

Volume 24

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NEW JERSEY**

NEWARK EDUCATION)	
WORKERS CAUCUS et al.,)	
)	
Plaintiffs,)	Case No. 2:18-cv-11025
)	
v.)	Judge Esther Salas
)	Magistrate Judge Cathy L. Waldor
CITY OF NEWARK et al.,)	
)	
Defendants.)	
)	

Declaration of Jeffrey K. Griffiths, M.D., M.P.H.&T.M.

I, Jeffrey K. Griffiths, do hereby affirm and state:

Introduction and Qualifications

1. I am a board-certified physician, having worked nationally and internationally on drinking water contamination, environmental health, and water-related health issues for more than thirty years. At present, I am Professor of Public Health and Medicine at Tufts University, where I have held a series of positions rising to Professor since 1988. At Tufts University, I hold joint appointments in Civil and Environmental Engineering at the School of Engineering and the Friedman School of Nutrition Science and Policy. I was also Director of the U.S. Agency for International Development Feed the Future Nutrition Lab for Africa. I previously served as the Director of Public Health programs at Tufts University from 2000 to 2005.

2. From November 1, 2009 to September 30, 2012, I served as Chair of the U.S. Environmental Protection Agency's Science Advisory Board's Drinking Water Committee. For three years prior, starting from November 1, 2006 to September 30, 2012, I was a member of the U.S. Environmental Protection Agency's Science Advisory Board. I also served on the National Drinking Water Advisory Council from 1998 to 2006. In these capacities, I served as a scientific advisor to the U.S. Environmental Protection Agency's drinking water program and reviewed scientific literature pertinent to the

impact of drinking water lead exposures on human health. I chaired the Science Advisory Board's meetings, and oversaw the report entitled Evaluation of the Effectiveness of Partial Lead Service Line Replacements, completed in September 2011. I also was a member of the National Research Council's Committee on Drinking Water Contaminants, a Division of the National Academies of Sciences, and helped to develop and write the 2001 Report, "Classifying Drinking Water Contaminants for Regulatory Consideration."

3. I graduated from Harvard College in 1977. In 1982, I received my medical degree from Albert Einstein College of Medicine, as well as my Masters in Public Health and Tropical Medicine from the Tulane University School of Public Health and Tropical Medicine in 1988, where I was the valedictorian and elected to Delta Omega Public Health honor society. I subsequently completed my two residencies in Internal Medicine and in Pediatrics at Yale-New Haven Hospital and undertook further post-doctoral scientific and medical training at the Harvard School of Public Health, and the Tufts-New England Medical Center.

4. I have authored more than 130 scientific research papers, including papers on the impact of drinking water contamination on the health of exposed populations and maternal health, often based on statistical analysis, primary research, and data collection.

5. In addition to my work with populations exposed to contaminated drinking water in the United States, I have worked and continue to work in Africa and South America on multiple projects related to drinking water contamination and environmental health. I lead multi-disciplinary teams addressing the public health policy implications of complex health problems.

6. I have extensively studied, researched, and written about the effects of drinking water contamination on human health. Through my research, clinical practice, teaching, professional memberships, educational training, and my knowledge of scientific literature, I have become a recognized expert, both within the United States and internationally, on drinking water contamination and associated health impacts.

7. A more complete description of my educational and work experience, as well as a list of my publications, is appended as Exhibit A-1 to this declaration.

8. The information set forth in this declaration is based upon my education, personal knowledge, and experience as well as my review of the literature and the documents attached as Exhibits [A - U].

Newark's Water System is in a State of Disrepair

9. I have reviewed several technical reports prepared by, or submitted to, the Newark Department of Water and Sewer Utilities (Newark

Water Department or system).¹ The reports commissioned by Newark paint a dire picture of the system's state of disrepair over the course of decades—dated and nonfunctioning equipment;² turbidity filters blanketed by a thick “surface crust;”³ failures to conduct routine instrument calibration and maintenance;⁴ poorly maintained communications systems;⁵ leaking drain valves;⁶ a feed system incompetent to apply the lime dosage necessary to adequately adjust the water's pH levels;⁷ and a rate of “unaccounted for” water loss of 33 percent—that is, a loss of about a third of the water flowing through the distribution system, likely through leaks due to exterior corrosion.⁸ The reports also document serial issues with the system's day-to-day operational

¹ CDM Smith, *Pequannock WTP Corrosion Control Review and Recommendations Draft, City of Newark Lead and Copper Rule Compliance Study, Newark, N.J.* (Oct. 10, 2018) (attached as Ex. A); H2M Associates Inc. et al., *City of Newark Department of Water & Sewer Utilities Division of Water Supply, Comprehensive Technical Assistance for the Pequannock Water Treatment Plant* (May 2016) (attached as Ex. B); Letter from Jim Meyerhofer, Senior Vice President, Carollo Engineers, Inc., to Michael Gelin, Asst. Dir., Newark Water Dep't (Apr. 29, 2016) (henceforth Carollo Study) (attached as Ex. C); Letter from Kareem Adeem, Asst. Dir., Newark Water Dep't, to Joseph J. Mattle, Supervisor, Bureau of Water Sys. Eng'g., N.J. Dep't Env'tl. Prot. (Nov. 8, 2018) (henceforth Corrosion Control Letter) (attached as Ex. D).

² H2M Associates Inc. et al., *supra* note 1, at ES-6 (Ex. B).

³ *Id.* at ES-2, 8-2.

⁴ *Id.* at ES-6.

⁵ *Id.* at 8-3.

⁶ *Id.* at 6-2.

⁷ CDM Smith, *supra* note 1, at 8-5 (Ex. A).

⁸ H2M Associates Inc. et al., *supra* note 1, at 2-17 (Ex. B).

management: an unlicensed superintendent;⁹ inadequate staff numbers;¹⁰ poor technological controls;¹¹ insufficient engineering expertise;¹² a “general disregard of a structured chain of command;”¹³ limited accountability;¹⁴ widespread “employee friction;”¹⁵ and deficient direct supervision and control “frequently resulting in unaccomplished required tasks.”¹⁶

10. I have also reviewed the Newark Water Department’s Safe Drinking Water Act violation history, as reported by the system to the U.S. Environmental Protection Agency.¹⁷ Newark has been cited for numerous violations of the Safe Drinking Water Act (Act). In addition to the Lead and Copper Rule violations alleged in this litigation, Newark has also been cited by the New Jersey Department of Environmental Protection for the following violations, among others: (1) numerous exceedances of maximum contaminant levels for Stage 2 Disinfectants and Disinfection Byproducts Rule

⁹ H2M Associates Inc. et al., *supra* note 1, at 11-21 (Ex. B).

¹⁰ *Id.* at 9-1.

¹¹ *Id.*

¹² *Id.*

¹³ *Id.* at 9-5.

¹⁴ *Id.*

¹⁵ *Id.* at 9-8.

¹⁶ *Id.* at 9-10.

¹⁷ U.S. Env’tl. Prot. Agency, Safe Drinking Water Info. Sys., *Water System Violation Report, Newark Water Department*, https://ofmpub.epa.gov/apex/sfdw/f?p=108:11:::NO:11,RIR:IREQ_PWSID:NJ0714001 (last accessed Jan. 30, 2019) (attached as Ex. E).

in 2015, 2016, and 2018; and (2) two consecutive violations of the requirement to comply with water filtration requirements under the Surface Water Treatment Rule and Interim Enhanced Surface Water Treatment Rule in 2018, and related monitoring violations in 2014.¹⁸

11. These violations have, in part, been caused by the poor operation and management of the Pequannock Plant.

The Pequannock Plant's Failures are Directly Linked to Newark's Failure to Control Corrosion of Lead Pipes

12. Newark has adjusted pH downwards in an attempt to address its Disinfection Byproducts violations, resulting in what has been described by a consulting company to Newark as "extreme" variations and abnormally low pH levels.¹⁹

13. Since at least 2015, the pH levels in Newark's water have fluctuated significantly. Between 2015 and 2018, pH levels in finished water leaving the Pequannock water treatment plant ranged from 6.0 to 8.8.²⁰ Over the two most recent years, however, finished water pH levels tended to range

¹⁸ N.J. Dep't Env'tl. Prot., Drinking Water Watch, Violations, https://www9.state.nj.us/DEP_WaterWatch_public/JSP/Violations.jsp?tinwsys=127 (last accessed Feb. 17, 2019).

¹⁹ CDM Smith, *supra* note 1, at 2-6 (Ex. A).

²⁰ *Id.*

from 6.5 to 7.5.²¹ A letter sent by the City of Newark to the New Jersey Department of Environmental Protection in November 2018 explains that extreme pH fluctuations at the Pequannock water treatment plant have been occurring over a period of several years, and happen unusually frequently:

. . . fluctuations experienced at the plant and across the system over the last few years are likely a result of operational issues at the Pequannock [water treatment plant] . . . This is evident from the historic daily, or even hourly, fluctuations experienced in pH at the Pequannock [water treatment plant point of entry] . . .²²

Extreme pH level variations also occur within Newark's distribution system, as one engineering report makes clear:

In the month of July 2018, daily pH at the Valley Road Rechlorination Station fluctuated between pH 6.29 and 7.65. This is an extreme variation in pH values over a 31-day period. Furthermore, the pH range throughout [Newark's] distribution system is even more extreme than the values measured at the distribution system [point of entry].²³

14. Since 2016, the system's average pH levels have declined, dropping to 7.1 in 2018.²⁴ Because the system's pH level remains unusually variable, the system's pH levels frequently dip below 6.²⁵ Low pH water is acidic water, and is corrosive to iron and lead pipes; therefore, Newark's

²¹ CDM Smith, *supra* note 1, at 2-6 (Ex. A).

²² Corrosion Control Letter, *supra* note 1, at 4 (Ex. D).

²³ CDM Smith, *supra* note 1, at 8-5 (Ex. A).

²⁴ *Id.* at 1-5.

²⁵ *Id.*

efforts to lower the system's pH levels have increased the corrosiveness of the system's water, and exacerbated the amount of lead released by the City's pipes and lead service lines into residents' drinking water.

Significant Upgrades Are Needed at the Pequannock Plant in Order to Achieve the Low, Stable pH that Would be Necessary to Avoid Future DBP Violations and Adequately Control Corrosion

15. In 2016, the City's consultant recommended that it take proactive steps to upgrade the Pequannock Plant. The plan recommended by the City's consultants to address the system's turbidity and disinfection violations constitutes a four-phase process, involving, among other things, installing new equipment and conducting refurbishments to the systems' turbidity filters.²⁶ Based on the documents I have reviewed, the City has not taken the steps necessary to complete those upgrades within the recommended timeline. pH variability will likely continue, with resulting inadequate corrosion control, until those adjustments are made.

Blood Lead Levels and Total Body Lead Burden

16. Lead is well established as a powerful neurotoxin with severe and irreparable effects on the human body, even at low levels. Digestive exposure to lead through drinking water is a known route of lead exposure. As drinking

²⁶ H2M Associates Inc. et al., *supra* note 1, at ES-10 (Ex. B).

water lead concentrations increase, water becomes an increasingly important source of lead exposure.²⁷ Drinking water may be the predominant source of exposure where water lead levels are high.

17. The human body accumulates lead over a lifetime, primarily in bones.²⁸ Blood serves as the initial receptacle of lead absorbed from drinking water. However, blood carries only a small fraction of the body's total lead burden. The half-life of lead in human blood is estimated to be about 28 days to 36 days; the lead is thereafter distributed throughout the body, to mineralizing and soft tissues and to the skeletal system.²⁹ Lead is deposited primarily in bones as the body mistakes it for calcium. It typically requires

²⁷ M.L. Miranda et al., *Changes in Blood Lead Levels Associated with Use of Chloramines in Water Treatment Systems*, 115 *Envtl. Health Persp.* 2, 221-5 (2007) (attached as Ex. F); M. Edwards et al., *Elevated Blood Lead in Young Children Due to Lead-Contaminated Drinking Water: Washington, DC, 2001-2004*, 43 *Envtl. Science & Tech.* 5, 1618-1623 (2009); R. Renner, *Out of Plumb: When Water Treatment Causes Lead Contamination*, 117 *Envtl. Health Persp.* 12, A542-A547 (2007).

²⁸ U.S. Dep't of Health & Hum. Servs., Agency for Toxic Substances and Disease Registry, *Lead Toxicity* (June 12, 2017), <https://www.atsdr.cdc.gov/csem/csem.asp?csem=34&po=9> (attached as Ex. G).

²⁹ T.B. Griffin et al., *Clinical Studies on Men Continuously Exposed to Airborne Particulate Lead*, in *Lead* 221-40 (Georg Thieme ed., 1975).

slightly over one year for children with blood levels greater than 10 micrograms per deciliter to decline to under 10 micrograms per deciliter.³⁰

Newark Children's Blood Lead Levels and Associated Harm

18. Notwithstanding the limitations of using blood lead levels to gauge cumulative lead exposure identified above, children's reported blood lead levels in Newark are strikingly high and indicate high recent exposure.

19. As the New Jersey Health Department recently noted, "Approximately 4,800 New Jersey children were identified with elevated blood lead levels (at or above 5 micrograms per deciliter) in 2016. About 13% of those children live in Newark, yet the city comprises only 3.8 percent of the state's children in that age group."³¹ Indeed, of Newark children screened in 2016, nearly a quarter of children under 6 years of age had blood lead levels of 3 to 4 micrograms per deciliter.³² In 2016, 5.3 percent of screened Newark children aged between 6 and 26 months tested at or above 5 micrograms per

³⁰ T. Dignam et al., *Reduction of Elevated Blood Lead Levels in Children in North Carolina and Vermont, 1996-1999*, 116 *Envtl. Health Persp.* 7, 981-5 (2008).

³¹ N.J. Dep't of Health, *Murphy Administration Committed to Reduce Childhood Lead Exposure* (Mar. 6, 2018), <https://www.nj.gov/health/news/2018/approved/20180306a.shtml> (attached as Ex. H).

³² Advocates for Children N.J., *Childhood Lead Exposure in Newark* 7 (2018), https://acnj.org/downloads/2018_03_27_newark_kids_count_childhood_lead_exposure.pdf (attached as Ex. I).

deciliter for lead in blood.³³ Further, 4.7 percent of children under age 6 tested at or above 5 micrograms per deciliter.³⁴ The percentage of Newark children at ages 6 to 26 months with blood lead levels at or above 5 micrograms per deciliter (5.3 percent) was more than twice as high as the percentage of children with elevated blood lead levels in the state of New Jersey overall (2.4 percent).³⁵

20. A substantial number of published, publicly available, and peer-reviewed studies document harm at these blood lead levels. Blood lead levels at 3 to 4 micrograms per deciliter are associated with significant health harms. Evidence of neurodegenerative, cardiovascular, renal, and reproductive effects at blood lead levels as low as 1 to 2 micrograms per deciliter have been summarized in the literature.³⁶ For children presenting with blood lead levels

³³ N.J. Dep't of Health, *Childhood Lead Exposure in New Jersey: Annual Report 16* (2016), <https://www.state.nj.us/health/childhoodlead/documents/reports/childhoodlead2016.pdf>.

³⁴ *Id.* at 20.

³⁵ N.J. Dep't of Health, *supra* note 33, at 14, 16.

³⁶ See, e.g., S.C. Cho et al., *Effect of Environmental Exposure to Lead And Tobacco Smoke on Inattentive and Hyperactive Symptoms and Neurocognitive Performance in Children*, 51 J. Child Psychol. Psychiatry, 1050-57 (2010); J.J. Fadowski et al., *Blood Lead Level and Kidney Function in U.S. Adolescents; The Third National Health and Nutrition Examination Survey*, 170 Archives of Internal Med. 1, 75-82 (2010); J.T. Nigg et al., *Confirmation and Extension of Association of Blood Lead with Attention-Deficit/Hyperactivity Disorder (ADHD) and ADHD Symptom Domains at Population-Typical Exposure Levels*, 51 J. Child Psychol. Psychiatry 1, 58-65 (2010); M.L. Miranda et al., *The Relationship between Early*

at 3 to 4 micrograms per deciliter, associated health harms include reduction of intelligence quotient and attention-related behaviors.³⁷

21. Research has also shown increased systolic blood pressure or risk of hypertension among environmental cohorts with average blood lead concentrations as low as 3 to 5 micrograms per deciliter.³⁸ A review of the epidemiological literature concluded that lead contributes to nephrotoxicity (kidney toxicity) at blood lead levels below 5 micrograms per deciliter; this is particularly true in susceptible populations, such as those with hypertension, diabetes and chronic kidney disease.³⁹

22. The impacts of blood lead levels at 5 micrograms per deciliter on societal cognitive resources and intellectual deficits are well-documented.

Childhood Blood Lead Levels and Performance on End-of-Grade Tests, 115 *Envtl. Health Persp.* 8, 1242–1247 (2007) (attached as Ex. J).

³⁷ See, e.g., R. Nicolescu et al., *Environmental Exposure to Lead, But Not Other Neurotoxic Metals, Relates to Core Elements of ADHD in Romanian Children: Performance and Questionnaire Data*, *Envtl. Res.* 110, 476–483 (2010); J.T. Nigg et al., *Low Blood Lead Levels Associated with Clinically Diagnosed Attention-Deficit/Hyperactivity Disorder and Mediated by Weak Cognitive Control*, 63 *Biol. Psychiatry* 3, 325–341 (2010); B.P. Lanphear et al., *Cognitive Deficits Associated with Blood Lead Concentrations <10 ug/dL in US Children and Adolescents*, 115 *Pub. Health Rep.*, 521–9 (2000) (attached as Ex. K).

³⁸ D. Martin et al., *Association of Blood Lead and Tibia Lead with Blood Pressure and Hypertension in a Community Sample of Older Adults*, 163 *Am. J. Epidemiol.*, 467–478 (2006); S. Vupputuri et al., *Blood Lead Level Is Associated With Elevated Blood Pressure in Blacks*, 41 *Hypertension*, 463–468 (2003).

³⁹ E.B. Ekong et al., *Lead-Related Nephrotoxicity: A Review of The Epidemiologic Evidence*, 70 *Kidney Int.*, 2074–2084 (2006) (attached as Ex. L).

Children who have blood lead concentrations over 5 micrograms per deciliter experience, on average, a lead-associated IQ deficit of 6.1 points.⁴⁰ These blood lead levels have been known to result in long-lasting, permanent damage to children's developing brains.⁴¹ Lead exposure also leads to attention deficit hyperactivity disorder and may lead to antisocial behavior.⁴²

Newark's Water Lead Levels and Associated Blood Lead Level Increase

23. There is substantial and compelling scientific evidence indicating a probable link between Newark's high blood lead levels and Newark's high drinking water lead levels. A large number of studies of exposure to lead through drinking water have reported strong associations with increased blood lead levels.

24. I have reviewed the water lead level data reported on the New Jersey Drinking Water Watch System for the Newark Department of Water and Sewer Utilities. I observed that Newark's 90th percentile lead levels

⁴⁰ Am. Acad. of Pediatrics, *Prevention of Childhood Lead Toxicity*, 138 Pediatrics 1, 4 (2016) (attached as Ex. M).

⁴¹ M.O. Min et al., *Cognitive Development and Low-Level Lead Exposure in Poly-Drug Exposed Children*, 31 Neurotoxicol. Teratol. 4, 225-231 (2009); L.M. Chiodo, *Blood Lead Levels and Specific Attention Effects in Young Children*, 2 Neurotoxicol. Teratol., 538-546 (2007).

⁴² David C. Bellinger, *Very Low Lead Exposures and Children's Neurodevelopment*, 20 Current Op. Pediatrics 2, 172-177 (2008) (attached as Ex. N).

exceeded 26.7 parts per billion (ppb) in two consecutive monitoring periods in 2017. Scores of homes have tested above 30 ppb in the past eighteen months; several homes have tested above 50 ppb and some homes exceeded 100 ppb. The 90th percentile lead level at the close of the 2018 monitoring period reached 42.9 ppb. As of the date of this writing, Newark's reported 90th percentile lead levels for the monitoring period still in progress had reached 74.4 ppb. To my knowledge, this most recent 90th percentile lead level is among the highest reported by a large water system in recent years. By way of comparison, in Flint, Michigan, independent testing demonstrated the 90th percentile value of lead in drinking water to be about 25 ppb during the peak of the city's lead crisis, in 2015.⁴³

25. I have also reviewed a recent report prepared by Newark's consultant, CDM Smith, discussing lead contamination issues in the Wanaque service area.⁴⁴ Of seven homes that were sampled sequentially within the Wanaque service area, three showed extremely high levels of lead, reaching

⁴³ It is difficult, however, to draw comparisons between drinking water sampling results in two different cities, particularly where different methodologies may have been used. Samples collected by researchers in the Flint Water Study were not limited to "Tier 1" homes that, under the Lead and Copper Rule, are most likely to show lead. However, I observe that many of the sampling results reported by Newark are customer requests, which similarly may not be taken from "Tier 1" homes.

⁴⁴ CDM Smith, Wanaque Service Area Report, Feb. 1, 2019 (attached as Ex. O).

maximums of 185 ppb, 52.4 ppb, and 58.2 ppb, respectively.⁴⁵ These high lead results are consistent with elevated lead levels previously reported in the Wanaque service area; since 2017, homes within the Wanaque service area have tested as high as 182 ppb, 84 ppb, 70.6 ppb, and 25.9 ppb, under the City's regular testing and reporting obligations.⁴⁶

26. Being exposed to drinking water with these lead concentrations is likely to increase children's blood lead levels by a large factor: in a dose-response relationship for children aged between 1 to 5 years, for example, every 1 ppb increase in water lead levels will result in a corresponding blood lead level increase of 35 percent after 150 days of exposure.⁴⁷ Similarly, a study conducted on children between 0.5 to 2 years of age demonstrated that drinking water lead level variations corresponding to an average concentration increase of 6.55 ppb for homes served by lead service lines, and an average concentration increase of 0.3 ppb for homes without lead service lines,

⁴⁵ CDM Smith, *supra* note 44.

⁴⁶ Wanaque Sampling Results Jan. 2017 through Oct. 2018 (attached as Ex. P).

⁴⁷ G. Ngueta et al., *Use of a Cumulative Exposure Index to Estimate the Impact of Tap Water Lead Concentration on Blood Lead Levels in 1-to 5-Year-Old Children (Montréal, Canada)*, 124 *Envtl. Health Persp.* 3 (2016). For modelling, Ngueta et al. consider a 50 percent gastrointestinal absorption rate; they assume that children consume on a daily basis 80 percent of stagnant water and 20 percent of flushed water. They also find that "a child's blood lead level will increase by an amount 1.10 times greater than a corresponding increase in the cumulative lead concentration ingested via drinking water."

quadrupled the number of children presenting with elevated blood lead levels, above 5 micrograms per deciliter.⁴⁸

27. The severity of the lead-contamination in Newark drinking water—in both the Pequannock service area and the Wanaque service area—is such that Newark water lead levels are likely to contribute to blood lead level increase among Newark children across the City. A compelling array of scientific studies have confirmed a positive correlation between drinking water lead levels and blood lead levels in the exposed population.⁴⁹ The overwhelming weight of the scientific evidence indicates that lead exposure through drinking water, at levels reflected in both the Pequannock and

⁴⁸ Gerard Ngueta et al., *Exposure of Young Children to Household Water Lead in The Montreal Area (Canada): The Potential Influence of Winter-To-Summer Changes in Water Lead Levels on Children's Blood Lead Concentration*, 73 *Envtl. Int.*, 57-65 (2014) (attached as Ex. Q).

⁴⁹ See, e.g., M. Hanna-Attisha et al., *Elevated Blood Lead Levels in Children Associated With the Flint Drinking Water Crisis: A Spatial Analysis of Risk and Public Health Response*, 106 *Am. J. Public Health* 2 (2016): 283-290 (attached as Ex. R); Patrick Levallois et al., *The Impact of Drinking Water, Indoor Dust and Paint on Blood Lead Levels of Children Aged 1–5 Years in Montréal (Québec, Canada)*, 24 *J. Exposure Science & Env'tl. Epidemiology* 2, 185-91 (2014); Marc Edwards, *Fetal Death and Reduced Birth Rates Associated with Exposure to Lead Contaminated Drinking Water*, 48 *Env'tl. Science & Tech.* 1, 739-46 (2014) (attached as Ex. S); Simoni Triantafyllidou et al., *Lead (Pb) in Tap Water and in Blood: Implications for Lead Exposure in the United States*, 42 *Critical Reviews in Env'tl. Science & Tech.* 13, 1297-1352 (2012) (attached as Ex. T); Bruce P. Lanphear et al., *Env'tl. Lead Exposure During Early Childhood*, 140 *J. Pediatrics*, 40-47 (2002) (attached as Ex. U).

Wanaque service areas in Newark, is a statistically significant contributor to elevated blood lead levels.

28. Young children and infants are among the most lead-sensitive population groups and among those at greatest risk of harm from ingestion of lead-contaminated drinking water in Newark. Researchers have reported that infants who were fed formula with 70 ppb lead had blood lead levels that spiked to an average of 14.4 micrograms per deciliter within a few months.⁵⁰ When the formula contained 10 ppb lead, the children's blood lead levels were at an average of 7.2 micrograms per deciliter.⁵¹ Infants and young children are believed to absorb about 50 percent of ingested water-soluble lead.⁵²

29. There is an established scientific consensus that increased drinking water lead levels contribute to elevated blood lead levels and that even low levels of lead in blood cause significant harm to human health. This substantial body of scientific evidence compels me to conclude that it is indisputable that Newark drinking water lead levels in both the Pequannock and Wanaque

⁵⁰ Rebecca Renner, *Exposure on Tap: Drinking Water as an Overlooked Source of Lead*, 118 Env'tl. Health Persp. 2, A68-A74 (2010).

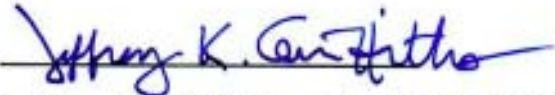
⁵¹ *Id.*

⁵² U.S. Dep't of Health & Hum. Servs., Agency for Toxic Substances and Disease Registry (2007), Toxicological Profile for Lead, <http://www.atsdr.cdc.gov/toxprofiles/tp13.pdf>.

service areas are likely causing severe and irreversible harm to Newark residents and particularly to children.

30. Mitigating exposure to lead in drinking water is necessary to prevent further harm to Newark residents.

I declare under penalty of perjury that the foregoing is true and correct.


Jeffrey K. Griffiths, M.D., M.P.H.&T.M.

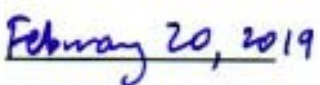

Date

Exhibit A-1

Jeffrey K. Griffiths AB MD MPH&TM

CURRENT POSITION TITLES

Professor of Public Health & Community Medicine; Professor, Division of Geographic Medicine and Infectious Diseases, Department of Medicine; Tufts University School of Medicine

Adjunct Professor of: Environmental Engineering, Tufts University School of Engineering; Nutrition, Tufts Friedman School of Nutrition Science and Policy; and Biomedical Sciences, Tufts Cummings School of Veterinary Medicine

Track Leader, MS in Sustainable Water Management, Tufts Institute of the Environment

Attending Physician, Infectious Diseases, Tufts Medical Center

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EDUCATION

Undergraduate

1977 AB Harvard College, Cambridge MA (Chemistry)

Medical and Graduate School

1982 MD Albert Einstein College of Medicine, Bronx NY

1982 MPH&TM Tulane University School of Public Health and Tropical Medicine, New Orleans, LA
(Master of Public Health and Tropical Medicine)

POSTDOCTORAL TRAINING

1982-1984	Internal Medicine	Intern and Resident, Department of Internal Medicine Yale-New Haven Hospital, New Haven, CT
1984-1986	Pediatrics	Intern and Resident, Department of Pediatrics Yale-New Haven Hospital, New Haven, CT
1986-1988	Tropical Public Health	Department of Tropical Public Health Harvard School of Public Health, Boston MA
1988-1991	Geographic Medicine and Infectious Diseases	Department of Medicine, Tufts-New England Medical Center, Boston MA (now Tufts Medical Center, Boston MA)

LICENSURE AND CERTIFICATIONS

- 1984 National Board of Medical Examiners (NBME)
- 1985 Connecticut Licensure in Medicine
- 1986 Massachusetts Licensure in Medicine
- 1987 Diplomate, American Board of Internal Medicine (ABIM)
- 1987 Diplomate, American Board of Pediatrics
- 1989 Govt. of Bangladesh Licensure in Medicine
- 1992 Diplomate, Sub-specialty Board in Infectious Diseases, ABIM
- 2000 Certificate of Knowledge in Clinical Tropical Medicine and Travelers' Health - CTropMed
- Commonwealth of Massachusetts Physician License 56966 expiration 05/06/2019

ACADEMIC APPOINTMENTS

- 1981-1982 Fellow in Tropical Nutrition, Department of Tropical Medicine, Tulane University
School of Public Health & Tropical Medicine
- 1982-1984 Instructor, Department of Medicine, Yale University School of Medicine
- 1984-1986 Instructor, Dept. of Pediatrics, Yale University School of Medicine
- 1986-1988 Instructor, Dept. of Tropical Public Health, Harvard School of Public Health
- 1986-1988 Instructor, Dept. of Medicine, Brigham and Women's Hospital
- 1988-1991 Instructor, Dept. of Medicine, Tufts University School of Medicine
- 1988-1989 Research Fellow, International Center for Diarrheal Diseases, Dhaka Bangladesh
- 1991-1999 Assistant Professor of Medicine, Tufts University School of Medicine
- 1991-1999 Assistant Professor of Biomedical Sciences, Tufts University School of Veterinary
Medicine
- 1991-1994 Consultant, the Applied Diarrheal Diseases Research Project, Harvard University
Institute for International Development
- 1997-1999 Assistant Professor of Family Medicine and Community Health, Tufts University
School of Medicine
- 1998-2000 Director, MD/MPH and DVM/MPH Tracks, Graduate Programs in Public Health,
Tufts University School of Medicine
- 1999- Associate Professor of Family Medicine and Community Health, Tufts University School
of Medicine
- 1999- Associate Professor of Medicine, Tufts University School of Medicine
- 2000-2004 Director, Graduate Programs in Public Health, Tufts University School of Medicine
- 2005- Director, Global Health, Department of Family Medicine and Community Health,
Tufts University School of Medicine
- 2006-2008 Global Health Concentration Leader, MPH Program, Department of Family Medicine
and Community Health, Tufts University School of Medicine
- 2007- Associate Professor, Friedman School of Nutrition Science and Policy
- 2007- Associate Professor, Civil and Environmental Engineering, Tufts University
School of Engineering
- 2009- Associate Professor of Biomedical Sciences, Cummings School of Veterinary
Medicine at Tufts University
- 2011- Professor of Medicine, and of Public Health and Community Medicine, TUSM

HOSPITAL APPOINTMENTS

1982-1984	Resident Physician, Department of Medicine, Yale-New Haven Hospital
1984-1986	Resident Physician, Department of Pediatrics, Yale-New Haven Hospital
1986-1988	Research Fellow, Department of Medicine, Brigham and Women's Hospital
1988-1991	Research and Clinical Fellow, Department of Medicine, Tufts-New England Medical Center
1991-2009	Attending Physician, St. Elizabeth's Medical Center of Boston
1991-1997	Director of Microbiology and Serology Laboratory, St. Elizabeth's Medical Center of Boston
1991-1997	Director, Traveler's Clinic, St. Elizabeth's Medical Center of Boston
1995-2015	Physician, Carney Hospital of Boston
1999-2015	Physician, Quincy Medical Center
1999-	Physician, Tufts Medical Center

AWARDS AND HONORS

- Zucker Family Research Prize, Tufts University School of Medicine, 2015
- Excellence in Teaching Award, graduating MD/MPH students, 2009
- International Professor, American Society of Microbiology, 2008
- Fellow of the American Academy of Pediatrics, 1991.
- Massachusetts Infectious Diseases Society Kass Award for Clinical Excellence in Infectious Diseases, 1990.
- Delta Omega National Public Health Honor Society, 1982. (In academic 2001-2002, began the Alpha Rho chapter of Delta Omega Public Health Honor Society at Tufts).
- MD granted with "special distinction" for research in tropical medicine, Albert Einstein College of Medicine, 1982.
- Valedictorian and Recipient of Dean's Academic Award, Tulane Univ. School of Public Health and Tropical Medicine, 1982.
- National Merit Scholar, 1973

NATIONAL COMMITTEES AND ADVISORY GROUPS

- Global Food Safety Partnership – Aflatoxin Steering Committee (coordinated by World Bank) 2014-
- Chair, Innovation Lab Council, USAID (2013-2014)
- Chair, Drinking Water Panel, Science Advisory Board, US EPA, 2009-2012
- Chartered Science Advisory Board of US EPA, 2006-2012
- NIH College of the Center for Scientific Review (for senior NIH reviewers), 2010-
- Report of the Environment Committee, Science Advisory Board, US EPA, 2009-2010
- Liaison, Science Advisory Board to the National Drinking Water Council, US EPA, 2008-2010
- Drinking Water Panel, Science Advisory Board, US EPA (2003-2012)
- Environmental Engineering Panel, Science Advisory Board, US EPA 2010-2012
- *Ad hoc* panel convened by the Science Advisory Board to advise the US EPA Administrator on Hydraulic Fracturing for Natural Gas and Water Contamination (2010)

- NIH Study Section Reviewer (2001-2005 Epidemiology of Clinical Disorders and Aging; currently *ad hoc* reviewer for Fogarty International Center)
- Member, National Drinking Water Advisory Council of the EPA (1998-2007; three terms)
- Member, Data Safety Monitoring Board of the National Institutes of Health, for International Training and Research Program in Emerging Infectious Diseases (2000-2006)
- Member, National Academies' Committee on Drinking Water Contaminants (1999-2001)
- Member, Public Interest Advisory Forum, American Water Works Association (1999-2005), Public Health Subgroup
- Federal representative for the National Association of People with AIDS (NAPWA) to the EPA Drinking Water Microbial Disinfection and Byproducts Committee, 1997-2000.
- Member, AIDS Clinical Trials Group (ACTG) Focus Group on Enteric Pathogens, 1998-.
- Member, AIDS Clinical Trials Group (ACTG) Focus Group on Microsporidiosis and Cryptosporidiosis, 1996-1998; Consultant to ACTG 336, A Phase II/III Placebo-controlled study of Nitazoxanide (NTZ) for persons with AIDS and Cryptosporidiosis.

U.S. CONGRESSIONAL TESTIMONY:

- **July 12, 2011. US Senate Committee on Environment and Public Works.** Testified on the US EPA's Office of Drinking Water's regulation of water contaminants.
- **December 8, 2009. US Senate Committee on Environment and Public Works.** I testified on the failure of US water supplies to provide water without contaminants such as lead and the need for a new paradigm regarding the protection of source water, water treatment, and accountability.
- **April 7, 2006. US Senate oversight hearing on the provision of contaminated water by Halliburton to US military personnel in Iraq.** I testified on the medical consequences to US armed services members of ingesting or washing with contaminated water.

Other Public Communication:

Griffiths, JK. Don't Drink the Sewage. Editorial Opinion Piece: Boston Globe, May 18 2005.

MASSIVE OPEN ONLINE COURSES (MOOCs):

The Biology of Water and Health – Fundamentals.

<https://www.edx.org/course/biology-water-health-fundamentals-oecx-ph241x-0>

The Biology of Water and Health – Sustainable Interventions

<https://www.edx.org/course/biology-water-health-sustainable-oecx-ph242x>

TRAINING OF GRADUATE STUDENTS/POST DOCTORAL STUDENTS

Clinical Training: I have taught post-doctoral clinical infectious diseases fellows since 1991 through the Tufts Medical Center Division of Geographic Medicine and Infectious Diseases. This has included clinical (bedside) teaching, conferences, lectures, and didactic sessions.

Similarly, I have taught resident physicians in the Tufts system (at Tufts Medical Center, St. Elizabeth's Medical Center, and the Shattuck Hospital) since 1988.

Masters and Doctoral Students: The Department of Public Health and Community Medicine (and its predecessor named Family Medicine and Community Health) does not have a doctoral program. A list of prior masters degree students can be provided. I have served on the doctoral committees for:

Nina Fefferman	PhD	Department of Biology, Tufts Arts & Sciences
Meera Chhagan	PhD	Friedman School of Nutrition Science and Policy
Jonathan Lautze	PhD	Tufts School of Engineering
Siobhan Mor	PhD	Cummings School of Veterinary Medicine (Chair)
Jyotsna Jagai	PhD	Friedman School of Nutrition Science and Policy
Geogia Kayser	PhD	Fletcher School
Antarpreet Jutla	PhD	Tufts School of Engineering
Jacqueline Lauer	PhD	Friedman School of Nutrition Science and Policy

PROFESSIONAL SOCIETIES

American Public Health Association
 American Society for Microbiology
 American Society of Tropical Medicine and Hygiene
 Infectious Diseases Society of America
 International Society for Environmental Epidemiology
 Massachusetts Medical Society

RESEARCH FUNDING

Principal sources of funding have been NIH, USAID, and the Gates Foundation.

EDITOR, EDITORIAL BOARDS and REVIEWER ACTIVITY:

Encyclopedias:

Co-Section Editor with Dr. Davidson Hamer, 'Communicable Diseases,' Elsevier International Encyclopedia of Public Health, 8th edition (2006-2008)

Co-Editor with Dr. Davidson Hamer and Dr. Jamie Maguire, 'Infectious Diseases and Public Health,' published March 2010.

Co-Editor with Dr. Davidson Hamer and Dr. Jamie Maguire, 'Infectious Diseases and Public Health,' second edition, to be published March 2015

Journals:

Associate Editor, Annals of Tropical Medicine and Parasitology (2010-) (Liverpool, UK)
Journal of Clinical Microbiology, Editorial Board (1998 –2006)
Current Opinion in Infectious Diseases, Parasitology Section Editor (1998-2000)

Reviewer for (Journals and Institutions):

American Journal of Tropical Medicine and Hygiene
American Journal of Clinical Nutrition
AIDS Journal
Antimicrobial Agents and Chemotherapy
Biochimica et Biophysica Acta
Biosecurity and Bioterrorism
Clinical Infectious Diseases
Cytokine
Emerging Infectious Diseases
European Journal of Clinical Microbiology and Infectious Diseases
Gastroenterology
Infection and Immunity
Infectious Diseases in Clinical Practice
Journal of AIDS
Journal of Clinical Microbiology
Journal of Infectious Diseases
Journal of Pediatrics
Lancet
National Institutes of Health
Pediatrics
Proceedings of the National Academy of Sciences
Alfred P. Sloan Foundation
United States Department of Agriculture
United States Environmental Protection Agency
United States Geological Service
Wellcome Trust

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SELECTED BIBLIOGRAPHY

IN REVIEW:

Griffiths, JK, Stopka TJ, Naumova EN. 2018. Epidemic Legionellosis in Flint and Genessee County, Michigan During 2014 and 2015 was Related to a Concurrent Change in Flint Drinking Water.

PEER REVIEWED PAPERS:

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1. Lauer JM, Duggan CP, Ausman LM, **Griffiths JK**, Webb P, Agaba E, Nshakira N, Tran HQ, Gewirtz AT, Ghosh S. 2018. Biomarkers of maternal environmental enteric dysfunction are associated with shorter gestation and reduced length in newborn infants in Uganda. *American Journal of Clinical Nutrition* 2018 Sep 21. doi: 10.1093/ajcn/nqy176. [Epub ahead of print]
 2. Lauer JM, Duggan CP, Ausman LM, **Griffiths JK**, Webb P, Wang JS, Xue KS, Agaba E, Nshakira N, Ghosh S. 2018. Association between maternal aflatoxin exposure during pregnancy and adverse birth outcomes in Uganda. *Maternal and Child Nutrition* 2018 Sep 22:e12701. doi: 10.1111/mcn.12701. [Epub ahead of print]
 3. Mokhtar RR, Holick MF, Sempértegui F, **Griffiths JK**, Estrella B, Moore LL, Fox MP, Hamer DH. 2018. Vitamin D status is associated with underweight and stunting in children aged 6-36 months residing in the Ecuadorian Andes. *Public Health Nutr.* 2018 Aug;21(11):1974-1985. doi: 10.1017/S1368980017002816. Epub 2017 Nov 22. PMID: 29162164
 4. Mor SM, Ascolillo LR, Nakato R, Ndeezi G, Tumwine JK, Okwera A, Sponseller JK, Tzipori S, **Griffiths JK**. Expectoration of *Cryptosporidium* Parasites in Sputum of Human Immunodeficiency Virus-Positive and -Negative Adults. *American Journal of Tropical Medicine and Hygiene* 2018 Apr;98(4):1086-1090. doi: 10.4269/ajtmh.17-0741.
 5. Widen EM, Collins SM, Khan H, Biribawa C, Acidri D, Achoko W, Achola H, Ghosh S, **Griffiths JK**, Young SL. 2017. Food insecurity, but not HIV-infection status, is associated with adverse changes in body composition during lactation in Ugandan women of mixed HIV status. *Am J Clin Nutr.* 2017 Feb;105(2):361-368. doi: 10.3945/ajcn.116.142513. PMID: 28052888
 6. Natamba BK, Mehta S, Achan J, Stoltzfus RJ, **Griffiths JK**, Young SL. 2017. The association between food insecurity and depressive symptoms severity among pregnant women differs by social support category: a cross-sectional study. *Matern Child Nutr.* 2017 Jul;13(3). doi: 10.1111/mcn.12351. PMID: 27507230
 7. Kulinkina AV, Kosinski KC, Plummer JD, Durant JL, Bosompem KM, Adjei MN, **Griffiths JK**, Gute DM, Naumova EN. 2017. Indicators of improved water access in the context of schistosomiasis transmission in rural Eastern Region, Ghana. *Sci Total Environ.* 2017 Feb 1;579:1745-1755. doi: 10.1016/j.scitotenv.2016.11.140. Epub 2016 Dec 6. PMID: 27939198
 8. Agaba E, Pomeroy-Stevens A, Ghosh S, **Griffiths JK**. 2016. Assessing Progress in

Implementing Uganda's Nutrition Action Plan: District-Level Insights. Food Nutr Bull. 2016 Dec;37(4 suppl):S142-S150. PMID: 27909259

9. Naumova EN, Liss A, Jagai JS, Behlau I, **Griffiths JK**. 2016. Hospitalizations due to selected infections caused by opportunistic premise plumbing pathogens (OPPP) and reported drug resistance in the United States older adult population in 1991-2006. J Public Health Policy (2016) doi:10.1057/s41271-016-0038-8
10. Miller LC, Joshi N, Lohani M, Singh R, Bhatta N, Rogers B, **Griffiths JK**, Ghosh S, Mahato S, Singh P, Webb P. Head growth of undernourished children in rural Nepal: Association with demographics, health and diet. Paediatr Int Child Health. 2016 Jan 29;PubMed PMID: [27077633](#).
11. Natamba BK, Kilama H, Arbach A, Achan J, **Griffiths JK**, Young SL. Reliability and validity of an individually focused food insecurity access scale for assessing inadequate access to food among pregnant Ugandan women of mixed HIV status. Public Health Nutr. 2015 Nov;18(16):2895-905. PubMed PMID: [25171462](#).
12. Natamba BK, Achan J, Arbach A, Cyok TO, Ghosh S, Mehta S, Stolfus RJ, **Griffiths JK**, Young SL. 2014. Reliability and Validity of the Center for Epidemiologic Studies-Depression Scale in Screening for Depression among HIV-Infected and –Uninfected Pregnant Women Attending Antenatal Services in Northern Uganda: A Cross-Sectional Study. BMC Psychiatry Nov 22; 14(1):303. Epub ahead of print.
13. Checkley W, White AC Jr, Jaganath D, Arrowood MJ, Chlamers RM, Chen S-M, Fayer R, **Griffiths JK**, Guerrant RL, Hedstrom L, Huston C, Kotloff KL, Kang G, Mead JR, Miller M, Petri W Jr, Priest JW, Roos DS, Stripen B, Thompson RCA, Ward HD, Van Voorhis W, Xiao L, Zhu G, Hout R. 2014. A Review of the Global Burden, Novel Diagnostics, Therapeutics and Vaccine Targets for Cryptosporidiosis. Lancet Infectious Diseases.
14. Sponseller J, **Griffiths JK**, Tzipori S. The Evolution of Respiratory Cryptosporidiosis: Evidence for Transmission by Inhalation. Clinical Microbiology Reviews.
15. Kayser GL, Moomaw W, Orellana Portillo JM, **Griffiths JK**. 2014. Circuit-Rider post-construction support: Improvements in domestic water quality and system sustainability in El Salvador. J Water, Sanitation and Hygiene for Development.
16. Kabunga N, Ghosh S, **Griffiths JK**. 2014. Can Smallholder Fruit and Vegetable Production Systems Improve Household Food Security and Maternal Nutrition Outcomes? Evidence from Rural Uganda. IFPRI Discussion Paper 01346, April 2014. [This working paper has been internally peer reviewed at IFPRI and will be submitted to a journal for publication]. <http://www.ifpri.org/sites/default/files/publications/ifpridp01346.pdf>
17. Masters W, Webb P, **Griffiths JK**, Deckelbaum R. 2014. Agriculture, Nutrition and Health in Global Development: Integrated Intervention Designs Call for Integrated Research Methods. *In press, Annals of the New York Academy of Sciences*.doi:10.1111/nyas.12352 (published online

26 Feb 2014). PMID 24571283.

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19. Khan WA, **Griffiths JK**, Bennish ML. 2013. Gastrointestinal and extra-intestinal manifestations of childhood shigellosis in a region where all four species of *Shigella* are endemic. *PLoS One* May 17;8(5):e64097. PMC 3656950.
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21. Harris, AM, Sempértegui F, Estrella B, Narváez X, Egas J, Woodin M, Durant JL, Naumova EN, **Griffiths JK**. 2011. Air pollution and anemia as risk factors for pneumonia in Ecuadorian children. *Environmental Health* 2011 Nov 3; 10:93 PMID 22050924
22. Jutla AS, Akanda AS, **Griffiths JK**, Islam S, Colwell R. 2011. Warming oceans, phytoplankton, and river discharge: Implications for cholera outbreaks. *Am J Trop Med Hyg* 85:303-308. PMID 21813852
23. Chui KKH, Jagai JS, **Griffiths JK**, Naumova EN. 2011. Hospitalizations due to non-specific gastroenteritis: a search for etiologic clues. *Am J Pub Health* November 2011, Vol. 101, No. 11, pp. 2082-2086. PMID 21653903
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26. Mor, SM, Tumwine J, Ndeezi G, Mahesprathi R, Kaddu-Mwalindwa DH, Tzipori S, **Griffiths JK**. 2010. Respiratory cryptosporidiosis in HIV-seronegative children, Uganda: potential for respiratory transmission. *Clinical Infectious Diseases* 2010; 50(10):1366-1372.
27. Jagai, JS, **Griffiths JK**, Kirshen, PH, Webb P, Naumova EN. 2010. Patterns of Protozoan Infections: Spatiotemporal Associations with Cattle Density. *Ecohealth*. 2010 Aug;7(1):33-46. Epub 2010 Mar 13
28. Egorov AI, Montuori Trimble LM, Ascolillo L, Ward H, Levy D, Morris RM, Naumova EN, **Griffiths JK**. 2010. Recent diarrhea is associated with elevated salivary IgG responses to *Cryptosporidium* in residents of an Eastern Massachusetts community. *Infection*. 38(2):117-123.

Epub 2010 March 26, 2010.

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immunocompetent mice with acid-water-pretreated *Cryptosporidium parvum* results in weight loss, and intestinal and (structural and physiological) alternations. *Parasitology Research* 102:457-463.

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50. *Classifying Drinking Water Contaminants for Regulatory Consideration*. 2001. Committee on Drinking Water Contaminants, Water Science and Technology Board, National Research Council of the National Academies of the USA. National Academy Press, Washington DC.
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CHAPTERS, INVITED REVIEWS, COMMENTARIES

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3. **Griffiths JK**, Barza M. 2014. Editorial Commentary: what happens in hospitals should stay in hospitals. *Clin Infect Dis* 2014 Jun 15;58(12):1666-7. doi: 10.1093/cid/ciu194. Epub 2014 May PMID: 24795327
4. **Griffiths, JK**. 2013. Vitamins. *In*: Hunter's Tropical Medicine, 9th edition. Edited by Magill, Maguire, Ryan, and Solomon. Academic Press, Elsevier. Linacre House, Oxford UK. 2013.
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8. Hamer, DH, and **Griffiths JK**. 2010. Introduction. Public Health and Infectious Diseases. Edited by D Hamer, JK Griffiths, JM Maguire, HK Heggenhougen, and SR Quah. Academic Press, Elsevier. Linacre House, Oxford UK.
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10. **Griffiths, JK.** 2009. Manure Pathogens and Their Effects on Humans. *In: Manure, Manure Pathogens, Regulations, and Water Quality Protection.* Edited by Dwight D. Bowman. Water Environment Federation Press, published for WEFPress by McGraw-Hill.
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12. **Griffiths, JK,** Winant EH. 2007. Environmental Health in the Global Context. *In: Global Health and Medicine*, edited by William Markle, Melanie Fisher, and Raymond Smego, Jr. McGraw-Hill Lange, p. 384-401.
13. **Griffiths JK.** 2004. Exotic and Trendy Cuisine. *In: Infections of Leisure*, Ed. D. Schlossberg. Third edition. American Society for Microbiology, Washington, DC.
14. **Griffiths, JK.** Protecting Sensitive Subpopulations. *In: Drinking Water Regulation and Health* (edited, Frederick W. Pontius), John Wiley & Sons; NY, NY. 2003
15. Bowman DD, **Griffiths JK.** (2000). Larval toxocariasis. *Current Treatment Options in Infectious Diseases* **2**:70-77.
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17. **Griffiths JK.** (1999). Exotic and Trendy Cuisine. *In: Infections of Leisure*, Ed. D. Schlossberg. Second edition. American Society for Microbiology, Washington, DC.
18. **Griffiths JK,** Morris RM. (1998). Seroepidemiology – the Key to Crypto Surveillance. (Viewpoint). *J AWWA* **90**:8.
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22. **Griffiths JK.** How humbling to understand so little: the importance of a rare observation. (*Commentary on: AIDS-Associated Cryptosporidiosis Presenting with Pneumatosis Intestinalis*). *Infectious Diseases in Clinical Practice* **6**, 54-56 (1997).
23. **Griffiths JK,** Tzipori SR. 1995. Cryptosporidiosis and Microsporidiosis: Emerging Diarrheal

Pathogens (*Cryptosporidium* y *Microsporidia* emergiendo como patógenos en diarrea).
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24. **Griffiths JK**. 1995. Commentary: Tuberculous Otitis Media in AIDS. *Infectious Diseases in Clinical Practice* **4**:70-71.
25. **Griffiths JK**, Snyderman DR. 1994. Anaerobic Pleuropulmonary Infections: Aspiration, Pneumonia, Abscess, and Empyema. In: Respiratory Infections: A Scientific Basis for Management. Ed: Niederman MS, Sarosi GA, Glassroth J. W.B. Saunders Co., Philadelphia, PA. pp. 345-358. 1994.
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28. Keusch GT, **Griffiths JK**. Cholera. 1993. In: *Gellis and Kagan's Current Pediatric Therapy*, 14th edition, Ed: FD Burg. W.B. Saunders Company, Philadelphia PA. pp 634-636.
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33. **Griffiths JK**, Keusch GT. 1992. *Shigellae*. In: *Roitt's Handbook of Immunology*, Third Edition. Ed: IM Roitt and PJ Delves. pp. 1371-1373.
34. **Griffiths JK**, Snyderman DR. 1992. The Use of Intravenous Immune Globulin in Viral Infections. Intravenous Immune Globulin in Infections. Ed: YP Yap. pp. 167-201.
35. **Griffiths JK**, Snyderman DR. 1992. Serum Therapy and Augmentation of the Host Response. In: Infectious Diseases in Medicine and Surgery. Ed: Sherwood Gorbach. pp.333-340. 1992.
36. Bennish M, **Griffiths JK**. Shigellosis. *Dialogue on Diarrhea*, Supplement, January 1991
37. Jungery M, **Griffiths JK**. 1989. Protein Transport and Membrane Biogenesis in Malaria-Infected Erythrocytes. In: Intracellular Parasitism. Ed. JM Moulder. pp. 193-211. CRC Press, 1989.

EDITORIALS

Griffiths JK, Barza M. 2014. Editorial Commentary: what happens in hospitals should stay in hospitals. *Clin Infect Dis* 2014 Jun 15;58(12):1666-7. doi: 10.1093/cid/ciu194. Epub 2014 May PMID: 24795327 (Listed above, not double counted)

1. **Griffiths, JK.** 2000. The Vitamin A Paradox (Editorial). *J Pediatrics* 137:604-607.
2. **Griffiths, JK.** (1998). Combination therapy for cryptosporidiosis (*Editorial*). *Journal of Infectious Diseases* 178:915-916.

INVITED TALKS (PARTIAL LISTING)

These include not only invited talks at NIH, the EPA, and other universities, but also a number of invited keynote addresses and speeches to key water and environment organizations. These include the National Academies of Science, a variety of State and Commonwealth environmental and public health departments and associations, the US EPA's annual Water Program Conference, regional and national groups such as the American Water Works Association and the New England Water Works Association, the Association of State Drinking Water Administrators, the Water Environment Federation, and many non-profit organizations such as Clean Water Action and the National Rural Water Association.

1. **Griffiths, J.K.** Why Food is Not Enough: the Prevention of Stunting. DevTalk, Launch of U.S. Global Development Lab, New World Stages NYC April 3, 2014. Administrator Rajiv Shah and Secretary Hillary Clinton were main speakers.
2. **Griffiths, JK.** Water, Sanitation, and the Prevention of Stunting. Innovative and Integrated Approaches To Reducing Malnutrition (Panel: Jeffrey I. Gordon, John F. Leslie, Patrick Webb, Per Pinstrup-Anderson). AAAS Annual Meeting 15 February 2014, Chicago IL.
3. **Griffiths, J.K.** Water, Aflatoxins, and the Prevention of Stunting. Global Webinar, USAID, February 11, 2014.
4. **Griffiths, J.K.** Water, Sanitation and the Prevention of Stunting. Global Webinar, USAID, August 6, 2013
5. **Mathiu, M and Griffiths, JK.** Use of curriculum co-development, and the TUSK learning management system, in Africa and India: implications for university OneHealth collaborations. HEALTH Alliance (network of public health schools in Congo and Eastern Africa) Dean's Meeting, October 15-16, 2010, Kampala Uganda.
6. **Griffiths, JK. Human Pathogens.** National Synthesis Workshop on Pathogens in Rural and Agricultural Water and Watersheds, May 16-20, 2010, Cornell University, Ithaca NY.

7. **Griffiths, JK. Micronutrient Deficiency in Infants and Children.** Impact of Micronutrients on Respiratory Infections. National Institutes of Allergy and Infectious Diseases, May 10-11, 2010
8. **Griffiths, JK. Organizer, Inaugural International Course in Nutrition Research Methods; Bangalore-Boston Nutrition Collaborative Workshop,** St. John's Research Institute, Bangalore India, January 11 – 22, 2010. Gave or discussed a series of three lectures: A. Infectious Diseases Epidemiology. Tuesday January 19, 2010. *Lecture discussed by Professor Mario Vaz, Head, Epidemiology and Statistics Unit, St. John's Medical Institute.* B. Clinical Nutrition in Pediatric Populations. January 19, 2010. Lecture by Dr. Rebecca Raj, Head of Clinical Nutrition at St. John's, *Lecture discussed by Griffiths.* C. Survey Methods and Data Analysis. January 21, 2010. Lecture by Dr. Tinku Thomas, Assistant Professor of Epidemiology and Statistics at St. John's, *discussed by Griffiths.* Participated in 23 instructional sessions.
9. **Griffiths JK.** Negotiated Rulemaking on Microbials and Disinfectant By-Products in Drinking Water. Columbia University workshop on Case Studies in Risk Assessment and Environmental Policy March 5, 2008.
10. **Griffiths, JK.** Measles: A case study. Adaptation of the proven ultrastable rinderpest vaccine. Defense Advanced Research Projects Agency (DARPA) and Program for Appropriate Technology in Health (PATH) Workshop on Emergency Vaccine Technologies for Epidemics and Disasters. Dulles, VA November 29-30, 2007.
11. **Griffiths, JK.** Alternative Secondary Disinfectants: Advantages and Disadvantages. Symposium on Disinfection and Disinfection Byproducts, Sponsored by the Vermont Agency of Natural Resources and Department of Public Health, Burlington, VT November 1, 2007.
12. **Griffiths, JK.** Use of Course Management Systems in Higher Education to Bridge the "Generation" to "Application" Gap. Boston - India Symposium on Essential Interfaces in Public Health, October 22, 2007.
13. **Griffiths, JK.** "Process, Policies and Ethics of Asset Management to Produce Safe Drinking Water: Microbes and Chemicals." 7th Center for Environmental Education, Conservation and Research, Inter American University of Puerto Rico (CECIA-IAUPR). April 26, 2007.
14. **Griffiths, JK.** "Curriculum Co-Development". 10th African Health Information and Librarians Association AHILA Meeting, Mombassa, Kenya October 2006.
15. **Griffiths, JK.** Keynote Speaker, "Public Health, Drinking Water & Local Land Use Decisions," US EPA- State of Connecticut Source Water Protection Meeting, May 10 2005, Groton CT.
16. **Griffiths, JK.** Keynote Speaker, "The Health and Water Connection," Groundwater

Foundation National Meeting, Washington DC, October 2004.

17. **Griffiths, JK.** “Drinking Water and Public Health: Current Issues.” Boston University School of Public Health, Sept. 10, 2004.
18. **Griffiths, JK.** “Protecting Public Health through Drinking Water Treatment.” Keynote Speaker: New England Water Works Association. May 20, 2004 Boxboro MA.
19. **Griffiths, JK.** “Endemic Cryptosporidiosis in Massachusetts.” Brown University/Tufts Center for AIDS Research (CFAR) Providence, Rhode Island, March, 2004
20. **Griffiths, JK.** “Are recent advances in science and technology able to meet the health challenges of providing safe drinking water?” Presentation given to the National Academy of Sciences Roundtable on Drinking Water, Washington DC, November 2003.
21. **Griffiths, JK.** “Why are we Protecting Source Water? The Public Health Connection.” Keynote Speaker: The 11th Latournell Symposium, University of Guelph Centre for Land and Water Stewardship, Ontario Canada. November 2003
22. **Griffiths, JK.** “The Role of Source Water Protection in Preserving Public Health.” Keynote Speaker, Ontario Water Works Association, May 12, 2004. Niagara Falls, Onatario.
23. **Griffiths, JK.** Session Chair, Drinking and Recreational Water Session, International Society for Environmental Epidemiology, Perth Australia October 2003
24. **Griffiths, JK.** “Surveillance for Drinking Water Bioterrorism” Association of State Drinking Water Administrators, National Security Workshop. October 2003 Boston MA
25. **Griffiths, JK.** “Protecting our Drinking Water at the Source: the Public Health Connection.” Keynote Speaker: Massachusetts Clean Water Action, Worcester MA, October 2003,
26. **Griffiths, JK.** “Waterborne Diseases in Healthy and Susceptible Populations: The Impact of Natural and Intentional Contamination.” American College of Preventive Medicine Conference on Bioterrorism Washington DC July 2003:
27. **Griffiths, JK.** “Why are we protecting source water? The public health connection.” Keynote Speaker, EPA Source Water National Meeting, Washington DC July 2003:
28. **Griffiths, JK.** “Drinking Water and Public Health.” National Drinking Water Symposium of the National Association of Regulatory and Utility Commissioners. St. Petersburg, FL March 2002.
29. **Griffiths, JK.** “What every drinking water professional should know about diagnosing waterborne diseases.” Annual conference of the American College of Preventive Medicine, San Antonio, TX, February 20 2002.

30. **Griffiths, JK.** “Public Health and Drinking Water.” The MassInsight Second Annual Conference on Economic Development and Infrastructure. Boston, MA December 14, 2001
31. **Griffiths, JK.** “Susceptible Populations.” National Rural Water Association meeting, Washington, DC. November 15, 2001.
32. **Griffiths, JK.** “A Career in International Public Health.” New England Regional International Health Medical Education Consortium Medical Student Conference, Massachusetts Medical Society, Waltham MA. October 6, 2001
33. **Griffiths, JK.** “Linking Drinking Water and Recreational Water: An Integrated Persepctive.” Office of Water, National EPA Water Program Meeting, Washington DC, May 17 2001.
34. **Griffiths, JK.** “Public Health 101: Linking Drinking Water and Public Health Professionals.” Massachusetts Drinking Water Education Partnership. Leominster Massachusetts. Drinking Water Day, May 10, 2001.
35. **Griffiths, JK.** “Linking drinking water to emerging diseases: cryptosporidiosis.” April 26, 2001, to GRASP center for Gastroenterology Research on Absorptive and Secretory Processes, Tufts University School of Medicine.
36. **Griffiths, JK.** “Water and Public Health.” Central Texas Conference of City Officials, Waco TX March 2001.
37. **Griffiths, JK.** Keynote Speaker: “Health Effects: When There Is No Source Water Protection.” American Water Works Association meeting on Source Water Protection, January 27 2001, Savannah GE.
38. **Griffiths, JK.** “Susceptible Populations.” Annual meeting of the California Water Association, Monterey California, November 16, 2000.
39. **Griffiths, JK.** “Public Health and Drinking Water” (main speaker) Annual meeting of the New England Water Works Association, Cambridge MA October 2000
40. **Griffiths, JK.** “Drinking Water Concerns from a Health Point of View.” Friday June 16, 2000. 64th Annual Education Conference and Exhibition of the National Environmental Health Association, Annual Meeting, Denver CO.
41. **Griffiths, JK.** “Health Care Provider Outreach: Reflections on the National Drinking Water Advisory Council’s Working Group and Report.” Annual meeting of the Water Utility Council of the American Water Works Association, Wednesday June 14, 2000, Annual Meeting and Exhibition, Denver CO.
42. **Griffiths, JK.** “The Regulatory Framework of the Future.” Remarks and Panel Discussion, American Water Works Association, Wednesday June 12, 2000, Annual Meeting and Exhibition, Denver CO.

43. **Griffiths, JK.** "The Convergence Between Wastewater and Drinking Water. Regulatory and Health Aspects." Keynote speech for the Water Environment Federation's (WEF) Disinfection 2000 conference, March 18 2000 New Orleans, LA.
44. **Griffiths, JK.** "Health Care Provider Outreach and Peer Education" Physicians for Social Responsibility conference on Drinking Water and Disease: What Every Health Care Provider Should Know, March 10 2000
45. **Griffiths, JK.** "Drinking Water and Health." *Balancing Public Health Risks, Technology and Affordability in Drinking Water*. Winter 2000 Meeting of the National Association of Regulatory Utility Commissioners, Water Issues Seminar March 5 2000; Washington DC
46. **Griffiths, JK.** "Education and Outreach. Educating our citizens and those with special health needs." Keynote address, 25th Anniversary of the Safe Drinking Water Act celebrations sponsored by the EPA, December 16th 1999, Washington DC.
47. **Griffiths, JK.** "Is Our Drinking Water Safe?" presentation at 23rd annual Fall Family Practice Review Program, Temple University School of Medicine, September 26-October 1, 1999.
48. **Griffiths, JK.** "Drinking Water Contaminants and Public Health: Waterborne Infectious Diseases in the United States." Tufts Institute of the Environment Conference on Drinking Water and Public health: From Science to Public Policy. April 3, 1998, Boston MA.
49. **Griffiths, JK.** "Microbiological Laboratory Advances," "Antibiotic Resistance in Nosocomial Infections," and "Opportunistic Infections in HIV," Primer Congreso Paraguayo de Infectologia, Sociedad Paraguaya de Infectologia (First Paraguayan Congress in Infectious Diseases, Paraguayan Society of Infectious Diseases), Asuncion, Paraguay 22 - 25 November, 1997.

Published Abstracts (PARTIAL LISTING):

1. Kayser G, **Griffiths JK.** 2010. Assessing the Impact of Post-Construction Support on System Performance & Sustainability in Community Managed Water Supply: Evidence from El Salvador. World Water Week, September 5-11, 2010.
2. **Griffiths JK.** 2009. Sharing and Co-Developing Knowledge for Medical Education with Developing Countries. *Symposium*. Susan Albright, Theodore Hanss, Kevin H. Souza, and Jeffrey K. Griffiths. 2009 Meeting of the American Association of Medical Colleges (AAMC) November 6-11, 2009.
3. Chui KKH, **Griffiths JK**, Naumova EN. Seasonality of Viral GI in the US elderly. 2009. Abstract 210393, Environmental program of the 137th APHA Annual Meeting, Philadelphia PA. November 11 2009.

4. Jagai, J., **Griffiths, JK.**, Kirshen, P., Webb, P., Naumova, EN. 2009. Variations in Seasonal Patterns of Gastrointestinal Infections within a Watershed. Abstract 210397. Environment program of the 137th APHA Annual Meeting, Philadelphia, PA, November 11, 2009.
5. **Griffiths, JK.** 2009. Controlling diarrheal disease through the augmentation of knowledge and practice and implemented by an African consortium of medical and public health faculties. Abstract 211388. Environment Program, Symposium “Re-establishing the primacy of primary prevention in the control of waterborne and zoonotic disease: selected examples” organized by Dr. David Gute. 137th APHA Annual Meeting, Philadelphia PA November 9 2009.
6. Mor SM, Tumwine JK, Ndeezi G, Maheswari GS, Kaddu-Mulindwa DH, Tzipori S, **Griffiths JK.** 2008. Late Breaker: Respiratory Cryptosporidiosis in Ugandan children. Monday December 8th, American Society of Tropical Medicine and Hygiene 57th Annual Meeting, New Orleans, LA.
7. Harris AM, Woodin M, Durant JL, Naumova EN, Estrella B, Sempertegui F, **Griffiths JK.** 2008. Ambient air pollution is associated with an increased risk for respiratory illness, stunting, and anemia in young Ecuadorian children. Abstract 1775112, American Public Health Association Annual Meeting, San Diego, California. October 27 2008
8. Lautze, J., Kirshen, P., and Griffiths, J., 2008. Reservoir Management to Improve Malaria Management in East Africa, Proceedings ASCE World Environmental and Water Resources Congress, Honolulu, Hawaii, 13-16 May 2008.
9. Herman, A., Miller, M., **Griffiths, J.K.**, Navidomskis, M. 2007. Improving Oral health in San Salvador: Feasibility Assessment of an International Salt Fluoridation Project. 14th Annual Meeting of the Hispanic Dental Association, Universal City, California, November 2-4 2006.
10. Mariner J, Lautze S, Ascolillo L, **Griffiths JK.** 2006. A Proof-of-Concept Thermostable Measles Vaccine. Annual Meeting of the American Society of Tropical Medicine and Hygiene, Atlanta, Georgia October 2006. Abstract 959.
11. Fernando Sempértegui, Bertha Estrella, Josefina Egas, Elena Naumova, Davidson H. Hamer, Simin N. Meydani, Christine Wanke, **Griffiths JK.** 2006. Pneumonia Adversely Affects Growth in Children: Results from the ‘Vitamin A and Zinc: Prevention of Pneumonia’ Study. Annual Meeting of the American Society of Tropical Medicine and Hygiene, Atlanta, Georgia October 2006. Abstract 771.
12. Carling, PC, Bruno-Murthra LA, **Griffiths, JK.** 2006. Identifying opportunities for Improving Environmental Hygiene in Cruise Ship Restrooms. Annual Meeting of the Infectious Diseases Society of America, abstract LB (late breaker)-32. Toronto, Canada. October 2006

12. **Griffiths JK**, Mariner J, Lautze S, Ascolillo L. 2006. A Proof-of-Concept Thermostable Measles Vaccine. Fifth World Congress on Vaccines, Immunisation and Immunotherapy. Montreal, Canada November 2006.
13. Russell KK, Egorov AI, Fenner-Elias AL, **Griffiths J**, Naumova EN. 2004. Childhood respiratory illness in prospective cohort study. American Public Health Association (APHA). 132nd Annual Meeting, Washington, DC, 11/04.
14. Fenner-Elias AL, Egorov AI, Naumova EN, Russell KK, BS, Ascolillo L, **Griffiths, JK. 2004.** Childhood gastrointestinal illness in a cohort study compared to regional and state data. APHA Annual Meeting, 11/04.
15. Egorov A, Ascolillo L, Montuori L, Naumova E, Ward H, Levy D, **Griffiths JK. 2004.** Recreational and drinking water exposures, diarrheal illness and salivary antibody responses to *Cryptosporidium* antigens in two Massachusetts cities. Proceedings of the 16th ISEE conference, New York, August 2004.
16. Naumova EN, Jagai J, DeMaria A, **Griffiths JK. 2004.** Effects of ambient temperature and precipitation on seasonality of enterically–transmitted infections. 16th Conference of the ISEE, August 2004. New York.
17. Naumova EN, Khurana G, Jagai J, Estrella B, Sempertegui F, Jativa E, **Griffiths JK. 2004.** Emergency room visits for respiratory conditions increased after volcanic eruptions in Quito, Ecuador. 16th Conference of the ISEE, August 2004. New York.
18. Kirshen, P., Vogel, R., Griffiths, J., Naumova, E., Rogers, B., Durant, J., Reed, R.M., and Gute, D. 2004. Incentives and Challenges in Graduate Education in Integrated Water Resources Management (IWRM), Proceedings of ASCE World Water and Environmental Resources Congress 2004, Salt Lake City Utah, June 2004.
19. Montuori L, Ascolillo L, Egorov AI, Naumova EN, Rice PE, Levy D, Morris RD, **Griffiths JK. 2003.** Recreational and drinking water exposures to *Cryptosporidium* and diarrheal illness in two Massachusetts towns. In the Proceedings of the ISEA/ISEE Conference. *Epidemiology*. 2003; 14(5) ISEE-612, S122
20. **Griffiths JK**, Egorov AI, Montuori L, Ascolillo L, Naumova EN. 2003. Water sampling and *Cryptosporidium* seroprevalence. In the Proceedings of the ISEA/ISEE Conference. *Epidemiology*. 2003; 14(5) ISEE-692, S138
21. **Griffiths JK**, Egorov A, Ascolillo L, Montuori L, Naumova EN. 2003. *Cryptosporidium* Oocysts in Drinking and Recreational Water, and Human Public Health. 78th Meeting of the American Society of Parasitologists, Halifax, Canada August 1-5 2003. Abstract 114.
22. Kato S, Gostyla KA, Naples LA, Marangu T, Else JG, Thakral M, Corso KA, **Griffiths JK. 2003.** Species and Genotype Identification of *Cryptosporidium* Oocysts in Wildlife and Domestic Animal Samples in Northern Kenya. 78th Meeting, American Society of

Parasitologists, Halifax, Canada August 1-5 2003. Abstract 77.

23. Kato, S., L. Ascolillo, L. Elson, K. Gostyla, L. Naples, J. Else, F. Sempértegui, J. Egas, and **J. Griffiths**. 2003. Waterborne *Cryptosporidium* genotyping and GIS for ecosystem studies in Kenya and Ecuador. VIII International Workshops on Opportunistic Protists (IWOP-8). Hilo, Hawaii, USA. Abs. #A11.
24. Egorov AI, **Griffiths JK**, Ascolillo L, Foster P, Meydani SN, Naumova EN. 2002, Serological Responses to *Cryptosporidium parvum* Antigens in the Elderly in Massachusetts. American Society of Tropical Medicine and Hygiene 51st Annual Meeting, Denver Colorado, November 10-14, 2002.
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TEACHING AT TUFTS UNIVERSITY

Clinical teaching (residents, infectious diseases fellows) has been continuous since 1988. I received the Excellence in Teaching Award, from the graduating MD/MPH students, in May 2009.

The course descriptions for formal didactic courses I have directed or co-directed in the last three years are reproduced below. For courses where I lecture but am not the director, a short description is given.

MPH/CEE 241 Biology of Water and Health. Course co-Director with Dr. David Gute, taught since 2004 as WSSS (Water: Systems, Science, and Society) offering. “Emphasis is placed on participants understanding the biology of water and health. Participant will demonstrate knowledge of the central role of water in health, including adequate hydration. Detailed coverage of selected prototypic or model disease which include Schistosomiasis, Cryptosporidiosis, cholera, and others. Participant will become familiar with widespread chemical agents and their interactions with pathogens. Participants will demonstrate a familiarity with the appropriate methods of assessing the occurrence of water borne disease. Participants will become knowledge about the principal methods of controlling the propagation of water-born disease. Participants will become knowledgeable social and institutional factors influencing sanitation and water treatment decision and the subsequent impacts on a variety of health indices.”

MPH243 /DHP P214 Introduction to Global Health. Course co-Director with Dr. Ronald Ruffing 2006 - 2008. Cross-listed with Fletcher School of International Law and Diplomacy; includes lectures on important infectious diseases, water and sanitation, maternal and child health, complex emergencies, climate change, and the built environment. “This course examines current and emerging health issues in developing and industrialized countries. Students learn to define the nature, determinants, and impact of selected health problems in developing countries and describe the pattern of morbidity and mortality in poor countries and by geographic region. Students are introduced to data sources and health service delivery. Considerations at the local, national, and regional levels, including sources of funding, the role of culture in health and disease, and the global impact of health, are explored.”

MPH 224 Infectious Diseases Epidemiology. Course director for >10 years, taken by advanced MPH students, Infectious Diseases fellows. Has been taught yearly as 2 credit course or every other year as 4 credit course (4 MPH credits = full course in Medford). “This course focuses on the epidemiological aspects of infectious diseases, concentrating on the epidemiology of bacterial and viral infections. Emphasis is placed on concepts of transmission and prevention. In addition, epidemiological problems are presented to explore how epidemiology is used to understand "new" diseases such as Legionella, AIDS, and Lyme disease.”

Lecturer in Epidemiology and Biostatistics for MD students – most recently lectured on how epidemiology and biostatistics are relevant to Global Health with a focus on infectious diseases 2005 – 2008. In 2009 was Small Group Leader.

Lecturer in Microbiology for MD students – most recently, “Emerging Infectious Diseases” (2008, 2009)

Case Developer in Human Anatomy for MD students – using internet based technology, we are CT imaging corpses in the US and in East Africa and developing tools to assist students in linking pathological findings to clinical medicine (2008, 2009)

Curriculum Developer with other Faculty for Global Health Concentration, MPH Program (developed during 2005 and 2006, and approved by Faculty December 2006). Now largest MPH concentration at Tufts. Revised an existing version of the Global Health course which was given to MD/MPH and DVM/MPH students for graduate students across Tufts, with cross-registrants

from other Universities. Was concentration leader for 3 years 2006 – 2008.

Prior courses at School of Medicine:

Course director for **Food-Borne Diseases** selective for MD/DVM/MPH students

Course director for **Emerging Infectious Diseases** selective for MD/DVM/MPH students

Course director for 4th year **clinical international electives** for MD/DVM/MPH students

Course director for 4th year **Applied Learning Experience** required of MD/DVM/MPH students, which is their practicum required for demonstration of their competencies

Co-Course director for **Introductory Epidemiology**, 1st year MD/MPH core course with Dr. Aviva Must.

Small group instructor in **Epidemiology and Biostatistics** (required of all MD students) not only in 2009 but also in the 1990s.

Lecturer in **Microbiology, Infectious Diseases**, advanced **Immunology** courses: lectures on (these are examples) Antihelminthic Therapy; Introduction to Bacterial Pathogens; Intestinal Helminths; Intestinal Coccidia: Cryptosporidium; Neisserial infections; Treponemal infections; Oral infections; Blood protozoa; Immunologic Basis of Disease: Streptococcal Infections; Waterborne Infections

Friedman School of Nutrition Science and Policy

Lecturer in 'Survey Research in Nutrition' NUTR210 - **Dr. Beatrice Rogers**

Lecturer in 'Nutritional Impact on the Immune System and Related Diseases' NUTR 291M - Dr. Simin Meydani

Lecturer in "Nutritional Impact on the Immune System and Related Diseases" NUTR 320 taught by Drs. Meydani and Wu (new in 2009)

School of Engineering :

Lecturer in **Sustainability Engineering ME 149B** - Dr. Douglas Matson

Lecturer in **Environmental Health and Safety, ES-27**. Dr. David Gute
(Co-director of CEE/MPH 241 with Dr. Gute as described earlier)

Cummings School of Veterinary Medicine:

Course director for **Veterinary Public Health** (required of all DVM students); 1992-1999

Dental School Courses (current):

Lecturer in **Microbiology** Course since 2000; lectures in: Sexually Transmitted Diseases; Orofacial Abscesses and Lung Abscesses

Exhibit A

PEQUANNOCK WTP
CORROSION CONTROL
REVIEW AND
RECOMMENDATIONS -
DRAFT

City of Newark
Lead and Copper Rule Compliance Study
Newark, NJ

City of Newark Department of
Water and Sewer Utilities

October 10, 2018



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Appendices

Appendix A Pipe Scale Analyses

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Section 1

Executive Summary

The City of Newark (Newark) exceeded the Lead and Copper Rule (LCR) Action Level for lead in the two sampling rounds in 2017 (January 2017 to June 2017 and July 2017 to December 2017) and in the first half of 2018 (January 2018 to June 2018). The 90th percentile concentrations during these periods were as follows:

- January to June 2017 – 27.0 µg/L
- July to December 2017 – 26.7 µg/L
- January to June 2018 – 17.8 µg/L

Lead concentrations during these monitoring periods were higher in the Pequannock-supplied portions of the distribution system. The recent lead exceedances were the first in nearly 20 years of consistent compliance. The City first implemented sodium silicate for corrosion control treatment (CCT) in 1997; however, these recent lead exceedances indicate that the CCT at the Pequannock WTP is not currently optimized and can be improved. Newark initiated a study in January 2018 to determine the causes of the recent exceedances.

This report addresses an assessment of the optimization of CCT for Newark's water supply. In January 2018, CDM Smith Inc. (CDM Smith), on behalf of Newark, commenced a corrosion control evaluation including the following studies:

- Statistical analyses and frequency distribution of lead data to understand the changing lead concentrations over time, and comparing the Pequannock and Wanaque systems
- Study of historic water quality trends impacting corrosion control
- Lead sequential sampling at selected residences in the system
- Pipe scale composition analyses performed by the United States Environmental Protection Agency (EPA)
- Lead solubility modeling

This report includes the results of these evaluations, which provide an understanding of the variability in water quality that occurred throughout recent history and the associated impacts on lead corrosion within Newark's system.

Historical Lead Concentrations

Figure ES-1 shows the frequency distribution of the historical LCR compliance sampling results on the Pequannock-supplied portion of the distribution system between 1992 and 2018. As can be seen from **Figure ES-1**, lead results have increased significantly in the last three rounds, in some cases exceeding the original 1992 values prior to when CCT was implemented in 1997.

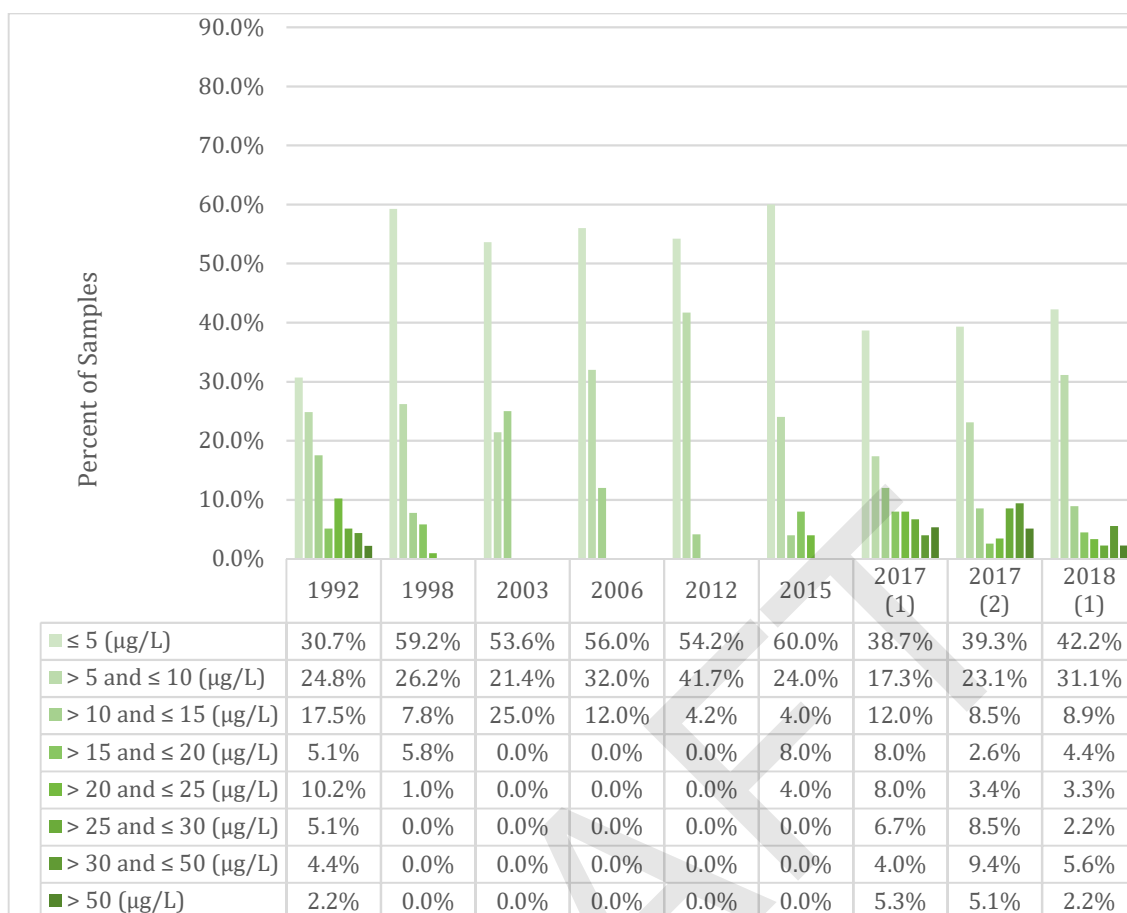


Figure ES-1 – Pequannock Service Area – Lead Sampling Data Percentage Frequency Distribution

Table ES-1 provides a summary of some statistical parameters based on the lead sampling compliance data in **Figure ES-1**.

Table ES-1 – Summary of Statistical Parameters for Pequannock Lead Sampling Data

Parameter	1992	1998	2003	2006	2012	2015	2017 (1)	2017(2)	2018 (1)
50th Percentile (µg/L)	8.5	4.0	4.8	4.1	5.0	0.0	7.4	7.8	6.4
75th Percentile (µg/L)	16.3	7.4	10.0	7.4	7.3	8.0	17.8	21.2	10.5
90th Percentile (µg/L)	26.8	12.3	12.2	9.5	9.7	15.8	29.8	36.0	22.9
Number of Samples (n)	137	103	28	25	24	25	75	117	90
Number of Samples >15 µg/L (n)	37	7	0	0	0	3	24	34	16
Percent > 15 & ≤ 25 µg/L	15.3%	6.8%	0.0%	0.0%	0.0%	12.0%	16.0%	6.0%	7.8%
Maximum (µg/L)	60.4	23.0	14.2	11.5	14.0	25.0	137.0	77.7	58.9

Scale Analysis

In February and March 2018, Newark took the initiative to send sections of three lead service pipes to the EPA Advanced Materials and Solids Analysis Research Core in Cincinnati, OH for characterization of the pipe scales. With the limited literature available and collective industry

experience on sodium silicate, Newark understood the criticality of analyzing the pipe scales to gather more data specific to their system. Two of the pipes were excavated from the North Ward and one was excavated from the South Ward. Analysis of pipe scales that reflect actual distribution system conditions provides a direct indication of the effectiveness of a current treatment protocol. Knowledge of the characteristics and behavior of the lead scales that have been formed in the service lines can be integrated with water quality, lead testing results and operational information to understand mechanisms of corrosion inhibition, speciation of metals and predictions of mobility/stability and can assist in implementation of corrective treatment changes. Knowing the chemical composition of a contaminant in distribution system scale materials can help with estimating the probability of unintended adverse consequences due to treatment or water quality changes.

Based on the testing performed by the EPA, the scales found on the outermost layers of the pipe walls were primarily hydrocerussite ($\text{Pb}_3(\text{CO}_3)_2(\text{OH})_2$), with cerussite (PbCO_3) and plattnerite (PbO_2). present as well. Hydrocerussite and cerussite are Pb(II) compounds that are carbonate-based scales. In carbonate-based scales, the hydroxide (OH^-), carbonate (CO_3^{2-}), or bicarbonate (HCO_3^-) ions bind with the metal (i.e., lead) to form metal/hydroxide/carbonate compounds of varying degrees of solubility on the interior wall of water pipes.. Cerussite is the stable Pb(II) phase at pH 8–8.5. Cerussite is much more soluble than hydrocerussite, which is the stable Pb(II) phase at higher pH (≥ 9.0). It is unusual to find hydrocerussite as the dominant scale at Newark's current operating pH of around 7.4.

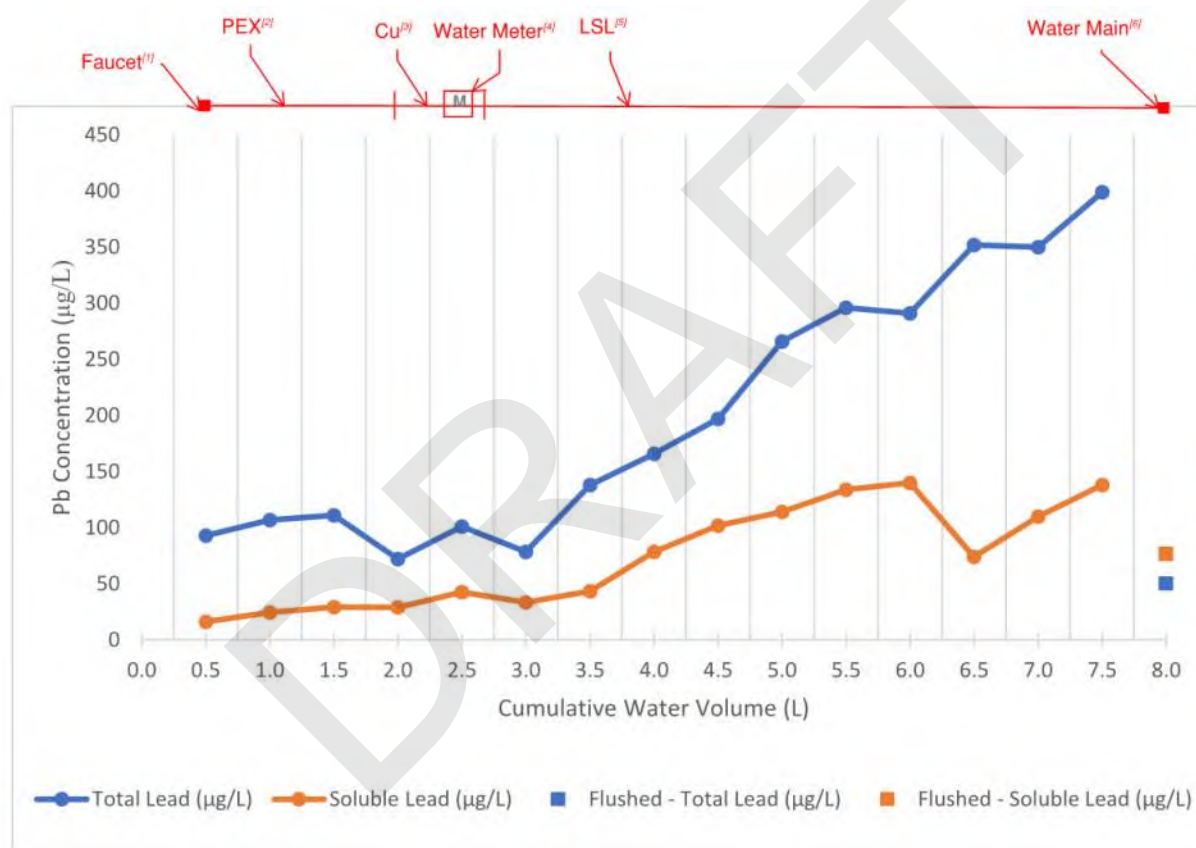
Plattnerite (PbO_2) is a Pb(IV) compound that is formed in waters with high redox potential (ORP). It is reported in the literature that a high ORP can be maintained when free chlorine is used (at levels typically over 1.5 mg/L), and that the rate of formation of PbO_2 appears to increase with increasing pH (Boyd, et al., 2008). Pb(IV) has also been observed in systems with free chlorine residuals less than 1.5 mg/L, including in Newark. Under these conditions, PbO_2 typically dominates or coexists with Pb(II) mineral forms, including hydrocerussite and cerussite. Plattnerite is appreciably less soluble than hydrocerussite and cerussite, making plattnerite more effective at maintaining low lead levels when the proper (high ORP) water chemistry is maintained.

The pipe scales did not contain any crystalline Si-Pb compounds, indicating that silicate complexation is not taking place and is not controlling soluble lead. However, a silica crust (SiO_2) was found on all three pipes. The silica crust was found to be porous and therefore was not acting as a barrier to the outward flux of lead from the pipe as the passivating layers (i.e. mainly plattnerite and hydrocerussite) were found forming behind, or closer to the pipe wall, than the silica crust.

The pH within the distribution system has a major impact on scale formation. In systems without orthophosphate, lead control relies on the formation of divalent lead carbonate scales or tetravalent lead (Pb(IV)) scales. For carbonate scales, such as cerussite and hydrocerussite, pH and alkalinity are critical parameters in their formation. For tetravalent lead, scale formation is dependent on pH, ORP and the presence of natural organic matter (NOM). Both types of scales were found in Newark's distribution system based on the scale analyses performed by the EPA.

Sequential Sampling

In September 2018, the City of Newark conducted sequential sampling at two locations with lead service lines (LSLs) and copper interior piping with lead solder. The purpose of this effort was to pinpoint potential sources of lead that exist within the service line and premise plumbing from the service connection in the street to the drinking water tap in the house. Sequential sampling is a tool to assist in developing an understanding of the system as part of the CCT optimization. The sources of lead at the tap measured in sequential samples can include LSLs, lead-based materials contained in the premise piping (e.g., leaded solder, brass/bronze fittings, galvanized piping), faucets, and water meters. The results are presented in Section 4 which indicate high lead levels of both soluble and insoluble forms in both the North and South Ward sampling locations. In comparison, higher lead levels were found in the South Ward location. **Figure ES-2** shows the sample results in a lead profile for the home tested in the South Ward compared with the associated plumbing component associated with that sample volume.



^[1] Kitchen Faucet Location, ^[2] Cross-Linked Polyethylene Pipe Segment, ^[3] Copper Pipe Segment, ^[4] Water Meter Location, ^[5] Lead Service Line Pipe Segment, ^[6] Water Main Location

Figure ES-2 – Site A – South Ward Lead Profile – September 10, 2018

In conclusion, the sequential sampling performed at opposite ends of Newark's distribution system show that the current corrosion practice is not optimized at controlling soluble lead release into the drinking water. Despite the silica concentrations in the water of approximately 8 mg/L as SiO₂ and the presence of a silica crust found in the EPA scale analysis (presented in

Section 5), soluble lead was well above the EPA's lead Action Level. In addition, if a passivating scale was intact and functioning as a protective scale, lead levels would be expected to be much lower (Boyd, et al., 2008) than what was found.

The results confirm that the scales found on the pipes from the EPA scale analyses are not functioning as protective corrosion control scales under the current water quality conditions. Regarding particulate lead, both locations have appreciable particulate lead in the samples. This could be a result of sediment in the service line, particulates that collected in the aerator during the flushing prior to the stagnation period, active breakdown of the lead scale, some recent plumbing work performed by the homeowner, or most likely a combination of these factors.

Potential Causes of Recent Lead Exceedances

Based on the analyses performed over the course of this study, the following factors are most likely to have influenced the 2017-2018 elevated lead levels in Newark's distribution system. These are described in more detail in Section 6 as well as other possible contributing factors.

- Decrease in pH in the distribution system
- LCR compliance sampling

pH has fluctuated substantially for the delivered water from the Pequannock WTP between 1992 and 2018 as shown in **Figure ES-3**. pH was maintained above 8.0 for several years. Starting in 2016, however, the pH declined to the current average of approximately 7.1.

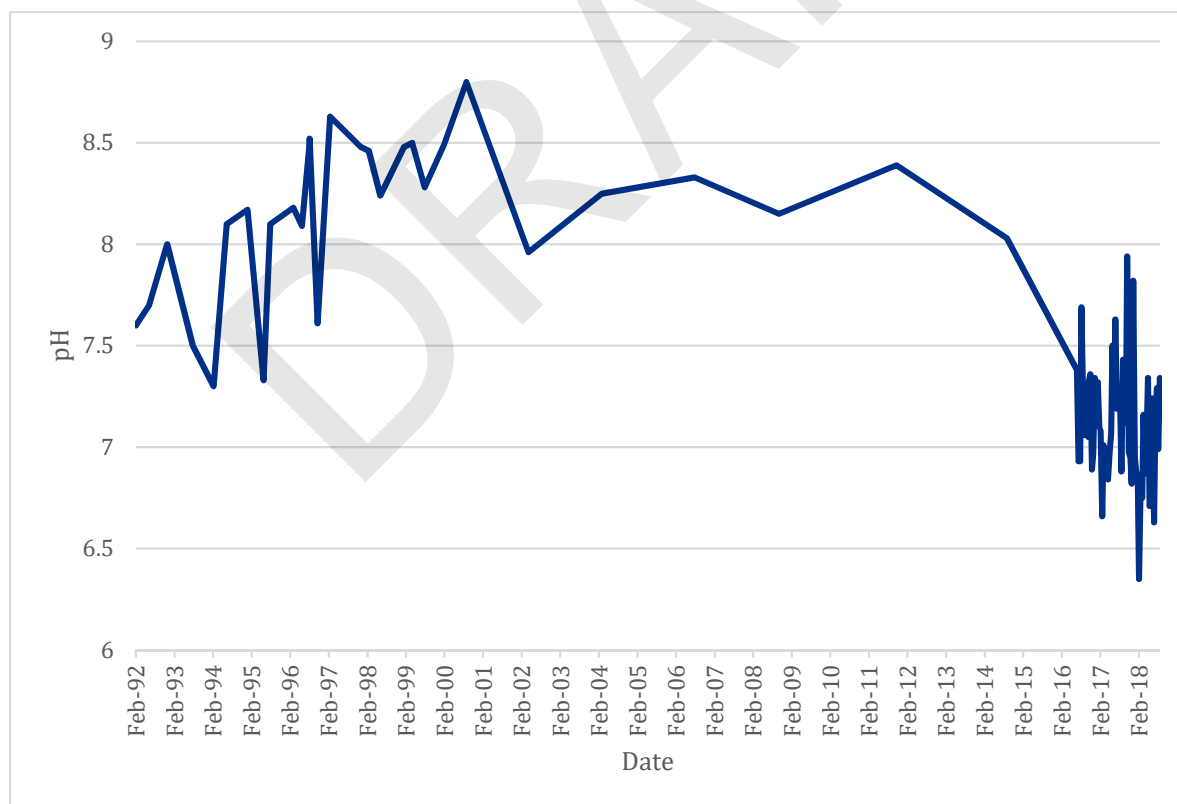


Figure ES-3 – Historic Pequannock WTP Delivered Water pH

Because both Pb(II) scales and Pb(IV) scales were found on Newark's LSLs and reducing pH negatively affects the formation of insoluble scales for both forms of lead, the reduction in pH in the Newark distribution system is likely the main cause for the 2017 and 2018 elevated lead levels. Raising pH to levels that will provide the desirable water chemistry for these scales to re-stabilize will risk Newark's ability to simultaneously comply with primary disinfection (CT) and disinfection byproduct regulations. Hence, returning to the corrosion control strategy Newark employed in the 1990s and early 2000s to comply with the LCR is no longer considered a viable option without other system upgrades to meet all regulations simultaneously.

It is not possible to confirm the exact duration of the elevated lead levels in Newark's distribution system. One reason for this is the possibility of compliance sampling between 1998 and 2015 not representing lead levels resulting from lead service lines since only the first draw samples are taken. True lead levels are not always reflected in compliance sampling for the LCR and an underlying issue may have been developing without Newark's knowledge. This is discussed further in Section 6.

Recommendations

With the results of the analyses performed in this study, several alternatives are recommended to reduce lead levels in the distribution system. The addition of orthophosphate is recommended to significantly reduce lead solubility without any adverse impacts on other water quality goals, e.g., without impacting simultaneous compliance with primary disinfection and disinfection byproduct regulations. The recommendations are summarized in **Table ES-2** and described in more detail in Section 8. The recommendations address both short-term implementation as well as long-term, sustained compliance with the LCR.

Table ES-2 – Summary of CCT Recommendations

Factor	Immediate CCT Recommendation	Longer Term CCT Recommendation	Additional Notes
Chemical	Phosphoric Acid	Phosphoric Acid or Zinc Orthophosphate	Conduct pipe loop study to evaluate selection of longer-term chemical inhibitors
Dosage	0.5 mg/L as PO ₄ increasing to passivation dose of 3.0 mg/L as PO ₄	Minimum 1.0 mg/L as PO ₄ (or as determined by pipe loop study)	Evaluate dosage in pipe loop study
Feed Location	Valley Road Rechlorination Station	Valley Road Rechlorination Station	
System pH	Stabilize pH to 7.3 to 7.4	Stabilize pH to 7.5 to 7.8	Evaluate optimal pH in pipe loop study
Sodium Silicate	Maintain current dose or slightly increase dose to aid in pH adjustment	Replace with a more cost-effective pH adjustment chemical	Evaluate any negative impacts from eliminating sodium silicate addition in pipe loop study
Demonstration Study	Conduct pipe loop study in parallel with implementation of immediate addition of phosphoric acid	Apply results of pipe loop study to long-term CCT plan	

Factor	Immediate CCT Recommendation	Longer Term CCT Recommendation	Additional Notes
Monitoring	Implement representative monitoring program, including sequential sampling	Continue monitoring program and sequential sampling until conditions are stabilized	
Public Health	Point-of-use filters and conduct public education program	CCT optimization and LSL Replacement Program	

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Section 2

Background

The City of Newark (Newark) supplies approximately 80 million gallons per day (mgd) of potable water to a population of over 300,000 customers located in Newark, NJ and its surrounding communities. Newark's population of approximately 280,000 is supplied potable water through a large, complex system that is managed by the City of Newark's Department of Water and Sewer Utilities (Department).

Newark utilizes two sources to supply their distribution system. The Pequannock Water Treatment Plant (WTP), located in West Milford, NJ, supplies approximately 40 mgd primarily to Newark's North, West, South and Central Wards, or the "higher" pressure gradients above 200 feet as shown in **Figure 2-1**. The Pequannock WTP treats surface water from the Charlotteburg Reservoir. The Pequannock WTP processes include pre-chlorination (for oxidation), coagulation, direct filtration with dual media filters, post-pH adjustment with lime, disinfection with chlorine gas, and sodium silicate addition for corrosion control. Treated water flows from the Pequannock WTP through a 72-inch aqueduct which splits into dual 48-inch and 42-inch steel aqueducts to the open, approximately 675 million-gallon (MG) Cedar Grove Finished Water Reservoir. The water then travels by gravity through the Valley Road Rechlorination Station in Montclair where it is rechlorinated prior to supplying Newark water distribution system's higher-pressure gradients.

The other water source for Newark is from the Wanaque WTP operated by the North Jersey District Water Supply Commission, which supplies the East Ward and parts of the North and Central Wards (pressure gradient of 165 ft and below) as shown on **Figure 2-1**. The Wanaque WTP is a conventional WTP with coagulation, clarification, and filtration and delivers water to Newark via two paths. The first is through the Wayne Pump station, which delivers up to 38 mgd, typically between 10 and 15 mgd, of treated water from the Wanaque WTP to the Pequannock system upstream of the Cedar Grove Reservoir, allowing it to supply the higher-pressure gradients. The Wanaque supply that is blended with the Pequannock supply is fully treated except for corrosion inhibitor. Wanaque water is also fed to Newark's lower pressure gradient through the Belleville Reservoir Complex at approximately 25 to 28 mgd. Upstream of the Belleville Reservoir Complex, zinc orthophosphate is added. This water feeds the lower pressure gradient (East Ward) in Newark's distribution system.

During the January to June 2017 Lead and Copper Rule (LCR) sampling round, Newark exceeded the Action Level (AL) for lead at the 90th percentile, based on a total number of samples of 233 customers. On July 11, 2017, the New Jersey Department of Environmental Protection (NJDEP) sent a letter to Newark that outlined a series of required actions in response to the Lead Action Level exceedance. Of the requirements, NJDEP required Newark to submit an Optimal Corrosion Control Treatment (OCCT) recommendation in accordance with 40 CFR 141.82(a) no later than six (6) months after the monitoring period when the action level was exceeded, or by December 31, 2017.

In response to NJDEP, Newark submitted an OCCT Memorandum on December 27, 2017. The 2017 OCCT Memorandum outlined the following recommended actions:

- Continuing to collect the Water Quality Parameter data “to ensure proper corrosion control treatment”
- Completion of a corrosion control optimization desktop study
- A coupon study at several locations in the distribution system
- Pipe loop testing

The 2017 OCCT Memorandum reported that the following Water Quality parameters would be maintained for the Pequannock system:

- pH over 7.2
- Alkalinity over 30 mg/L
- Silica over 6.0 mg/L as SiO₂

Newark also stated they would increase the sodium silicate dose to 12-15 mg/L from 8-12 mg/L, effective July 24, 2017.

Since the 2017 OCCT Memorandum was issued, Newark has exceeded the Lead Action Level in the second half of 2017 and the first half of 2018. Newark is currently evaluating both immediate and long-term measures to minimize lead levels throughout the system. Specifically, Newark is looking to: a) implement a program to replace all lead service lines in Newark; and b) optimize corrosion control treatment. Newark’s initiative to replace all lead service lines in the City is being performed under a separate project and is not discussed in this report.

This report addresses the optimization of corrosion control treatment for Newark’s water supply. Provided herein are the results of CDM Smith’s evaluations of historic and current water quality in the source water and distribution system. These evaluations provide an understanding of the variations in water quality that occurred throughout recent history and the associated impacts on lead corrosion within Newark’s system. With this understanding, several alternatives were considered to reduce lead solubility in the distribution system. Recommendations are provided for short-term implementation as well as long-term, sustained compliance with the LCR.

2.1 Current Corrosion Control Treatment (CCT)

The Pequannock WTP has dosed sodium silicate at the plant since 1997, based largely on the Corrosion Optimization Study prepared by the City of Newark in June 1994. The Wanaque WTP has dosed zinc orthophosphate upstream of their Belleville Reservoir Complex since the mid-1990s. Details on the current CCT implemented in both water supplies are discussed in this section of the report.

2.1.1 1994 Corrosion Optimization Study

When the LCR was established in 1991, both the Pequannock and Wanaque systems experienced high lead levels when performing the initial requisite monitoring programs in 1992 and 1993. At that time, both systems commenced corrosion control studies and implemented corrosion control treatment (CCT) in the mid- to late-1990s.

The Pequannock WTP implemented CCT based on a study performed by the Division of Water/Sewer Utility and summarized in a report, “City of Newark Report on Corrosion Optimization Study,” dated June 1994. The study included bench-scale testing and a pipe loop study evaluating the effectiveness of the following corrosion inhibitors:

- Increased lime (to increase pH)
- Orthophosphate
- Ortho-poly blended phosphate
- Sodium silicate

The bench-scale testing involved a two-cell corrosion test device where raw water was fed into the first cell and mild steel metal coupons were suspended in both cells. A corrosion inhibitor was applied to the water before it entered the second cell (Newark, 1994). The anticipated percent reduction of lead leaching for each of the inhibitors was estimated based on a function of weight loss by the mild steel coupons which were used as a surrogate for lead. The estimated reductions were as follows:

- 15% reduction for lime, pH 8.5 to 9.0 maintained
- 50% reduction for zinc orthophosphate based on a dose of 1 mg/L as PO_4 (pH not specified)
- 40% reduction for ortho-polyphosphate blend (dose and pH not specified)
- 45% reduction for silicate based on a dose of 20 mg/L as SiO_2 for 1 month and a dose of 9 mg/L as SiO_2 (pH not specified)

The bench-scale tests were followed by pipe loop experiments. The pipe loops had new ½-inch lead and copper piping and flow was maintained at 1 gallon per minute (gpm) to simulate typical flow in a home. The loops were run without any addition of a corrosion inhibitor for the first 6 weeks at a pH of approximately 7.3. By the end of the 6 weeks, the pipe loops were considered “stabilized” and results were showing consistent water quality characteristics across all six (6) pipe loops, including lead concentrations (Newark, 1994). Subsequent testing was performed with orthophosphate and an ortho-polyphosphate blend for 26 weeks and with silicate for 40 weeks. Sodium silicate was tested at dosages ranging from 8 mg/L to 24 mg/L, which raised the pH of the water to between 8.4 and 9.0 (Thompson, 1997). Although not specifically stated in the study, it is assumed that the dosages are presented in units “as silica (SiO_2)”. If the dosages were “as silica,” then the “as sodium silicate product” dose would be approximately three (3) times these values, or 24 mg/L and 72 mg/L, respectively. The silicate treatment proved to be effective

under these conditions, reducing lead release from lead pipe by 65% and from lead-soldered copper pipe by 60% over the control.

Orthophosphate also proved to be effective at a pH of 7.4 to a similar degree as the silicate, but was eliminated since it could not be dosed at the plant upstream of the Cedar Grove Reservoir without risking algae growth in the open reservoir. At the time, the author of the study stated that the City would have to construct “a number of satellite feeding stations which may involve substantial capital improvements and, hence, create a liability to the City’s financial implication.” (Newark, 1994). At the time, the City was providing treated water to other municipalities upstream of the Cedar Grove Reservoir. Currently, only the Township of Pequannock is fed upstream of the Cedar Grove Reservoir, other than emergency interconnections.

The 1994 report noted that Newark also had concerns with phosphates due to a prior experience involving water complaints following the addition of a polyphosphate blend at the Pequannock WTP for 2 years in the mid-1980s. Newark stopped using the polyphosphate due to these complaints, as well as severe algae growth in the Cedar Grove Reservoir (Newark, 1994).

Newark ultimately recommended sodium silicate as the optimal corrosion control treatment, at a starting dose of 18-20 mg/L for an initial passivation period then decreasing to an 8 mg/L maintenance dose (Newark, 1994). It is believed that the recommended dose was provided “as silica (SiO₂)”. The raw water silica concentration was reported to be 4.0 mg/L (Newark, 1994); therefore the residual silica concentration would be expected to be approximately 12 mg/L in the finished water. No final pH was recommended; however, the pipe loop testing was performed at a pH of 8.5 to 9.0, which was achieved through the addition of lime and silicate.

Research on sodium silicate was limited at the time of the 1994 report. Since that time, it is believed that silica does not complex with lead in a similar manner to orthophosphate which forms lead compounds with low solubility (Taylor, et al., 2008). Instead, silicate helps to raise the pH which promotes the formation of lead-carbonate scales at higher pH values. See Section 7 regarding sodium silicate research and available literature.

2.1.2 Treatment Modifications Impacting Corrosion Control Since 1994

In 2003-2004, the Pequannock WTP supply was reduced from approximately 50-60 mgd to 40-45 mgd in order to reduce loading rates on the filters to meet stricter regulations on turbidity and disinfection byproducts. The difference was made up by increasing the Wanaque supply at the Wayne Pump Station to its current 10 to 15 mgd, which is blended with the Pequannock water and distributed to customers in Newark’s high-pressure gradients. The Wanaque water does not have any corrosion inhibitor when it is blended with the Pequannock water at Wayne. This dilutes the sodium silicate concentration prior to distribution to customers downstream of the Cedar Grove Reservoir. Based on our review of operational records, it is unclear if the sodium silicate dose was increased to account for the additional flow from Wanaque or if the effective feed rate to the Pequannock WTP supply was reduced, subsequently reducing the dose in the blended water.

Other changes to treatment that have occurred at the Pequannock WTP since the original pipe loop testing include:

- Between 2015 and 2018, finished water pH was maintained at the Pequannock WTP at approximately 6.9 to 7.3. The finished water pH is currently maintained below 7.4 and is averaging below 7.0 in order to achieve primary disinfection (CT) and minimize formation of disinfection byproducts. In the late 1990s, pH was maintained around 8.5 based on the recommendations from the 1994 pipe loop study. See Section 3.3, Historic Water Quality Trends, for additional information on pH over time.
- The quicklime system was replaced with a hydrated lime system in April 2017. According to operators at the Pequannock WTP, the hydrated lime system initially had operational difficulties and was limited in its feed capacity. In September 2018, the system was upgraded to provide a higher feed rate.
- The current sodium silicate system occasionally struggles to meet the staff's desired dose of 12 to 15 mg/L as sodium silicate. It is not known if the current equipment is sized meet the 24 mg/L dose (as sodium silicate) recommended in the 1994 CCT study.

2.1.3 Current Corrosion Control Treatment

Pequannock Supply

As noted above, the water supply to Newark's higher-pressure gradients (above 200 feet) is a blend of treated water from the Pequannock WTP and Wanaque water that is fed at the Wayne Pump Station. The Pequannock pressure gradients include all homes located in the West and South Wards and a majority of homes located in the Newark's North and Central Wards. As a result of the recent lead exceedances in these areas, Newark increased the sodium silicate dose from 8-12 mg/L to 12-15 mg/L as sodium silicate, or as close as possible to this dose with the existing equipment, in July 2017. The current target dosage is equivalent to approximately 3.5-4.4 mg/L as silica (SiO_2), approximately half of the recommended dose from Newark's 1994 study. If Newark was to double the sodium silicate dose, the pH would increase accordingly, potentially creating issues with Stage 2 Disinfection Byproduct Rule compliance and meeting primary disinfection requirements at the plant.

In the 2017 OCCT Memorandum, Newark stated that their target is to maintain a residual silica concentration of 6 mg/L throughout the distribution system. The silica concentration is measured in the plant finished water (Test House) and in the distribution system on a bi-weekly basis. Since the raw water provides approximately 4.0 mg/L of naturally occurring silica (Newark, 1994), only an additional 2 mg/L of silica (or approximately 6.9 mg/L of sodium silicate) is required to be added to meet this target. When the silicate treatment was first initiated, it is assumed that the silica concentrations in the distribution system would likely have been closer to 12 mg/L (approximately 8 mg/L from the sodium silicate and approximately 4 mg/L from the raw water). If the report recommendations were followed, the initial silica residual would have been 28 mg/L (24 mg/L from the sodium silicate and approximately 4 mg/L from the raw water). No data is available to confirm the initial dose of silicate or the initial silica residuals in the distribution system when the corrosion control treatment was first implemented.

Wanaque Supply

Newark's 165-foot pressure gradient is primarily comprised of the East Ward and small sections within the North, Central and South Wards. The 165-foot pressure gradient is supplied by water

treated at the Wanaque WTP. The Wanaque supply to this system has been adding zinc orthophosphate upstream of the Belleville Reservoir Complex since the mid-1990s. The Wanaque system maintains a pH of approximately 7.6 and doses approximately 1.2 mg/L as orthophosphate. This area has experienced much lower lead concentrations since implementing CCT in the 1990s than the regions supplied by the Pequannock WTP. Therefore, this study focuses on the sections of the distribution system supplied by the Pequannock WTP, as shown in **Figure 2-1**.

Recent CCT Optimization Efforts

In February 2018, CDM Smith Inc. (CDM Smith), on behalf of Newark, commenced a corrosion control evaluation including the following studies:

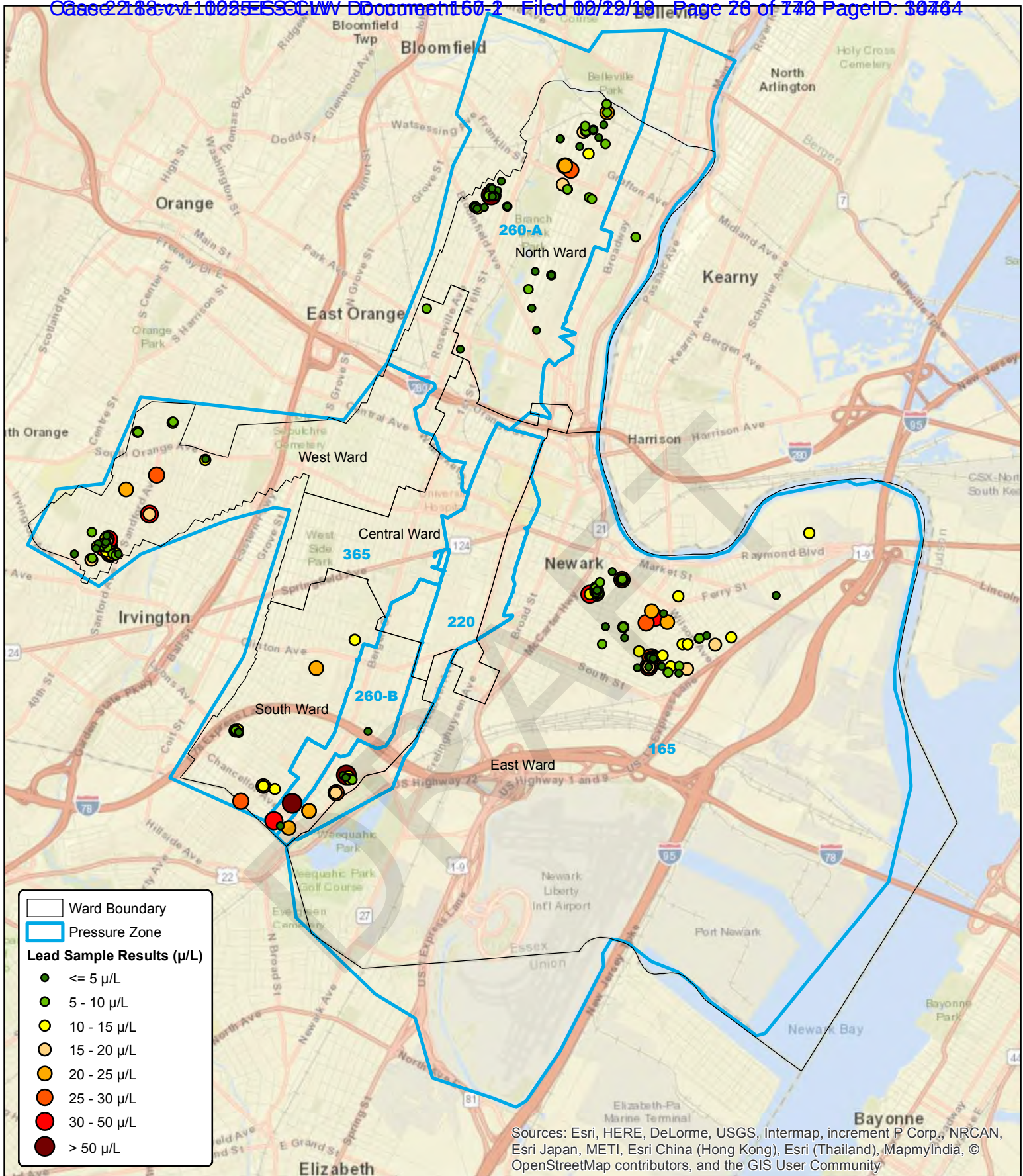
- Statistical analyses and frequency distribution presentations to understand the changing lead concentrations over time, and comparing the Pequannock and Wanaque systems
- Study of historic water quality trends impacting corrosion control
- Lead sequential sampling at residences in the system
- Pipe-scale composition analysis performed by the United States Environmental Protection Agency (EPA)
- Lead solubility modeling

The results of these studies are provided in this report in Sections 2.3, 3, 4, 5 and 7.

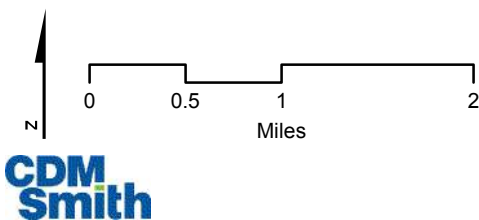
2.2 Lead and Copper Rule Compliance Sampling Results

As discussed above, due to consecutive rounds of Lead Action Level exceedances in 1992 (90th percentile above the Action Level of 15 µg/L), both the Pequannock and Wanaque systems implemented CCT in the 1990s. After 1992, water quality data is available for the subsequent residential LCR compliance sampling performed in 1998, 2002, 2003, 2006, 2009, 2012, 2015, 2017, and the first half of 2018. The second round of sampling in 2018 (from July to December) is ongoing at the time of this report. This analysis focuses on residential sampling. Additional sampling has been performed at schools with similar results.

Maps showing the locations and lead concentrations for all compliance sampling events, including the initial sampling in 1992 leading to implementation of CCT, are provided in **Figures 2-2 through 2-12**. As shown in the figures, Newark did experience a period with very low lead concentrations in their sampling pool between 1998 and 2012. During this period, the compliance sampling locations varied by year and were not consistently representative of both the Pequannock and Wanaque supplies. For example, in 2002 and 2009, only homes receiving Wanaque water were sampled. In 1998 and 2006, only homes receiving Pequannock water were sampled. In 2015, slightly elevated lead concentrations were found, but they were still below the Action Level. During the subsequent sampling rounds, lead levels exceeded the Action Level during the first and second half of 2017, as well as the first half of 2018. The Action Level was also exceeded in the last two sampling rounds by Newark's consecutive system, Bloomfield, which receives a large percentage of its supply from Newark's Pequannock WTP.



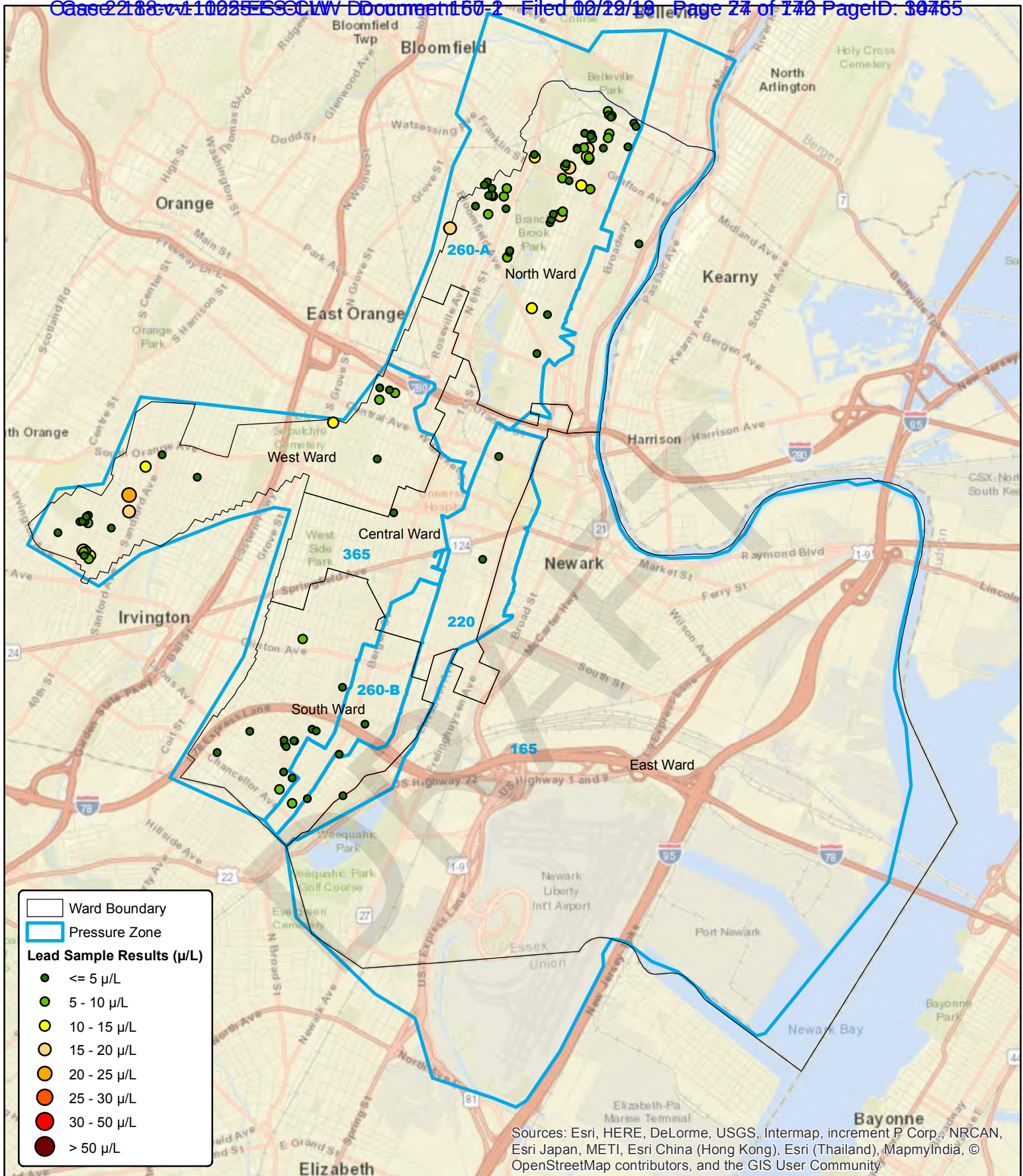
Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



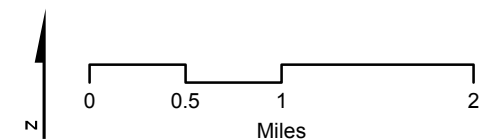
Lead Level in the City of Newark

Data Collected: 1992

Figure 2-2



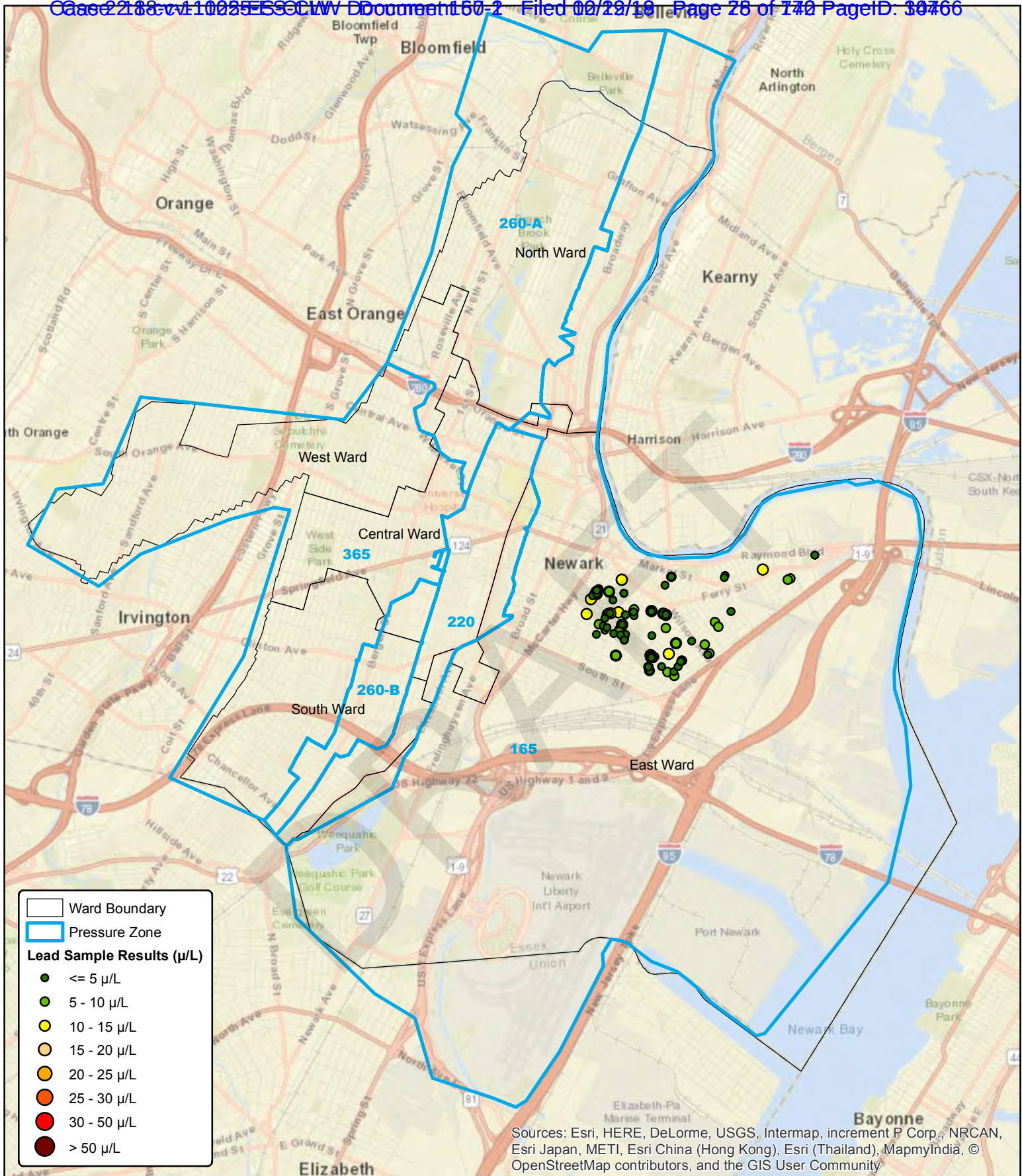
Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



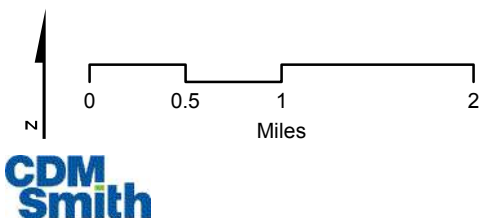
Lead Level in the City of Newark

Data Collected: 1998

Figure 2-3



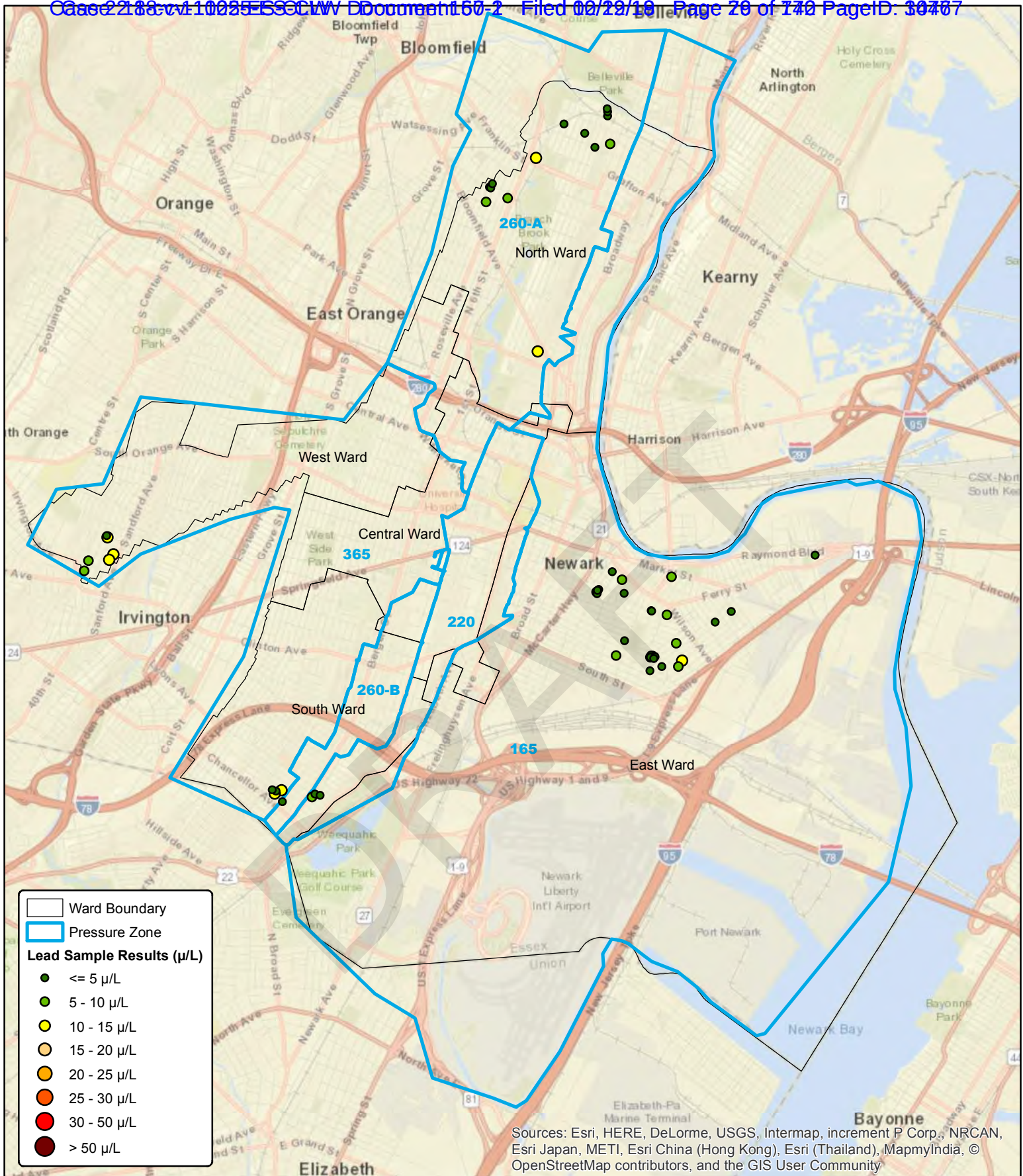
Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



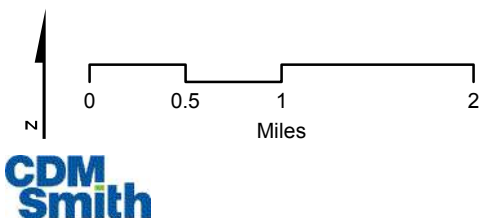
Lead Level in the City of Newark

Data Collected: 2002

Figure 2-4



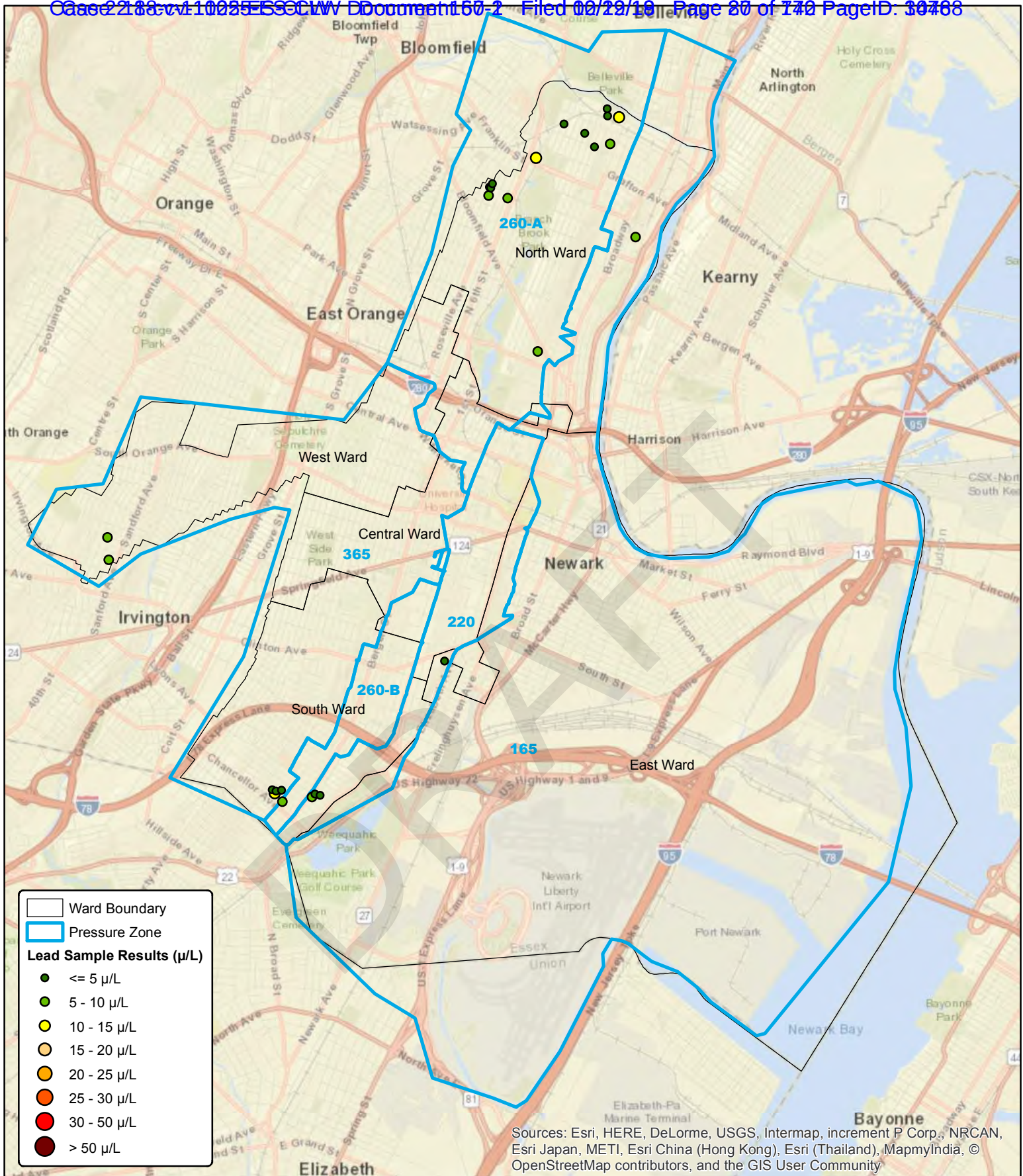
Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



Lead Level in the City of Newark

Data Collected: 2003

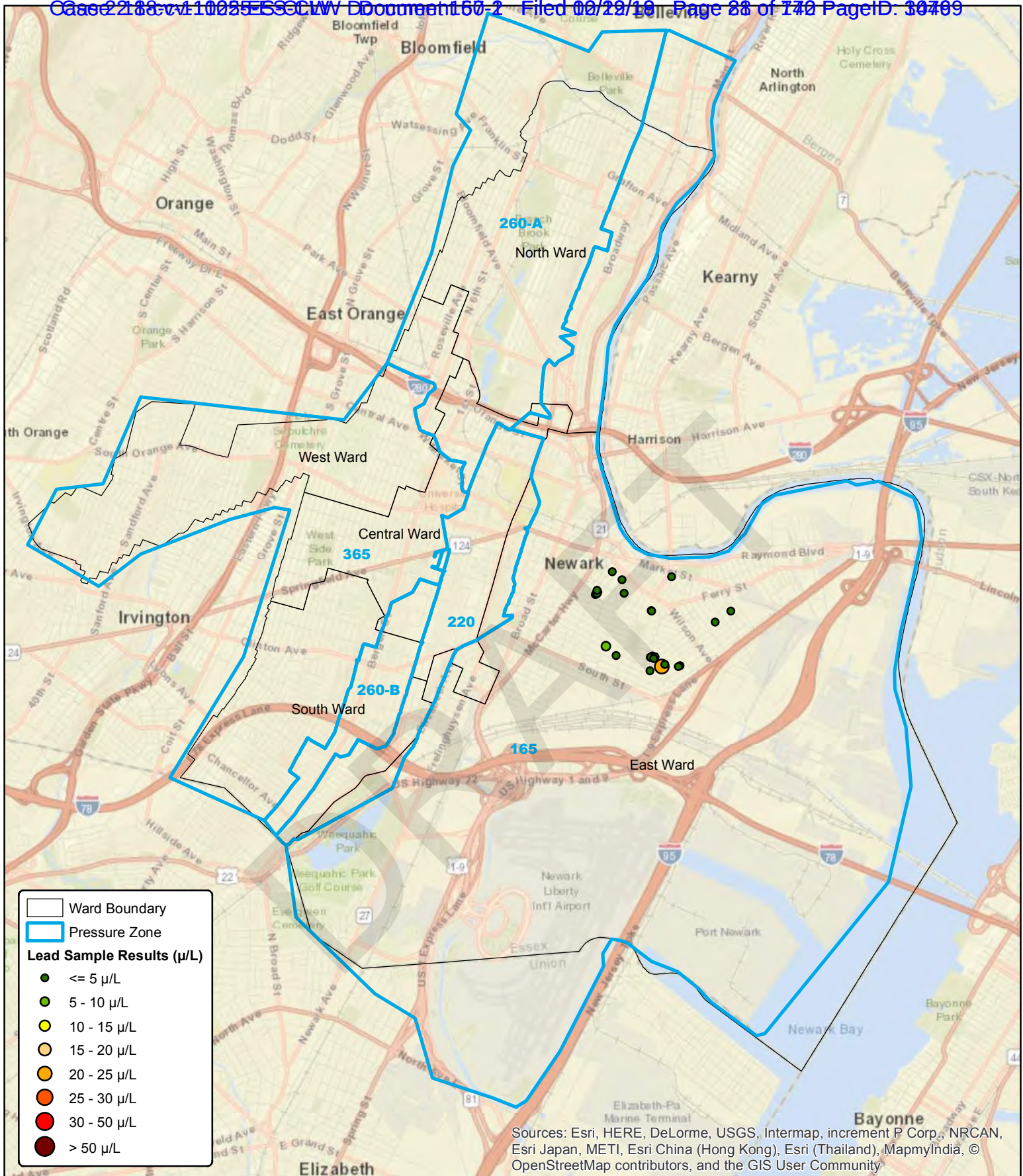
Figure 2-5



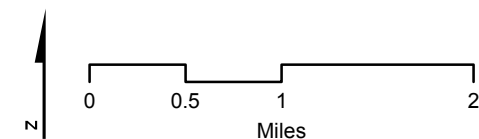
Lead Level in the City of Newark

Data Collected: 2006

Figure 2-6



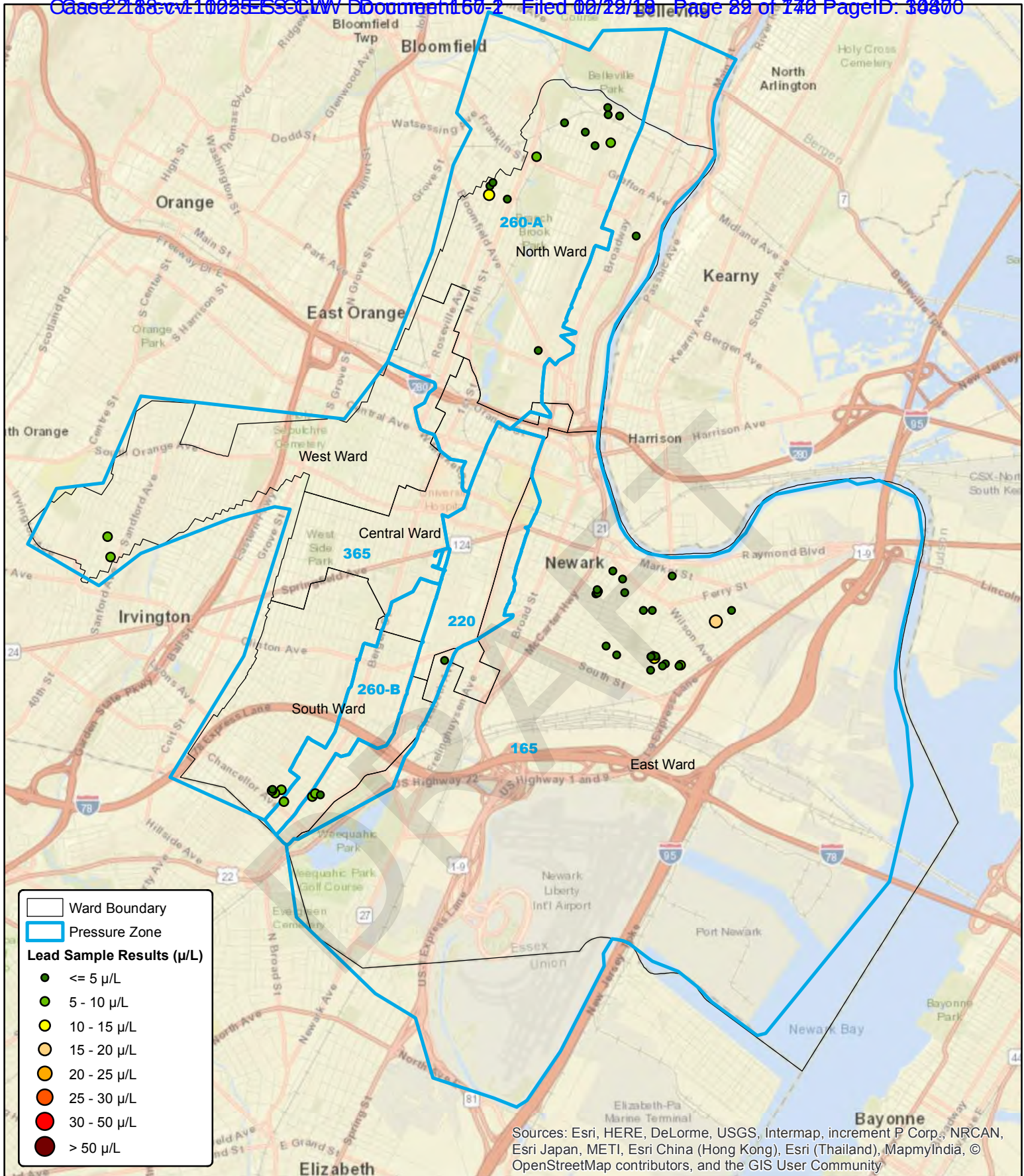
Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



Lead Level in the City of Newark

Data Collected: 2009

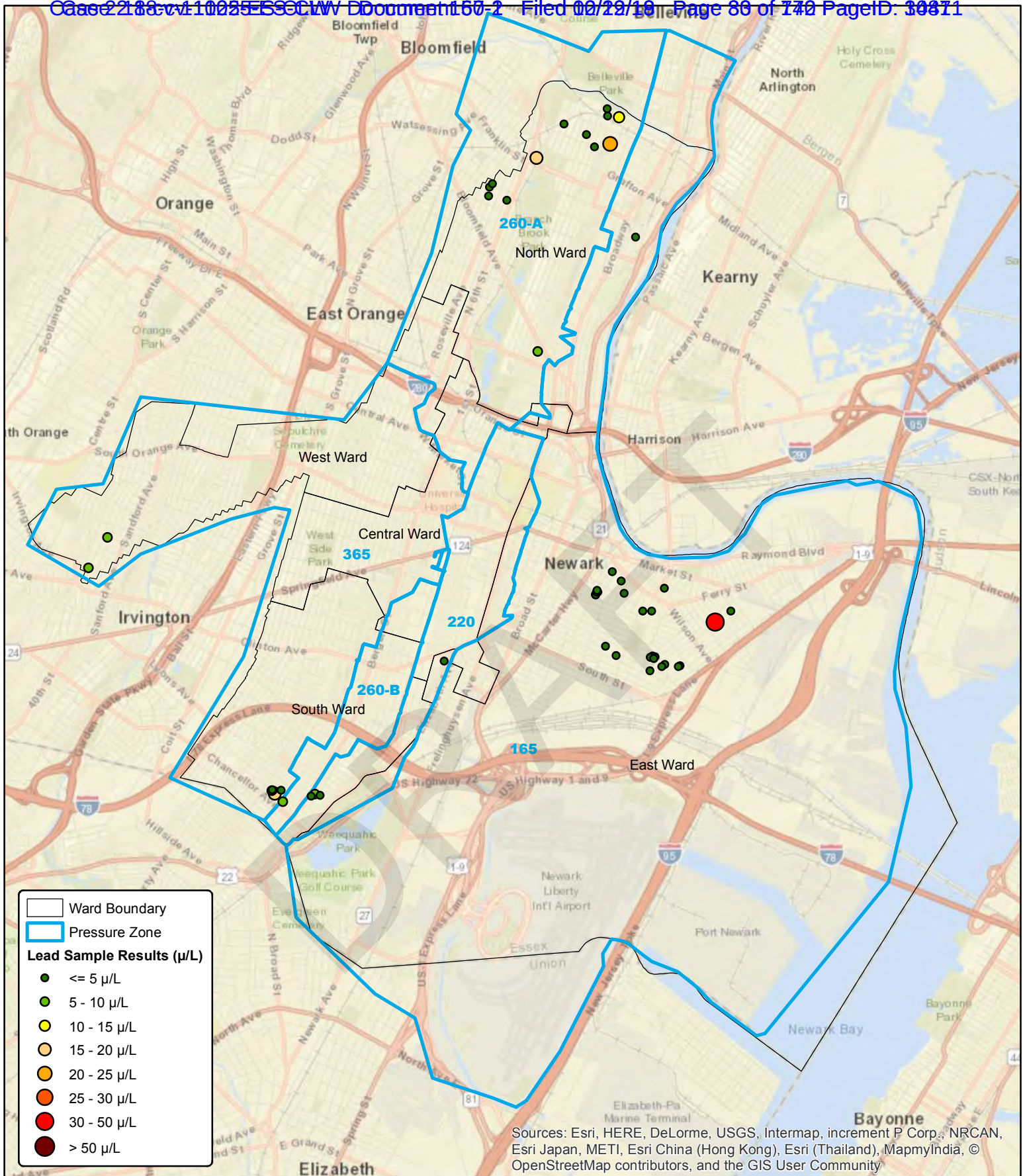
Figure 2-7



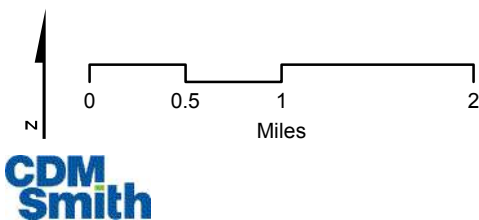
Lead Level in the City of Newark

Data Collected: 2012

Figure 2-8



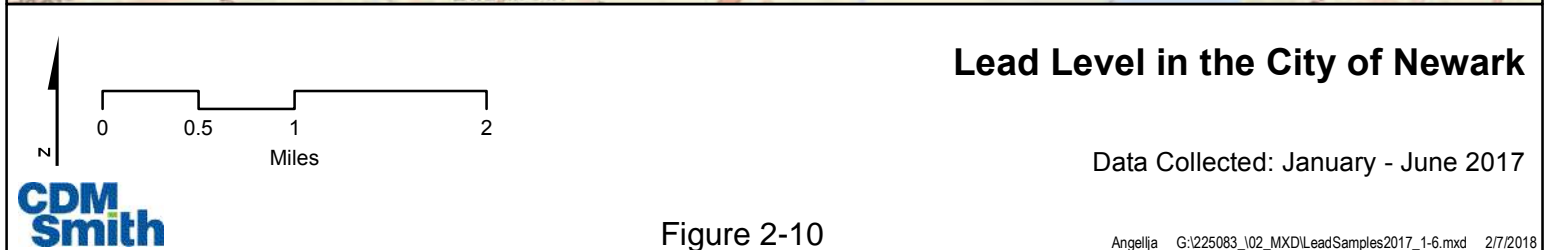
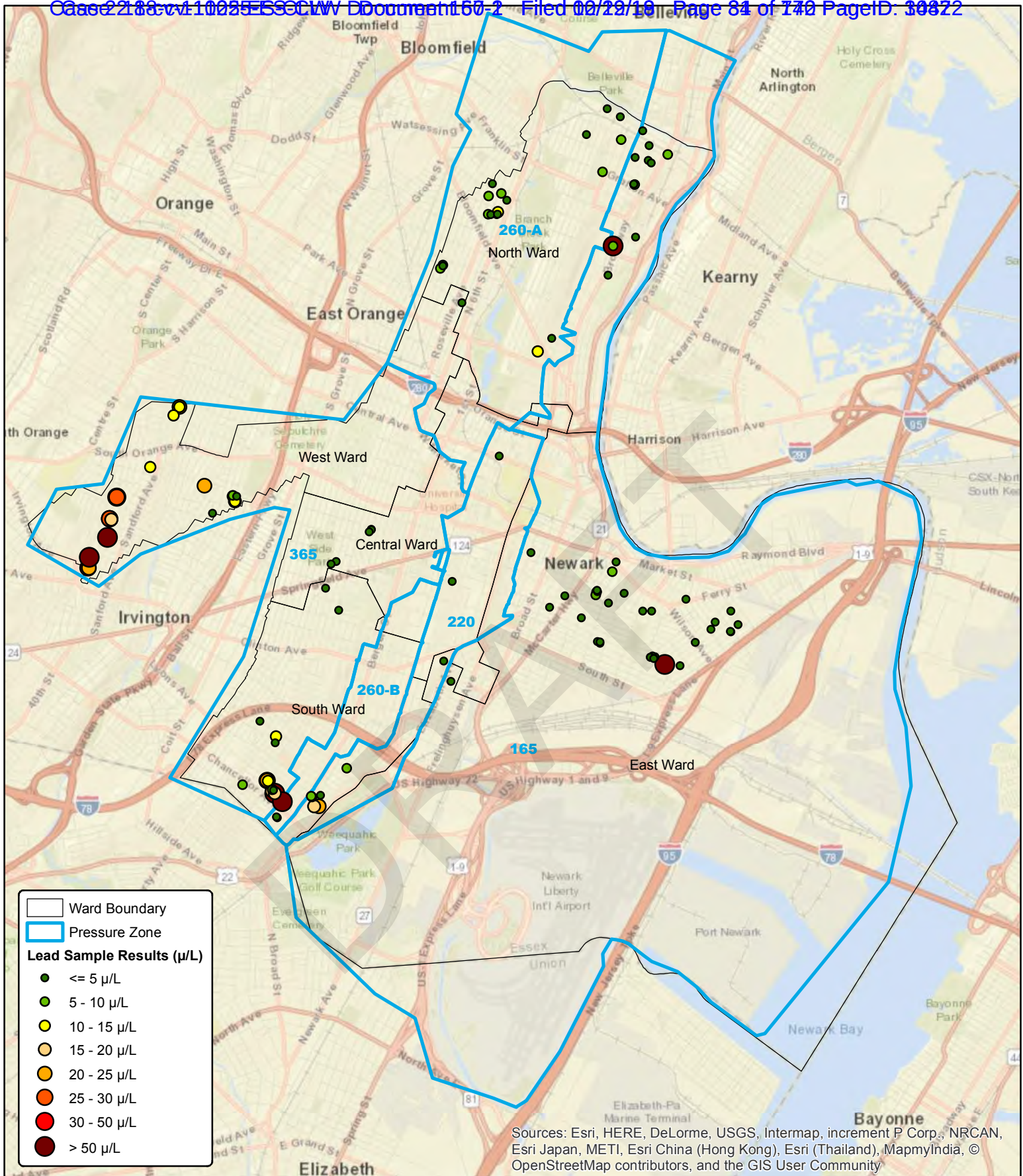
Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

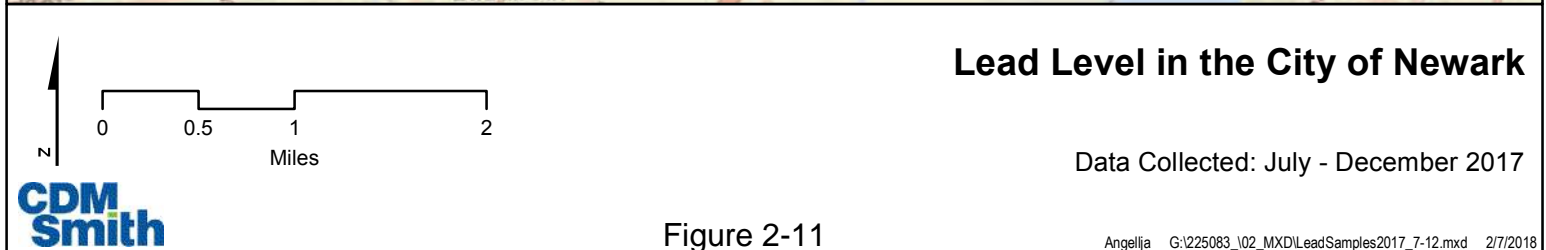
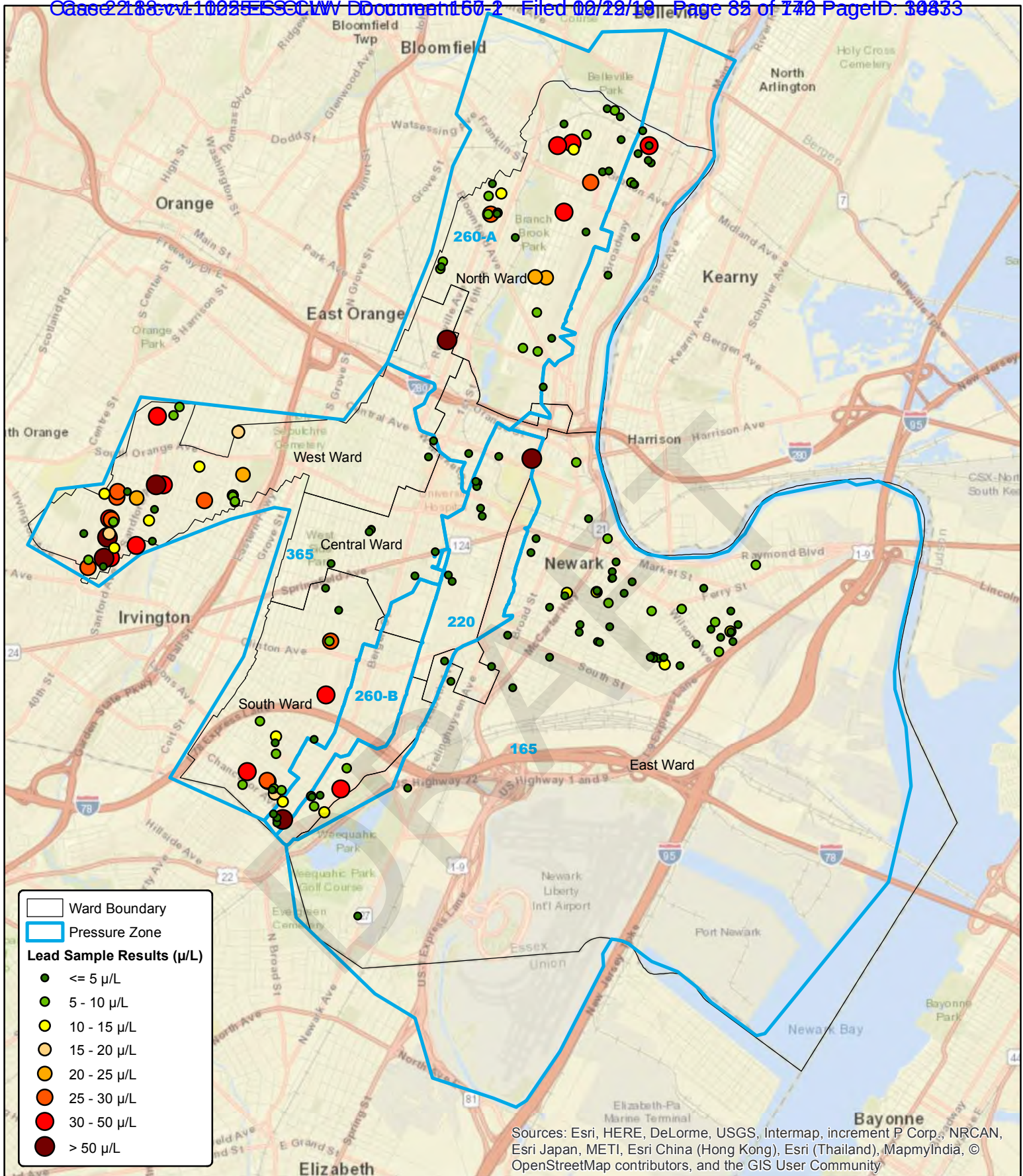


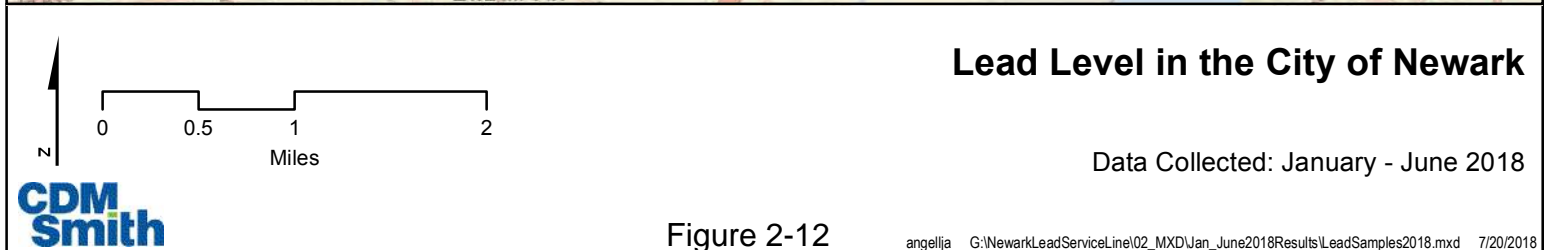
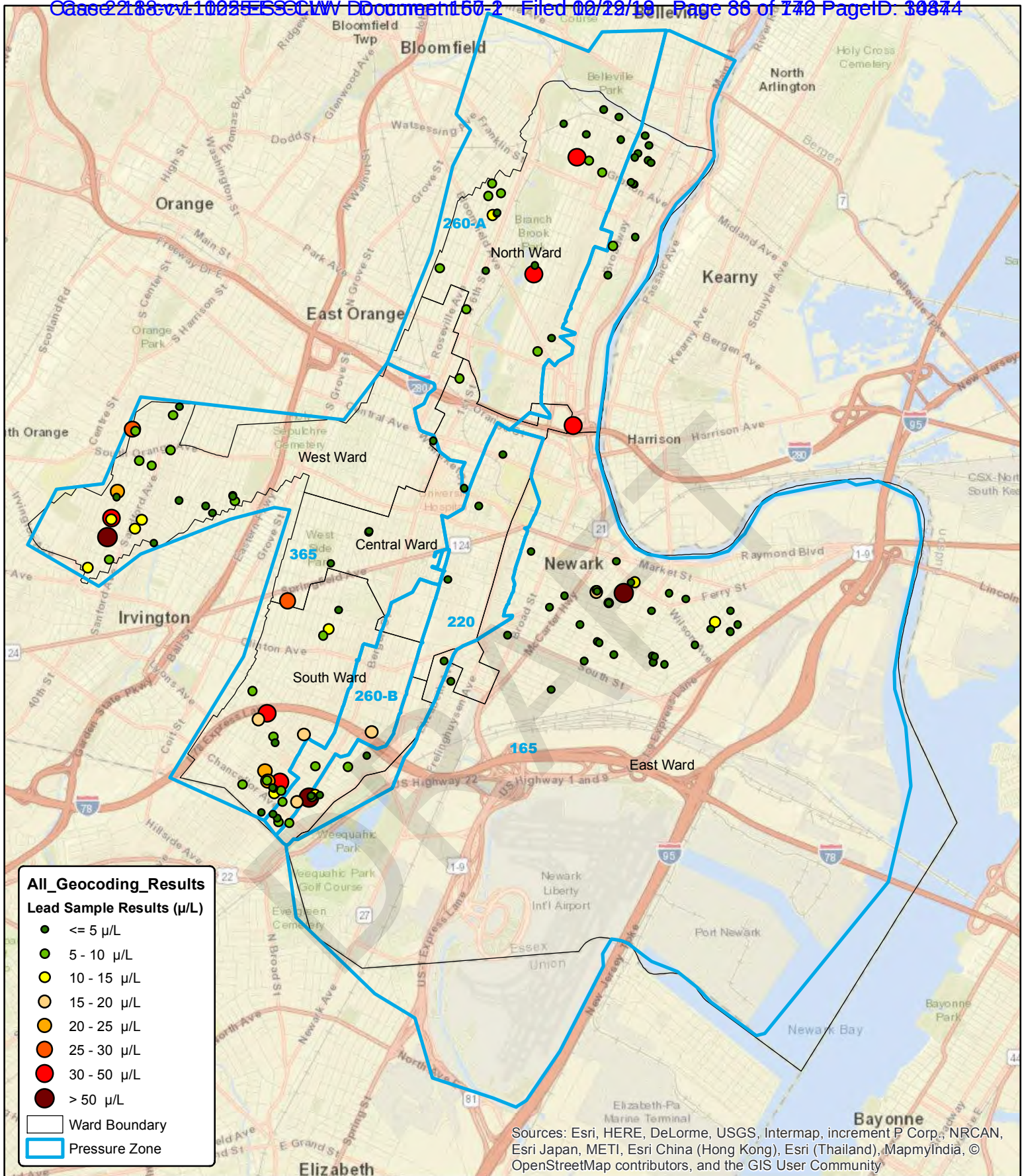
Lead Level in the City of Newark

Data Collected: 2015

Figure 2-9







The LCR Action Level for copper is 1.3 mg/L. Newark has not experienced high copper levels in their system based on the data analyzed. Additional treatment for copper, therefore, is not addressed in this report.

2.3 Lead Frequency Distribution

A frequency distribution analysis was conducted using multiple rounds of compliance sampling data for both the Pequannock and Wanaque service areas. The analysis was conducted for each service area separately, as the service areas receive different CCT as described in Section 2.1.

Frequency distributions can provide insight as to whether changes in lead levels may be the result of CCT, sampling variability, or a combination of the two. (Burlingame, 2004) Frequency distributions can assist in establishing the cause of a change in the 90th percentile value and Action Level exceedance. The frequency distribution presented in this Section provides an analysis of the lead sampling results collected since 1992. The data were sorted into several “bins” and percentile categories by lead concentration. The three “bins” that provide the best indication of whether or not CCT has been optimized are: (1) percent less than or equal to 5 µg/L, (2) 50th (median) percentile (µg/L), and (3) percent greater than 15 µg/L and less than or equal to 25 µg/L. Overall trends are also revealed by the frequency distribution data.

2.3.1 Lead Frequency Distribution – Pequannock Service Area

For the Pequannock service area, the frequency distribution analysis was conducted for compliance sampling data collected in 1992, 1998, 2003, 2006, 2012, 2015, the two sampling periods in 2017, and the first period in 2018. Lead sampling rounds were also conducted by the City of Newark in 2002 and 2009; however, samples taken during these periods were concentrated in areas outside of the Pequannock service area.

Figure 2-13 provides an overview of the lead sampling compliance data from the nine (9) sampling events for the Pequannock service area for the different “bins” from less than 5 µg/L to greater than 50 µg/L. **Table 2-1** provides a summary of some statistical parameters based on the lead sampling compliance data, and **Table 2-2** provides an interpretation of the findings of the frequency distribution analyses for the Pequannock service area.

Section 2 • Background

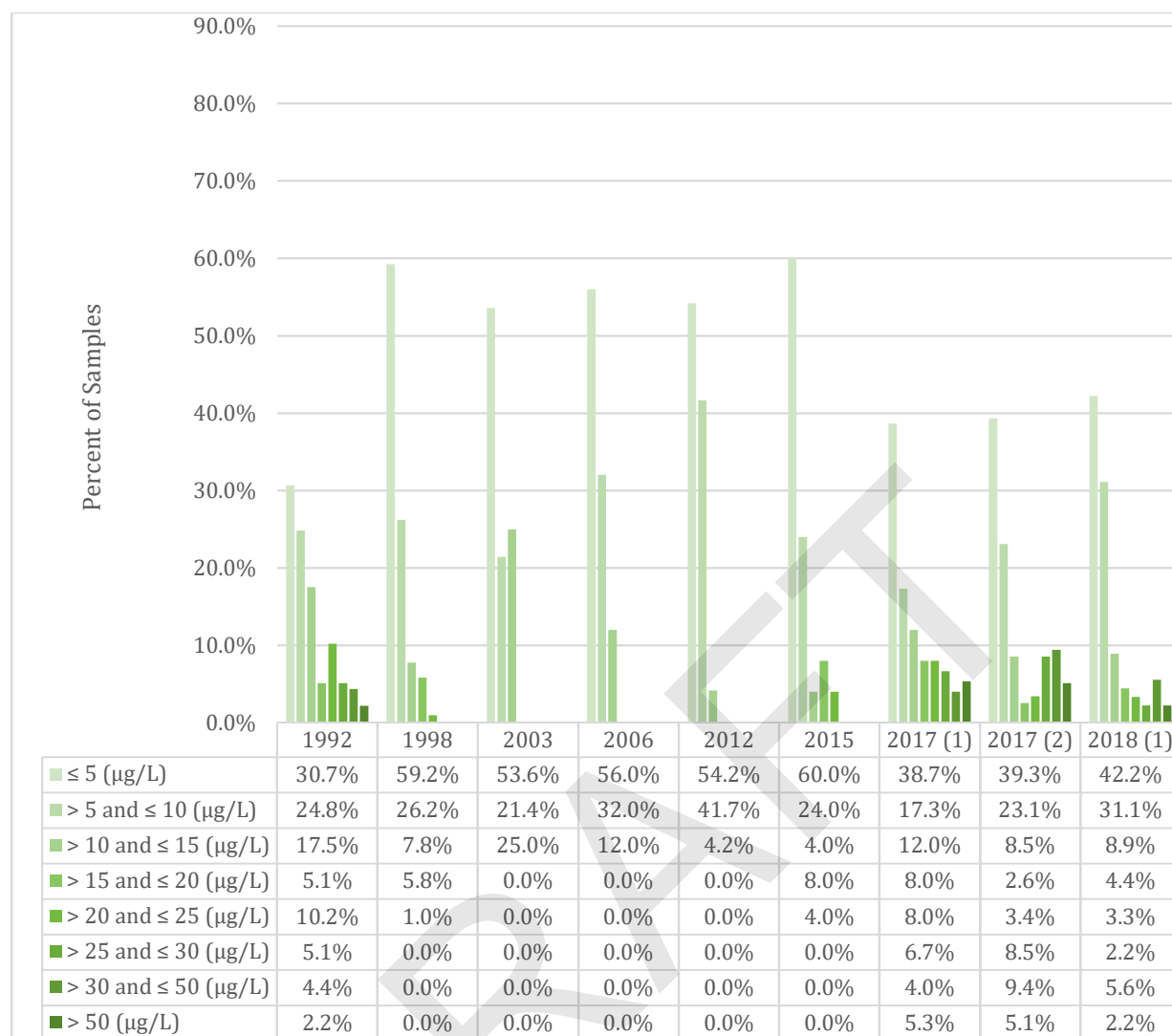


Figure 2-13 – Pequannock Service Area – Lead Sampling Data Percentage Frequency Distribution

Table 2-1 – Summary of Statistical Parameters for Pequannock Lead Sampling Data

Parameter	1992	1998	2003	2006	2012	2015	2017 (1)	2017(2)	2018 (1)
50th Percentile (µg/L)	8.5	4.0	4.8	4.1	5.0	0.0	7.4	7.8	6.4
75th Percentile (µg/L)	16.3	7.4	10.0	7.4	7.3	8.0	17.8	21.2	10.5
90th Percentile (µg/L)	26.8	12.3	12.2	9.5	9.7	15.8	29.8	36.0	22.9
Number of Samples (n)	137	103	28	25	24	25	75	117	90
Number of Samples >15 µg/L (n)	37	7	0	0	0	3	24	34	16
Percent > 15 & ≤ 25 µg/L	15.3%	6.8%	0.0%	0.0%	0.0%	12.0%	16.0%	6.0%	7.8%
Maximum (µg/L)	60.4	23.0	14.2	11.5	14.0	25.0	137.0	77.7	58.9

Table 2-2 – Pequannock Service Area Frequency Distribution Analysis

Data Category/Bin	What does it tell us?	Newark Pequannock Pb Results
Overall frequency distribution	Gives a comprehensive picture of sampling results and allows for comparisons over different periods of time.	The Pequannock WTP implemented sodium silicate chemical addition for CCT in 1997. The lead results from 1998 through 2012 reflect effective control of lead release. However, starting in 2015, lead levels returned to and, in some cases, exceeded 1992 levels. This points to a significant change in system behavior around 2015.
Less than or equal to 5 µg/L	Typically, optimization of a corrosion control treatment is signified by an increased percentage of values that are less than 5 µg/L. When water is treated to be less corrosive, or chemistry is modified to create a stable and insoluble lead compound, overall lead levels will decrease, thereby increasing the percentage of samples with the lowest lead concentrations.	The percentage of samples less than or equal to 5 µg/L increased after CCT was implemented (1997). However, this category only saw 60% of the samples at best, compared to optimized systems which typically see well above 80% of samples less than 5 µg/L. In 2017, the number of samples less than 5 µg/L decreased significantly from 50-60% to about 40%.
50th percentile (µg/L)	The nature of the 90th percentile Action Level is such that it only takes a few samples to greatly affect the outcome of a monitoring period. One seemingly benign deviation in the sampling protocol can greatly skew the 90th percentile value. The 50th percentile is much more resilient and, as such, is a good indicator of the relative effectiveness of a CCT.	The 50 th percentile value decreased from 1992 levels by about half after CCT was implemented in 1997. However, the 50 th percentile nearly doubled in 2017.
Greater than 15 µg/L and less than or equal to 25 µg/L	A small deviation within the 15 to 25 ppb range of samples above could put a system out of compliance. By improving the CCT, a system can provide a greater buffer between the 90th percentile values and the AL of 15 ppb, so as to lessen the effects of an unrepresentative sample.	Prior to implementation of CCT (1992), a significant percentage (15%) of the samples were in this range. After many years of no results being in this range, an uptick in results between 15 and 25 ppb began in 2015, continuing to the first half of 2017; and were still elevated thereafter but slightly less than between 2015 and the first half of 2017. This may be indicative that the most significant impact to the pipe scales may have peaked by early 2017, but this cannot be confirmed.

2.3.2 Lead Frequency Distribution – Wanaque Service Area

A frequency distribution analysis was conducted for compliance sampling data collected in 1992, 2002, 2009, 2012, 2015, the two sampling periods in 2017, and the first period in 2018 for the Wanaque service area. Lead sampling rounds were also conducted by the City of Newark in 1998 and 2003; however, samples taken during these periods were concentrated in areas outside of the Wanaque service area.

Figure 2-14 provides an overview of the lead sampling compliance data from the eight (8) sampling events for the Wanaque service area for the different “bins” from less than 5 µg/L to greater than 50 µg/L. **Table 2-3** provides a summary of some statistical parameters based on the lead sampling compliance data, and **Table 2-4** provides an interpretation of the findings of the frequency distribution analyses for the Wanaque service area.

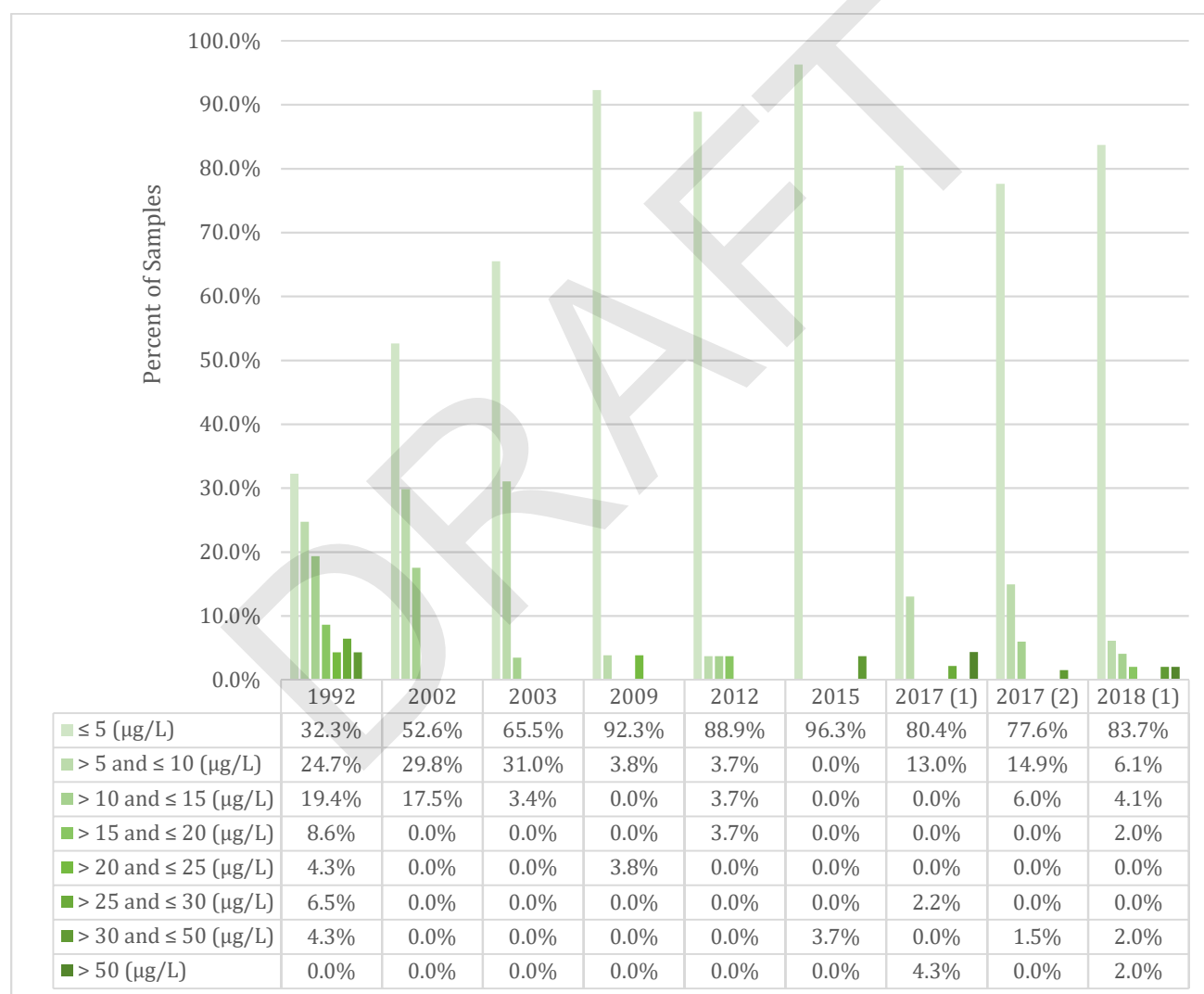


Figure 2-14 – Wanaque Service Area – Lead Sampling Data Percentage Frequency Distribution

Table 2-3 – Summary of Statistical Parameters for Wanaque Lead Sampling Data

Parameter	1992	2002	2003	2009	2012	2015	2017 (1)	2017 (2)	2018 (2)
50th Percentile (µg/L)	6.6	4.6	3.3	0.0	0.0	0.0	0.0	0.0	0.0
75th Percentile(µg/L)	14.2	9.0	6.5	0.0	0.0	0.0	0.0	0.0	0.0
90th Percentile (µg/L)	25.7	11.2	8.4	0.0	6.2	2.0	7.4	8.7	8.7
Number of Samples (n)	93	114	29	26	27	27	46	67	49
Number of Samples >15 µg/L (n)	22	0	0	1	1	1	3	1	3
Percent > 15 & ≤ 25 µg/L	12.9%	0.0%	0.0%	3.8%	3.7%	0.0%	0.0%	0.0%	2.0%
Maximum (µg/L)	49.4	14.9	12.3	24.6	19.0	37.0	84.0	46.1	182.0

Table 2-4 – Wanaque Service Area Frequency Distribution Analysis

Data Category/Bin	What does it tell us?	Newark Wanaque_Pb Results
Overall frequency distribution	Gives a comprehensive picture of sampling results and allows for comparisons over different periods of time.	The Wanaque WTP implemented zinc orthophosphate chemical addition for CCT treatment in the mid 1990s. Between 1992 and 2018, lead sampling results for the Wanaque service area shifted in multiple “bins” (ranges). The 1992 sampling was prior to the CCT treatment improvements. These results point to CCT effectiveness as the cause of a significant decrease in action level beginning in the early 2000s and a shift in the percentage of results into lower bins.
Less than or equal to 5 µg/L	Typically, optimization of a corrosion control treatment is signified by an increased percentage of values that are less than 5 µg/L. When water is treated to be less corrosive, or chemistry is modified to create a stable and insoluble lead compound, overall lead levels will decrease, thereby increasing the percentage of samples with the lowest lead concentrations.	Between 1992 and 2017, there was a large increase in % of samples in this category. Where 1992 saw 32% of samples in this category, 2017 and 2018 sampling saw an increase to an average of 80% between the three sampling pools for lead results less than or equal to 5 ppb. This can again be tied to CCT treatment of zinc orthophosphate. Typically, optimized systems have a majority of sample results (>80%) in the category of <5 ppb.
50th percentile (µg/L)	The nature of the 90th percentile Action Level is such that it only takes a few samples to greatly affect the outcome of a monitoring period. One seemingly benign deviation in the sampling protocol can greatly skew the 90th percentile value. The 50th percentile is much more resilient and, as such, is a good indicator of the relative effectiveness of a CCT.	The 50 th percentile value decreased from 6.6 in 1992 to zero (0) in 2009, and remaining as such ever since indicating effectiveness of the zinc orthophosphate CCT treatment.

Data Category/Bin	What does it tell us?	Newark Wanaque_Pb Results
Greater than 15 µg/L and less than or equal to 25 µg/L	A small deviation within the 15 to 25 µg/L range could put a system out of compliance. By improving the CCT, a system can provide a greater buffer between the 90th percentile values and the AL of 15 µg/L, so as to lessen the effects of an unrepresentative sample.	There was a large decrease in the number of results in this category after the initial sampling round in 1992, which was prior to implementation of CCT. In 2009 and 2012, there was a slight increase in result in this category, which could indicate sampling variability but not definitively. Overall, occurrences of lead levels above the action level decreased significantly indicating the effectiveness of the CCT treatment.

DRAFT

Section 3

Historic Water Quality and Chemical Usage Data

Historic water quality data was obtained from multiple sources provided by NJDEP Drinking Water Watch (as of September 21, 2018), as well as from the City of Newark. The data used for this analysis includes the following:

- City of Newark – Raw Water Supply Quality Analysis for 2016 and 2017. This included monthly averages of pH, temperature, turbidity, color, calcium, alkalinity, hardness and conductivity.
- Optimal Corrosion Control Treatment Recommendations report, prepared by the City of Newark, December 2017.
- Comprehensive Technical Assistance (CTA) Report, prepared by H2M, May 2016.
- Comprehensive Performance Evaluation Pequannock Water Treatment Plant Report, prepared by Aquamize, July 2014.
- Disinfection By-Product Control Bench Scale Investigation, prepared by Carollo Engineers, May 2016
- Daily analysis sheets recorded at the Pequannock WTP lab for delivered and raw water from 2015-2018 (excluding January – October 2017, but including July 2nd, 3rd and 4th of 2017) provided by the City of Newark. This included pH, temperature, chlorine residual, turbidity, color, calcium, alkalinity, hardness and conductivity for delivered water and pH, temperature, turbidity, color, calcium, alkalinity, hardness and conductivity for the raw water.
- Pequannock WTP monthly chemical usage for 2016 (excluding November), as well as January – March of 2018 provided by the City of Newark. This includes Clarion (potassium aluminum), lime, sodium silicate, chlorine (pre and post) and PACl as minimum, maximum and average dosages in mg/L, as well as total amounts used in pounds per day (lbs/day).
- Monthly averages for raw and delivered water data, as well as chemical dosage data, for 2016 and 2017. This includes the turbidity and alkalinity for raw water and the average pH and chlorine residual for delivered water. The monthly average chemical dosage data was provided for Clarion (potassium aluminum), PACl, silicate, chlorine and polymer in mg/L, and lime in lbs/day.
- Monthly average data for delivered water from January – September 2017, provided by the City of Newark. This includes free chlorine residual, total chlorine residual, calcium, alkalinity, hardness, total organic carbon (TOC), and conductivity.
- Total organic carbon (TOC) monthly data for raw and delivered water, provided by the City of Newark. This includes October of 2014, May – August and October of 2016, all of 2017

and January – April of 2018 for raw water. January – March, May, November and December of 2017 as well as February and April of 2018 data, were provided for delivered water.

- Pequannock WTP annual average chemical dosing for 2014 provided by the City of Newark.
- Delivered water monthly averages for 2016, 2017 and January-March of 2018, provided by the City of Newark. This includes sulfate, magnesium and total dissolved solids (TDS).
- Chemical dosing 2017 monthly chemical usage (lbs), yearly total usage and yearly average, provided by the City of Newark. This includes alum/polymer, chlorine, PACl, lime, polymer and silicate.
- Raw and delivered water monthly turbidity averages for 2017, provided by the City of Newark.
- Raw and delivered water data, as well as chemical dosage data, for the first half of September 2018, provided by the City of Newark. This included average pH, temperature, alkalinity and calcium for raw water, and pH, temperature, chlorine residual, alkalinity and calcium sampled at Test House.
- Source Water Monitoring Program data, provided by the City of Newark for September 2015, March, April, May, June and September of 2016, and April of 2017. This included a sample from each month for temperature, dissolved oxygen (DO), pH, conductivity, color, turbidity, alkalinity, hardness and TOC.
- Data from NJDEP Water Watch which was mainly used to fill in gaps in the City of Newark's data for raw and delivered water, when available. In addition, NJDEP Water Watch was used to collect data at the other sampling sites, such as the Cedar Grove Reservoir, Valley Road, Belleville Reservoir and the distribution system.
- Valley Road Rechlorination Station daily chlorine residual and pH from 2005 to September 2018, and a few data points prior to 2005.

3.1 Recent Water Quality Data

Recent data obtained from Newark and NJDEP's Water Watch were used for the purpose of understanding the source and finished water characteristics of the Pequannock WTP as related to corrosion control. The data used are summarized in **Table 3-1**.

Table 3-1 – Key Water Quality Parameters for Corrosion Control Evaluation

Parameter	Water Type	Duration	Frequency
Temperature	Source/Finished	January 2015 – April 2018	Daily, excluding January – October 2017

Parameter	Water Type	Duration	Frequency
pH	Source/Finished/ Valley Road Rechlorination Point-of-Entry (POE)	January 2015 – August 2018 (used for current averages) February 1992 – August 2018 (used for historic trends) Valley Road: January 2005 to August 2018 (used for distribution system POE)	2015-2018: Daily, excluding January – October 2017, bi- weekly after April 2018 for delivered water 2005-2018 historic: a few samples per year; sporadic Valley Road: daily
Alkalinity	Source/Finished	January 2015 – August 2018	Daily, excluding January – October 2017, bi-weekly after April 2018 for delivered water
Calcium	Source	January 2015 – April 2018	Daily, excluding January – October 2017
Chlorine Residual	Valley Road Rechlorination – Post-Chlorine POE	Valley Road: January 2005 to August 2018	Daily
Magnesium	Source	January 2016 – February 2018	Monthly averages, excluding September 2016
Total Dissolved Solids	Source	January 2016 – March 2018	Monthly averages ⁷
Chloride	Source	June 1994 – October 2017	16 samples
Silica	Finished	June 2009 – August 2018	5 samples in 2009, bi weekly starting July 2016
Sulfate	Finished	June 1994 – March 2018	22 samples from NJDEP Water Watch, monthly averages from the City of Newark for January 2016 – February 2018 (excluding September 2016)

Because water systems experience variability in water quality throughout the year, as would be expected with a northeast reservoir supply, it is important to evaluate the full range of water quality expected. Four (4) seasonal scenarios were developed based on seasonal water quality fluctuations in the Pequannock Reservoir source water. The seasonal scenarios are as follows:

- Warm temperature conditions (June 19th – September 18th) – Summer
- Cooling period (September 19th – December 18th) – Fall
- Cold temperature conditions (December 19th – March 18th) – Winter
- Warming Period (March 19th – June 18th) – Spring

Figures 3-1 through 3-10 illustrate source and delivered water quality (where available), as well as seasonal trends, for temperature, pH, alkalinity, calcium, and magnesium. **Figure 3-11** provides the amount of silica residual present in the delivered water in comparison to the amount of sodium silicate being dosed into the water, in mg/L as SiO₂. **Figure 3-12** presents the delivered water levels of chloride and sulfate from the available data. As evident from the

figures, daily data from January through October 2017 are missing from Newark's records for alkalinity and calcium. The following remarks on data analysis are noted:

- The seasonal variability in source water temperature is evident, as color-coded and labeled in **Figures 3-1** and **3-2**. The source water temperature, over the last four years, from 2015 to 2018, generally ranged from 5 degrees Celsius in winter to 25 degrees Celsius in the summer.
- Source water pH ranges from 5.7 to 7.5 as shown in orange in **Figure 3-3**. Finished water pH leaving the Pequannock WTP over the last four years, from 2015 to 2018, has shown variability ranging from 6.0 to 8.8. as shown in blue. Over the last 2 years, finished water pH has tended to range from 6.5-7.5. Longer term pH trends are described in Section 3.3.1.
- Alkalinity in the source water generally ranged between 10 and 35 mg/L as CaCO₃ over the last four years, from 2015 to 2018, as shown in **Figures 3-5** and **3-6**, depending on the season. Alkalinity increases as the water temperature increases and decreases as the water cools.
- Calcium levels in the source water have a generally increasing trend from the cold to warm seasons, as shown in **Figures 3-7** and **3-8**. Calcium concentrations in the source water are generally between 6 and 14 mg/L as Ca²⁺ and increase in the finished water to between 10 and 18 mg/L as Ca⁺. due to the addition of lime
- Magnesium in the delivered water ranged from 3.8 mg/L as Mg to 5 mg/L as Mg as shown in **Figures 3-9** and **3-10**. No obvious seasonal trends are present. The raw magnesium levels are assumed to be similar to the levels in the delivered water, as no chemicals with significant amounts of magnesium are added at the plant.
- Silica concentrations measured at the plant finished water (Test House) ranged from 5.7 to 12.0 mg/L as SiO₂ between December 2015 and August 2018 as shown in **Figure 3-11**. The sodium silicate dosed at the Pequannock WTP ranged from 10.1 – 14.1 mg/L as sodium silicate, or 2.9 to 4.1 mg/L as SiO₂. It is reported that the silica concentration in the raw water is approximately 4.0 mg/L as SiO₂ (Newark, 1994).
- Chloride in the delivered water ranged from 25 mg/L as Cl to 45 mg/L as Cl from 1994 to 2017 as shown in **Figure 3-12**. Polyaluminum chloride (PACl) is added at the Pequannock WTP for coagulation, which contributes to increased chloride levels. As expected due to runoff from road salts, chloride levels were higher in the winter months than in other seasons. The overall annual average was 33.1 mg/L as Cl.
- Sulfate in the delivered water ranged from 8.1 mg/L as SO₄ to 16.3 mg/L as SO₄²⁻ with an average of 11.4 mg/L as SO₄ as shown in **Figure 3-12**. The Pequannock WTP adds aluminum sulfate (alum) as one of their coagulants, which contributes to the sulfate levels.

Figure 3-1 Historic Pequannock WTP Temperature - Influent and Delivered Water

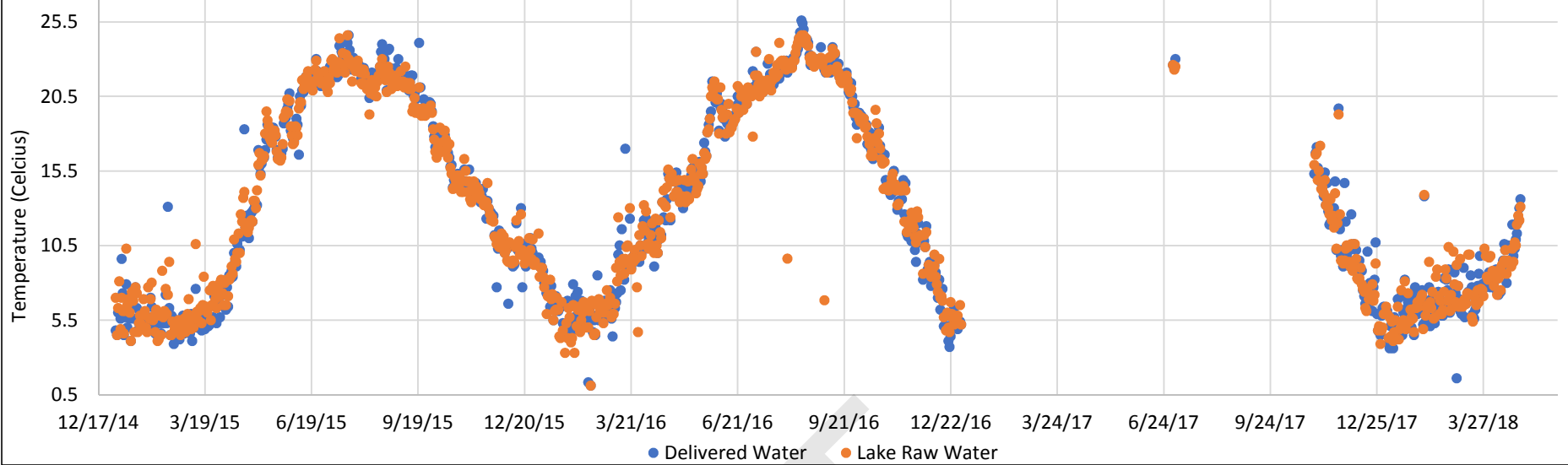


Figure 3-2 Historic Pequannock WTP Temperature - Influent Water Seasonal Trends

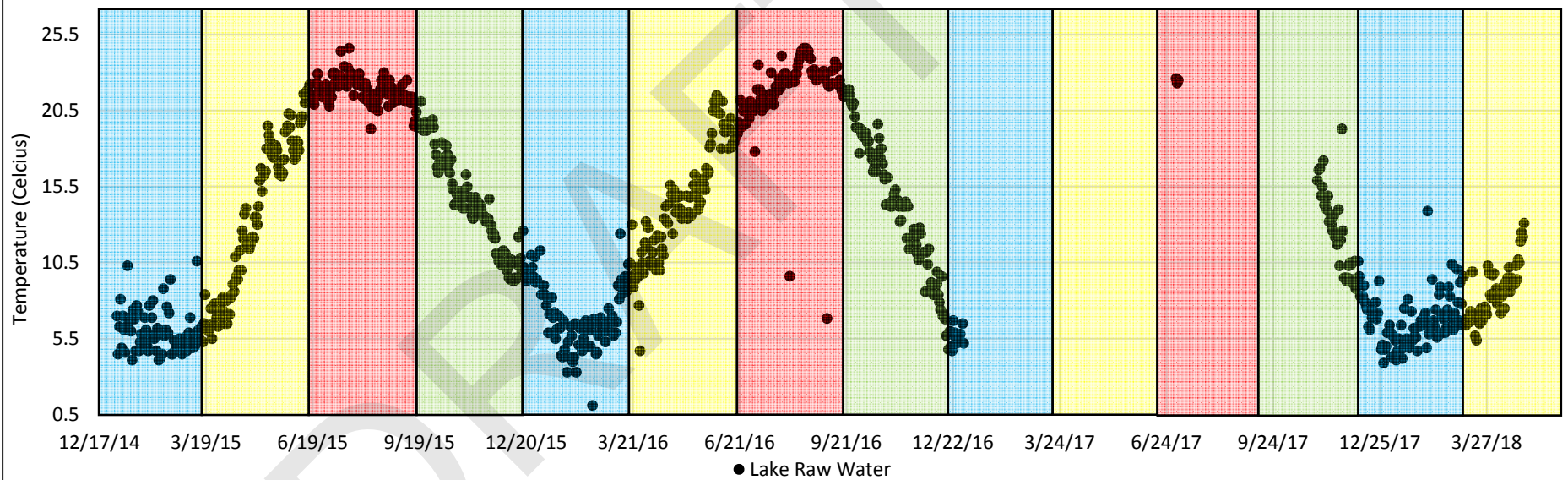


Figure 3-3 - Historic Pequannock WTP pH - Influent and Delivered Water

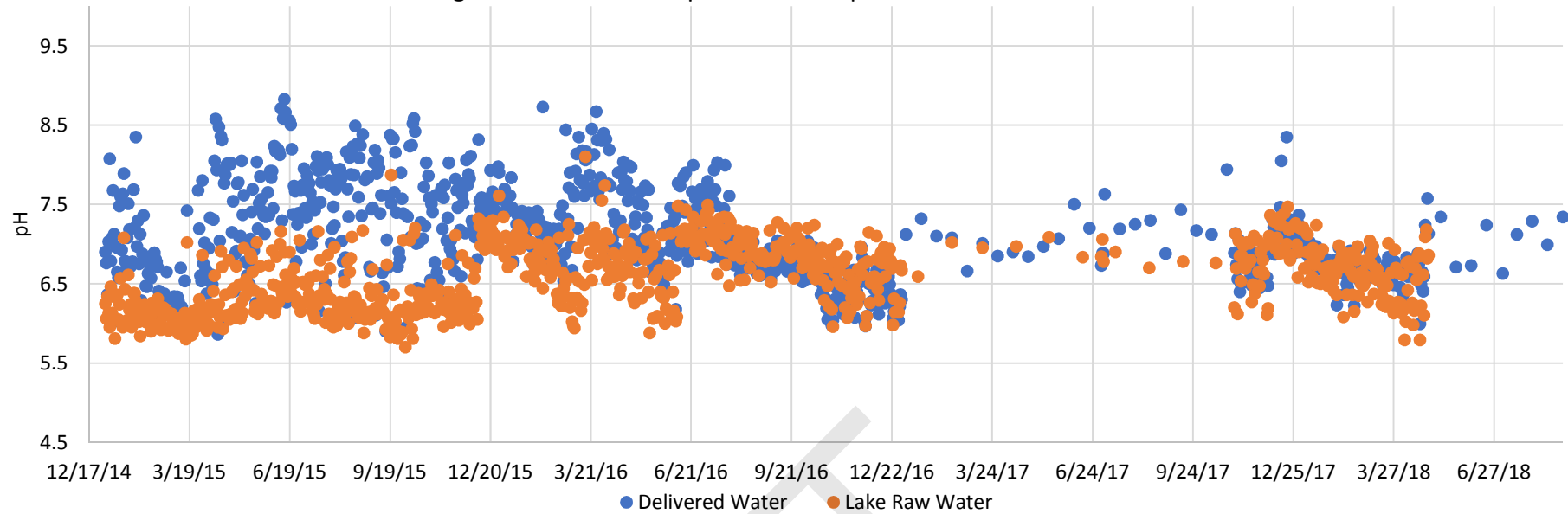


Figure 3-4 - Historic Pequannock WTP pH - Influent Water Seasonal Trends

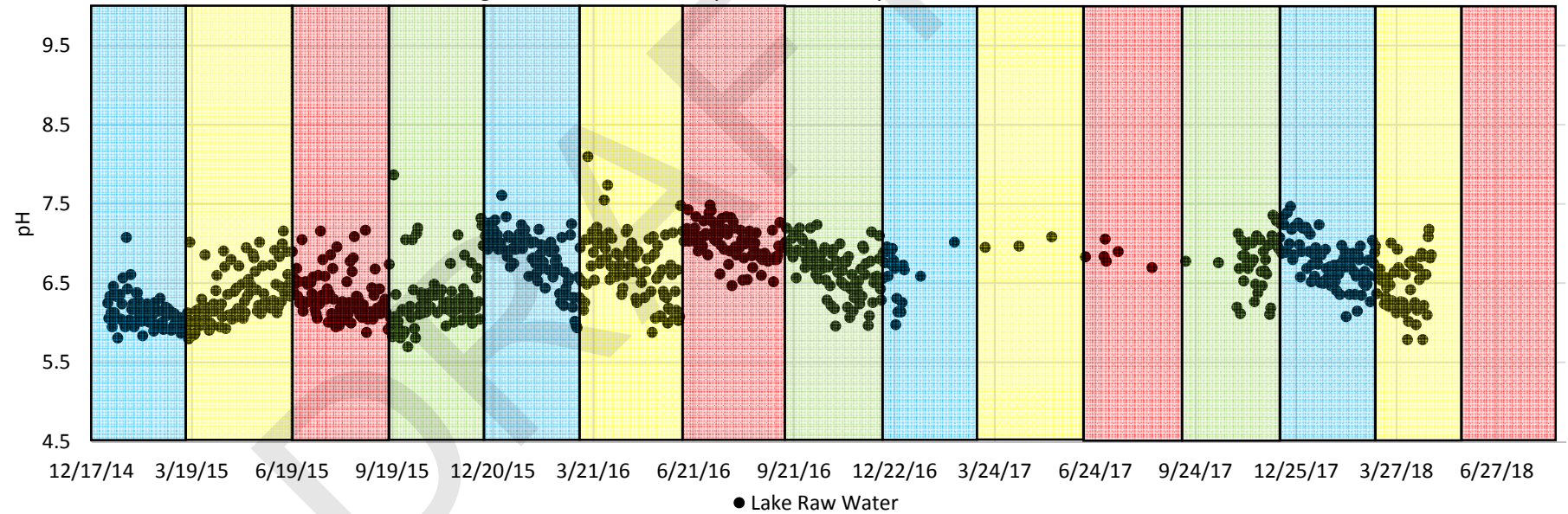


Figure 3-5 - Historic Pequannock WTP Alkalinity - Influent and Delivered Water

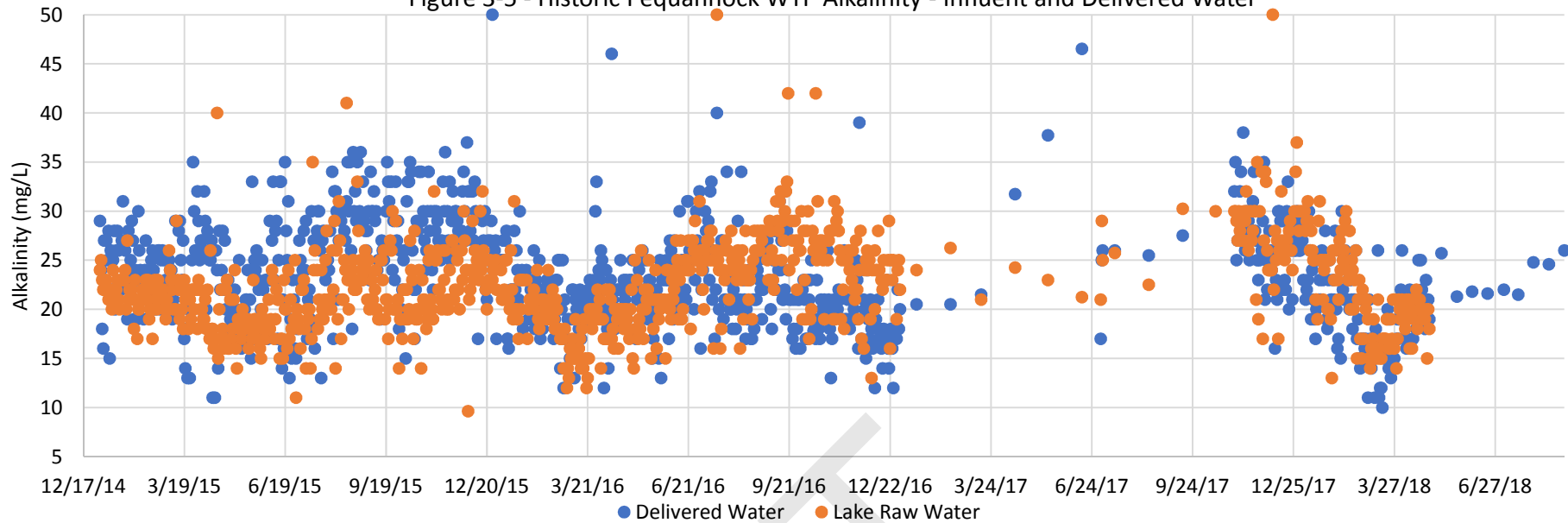


Figure 3-6 - Historic Pequannock WTP Alkalinity - Influent Water Seasonal Trends

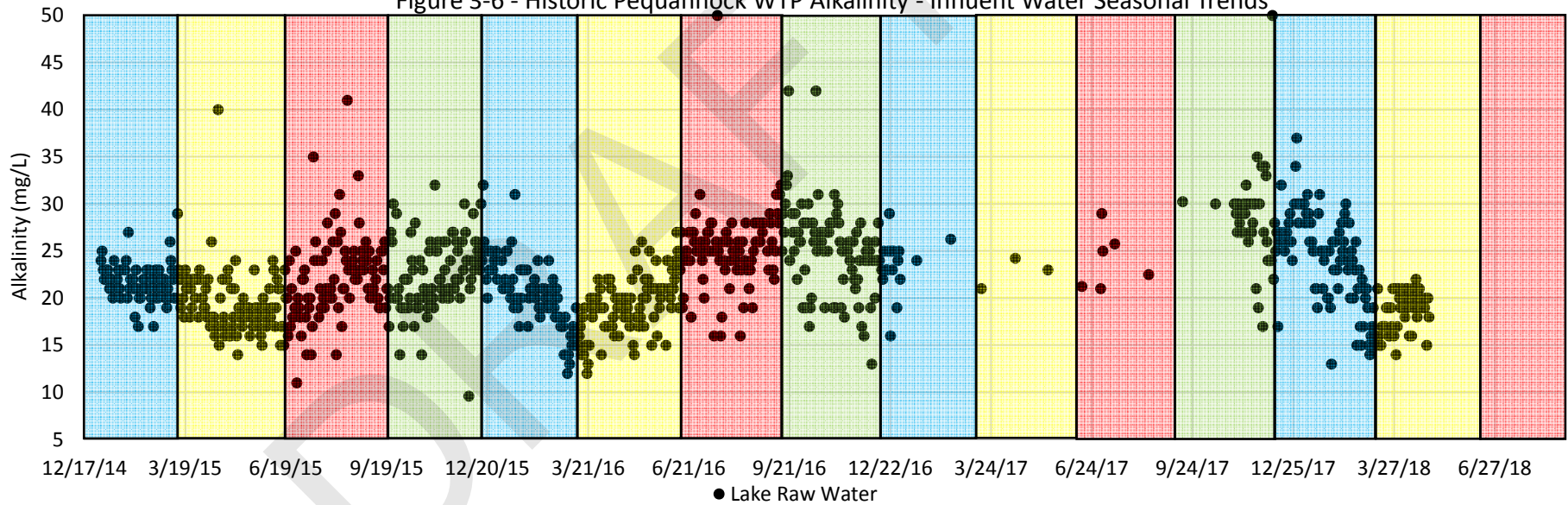


Figure 3-7 - Historic Pequannock WTP Calcium - Influent and Delivered Water

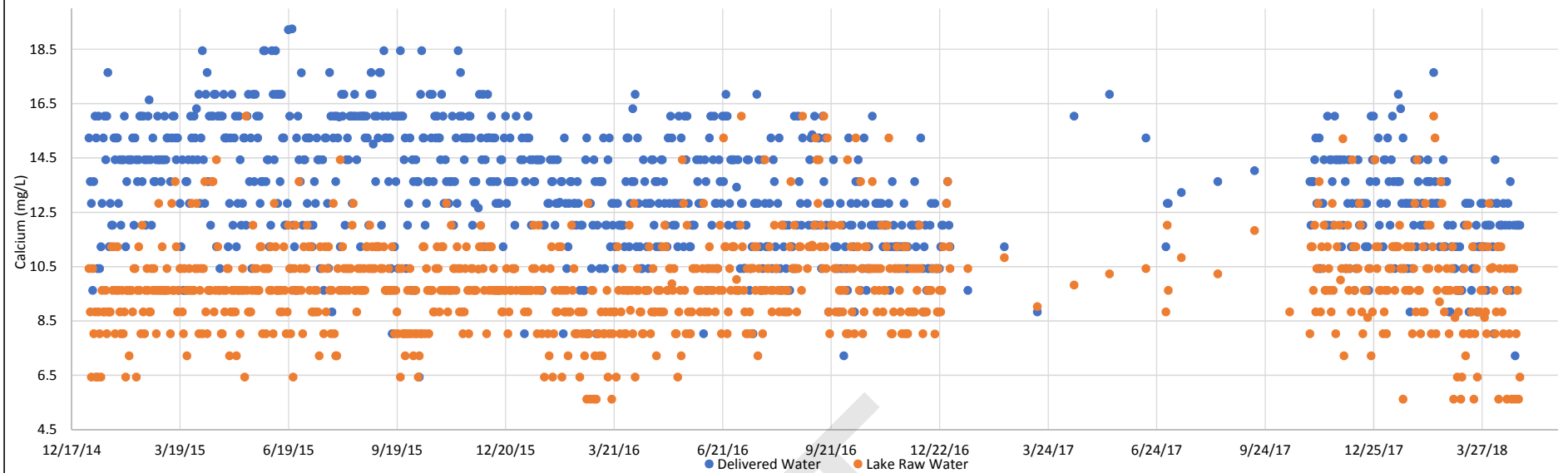
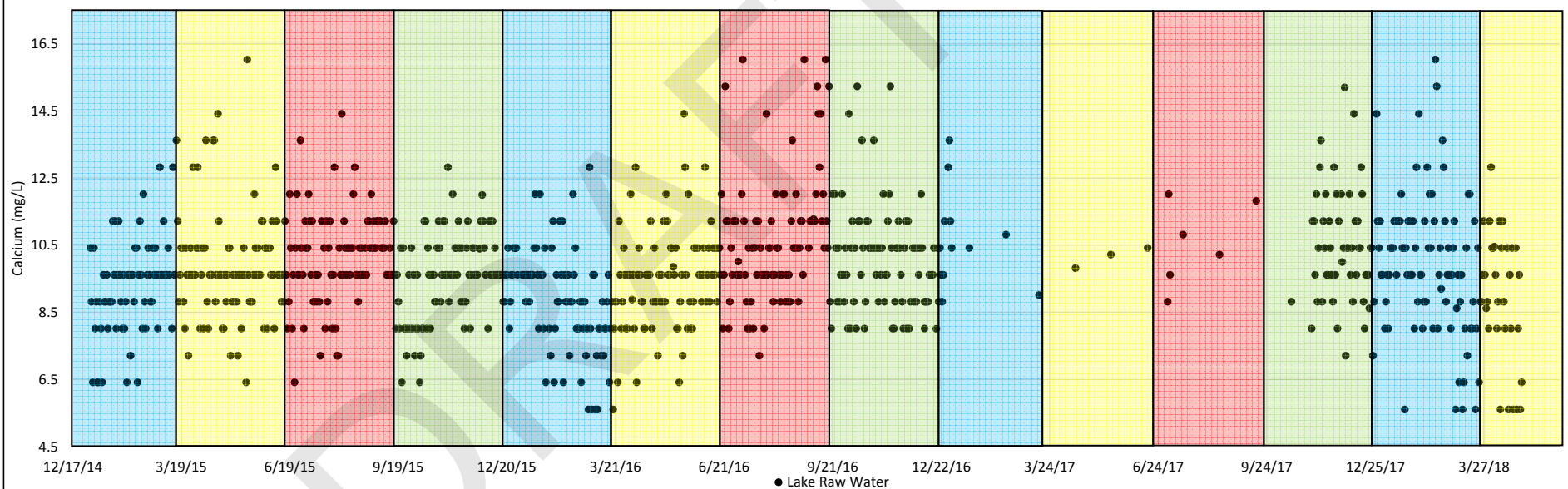
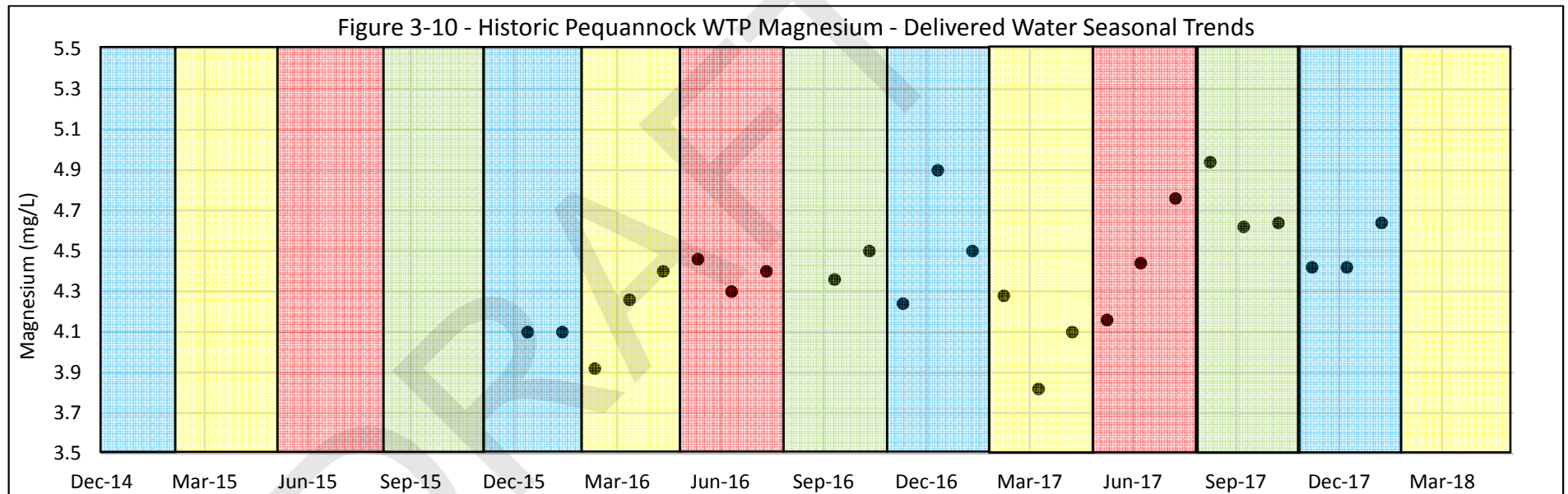
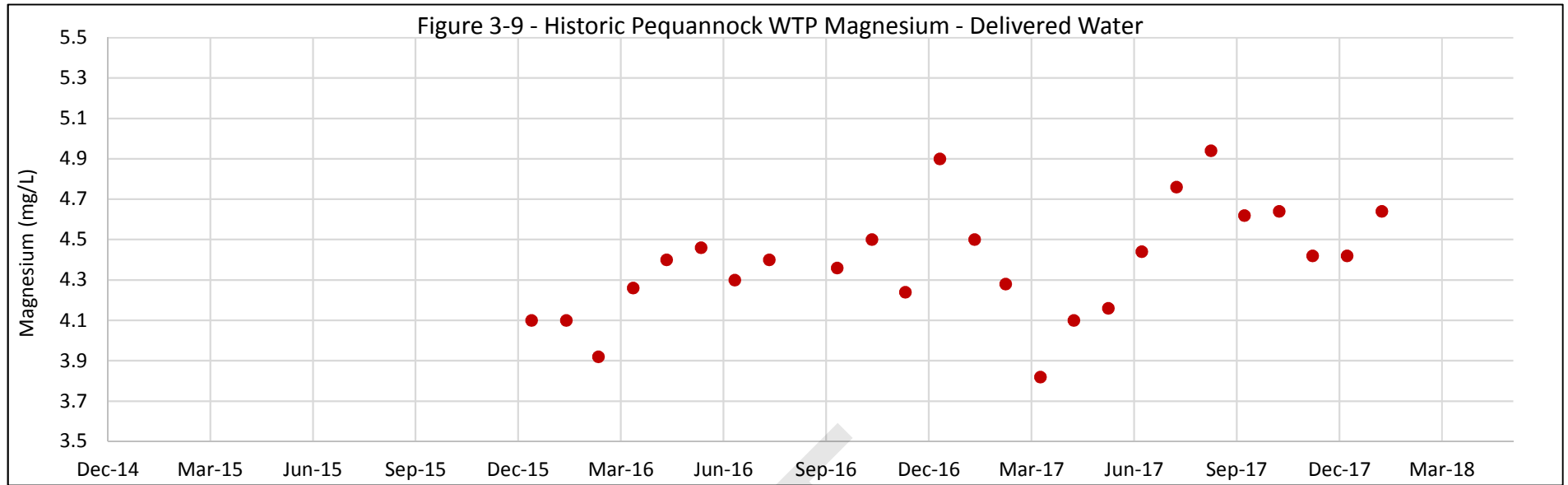


Figure 3-8 - Historic Pequannock WTP Calcium - Influent Water Seasonal Trends





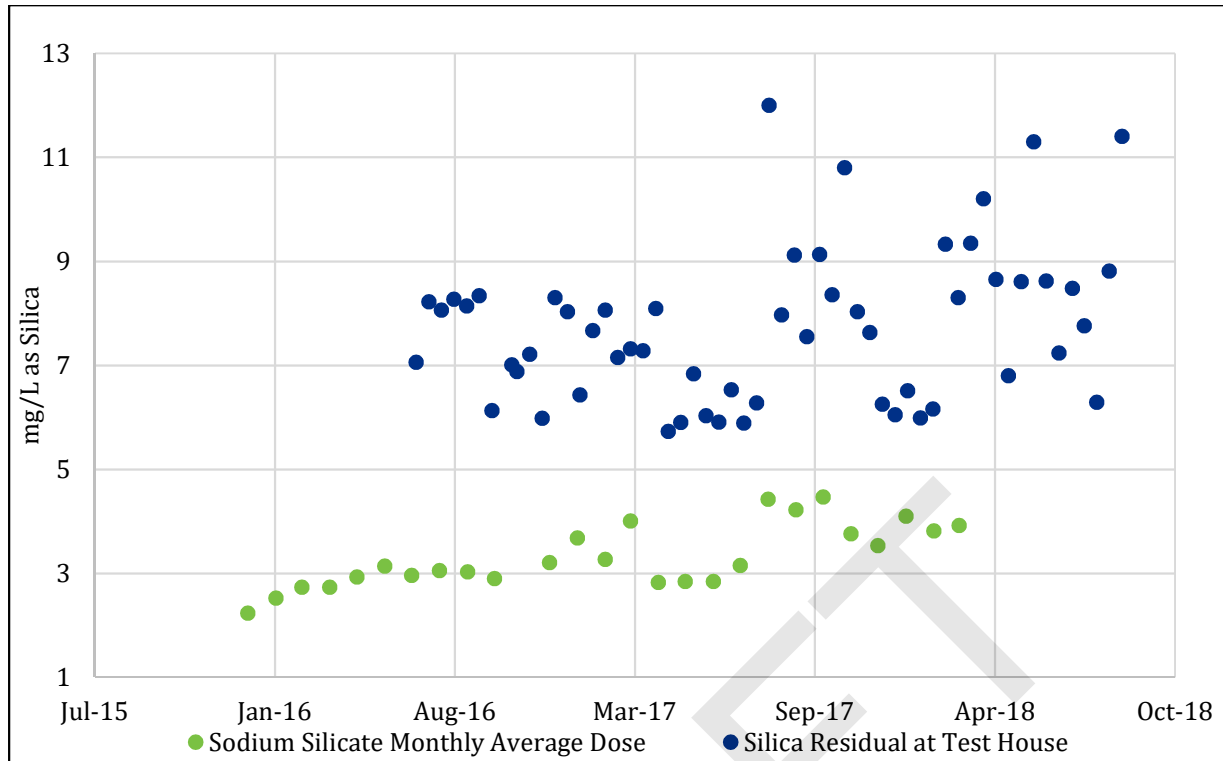


Figure 3-11 – Historic Pequannock WTP Silica – Dose vs. Delivered Water

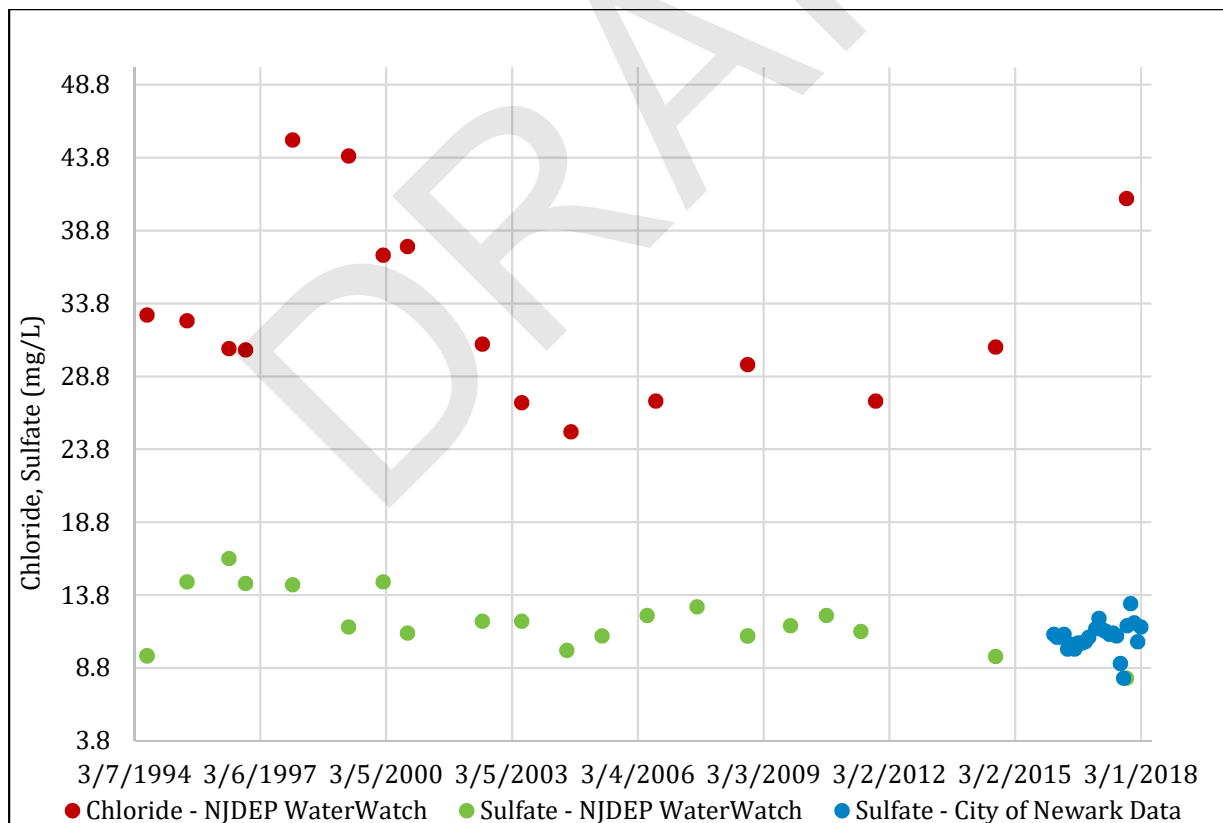


Figure 3-12 – Historic Pequannock WTP Chloride and Sulfate – Delivered Water

3.1.1 Chloride-to-Sulfate Mass Ratio

Galvanic corrosion on lead-copper joints can be accelerated and cause a release of lead with a higher chloride to sulfate mass ratio (CSMR). CSMR is calculated by dividing the average chloride concentration by the average sulfate concentration (Nguyen, Stone, Clark, & Edwards, 2010). The literature reports a “threshold” CSMR value of 0.5, above which galvanic corrosion of lead solder on copper piping can increase. The greatest concerns, however, are utilities with lead solder joints that change their water chemistry to increase CSMR from below 0.5 to above 0.5 as indicated in the Water Research Foundation (WRF) 4088 Study (Nguyen, Stone, Clark, & Edwards, 2010).

The researchers in the WRF study observed that in waters with chloride to sulfate equal to or less than 0.5, very low corrosion rates were observed. High chloride relative to sulfate, yielding CSMRs above 0.5, tended to increase galvanic corrosion of lead solder connected to copper pipe. They also observed, statistically, that as relative concentrations of chloride to sulfate increased in the water supply, the 90th percentile lead concentration generally increased. In their bench-scale experiments, waters with high CSMR were consistently more aggressive in increasing lead leaching from solder galvanically connected to copper.

Based on an average chloride concentration of 33.1 mg/L and an average sulfate ratio of 11.4 mg/L, Newark’s average CSMR is 2.9. Although Newark’s CSMR is above the 0.5 threshold, there are many systems that operate with similar or higher CSMRs that do not have high lead levels or Action Level exceedances. The likely reason for this is that much of the solder exposed to the water may have been released at extremely low rates over decades. The WRF research focused on simulating release of lead from solder that was abruptly subjected to high CSMR water. This is corroborated by full-scale experience where the CSMR changed abruptly due to a process or water quality change (e.g., systems changing from alum to PACl or alum to ferric chloride). In these cases, the “baseline” condition was a relatively low CSMR (often times greater than 0.5), and the operational change caused a sudden increase in CSMR, which contributed to lead release and spikes in tap water sampling results (Nguyen, Stone, Clark, & Edwards, 2010).

Newark doses both alum and PACl as coagulants at their Pequannock WTP and has had a consistent dosing ratio in recent history. The data for chloride and sulfate have shown consistent levels within a narrow range since the beginning of the available data set in 1994, as shown in **Table 3-2**. The galvanic corrosion in lead solder joints on copper piping due to the elevated CSMR in Newark’s system has likely occurred over many years at a slow rate, since no drastic change in the CSMR is apparent in at least the last 24 years.

Table 3-2 – Calculated CSMR Values from Available Chloride and Sulfate Data

Date	Chloride as Cl	Sulfate as SO ₄	Calculated CSMR Value
6/23/1994	33	9.64	3.42
6/6/1995	32.6	14.7	2.22
6/4/1996	30.7	16.3	1.88
10/28/1996	30.6	14.6	2.10
12/12/1997	45	14.5	3.10
4/14/1999	43.9	11.6	3.78
2/7/2000	37.1	14.7	3.31
9/7/2000	37.7	11.2	3.37

Date	Chloride as Cl	Sulfate as SO ₄	Calculated CSMR Value
6/21/2002	31	12	2.58
5/30/2003	27	12	2.25
10/16/2008	29.6	11	2.69
9/11/2014	30.8	9.58	3.22
10/25/2017	41	8.09 ^[1]	5.07 ^[1]

^[1] Sulfate data from October 25, 2017 appears to be an anomaly and too low, resulting in a high apparent CSMR. Additional data will be reviewed to determine if this value is accurate.

3.2 Chemical Usage Observations

Chemical usage data at the Pequannock WTP was obtained from the City of Newark and analyzed for dosage trends that may affect the seasonal water quality variations for pH, alkalinity, calcium, and other corrosion-related parameters as discussed in Section 3.1. The data obtained includes monthly averages from January 2016 – March 2018, excluding 2017, for the following chemicals:

- Clarion – Potassium alum
- Lime (100% Hydrated Lime)
- Sodium Silicate
- Polyaluminum chloride (PACl)
- Chlorine gas

Figures 3-13 and 3-14 show the chemical dosage data for Clarion, lime, sodium silicate, and PACl, and seasonal trends where present. The data was also compared with 2014 data presented in the CTA report. The following remarks on data analysis for chemical usage are noted:

- No significant seasonal variation was observed in Clarion (alum) dosage, which ranged from 8.9 mg/L to 9.9 mg/L. The average dose of the data provided for Clarion was 9.5 mg/L. Generally, the average Clarion dose is consistent throughout the year and consistent with the average dose in 2014 which was 9.2 mg/L.
- No significant seasonal variation was observed in lime dosage, which ranged from 2.6 mg/L to 4.2 mg/L. The average dose of the data provided for lime was 3.1 mg/L. According to the CTA, the average lime dose in 2014 was 4.5 mg/L.
- No significant seasonal variation was observed in the sodium silicate dosage, which ranged from 9 to 11.0 mg/L as sodium silicate. The average dose of the data provided for sodium silicate was 11.4 mg/L as sodium silicate. Generally, the sodium silicate dose has been maintained around this average value, but it was noted that starting July 24, 2017, the sodium silicate dose was reportedly increased to 12-15 mg/L as sodium silicate. In comparison with the CTA, the average sodium silicate dose in 2014 was 8.3 mg/L as sodium silicate.

Figure 3-13 - Historic Pequannock WTP Chemical Dosages - Clarion, Lime, Sodium Silicate, PACI

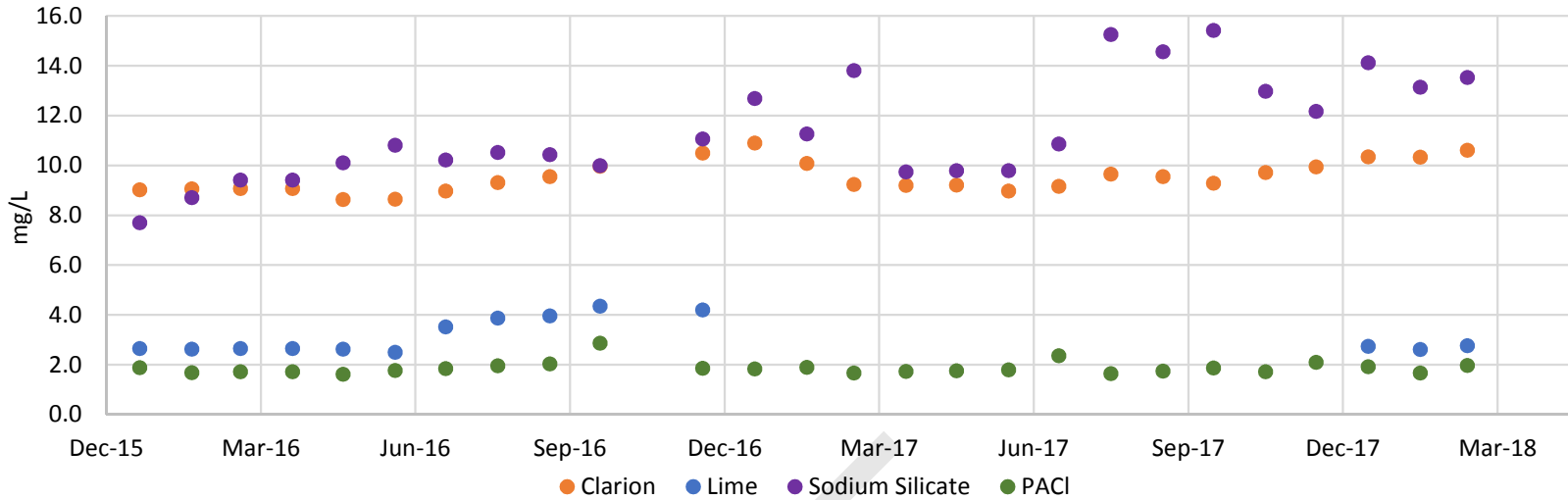
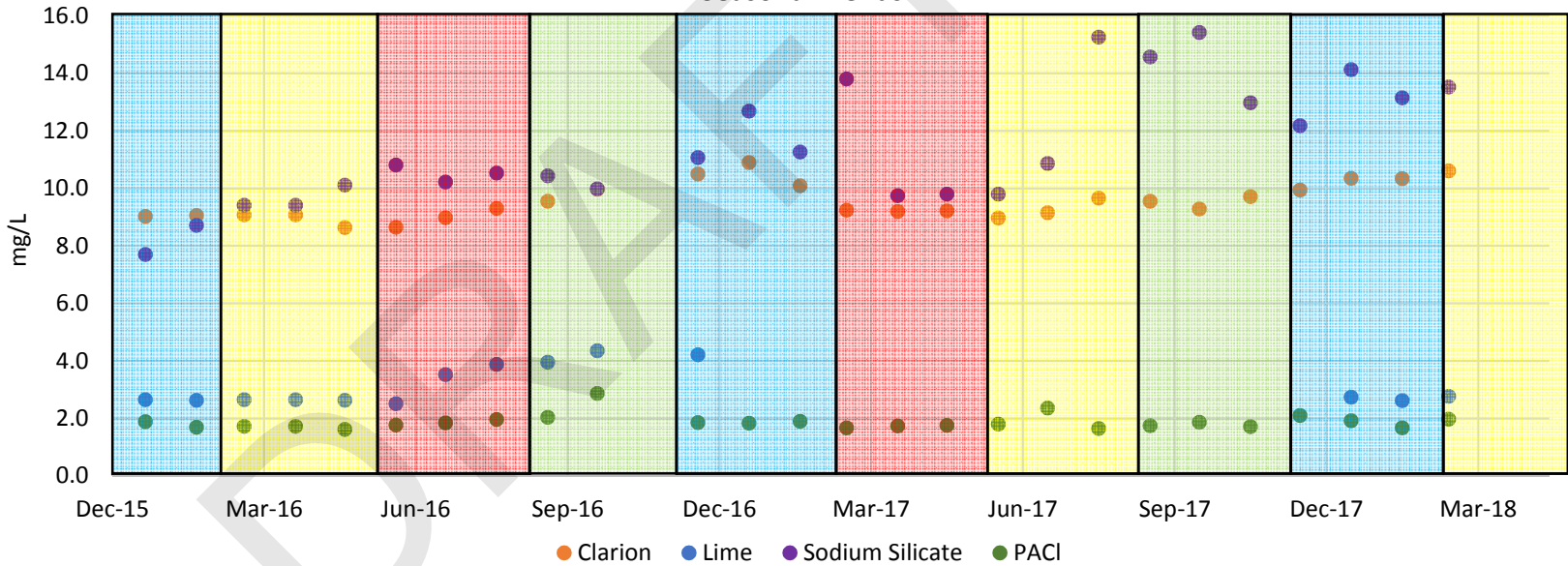


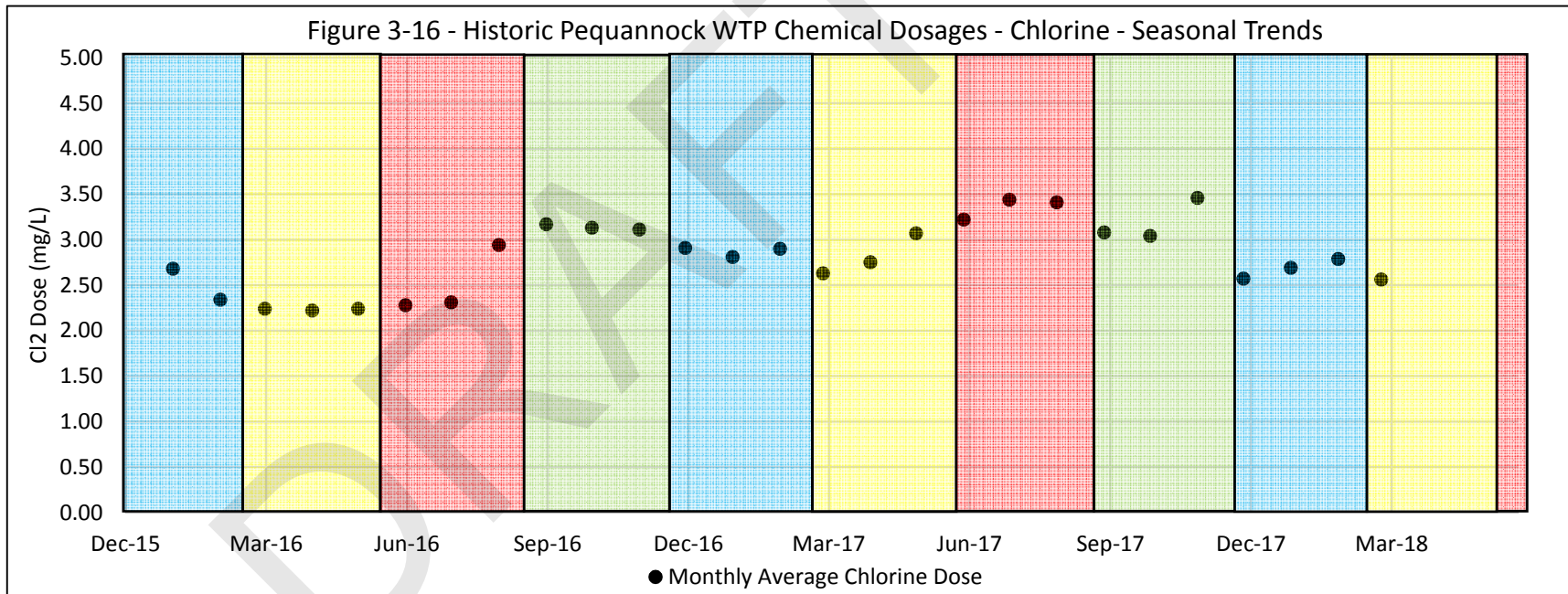
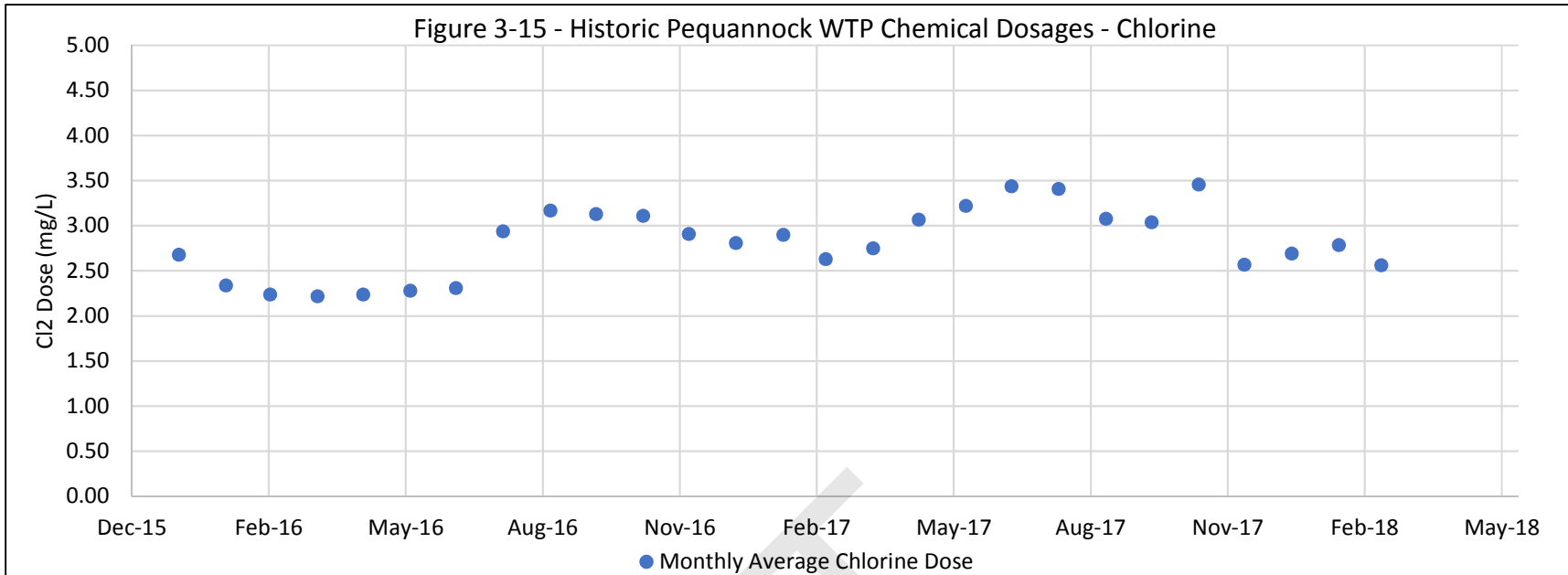
Figure 3-14 - Historic Pequannock WTP Chemical Dosages - Clarion, Lime, Sodium Silicate, PACI - Seasonal Trends



- No significant seasonal variation was observed in the PACl dosage, which ranged from 1.7 mg/L to 2.5 mg/L. The average dose of the data provided for PACl was 1.9 mg/L. Generally, the average PACl dose is consistent throughout the year and consistent with the average dose in 2014 which was 1.6 mg/L.

Figures 3-15 and 3-16 show the chemical dosage data and the seasonal trends for chlorine, from January 2016 – March 2018. January – March 2018 monthly dose averages were calculated from the use of chemical (lbs/month) and the 2017 daily flow to produce average seasonal data. The following remarks are noted from the data analysis for chlorine usage:

- The chlorine dosage ranges from 2.5 to 4.0 mg/L. The average dose of the data provided for chlorine is 3.0 mg/L (total of pre and post-chlorine addition). Generally, the chlorine dose has been maintained in this range. An increase in dosage in the summer months is observed, as expected due to warmer temperatures and chlorine's greater reactivity.
- The data does not include the sodium hypochlorite that is added at the Valley Road Rechlorination Station. The chlorine residual data from the addition of sodium hypochlorite at the Valley Road Rechlorination Station are included in Section 3.3.2.



3.3 Long-Term Water Quality Trends

This section reviews some of the longer-term trends of water quality parameters in Newark's system that have been variable over time and are known to have an impact on corrosion and corrosion control.

3.3.1 Historic pH – Pequannock WTP and Valley Road Rechlorination Station

Historic pH data leaving the Pequannock WTP (at the "Test House") was available from February 1992 to September 2018 on Water Watch. **Figure 3-17** indicates that after the CCT study was performed in 1994 (See Section 2.1.1), Newark slowly raised its delivered water pH to around 8.5 from 1996 through 2002. In 2002, pH levels fell slightly to approximately 8.0 to 8.3. Although there are not many data points available, it appears that Newark generally maintained this level between 2002 and 2012. In 2013, pH levels fell to below 8.0 and have not been above 8.0 since. In the last 4 years, the average pH of the Pequannock WTP finished water was 7.1 based on data provided at the Test House. The averages over the last four recent years were as follows:

- 2015 – average pH of 7.26
- 2016 – average pH of 7.04
- 2017 – average pH of 7.00
- 2018 – average pH of 6.72 (January through August 2018)

The reduction in pH generally correlates to when monitoring for the Stage 2 Disinfectants and Disinfection Byproducts (DBPs) Rule commenced. Large systems were required to start monitoring and reporting DBPs using the Location Running Annual Average (LRAA) in 2012. It appears that Newark may have started decreasing pH around this time in an effort to meet the DBP regulatory requirements.

Historic data was also available between 2005 and 2018 for the pH leaving the Valley Road Rechlorination Station before it enters the distribution system. **Figure 3-18** provides the pH data leaving the Rechlorination station during this period. The pH values at the Rechlorination Station tend to vary because of the low alkalinity (low buffer intensity), and are less than the pH of the Pequannock WTP finished water. Based on **Figure 3-18**, the average pH ranged from 7.6 to 8.0 from 2005 to 2012, with a few sustained periods above pH 8.0. After 2012, pH dropped to an average range of 7.5 to 7.7. pH increased to above 8.0 for a few months in 2015, and then decreased again in 2016, 2017 and 2018 to the current average around 7.0. A drop in pH starting in 2016 is apparent in both the Pequannock WTP delivered water data as shown in **Figure 3-17** and the Valley Road Rechlorination Station data as shown in **Figure 3-18**.

Additional data points were provided for years prior to the silicate addition by Newark. In 1984, pH generally ranged between 7.8 and 8.0. In 1989-1990, pH ranged between 7.1 and 7.6.

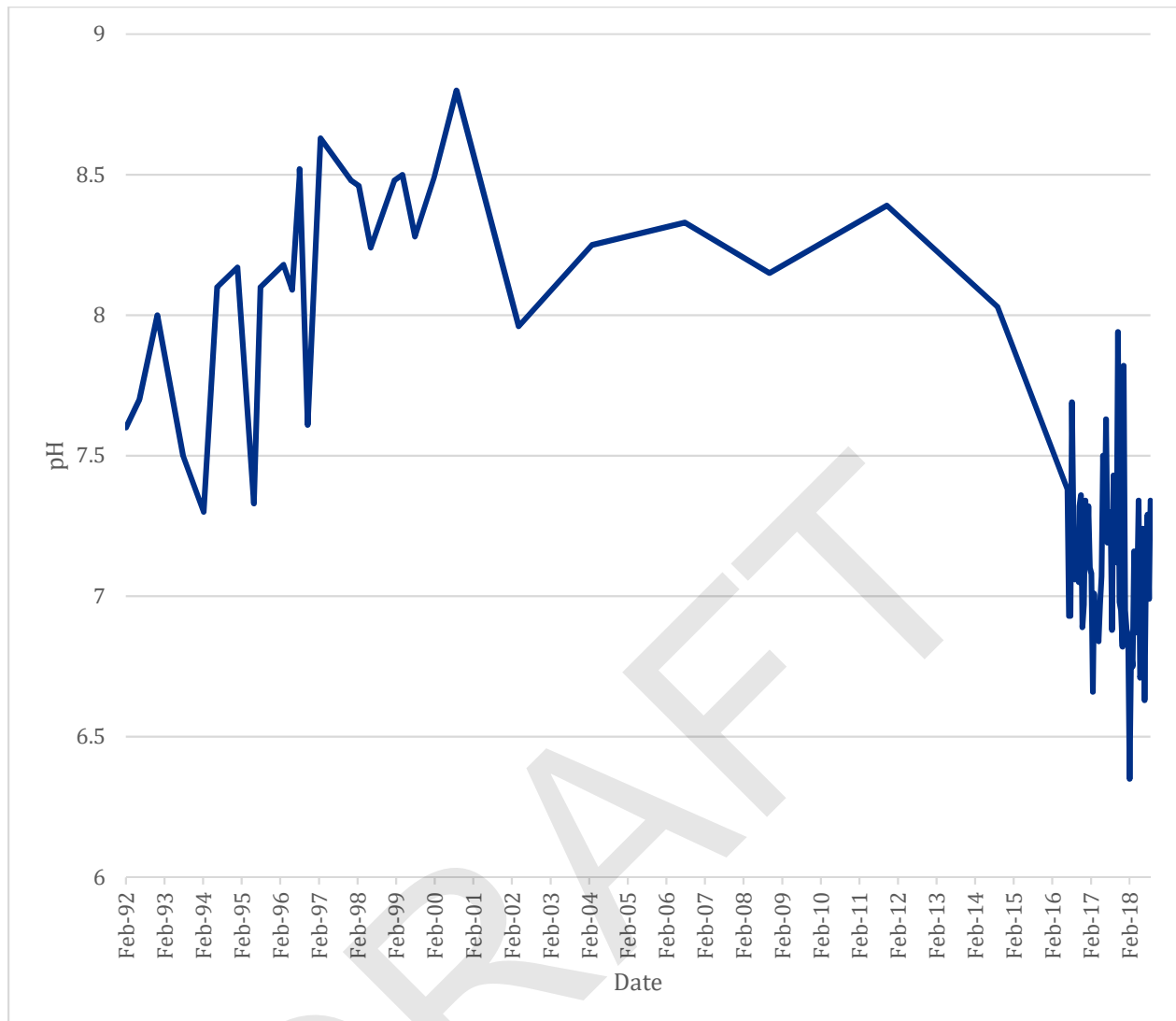


Figure 3-17 – Historic Pequannock WTP Delivered Water pH

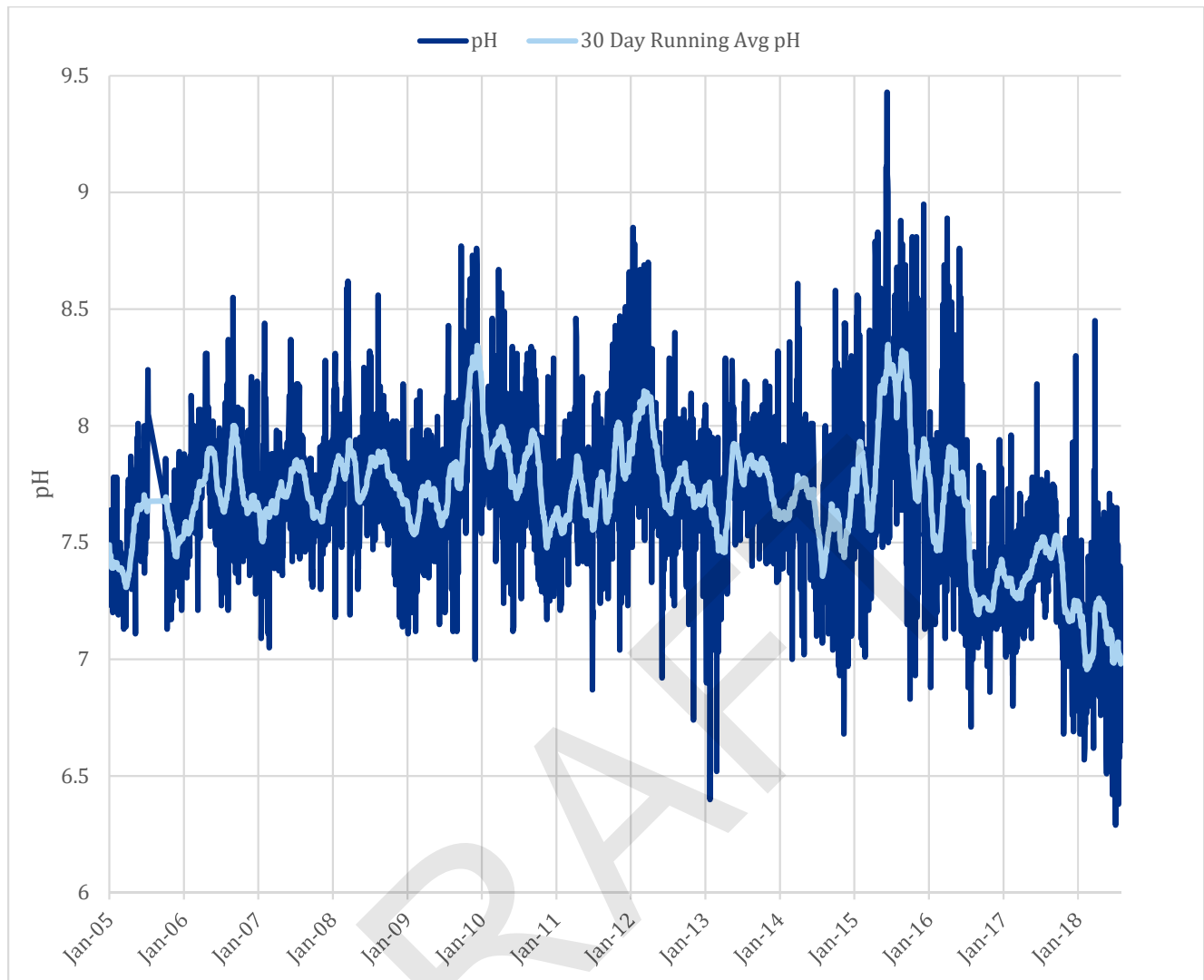


Figure 3-18 – Historic Valley Road Rechlorination Station pH (Distribution System POE) (2005 – 2018)

3.3.2 Historic Chlorine Residual – Valley Road Rechlorination Station

Historic free chlorine residuals at the Valley Road Rechlorination Station, which is the point-of-entry into the distribution system for all but a small amount of water that is supplied upstream directly to the Township of Pequannock, were analyzed to determine changes over time. Daily “post-rechlorination” data were provided by Newark for the period between 2005 and 2018. The data, shown in **Figure 3-19**, indicate that chlorine residual leaving the rechlorination station generally ranged between 0.8 and 1.1 mg/L until about mid-2009, when chlorine residual trended steadily upwards to a range of 1.0 to 1.2 mg/L to mid-2015, and then continued to increase to a range of 1.1 to 1.3 mg/L until mid-2018. Current chlorine residual appears to be trending downward towards an average of 1.0 mg/L in the last few months. In general, the chlorine residuals have been held fairly constant on a 30-day running average over the dataset at the Valley Road Rechlorination Station, although there are some significant daily variations.

Additional chlorine residual data at the Valley Road Rechlorination Station was provided by Newark for years prior to the silicate addition. In 1984, chlorine residuals generally ranged between 1.0 and 1.2 mg/L. In 1989-1990, chlorine residual was reported to be consistently 1.0 mg/L.

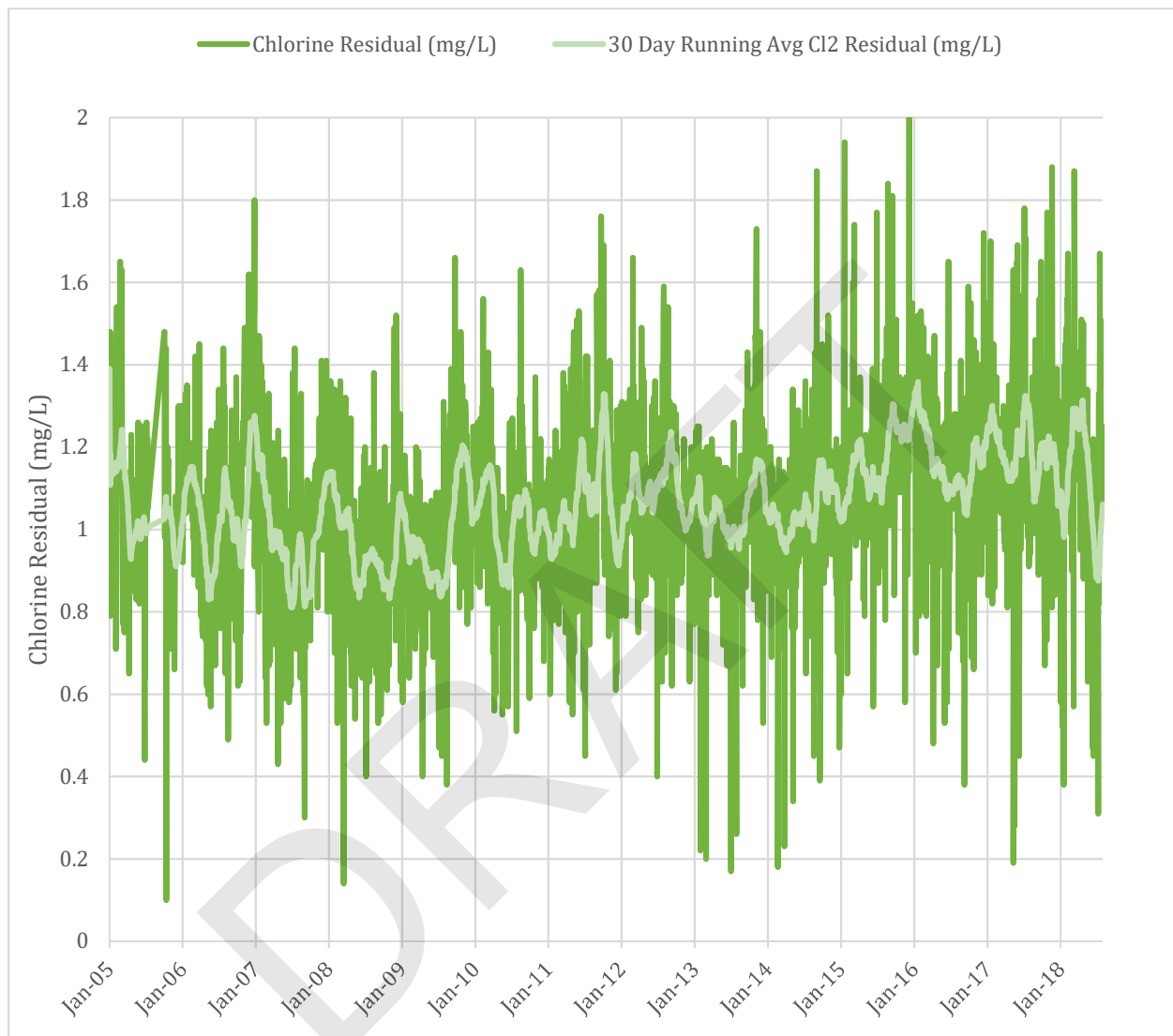


Figure 3-19 – Historic Valley Road Rechlorination Station Post Chlorine Residual (Distribution System POE) (2005 – 2018)

Section 4

Lead Sequential Sampling

The City of Newark conducted sequential sampling at two locations in September 2018. The purpose of this effort was to pinpoint potential sources of lead that exist within the service line and premise plumbing from the service connection in the street to the drinking water tap in the house. Sequential sampling is an additional tool to assist in developing an understanding of the system as part of the CCT optimization. The sources of lead at the tap measured in sequential samples include lead service lines, lead-based materials contained in the premise piping (e.g., leaded solder, brass/bronze fittings, galvanized piping), faucets, and water meters.

4.1 Sequential Sampling Program Protocol

The sequential sampling program consisted of collecting the full volume of water between the kitchen faucet and the water main in small increments allowing for the isolation of water from various plumbing components, such as, but not limited to, fixtures, valves, pipe materials and meters. A memorandum dated September 10, 2018 by CDM Smith titled “Sequential Sampling Program Protocol for Tracking Lead in Drinking Water” provided the protocol for performing the sequential sampling.

In general, the sequential sampling process consists of the following:

1. **Site Audit** - An initial visit to each home was conducted to document the cold-water piping, beginning at the faucet and traced back towards the water main in the street. This was used to calculate the volume in the water service line and determine the number and timing of samples needed for collection.
2. **Sample Collection and Analysis** - Sequential sampling is conducted after a stagnation period, between 6 to 12 hours, per the Lead and Copper Rule requirements. A 10-minute flush is conducted, without removing the aerators, prior to the stagnation period. Samples are taken at the kitchen sink in increments of 500 mL, or as determined by the site audit. A flushed sample is also taken at the end of the sequential program to test the water in the main. The aerator was not removed for the flushing or the sampling. Samples are analyzed for the following information:
 - *pH (first sample, a middle sample, and flushed final sample measured in the field)*
 - *Temperature (first sample, a middle sample, and flushed final sample measured in the field)*
 - *Free chlorine (first sample, a middle sample, and flushed final sample measured in the field)*
 - *Total Lead*
 - *Dissolved Lead*

- *Total Copper*
 - *Silica Residual (SiO₂) (first sample, a middle sample, and flushed final sample)*
 - *Alkalinity (first sample, a middle sample, and flushed final sample)*
 - *Conductivity (first sample, a middle sample, and flushed final sample)*
3. **Data Evaluation** – Once the samples are analyzed, the profile is plotted with cumulative volume on the X-axis and lead results on the Y-axis. Specific plumbing components are located along the service volume axis and the plumbing components most contributing to high lead values are noted.
 4. **Monitoring** – When the CCT is modified, the sequential sampling program is performed on a regular basis to ascertain the effectiveness of the new/modified CCT treatment.

4.2 Results of Newark's Initial Sequential Sampling

During the week of September 10, 2018, two residential locations were sampled for Newark's sequential sampling study as the initial baseline sampling, prior to any modifications to the CCT.

- Site A – South Ward
- Site B – North Ward

Each home has a lead service line and lead solder with copper indoor plumbing before the meter. Site A had cross-linked polyethylene (PEX) for the majority of their interior plumbing, with some sections of copper joined by lead solder. The locations of the sequential sampling sites are shown on **Figure 4-1**, including proximity to the harvested lead service lines that were sent to the EPA for pipe scale analysis discussed in Section 5.

Samples for total lead, dissolved lead and copper were taken every 500 mL as described in Section 4.1. It was estimated that Site A needed 15 samples and Site B needed 12 samples to encompass the entire interior plumbing and service line prior to reaching the main. After the final sample on the service line, the main was flushed for 10 minutes and another sample was taken at each house.

Background water quality collected at the time of the testing for each home is provided in **Table 4-1**. The background water quality was analyzed at the start of the testing (first draw sample), the middle of the testing (middle sample) and after a 10-minute flush (flushed sample). As can be seen in **Table 4-1**, the free chlorine residual is significantly less at Site A in South Ward than at Site B in the North Ward. This is to be expected as the North Ward is closer to the Valley Road Rechlorination Station and the South Ward is located at the other end of the distribution system.

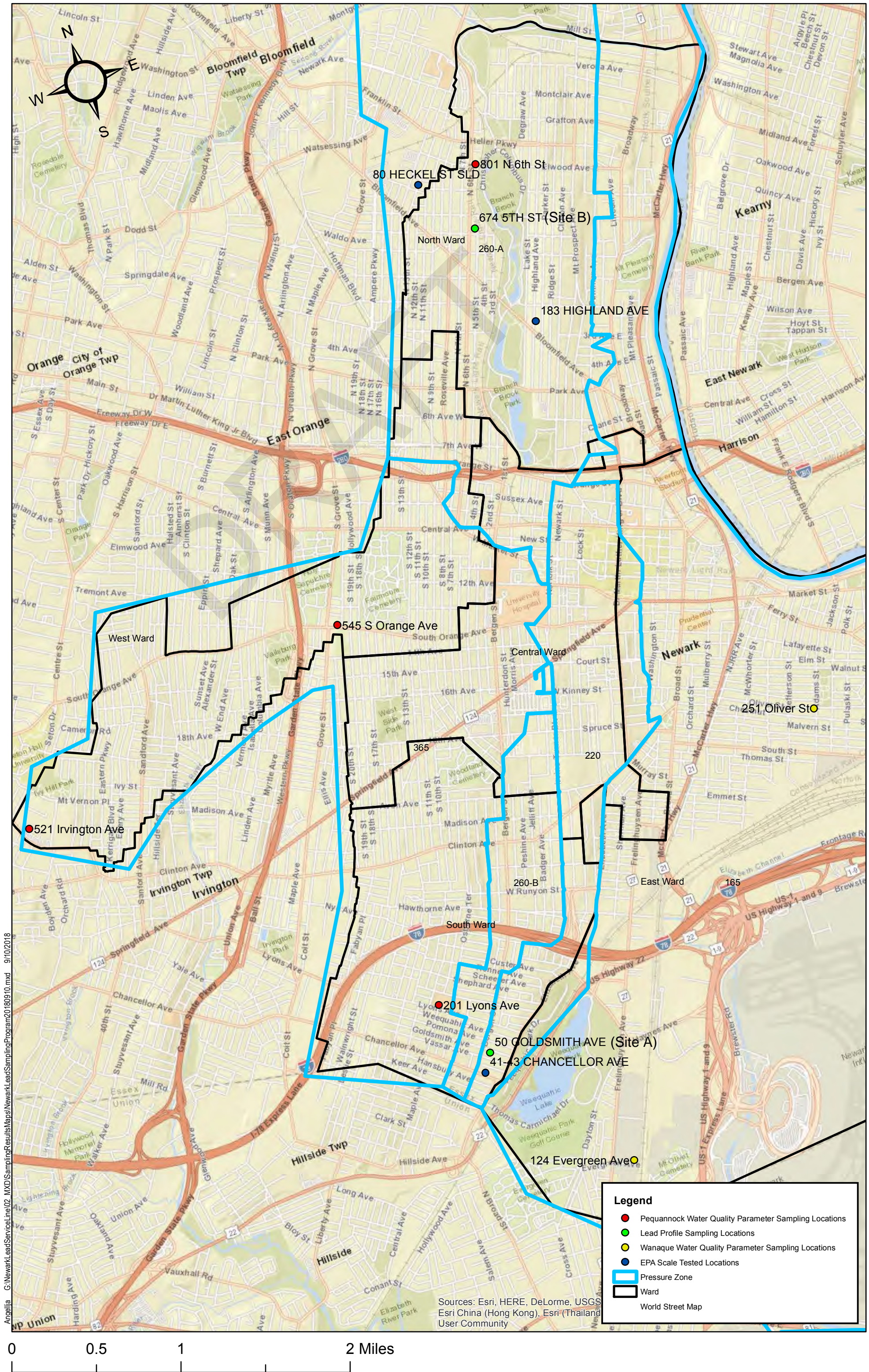


Table 4-1 – Water Quality Analysis at Sequential Sampling Sites

	Site A – South Ward			Site B – North Ward		
	First Draw Sample	Middle Sample	Flushed Sample	First Draw Sample	Middle Sample	Flushed Sample
pH	7.91	7.13	7.66	7.62	7.37	7.32
Temp (deg C)	20.9	20.7	21.6	21	22	22
Free Cl ₂ (mg/L)	0.02	0.04	0.21	0.22	1.21	1.04
Alkalinity (mg/L CaCO ₃)	34	34	36	34	35	33
Conductivity (uMhos/cm)	210	238	206	221	214	222
Silica (mg/L SiO ₂)	7.48	7.38	8.17	8.10	8.33	8.70

Total lead and soluble lead were plotted against the cumulative water volume in a profile to identify lead contributions from different plumbing materials. The difference between the total lead and soluble lead is insoluble or particulate lead. Particulate lead is typically a result of scouring of deposits off the pipe wall or disturbing the scale layers that have formed over time, causing them to slough off the pipes. Soluble lead is dissolved lead that has leached from the piping into the water. The profile for Site A is shown in **Figure 4-2** and the profile for Site B is shown in **Figure 4-3**. Plumbing fixtures and materials are shown above each profile for correlation of plumbing fixtures to the samples. The estimated total lead, soluble lead and particulate lead results in the samples at Site A and Site B corresponding with the figures are listed in **Table 4-2** and **Table 4-3**, respectively.

The following are the observations for the lead profile results for Site A – South Ward, as shown in **Figure 4-2** and listed in **Table 4-2**:

- The highest lead levels at this address were found in the lead service line (LSL) pipe section. Soluble lead peaked at 140 µg/L and total lead peaked at 399 µg/L.
- Significant particulate lead was found at this address. The particulate lead may be a sign of the breakdown of a protective scale on the LSL which is further discussed in Section 5. It may also indicate that some particulate lead collected on the aerator after the flushing (or prior to that) and was present throughout the sampling.
- Both soluble and insoluble lead levels are high, indicating the current CCT is not optimized.
- Silica concentrations were an average of 7.68 mg/L as SiO₂, which generally coincides with the Pequannock WTP delivered water concentrations measured at the Test House.



^[1] Kitchen Faucet Location, ^[2] Cross-Linked Polyethylene Pipe Segment, ^[3] Copper Pipe Segment, ^[4] Water Meter Location, ^[5] Lead Service Line Pipe Segment, ^[6] Water Main Location

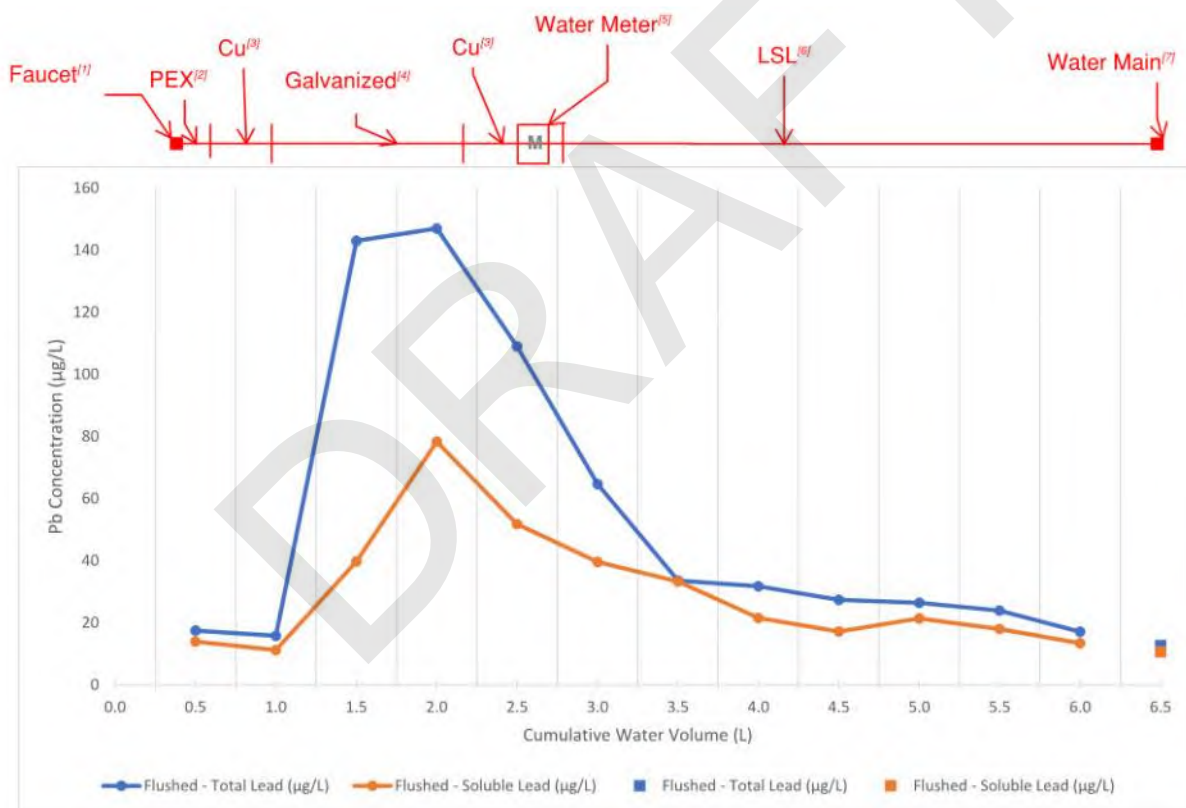
Figure 4-2 – Site A – South Ward Lead Profile – September 10, 2018

Table 4-2 – Site A – South Ward Lead Results

Sample ID	Total Lead (µg/L)	Soluble Lead (µg/L)	Particulate Lead (µg/L)
A1	93.1	16.2	76.9
A2	107	24.6	82.4
A3	111	29.4	81.6
A4	72.2	29.1	43.1
A5	101	42.5	58.5
A6	78.6	33.4	45.2
A7	138	43.4	94.6
A8	166	78.4	87.6
A9	197	102	95
A10	266	114	152
A11	296	134	162
A12	291	140	151
A13	352	74	278
A14	350	110	240
A15	399	138	261
Flushed	50.5	76.6	0

The following are the observations for the lead profile results for Site B – North Ward, as shown in **Figure 4-3** and listed in **Table 4-3**:

- The highest lead levels at this address were found in the galvanized steel pipe section that is likely lead-lined, and the copper pipe section with lead-soldered joints. Soluble lead peaked at 78.3 µg/L and total lead peaked at 147 µg/L.
- Particulate lead was evident in the pipeline for 3 samples – liters 2.0, 2.5 and 3.0. The high particulate lead levels may be a sign of breakdown of a protective scale, which is further discussed in Section 5.
- Both soluble and insoluble lead levels are high, indicating the current CCT is not optimized.
- Silica concentrations were an average of 8.38 mg/L as SiO₂, which generally coincides with the Pequannock WTP delivered water concentrations measured at the Test House. The silica concentrations found in the North Ward were slightly greater than the concentrations found in the South Ward site (Site A).



^[1] Kitchen Faucet Location, ^[2] Cross-Linked Polyethylene Pipe Segment, ^[3] Copper Pipe Segment, ^[4] Galvanized Steel Pipe Segment
^[5] Water Meter Location, ^[6] Lead Service Line Pipe Segment, ^[7] Water Main Location

Figure 4-3 – Site B – North Ward Lead Profile – September 11, 2018

Table 4-3 – Site B – North Ward Lead Results

Sample ID	Total Lead (µg/L)	Soluble Lead (µg/L)	Particulate Lead (µg/L)
B1	17.5	13.9	3.6
B2	15.8	11.2	4.6
B3	143	39.7	103.3
B4	147	78.3	68.7
B5	109	51.8	57.2
B6	64.6	39.6	25
B7	33.6	33.3	0.3
B8	31.7	21.5	10.2
B9	27.4	17.2	10.2
B10	26.4	21.4	5
B11	23.9	18	5.9
B12	17.1	13.4	3.7
Flushed	12.8	10.5	2.3

4.3 Discussion

The sequential sampling performed at the two locations on opposite ends of Newark's distribution system indicates that the current CCT is not effective at controlling soluble lead release into Newark's drinking water. Despite dissolved silica concentrations of approximately 8 mg/L as SiO₂ and the existence of a silica crust on the pipe walls (see EPA scale analysis in Section 5), the soluble lead concentration is still well above the EPA's LCR Action Level for lead. In addition, if a passivating scale (a protective layer on the pipe wall formed through chemical reactions between the water and carrier pipe) was intact and functioning as a lead-containing mineral scale to limit lead solubility, the lead levels would be expected to be much lower (Boyd, et al., 2008) than what was found. This indicates that the scales on the pipes in these two homes are not functioning as protective corrosion control scales and may be breaking down under the current water quality conditions. Regarding particulate lead, both homes had appreciable particulate lead in their tap water at the time the sequential sampling was conducted. This could be a result of lead-containing sediment in the service line, particulates that collected in the aerator, active breakdown of lead mineral scales on the pipe walls, or most likely a combination of these factors. After the sampling was conducted, it was reported that the home in the South Ward (Site A) has performed some recent plumbing improvements by replacing sections of copper and galvanized pipe with new copper and new PEX plumbing.

Lead sequential sampling is a useful tool to isolate the source of lead in tap water in a given home, to evaluate the magnitude of the current lead exposure to the public, and to evaluate differences in lead levels that may exist throughout the distribution system. It is recommended that additional sequential sampling be performed in homes in other Wards in Newark's distribution system. It is also recommended that Site A be re-tested after cleaning out the aerator and flushing without the aerator to see if the high particulate lead results were due to a build-up of particulate lead behind the aerator.

In addition to evaluating the current level of lead in the Newark system, lead sequential sampling can be used as a tool to monitor the effectiveness of CCT implementation. It is recommended that a few homes be sampled monthly during any modifications to the system's CCT until lead levels stabilize.

DRAFT

Section 5

Pipe Scale Analysis

In February and March 2018, Newark sent three lead service pipes from the City's distribution system to the EPA Advanced Materials and Solids Analysis Research Core in Cincinnati, OH for characterization of the solid phases on the pipe walls. The pipes came from the following addresses:

- 43 Chancellor Avenue (South Ward)
- 80 Heckel Street (North Ward)
- 183 Highland Avenue (North Ward)

The locations are shown on the map in **Figure 4-1**. This section presents the results of the analyses that EPA performed on the pipe scales.

Analysis of scales from pipes that reflect actual distribution system conditions provides a direct indication of the effectiveness of a current treatment process to control lead release. Knowledge of the characteristics and behavior of the lead solids that have been formed on the pipe walls can be integrated with water quality and operational information to understand mechanisms of corrosion inhibition, speciation of metals, and predictions of lead mobility/stability, and can assist in implementation of corrective treatment changes. Knowing how a contaminant is chemically associated in distribution system scale materials can help with estimating the probability of unintended adverse consequences of treatment or water quality changes.

5.1 EPA Testing and Results

The EPA conducted the following tests on the three lead pipes:

- X-ray diffraction (XRD) analysis – identifies crystalline mineral compounds
- Scanning electron microscopy (SEM)/Energy dispersive spectroscopy (EDS) elemental mapping – identifies general areas where different elements exist within the scale

The testing evaluated the scales in different layers on the pipe walls, which can indicate the history of water chemistry impacts over time. The technique involves separating each solid phase layer for analysis, from the outermost layer (the layer in direct contact with the flowing water) to the innermost layer (the layer directly against the lead pipe wall).

The EPA results were provided on September 21, 2018. **Figures 5-1, 5-2 and 5-3** show images of the pipe scales in cross section for the each of the three sites. The entire report is included as **Appendix A**. A summary of the compounds found at each location from the outermost layer in contact with the flowing water (L1) to the innermost layer adjacent to the pipe wall (highest "L") is provided in **Table 5-1**. The "+" indicates the relative presence of a compound in the scale analyzed.

Section 5 • Pipe Scale Analysis



Figure 5-1 – Lead Scale Images for Pipe Extracted from 43 Chancellor Avenue



Figure 5-2 – Lead Scale Images for Pipe Extracted from 80 Heckel Street

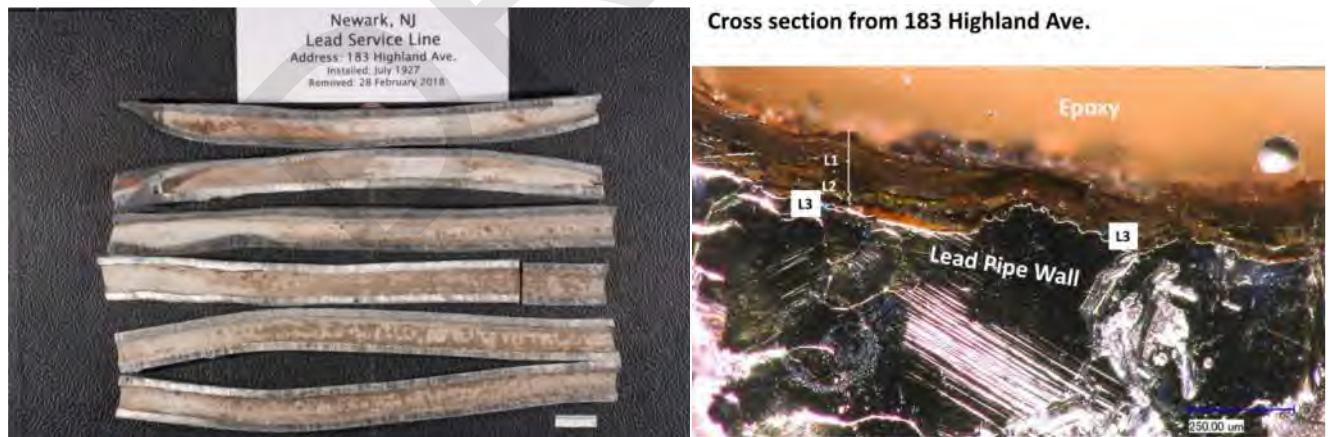


Figure 5-3 – Lead Scale Images for Pipe Extracted from 183 Highland Avenue

Table 5-1 – General Characterization of Solid Phases in Pipe Deposits

Location	Layer	Hydrocerussite $\text{Pb}_3(\text{CO}_3)_2(\text{OH}_2)$	Cerussite $\text{Pb}(\text{CO}_3)$	Plattnerite PbO_2	Litharge PbO	Massicot PbO	Scrutinyite PbO_2
43 Chancellor Avenue (South Ward)	L1	++	+++	+	none	none	none
	L2	+++	++	+	none	none	none
	L3	+++	++	++	none	none	none
	L4	+++	+	++	+	none	none
	L5	++	+	none	+++	+	none
80 Heckel Street (North Ward)	L1	+++	+	+++	none	none	+
	L2	++	+	+++	none	none	+
	L3	++	none	+	+++	none	+
183 Highland Avenue (North Ward)	L1	+	none	+++	none	+	none
	L2	+++	none	+++	none	+	none
	L3	+	none	+	+++	+	none

Note: +++ = predominant, ++ = moderate, and + = trace/minor

The scales found on the outermost layers were primarily hydrocerussite, along with cerussite and plattnerite. Hydrocerussite and cerussite are divalent Pb(II) compounds that are carbonate-based scales. In carbonate-based scales, the hydroxide (OH^-), carbonate (CO_3^{2-}), or bicarbonate (HCO_3^-) ions complex with the metal (i.e., lead) to form insoluble metal/hydroxide/carbonate compounds on the pipe walls. These different lead minerals have varying degrees of solubility. Cerussite is the most stable Pb(II) phase at pH 8–8.5. Cerussite is more soluble than hydrocerussite, which is the most stable Pb(II) phase at higher pH (≥ 9.0). It is unusual to find hydrocerussite as the dominant mineral phase at Newark's current operating range around pH 7.4.

Plattnerite (PbO_2) is a tetravalent Pb(IV) compound that is formed over time in waters with high redox potential (ORP). It is reported in the literature that a high ORP can be achieved with free chlorine at levels typically over 1.5 mg/L, and that the rate of formation of PbO_2 appears to increase with increasing pH (Boyd, et al., 2008). Pb(IV) has been observed in systems with free chlorine residuals less than 1.5 mg/L, including Newark. ORP data is not available from within the Newark distribution system so correlations with chlorine residual are not possible. Under these conditions, PbO_2 typically dominates or coexists with Pb(II) mineral forms including hydrocerussite and cerussite. Plattnerite is less soluble than hydrocerussite and cerussite, making plattnerite more effective at achieving low lead levels when the proper (high ORP) water chemistry is maintained.

The pipe scales did not contain evidence of any crystalline Si-Pb compounds, indicating that silicate complexation with lead is not taking place to control soluble lead levels. However, a silica crust (SiO_2) was found on all three pipes. The silica crust was found to be relatively porous and therefore not acting as an effective barrier against the outward flux of lead released from the pipe as the passivating lead layers (mainly plattnerite and hydrocerussite) were found behind the silica crust.

5.2 Analysis of Results

5.2.1 Comparison of Sequential Sampling Results and Scale Analysis

More dominant plattnerite scales were found on the pipes harvested in the North Ward at 80 Heckel Street and 183 Highland Street where the chlorine residuals have likely always been the highest in the system because they are closest to the Rechlorination Station. This was confirmed by the lead sequential sampling results presented in Section 4. The North Ward address (Site B) had a chlorine residual over 1.0 mg/L while the South Ward site had a chlorine residual of 0.21 mg/L in the water main and 0.04 mg/L in the service line. **Table 5-2** correlates the information from the EPA pipe scale analysis with the lead sequential sampling study based on proximity to each other. The test locations relative to each other geographically are provided in **Figure 4-1**. The solid phase (scale) minerals in the last column of **Table 5-2** are listed from most prominent to least prominent.

Table 5-2 – Comparison of Lead Sequential Sampling Data and EPA Scale Analysis Results

General Location	Chlorine Residual (mg/L)		pH		Most Prominent Scale Compounds Found
	First Draw	Flushed Sample	First Draw	Flushed Sample	
North Ward	0.22	1.04	7.62	7.32	Plattnerite > hydrocerussite > litharge
South Ward	0.02	0.21	7.91	7.66	Hydrocerussite > cerussite > plattnerite

As shown in **Tables 5-1** and **5-2**, the pipe from the South Ward (43 Chancellor Avenue) tested by EPA showed predominantly hydrocerussite and cerussite scales, which are more soluble than plattnerite scales. This was also evident in the lead sequential sampling results presented in Section 4 where the soluble lead levels were higher at the South Ward profile (Site A) than the North Ward profile (Site B). This indicates that the current pipe scale in the South Ward is less effective at controlling soluble lead than the North Ward scale. The high particulate lead content may indicate that the scale is currently sloughing off due to its porosity and physical instability.

5.2.2 Formation of Tetravalent Lead (Pb(IV)) Scales

As noted above, free chlorine residual is an indicator of the ORP of the water. In highly oxidizing waters with high ORP, tetravalent lead (Pb(IV)) compounds, such as PbO₂, can form a scale on the pipes (Boyd, et al., 2008). The reaction time and concentration of chlorine residual needed to form tetravalent lead scales is unique to each system and is influenced by natural organic matter (NOM) and alkalinity (Boyd, et al., 2008), in addition to pH. Tetravalent lead scales are very effective at reducing lead corrosion in the system when the appropriate water chemistry is maintained. However, when the water chemistry is modified, such as if the ORP is lowered (e.g., due to a low free chlorine residual) and/or pH is lowered, the scales will destabilize relatively quickly and result in release of particulate lead. Without the presence of a high ORP or the addition of orthophosphate to form highly insoluble lead-phosphate mineral phases, carbonate scales such as hydrocerussite and cerussite are the dominant mineral phases that will form and these mineral phases are more soluble, particularly at the lower pH values existing in the Newark

distribution system. This appears to be the situation in both the North and South Wards according to the scales analyzed by the EPA and the results of the sequential sampling. The situation appears to be occurring to a greater degree in the South Ward.

When redox conditions change, the highly insoluble PbO_2 reduces back to the more soluble Pb(II) if the ORP is not maintained, thereby increasing soluble lead levels in the water. This can happen if the disinfectant changes, such as from free chlorine to chloramines, or if there is a loss of chlorine residual (DeSantis, Conversion of Lead Corrosion Scale Under Changing Redox Conditions, 2017). Newark does not have historic ORP data. However, chlorine residual data at the Rechlorination Station are presented in Section 3.3.2. The data show a recent slight drop in chlorine residual from a range of 1.1 to 1.3 mg/L to an average of approximately 1.0 mg/L which is not a significant enough decrease in ORP to reduce PbO_2 scales back to the more soluble Pb(II) scales based on that one factor alone.

Plattnerite (PbO_2) scales can also change and reduce back to more soluble Pb(II) if there is a reduction in pH in the system. Historic pH values presented in Section 3.3.1 indicate that pH was reduced appreciably in 2016. Before that time, pH was maintained above 8.0. It is possible that the ORP was high enough at that pH to form and maintain PbO_2 scales in Newark's system. This is discussed in more detail in Section 6.

The EPA scale analysis report provided in Appendix A (EPA, 2018) noted that the Newark plattnerite scales have a more complex internal structure compared to plattnerite-dominated scales they have observed from distribution systems with a history of stable water quality. With Newark's variability in water quality over time, the plattnerite scale may currently be unstable, resulting in particulate lead release. The results of the lead sequential sampling in Section 4 indicating high particulate lead concentrations further strengthens this presumption.

5.2.3 Additional Scale Analyses

Additional scale analyses are recommended to be performed in other wards in Newark, including one lead pipe from the West Ward and one lead pipe from the Central Ward, which are supplied mainly by water from Pequannock. It is reported that an area of the Central Ward sees blended water and is reported to have both silica and orthophosphate. One or two scales are also recommended to be analyzed from the East Ward, which is supplied by water from Wanaque which contains orthophosphate. This will provide a useful comparison with the rest of the system.

Ideally, a scale analysis would be paired with a sequential sampling site. If possible, the LSLs from the locations where the sequential sampling tests were performed are recommended to be excavated and sent to the EPA for analysis. A follow-up sequential sampling test should be performed, once the LSL is removed, to evaluate the effectiveness of the LSL replacement and the extent to which the remaining plumbing components contribute to elevated lead levels.

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Section 6

Potential Causes of Elevated Lead Levels

6.1 Overview

Every water system is unique, based on its water chemistry and treatment history. Although there is not complete certainty as to the cause of the recent increase in lead levels in Newark, there are many factors that potentially contributed to it. This section reviews these factors in an attempt to explain the increase in lead in Newark's distribution system in 2017 and 2018.

The following factors may have influenced the 2017-2018 elevated lead levels in Newark's distribution system and are described in more detail in Sections 6.2 and 6.3 of this report:

- Decrease in pH in the distribution system
- LCR compliance sampling

The following factors may have played a role, but are less likely to have contributed significantly to the 2017-2018 elevated lead levels:

- **ORP.** Changes in ORP in the distribution system are unlikely to have contributed to the recent increase in elevated lead levels based on the 2005 to 2018 chlorine residual levels at the Valley Road Rechlorination Station, which were fairly consistent on a monthly average basis.
- **Silicate.** Based on all available information for this project, it seems that sodium silicate is acting as a pH adjustment chemical and not as a corrosion inhibitor. Therefore, the reported reduction in sodium silicate dosing since the late 1990s impacts lead levels insofar as it correlates with reduced pH leaving the Pequannock WTP. Although a silica layer was found on the LSLs analyzed by the EPA, the lead results in the sequential sampling indicate that the silica layer is not effectively preventing soluble lead release. It is believed that sodium silicate is not currently providing a beneficial impact on lead levels in the distribution system beyond pH adjustment. The impact of pH from reducing the sodium silicate dose is addressed in Section 6.2.
- **CSMR.** A CSMR of approximately 3 (range 1.9 – 3.8) has been consistent in the Newark system for at least 24 years and is unlikely to be contributing significantly to the recent increase in elevated lead levels. There is not enough data to accurately determine the CSMR in 2015 and 2016. The CSMR was calculated to be 5.1 from data collected in October 2017, as was shown in **Table 3-2**. This was a greater level than observed for the 20+ previous years, and results from an unusually low sulfate value, which appears to be an outlier.

6.2 Decrease in pH in the Distribution System

As presented in Section 3.3.1, the pH at the Valley Road Rechlorination Station, just upstream of the distribution system, fluctuated significantly between 2005 and 2018. As shown in **Figure 3-**

18, the average pH range was 7.6 to 8.0 from 2005 to 2012, with a few sustained periods above 8.0. After 2012, the pH decreased to an average range of 7.5 to 7.7, and then briefly returned to an average of 8.0 in 2015 for a few months. Starting in 2016, the pH decreased to the current average of approximately 7.0. **Figure 3-17** shows the pH leaving the Pequannock WTP over an even longer history, where the pH decrease is apparent. The graph shows a pH range of 8.5 to 9.0 in the 1990s, decreasing to a range of 8.0 to 8.3 until 2013, and then to the recent average of approximately 7.1.

The reason for the decrease in pH is due to Newark's efforts to reduce disinfection byproduct formation and improve primary disinfection at the Pequannock WTP. Previous operational difficulties with the quicklime system that was removed in 2017, the new hydrated lime system and the sodium silicate feed system discussed in Section 2, may have also temporarily contributed to the decrease in pH.

The pH within the distribution system has a major impact on corrosion control. In systems without orthophosphate, control of lead relies on the formation of carbonate scales or tetravalent lead (Pb(IV)) scales. For carbonate scales, such as cerussite and hydrocerussite, pH and alkalinity are critical parameters in their formation. For tetravalent lead, scale formation is based on pH, ORP and the concentration of natural organic material. Both types of scales are found in Newark's distribution system. The following section describes the impact of reduced pH on these two types of lead scales.

6.2.1 pH Impacts on Pb(II) Scales

Section 7 discusses the solubility of lead carbonate mineral scales and provides an estimation of the required pH for carbonate scales alone to reduce lead levels substantially in Newark's distribution system. As presented in Section 7, the pH would need to be over 9.0 to theoretically reduce soluble lead in Newark's system using Pb(II) carbonate scales.

Based on corrosion chemistry and solubility modeling, a pH of 8.0 or less would not reduce soluble Pb(II) significantly enough to be in compliance with the LCR. Since Newark was in compliance with the LCR from 1998 to 2015, when the pH ranged from 7.6 to 8.0 during the majority of that period, it is possible that tetravalent lead (Pb(IV)) or plattnerite scales were more prominent during that time, providing some degree of protection against lead release.

6.2.2 pH Impacts on Pb(IV) Scales

Plattnerite is more likely to form in systems with higher pH values, high oxidative conditions (i.e., high ORP) and low organic matter conditions. Plattnerite is extremely insoluble and, if the scale is stable with consistent water quality, would be more protective against lead being released than Pb(II) scales (Boyd, et al., 2008).

ORP ~~OBJECT OBJECT~~ is a quantitative measure of the state of oxidation in water and varies with pH, temperature, and dissolved inorganic carbon (DIC), but is primarily driven by the type and concentration of disinfectant in the water (e.g., chlorine or chloramines). ORP is measured using a platinum reference electrode and reported in units of volts (V), and then normalized with respect to a standard hydrogen electrode and reported as electric potential (Eh).

Figure 6-1 illustrates an Eh-pH (Pourbaix) diagram for system conditions with a dissolved DIC level of 8.5 mg/L as C, in the range of what is seen in Newark's system. Eh-pH diagrams, also called predominance area diagrams, are based on theory, and the boundaries of the species can vary, depending upon the data used to construct the diagram. In **Figure 6-1**, Eh represents ORP, which correlates with chlorine residual. At a sufficiently high ORP, plattnerite (PbO_2) would form in this water across a wide range of pH conditions, with formation occurring more dominantly at higher pH levels. As shown on **Figure 6-1**, plattnerite is in the dominant phase when operating at historical pH values of 8.0 and above at high ORP values. By lowering pH to 7.0, predicted dominance shifts towards PbCO_3 and Pb^{2+} , this leading to PbO_2 instability. It should be noted that ORP data collection is not a regulatory requirement and historic values are not available for the Newark system.

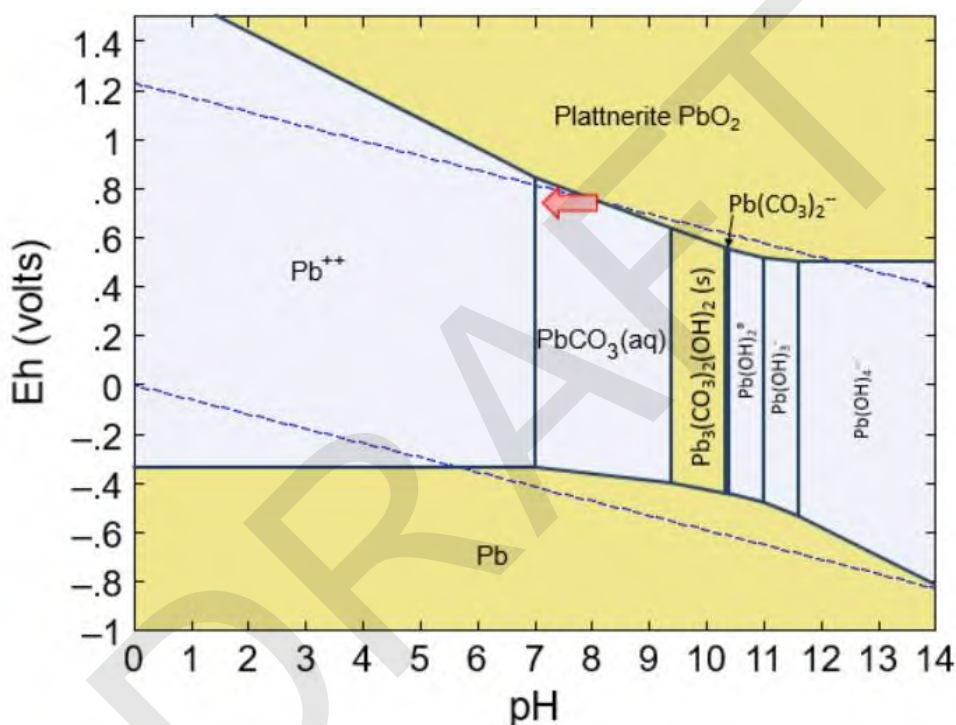


Figure 6-1 – Potential-pH (Pourbaix) Diagram for Water with DIC = 8.5 mg C/L

In systems where there has been a known increase in lead at the tap resulting from destabilization of Pb(IV) scales, it is typically a result of a decrease in ORP, such as changing the disinfectant from free chlorine to chloramines. As can be seen in **Figure 6-1**, decreasing ORP (Eh) would convert PbO_2 , an extremely insoluble compound, to the more soluble Pb(II) carbonate compounds, resulting in lead release into the water.

Additionally, if the ORP is stable but the pH decreases, then conditions amenable to PbO_2 dominance change and cause previously stable PbO_2 to become unstable and convert to more soluble Pb(II) carbonate compounds and soluble Pb (Pb^{++}). This is represented by the red arrow shown on **Figure 6-1**. If this situation occurs, one would expect to see elevated levels of soluble lead during sequential sampling, as well as insoluble (particulate) lead as a result of the scale becoming destabilized. As presented in Section 4, the results of the sequential sampling in

Newark showed elevated levels of both soluble and particulate lead, indicating that conversion from PbO_2 to Pb(II) scales and Pb^{++} may currently be taking place at the reduced pH of Newark's distribution system.

Because both Pb(II) scales and Pb(IV) scales were found on Newark's LSLs and reducing pH adversely affects the solubility of both types of scales, the reduction in pH in the Newark distribution system is likely the main cause for the 2017 and 2018 elevated lead levels. Raising the pH to levels that will provide the desirable chemistry for these scales to re-stabilize and control lead release will risk simultaneous compliance with primary disinfection and disinfection byproduct regulations. Simply returning to the corrosion control strategy Newark had in the 1990s and early 2000s to comply with LCR is no longer considered a viable option unless corrective actions are taken to achieve primary disinfection and disinfection byproduct compliance (e.g., alternate disinfectant, removal of disinfection byproduct precursors, etc.).

6.2.3 Sodium Silicate and pH

The primary corrosion protection offered by sodium silicate is the increase in pH that comes from the addition of the chemical, particularly in low alkalinity waters (AWWA, 2017). The 1994 Corrosion Study recommended a starting dose of 24 mg/L as SiO_2 (or 72 mg/L as sodium silicate) and a maintenance dose of 8 mg/L as SiO_2 (or 24 mg/L as sodium silicate), which resulted in a finished water pH between 8.4 and 9.0 (Newark, 1994). If the study recommendations were implemented in the mid-1990s, this would explain the pH levels of over 8.5 in the Pequannock WTP finished water as shown in **Figure 3-17**. The current silicate dosing of approximately 12 to 15 mg/L (or 3.5 to 4.4 mg/L as SiO_2) may partially explain the decrease in pH seen over time as shown in **Figure 3-17**.

As mentioned in Section 6.2.2, it would not be advisable at this time for Newark to increase the sodium silicate dose to the levels recommended in the 1994 corrosion optimization study, thereby increasing pH (8.4-9.0), unless a strategy for compliance with disinfection and disinfection byproduct regulations is developed.

6.3 LCR Compliance Sampling

It is well-known that LCR compliance sampling does not always reflect actual lead levels that customers are exposed to and does not always confirm if CCT is optimized. In the case of Newark, the following LCR compliance sampling factors could have affected the early detection of an ongoing or growing lead problem:

- First-draw sample volume required by the LCR
- Error resulting from customer collection of samples
- Accuracy of inventory and confirmation of sample sites
- Proportional mix of Pequannock and Wanaque sampling sites

These are described in more detail below.

6.3.1 First-Draw Sample Volume Required by the LCR

As is the case in many water systems, the first-draw one-liter (L) sample after a 6+ hour stagnation period, as required by the LCR, may not represent the highest levels of lead in the service line. This sample only represents the water closest to the faucet (typically the first 10-20 feet of the premise plumbing), whereas the stagnant water in the lead piping may not be drawn until much later, depending on the layout of the home plumbing.

As described in Section 4, two lead profiles were generated by performing sequential sampling at two sites, Site A (South Ward) and Site B (North Ward). The first draw sample (of 500 mL) for Site A resulted in 93.1 µg/L total lead; however, lead levels peaked at 399 µg/L in the 15th sample (at a cumulative volume of water of 7.5 L). The lead reached the highest value where the volume of water represents the location of the lead service line. For Site B, the first draw sample (of 500 mL) resulted in 17.5 µg/L of total lead, whereas the lead results peaked with a value of 174 µg/L in the 4th sample (at a cumulative volume of 2.0 L). The lead reached the highest value in the location of the galvanized piping.

It is clear from the sequential sampling that first-draw samples are not likely to capture the highest lead sample.

6.3.2 Error Resulting from Customer Collection of Samples

As per the LCR, the customer is responsible for collecting a sample after 6+ hour stagnation period. This could result in variability of the amount of lead in the sample. Because customers may collect each sample after different stagnation periods or may not sample exactly the same way each time, lead samples could easily show significant variability. Further, the number of required samples has increased over the years from 50 samples every 3 years to 100 samples twice a year. By increasing the number of samples, the potential for variability increases.

6.3.3 Accuracy of Inventory and Confirmation of Sample Sites

Upon review of the City of Newark's historic compliance sampling over the last 20+ years, it is not clear if all homes selected for sampling in some years that were confirmed as sites with lead service lines (i.e. Tier 1 sample sites). The LCR requirements for the sampling pool have been clarified over time and the original Rule did not establish clear guidelines for the site selections. It has not been confirmed if the historic sample sites were Tier 1 sites at the time of each sampling round. Newark has confirmed that their sampling pool in 2017 and 2018 contains only Tier 1 sites.

6.3.4 Proportional Mix of Pequannock and Wanaque Sampling Sites

Upon review of the City of Newark's historic compliance sampling results, it was observed that the compliance sampling program did not proportionally represent both Pequannock-supplied areas and Wanaque-supplied areas in each sampling round. For example, in some sampling rounds, only areas served by Pequannock were sampled, and in other rounds, only areas served by Wanaque were sampled. This would influence the ability to identify clear data trends, such as increasing lead levels in the system.

Section 7

Desktop Corrosion Control Evaluation

This section presents an overview of available corrosion control treatment (CCT) methods for lead. In addition, this section summarizes theoretical lead solubility modeling of carbonate and phosphate-based chemistry.

7.1 Theoretical Lead Solubility Modeling

The 1991 Lead and Copper Rule (and subsequent revisions) stipulates that public water systems evaluate the effectiveness of each of the following treatments (or, if appropriate, combinations of the following treatments) to identify the optimal corrosion control treatment for that system:

- (i) Alkalinity and pH adjustment;
- (ii) Calcium hardness adjustment; and
- (iii) The addition of a phosphate or silicate-based corrosion inhibitor at a concentration enough to maintain an effective residual concentration in all test tap samples.

Guidance manuals to support implementation of the LCR requirements were developed by USEPA initially in 1997, revised in 2003, and most recently revised in 2016 (US Environmental Protection Agency, 1997).

Subsequent to the promulgation of the LCR and designation of CCT methods, research and full-scale system experience identified that plattnerite (PbO_2), an insoluble Pb(IV) mineral, can form under certain highly oxidative conditions found in distribution systems. Pb(IV) was discovered in the Newark system, along with Pb(II) mineral phases, as reported in Section 5. Pb(II) is discussed in Section 7.1.2 below. Pb(IV) is discussed in detail in Sections 5 and 6 of this report.

7.1.1 Calcium Hardness Adjustment

Since the time of promulgation of the LCR, it has been recognized that calcium hardness adjustment is not an effective form of corrosion control as research has shown that calcium carbonate films only rarely form on lead and copper pipe. As such, calcium hardness is not considered in this report.

7.1.2 Alkalinity and pH Adjustment

Changing the alkalinity and pH causes the formation of insoluble lead/hydroxide/carbonate compounds on the interior wall of water pipes. This process approach binds the lead into complex mineral films of limited solubility, thereby reducing dissolved lead concentrations. In raising the pH, the hydroxide (OH^-) and carbonate (CO_3^{2-}) concentrations are increased. These ions then bind with the lead to decrease lead solubility. In low alkalinity waters with a pH range of 9 to 10, it is generally anticipated that the following insoluble Pb(II) carbonate mineral phases will form:

- Cerussite (PbCO_3) (simple lead carbonate)
- Hydrocerussite ($\text{Pb}_3(\text{CO}_3)_2(\text{OH})_2$), or
- Plumbonacrite ($\text{Pb}_{10}(\text{CO}_3)_6(\text{OH})_6\text{O}$)

7.1.3 Phosphate-based Corrosion Inhibitors

Phosphate-based corrosion inhibitors have been widely used to control lead and copper release. Within the general classification of phosphate compounds, there are two primary types – **orthophosphates** and **polyphosphates**. There are also products termed **blended phosphates** that consist of blends in various proportions of ortho- and poly-phosphates. Orthophosphate inhibitors form relatively insoluble compounds with Pb(II) which, in turn, render the lead relatively immobile. This occurs through the reaction of lead with the orthophosphate to form very insoluble compounds such as hydroxypyromorphite ($\text{Pb}_5(\text{PO}_4)_3\text{OH}$) and tertiary lead orthophosphate ($\text{Pb}_3(\text{PO}_4)_2$).

The literature and actual operating experience establish that orthophosphate (not polyphosphate) is the active form of the corrosion inhibitor that effectively reduces lead solubility. Reiber et al., states, “Almost all studies agree that orthophosphate is, within a narrow pH window, an effective corrosion inhibitor for both lead and copper surfaces. There is little evidence to suggest that pure polyphosphates play a role in corrosion inhibition.” (Reiber, 1991)

Several factors govern the effectiveness of orthophosphate addition – namely the pH, dissolved inorganic carbon (DIC), and orthophosphate dosage. The optimum pH for lead solubility reduction by orthophosphate depends on the background DIC/alkalinity of the water. Solubility models predict that the maximum benefit from orthophosphate inhibitors will occur in the lowest alkalinity waters (Reiber, 1991).

7.1.4 Silicate-based Corrosion Inhibitors

Silicate-based corrosion inhibitors are limited in terms of the information available on their use and effectiveness. Sodium silicate (Na_2SiO_3) is used primarily as a sequestering agent for the control of iron and manganese, but has been used with varying degrees of success in controlling lead and copper corrosion.

Little research and field information are available to prove the effectiveness of silicate-based inhibitors for lead control. The limited work that has been done has shown that a relatively high concentration of silicate is needed (around 20 mg SiO_2/L), and that it may take months to see any reduction in lead concentrations (American Water Works Research Foundation and DVGW-Technologiezentrum Wasser, 1996). The mechanism by which sodium silicate works to prevent lead from leaching into the water is not known. Speculation ranges from the formation of a passivating compound on the pipe wall to adsorption of lead ions (as well as other ions such as iron and manganese) to the surface of a silicate film on the pipe wall (American Water Works Research Foundation and DVGW-Technologiezentrum Wasser, 1996).

The inhibitory effects on corrosion scale formation and surface roughness of pipe materials common to drinking water distribution systems with and without exposure to phosphorus- and silicon-based inhibitors were investigated using X-ray photoelectron spectroscopy (XPS) and

profilometry in a 2008 research project. (Water Research Foundation, 2008). XPS was used to identify various forms of lead corrosion scales to determine the controlling solid phase(s). No Pb-Si complexes were found in the scales when silicates were used. The researchers also noted that, after a thorough review of lead complex formation literature, there was no evidence to suggest complexation of lead and silica.

Notwithstanding the unknown protection mechanism, it is reported that for passivation of lead, the required dose of sodium silicate solution is typically much higher (20–30 mg/L as sodium silicate) than that of the phosphate-based inhibitors (1–2 mg/L as P) (AWWA, 2017).

Because silicates are highly alkaline, the primary corrosion protection offered by silicates is believed to be the increase in pH that comes from the addition of the chemical, particularly in low alkalinity waters. Increased pH is beneficial as it promotes formation of low solubility lead carbonate mineral phases as discussed above. However, it would likely be more economical to increase pH using standard chemicals such as lime or sodium hydroxide.

The WRF study on corrosion inhibitors detected silica in the scale of 50% of the coupons exposed to a silicate inhibitor (Water Research Foundation, 2008). The scale on all coupons exposed to the silicate inhibitor appeared denser than other scales formed in the presence of phosphate or carbonate inhibition. The study noted that an advantage of silicate addition may be in the promotion of a more dense amorphous silica layer.

The silicate in sodium silicate solutions carries a negative charge and will, in theory, migrate to anodic areas where it can react with metallic ions. One manufacturer of sodium silicate (PQ Corporation) reported that monomeric silica represented by SiO_3^{2-} is adsorbed onto pipe surfaces at anodic areas, forming a thin monomolecular film on the interior of the pipe, preventing further corrosion at the anode (Water Research Foundation, 2008). This work included microscopic and X-ray examination of the film formed at the metal surface, which showed it had two layers, with most of the silica in the surface layer adjacent to the water. This work also reported that naturally occurring silica in the form of SiO_2 probably reacts with cations in bulk water and may not be effective in reacting with pipe surfaces.

As discussed in Section 5, a silica crust (SiO_2) was found on all three lead service lines examined from the Newark system. The silica crust was found to be relatively porous and therefore not acting as an effective barrier against the outward flux of lead released from the pipe as the passivating lead layers (mainly plattnerite and hydrocerussite) were found behind the silica crust.

In summary, no evidence has been found to demonstrate that silicates form insoluble (or low solubility) phases with lead to immobilize lead into protective pipe scales. The likely benefit of silicates is the resulting boost in pH, which promotes the formation of lead carbonate scales, or in the formation of a dense silica scale to form a barrier against lead release.

7.2 Theoretical Lead Solubility Modeling

Equilibrium solubility models can be useful to evaluate corrosion characteristics of water and to predict changes in those characteristics with changes in water quality conditions and treatment. However, solubility models are dependent upon the accuracy of the *characterization of the*

solids and complexes considered, the accuracy of the thermodynamic constants used for the various chemical reactions, and do not take into account important aspects of kinetics, interaction with organic materials or tuberculation/ corrosion products, and post-treatment deposition of various scales (such as compounds of iron, calcium and manganese). The most widely-used solubility models are based on Pb(II) mineral phases – either carbonate or phosphate – controlling lead solubility.

As presented in Section 5, the scale analyses conducted by the EPA revealed that Pb(II) chemistry is only partially applicable to Newark's current conditions, as Pb(IV) solids are also present in the pipe scales. All three locations analyzed showed both Pb(II) and Pb(IV) scale deposits, with the outermost layers being primarily hydrocerussite (Pb(II)), with cerussite (Pb(II)) and plattnerite (Pb(IV)) also present.

Work by Schock and Gardels in 1983 identified a discrepancy in lead solubility data when compared with predicted solubility curves. At the time, it was believed that the discrepancy was a result of experimental and theoretical errors and to the possible presence of Pb(IV) compounds in chlorinated waters. Subsequent research by Schock, published in 1990 and 1996, indicated that the discrepancy was likely due to the potential formation of Pb(IV) compounds in drinking water distribution systems (Boyd, et al., 2008) which are not represented by the Pb(II) solubility models.

CDM Smith often uses the Water!Pro Corrosion Control and Treatment Process Analysis Program (Water!Pro), supplemented by published lead solubility diagrams (American Water Works Research Foundation and DVGW-Technologiezentrum Wasser, 1996)), to evaluate theoretical lead solubility and effectiveness of alternative corrosion control treatment options. As with most other equilibrium solubility models, Water!Pro is based on Pb(II) solids controlling lead solubility.

For the Newark desktop analysis, the Water!Pro model was used as a guide to provide information to supplement the decision-making process, recognizing the limitations of its applicability given the scale analysis findings of mixed Pb(II) and Pb(IV) mineral phases. The model analysis is presented herein to evaluate alternatives to reduce lead solubility based on anticipated future conditions being dominated by Pb(II) as the controlling lead species. As discussed in this report, it is not viable to attempt to maintain Pb(IV) as the controlling oxidation state given the current challenges with achieving simultaneous compliance with the Stage 2 Disinfection Byproducts Rule.

The model analysis in no way predicts the transition from Pb(IV) to Pb(II), or the reduction in lead solubility from current conditions to the future proposed scenarios, due to the limitations of the model. It is also important to note that the theoretical Pb(II) solubility values predicted by the model are **not** lead concentrations that would be measured at customers' taps. In practice, lead levels at the customers' taps are often lower than predicted. In the field, sampling rarely occurs under ideal conditions of true chemical equilibrium as assumed by the solubility models. In addition, some water constituents that may affect lead corrosion in drinking water may not be adequately represented in the model, as discussed above.

7.3 Model Inputs

The historic water quality and chemical usage for Newark is presented in Section 3. **Table 7-1** below summarizes the key water quality parameters, by season, that were used as input for the Water!Pro model.

Table 7-1 – Model Input of Seasonal Water Quality Parameters

Source Water	Newark - Pequannock Reservoir			
Scenario #	1	2	3	4
Season	Summer (Jun-Aug)	Fall (Sept-Nov)	Winter (Dec-Feb)	Spring (Mar-May)
Water Quality Input				
TDS, mg/L ^[1]	118.0	116.0	109.3	118.0
Calcium, mg/L Ca ²⁺	10.4	10.0	9.5	9.5
Total Alkalinity, mg/L as CaCO ₃	23.8	24.6	21.7	19.5
pH	6.7	6.6	6.6	6.5
Field Water Temperature, deg. C	21.8	13.8	6.5	13.3
Cl ⁻ , mg/L ^[2]	30.8	34.7	37.1	33.6
SO ₄ ²⁻ , mg-/L ^[3]	10.7	10.1	11.5	11.3
Mg ²⁺ ^[4] , mg/L	4.4	4.6	4.4	4.1

^[1] 9 monthly averages from the 'Optimal Corrosion Control Treatment Recommendations Dec 2017' report.

^[2] 16 samples from 1994-2017 from NJDEP Drinking Water Watch

^[3] 22 samples from 1994-2017 from NJDEP Drinking Water Watch

^[4] 17 samples from 1994-2017 from NJDEP Drinking Water Watch – Delivered Water

Table 7-2 summarizes the chemical additives used in the Water!Pro model, based on seasonal averages, from the information provided by the Newark plant staff. Sodium hypochlorite was used in the model instead of chlorine gas, as the City of Newark will be switching their current feed system to a sodium hypochlorite feed system in the near future.

Table 7-2 – Model Input of Seasonal Chemical Addition Parameters

Source Water	Newark – Pequannock WTP			
Scenario #	1	2	3	4
Season	Summer (Jun-Aug)	Fall (Sept-Nov)	Winter (Dec-Feb)	Spring (Mar-May)
Chemical Addition Input				
100% Hydrated Lime (Ca(OH) ₂), mg/L	3.3	4.2	3.2	2.7
Clarion (0.5% Acid Alum*14.3H ₂ O), mg/L	9.0	9.8	9.9	9.4
Sodium Hypochlorite (NaOCl), mg/L as Cl ₂	3.5	3.1	2.7	2.3
PACI (12.2% Al, 70% Basicity), mg/L	1.9	2.5	1.8	1.8

7.4 Lead Solubility – Existing Conditions

As noted above, the current Newark conditions cannot be modeled with the Water!Pro model because the model is based on Pb(II) minerals (either carbonate or phosphate) being the controlling lead phase whereas both Pb(II) and Pb(IV) were found in the Newark system scales. However, knowing that it is impractical to maintain the Pb(IV) scales to control lead, any future corrosion control treatment will involve either carbonate or phosphate chemistry. As such, the model was utilized to illustrate the **theoretical** lead solubility for various carbonate and phosphate conditions.

The initial step was to estimate the theoretical lead solubility under current conditions, assuming only Pb(II) carbonate solids are controlling lead release. This was then compared to the theoretical lead solubility for: (1) optimized pH/alkalinity conditions, and (2) with the use of orthophosphate.

Newark's system operated with an average finished water alkalinity that ranged from 22.0 mg/L to 24.9 mg/L from 2015-2018, with an average of 23.5 mg/L as CaCO₃. From 2015-2018, the pH ranged from 6.9 to 7.3. The dissolved inorganic carbon (DIC) level was calculated as 8.2 to 9.7 mg/L as C.

The theoretical lead solubility of Newark's current system is presented in **Table 7-3**, and seasonally ranges from 207 µg/L to 437 µg/L of lead.

Table 7-3 – Theoretical Lead [Pb(II)] Solubility by Season (with Sodium Hypochlorite)

Season	pH 2018 operating range	Theoretical Lead [Pb(II)] Solubility (µg/L)
Summer	6.72 – 7.3	437 – 259
Fall	6.72 – 7.3	355 – 209
Winter	6.72 – 7.3	352 – 207
Spring	6.72 – 7.3	402 – 209

These values were then used as a “baseline” for comparison to alternatives aimed at reducing theoretical Pb(II) solubility, and thus achieving lower lead levels at the tap.

7.5 Lead Solubility – Modified CCT Alternatives

Several alternatives were evaluated to determine their impact on the theoretical Pb(II) solubility including:

- Increased finished water pH
- Addition of orthophosphate

The following discussion summarizes the results.

7.5.1 Increased Finished Water pH

Both lime and sodium hydroxide were evaluated for pH adjustment. Both chemicals provided the same reduction in theoretical lead solubility, therefore only the results for lime are presented

here. **Figure 7-1** demonstrates the theoretical Pb(II) solubility for the summer water quality parameters as pH increases. Similar results were observed under all seasonal conditions. As shown in **Figure 7-1**, the theoretical Pb(II) solubility significantly decreases as pH is increased to approximately 9.5. A pH level of about 9.0 – 9.5 would theoretically be needed to optimize carbonate scale formation and maintain dissolved lead levels at acceptable values.

Increasing pH to 9.0 – 9.5 reduces lead solubility, but will likely result in increased disinfection byproduct levels. Newark is currently challenged with compliance of the Stage 2 Disinfectant and Disinfection Byproducts Rule for both trihalomethanes (THMs) and haloacetic acids (HAAs). It is not advisable for Newark to raise the pH to optimize carbonate scale formation at this time with the current treatment processes, open water reservoir, and disinfection chemicals. A more systematic and comprehensive evaluation to control disinfection byproduct formation and achieve effective primary disinfection would be needed.

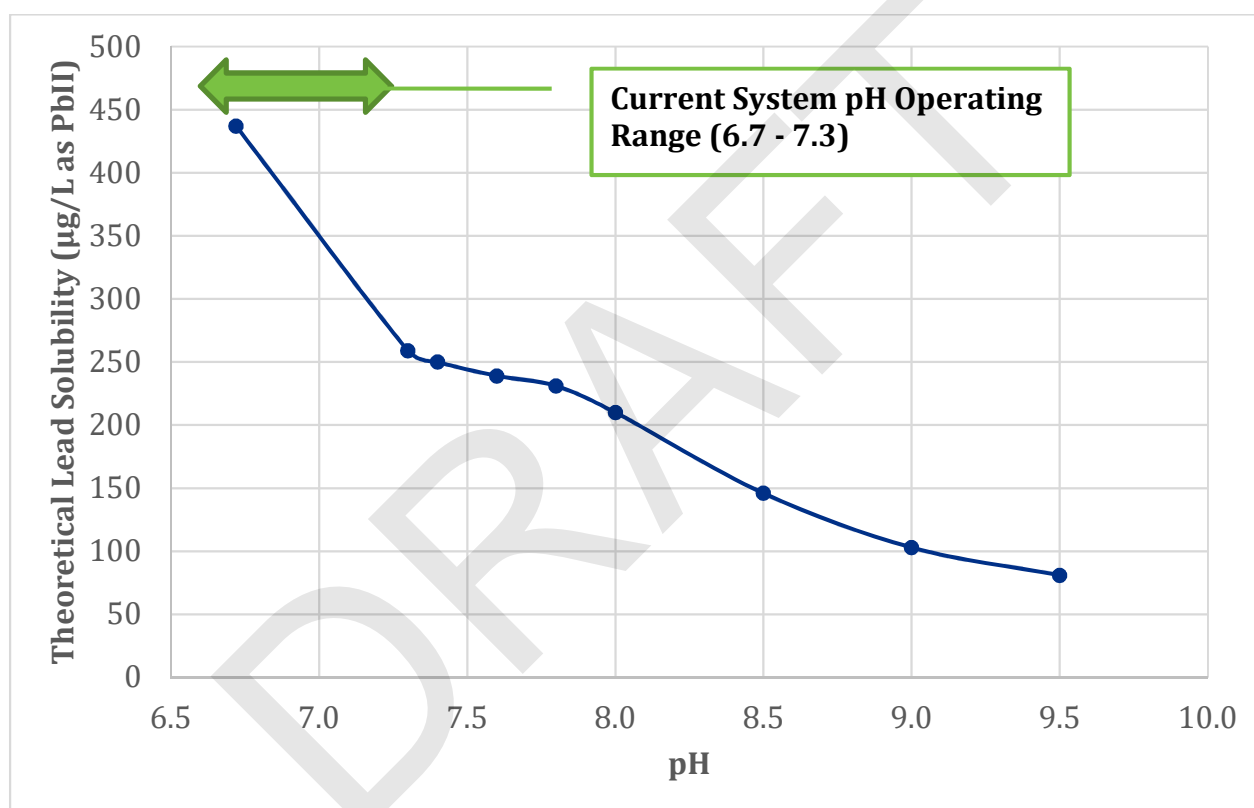


Figure 7-1 – Effect of pH Adjustment on Theoretical Pb(II) Solubility

7.5.2 Addition of Orthophosphate

The use of orthophosphate has been a successful approach for minimizing corrosion of lead-containing materials (USEPA, 1993). Solubility models and experience indicate that the optimal pH for orthophosphate scale formation is between 7.2 and 7.8 (US Environmental Protection Agency, 2016).

Using the seasonal water quality data in Table 7.1, theoretical lead solubility values were modeled for various orthophosphate concentrations at the current baseline average pH of 7.1, as well as at

pH of 7.3 and 7.5, to cover the anticipated range of optimal pH conditions. Results at pH 7.8 were theoretically the same as at pH 7.5.

Figure 7-2 presents theoretical lead solubility across a range of orthophosphate dosages (0.5 to 3.5 mg/L as PO₄) and pH levels for summer conditions. Similar results were achieved for all seasonal conditions showing a reduction in lead solubility. Movement from one place on the graph to another with lower lead solubility is expected to result in reduced concentrations of soluble lead in the field.

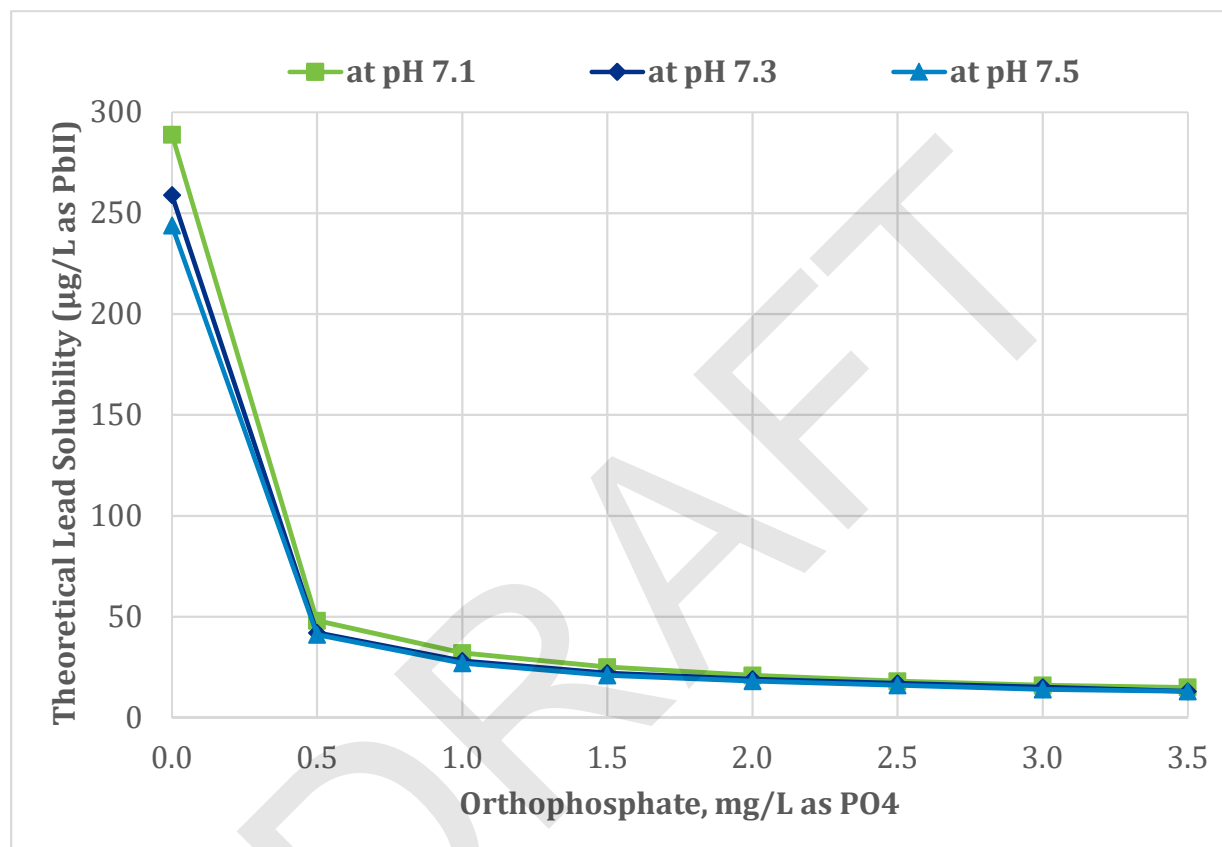


Figure 7-2 – Effect of Orthophosphate on Theoretical Pb(II) Solubility at Varying pH Values in Summer

Overall, the results show that orthophosphate can significantly reduce theoretical lead solubility in the City of Newark's drinking water considering only Pb(II) chemistry. For example, as shown on **Figure 7-2**, at an average pH of 7.3, lead solubility as Pb(II) is theoretically reduced by 83% with the first 0.5 mg/L of orthophosphate as PO₄ and by 89% when orthophosphate is increased to 1.0 mg/L as PO₄.

Although benefits to reducing lead solubility continue with increasing PO₄ dose, as demonstrated in **Figure 7-2**, the incremental reduction in theoretical Pb(II) solubility becomes less significant with dosages greater than 1.0 mg/L as PO₄. However, this does not account for particulate lead that may enter the system as a result of the instability of the legacy Pb(IV) and Pb(II) carbonate scales. It is not known what level of orthophosphate addition would be required to control the

distribution and mobility of lead particles. However, full-scale experience from other systems with lead release conditions has shown that orthophosphate doses in excess of that theoretically required were necessary. The addition of orthophosphate can readily lower dissolved lead levels, but total lead concentrations can persist at elevated levels for a longer period of time (Giammar, 2017).

In comparing the pH adjustment alternative to the orthophosphate option for controlling soluble Pb(II) lead, the theoretical dissolved Pb(II) concentration with pH adjustment to 9.5 without orthophosphate addition is almost three times higher than that with 1.0 mg/L of orthophosphate as PO_4 at a pH of 7.3. This does not account for any impact of legacy Pb(IV) solids in the system. It is important to recognize that theoretical lead solubility modeling only considers Pb(II) mineral phases to control soluble lead. Elevated lead concentrations at the tap can occur due to the presence of insoluble lead particles dislodged from lead pipe, solder or brass plumbing fixtures. Elevated lead concentrations due to particulate lead cannot be predicted.

As discussed in Section 7.1.4, the current practice of sodium silicate addition provides an increase in pH, which may be more economically achieved by the addition of a less costly alkaline chemical such as lime or sodium hydroxide. Because the Pequannock WTP currently uses lime, the amount of lime needed to increase pH without the use of sodium silicate was examined. It is recognized that the existing lime system has limitations that would need to be addressed should sodium silicate addition be discontinued in the future.

Table 7-4 presents an estimate of the amount of hydrated lime needed to accompany various amounts of added orthophosphate (without the addition of sodium silicate) to achieve finished water pH conditions of 7.2 and 7.4. The addition of lime increases with the addition of orthophosphate since orthophosphate is an acid.

Table 7-4 – Estimated Theoretical Lime Dose to Maintain Desired pH for Orthophosphate

Season	Dose (mg/L as PO_4)	Hydrated Lime Dose Needed to Achieve Target pH (without Silicate) (mg/L)	
		7.2 pH	7.4 pH
Summer	0.5	7.3	8.4
	1.0	7.6	8.8
	2.0	8.3	9.7
	3.0	9.2	11.1
Fall	0.5	10.5	12.1
	1.0	10.8	12.4
	2.0	11.6	13.3
	3.0	12.4	14.2
Winter	0.5	10.7	12.3
	1.0	11.0	12.7
	2.0	11.7	13.5
	3.0	12.4	14.4
Spring	0.5	11.2	12.5

Season	Dose (mg/L as PO ₄)	Hydrated Lime Dose Needed to Achieve Target pH (without Silicate) (mg/L)	
		7.2 pH	7.4 pH
	1.0	11.5	12.9
	2.0	12.2	13.8
	3.0	13.0	14.8

7.5.3 Other Alternatives Not Considered

As discussed in Section 7.1, the Lead and Copper Rule, as well as the recent EPA OCCT Evaluation Technical Recommendations for Primary Agencies and Public Water Systems (US Environmental Protection Agency, 2016), identifies three available corrosion control treatment methods: (1) pH/alkalinity/DIC adjustment, (2) phosphate-based corrosion inhibitors, and (3) silicate-based corrosion inhibitors. The evaluation presented above considered the first two methods. As discussed in Section 7.1, sodium silicate has not been proven to be effective for controlling lead corrosion. Other than its ability to increase pH and encourage formation of carbonate scales at higher pH conditions, it provides only a porous silica crust on the pipe that does not appear to prevent lead release as no Si-Pb crystalline compounds are formed. (see EPA scale analysis in Section 5 and Appendix A). Continuing the use of sodium silicate as the only method for CCT for Newark is not recommended.

Only recently has the formation of the solid phase tetravalent lead (Pb(IV) or PbO₂) been recognized in EPA OCCT Guidance (US Environmental Protection Agency, 2016). Newer research (Schock, 2001) has confirmed that Pb(IV) compounds (e.g., plattnerite) can be the predominant compounds in lead pipe scales under highly oxidative conditions and under low organic matter conditions. (see Pourbaix diagram in Figure 6-1). PbO₂ is extremely insoluble and is very effective in preventing lead from being released to the water. Based on studies performed on systems with known plattnerite scales compared with Pb(II)-based scales, lead levels at the tap and during sequential sampling were lower for the Pb(IV) scales than for the Pb(II) scales (Triantafyllidou, Schock, DeSantis, & White, 2015).

Under high ORP conditions (i.e., high chlorine residual), and in the absence of corrosion inhibitors or other interfering surface deposits, Pb(IV) scales can form on lead pipe surfaces. The predominance of Pb(IV) scales is dependent on ORP (i.e., chlorine residual), pH, and the presence of NOM (Boyd, et al., 2008). As discussed in Section 5.1, the conditions needed for PbO₂ formation may be found in systems that have a high ORP. If the specific water quality conditions are modified, such as decreasing pH and/or reducing chlorine residual which would reduce ORP, the Pb(IV) scale is destabilized and converts back to Pb(II) (Boyd, et al., 2008), and as shown in Figure 6-1. Recent evidence shows that Pb(IV) scales may be more prevalent in systems than previously thought, and may exist at lower chlorine residual levels. The impact pH has on Pb(IV) scales is further discussed in Section 6.2.2 and is illustrated in Figure 6-1.

Because of the importance of pH, maintaining Pb(IV) scales to control lead release is not a realistic option for Newark while simultaneously complying with the Stage 2 Disinfectants and Disinfection Byproducts Rule. In addition, questions remain as to the required chlorine residual

that should be maintained in the distribution system and lead service lines for the formation and maintenance of Pb(IV) scales. For this reason, EPA has not adopted Pb(IV) scale formation as an acceptable corrosion control treatment technique at this time.

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Section 8

Recommendations

This section presents recommendations for the City of Newark to improve their corrosion control program in their distribution system. Both immediate and long-term corrosion control treatment recommendations are provided, as well as interim measures to reduce public health risks until the treatment has time to be effective in reducing lead levels.

The following alternatives were eliminated from further consideration either due to ineffectiveness in reducing lead solubility, or their likely adverse impacts on other water quality goals. The alternatives that were eliminated are discussed in detail in the report sections identified in parentheses below.

- Increase finished water pH to above 9.0 to promote more effective carbonate scale formation (see Section 7)
- Increase finished water pH and ORP for tetravalent lead scale stabilization and maintenance (see Section 5 and Section 6)
- Increase sodium silicate dosing (see Section 6)

The primary recommendation for achieving optimized CCT in Newark's water supply is the addition of an orthophosphate chemical feed system. Details of the proposed system are further discussed in this section the report. The addition of orthophosphate is anticipated to provide reductions in lead levels without expected adverse impacts on other water quality goals, namely compliance with primary disinfection and disinfection byproduct regulations for Newark and its consecutive systems (i.e. Bloomfield, Belleville, etc.). The benefits and constraints of adding an orthophosphate system in Newark's distribution system are noted as follows:

Benefits of Adding Orthophosphate

- Full-scale experience combined with corrosion control theory indicates orthophosphate will effectively reduce Pb(II) lead solubility in Newark's distribution system with a pH between 7.2 and 7.8.
- Scale analysis performed by the EPA shows a breakdown of the existing tetravalent and carbonate scales. Other systems with similar conditions experienced a significant reduction in total lead within a few months of adding orthophosphate.
- Common, proven treatment for lead corrosion control in distribution systems in New Jersey and across the country.
- Will reduce duration of elevated lead levels at the tap resulting from soluble and insoluble lead compared with making no system changes and compared with raising the sodium silicate dose.

- Does not require significant water quality modifications, such as a high pH or high chlorine residual, allowing for greater opportunity for simultaneous compliance with primary disinfection and disinfection byproduct regulations.
- Consistent with corrosion control treatment in Wanaque system.
- Orthophosphate is widely available from suppliers.

Secondary Impacts and Possible Constraints of Adding Orthophosphate in Newark

- Unknown potential for increase in insoluble lead during the initial passivation phase as the plattnerite scale continues to be unstable and is replaced with a phosphate-based scale. It is unknown if the orthophosphate will initially exacerbate the particulate issue short-term prior to seeing a reduction in lead levels. Point-of-use filters are recommended to reduce customer exposure to lead during this period.
- Increased phosphorus loading in wastewater.
- Increased zinc concentrations in wastewater sludge if using zinc orthophosphate.
- Potential effect of higher phosphates on some industrial users.
- Potential for white cloudy water with orthophosphate concentrations above 3.2 mg/L as PO₄. (Tesfai, Constanst, & Reibier, 2006)
- Potential for stimulating algae growth if orthophosphate gets into an open body of water, such as the Cedar Grove Reservoir.
- Additional building and security will be needed at the Valley Road Rechlorination Station.
- Possible need for a satellite chemical feed system for Pequannock and any other users upstream of the Valley Road Rechlorination Station.

8.1 Chemical and Orthophosphate Dosage

Orthophosphate (PO₄), commonly used as a corrosion inhibitor for lead and copper control, was evaluated in a desktop study under four seasonal scenarios and was concluded to be effective in reducing the theoretical lead solubility in all four seasons. The results are presented in Section 7. Orthophosphate reduces lead concentrations through the formation of insoluble Pb(II)-PO₄ mineral phases. (DeSantis, Schock, & Bennett-Stamper, Incorporation of Phosphate into Destablized PbO₂ Pipe Scales, 2012)

For the City of Newark, either phosphoric acid or zinc orthophosphate is recommended. Zinc orthophosphate is a liquid that is available in blends that contain various ratios of zinc to orthophosphate. A zinc orthophosphate blend offers the additional benefits of introducing zinc to the distribution system, which can help reduce corrosion in cement-lined pipes in low alkalinity waters, reduce iron corrosion in unlined pipe, and reduce lead release from brass fittings containing lead. Zinc orthophosphate is more dilute than phosphoric acid, requires twice as much storage volume, and is 3 to 5 times more costly than phosphoric acid for the same active PO₄ dose.

In addition, zinc orthophosphate adds zinc into the wastewater sludge, which can impact disposal options for the wastewater treatment facility. Each of these chemicals would be effective for Newark's distribution system as the active ingredient, orthophosphate, is the same.

Although CDM Smith's desktop evaluation presented in Section 7 found that a significant reduction in lead solubility can theoretically be achieved with the first 0.5 mg/L of orthophosphate, the solubility model evaluations cannot account for any soluble lead currently being released into the water as a result of the ongoing destabilization of the PbO_2 scale to soluble $Pb(II)$. To counteract the current lead release issue without delay, it is recommended that orthophosphate treatment in Newark's distribution system gradually increase to a higher passivation dose prior to settling on a maintenance dose. The 2016 EPA OCCT Guidance Manual states that some systems start with a passivation dose 2 to 3 times higher than the target maintenance dose to build up a protective barrier quickly (US Environmental Protection Agency, 2016). In addition, full-scale experience in other systems with PbO_2 scale destabilization has shown that higher orthophosphate doses (3 to 3.5 mg/L as PO_4) have been able to mitigate the lead release in a relatively short period of time (several months). CDM Smith recommends gradually introducing orthophosphate into the distribution system, starting with a dose of 0.5 mg/L as PO_4 as soon as possible and working up to a passivation dose of 3.0 mg/L as PO_4 . The system will be monitored as discussed later in this Section during the implementation of orthophosphate

As an example of a similar system, Washington, D.C. started adding orthophosphate in August 2004 in the form of phosphoric acid after it was discovered that a change in disinfectant from free chlorine to chloramines reduced ORP converting PbO_2 , an insoluble tetravalent lead compound, to the more soluble $Pb(II)$ carbonate compounds, resulting in lead release into the water. Washington, D.C. slowly increased the dose of the orthophosphate over a two-week period to 3.5 mg/L as PO_4 . At that dose, lead levels in the residential lead service lines reduced from 150 $\mu\text{g/L}$ to 15 $\mu\text{g/L}$ in 8 months based on the sequential sampling profiles. (Giani, Keefer, & Donnelly, 2005)

As described in Section 8.2 below, limited space is available at the proposed dosing location, the Valley Road Rechlorination Station. Therefore, it is recommended that Newark commence orthophosphate dosing with the more concentrated phosphoric acid using a temporary chemical feed system. If, at a later date, Newark prefers to use zinc orthophosphate, the chemicals can be switched since they contain the same active ingredient. Options for two different storage tank sizes based on utilizing phosphoric acid with a passivation dose of 3.0 mg/L and a maintenance dose of 1.0 mg/L is provided in **Table 8-1**. Both tanks shown are double-walled tanks for containment. The 3,070 gallon tank has an 8 to 12 week lead time and the 2,050 gallon tank has a 4 week lead time.

Table 8-1 – Initial Tank Sizing for Orthophosphate Feed System

Scenario	Dose (mg/L)	Tank Size (gallons)	Days of Storage at Average Flow (55 mgd)	Days of Storage at Max Flow (80 mgd)
Initial Passivation Dose	3.0 mg/L	2,050	15 (133 gpd)	11 (194 gpd)
		3,070	23 (133 gpd)	16 (194 gpd)
Maintenance Dose	1.0 mg/L	2,050	46 (44 gpd)	32 (65 gpd)
		3,070	69 (44 gpd)	48 (65 gpd)

A concurrent pipe loop demonstration study is recommended to be performed in parallel with full-scale implementation of the orthophosphate feed system to optimize treatment by studying factors such as pH, dose and type of orthophosphate chemical. Details of the recommended pipe loop demonstration study are discussed in Section 8.4.

In dosing orthophosphate, an increase in phosphorous concentrations will occur in the wastewaters collected in Newark and other communities using the Newark's water. Owners of wastewater treatment facilities that will encounter increased phosphorous concentrations will need to be notified to determine any potential implications to NJPDES permit compliance that may result from the orthophosphate chemical addition.

8.2 Chemical Feed Location Recommendations

As mentioned in Section 2, the Cedar Grove Reservoir is an open, finished water reservoir. Dosing of orthophosphate into an open reservoir will increase phosphorus concentrations. Phosphorus is a nutrient that stimulates algal growth, which cause algal blooms. The New Jersey Surface Water Criteria for total phosphorus in freshwater reservoirs and lakes is a maximum of 0.05 mg/L. In view of this, CDM Smith recommends dosing orthophosphate at the Valley Road Rechlorination Station located in Montclair, downstream of the Cedar Grove Reservoir and just north of Newark's distribution. Sodium hypochlorite is dosed at this location and pH and chlorine residual are monitored on site. Newark staff indicated that an operator visits this location twice per day.

Based on an initial site visit, it does not appear that an orthophosphate chemical bulk storage tank would fit within the existing building. In the interest of dosing orthophosphate as quickly as possible, the orthophosphate chemical storage tank can be located outside, as orthophosphate has a low freezing point. Temporarily locating tanks on the existing driveway or exterior loading dock will expedite the process of feeding orthophosphate in the drinking water. The tank would need to be designed to handle wind loads and be properly anchored. Additional security features at the site may be needed to protect the outdoor storage tank.

The remainder of the feed system, including a smaller day tank, two metering pumps (one duty, one standby), control panels and variable frequency drives (VFDs), can fit within the available footprint in existing basement. Orthophosphate would be injected into the pipe adjacent to the existing chlorine injection for rechlorination. The dosing would be flow-paced with the existing venturi meter to maintain a consistent dose.

An evaluation of all users supplied by the Pequannock WTP upstream of the Cedar Grove Reservoir is required to determine if any satellite orthophosphate feed systems will be necessary in addition to the Valley Road Rechlorination Station feed system.

8.3 Distribution System pH Recommendation

Currently, the average pH at the Valley Road Rechlorination Station is approximately 7.1 at the point of entry (POE) into the distribution system. The EPA OCCT Guidance Manual, confirmed by full-scale experience, recommends a pH range of 7.2 to 7.8 for orthophosphate addition (US Environmental Protection Agency, 2016); however, every system is unique with respect to its

optimal pH range. With the pH variability known to occur in the City's distribution system, it is recommended that Newark aim to achieve a slightly higher pH, in the interim, of approximately 7.3 to 7.4 leaving the Valley Road Rechlorination Station to stay above pH 7.2 in the far reaches of the distribution system. At a pH below 7.2, the orthophosphate will be slower to react and will not be as effective in reducing lead solubility.

In the long-term, if Newark can improve its removal of disinfection byproduct precursors and find a suitable means of assuring primary disinfection, then pH can be increased further to a more effective range for orthophosphate, likely between 7.5 and 7.8. The optimal pH range for Newark's water can be evaluated in the loop study discussed in Section 8.4.

To achieve the recommended pH values of 7.3 to 7.4 without sodium silicate in all seasons, a lime dose of approximately 12 to 15 mg/L would be required. Based on input from Newark's staff, the existing lime feed system cannot maintain this dose. Therefore, it is recommended that sodium silicate continue to be used as a pH adjustment chemical until the lime feed system is upgraded, or a more cost-effective pH adjustment chemical can be reliably supplied. Sodium silicate use should also be continued until the pilot loop study can evaluate whether there will be any negative impacts of discontinuing the silicate application in the distribution system.

Maintaining a consistent pH is as important as the actual pH level itself. In the month of July 2018, daily pH at the Valley Road Rechlorination Station fluctuated between pH 6.29 and 7.65. This is an extreme variation in pH values over a 31-day period. Furthermore, the pH range throughout the distribution system is even more extreme than the values measured at the distribution system POE. It is recommended that Newark either stabilize pH at the Pequannock WTP with upgrades to their existing lime and/or sodium silicate systems, install a new sodium hydroxide feed system at the Pequannock WTP to replace the existing lime and silicate systems, or install a small supplemental sodium hydroxide feed system at the Valley Road Rechlorination Station.

8.4 Demonstration Pipe Loop Study

To optimize the addition of orthophosphate to Newark's distribution system, a pipe loop demonstration study should be performed. However, in the interest of public health protection, it is not recommended that full-scale implementation of orthophosphate addition be delayed until after the pipe loop study is completed. In parallel with full-scale implementation of orthophosphate addition, the pipe loop study would evaluate parameters such as:

- Optimal PO_4 dose
- Chemical comparison (i.e., zinc orthophosphate vs. phosphoric acid)
- Optimal pH
- Change in pH adjustment chemical (i.e., replacing sodium silicate with an alternative alkaline chemical)

A protocol for the pipe loop study would be developed in conjunction with Newark and provided to NJDEP for review prior to commencing the study. In general, the study could include one rack of three or four pipe loops to be installed at the Pequannock WTP. Each loop would contain a

section of excavated lead service line from Newark's distribution system. A portion of each LSL would also be sent to EPA for analysis of the pipe scales to document baseline conditions. Scale analyses would then be conducted on the pipe segments within the loops later in the study to correlate actual scale deposits with the water chemistry conditions. During development of the study protocol, the need to condition the pipe segments at the start of the study using Newark's current finished water would be determined. If conditioning is performed, then, after a short period of initial conditioning, all but one loop would be modified to evaluate the different parameters enumerated above. The remaining pipe loop would continue to represent existing water chemistry conditions as a "control." Sampling is expected to include total and dissolved lead, pH, ORP, chlorine, alkalinity, orthophosphate residual, silica residual and aesthetic water quality parameters such as iron and manganese. A detailed sampling plan would be prepared as part of the study protocol development.

It was confirmed with the EPA in September 2018 that there has not been a successful pipe loop study involving excavated lead pipe containing tetravalent lead scales that have returned to "existing conditions" after a period of conditioning. Once lead pipes with tetravalent lead scales are excavated and disturbed, they continue to behave erratically with an increased release of particulate lead. For this reason, the incorporation of a conditioning period (and the duration of that period) would be evaluated as part of the study protocol development. It may be that, instead of running an extended conditioning period for the loops, CCT modifications will be introduced while the pipes are releasing high levels of particulate lead. CCT solutions that are effective for such a "worst case" condition in the pipe loop study would be anticipated to be effective in the distribution system under the same water chemistry conditions.

As mentioned in Section 5, additional pipes in the West Ward, Central Ward and East Ward are recommended to be excavated and sections sent to the EPA for scale analysis and comparison with the scales already analyzed. In addition, sections of the pipes where the sequential sampling tests were performed have been removed and sent to the EPA for scale analysis.

8.5 Implementation Schedule

It is estimated that the orthophosphate system could be installed and operating in 5 to 6 months following award of a construction contract. Newark may consider procurement alternatives to expedite the overall schedule. Anticipated completion schedule for efforts related to this improvement project include:

- 4-6 weeks for design and submission of a permit application to NJDEP
- 2-4 weeks for NJDEP review and approval of a Bureau of Safe Drinking Water Permit
- 3-4 months for construction (providing 8-12 weeks for tank and control panel lead time from approved shop drawings)
- 4-6 weeks installation and operation

It is anticipated that the pipe loop study could be placed into operation at least 2 months prior to the start-up of the proposed orthophosphate system. During this time, the initial introduction of

orthophosphate into the lead pipes can be closely monitored to better predict anticipated behavior in the distribution system prior to introducing to the full Pequannock supply.

The cost of the new orthophosphate system as described herein is estimated to be approximately \$600,000 including engineering, materials, labor and equipment. This assumes that the bulk storage tank would be outside and not housed in a building.

8.6 Monitoring During Implementation

To monitor changes in water chemistry due to the full-scale addition of orthophosphate in the distribution system, it is recommended that a targeted monitoring program be developed and executed. The purpose of the monitoring program is to assess the progression of orthophosphate residual levels in the system, as well as to determine if any adverse water quality effects are occurring as a result of the change in treatment. It is anticipated that sampling would be conducted monthly or more frequently as lead concentrations decrease and stabilize. Flowing samples would be collected from routine coliform sampling sites and analyzed for parameters such as pH, alkalinity, chlorine residual, ORP, color (apparent), turbidity, iron (total and dissolved), manganese (total and dissolved), coliform, HPC, silica and orthophosphate residual. First-draw tap sampling, as well as sequential sampling (discussed below), would be performed periodically at homes with lead service lines selected from the sampling pool for LCR compliance.

In addition, Newark's Water Quality Parameter Sampling Plan will be updated to include monitoring of orthophosphate residual, as well as continuing to monitor pH and chlorine residual. The results from the sampling will be reviewed on an ongoing basis to monitor changes in the distribution system and the sampling program (and treatment) will be adjusted, as necessary.

8.6.1 Sequential Sampling – Before and During Implementation

It is recommended that Newark perform additional sequential sampling to evaluate conditions in the wards not yet tested. This would include the West Ward (Pequannock-supply), Central Ward (potential mix of both Pequannock-supply and Wanaque-supply), and the East Ward (Wanaque-supply). In addition, it is recommended that, as part of Newark's monitoring plan, sequential sampling (measurement of lead profiles), as presented in Section 4, continue to be performed after orthophosphate addition is implemented. The sequential sampling would be performed at homes with lead service lines and lead solder to evaluate the effectiveness of the orthophosphate in reducing dissolved and particulate lead concentrations throughout the service line, including all contributing factors. It is recommended that such sequential sampling be performed at a couple of homes that are easily accessible and will remain with a lead service line for at least the next year. Sampling would be performed at the select homes prior to commencing dosing of orthophosphate and then once every month after orthophosphate is implemented until the lead results stabilize.

8.7 Additional Recommendations

The following are additional recommendations for a holistic approach to improving Newark's water quality.

8.7.1 Short-Term Recommendations

As indicated in this report, there is evidence that protective lead scales that have formed on lead service lines and lead components within premise plumbing in the Newark distribution system have been destabilizing and are porous, allowing lead to be released into the drinking water. Health risks exist for customers with lead service lines and for customers with premise plumbing components that contain lead, such as lead solder, galvanized plumbing and/or brass fittings with lead content. Health risks are greatest for infants, young children, pregnant women and adults with kidney problems or high blood pressure.

The EPA guide, Implementing the Lead Public Education Provision of the Lead and Copper Rule, dated June 2008, should be used as guidance for providing public education and to reach the most vulnerable populations. Other resources are available from the American Water Works Association and the Lead Service Line Replacement (LSLR) Collaborative.

For customers in Newark, utilization of point-of-use filters is the recommended approach to minimize lead exposure through the removal of particulate lead. Filters are recommended until the new orthophosphate system can substantially decrease both dissolved and particulate lead prior to and during the initial passivation period of the orthophosphate. Filters are recommended to help protect customers both in homes with lead service lines and in homes with interior plumbing that contain lead solder, galvanized piping or brass fittings with lead content. Filters are recommended over promoting flushing of premise plumbing since, at this time, the scales are unstable and can be easily disturbed potentially releasing particulate lead during flushing. Point-of-use filters should be NSF 53 certified for lead removal (NSF/ANSI 53: Drinking Water Treatment Units - Health Effects).

If Newark provides residents with point-of-use filters, the program should provide specific guidance to the customers regarding replacement of the filters at the frequency recommended by the manufacturer. Risk of contamination can be increased if filters are not properly maintained and replaced regularly.

8.7.2 Long-Term Recommendations

In considering a holistic approach to achieve simultaneous compliance with all drinking water regulations, it is recommended that Newark evaluate alternatives for the following process modifications:

- **Stabilization of pH in the distribution system.** Stabilizing the pH will help improve water quality. Stabilization may include upgraded chemical feed equipment and monitoring at the Pequannock WTP, pH adjustment at the Valley Road Rechlorination Station, and/or improved monitoring and flushing in the distribution system to maintain a consistent pH from the North Ward to the South Ward.
- **Removal of disinfection byproduct precursors.** Improving filter performance and/or the addition of a clarification process would reduce the organic carbon concentration during treatment and help Newark achieve compliance with the Stage 2 Disinfection Byproducts Rule.

- **Utilizing an alternate primary disinfectant.** An alternate primary disinfection process, such as ozone, may help Newark meet primary disinfection requirements as well as reduce disinfection byproduct formation.
- **Aeration in the Cedar Grove Reservoir.** Aeration would strip a percentage of the volatile trihalomethane compounds (primarily chloroform) from the water prior the rechlorination facility and thereby reduce disinfection byproduct concentrations in the system. Aeration would have no impact on haloacetic acids (HAAs) as they are not volatile compounds.

8.8 Recommendation Summary

Table 8-2 summarizes the recommendations presented in this report.

Table 8-2 – Summary of CCT Recommendations

Factor	Immediate CCT Recommendation	Longer Term CCT Recommendation	Additional Notes
Chemical	Phosphoric Acid	Phosphoric Acid or Zinc Orthophosphate	Conduct pipe loop study to evaluate selection of longer-term chemical inhibitors
Dosage	0.5 mg/L as PO ₄ increasing to passivation dose of 3.0 mg/L as PO ₄	Minimum 1.0 mg/L as PO ₄ (or as determined by pipe loop study)	Evaluate dosage in pipe loop study
Feed Location	Valley Road Rechlorination Station	Valley Road Rechlorination Station	
System pH	Stabilize pH to 7.3 to 7.4	Stabilize pH to 7.5 to 7.8	Evaluate optimal pH in pipe loop study
Sodium Silicate	Maintain current dose or slightly increase dose to aid in pH adjustment	Replace with a more cost-effective pH adjustment chemical	Evaluate any negative impacts from eliminating sodium silicate addition in pipe loop study
Demonstration Study	Conduct pipe loop study in parallel with implementation of immediate addition of phosphoric acid	Apply results of pipe loop study to long-term CCT plan	
Monitoring	Implement representative monitoring program, including sequential sampling	Continue monitoring program and sequential sampling until conditions are stabilized	
Public Health	Point-of-use filters and conduct public education program	CCT optimization and LSL Replacement Program	

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Appendix A

Pipe Scale Analyses

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Newark, NJ

LSL samples extracted February/March 2018

Report from:

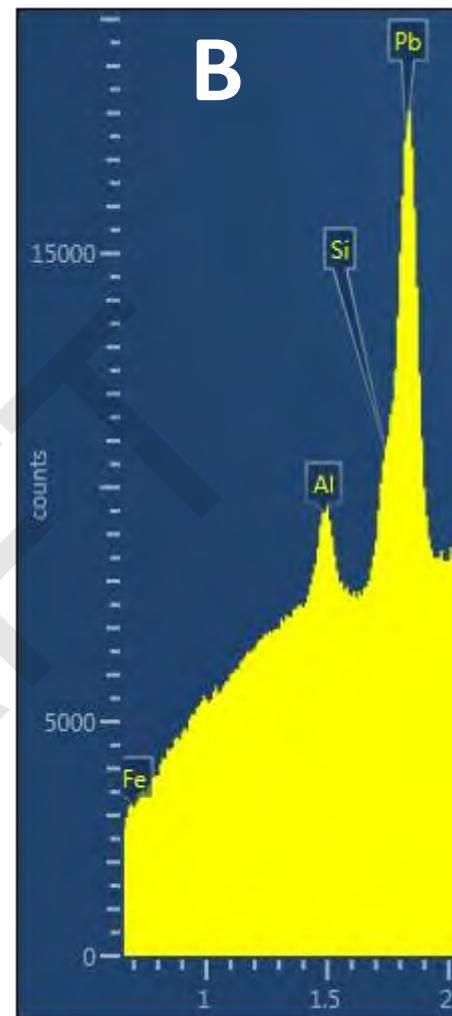
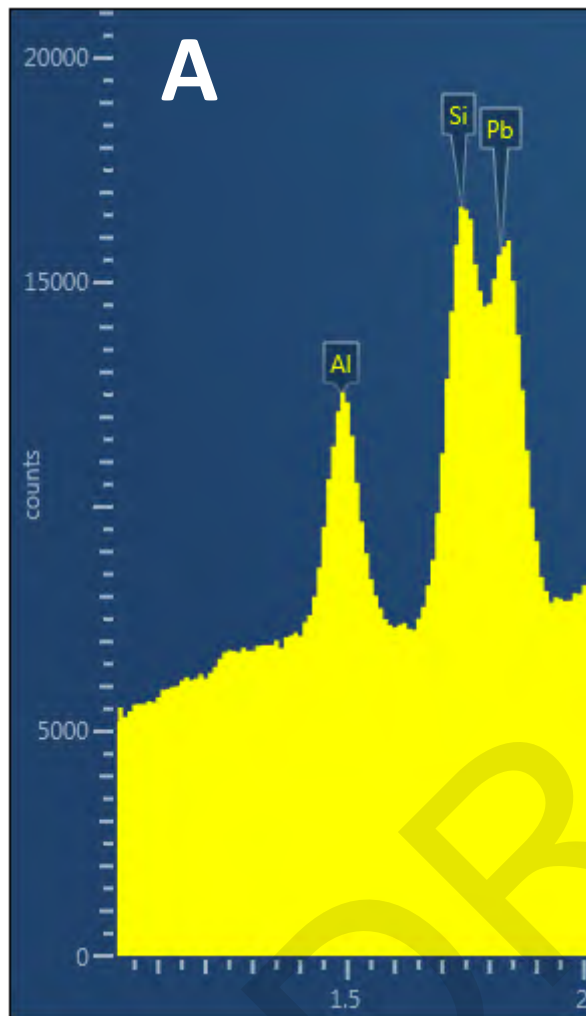
Advanced Materials and Solids Analysis Research Core

Cincinnati, OH

Some explanation to help with the interpretation of the EDS elemental maps particularly in regards to Si

(A) Si and Pb have peaks that are very close to one another

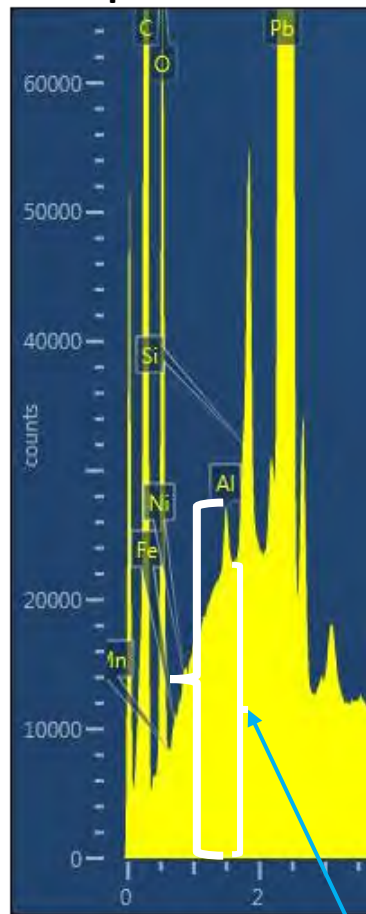
(B) In samples with significant Pb these peaks can blend together and Si becomes a shoulder of the Pb peak



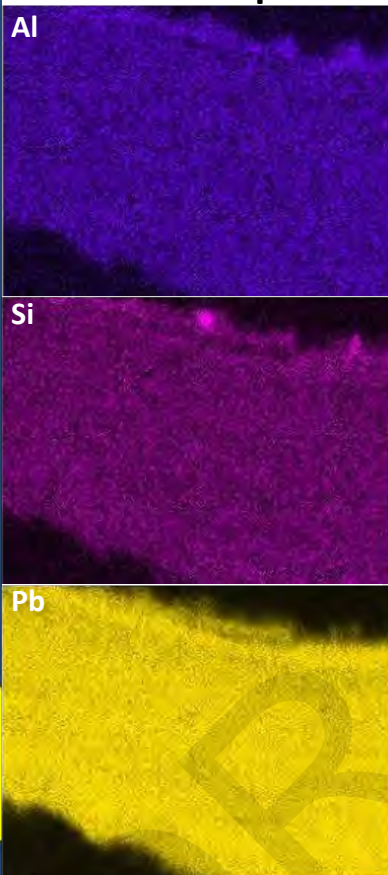
High counts for Pb can also cause problems in interpreting the elemental maps. The elemental maps are generated by placing a dot on the image where a specific X-ray energy was detected. That dot's brightness is then adjusted based on how many counts that spot generates.

In looking at the spectra and associated maps below it appears that the scale is evenly comprised of Al and Si with slightly more Pb. However, higher concentrations of Pb (which are found closer to the pipe wall and in lead minerals) increase the background counts in the EDS spectra (see brackets).

EDS Spectra



Elemental Maps



The software places Al dots at all locations where that specific X-ray energy was measured. When Pb concentrations increase the spectra background increases. Then in areas that only contain Pb the program will see some counts at the specific Al X-ray energy range and will place a dot accordingly.

The same goes for Si, due to the increase in background there are Si dots in the scale where Pb is more prevalent and Si is not present.

However, we cannot just remove these elements because both Si and Al are present in the upper portion of the scale as evidenced by an increase in brightness. But, the line of reasoning described above needs to be applied to their presence elsewhere in the cross section.

Not all the result of Al's presence, some background from Pb



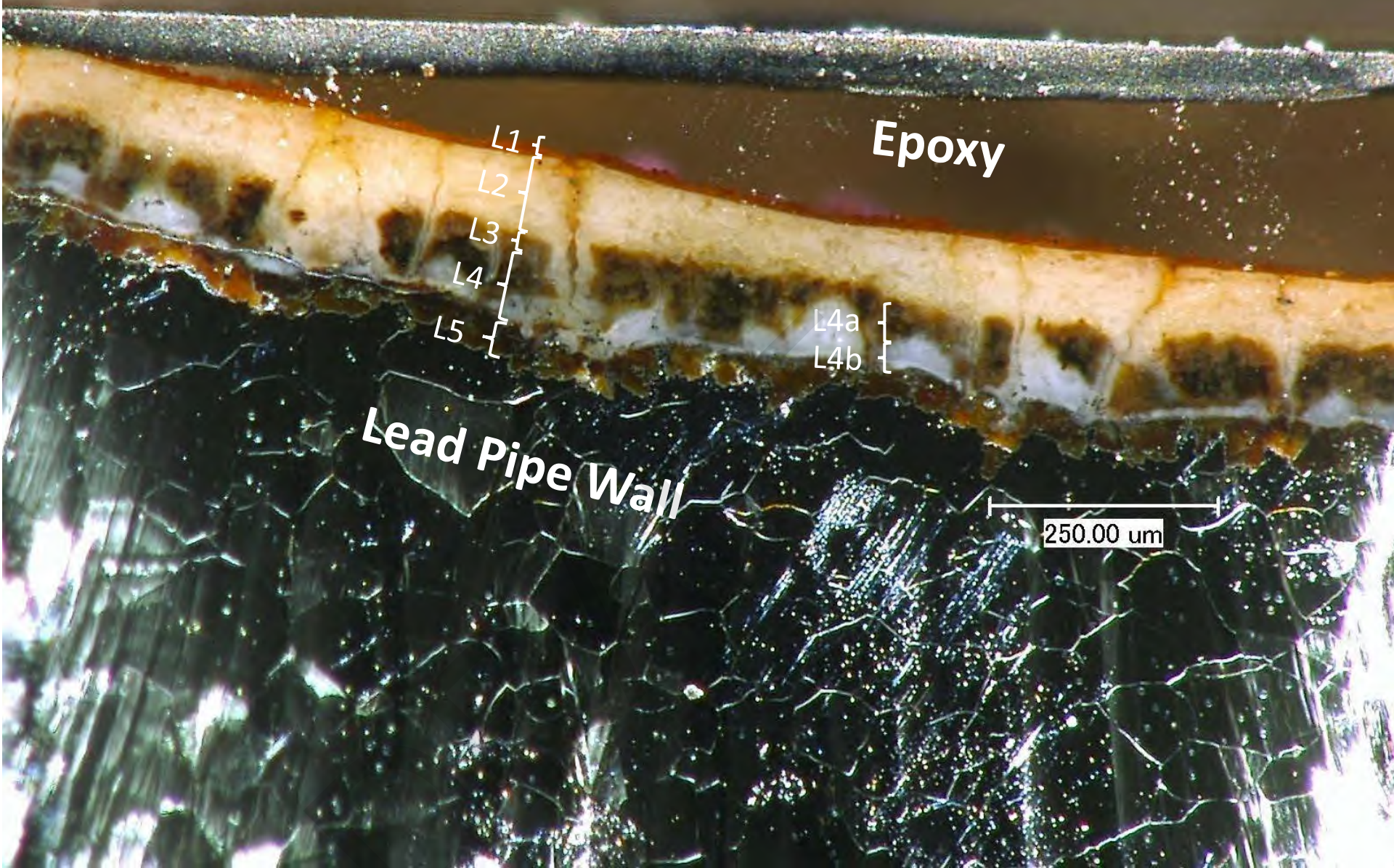
Newark, NJ
Lead Service Line
Address: 43 Chancellor Ave.
Installed: 1925
Removed: 10 February 2018

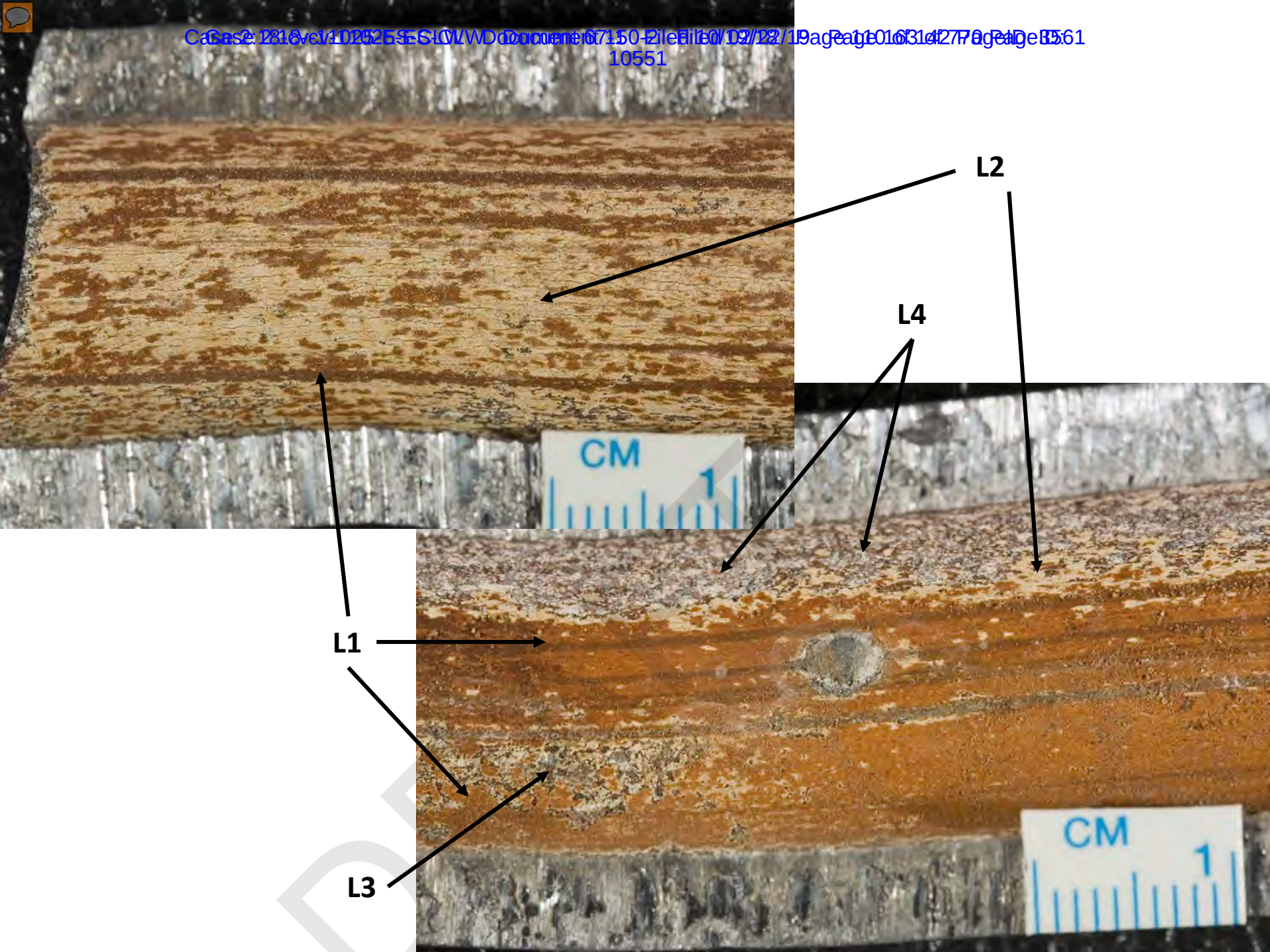


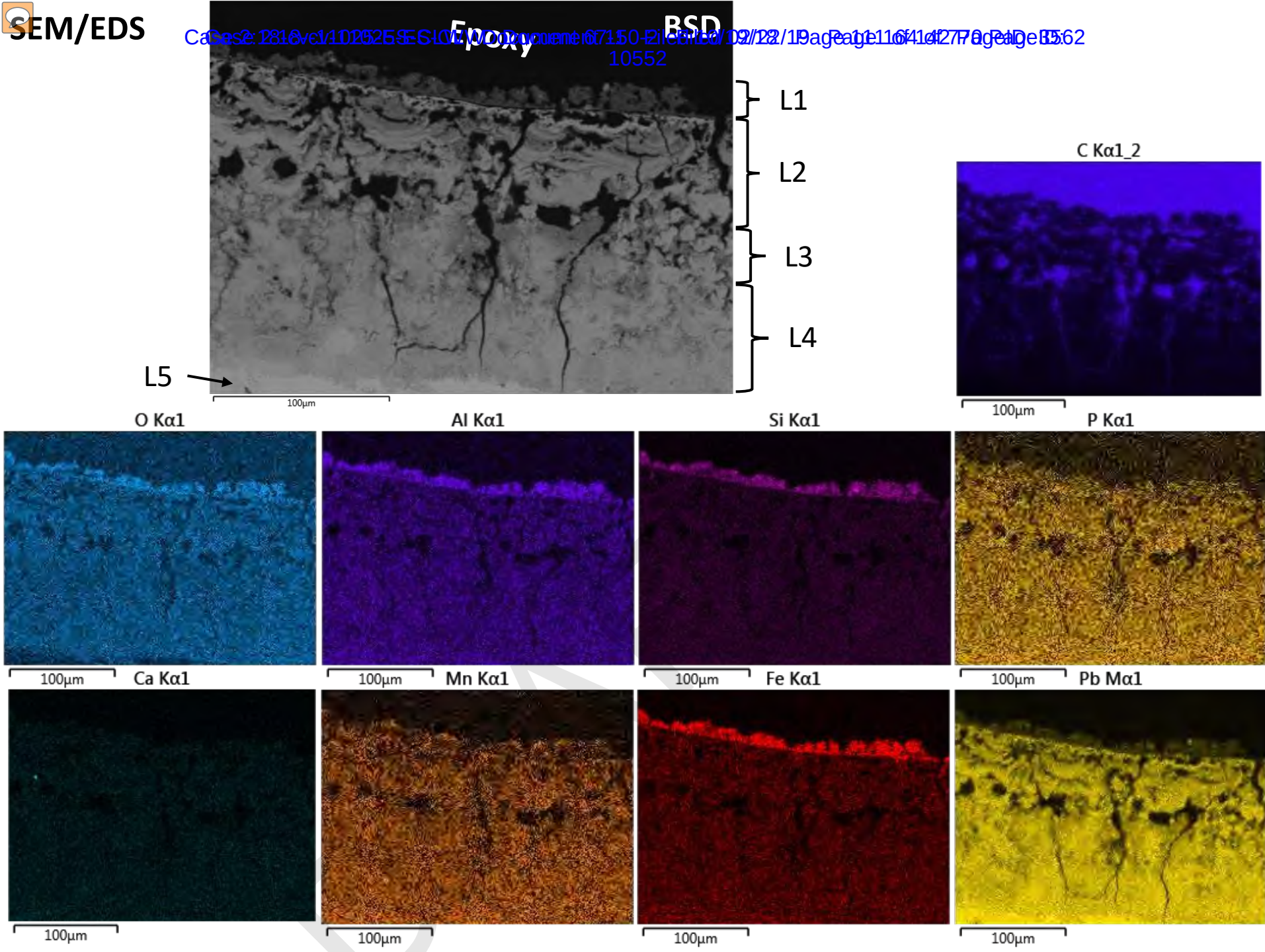


Cross section from 43 Chancellor Ave

Case: 23-cv-01025-ESL Document 57-150 Filed 12/18/19 Page 16 of 27 PageID
10550









20kV X950 20μm 0000 10 60 20Pa

O K α 1Al K α 1Si K α 1C K α 1_2

50μm

 $P K\alpha 1$ 50 μm Ca K α 1

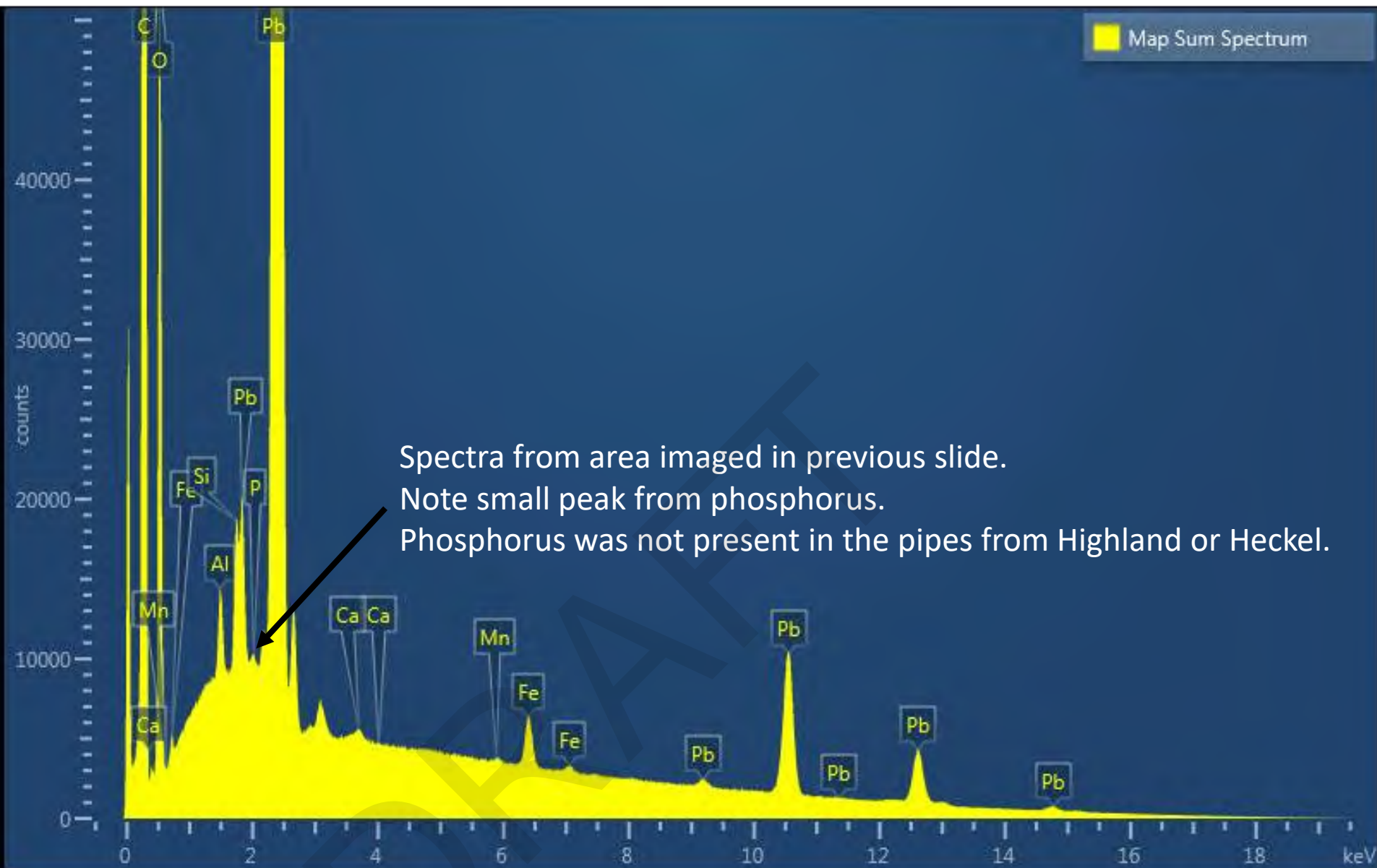
50μm

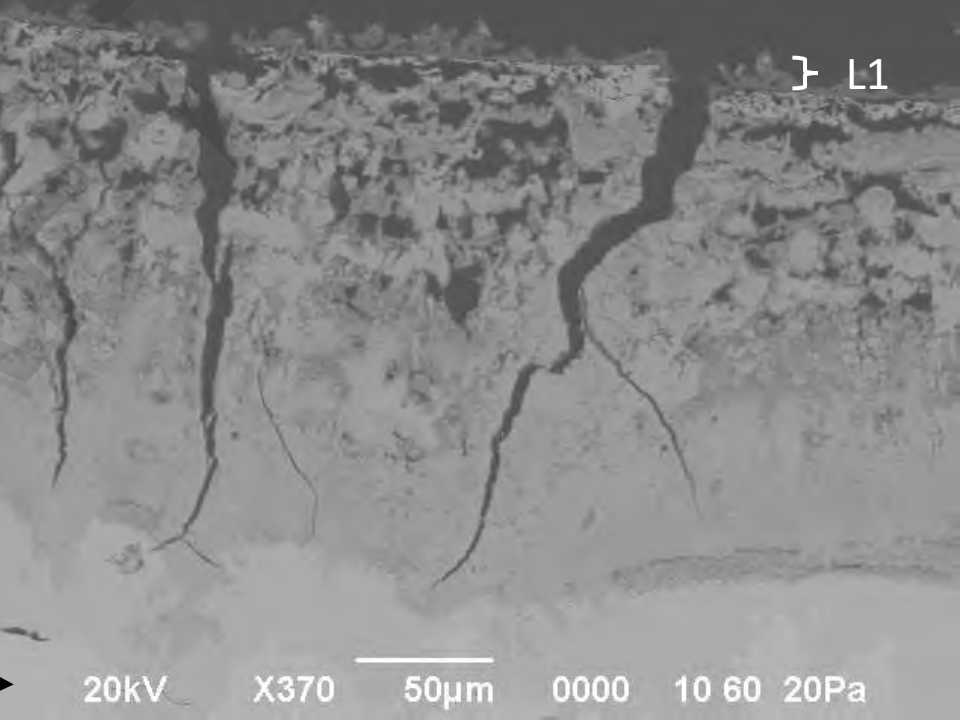
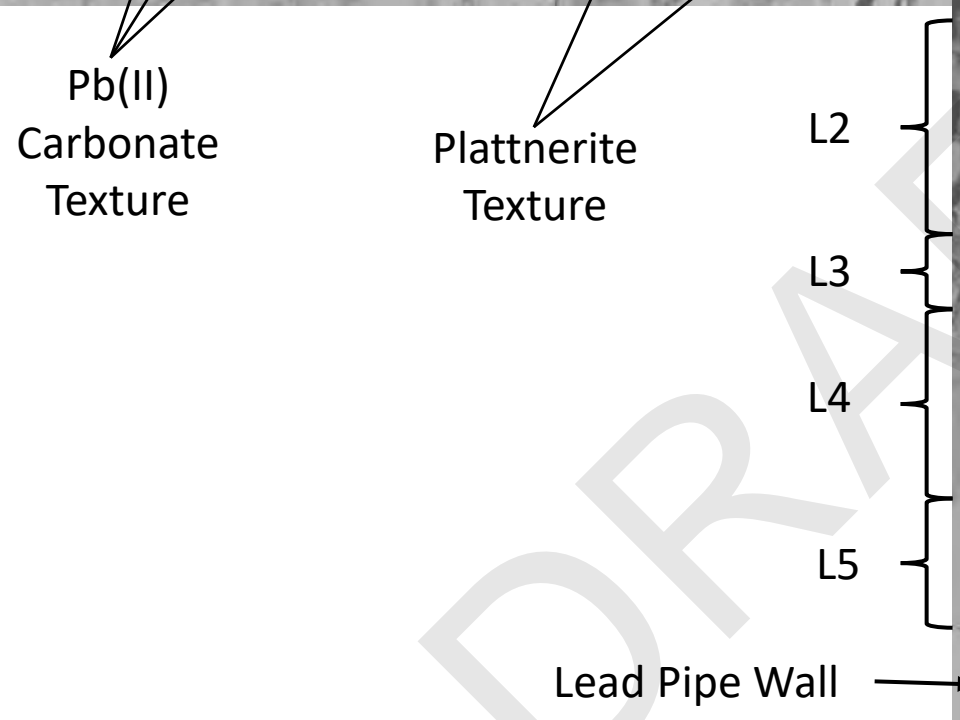
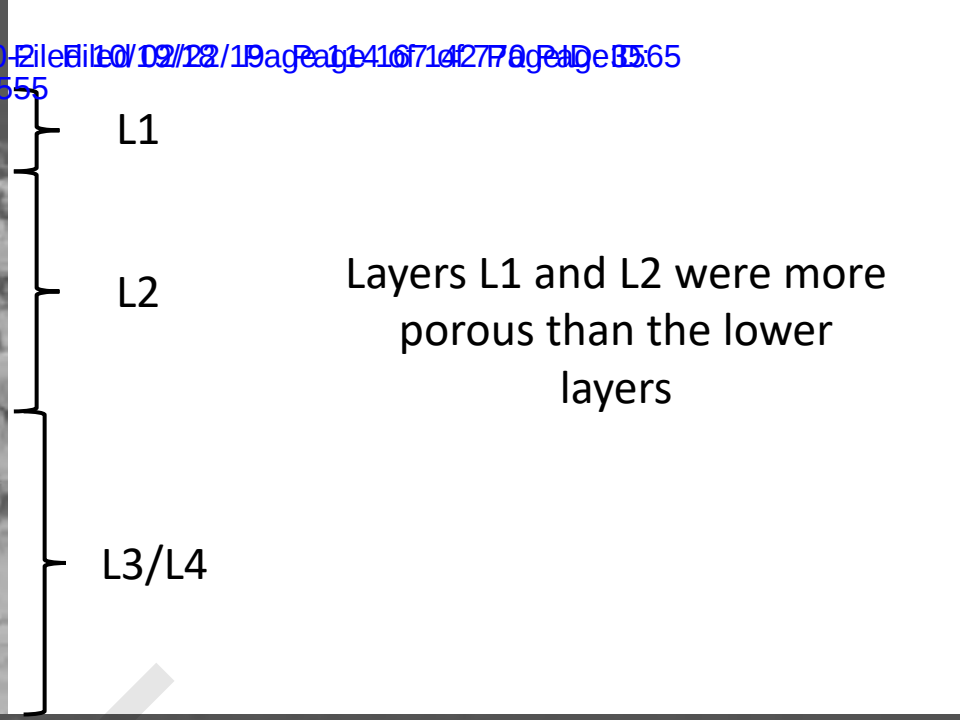
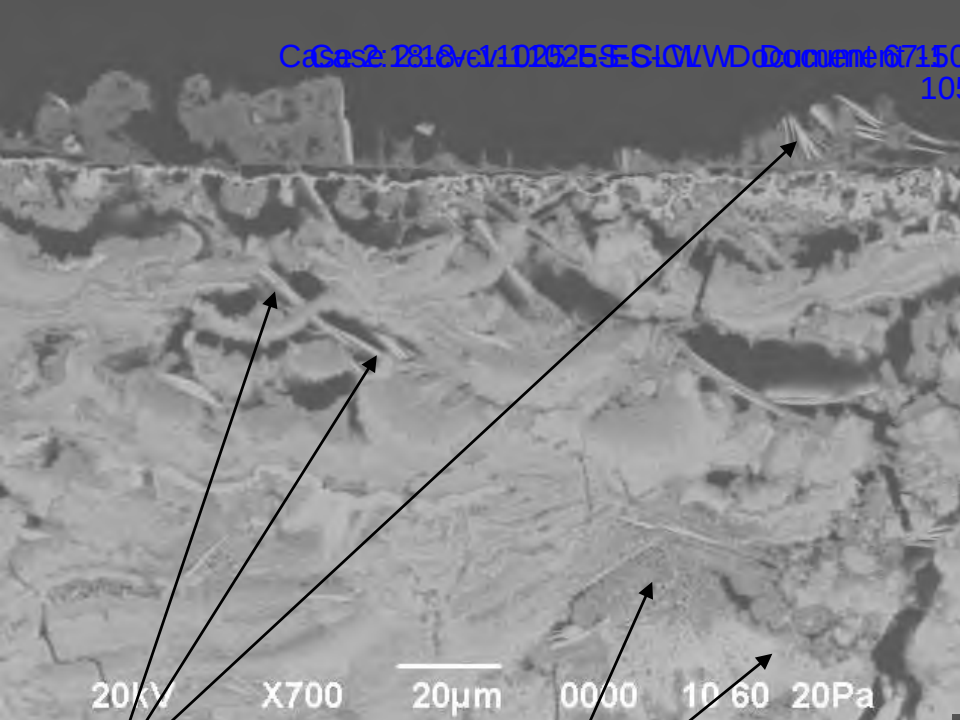
Mn K α 150 μm Fe K α 150 μm Pb M α 1

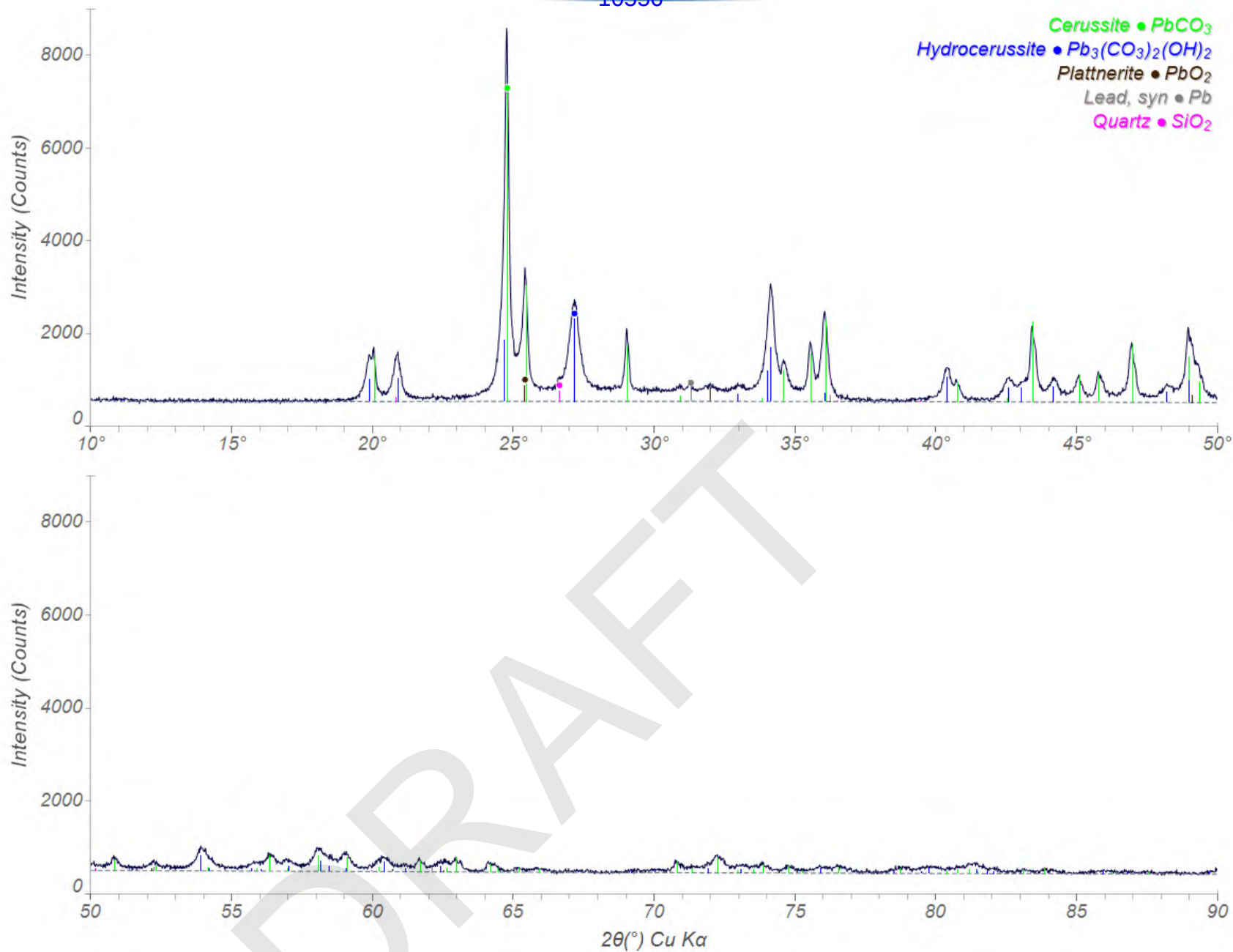
50μm

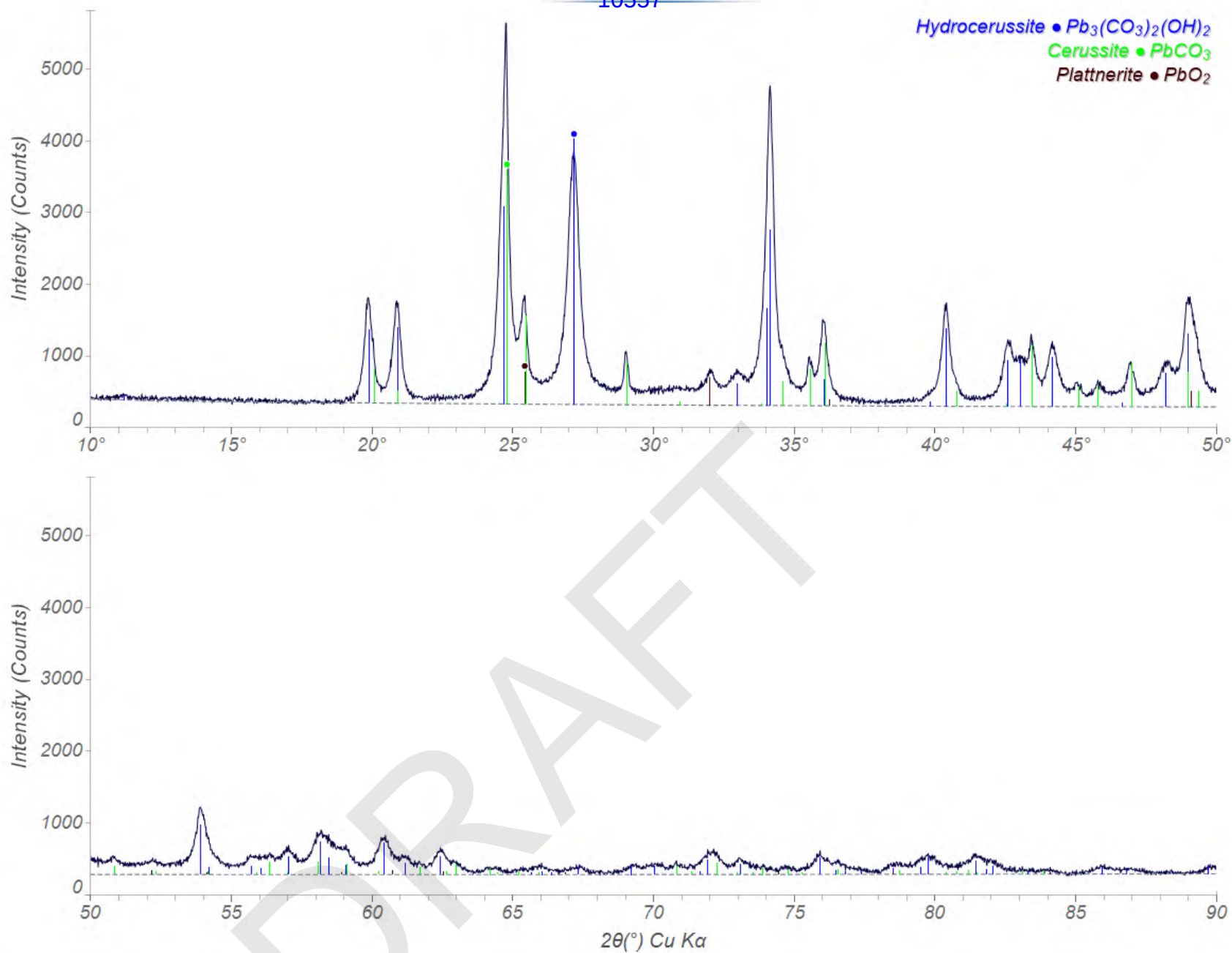
50μm

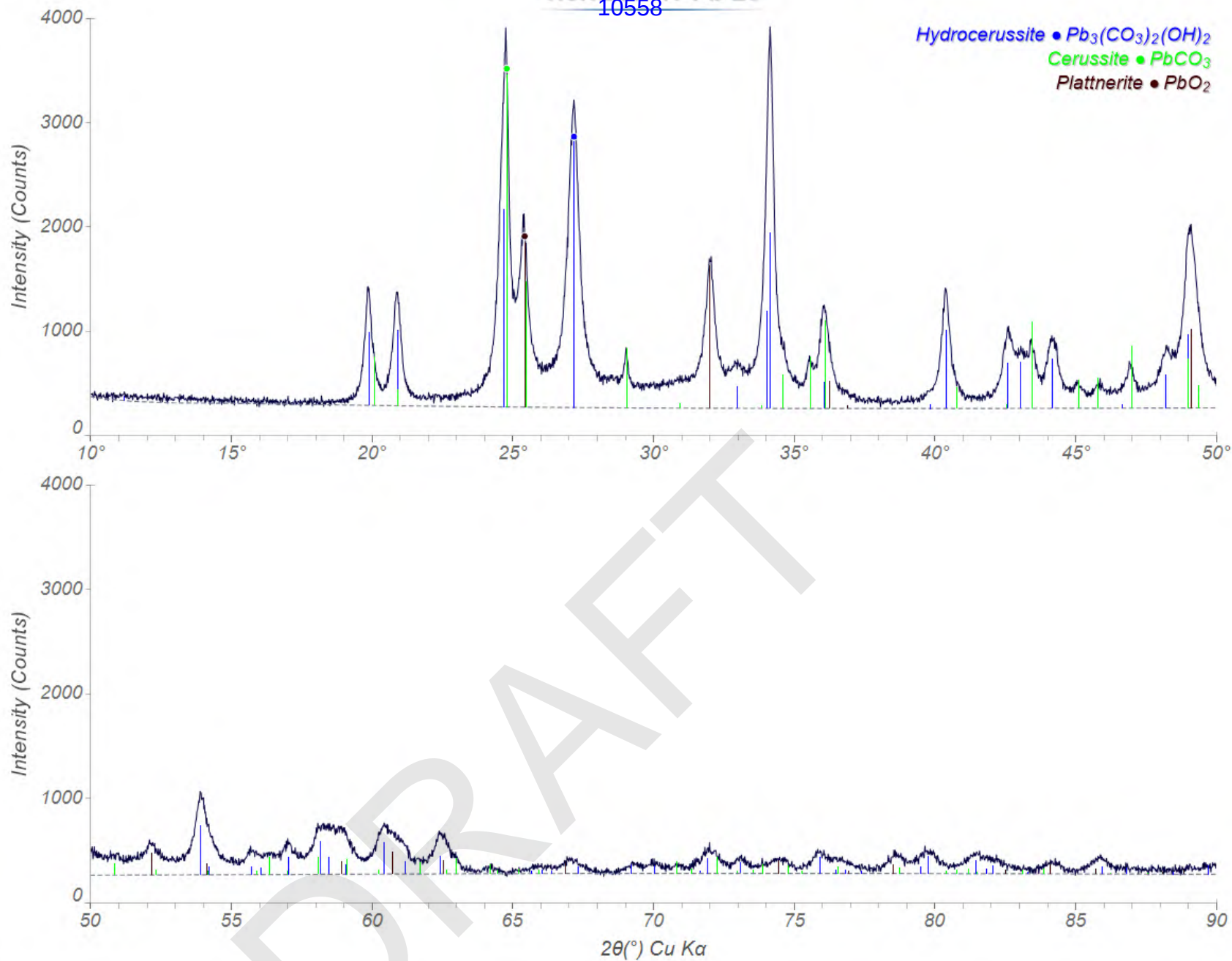
50 μ m50 μ m

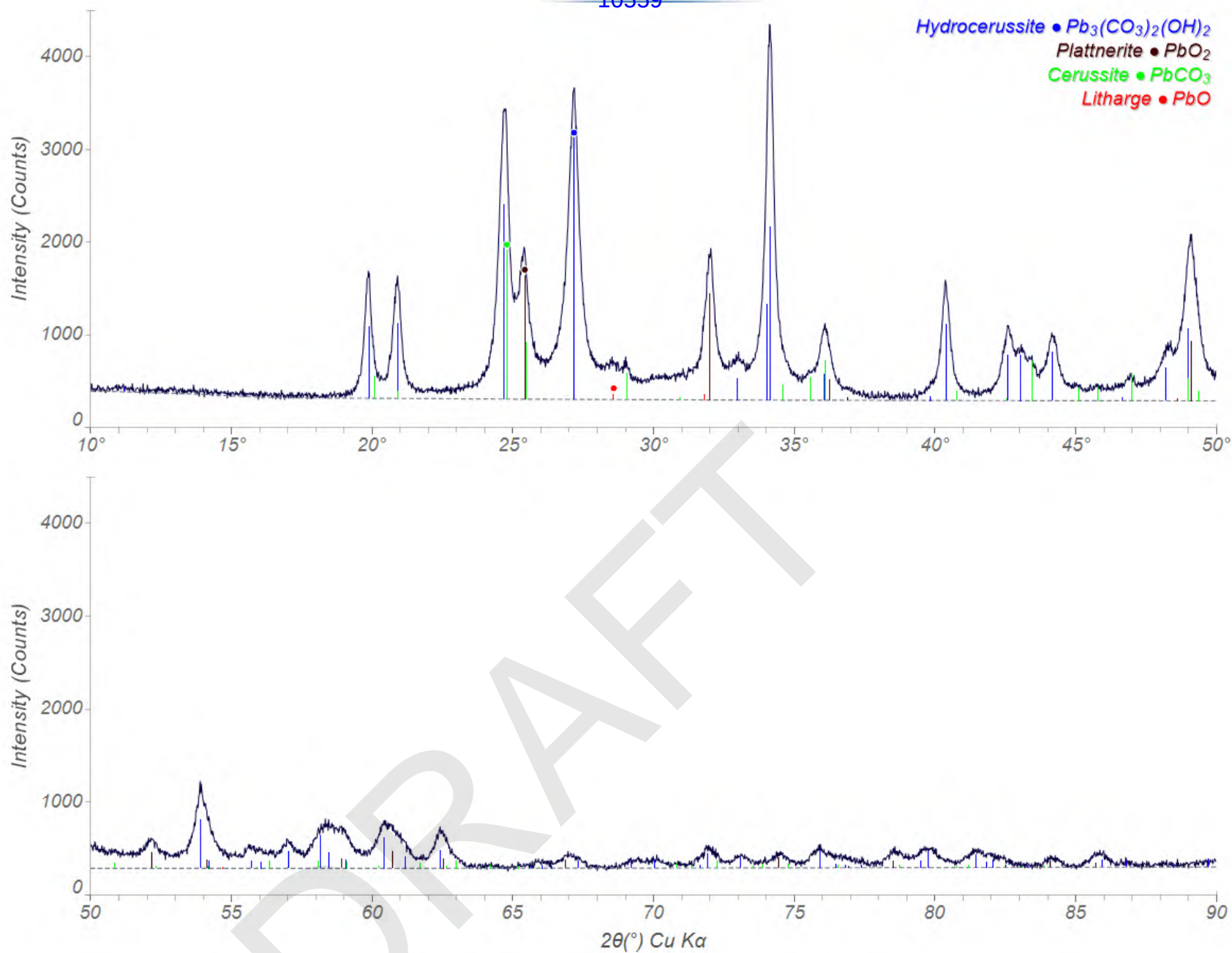


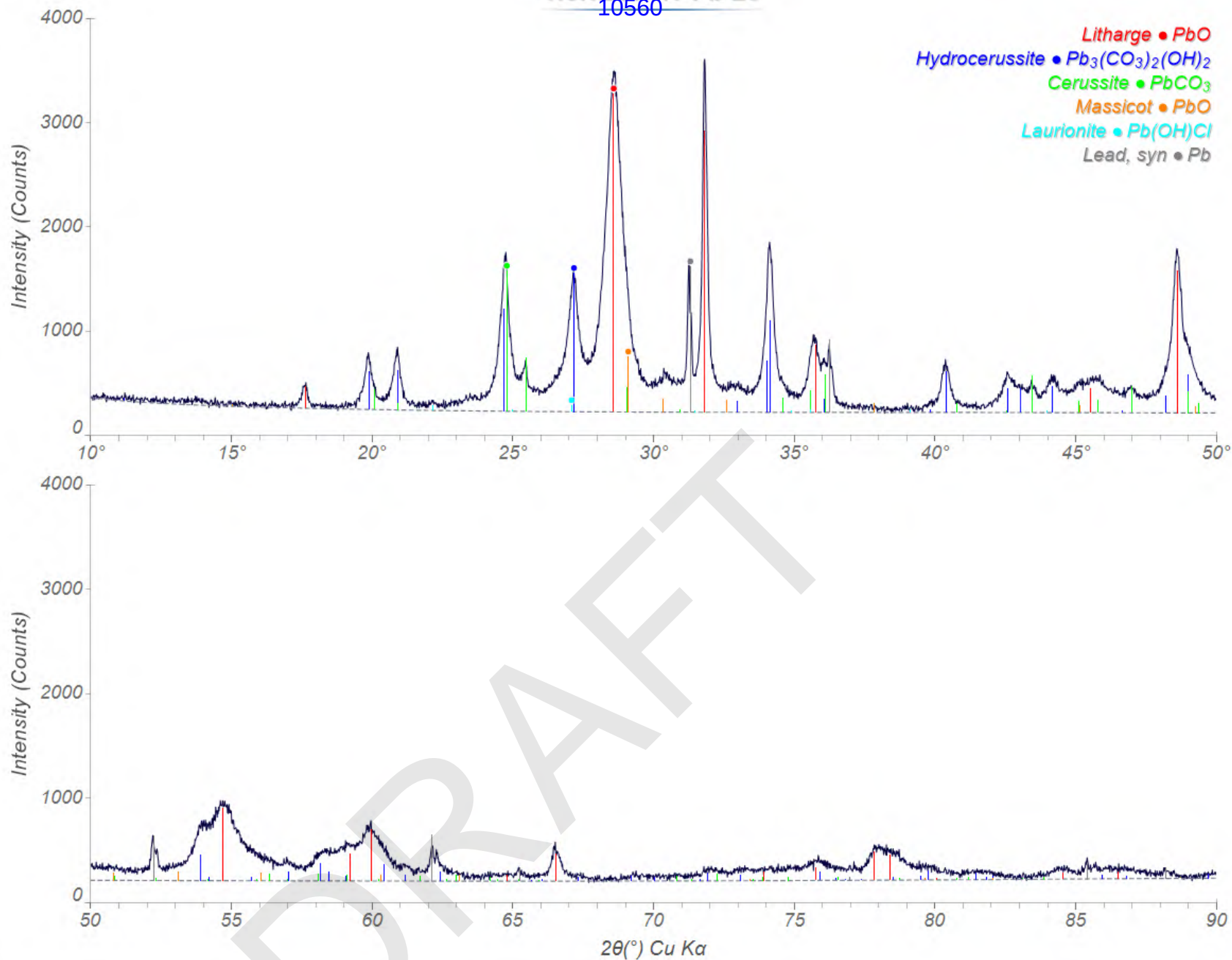














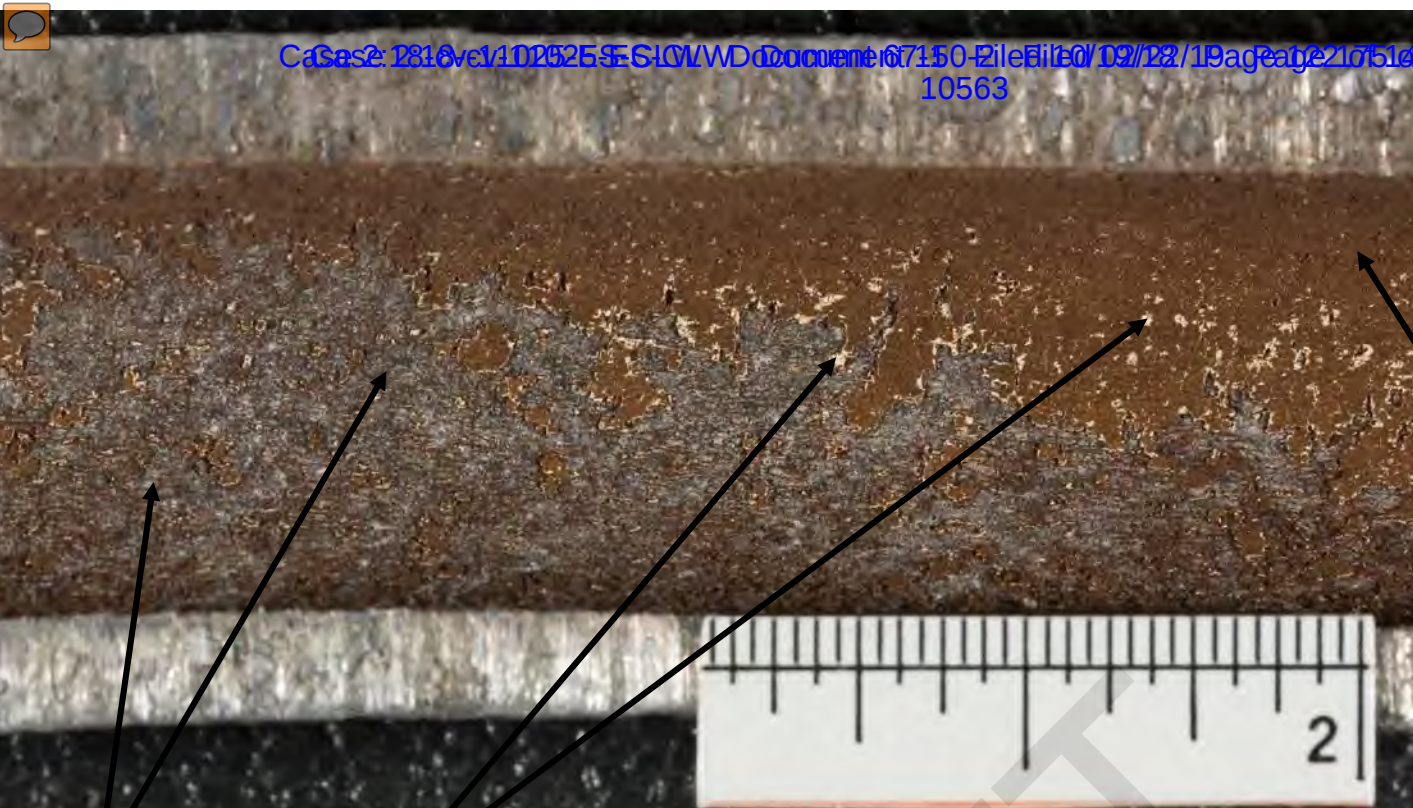
Newark, NJ
Lead Service Line
Address: 80 Heckel St.
Installed: January 1909
Removed: 09 March 2018



Figure 1 shows a schematic diagram of the three-layer structure of the proposed device. The structure consists of three layers labeled L1, L2, and L3, separated by arrows indicating the direction of light propagation.

Lead Pipe Wall

250.00 μm



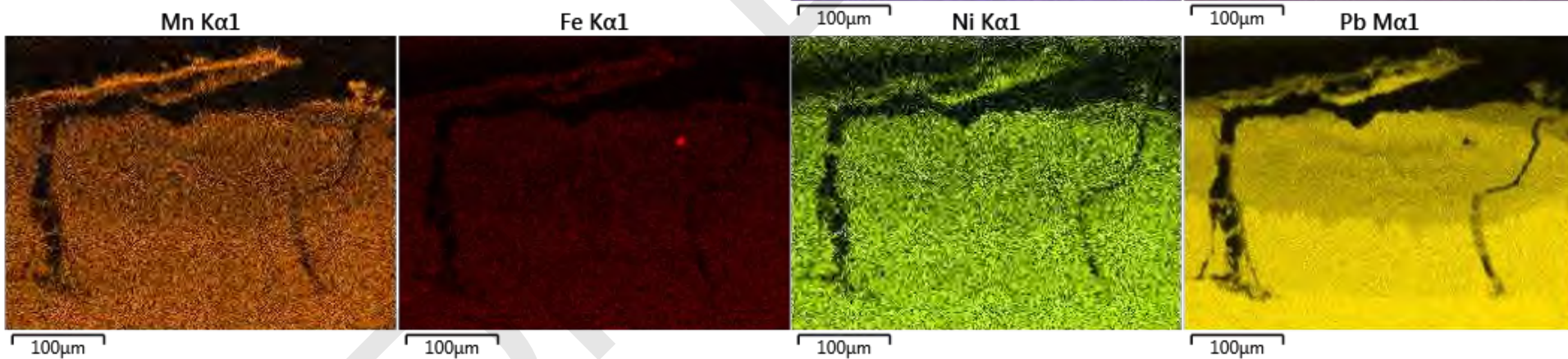
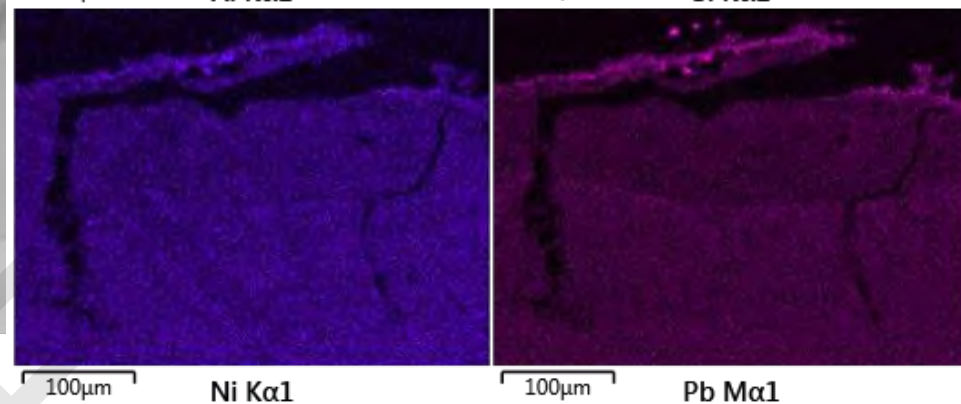
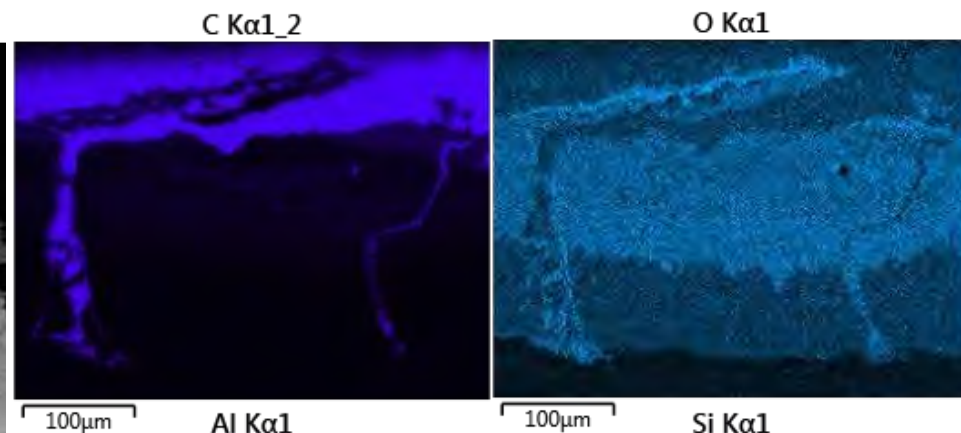
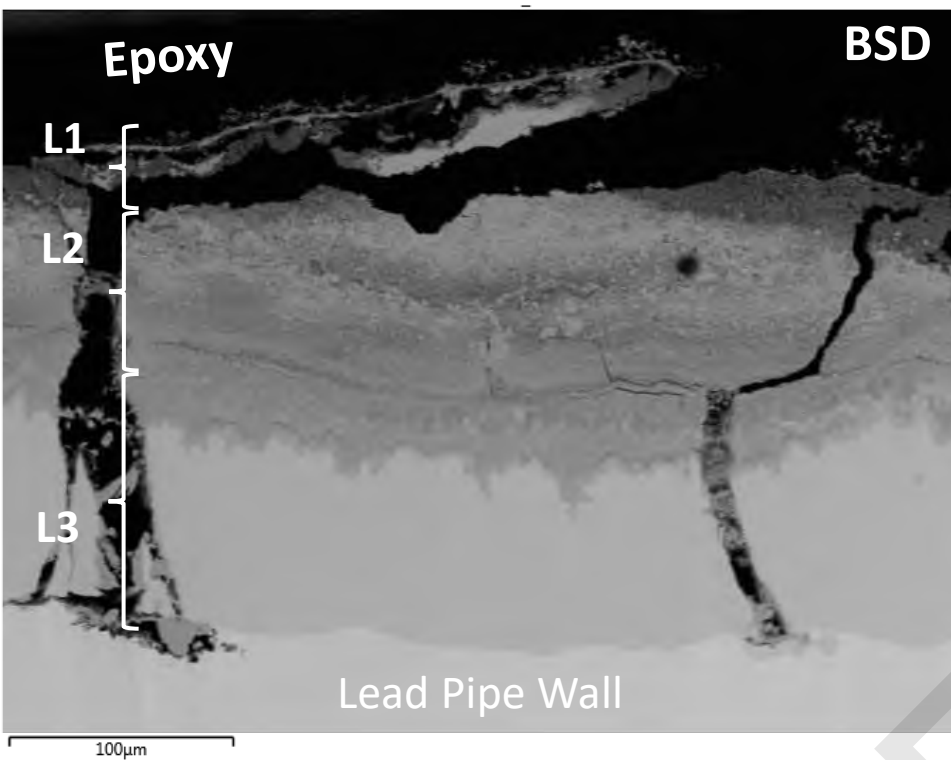
L1

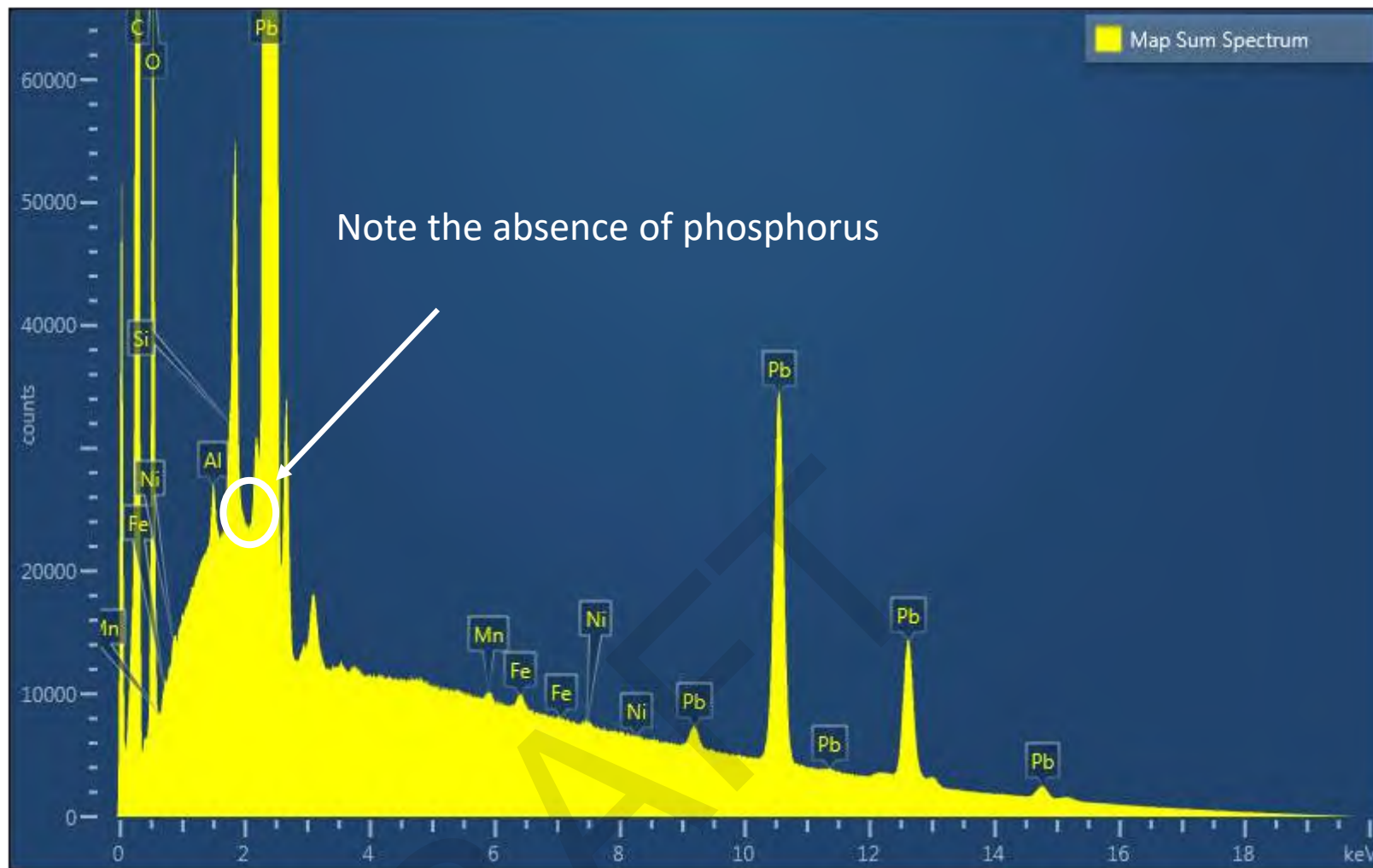
Sediment

L3

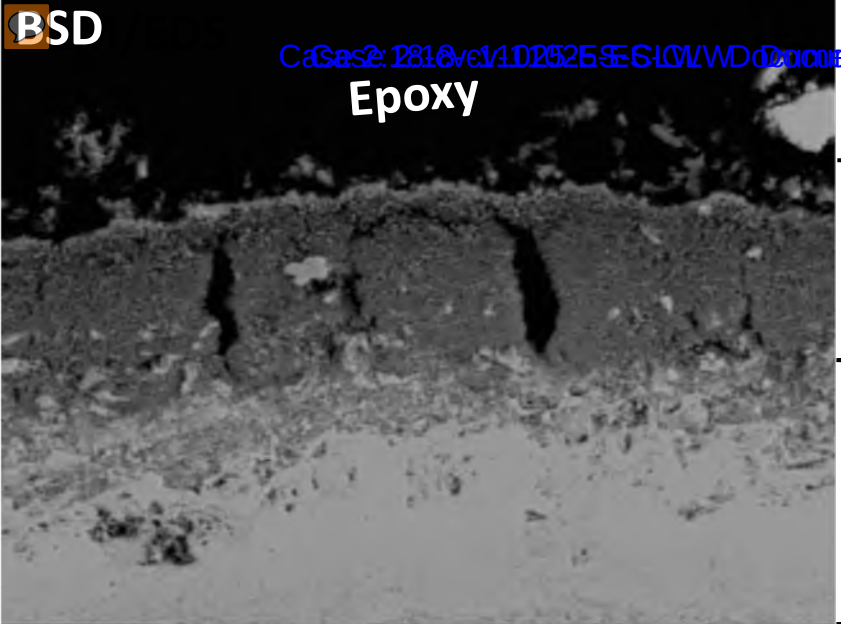
L2







Epoxy



L1

L2

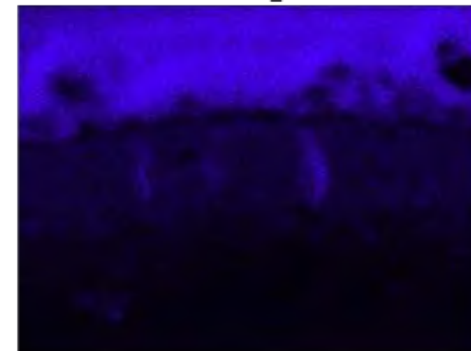
25µm

O Kα1

Al Kα1

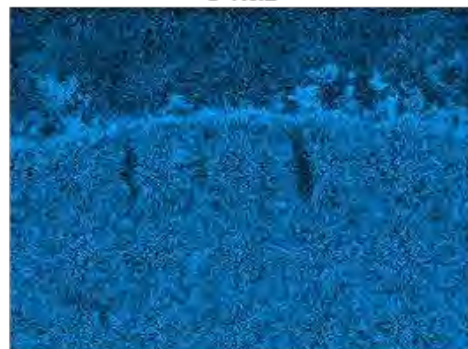
Si Kα1

C Kα1_2



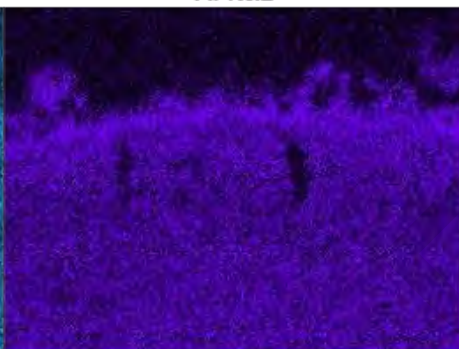
25µm

Ca Kα1



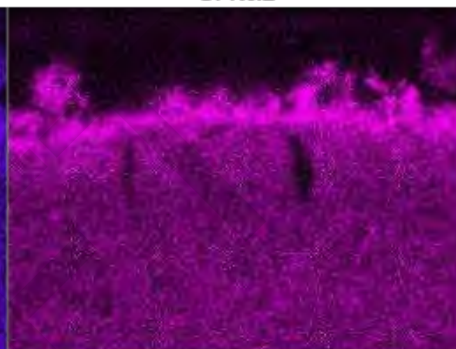
25µm

Mn Kα1



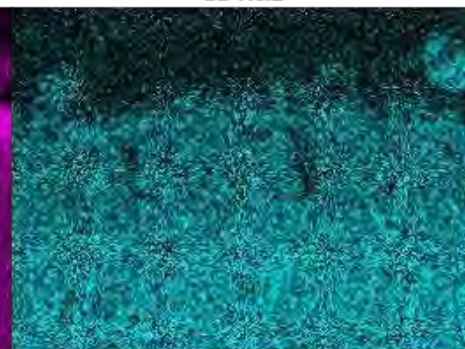
25µm

Fe Kα1



25µm

Ni Kα1



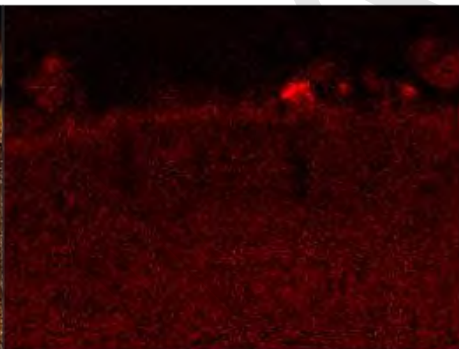
25µm

Pb Mα1



25µm

Mn Kα1



25µm

Fe Kα1



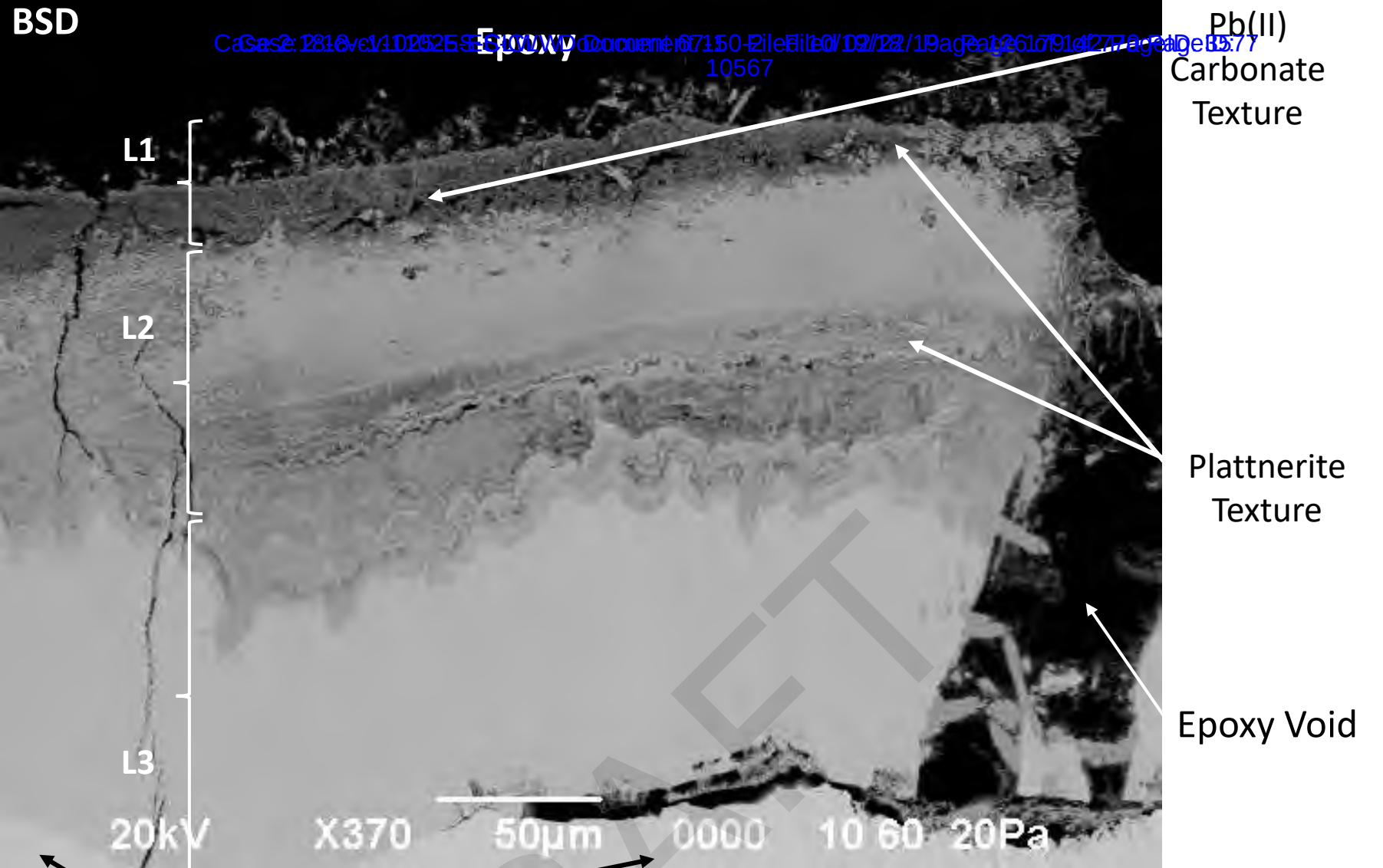
25µm

Ni Kα1

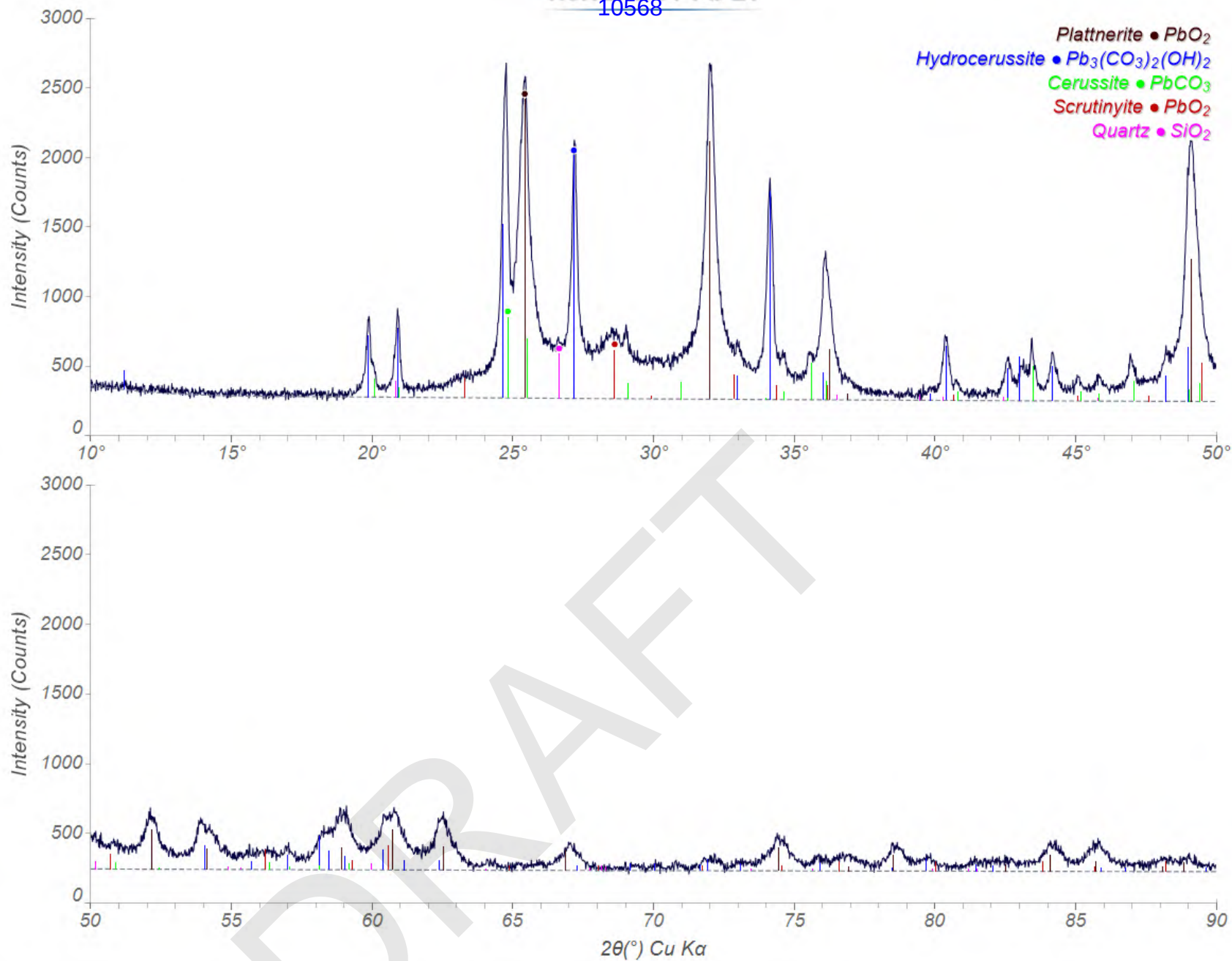


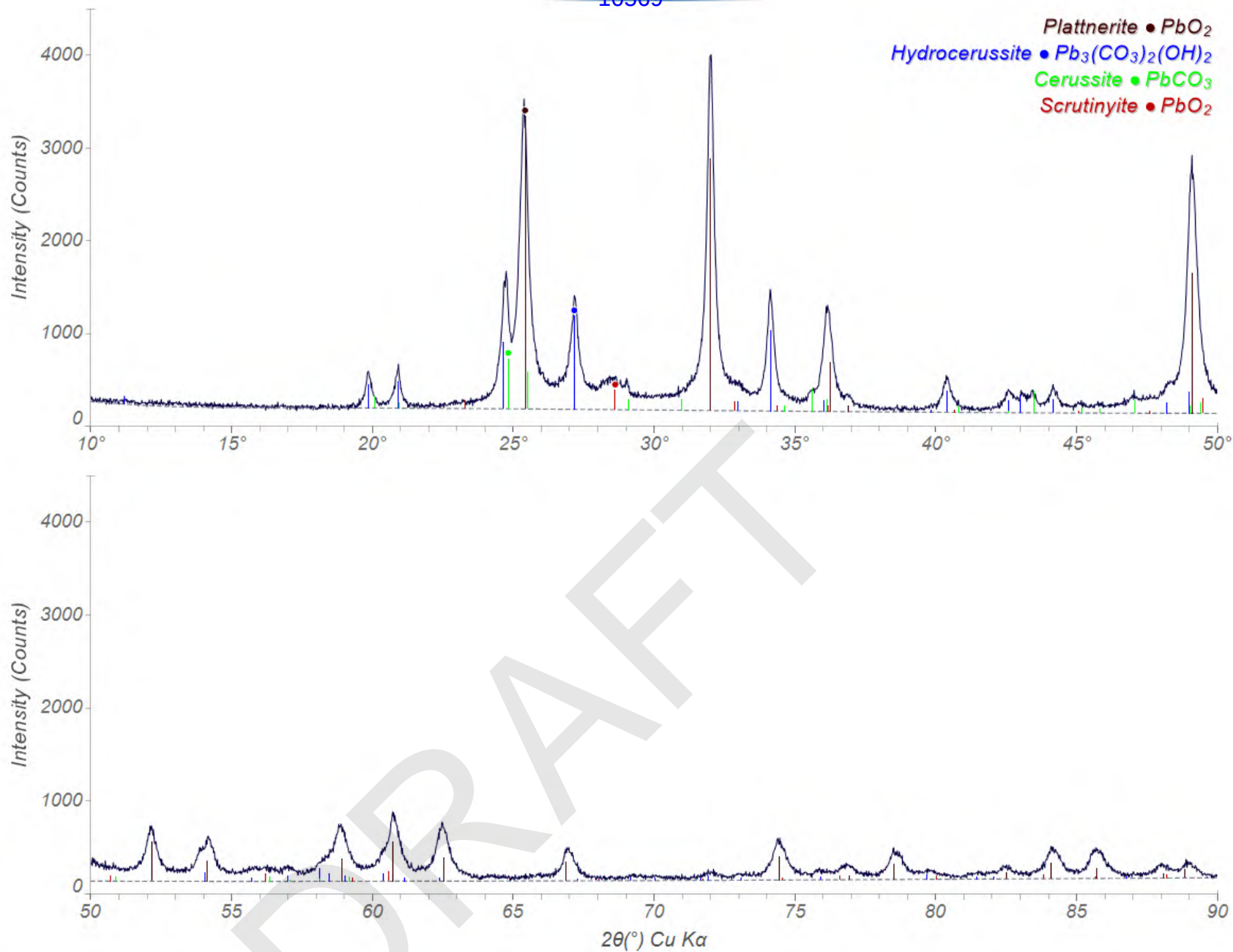
25µm

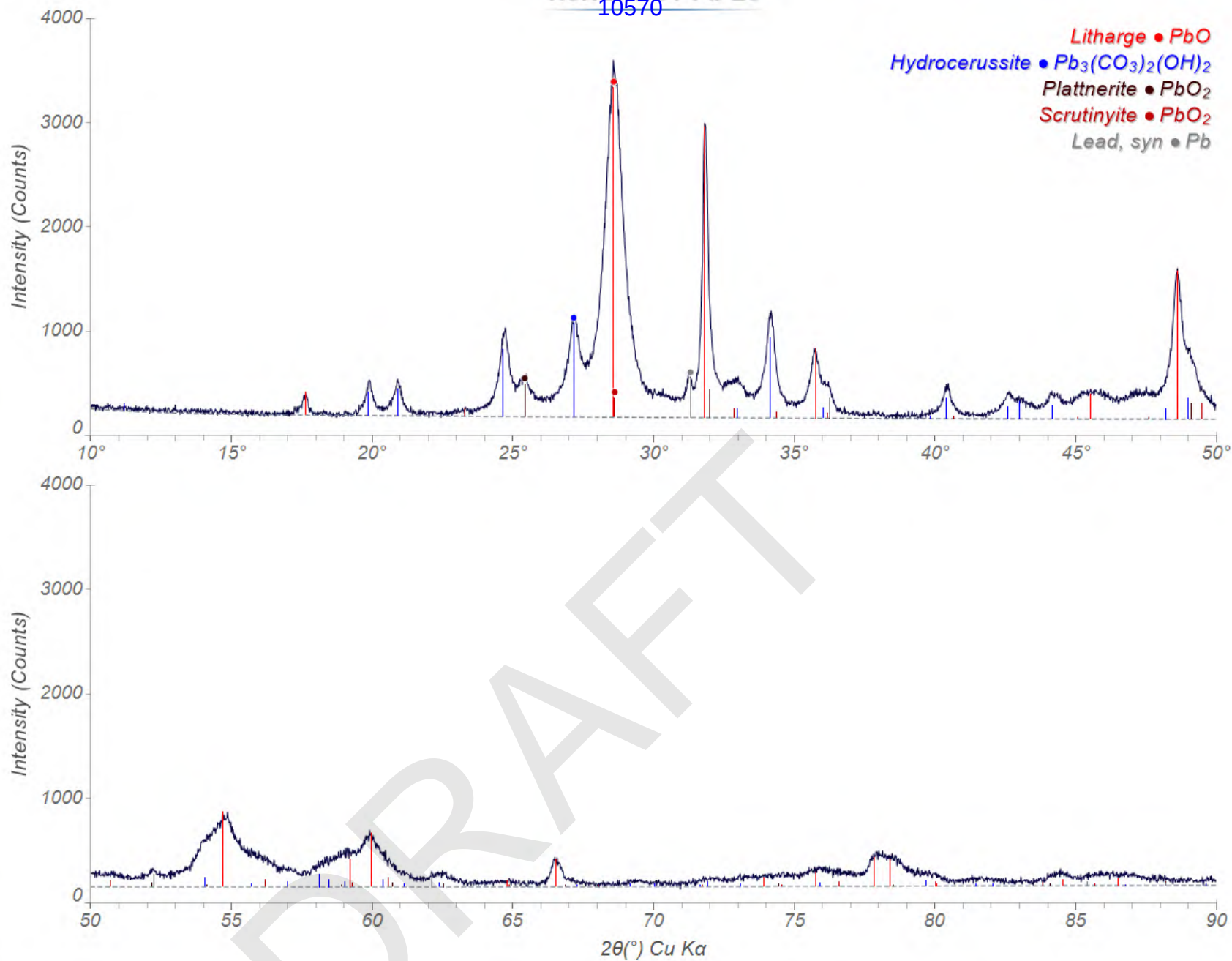
Pb Mα1



Layers L1 and L2 were more porous than the lower layers









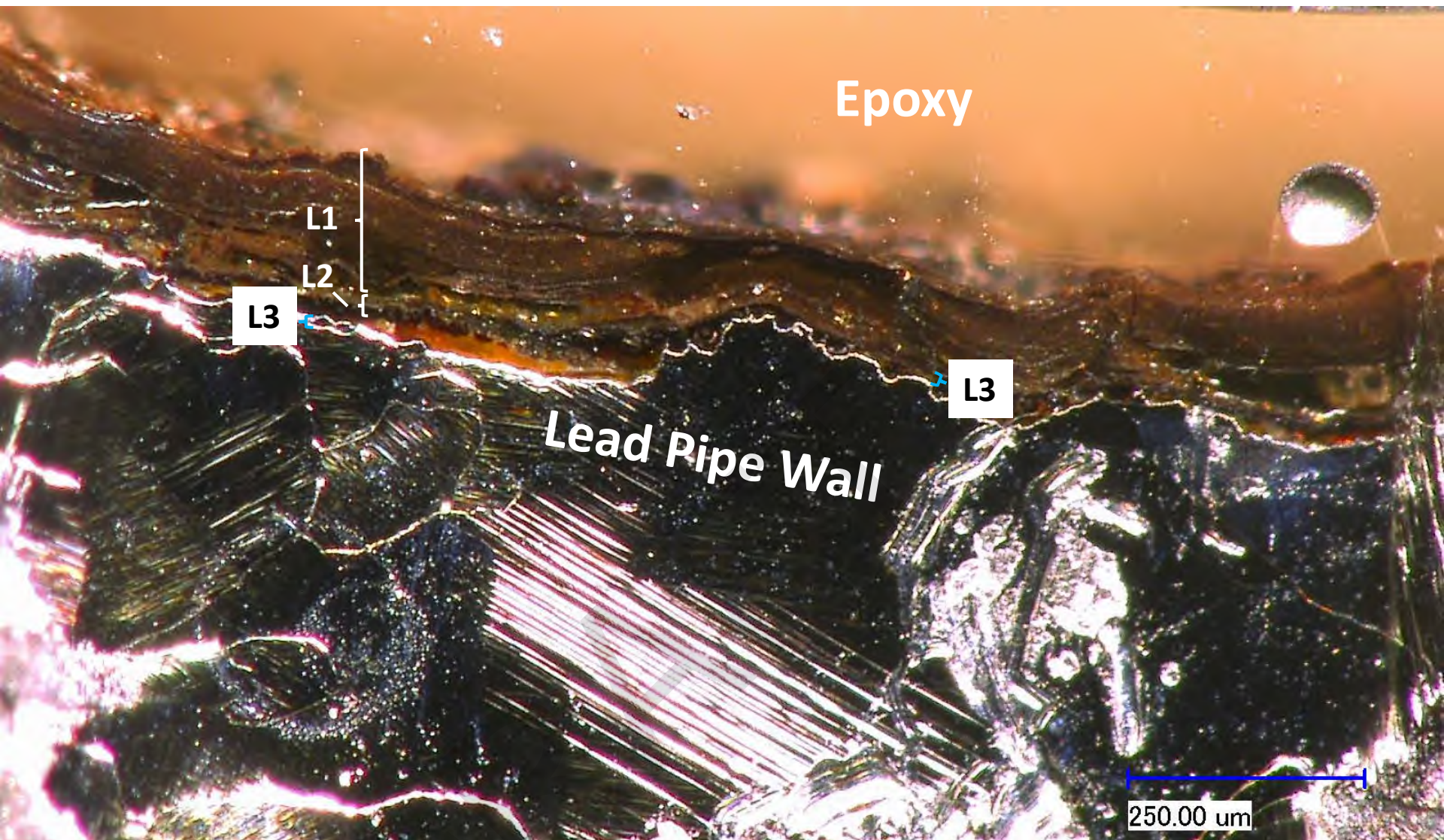
Newark, NJ
Lead Service Line
Address: 183 Highland Ave.
Installed: July 1927
Removed: 28 February 2018

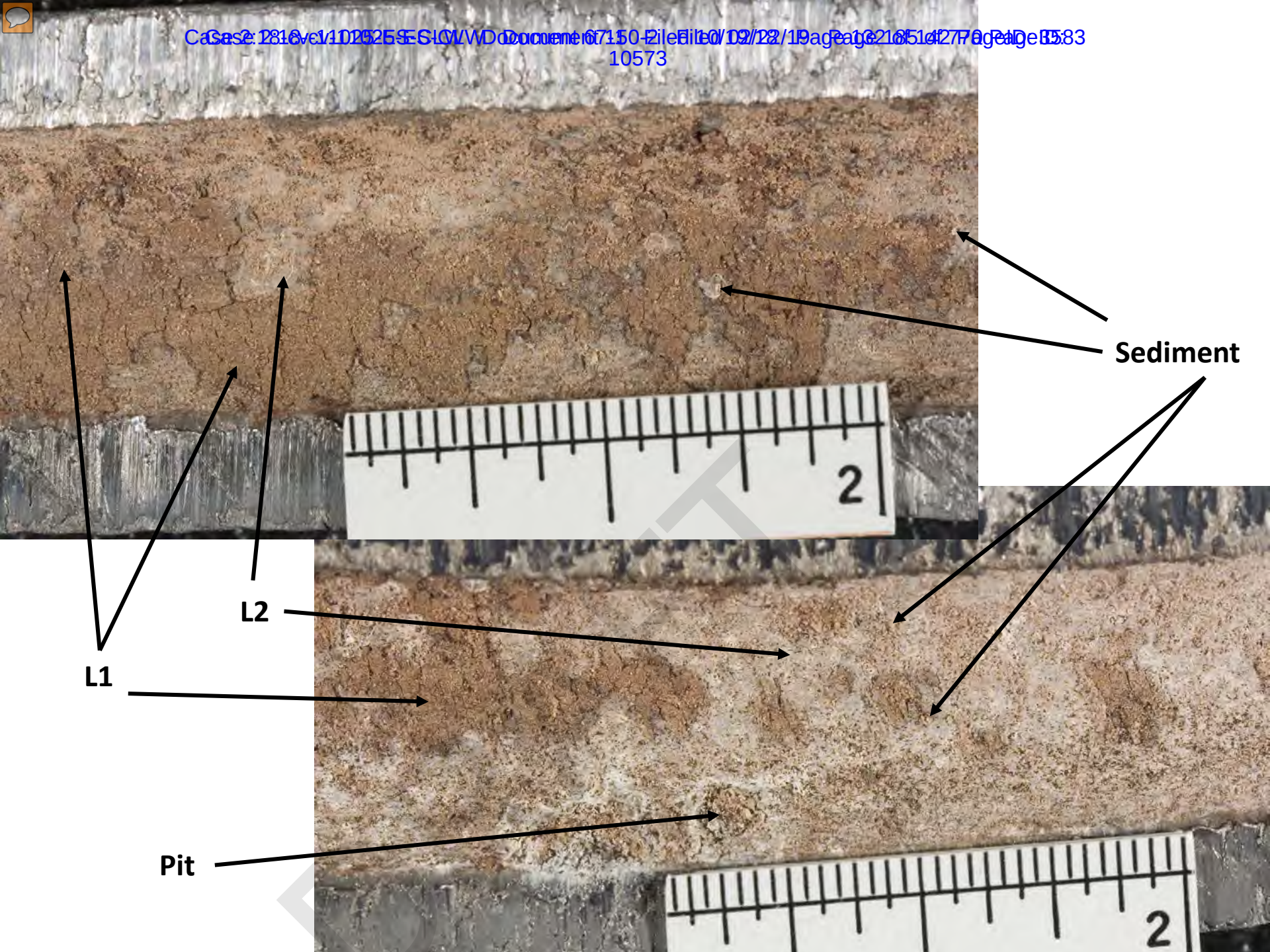




Cross section from 183 Highland Ave.

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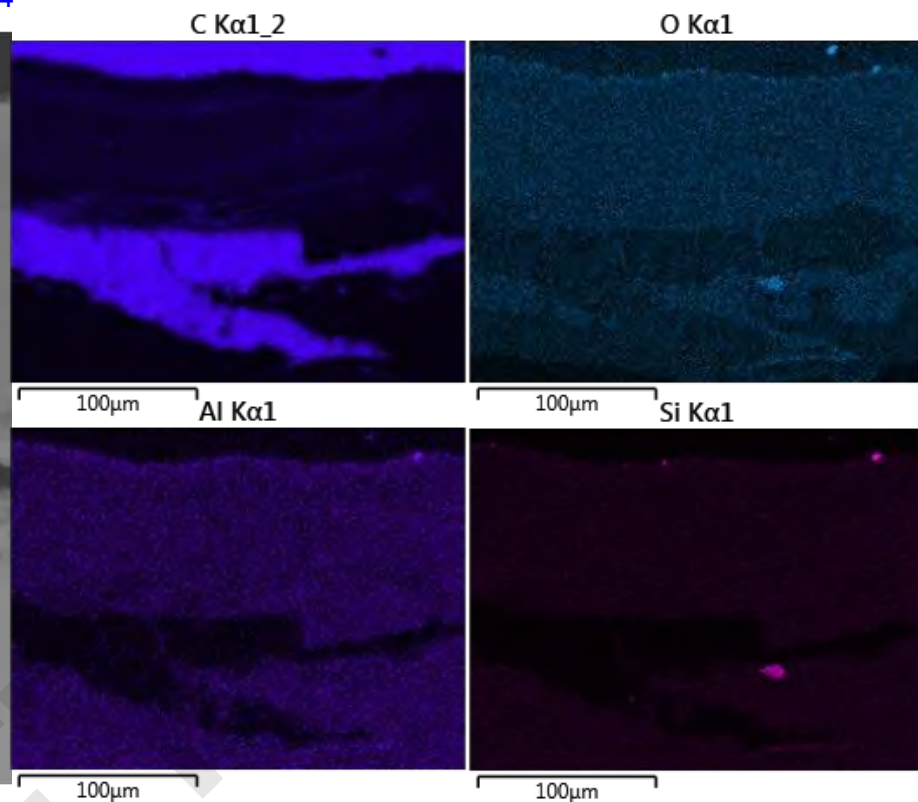
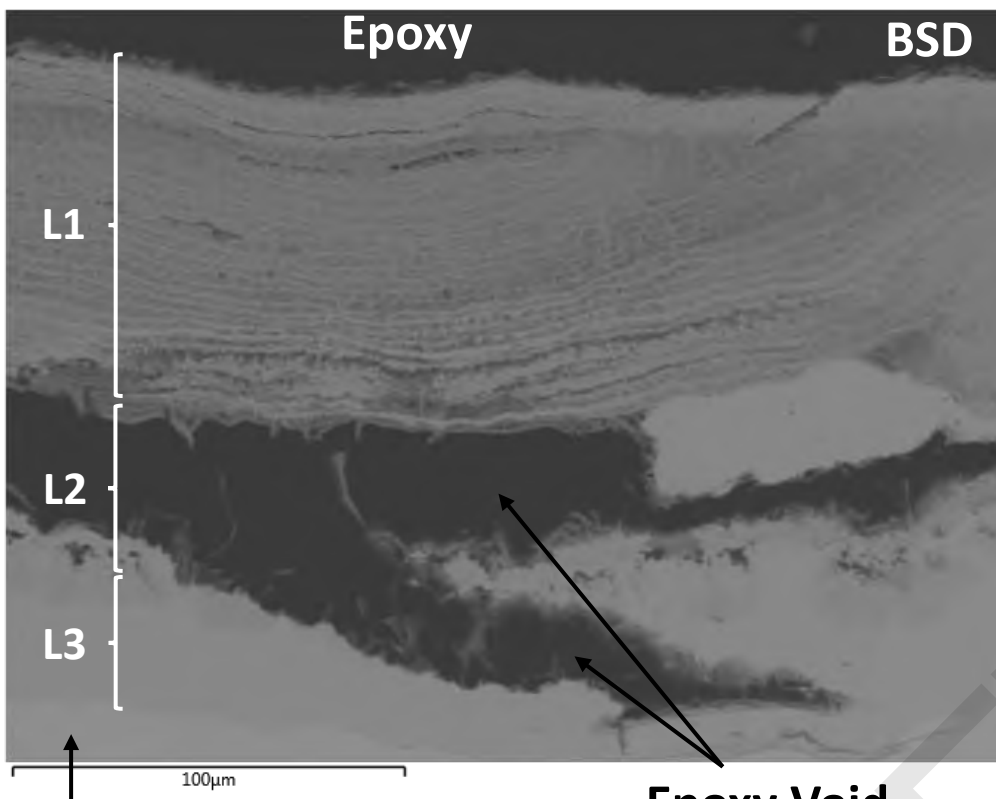
Sediment

L2

L1

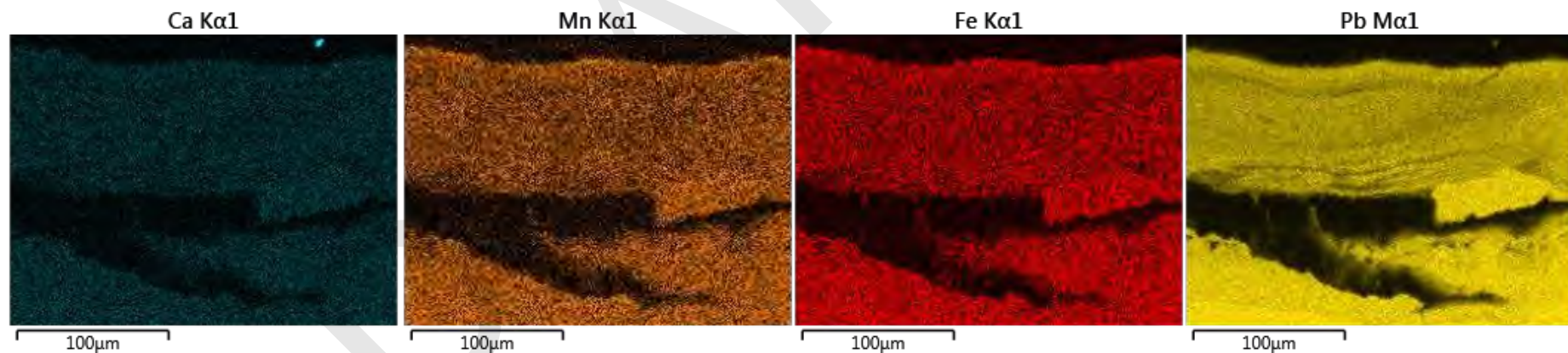
Pit

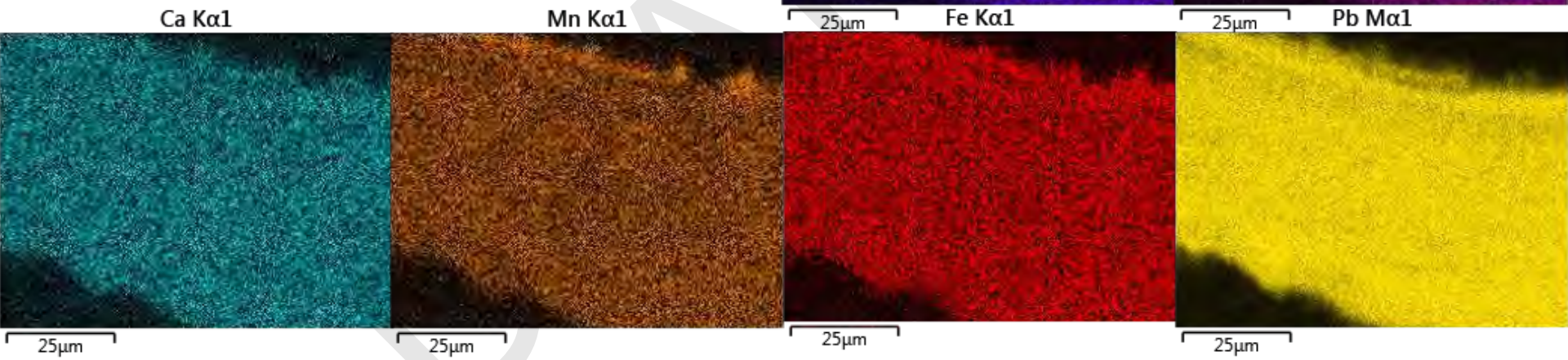
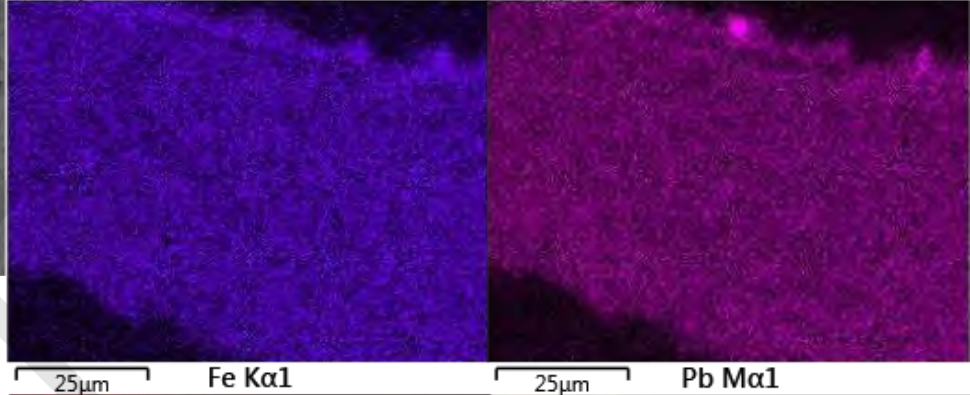
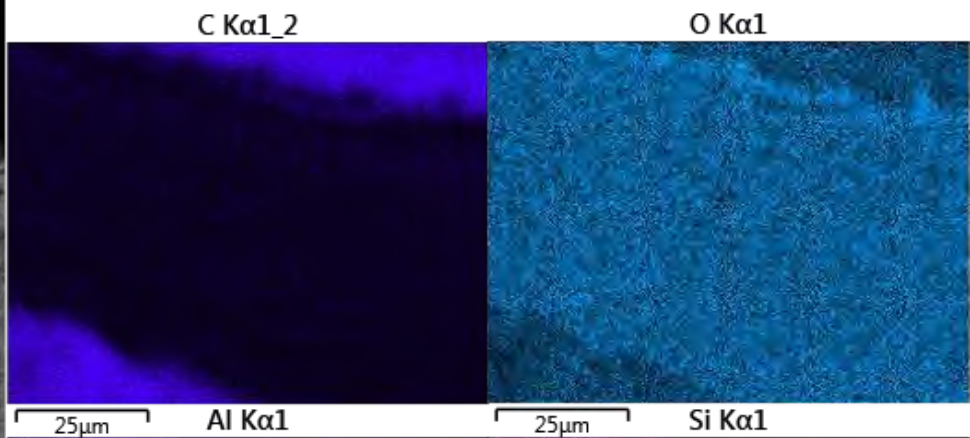
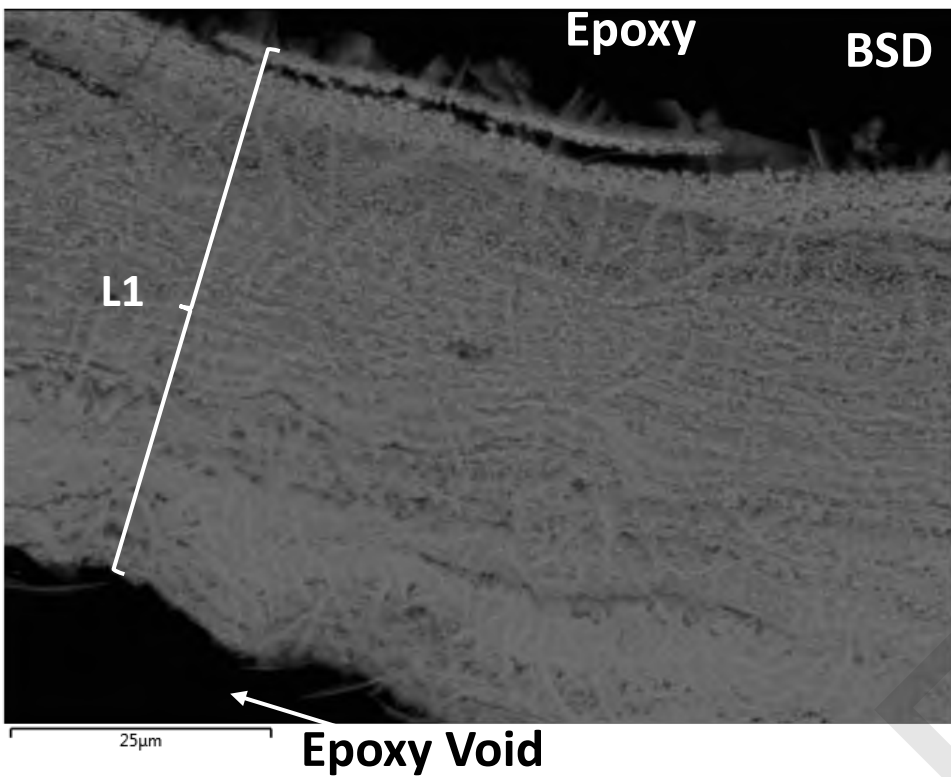
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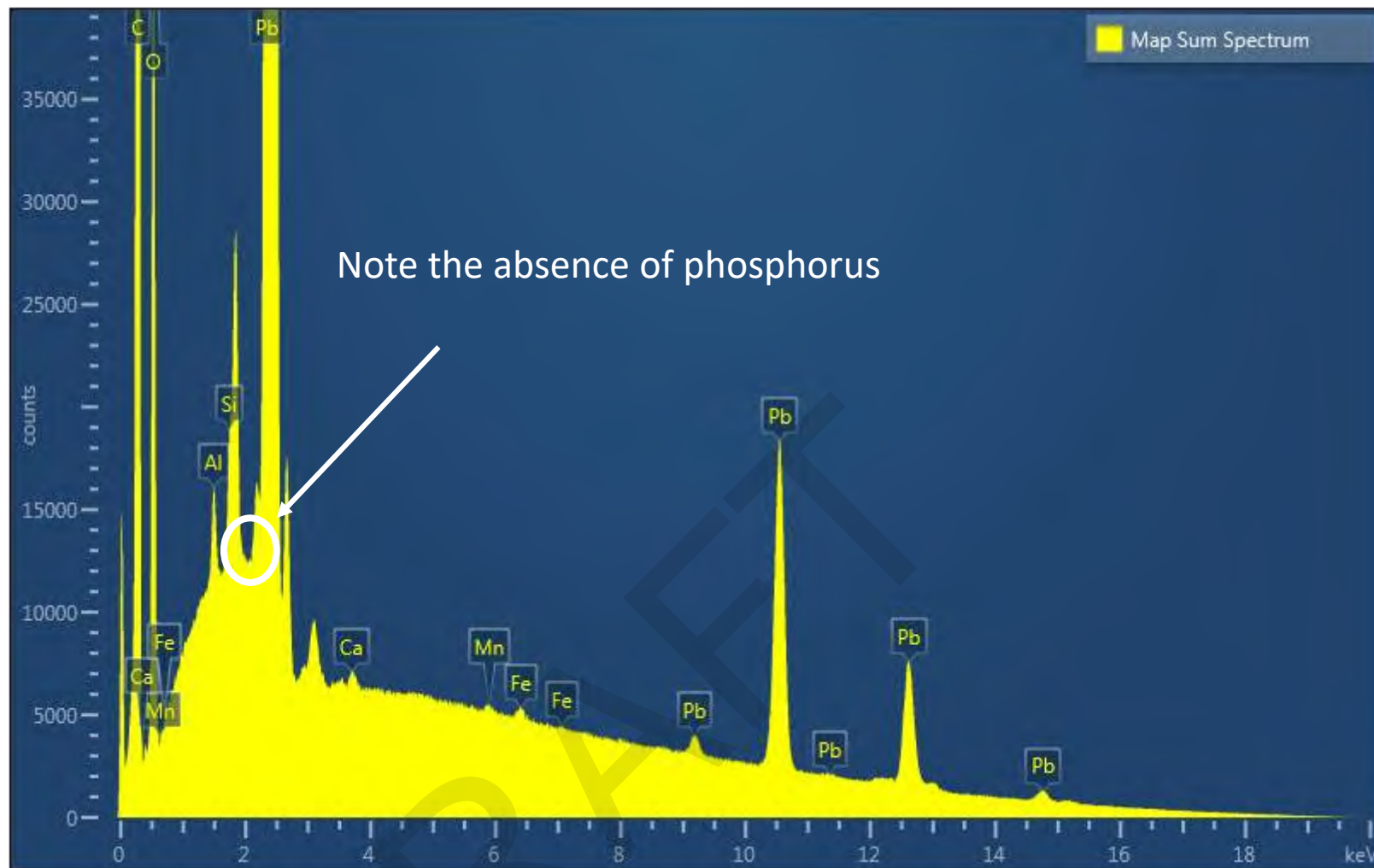


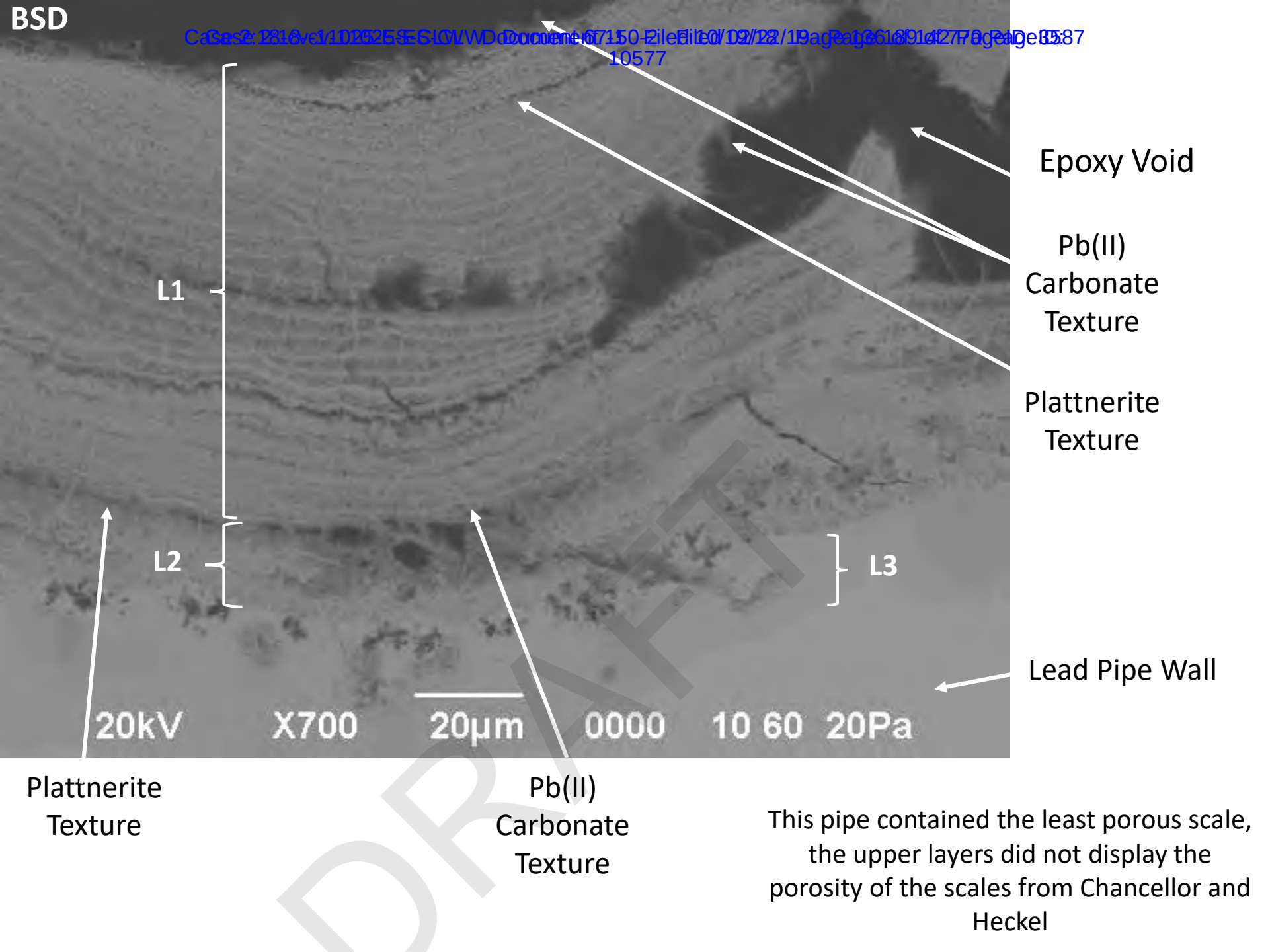
Lead Pipe Wall

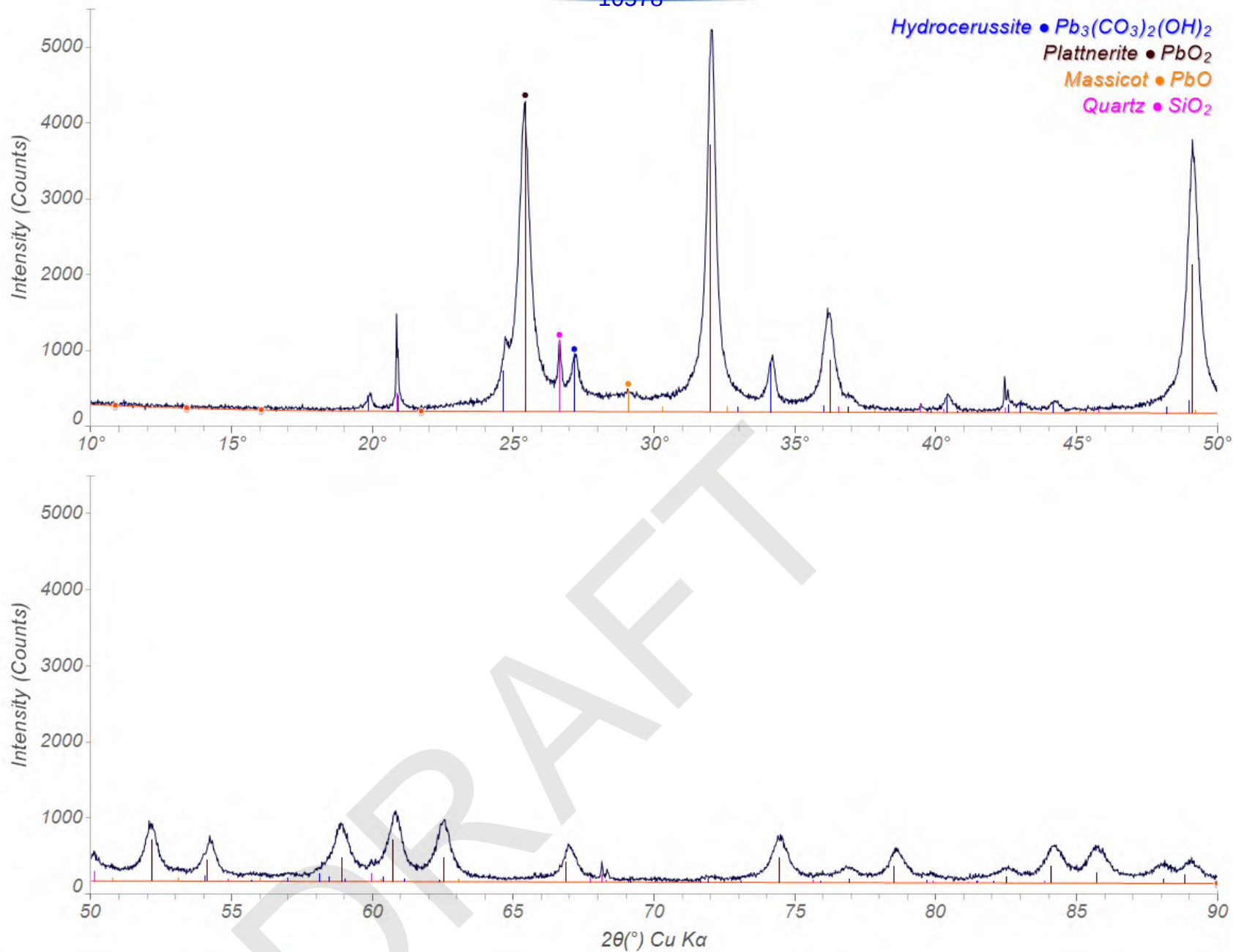
Epoxy Void

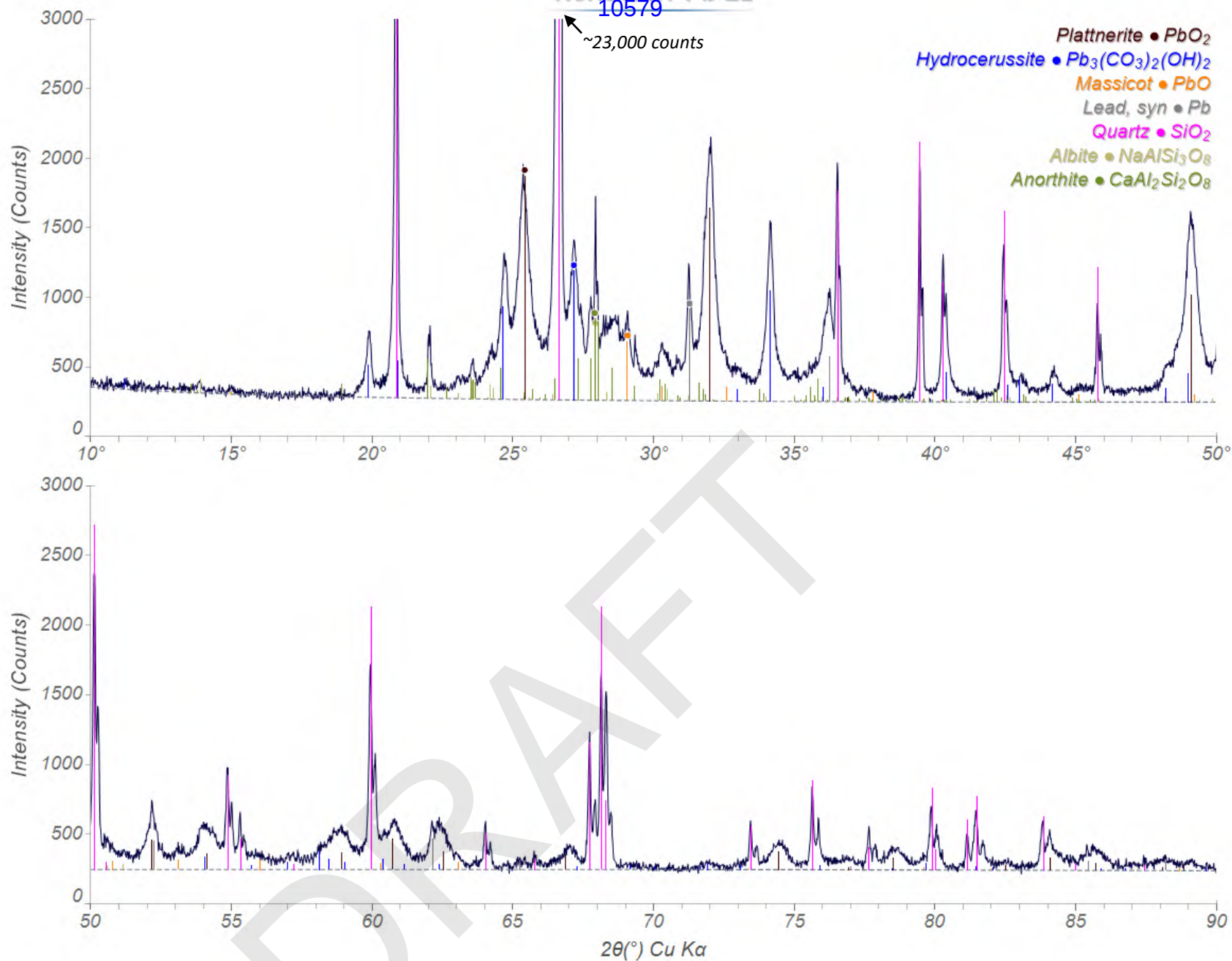


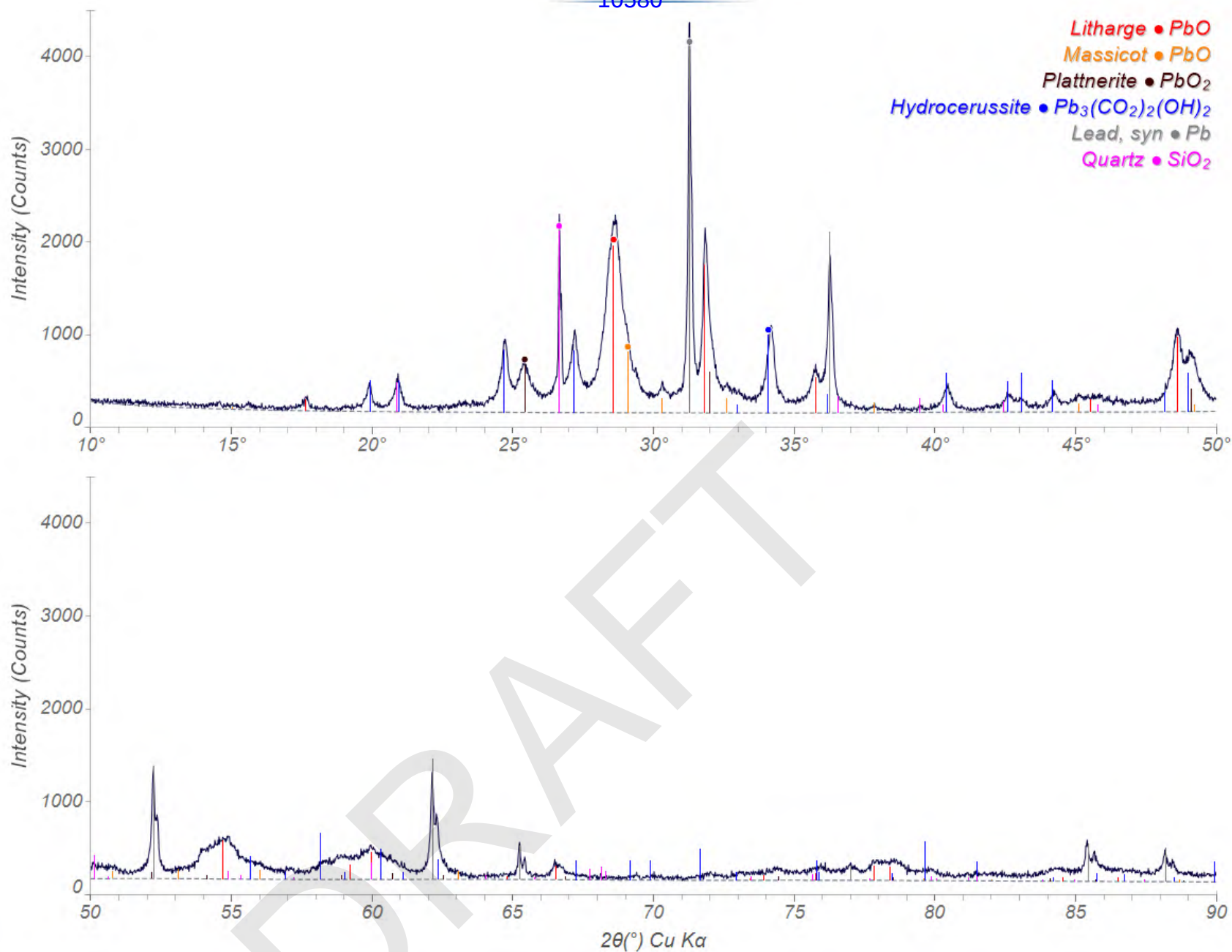


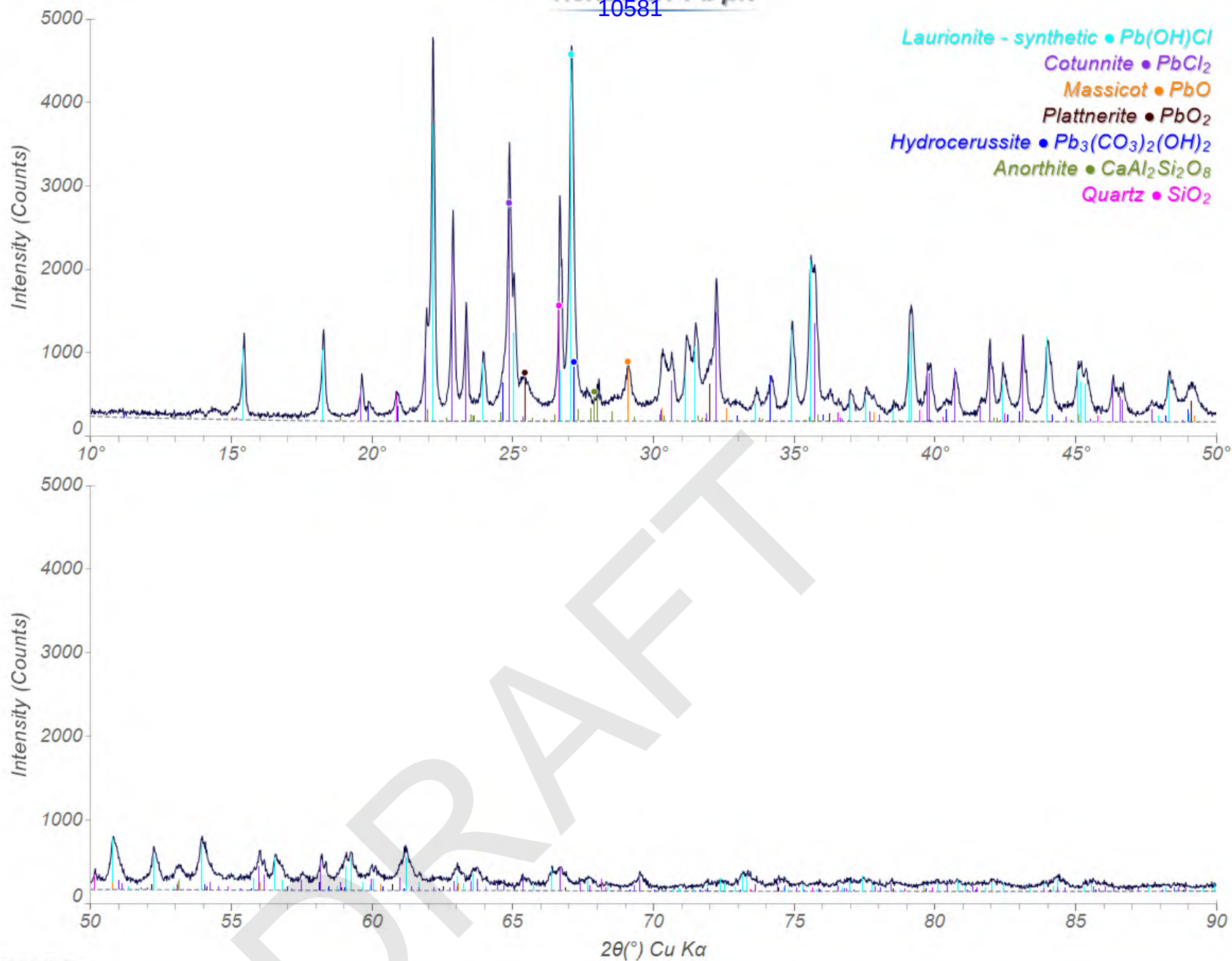












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Exhibit B

CITY OF NEWARK

DEPARTMENT OF WATER & SEWER UTILITIES
DIVISION OF WATER SUPPLY

COMPREHENSIVE TECHNICAL ASSISTANCE FOR THE PEQUANNOCK WATER TREATMENT PLANT

MAY 2016

H2M Project No. NEWK 1501

Prepared for:

City of Newark
Department of Water & Sewer Utilities
920 Broad Street, Room B-31F
Newark, New Jersey 07102

Prepared by:

H2M Associates, Inc.
119 Cherry Hill Road, Suite 110
Parsippany, New Jersey 07054

in association with:

Carollo Engineers
The Canning Group, LLC

PATRICK K. COLE, P.E.

New Jersey Professional Engineer
License No. 24GE04587100



architects + engineers



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ABBREVIATIONS

°F	Degrees Fahrenheit
Ø	Diameter
ACU	Apparent Color Units
AMP	Asset Management Plan
AWWA	American Water Works Association
BPU	Board of Public Utilities
cfs	Cubic Feet per Second
cfm	Cubic Feet per Minute
Cl	Chlorine
CIP	Capital Improvement Plan
COLA	Cost of Living Adjustments
CTA	Comprehensive Technical Assistance
D/DBP	Disinfectants and Disinfectant By-Products
D/DBPR1	Disinfectants and Disinfectant By-Products Rule - Stage 1
D/DBPR2	Disinfectants and Disinfectant By-Products Rule - Stage 2
DAF	Dissolved Air Flotation
DBPs	Disinfectant By-Products
e.g.	For example
EPA	United States Environmental Protection Agency
Fe	Iron
FTW	Filter-to-Waste
fpm	Feet per Minute
fps	Feet per Second
ft	Foot/Feet
ft ²	Square Foot/Feet
ft ³	Cubic Foot/Feet
ft/hr	Foot/Feet per Hour
gal	Gallon
GPD	Gallons per Day
GPH	Gallons per Hour
GPM	Gallons per Minute
GPM/ft ²	Loading rate in gallons per minute per square foot/feet
GWR	Groundwater Rule

ABBREVIATIONS

HAAs	Haloacetic Acids
i.e.	That is
I/O	Input/Output
IOC	Inorganic Compounds
ksi	1,000 pounds per Square Inch
L	Length
LAN	Local Area Network
lb	Pounds
lb/gal	Pounds per Gallon
lb/MG	Pounds per Million Gallons
lb/yr	Pounds per Year
LCR	Lead and Copper Rule
m	Meter
MCL	Maximum Contaminant Level
MG	Million Gallons
mg/L	Milligrams per Liter
MG/yr	Million Gallons per Year
MGD	Million Gallons per Day
N/A	Not applicable
NaOCl	Sodium Hypochlorite
NaOH	Sodium Hydroxide
NFPA	National Fire Protection Association
NIST	National Institute of Standards and Technology
NJDEP	New Jersey Department of Environmental Protection
NJEIT	New Jersey Environmental Infrastructure Trust
NJPDES	New Jersey Pollutant Discharge Elimination System
NIPDWR	National Interim Primary Drinking Water Regulation
NPDWR	National Primary Drinking Water Regulation
NSDWR	National Secondary Drinking Water Regulation
NTU	Nephelometric Turbidity Units
NWCDC	Newark Watershed Conservation and Development Corporation
O&M	Operation and Maintenance
O ₃	Ozone

ABBREVIATIONS

OSHA	Occupational Safety and Health Administration
pcf	Pounds per Cubic Feet
PEOSH	Public Employees Occupational Safety & Health
pH	Decimal logarithm of the reciprocal of the hydrogen activity (i.e. <7.0 acidic & >7.0 basic)
PLC	Programmable Logic Controller
PPE	Personal Protective Equipment
PRV	Pressure Relief Valve
psf	Pounds per Square Feet
psig	Pounds per Square Inch Gauge
PVC	Polyvinyl Chloride
PWS	Public Water System
RTW	Rinse-to-Waste
RTCR	Revised Total Coliform Rule
SCADA	Supervisory Control and Data Acquisition
SDWA	Federal Safe Drinking Water Act
SG	Specific Gravity
SMCL	Secondary Maximum Contaminant Level
SOP	Standard Operating Procedure
su	Standard Units (i.e. turbidity, color, odor)
SVOCs	Semi-Volatile Organic Compound
TBD	To Be Determined
TCR	Total Coliform Rule
THM	Trihalomethanes
TMF	Technical, Managerial, and Financial
TOC	Total Organic Carbon
TTHMs	Total Trihalomethanes
UCMR3	Unregulated Contaminants Monitoring Rule 3 - Third Round
µg/L	Microgram Per Liter
UFRV	Unit Filter Run Volume
UOC	Unspecified Organic Contaminant
USGS	United States Geological Survey
UV	Ultraviolet
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

The Comprehensive Technical Assistance (CTA) is the second part of the Composite Correction Program (CCP). The City of Newark has already conducted part one of the program, the Comprehensive Performance Evaluation (CPE) for the Pequannock Water Treatment Plant (PWTP). As stated in the USEPA CCP Handbook, the objective of the CTA is to achieve and sustain optimized performance goals. This entails optimizing plant operation, unit processes, and management.

The Pequannock Water Treatment Plant (WTP) was constructed in the late 1950's and expanded in 1989 to include the filtration plant. The plant is located in a median strip of Route 23 in West Milford Township, New Jersey. Pequannock WTP currently operates as an in-line filtration plant, and is rated for a plant capacity of 60 million gallons per day (MGD). This report examines the Pequannock WTP to determine current conditions and performance, as well as identifies opportunities to improve plant operations.

Objectives

This report presents the results from the Comprehensive Technical Assistance (CTA) of the Pequannock WTP based on the following four objectives:

1. Assess ability of the existing facilities to reliably produce 60 MGD of treated water under all raw water quality conditions.
2. If the reliable production capacity is not 60 MGD, provide the reliable treatment capacity under all raw water conditions.
3. Provide recommendations to enhance plant performance utilizing the existing facilities.
4. If necessary, provide recommendations for capital improvements to reliably produce 60 MGD of treated water under all raw water quality conditions.

Raw Water Quality

The existing raw water supply for the Pequannock WTP is the Charlotteburg Reservoir, which is located on the Pequannock River. The Pequannock River watershed contains a mix of public and private landowners with a variety of land uses including agriculture, natural wildlife populations, and small towns and hamlets. The City has

permits to appropriate up to 60 MGD from this water source. Raw water quality data collected during 2014 is presented in Table ES.1.

Table ES.1 Raw Water Quality for the Pequannock WTP⁽¹⁾

Parameter	Unit	Average	Minimum	Maximum
pH	-	6.4	5.7	7.6
Turbidity	NTU	1.5	0.5	4.9
Alkalinity	mg/L as CaCO ₃	23	12	41
Hardness	mg/L as CaCO ₃	41	26	72
Calcium	mg/L	9	6	16
Color	ACU	24	5	45
Temperature	deg. C	14	4	23
Note				
1. Data collected from January 1, 2014 to December 31, 2014.				

Filter Evaluation

A comprehensive evaluation of the existing filters was completed, and is described below.

Existing Filter Conditions

Pequannock WTP has twelve granular media filters that are operated in a declining rate control mode. Each filter has 1,200 ft² of filter surface area. The original filter media consisted of 24 inches of anthracite and 10 inches of sand over 14 inches of gravel. The filters are equipped with clay block underdrains.

A surface crust up to one inch has accumulated on top of the media. A photograph of a drained filter after a backwash is presented in Figure ES.1.

Filter Inspection and Evaluation

An on-site inspection and evaluation of the filters at Pequannock WTP was conducted on August 17-20, 2015 using a variety of techniques. Tools used to determine the performance of the filters include:

- Coring of existing filter media
- Analysis of existing media to determine physical characteristics of the media
- Evaluation of filter performance data to determine production efficiencies
- Development of floc retention profiles
- Development of filter waste washwater turbidity profiles



Figure ES.1 Drained Filter After Backwash

Observations based on the outcomes of these tools are presented below.

Filter Media L/d Ratio

The L/d ratio is an indicator of the adequacy of the size and depth of a filter bed for solids capture and storage. "L" is the depth of the filter bed and "d" is the effective size of the media. The L/d ratio for Filter No. 4 is 1,180. Our recommended L/d ratio for direct or in-line filtration plants with a single removal barrier is 1,800.

Unit Filter Run Volume

Unit filter run volume (UFRV) is the volume of water filtered per unit area of a filter bed during a filter run and is expressed as gallons/ft². In general, a goal for a well operated in-line or direct filtration plant would be to have a UFRV of at least 5,000 gal/ft² while maintaining finished water quality in terms of turbidity and particle counts. The average UFRV at the Pequannock WTP during 2014 was 3,400 gal/ft².

Filter Media Compatibility

Effective backwashing of dual media filters requires hydraulic matching of the anthracite and sand. Results from Filter No. 4 matched media calculations which demonstrated that the anthracite and sand may not be matched hydraulically. Appropriate backwash rates at 20°C for the existing sand and anthracite were determined to be approximately 22 gpm/ft². The average measured backwash rate for Filter No. 4 during 2014 was 19.6 gpm/ft². However, measured flow rates have not been verified through a meter and pump calibration in over 20 years, and actual backwash rates may not be accurate.

Floc Retention Profiles

Floc retention profiles indicate how solids are removed within a filter and how effective a backwash removes the captured solids. Before backwash and after backwash floc retention profiles were developed for Filter No. 4 for the August 2015 filter corings. A profile for Core Location 1 is shown in Figure ES.2. Observations based on the floc retention profiles are listed below.

- Surface and sub-surface mudballs were discovered in a majority of the filter corings. This indicates a history of inadequate backwash rates, uneven backwash distribution, and an ineffective surface wash.
- Solids loading in the filter media is significantly greater in the upper media layers. This indicates that floc has not been properly conditioned for filtering by the pretreatment processes and filter surface straining is occurring. The entire storage capacity of the filter bed is not being utilized.

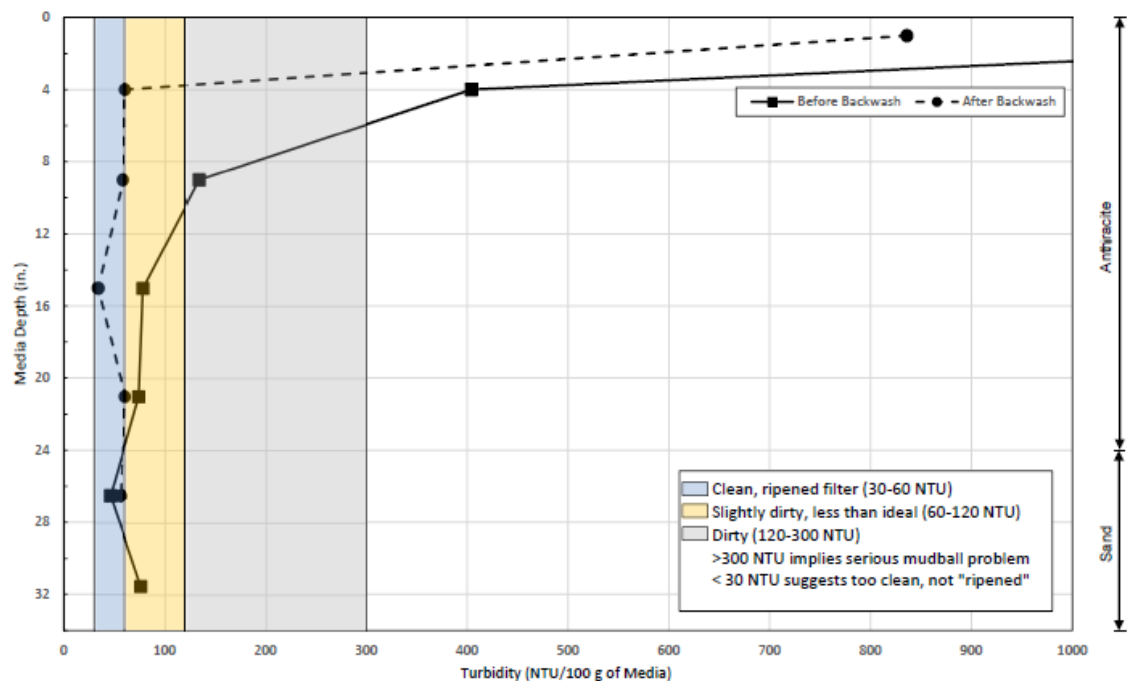


Figure ES.2 Filter No. 4 - Core Location 1 Floc Retention Profile

Filter Washing Procedures

Profiles of filter waste washwater turbidity were developed by collecting samples from the washwater trough during backwash at various time intervals during a backwash sequence. The filter washwater turbidity profiles exhibit an indistinct peak and low profile indicative of a less effective wash.

Residuals Handling

The existing residuals handling facilities consist of two filter backwash wastewater holding tanks, two decant tanks equipped with plate settlers, a sludge lagoon, and pumping facilities. During a filter backwash, the waste washwater is routed to the holding tanks for equalization, and then pumped to the decant tanks for settling and thickening. The clarified water from the decant tanks is recycled to the front of the treatment plant. The waste solids from the decant tanks are pumped to the sludge lagoon.

Solids Production

Based on plant historical data from 2014, the sludge flow produced at the maximum plant flow rate (60 MGD) and minimum percent solids (0.6 percent) was estimated to be 118,000 gallons per day (gpd). This

value is consistent with the design sludge flow of 125,000 gpd at 0.6 percent solids that is used on the residuals treatment facility project that is currently under design.

Raw and Finished Water Flow Measurements

The raw water and finished water flow rates at the Pequannock WTP are monitored by flow measuring devices. A Parshall flume upstream of the filters is utilized to measure raw water flow. Two Venturi meters downstream of the clearwells are utilized to measure finished water flow. Field assessment of Parshall flume measurements often result demonstrated accuracies of 5 to 8 percent. A Venturi meter can exhibit accuracies to within 0.5 to 1 percent of actual flow, if installed without upstream disturbances to the flow profile.

A comparison of the raw and finished water volume indicates that on average the volume of finished water measured by the Venturi meters is approximately 0.1 percent less than the volume of raw water measured by the Parshall flume. The 0.1 percent loss between raw and finished water flows seen in the available flow data is consistent with expected measured values.

Plant staff has noted that instrument calibrations have been infrequent. It is recommended that the differential pressure devices on the Venturi meters and the level instruments on the Parshall flume be inspected and calibrated on a consistent and routine basis.

Discussion on the filter backwash and surface wash flow meters is provided in the filtration section.

Electrical and Instrumentation

Pequannock WTP utilizes General Electric 12.4 KV 600 Amp switchgear with 2,000 KVA transformers. This equipment feeds 480 V switch gear that distributes power to the plant motor control centers that feed to power and lighting panels. A majority of the electrical power equipment was installed in 1989. The City has a service contract with General Electric to provide on call maintenance. There is presently no plant electrical staff; therefore, plant staff is not performing maintenance on electrical equipment.

A majority of plant instrumentation, including programmable logic controllers (PLCs), were installed over 15 years ago. Instruments have been replaced as needed once they are no longer functioning or become unable to maintain accuracy. Staff noted that most instrument calibration is out of date and documentation of calibration is limited.

Based on the existing conditions at Pequannock WTP, the following improvements are recommended.

- A majority of the electrical equipment is nearing its service life. Any equipment over the age of 25 years or the manufacturer's listed life is recommended for replacement. It is recommended that an asset management list be generated to identify criticality, age, reliability, and schedule for replacement.
- Instruments are in a wide array of conditions. Some instruments have been replaced due to recent failures, but a majority are nearing their service life or cannot be relied upon for accuracy due to limited calibrations. It is recommended that a certified instrumentation calibration company be contracted or qualified staff identified to list the instruments, perform/document calibration, and schedule lists of instruments in need of replacement.

CT Tracer Study

The Pequannock WTP uses free chlorination introduced downstream of the filters to achieve contact time (CT) credits. A tracer study was performed on August 19, 2015 for this disinfection zone. T_{10} values for different plant flow rates and clearwell water surface elevations were determined and are presented in Table ES.2.

Table ES.2 Summary of T_{10} Values (minutes)⁽¹⁾

Clearwell WSE ⁽²⁾	Plant Flow Rate			
	30 MGD	40 MGD	50 MGD	60 MGD
603 ft MSL	39	29	24	20
605 ft MSL	41	30	24	20
607 ft MSL	42	32	25	21
609 ft MSL	43	33	26	22
Notes				
1. Calculated using a baffling factor of 0.2 for the clearwells and 1.0 for the finished water pipe per Tracer Study results on August 19, 2015.				
2. WSE - water surface elevation.				

Jar Testing

Bench scale testing was performed to optimize the water treatment processes at Pequannock WTP and supplement the screening of treatment approaches. The data collected during jar testing led to the following observations:

- Adding filter backwash water 10 percent by volume to the raw water produced lower filtered water turbidities.

- Prechlorination had minimal effect on filtered water turbidity after coagulation with Clarion and polyaluminum chloride (PACl).
- Coagulation with alternate direct filtration mixing strategies (flash mix followed by two-stage flocculation) produced lower filtered water turbidities.
- Coagulation with higher doses of PACl and with equivalently lower doses of Clarion produced lower filtered water turbidities.
- Coagulation with alternate coagulants (alum with cationic polymer) produced higher filtered water turbidities at equivalent doses.

Conclusions and Recommendations

Four objectives were identified for the CTA of the Pequannock WTP. Each are listed below:

1. Assess ability of the existing facilities to reliably produce 60 MGD of treated water under all raw water quality conditions.

The existing facilities at the Pequannock WTP cannot reliably produce 60 MGD of treated water under all raw water quality conditions.

2. If the reliable production capacity is not 60 MGD, provide the reliable treatment capacity under all raw water conditions.

The existing facilities at the Pequannock WTP can reliably produce 40 MGD (± 10 percent) of treated water under all raw water quality conditions. However, if no changes are made at the plant, this reliable capacity will decrease over time.

3. Provide recommendations to enhance plant performance utilizing the existing facilities.

Recommendations to improve plant performance are presented below.

4. If necessary, provide recommendations for capital improvements to reliably produce 60 MGD of treated water under all raw water quality conditions.

Recommended capital improvements to reliably produce 60 MGD under all raw water quality conditions are presented below in a phased approach.

Process Optimization of the Existing Facility

Recommendations to enhance plant performance utilizing the existing facility are listed below.

- The backwash sequence should be revised. Our recommendation is to draw the water level in the filters down to 4 inches above the media prior to surface wash, eliminate the low rate wash, and add a rinse-to-waste step to limit turbidity breakthrough at the beginning of a filter run.
- A surface crust up to one inch has accumulated on top of the media. Removing the crust off the media is recommended.
- The existing filter valves should be repaired and/or replaced. The amount of leakage is substantial and induces a burden on plant operations. The leakage takes up valuable volume in the washwater equalization basins and residuals handling facilities. The lost water also reduces production efficiency of the plant.
- Flow measurement of a filter backwash rate and surface wash rate should be upgraded. These rates need to be reliable and adjustable to allow operators to maximize performance of these filter cleaning tools.
- The filters are currently operated in a declining rate filtration mode. It is recommended that the filters be operated in level rate-of-flow control. In this control system, flow from the filters is equally divided between the online filters through a flow control valve and meter on the discharge of each filter. Rate-of-flow control results in increased production, increased UFRVs, and reduces the number of backwashes per day.
- Jar testing results indicate that coagulation with higher doses of PACl and equivalently lower doses of Clarion produced lower filtered water turbidities. The City may consider adjusting the chemical feed doses accordingly, and evaluating plant performance at full scale.
- A series of recommended improvements to the electrical and control systems at the plant are presented previously. In general, outdated and unsafe electrical gear requires replacement. Process control equipment needs replacement and a commitment to routine and frequent maintenance.

Recommended Capital Improvements

To achieve reliable treatment under all raw water quality conditions at the plant's rated capacity of 60 MGD, capital improvements will be necessary. Even if the existing plant is optimized to its full potential, an in-line filtration plant is not equipped to treat the high turbidity, color, algae, and taste and odor events present in the plant's source water. A proposed phasing of projects that will allow the Pequannock WTP to reliably produce 60 MGD of treated water under all raw water quality conditions is presented below, and is graphically shown in Figure ES.5.

- **Phase 1 - New Coagulation Facilities (Flash Mix).** Project includes a new pump diffusion flash mix system. A pump diffusion flash mix system will improve downstream processes such as flocculation and filtration and will result in lowered coagulant requirements. A schematic of a pumped diffusion flash mix system is shown below in Figure ES.3.
- **Phase 2 - Filter Improvements.** The recommended filter improvements are broken into two phases: Phase 2a and Phase 2b. **Phase 2a** is the addition of two new filters. The primary objective of constructing two new filters first is to eliminate subsequent interruption of plant production when the existing filters are rebuilt. **Phase 2b** is the rebuild of the existing 12 filters. It is envisioned two filters would be refurbished at a time. Approximate duration to refurbish two filters is four (4) months. Included in Phase 2b are improvements the existing filter backwash and surface wash systems. If filter improvements are made, Figure ES.4 contains two options for a new media design and filter underdrains. Both designs result in a more robust filter suitable for current and future turbidity regulations.
- **Phase 3 - New Dissolved Air Flotation (DAF) Trains.** The DAF system could also be installed in two phases. **Phase 3a** would be construction of two stage flocculation. **Phase 3b** would be the actual dissolved air flotation basins and support facilities. DAF is particularly well-suited to address algae, color, and tastes and odors present in the raw water. Additionally, incorporation of a clarification process would result in increased filter production, increased UFRVs, and reduce the number of backwashes per day.
- **Phase 4 - New Ozone System.** Project includes a new ozone generation and feed system. Ozone is a powerful oxidant and disinfectant. It is used in water treatment plants to control algae and associated taste and odor producing compounds, enhance color removal, as an alternative to chlorine for primary disinfection, and to oxidize dissolved metals and synthetic organic chemicals resulting from man-made pollution.

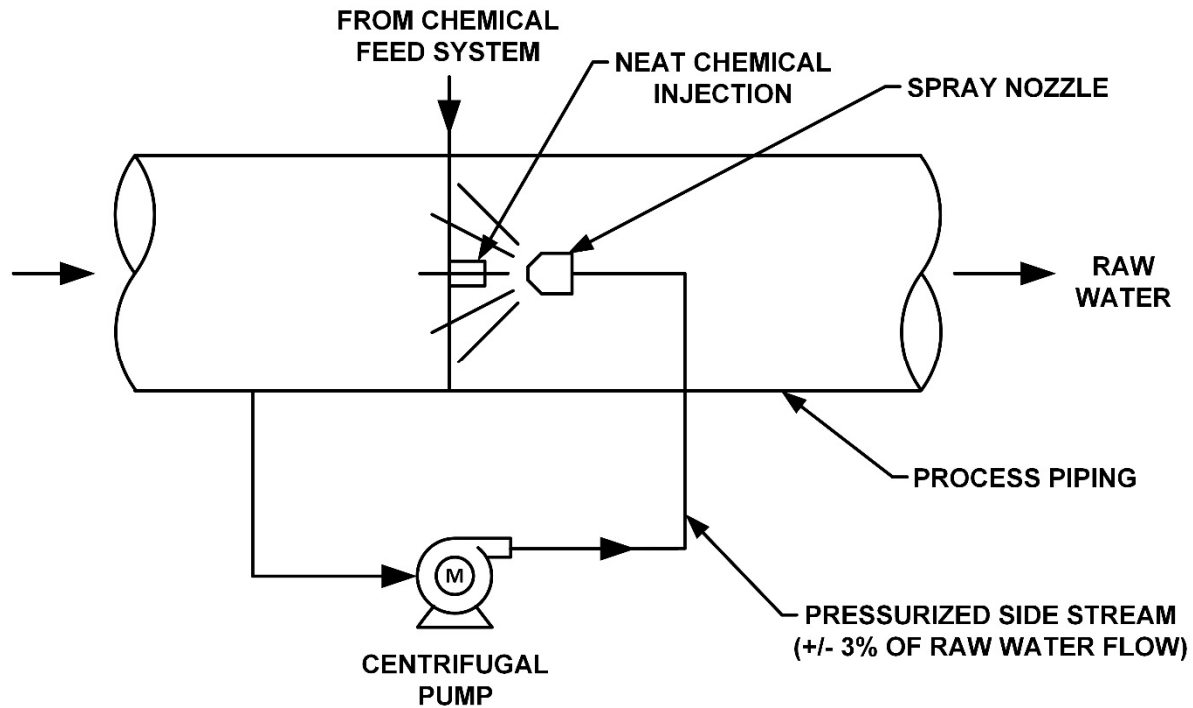


Figure ES.3 Pumped Diffusion Flash Mix Schematic

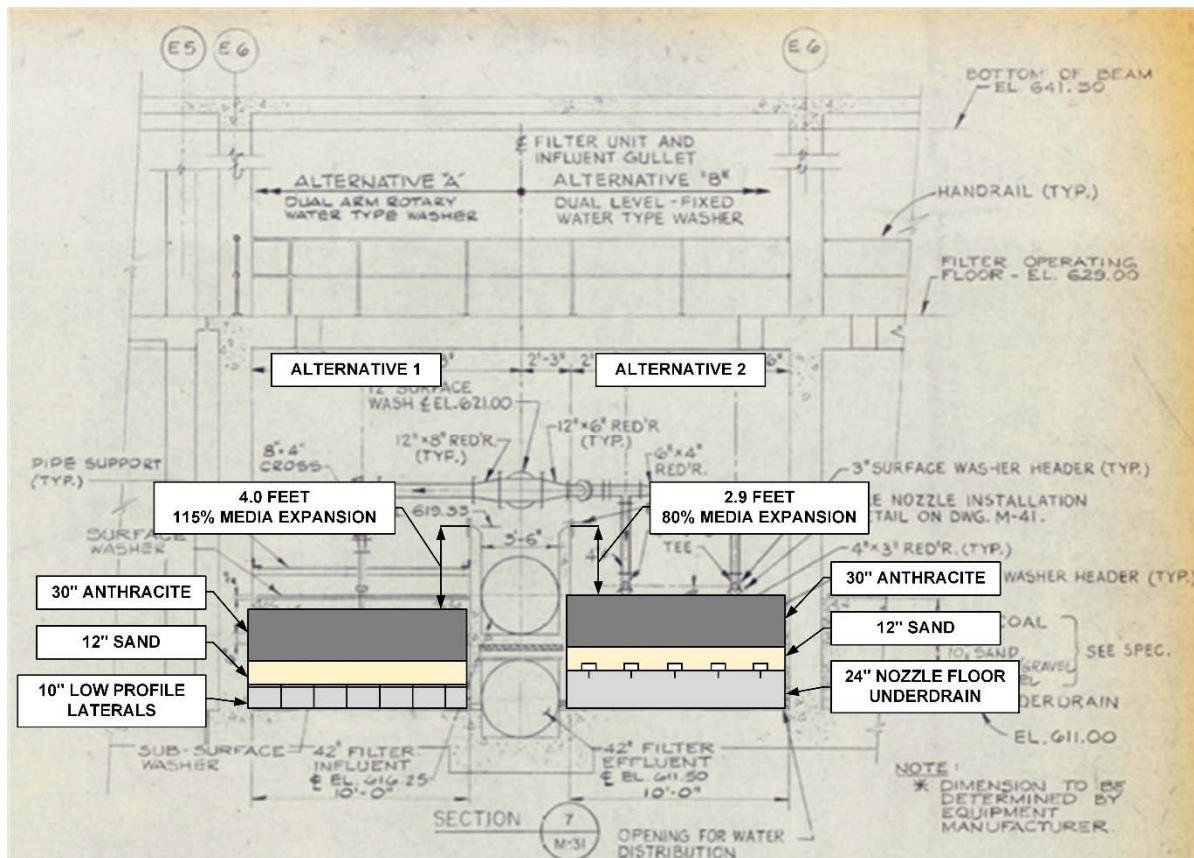


Figure ES.4 Filter Media and Underdrain Alternatives

Conceptual Level Cost Estimate

Construction cost estimates for the proposed capital improvements are based on November 2015 costs and the accuracy of costs presented herein is in the range of +/- 30 percent of actual costs, as determined with a master planning level of engineering detail. The project cost estimates included herein are intended to serve as a guideline for preliminary financial planning. Estimated construction costs are presented in Table ES.3.

Table ES.3 Construction Cost Estimate for Improvements to Existing WTP⁽¹⁾

Project	November 2015 Estimate ⁽²⁾
Phase 1 - New Pump Diffusion Flash Mix System	\$300,000
Phase 2 - Filter Improvements	
2a: Two New Filters	\$7,500,000
2b: Rebuild Existing 12 Filters	\$15,000,000
Phase 3 - New DAF Trains	
3a: Two Stage Flocculation	\$9,000,000
3b: DAF System	\$12,000,000
Phase 4 - New Ozone System at Pretreatment Building	\$4,000,000
Notes	
1. Expected accuracy between +/- 30 percent of actual costs, as determined with a master planning level of engineering detail.	
2. Costs based on conventional design-bid-build delivery approach.	

Regarding managerial optimization, interviews of personnel were conducted, as well as document review and financial analysis of existing conditions. The managerial processes, personnel, and organizational flow as they affect the operation of City of Newark's WTP were also examined.

Specifically, the CTA focused on the tasks of administrative audit, and financial audit (which included an analysis of the funding of capital improvements). The standards utilized to evaluate the Water Treatment Plant (WTP) for the CTA were:

- Currently effectively manage the water supply system
- Establish and have in place valid operating procedures
- Establish an emergency management plan and procedures, including periodic plan testing to insure proper deployment and implementation well before any eventuality
- Establish and implement a financial plan to adequately fund required water system operations and track revenues and expenditures
- Establish and periodically update the rate structure allowing an effective revenue stream
- Bond for future capital projects
- Establish and operate an effective personnel succession system

A summary of these conclusions is found on page 11-22. The CTA report is an operations optimization analysis providing additional information on the City of Newark's Pequannock Water Treatment Plant located on Route 23 in West Milford, NJ. This information supplements, and expands upon, the information provided in the Technical, Managerial, and Financial, Report (TMF) by H2M on the City of Newark's overall Water Utility. Much of the information contained in the TMF report that is pertinent to the WTP administration, operations, and fiscal implications, is duplicated in this CTA report.

The comments in the TMF report concerning the Water Treatment Plant are valid and very pertinent to the management and financial issues affecting the WTP. This CTA report is provided to expand these comments as they relate to the Water Treatment Plant, specific operations, and unique management and operational issues.

A process flow diagram of the Pequannock WTP including the proposed capital improvements is presented in Figure ES.5.

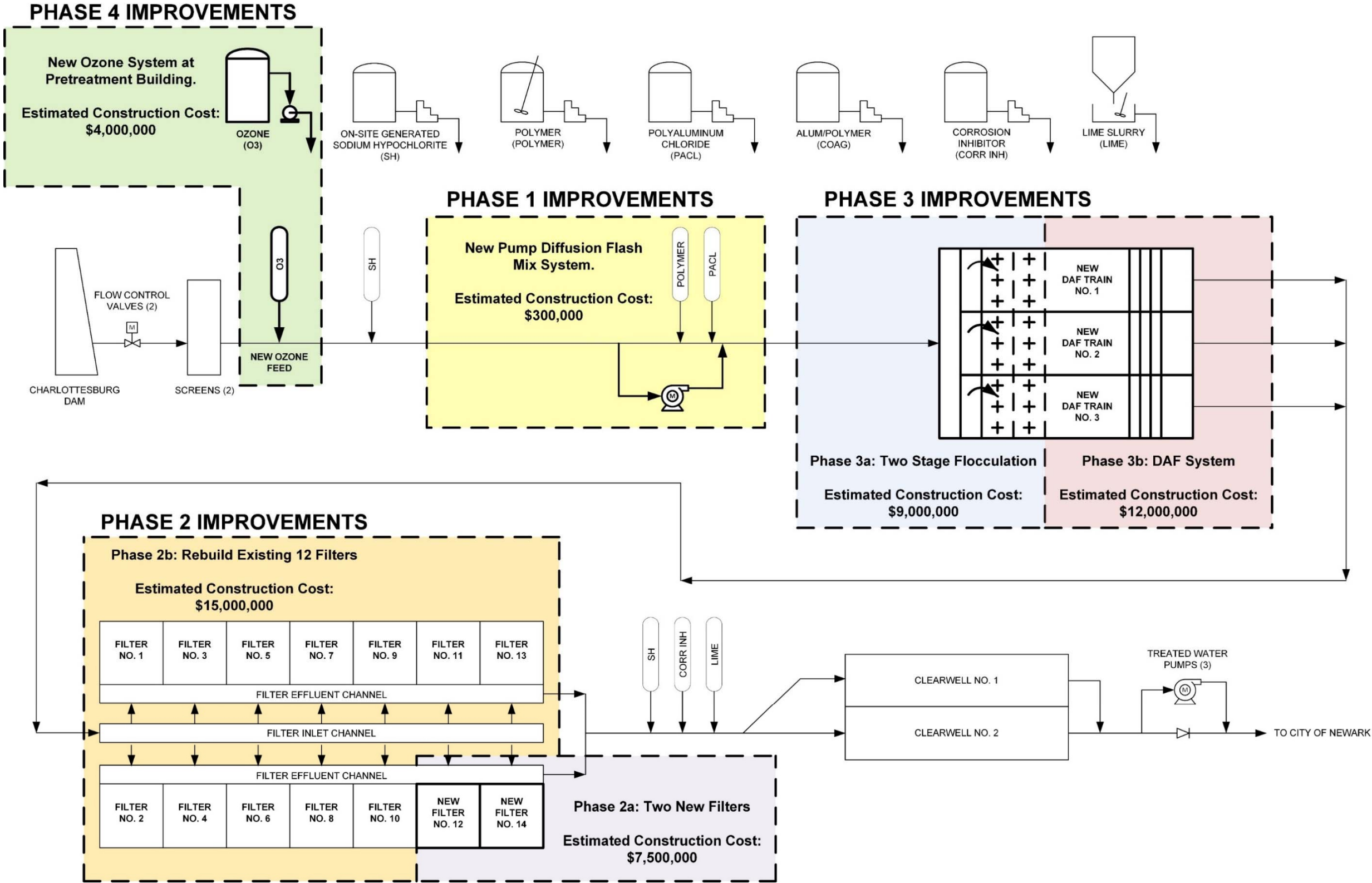


Figure ES.5 Process Flow Diagram

1.0 INTRODUCTION - PURPOSE & SCOPE

The City of Newark, with a population of approximately 280,000, is the largest city in the State of New Jersey and is also the county seat of Essex County. Located in the center of New Jersey's Gateway Region, the City of Newark has been a major regional commerce and transportation hub since the 19th century. The City's population is supplied potable water through a large system of source, treatment, transmission, distribution, and storage facilities, some of which exhibit an age of over 150 years. As one of the largest publicly owned and operated water systems in the State of New Jersey and the United States, the system provides approximately 80 million gallons per day (MGD) of water to a service population of over 300,000 customers within the City of Newark, its surrounding communities, and several commercial and wholesale customers.

The City of Newark Department of Water and Sewer Utilities (Department) is responsible for managing a very precious water resource and providing residents, business customers, and municipal bulk sale customers with a continuous supply of reliable and adequate potable water of superior quality, in the most effective and cost-effective manner, while meeting or exceeding all current Federal and State regulations.

Comprehensive Technical Assistance (CTA)

The Pequannock Water Treatment Plant classifies as a Type 2 Facility, which, according to the EPA CCP handbook, is characterized as follows:

"For Type 2 plants, some or all of the major unit processes have been determined to be marginal. Improved performance is likely through the use of a CTA; however, the plant may or may not meet optimized performance goals without major facility modifications. For these plants, the CTA focuses on obtaining optimum capability of existing facilities. If the CTA does not achieve the desired finished water quality, unit process deficiencies will be clearly identified, and plant administrators can be confident in pursuing the indicated facility modifications."

This CTA will be targeting a maximum filtered water turbidity goal of 0.3 NTU for existing production rates up to and including an optimization goal of 50 MGD. Although the CTA states an optimized performance goal of 0.1 NTU 95% of the time for filtered water turbidity, the current focus for PWTP is to increase plant capacity under all raw water conditions. Once plant capacity is increased after implementing the short-term recommendations stated in the conclusion, focus can shift to long-term recommendations and capital improvements, and targeting a maximum filtered water turbidity of 0.1 NTU.

The CPE was performed for the City and published in July 2014, by the consultancy Aquamize, LLC. Aquamize recommended that the City move forward with execution of the CTA, with the intent to “establish, achieve, and sustain the performance goals for optimization identified in the CPE report.”

To simplify, the CPE performs conceptual analysis of a plant’s unit processes and administrative controls, and identifies areas of relative risk and criticality. The CTA dissects these critical points, posits methods of improvement and optimization, and provides a mechanism for transfer of findings to plant operations leadership and staff.

This report presents the results of the CTA for the Pequannock WTP based on four objectives:

1. Assess ability of the existing facilities to reliably produce 60 MGD of treated water under all raw water quality conditions.
2. If the reliable production capacity is not 60 MGD, provide the reliable treatment capacity under all raw water conditions.
3. Provide recommendations to optimize plant performance using the existing facilities.
4. If necessary, provide recommendations for capital improvements to reliably produce 60 MGD of treated water under all raw water quality conditions

The H2M Team provided the field investigations, analyses, recommendations, and training necessary to deliver a Comprehensive Technical Assistance package, based upon the recommendations issued in the CPE. The evaluation was composed of evaluating and optimizing those elements of plant treatment processes and administration deemed to be of critical importance in the CPE. In its RFP dated December 2, 2014, the City issued a list of ten (10) major scope parameters to be addressed in the CTA analysis. Below, H2M addresses the approach for each of these items:

1.1 Task 1 – Administrative Audit

Administration audit results, recommendations for administrative structure and tiered tree for operational and executive decision-making responsibilities and reporting

- Wholesale audit
- Overhaul of PWTP administrator framework and procedural steps for daily operations

- Review existing organizational approach
- Determine potential changes necessary
- Establish decision trees in simple formats indicating where operational choices can be delegated to experienced staff in responsible charge
 - A decision tree consists of 3 types of nodes:
 - Decision nodes - commonly represented by squares
 - Chance nodes - represented by circles
 - End nodes - represented by triangles
- Recommended a framework and annual schedule for implementation of management and evaluation at a minimum yearly interval
- Benchmark existing plant-management structure from existing plants operating similar treatment unit processes, in nearby watersheds:
 - Jersey City MUA
 - North Jersey District Water Supply Commission

1.2 Task 2 – Capital Improvement Plan

Capital Improvement Plan (1, 5, and 10-year intervals).

Produce a characterization of various plant unit processes, ancillary equipment, and facility grounds.

1.3 Task 3 – Financial Audit

Plant financial audit, recommendations for financial structure improvements, and best practice citations.

Audit the City's financial structure and operational cash reserves, for the water supply system as a whole, and specific to PWTP. H2M will issues recommendation as necessary to bring the City into compliance with industry best practices and the technical, managerial, and financial requirements established by the State of New Jersey for operation of a public water system.

1.4 Task 4 – Filter Unit Process Evaluation

Filter unit process evaluation and optimization recommendations

- Identify and implement corrective measures to filter design and operations to consistently produce filtered water turbidity below 1.0 NTU

- Conduct physical inspection and audit of existing filter media and hydraulic conditions including the following:
 - Review filter box dimensions, depth of water column above media, and determine clean bed and total available head across the filter.
 - Inspect, collect, sample and analyze filter media(s), coal and sand, for depth, effective size, uniformity coefficient, and apparent specific gravity.
 - Collect media at various depths and develop floc retention profiles for both before and after backwash.
 - Monitor filter headloss development during a filter cycle.
- Conduct filter performance audit including:
 - Chemical coagulation and pretreatment processes.
 - Filtrate quality and profiling.
 - Filter run time and unit filter run volume (UFRV).
 - Mode of filter control and operations.
- Review filter backwash facility and operations
 - Observe filter backwash and assess underdrain condition and performance.
 - Backwash supply and capacity.
 - Backwash rates and sequence.
 - Use of auxiliary wash systems including surface wash and need for air scour.
 - Calculate unit filter backwash volume and resultant filter efficiency.
 - Develop filter waste
- Develop and evaluate methods for correcting filter operation including the following potential improvements:
 - Media maturation with optimized filter-to-waste (FTW) and rinse-to-waste (RTW).
 - Media rehabilitation and/or replacement.
 - Media depth and resultant filtering capacity as calculated by L/d ratio.
 - Optimize backwashing steps and procedures to maintain media cleanliness and integrity.
 - Need for new underdrain system.
 - Mode of filter control and instrumentation.
 - Filter run time, headloss, and filtrate quality measurement and monitoring.
- Prepare preliminary CTA information to include
 - Improvement concepts and layout.
 - Implementation schedules
 - Preliminary budget and capital costs

1.5 Task 5 – Residuals Handling Unit Process Evaluation

Residuals handling unit process evaluation and optimization recommendations

- Identify and implement corrective measures to sludge and backwash handling in support of appropriate filter and backwashing operations.
- Review existing sludge and spent filter backwash handling and treatment methods.
- Estimate monthly and annual plant residual production.
- Recommend needed improvements in backwash solids and sludge handling for implementation.
- Review sludge disposal options (on-site, off-site).
- Review and comment on the City's proposed design and construction project that will update the plant residual handling process and facilities

1.6 Task 6 – Flow Measurement Calibration Outputs

Flow measurement calibration outputs and correctional recommendations

- Review existing flow meter design, operation, and calibration data
- If needed, conduct full-scale volumetric testing of filter backwash and surface meters
- Assess flow signal generation and calibration both in field and instrumentation/SCADA devices.
- Make recommendations for resolving flow metering issues

1.7 Task 7 – Process Controls Evaluation

Process controls evaluation and optimization report + CT tracer study

- Recommend procedures and control features that will effectively improve plant operations and process control.
- Review plant Standard Operation Procedures (SOPs) and make recommendations for changes to be implemented.
- Review plant instrumentation and SCADA system and recommend appropriate improvements.
- Assess existing automation for data collection, logging, and reporting including plant flow rates, water quality parameters, and process control settings.
- Evaluate current methods for meeting disinfection CT and provide concepts for improving overall disinfection, monitoring and reporting at the plant.

- Conduct a CT tracer study of the disinfectant contactor

1.8 Task 8 – Preventative Maintenance Program

Preventative Maintenance Program, wear materials and equipment stocking recommendations, procurement procedures recommendations, proactive O&M documentation SOPs

- Identify a program for existing plant asset O&M, status reporting, materials, equipment stocking, and procurement methods for regular wear items vs. one-time large capital equipment

1.9 Task 9 – Training of Plant Personnel

Conduct a training session consisting of five (5) working days of continuous training for all plant operations and managerial staff. The training will include modules to allow appropriate staff to identify which components of the training are most important and relevant to their individual roles.

1.10 Task 10 – Meetings with NJDEP

Attendance at up to six (6) regulatory coordination meetings, including generation of agenda, minutes, and coordination for review/approval of minutes.

2.0 FINANCIAL RESERVES

2.1 Financial Reserves

Excerpt from: CPE Report, July 2014 by Aquamize, LLC, pg. 19:

["Financials/Reserves – Administration (A) Understanding the Pequannock Water Treatment Plant is in the midst of a transition process where the City is learning to manage the operation of plant again, the City must have a capital reserve fund to cover unexpected (but often anticipated) expenses and upcoming facility infrastructure replacement. Through interviews at all levels of City staff, one hurdle to overcome is the establishment of water rate increases to adequately support daily operations at the plant and be able to establish sufficient reserve funds to finance replacing facility infrastructure that can no longer be repaired.

Plant Administrators/Complacency—Administration (B) The operations staff does its best to stay vigilant for changes in operating conditions. However, the relative daily consistency of the raw water quality, the lack of "span of control" and authority the operators possess to make changes to the treatment processes, and the absence of a culture that encourages and rewards innovation among the operators is a breeding ground for complacency. The emergency response plan for any unusual treatment process or water quality issue is consultation with the Public Works Director. Complacency can often be combined with a poor work environment, which is another metric of the 50 individual performance limiting factors. Work environment could be separately listed as a "B" rated performance limiting factor related to the plant staff. But a challenged work environment in this case is a symptom of the policies, supervision, and complacency (performance limiting factors #1, #2, and this one, #7 and not necessarily an independent performance limiting factor."]

Approaches the City has conducted in recent years and mechanisms put in place prior to the financial steps taken were identified to ensure system viability. The plant personnel are indeed, due to the very repetitive nature of the occupation, susceptible to one of complacency. After examination, the following positive steps and mechanisms in place were identified:

- Implementation of required rate increases to provide for long-term financial affordability of system upgrades.
- The existence of a long-term project plan.
- The existence of an in place emergency management plan
- The existence of yearly training and exercising of this plan by Michael Awertschenko, the Water Treatment Plant Superintendent.

2.1.1 Capital Projects

Capital projects have been identified through consulting engineer consultation in recent years and have been recommended in the 10-year strategic plan and the 2011 Water System Master Plan Update by Hatch Mott MacDonald, and the capital plan submitted in the adopted NW Financial Rate Study.

Current capital projects of the City specific to the WTP and watershed as identified in the NW Financial Report to the City of Newark dated December 16, 2014, are listed below:

Pequannock Water Treatment Plant:	\$20 million
Dam Improvements:	\$5 million
Valve Replacement Program:	\$10 million

2.1.2 Procurement and Budget Unit

The procurement and budget function is handled by their Chief of Staff's Office reporting to the Department Director. The primary function is to serve as the intermediate between the operations in the field and the processing of a Purchase order requisitions/requests. The City's various water supply and distribution facilities are not linked via cloud based systems or T-1 line based communications. The City could benefit from having one state-of-the-art automated central requisition and finance system.

Requisitions are placed by the field personnel through their department head and vetted through the procurement and budget section. The use of preferred city contracts is maintained here as well as informative dissemination to the sub-units of available state contracts, city contracts or other contracts for use.

As noted above in the comments, under Purchasing (below), there exists a disconnect between the newer personnel at the WTP and the procurement section. These issues appear to be improving as all parties involved are gaining a better understanding of the other's needs.

2.1.3 Purchasing

During interviews, the administration and staff at the WTP universally expressed concern over what is perceived as a very long, cumbersome process to purchase even the most basic

necessary materials, supplies, equipment and services through the City of Newark procurement system. The staff's unfamiliarity with the process as outlined and mandated within the New Jersey Local Publics Contract Law (N.J.S.A.40A:11-1 et. Seq.,) has contributed enormously to the disconnect.

The issue identified by the WTP staff is that the City, in the early stages of transition, has not had in place the necessary legally mandated contracts, inhibiting the ability to make an expedited purchase. There have been efforts at breaking down these barriers through training in Newark purchasing systems.

Formerly, the personnel at the WTP were capable of purchasing goods and services without the municipal and state constraints that govern the expenditure of public funds and the accompanying thresholds. The City has held training sessions and attempted to identify contract for goods and services, which would require differing actions as demanded of the New Jersey Local Public Contract Law. The early results of the process were of some concern and frustration, although in subsequent interviews it was later learned that these hurdles have been significantly overcome and the efforts at training from the procurement section within the City of Newark has paid dividends with the greater cooperation of purchasing efforts at the WTP.

There is legitimacy to both sides of these two concerns and it appears that the transition process from the Newark Watershed Conservation and Development Corporation (NWDC) to the City are slowly bridging these and other difficulties. The issues appear to have greatly subsided and are no longer significant to current operations.

The annual budget is developed pursuant to the regulations governing municipal finance as set forth in the regulations of the Department of Community Affairs – Division of Local Government Services, as well as specific state statutes (New Jersey Local Budget Law N.J.S.A. 40A:4-1 et. Seq., and the New Jersey Local Fiscal Affairs Law, N.J.S.A. 40A:5-1 et. Seq.) As an operating water utility within the overall budget of the City, the City of Newark must comply with these various financial regulations and reporting including the approval by the State of its annual operating budget.

The regulations as established by the Mayor and City Council have established a monthly meter reading and billing process. This is verified by both the Business Administrator and Finance department officials in separate, to whom the personnel of the water utility report activities and financial data.

2.1.4 Inventory Control – Availability of Parts and Equipment

Inventory for replacement parts and supplies have been one of constant dissatisfaction. The inventory at the treatment plant has been characterized by the staff as being inadequate for emergency needs. As is noted under the Procurement section, this has been the result of cultural frustration in transitioning from an outsourced quasi-public entity but one not subject to the procurement rules of the New Jersey Local Publics Contract Law (N.J.S.A.40A:11-1).

The reports of procurement and the accompanying inventory availability have improved as the procurement process has become more institutionalized.

2.1.5 Budget Development and Rate Structure

The Mayor and City Council set usage rates after receiving recommendations from water utility personnel, the finance office, and City auditor regarding adequacy of funding structure. These rates as contained within City Ordinance 33:4-1, are adopted only after publication of notice of consideration and the actual rate structure and public hearings on all changes in the existing structure. Pursuant to these statutory procedural requirements, in January/February of 2015 the Mayor and Council adopted significant rate increases for both the water and sewer utilities, including increases in related user fees and charges.

2.2 Financial Evaluation

Highlights of the Financial Examination:

- Increase water department involvement in financial planning
- Recent efforts of 3 rate year increase have had positive effect on ability to finance capital improvements.
- Past revenue analysis indicates future revenue projects are reasonable taking into account delinquencies as anticipated revenues requires close monitoring
- City should engage in a biennial revenue/expense analysis and compare to NW financial analysis to ensure accuracy of plan and potential adjustment
- Water usage for the City has shown little growth over past 5-7 years
- City must identify long term plan of using existing utilization of excess water for future growth and revenue potential
- City should develop a more formal capital equipment and vehicle replacement program

2.2.1 Five-Year Budget

This section is discussed in three sub-sections:

- Overview and comments on the existing revenue structure
- Overview and comments on the existing expenditure structure
- Overview and comments on fiscal years 2015 thru 2023 as projected in a financial study by NW Financial with analysis and comments on these projections

The attached spreadsheets found in the appendices show the history of the Water Utility's revenues and expenditures from 2007 to 2015. The data on these sheets was taken from the annual audits of the City as well as the on-line budgets of the water utility. This data is discussed in more detail in the TMF report while relevant summaries are included in this CTA report.

2.2.1.1 Revenue / Expenditure Analysis - Comments on the Revenue Data

Please refer to Newark Revenue Summary Data Sheet (Appendix 2A)

In order to better understand the projected rate increase and related revenue structure for the City of Newark, the attached spreadsheet analysis was prepared.

Lines 4 through 9 of the spreadsheet reflect consumption data for 2007 thru 2014 with 2015 estimated. In sum, the consumption data remains fairly stable in recent years down somewhat from 2008, which was the banner year. Given this long term trend, it is not reasonable to project consumption growth in any financial base information absent specific listing of potential consumer increases or reasonably anticipated new customers.

It must be emphasized that this data is taken from the meter reading in the utility and that all customers have meters. The City has indicated that all user accounts are metered and billed monthly. This includes City owned facilities, local public schools, churches, Essex County facilities, State of New Jersey facilities, Universities, and non-profit corporations. If a reading is not obtained, an estimated usage is made. This data reflects total water usage, short of unmetered anomalies, such as hydrant use for fire protection or recreation purposes, water theft or line loss, or underperforming meters. The usage by meter readings approximates 48 million gallons per day (MGD).

This is in comparison to the water supply sent to the City. On average, the Pequannock Water Treatment plant produces 39 MGD and the North Jersey District Water Supply Commission provides between 32 MGD and 38 MGD for an availability of 70 MGD to 75 MGD.

This bulk data indicates that there is 25 MGD of water per day that is produced but not billed to customers. It should be noted that in the 2011 Newark Water System Master Plan Update on page 57, there is a detailed discussion of “unaccounted for water” which is defined as “the difference between water drawn from all sources and water used (all metered customers and unmetered usage for which reasonable estimates can be made and are recorded)”. In that study, they show “unaccounted water” between 29%-32% and note that it could be as high as 35%. The report also noted that “unaccounted water” includes line leakage, unmetered official uses (such as firefighting, possible summer recreation use, and street cleaning), theft, and inaccurate water metering. They further note that old meters can under record usage by 28%-35%. This 2011 data is very similar to the above cited bulk data.

As noted in the TMF report, in the projected capital improvement program of the City, there are significant funds set aside for improvements to the water transmission and distribution mains and meter replacement to address this loss. When those improvements are completed, the amount of water lost through leakage/under readings should be recaptured and reflected in sales/system income. However, as the “water loss” through leakage is reduced, the “excess water produced” will actually increase.

Lines 11 through 13 reflect data from the internal records of the Water Department from 2007 thru 2015. It must be noted that the City reads meters and bills monthly and all water customers (even large bulk users) are metered.

Lines 13 through 16 reflect uncollected billing. As noted in the TMF report, there is probability that \$2,000,000 should be considered as uncollectible; it would be reasonable to project a 90% collection ratio for current billings and a 75% collection of arrears on a continuing basis for collectable delinquencies if personnel changes, are implemented.

Lines 17 through 22 reflect annual billing data. City usage and billings remain fairly flat given COLA (cost-of-living adjustments) that may have occurred over the billing period (2007-2015). Both of the City's main user groups (city users and bulk users) on the

aggregate decrease over this timeframe although the City usage may have decreased at a greater rate. The 2015 rate increases impact the City users whereas we are advised that bulk rate customers will not see these increases since they are governed by long term contractual relationships, which can only be adjusted through the negotiation process. This is supported by the NW Financial report projection of income from these bulk customers (see later section).

Lines 23 through 28 reflect collections history. Note that included in the collection data is accrued interest and penalties and other non-consumptive cost data. This data reflects an improvement in 2014 in the collection ratios that must be maintained in future years to generate the income needed for rate increases. The decrease in the arrears collection ratios may be a function of the growth of truly uncollectable accounts that may be vacant, abandoned, bankrupt etc. Each of these accounts must be field inspected and verified to determine if they are active users or if they should be reclassified as inactive/liens.

Lines 30 through 33 reflect account status at the end of the year. This is fairly consistent but reinforces the above comments about truly uncollectible accounts.

Lines 36 through 95 reflect data from the annual audits, which verify the other data in this report and the financial condition of the utility. Note, there is a wide variation in the use of available fund balance in the annual budget (surplus income). This is a reflection of either the lack of a clear policy by the governing body as to the amount of fund balance to be retained to offset unforeseen circumstances (often called working capital), or a commitment to a capital project. Also note that the amount of user charges levied (**line 67**) tends to vary, whereas the actual collections (**line 73**) is more moderate reflecting the time lag to recoup major rate changes.

2.2.1.2 Comments on the Expenditure Data

Please refer to Newark Expenditure Summary Data Sheet (Appendix 2B)

In order to better understand the projected rate increase and related expenditure structure for the City of Newark, the attached spreadsheet analysis was prepared.

Lines 1 through 17 reflect data taken from recent adopted budgets of the City. In essence, due to the replacement of the contract with the Newark Watershed

Conservation and Development Corporation with direct management by the City of Newark, data before 2013 is not directly comparable to present experience. **Lines 1 through 17** contain summary data followed by more specific information actual cost data from the annual audit on the personnel costs in the water utility in **lines 18 through 26**. Please note the large variation between budget versus actual in 2012 through 2014 in the Water Supply Division reflecting the transfer of employees from the NWCDC. This is offset by the reduction of Services by Contract (**line 8**). Plus, the City in 2013 and in 2014 had a significant number of budgeted but unfilled positions (**line 26 vs. line 4**). Year to year budget projection seems fairly normal whereas actual expenditure data indicates a freeze on hiring by the Central Administration.

The above data is reinforced by **lines 31 to 39** reflecting Audit findings on actual expenditures. **Line 41** reflects the variation between the budget and actual expenditures. However, it must be emphasized that the audit data in **lines 32 through 39** reflects expenditures, not encumbrances, placed but not paid or accounts payable not yet paid out. This data is reflected on the **lines 43 through 46**.

In terms of the financial expenditure data for the last 3 years, there is a large variable in capital improvements. Debt service decreases in 2014 seem to be an accounting issue with some of the debt reflected in the Deferred Charges Line (**line 34 versus line 35**).

2.2.1.3 Comments on the future budgets and the impact of an adopted rate increase

Please refer to Projected Revenues and Expenditure Sheet Appendix 2C

In 2014, the City of Newark commissioned NW Financial to prepare a detailed analysis of the existing revenue and expenditure patterns for the water utility (plus the sewer utility which is not the subject of this report). In addition, given the projected capital needs of the City as delineated in several reports by Hatch Mott McDonald, the City's water/sewer consulting engineers, NW Financial was to prepare a projection of future capital and operational requirements and the income and rate structure necessary to finance these improvements as well as ongoing operations. The projection part of the report dated,

December 16, 2014 is attached (Appendix 2C) to and made a part of this overall analysis and is used as the starting point for these comments.

Based upon the information in this report, the City of Newark in the Winter of 2015 did increase their rate structure as recommended in the overall study. However, it should be noted that the final rate increases did not exactly match the overall recommendation of the NW Financial report [in correspondence with NW Financial they indicated that the action by the City would generate revenues that closely approximate those shown in the existing report].

Given the above comments and the attached spreadsheet analysis, the following comments relate to the financial analysis and plan prepared by NW Financial and adopted by the City in early 2015.

Lines 2 through 16 are the revenue projections starting in Column D, 2014, and continuing to column for 2023. Column E is the Water Department data for actual collections for 2014, and Column F is the audit findings for that year. The bottom line is that the City's total revenues in 2014 were \$986,874 greater than the study projected. This is critical since NW Financial used their 2014 data (the actual budget for the year 2014) as the base line for their financial projections. For 2015, NW Financial projected a revenue (and matching expenditure budget) of \$50,445,844 whereas the actual 2015 adopted budget was for \$48,240,579. Again, this is significant since it appears that initially the City is collecting and expending less than the study projected.

In the column after each year, there is a calculation of the percentage of the revenue increase that is anticipated. The 2015 rate increase starting in April of the year is projected to increase revenues by 7.1% with further increases in 2016 (10.38%) and 2017 (12.2%). In subsequent years, the increase is based upon an automatic COLA. The increase is applied to the City customers and the bulk customers are projected at a lower rate since their rates are established through negotiated contracts.

The NW Financial projection for "other revenues" may be optimistic. In 2014 and 2015, there was significant income from a two-year settlement with the City of East Orange. After that time, (assuming no similar types of extraordinary reoccurring income) the "other" will largely be prior year surplus and "non-budgeted income" which should be reasonable assuming a continuation of the current trends for interest and penalties.

The projection for collection of “arrears” may be optimistic (for the reasons cited above). If the truly uncollectible arrears are transferred to a lien/non-active account basis, then the projections used for future years may be problematic.

For the 2015 revenue projections, the actual adopted budget was less than projected, another good sign for future projections. This will also allow for some flexibility to address personnel issues cited elsewhere in this CTA as well as the TMF report.

Lines 18 through 30 reflect the NW Financial Report of budget expenditure requirements for the next 8 years. **Line 21** was added to reflect percentage adjustments to the personnel line. For 2014, the base year for the multiyear projection, the NW Financial Report is the actual adopted budget for the City. As noted on **line 39** (Audit) the City actually expended less than the actual budget by \$261,922 (however the final number after the 2015 audit is completed will be higher after encumbrances and accounts payable are factored in). For 2015, the NW Financial Report anticipated a higher budget than was actually adopted by almost \$2.2 million. **Line 28** reflects the fact that there may be a mathematical error in the NW Financial calculations versus the spreadsheet totals. This anomaly is not significant.

It was verified that the debt service projected in the report (**line 26**) represents the existing City debt plus projected NJEIT debt, assuming the future NJEIT interest rates remain stable.

In summary, the financial projections are reasonable given the unknowns in any future governmental budget indicating that if the revenues generate the funds that are anticipated, the City should be able to balance its budget in future years even with the increase in debt service. However, the annual operating costs, particularly the personnel costs, may increase in 2016 and beyond as changes in personnel and operations are implemented based upon the final recommendations of these reports. In terms of additional personnel, given the variation between the NW Financial projection and the actual 2015 budget, there is a limited capability to increase operational personnel to reflect required manning strength at the water treatment plant and distribution system maintenance.

It would be prudent that the City of Newark, before issuing additional debt in 2017 and each year thereafter, review the actual revenue (and expenditure) data versus the projected data in the NW Financial report to determine if adjustments in either the revenue or expenditure stream are necessary. In this context, if the revenue stream is not matching or exceeding that projected, it may be advisable to restructure the debt issuance profile to either delay some projected projects until the revenues are present or change the scope of the projected annual issuance.

2.2.2 Reserve Accounts for Emergency Funding and Equipment Replacement

A review of recent audit reports for the City show that there are no significant reserves being established to maintain the water system. In a public utility it is not unusual for municipalities to avoid the use of a "reserve for improvement" account per se; normally a municipal utility will accumulate unappropriated funds in its "Capital Fund" for this purpose or to maintain a reasonable General Fund Balance. As noted on the included spreadsheet (Newark Financial Information, Appendix 2D) summarizing Audit information for 2007 through 2014, the Capital Improvement Fund Balance or the General Capital Fund Balance are nominal amounts (**line 84**). However, the Water Utility General Fund Balance (also referred to as surplus) (**line 61** for 2014) is healthy. This balance, although, did suffer a major setback in 2012 primarily due to increase in various receivables and appropriation reserves and payables leaving a balance of zero. Since that time, Fund Balance has been stabilized and as of December 31, 2014, the balance was reported at a little more than \$4.1 Million. Traditionally, Fund Balance is utilized as a tool to manage budgets to avoid peaks and valleys and also to provide a certain level of liquidity. Managing Fund Balance levels will help to avoid any unnecessary or drastic rate increases. Historically the City was maintaining the Fund Balance levels at approximately \$4.2 Million.

The Capital Improvement Fund is another potential funding source; however, the account currently maintains a balance of \$1.87 Million and has for several years.

Capital Fund Balance would be yet another source of funding, however, that account has only \$53,000 which would be able to handle small equipment purchases.

The bond laws of The State of New Jersey require that at least 5% of a capital improvement to be bonded be available in the existing pre bond capital improvement fund. The exception to this is self-liquidating utilities, which can waive this requirement as long as their annual fund balance is solvent. Consequently, as the overall utility fund remains solvent, the absence of a specific capital improvement funds balance is not critical to the future use of debt to finance improvements.

A review of the 2015 Water Utility budget showed that the City increased the Capital Outlay portion of the budget for Equipment from \$926,316 in 2014 to \$1,300,000 in 2015. This increase of \$373,684 amounts to a 40.34% increase and is evidence that the City is focusing their efforts on addressing the capital needs of the water system.

2.2.3 5-Year Capital Improvement Plan

In view of the fact that the City of Newark is operating a water supply system in excess of 100 years old, a series of recent engineering reports from Hatch Mott MacDonald have highlighted approximately \$120 million in water system capital investments needed for operational improvements. In order to document these looming capital demands and to address the system as a whole as well as future budget impacts, the City employed the financial planning firm of NW Financial in 2014 to prepare an overall capital plan and required fiscal analysis and the rate structure required to implement the cited improvements. The plan provides for both the water and sewer utilities, however, this report is limited to the water utility only.

The NW Plan estimated that a 40% increase in annual expenditures would be required in order to fund the much needed projects while prior to the rate increase implementation (based upon the NW Rate Analysis) revenues were expected to increase by 20% over same time period. As noted in the preceding section, the financial portion of this study was reviewed and found to be reasonable.

Based upon the rate analysis the NW Financial Plan recommended that the City pursue the following opportunities to increase revenue flow:

- Implement a new rate structure (accomplished in February 2015)
- Increase collection rates (currently at 85%), the national average is 90-95% for municipal run systems
- Potential sale of Newark raw water
- Increase in bulk water sale rates

The City has adopted the revised rate study and advised that the other recommendations are being pursued. With this financial mechanism in place, it is reasonable to review the capital improvement plan contained in the study. The Capital projects list totaled \$120 Million in various projects. The duration and timing of the projects varied over the next 5 to 7 years. A list of those capital projects and descriptions/comments as provided in the report is as follows:

Pequannock Water Treatment Plant Improvements/Repairs:

- Project Description: Replacement of the chlorination system, the rehabilitation of the sludge lagoon, design and construction of a residuals handling facility, replacement of filter beds, and installation of additional filters, upgrade lime system, and upgrade of the mechanical system.
- Project Need: Optimization of Treatment Plant – increase daily production
- Timing: 2015-2019
- Projected Cost: approximately \$20 million

Design and Installation of New Meters:

- Project Description: Replace large meters 2 inches and above that are 10 years old or older, and install automated meter technology for all meters in our system.
- Project Need: Increase billing and revenue
- Timing: 2015-2018
- Projected Cost: approximately \$20 million

Cleaning and Lining Water Mains:

- Project Description: clean and cement line 200 miles of water main pipe
- Project Need: Improve water pressure and quality
- Timing: 2015-2019
- Projected Cost: approximately \$50 million

Various Emergency Repairs:

- Project Description: Dam Repairs at Charlottesburg, Canistear, Clinton and Echo Lake, Belleville Reservoir Cleaning and Repairs and Pressure Zone Analysis
- Project Need: Improve firm capacity of reservoirs
- Timing: 2015-2019
- Projected Cost: approximately \$15 million

Fire Hydrant Replacement Program

- Project Description: replace 2000 fire hydrants. Majority of fire hydrants are AP Smith hydrants that parts cannot be purchased. Replace these hydrants with the new M-94 style.
- Project Need: Improve fire protection rating for the City
- Timing: 2015-2019
- Projected Cost: approximately \$5 million

Green Energy Projects

- Project Description: Explore the use of green technology at our dams – installation of solar panels and windmills
- Project Need: Reduce energy costs and create new revenue stream
- Timing: 2015-2019
- Projected Cost: approximately \$10 million

The study accounted for the additional future debt requirements over the next 5 years and beyond. The first 5 years of the analysis address the pending improvements listed above. In addition, there is an assumption that the City will need to spend on average \$25 million annually to maintain the water system.

To add credence to the results of the study, debt service requirements were verified in the base years of 2014 and 2015 and reviewed the future demands based upon the assumptions in the study. While interest rates will vary, the overall projected obligations appear to be addressed in the projected budgets and the rates that were recommended appear to be sufficient to adequately fund normal operations as well as the new proposed debt burden of the City.

As noted in the above comments, after receiving the 2011 capital improvement program prepared by Hatch Mott MacDonald, the Mayor and City Council adopted a series of ordinances addressing many of the same issues contained in the NW Financial study listed above. These ordinances could not be implemented due to the lack of available financing. As noted in the 2014 Water Capital Audit, the City had a total of \$36,179,250 of authorized but unfunded ordinances (schedule D-40, see Appendix 2E attached). Given the existence of these prior ordinances, and the new funding stream, the City Administration can now proceed with the final stages of borrowing the necessary funding and initiating the required projects without further authorization

except the approval of the final loan agreements with the State of New Jersey Environmental Infrastructure Trust (NJEIT).

It should also be noted that in the financial projects provided in the NW Financial study there were provisions for annual capital improvements (approximately \$1,100,000 was included in the 2014 budget which constituted the base year for the projections and a slightly larger amount in the 2015 adopted budget the total of which was less than originally projected). Consequently, within the new revenue stream, there is the capability to replace other vehicles and equipment according to a reasonable replacement schedule in a timely manner, although these replacements are not cited directly within the rate study.

Attached in Appendix 2F is a summary report of the City's pending state fiscal year 2016 NJEIT application indicating the City's implementation of the proposed capital improvement program.

2.2.4 Description of Budget and Expenditure Control Procedures

Comments on Budgeting procedures are contained in the preceding sections of this report and/or the TMF report.

As for expenditure control procedures, State statutes and regulations establish strict standards governing purchasing and contract procedures as well as over expenditures of established appropriations. These standards are implemented through the City's finance and purchasing offices, and not personnel within the Water Utility.

A review of the City's audit reports from 2008 through 2014 revealed no instances of funds being over-expended or other such deferred charge that would be an indication of poor budget controls and failure to adhere to the budget controls. N.J.S.A. 40A-4.1 et. Seq. is the statutory requirement for budget control.

With that said, the 2014 audit report contained findings 2013-22 and 2013-23 which refer to the PeopleSoft accounting system that was purchased by the City in 2003. In the findings, it refers to the budget expenditure reports and how they should be prepared monthly and also reconciled to the general ledger. This is more a procedural and management issue and not an indication of the misuse of funds.

2.2.4.1 Quarterly Reports Comparing Actual vs. Budgeted Expenditures

Discussions with the City's Chief Financial Officer indicate that the existing software in use by the City allows operating departments to prepare monthly or quarterly reports on their budget status (budget versus expenditures and encumbrances to date). In addition, revenues collected can be measured against budget projections. Furthermore, since the City central operation issues all payroll and purchasing, as well as centralized collection, the City's financial system accurately reflects the cash position of the utility. As noted above, the annual audits of the utility by an independent auditor verify the accuracy of this statement.

2.2.4.2 Purchasing Policy to Prevent Misuse of Funds

The City of Newark has a purchasing manual that sets forth the procedures to be used in procurement and contracting. A reference to this manual is included in the bibliography. The manual conforms to standard purchasing practices in place in many New Jersey cities, and given the absence of audit citations as to non-compliance with state regulations, it appears that these established practices are followed within the water utility. The purchasing policy manual was last revised in 2009.

Procurement and Budget Unit - Within the Director's Office for the Department of Water and Sewer, there is the procurement and budget section which has the responsibility of acting as the intermediate between operations in the field and processing of purchase order requisitions/requests. The City is not linked via cloud-based systems or T-1 line based communications. The City could benefit from having one state-of-the-art automated central requisition and finance system to allow operating officials up-to-date information on their budget status as well as information on pending purchases.

Requisitions are placed by the field personnel through their department head and vetted through the procurement and budget section. The use of preferred city contracts is maintained here as well as informative dissemination to the sub units of available state contracts, city contracts or other contracts for use.

2.2.4.3 Financial Capacity Evaluation

The City has adopted a new rate structure and is revising its other rates and fee to provide the funding necessary to address the capital needs of the water utility. These

new user fees took effect in April 2015 and as of Fall 2015 appear to be operating as anticipated. Since the water utility is self-funded and ended the fiscal year 2013 and 2014 with a favorable fund balance, there is no statutory restriction preventing the City from obtaining the necessary funding to implement the delineated capital improvement program once the revenue flow from the new rate structure verifies the future financial viability of the utility.

2.2.4.4 Collections Percentage and Unaccounted-for Water

The Collection rate for current billings as well as arrears is shown on the spreadsheet entitled Newark Revenues (Appendix 2A) **lines 23 through 28**.

The unaccounted for water is being calculated based upon financial and statistical information and not engineering information. As noted in several previous sections of this report, all of the City's customers are metered, even bulk purchasers. The Water Collections and Billing Division have stated that these meter readings are the basis of their billings. Historic data shows that the City bills for the use of approximately 48 MGD. The City's water plant produces approximately 39 MGD of water plus the City receives between 32 MGD and 38 MGD from the North Jersey District Water Supply Authority for a daily total of approximately 75 MGD (this total is often cited in literature supplied by the Water Division). Consequently, the City's "unaccounted for" water loss is approximately 25 MGD per day, or 33%.

2.2.4.5 Capacity to Self-Liquidate the Utility

As shown on the various financial spreadsheets accompanying this report, the City's water utility is currently operating in a self-liquidating basis and should remain so given the recently adopted rate plan. Under the laws governing New Jersey Municipalities, if the utility is not self-liquidating and runs a deficit, this deficit must be made up in the following year or financed through an appropriation for the City's general fund.

2.2.4.6 Ability to Borrow and Pay Debt

Given the adopted and enacted new rate structure, the City should have the capability to finance the capital and operating improvements outlined in this report. In this context, the City has received preliminary approval from the State to use the State Environmental Infrastructure Trust Fund for these improvements.

2.2.4.7 Current Rate Structure Assessment

Sufficiency of Revenues Generated from Current Rates to Provide Necessary Revenues to Support Expenses and Investments

Appendix 2C provides information on the prior water user rate structures and the new rate structure adopted in February 2015. Note that this new structure is phased in over a three-year period reflecting the recommendation in the NW Financial study. In addition to these rates the ordinance provides for further rate increases according to an annual COLA as well as increases for any pass through cost increase from the New Jersey District Water Supply Authority.

The analyses provided earlier in their report indicate that these rates should be sufficient to provide the funds for the necessary operating and capital costs of the water utility.

The City of Newark is the owner of the water system from the watershed, through the Pequannock Water Treatment plant to its distribution in client towns and the City of Newark.

In addition to owning the watershed and supply, the City also owns 40.5% of the Wanaque North watershed and reservoir, possessing an allocation of 38.07 MGD from NJDWSC. The City further owns 28% share of the Wanaque South watershed and reservoir, possessing an allocation of 11.33 MGD. This ownership is created through state required membership in the North Jersey District Water Supply Commission. The total from the contractual ownership agreement is 49.4 MGD. Further, Newark possesses a portion known as the Bloomfield allotment from the NJDWSC of 6.51 MGD. Although the above heading implies that this is a “purchase contract”, in essence it is not, since the City is a part owner of the system in question.

The City is obligated to finance this portion of the budget of the North Jersey District Water Supply Commission. This cost is built into the existing rate structure with a provision that any cost-of-living adjustments (COLA) increase from the Commission be directly passed on to the City’s customers.

In essence, the water rate structure of the City is based upon a total supply of more than 90 MGD even though the usage is between 70 and 75 MGD and the billing usage is approximately 48 MGD. The City does have contracts to provide bulk water sales to various other municipal entities (See Appendix 2G). Each of these contacts has individually negotiated rate structures:

Table 2-1: Bulk Unit Water Sales Contracts

Contract Unit	Term	Maximum Gallonage	Charge
Wayne Township	1/1/2006- 12/31/2015	2 MGD	\$1989.23 / million gallons as of 2007 Adjusted cpi annually until 2015
City of Elizabeth	1/1/2016- 12/31/2025	8 MGD	1/1/2016 - \$2,800 /million 1/1/2017 \$2,950.00 / million gallons CPI annually
Pequannock Twp	1/1/2010- 12/31/2020	1 MGD	\$2,361.38 / million gallons
City of East Orange	8/15/2013- 8/14/2023	3.493 MGD	\$2,542.76 / million
Belleville	1/1/2016- 12/31/2015	7 MGD	1/1/2016 - \$2,800/million 1/1/2017 \$2,950.00 / million gallons - CPI annually
Bloomfield	7/15/2013- 7/14/2023	9.765 MGD	At current rates

The total annual maximum gallonage cited above is 31.258 MGD. Actual usage reports for the past three years indicates that the actual amount consumed on average is 18.409 MGD (2012), 18.199 MGD (2013), and 16.031 MGD (2014). Note, that the maximum MGD cited is the average annual flow converted to daily flow. The MGD above can vary significantly in some of the cited contracts in high demand or other unique situations.

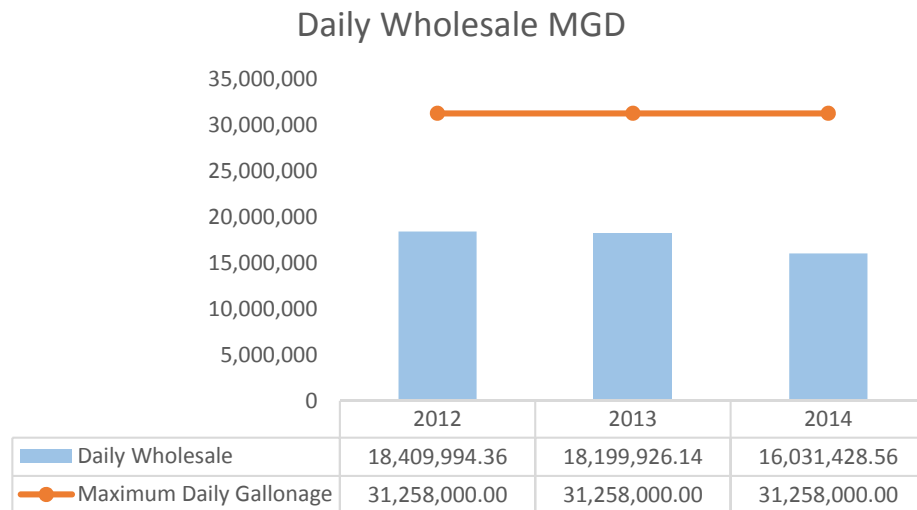


Figure 2-1: Daily Wholesale MGD

In addition to the above cited contract users, the City supplies water to Newark Liberty International Airport and surrounding areas averaging 4.8 MGD. This data is included in the above system usage details.

2.3 Capital Projects

2.3.1 Review of Past 10 Years

Included in Appendix 2H (in CD format) is the 2013 Audit of the City's water division indicating capital ordinances that are in existence and represent that past 10 years' worth of capital expenditures. Also included, is a report of prior improvements that have not yet been added to the capital inventory as well as the current updated capital inventory of the utility. In essence, from 2010 onward, the revenue structure of the City water utility did not support a significantly increased debt service. Consequently, even though the City authorized needed capital improvements on an annual basis, these authorizations could not be funded until the City increased its revenue structure which finally happened in February 2015.

2.3.2 Potential Revenue Enhancement Opportunities

The City of Newark as the owner of 35,000 acres of watershed property also potentially possesses the unique rights and abilities to engage in a sale of the systems assets but retain its water rights. There is some precedent to this approach as Jersey City conducted a similar sale of the Split Rock reservoir in Rockaway Township but retained its water rights. This approach bears

further examination and study to be potentially considered a viable option. The City has already sold any development rights in the watershed to the NJ Green Acres Program.

The City has expressed the concern over the location of the property in various municipalities and being subject to property taxation since the system is technically a revenue producer. This has resulted in numerous tax appeals processes and variation among the taxing districts. The City questions these values since having sold the development rights. The residual value for the land, in the City's view, is minor. Discussion of the tax liability of these properties is outside the scope of this study and one that is significantly litigated.

As cited above and included in Appendix 2C, based upon the rate analysis, the NW Financial Plan recommended that the City pursue the following opportunities to increase revenue flow: sale of additional bulk treated water and the sale of currently excess raw water.

2.3.3 Bulk Sale of Water

The City of Newark currently enjoys an excess of 15 MGD in treated water. This excess does not include any future improvements at the WTP and water distribution system, which would potentially result in an additional excess of unused gallonage and would place the City of Newark in excellent position as a regional water purveyor. It is recommended that the City strive to seek opportunities to maximize these resources in future contracts for its own development and budgetary stabilization.

Regarding potential sale of Newark raw water, the City estimates that it has at least 5 million gallons per day of raw untreated water that it could sell. Engineering feasibility is in progress to determine how this water can be transferred to another utility for their use.

As bulk water contracts come up for renewal, the City should make a strong effort to increase these rates. As noted above there, is a variation in the existing bulk sales contracts. The major limiting feature here is the potential availability of water from other suppliers in the region. The City is also seeking additional clients for its available treated surplus. To achieve this increase in bulk customers will require a recognition of the regional nature of water supply in Northeast New Jersey and an active program by regional and state authorities to maximize the ability to wield water to existing and potential customers as well as fostering best management water supply and usage practices by all involved parties.

3.0 EVALUATION OF EXISTING SYSTEM & SOURCE WATER

3.1 Existing Conditions

The Pequannock WTP was constructed in the late 1950s and expanded in 1989 to include the filtration plant. The plant is located in a median strip of Route 23 in West Milford Township, New Jersey. Pequannock WTP currently operates as an in-line filtration plant with the following elements:

- Charlotteburg Dam
- Letdown Control Valves
- Screenhouse
- Pretreatment Chemical Feed
- Filters
- Clearwells
- Waste Washwater Solids Concentration Facilities
- Waste Solids Storage Lagoons

The Pequannock WTP is rated for a plant capacity of 60 MGD. Historical data indicates the plant is unable to provide 60 MGD of treated water on a consistent basis due to plant performance restrictions. The CPE prepared by Aquamize, LLC in 2014 identified the filters as the primary treatment element performing at a sub-optimal level.

3.2 Water Quality and Process Selection

There are a wide variety of treatment processes which can be incorporated into a water treatment facility. The key to selecting of the most appropriate treatment process is water quality. The raw water quality and the treated water goals determine the treatment process. The most appropriate treatment process is one that cost effectively treats raw water and reliably produces treated water that meets quality and quantity goals.

3.3 Raw Water Quality

The existing raw water supply for the Pequannock WTP is the Charlotteburg Reservoir, which is located on the Pequannock River. The Pequannock River watershed contains a mix of public and private land owners with a variety of land uses including agriculture, natural wildlife populations, and small towns and hamlets. The City has permits to appropriate up to 60 MGD from this water source. Raw water quality

data collected during 2014 is presented in Table 3-1. Table 3-2 contains typical water quality data as provided in the 2014 CPE report.

Table 3-1 Raw Water Quality for the Pequannock WTP⁽¹⁾

Parameter	Unit	Average	Minimum	Maximum
pH	-	6.4	5.7	7.6
Turbidity	NTU	1.5	0.5	4.9
Alkalinity	mg/L as CaCO ₃	23	12	41
Hardness	mg/L as CaCO ₃	41	26	72
Calcium	mg/L	9	6	16
Color	ACU	24	5	45
Temperature	deg. C	14	4	23
Iron ²	mg/L	-	-	-
Manganese ²	mg/L	-	-	-
Note				
1. Data collected from January 1, 2014 to December 31, 2014.				
2. Data were not available for these two parameters. However, red and black staining were visible throughout the plant suggesting both metals are in the raw water supply.				

Table 3-2 Raw Water Quality Data Presented in the 2014 CPE

Parameter	Analytical Level
Turbidity (range)	1 - 1.5 NTU
Turbidity (historical high)	10 NTU
Color (summer range)	30 - 40 units
Color (winter range)	12 - 20 units
Total Organic Carbon (TOC)	4 - 6 mg/L

3.4 Treated Water Quality

Tables 3-3, 3-4, and 3-5 contain performance and treatment water quality information for the Pequannock WTP in 2014. Observations regarding current performance are listed below:

1. Average and maximum production rates were 38 and 41 MGD, respectively.
2. Chemical dosages were consistent throughout the year. From experience with other in-line and direct filtration plants, chemical dosages used at Pequannock are more closely aligned with a direct filtration plant.
3. Treated water quality was outstanding.

Table 3-3 Pequannock WTP Plant Flow Rates

Parameter	Unit	Average	Minimum	Maximum
Raw Water	MGD	38.1	29.7	41.3
Wash Water	MGD	3.3	0.1	5.2
Delivered Water	MGD	38.1	29.6	41.3
Note				
1. Data collected from January 1, 2014 to December 31, 2014.				

Table 3-4 Pequannock WTP Chemical Feed

Parameter	Unit	Average	Minimum	Maximum
Alum/Polymer	ppm	9.2	8.4	13.2
Chlorine	ppm	2.6	2.1	3.6
PACl	ppm	1.6	0.4	2.8
Lime	ppm	4.5	0.0	9.0
Polymer (Floc-Aid)	ppm	0.04	0.00	1.92
Polymer (Filter-Aid)	ppm	0	0	0
Polymer (Decant-Aid)	ppm	0.8	0.3	3.0
Sodium Silicate	ppm	8.3	2.0	17.2
Note				
1. Data collected from January 1, 2014 to December 31, 2014.				

Table 3-5 Pequannock WTP Delivered Water Quality

Parameter	Unit	Average	Minimum	Maximum
pH	-	6.8	5.8	8.7
Turbidity	NTU	0.06	0.01	0.31
Chlorine	mg/L	1.04	0.64	1.57
Alkalinity	mg/L as CaCO ₃	25	12	50
Hardness	mg/L as CaCO ₃	50	27	80
Calcium	mg/L	12	7	18
Color	ACU	1	0	5
Temperature	deg C	13	0	23
Note				
1. Data collected from January 1, 2014 to December 31, 2014.				

3.5 Process Selection Criteria

The basic water treatment objectives are to provide the removal of contaminants and disinfection of microorganisms. The contaminant removal process for most water supplies involves the addition of chemicals to destabilize particles (coagulation) followed by the addition of sufficient energy (flocculation) to allow formation of settleable and filterable particulates (floc). The water treatment industry has developed a number of alternate processes which can be applied to different qualities of raw water. Basic process alternatives which include chemical coagulation and filtration are:

- In-line (contact) filtration, consisting of coagulation and filtration (solids removal).
- Direct filtration, consisting of coagulation, flocculation, and filtration (solids removal).

- Conventional (complete) treatment, consisting of coagulation, flocculation, sedimentation (solids removal), and filtration (final solids removal)

In general, the cost of water treatment (both capital and O&M) increases with the ability of the process to handle more severe raw water quality. The objective in process selection is to determine the most economical process that can treat the available raw water quality to meet the finished water objectives in a manner that achieves the goals set for process reliability, operational flexibility, and ease of maintenance. The Pequannock WTP is currently operated as an in-line filtration plant. Given its current arrangement, the most economical treatment options would build off the existing facilities. As such, additional treatment alternatives to those listed above can be examined, including:

- Direct filtration with ozone consisting of ozone pretreatment, coagulation, flocculation, and filtration (solids removal).
- DAF plus filtration consisting of coagulation, flocculation, DAF (solids removal), and filtration (solids removal).

Table 3-6 shows treatment process selection criteria for six different parameters. This table reflects years of experience in plant operation and represents a high level of reliability in treatment. The EPA Surface Water Treatment Rule Guidance Manual divides the processes shown in Table 3-6 into two categories:

- Direct filtration includes those processes which remove all solids on the filter.
- Conventional treatment includes those processes which remove some solids through pretreatment prior to filtration.

Table 3-6 Process Selection Criteria⁽¹⁾

Parameter	In-line Filtration	Direct Filtration	Direct Filtration with Ozone	DAF ⁽²⁾ Plus Filtration
Turbidity (NTU)	<5	<20	<30	<100
Color (ACU)	<15	<20	<100	<100
Total Organic Carbon (mg/L)	<2.5	<2.5	<7.0	<5.0
Coliform (no./mL)	<10 ³	<10 ³	<10 ⁶	<10 ⁴
Algae (ASU/mL)	<10 ²	<10 ³	<10 ³	<10 ⁴
Taste & odor (TON)	<3	<4.5	<7	<5
Notes				
1. Data from Integrated Design of Water Treatment Facilities, Susumu Kawamura, John Wiley & Sons, 1991, 2000.				
2. Dissolved Air Flotation				

A comparison of raw water quality data for the Charlotteburg Reservoir shown in Tables 3-1 and 3-2 and the process selection criteria leads to the following observations:

1. The Charlotteburg Reservoir may exceed the in-line filtration criteria for turbidity (5 NTU) during large storm events and would require the addition of flocculation stages for reliable treatment of water.
2. The Charlotteburg Reservoir typically exceeds the in-line filtration criteria for color (15 ACU) and would require the addition of flocculation and ozone (i.e. direct filtration with ozone) or DAF plus filtration for reliable treatment of water.
3. The Charlotteburg Reservoir probably exceeds the in-line filtration criteria for TOC (2.5 mg/L) and would require additional treatment for algae removal.
4. The Charlotteburg Reservoir exceeds the in-line filtration criteria for algae and tastes & odors (3 TON) and may require additional treatment for its removal.

Of these parameters, the most critical is turbidity. Turbidity removal represents the efficiency of the treatment plant as a barrier against the passage of microorganisms into the distribution system. In addition, turbidity can shield pathogenic microorganisms and interfere with the disinfection process. For these reasons, there are stringent Federal and State standards regulating treated water turbidity levels.

During the 2014 operation year, raw water turbidity did not exceed the 5 NTU limitation of the existing in-line filtration process. However, plant staff indicated that raw water turbidity spikes of greater than 5 NTU have occurred, but are infrequent. TOC data contained in the 2014 CPE indicate the historical raw water maximum level is 10 NTU. It is most likely appropriate to state that raw water turbidity exceeds the treatment capabilities existing process less than one percent of the time. In actual operation, high raw water turbidity can be dealt with by the treatment plant staff in a number of ways, including reducing plant capacity to reduce the solids loading to the filters. However, this practice indicates the existing treatment process may not be the most appropriate to treat the raw water.

Data for raw water color is presented below in Table 4-7. The data shows that 95 percent of the time raw water color exceeds capacity of an in-line filtration process.

Table 4-7 Raw Water Color Concentrations - Percentiles⁽¹⁾

Parameter	Range	Percentiles						
		5% ⁽²⁾	25%	50%	75%	90%	95%	100%
Color (ACU)	5 - 45	15	20	25	30	30	30	45
Notes								
1. Data collected from January 1, 2014 to December 31, 2014.								
2. 95 percent of the time raw water color concentration is 15 ACU or greater.								

Color measurements are an indicator of the organic concentration in the raw water. Increasing color levels suggest elevated TOC concentrations. TOC data presented in the 2014 CPE report list a range of 4 to 6 mg/L. TOC concentrations at this level provide a two-fold treatment challenge: one, exert a primary coagulant demand thus increasing the solids loading on the downstream processes; and two, produce disinfection by-products when chlorine is added for disinfection.

Turbidity information for raw and filtered water contained in the 2014 CPE report demonstrates correlation between concentrations. In other words, combined filtered turbidity levels rise and fall with raw water turbidity levels. This result suggests improper conditioning of particles for subsequent removal in a downstream solids removal process. This indicates an existing unit treatment process (coagulation) is not optimal, but also suggests a second floc conditioning process (flocculation) may be necessary.

3.6 Process Recommendations

The Pequannock WTP has successfully met current primary water quality standards using the in-line filtration process. However, it has been necessary for operators to accommodate deficiencies of the plant by reducing plant capacity. To achieve reliable treatment under all raw water quality conditions at the plant's rated capacity of 60 MGD, it will be necessary to upgrade the Pequannock WTP from an in-line filtration process. Even if the existing plant is optimized to its full potential, an in-line filtration plant is not equipped to treat the elevated color and TOC levels present in the plant's raw water supply.

A more robust treatment process is needed to reliably treat the raw water under all conditions. Direct filtration, direct filtration with ozone, and DAF plus filtration are viable treatment processes. Discussion of recommended capital improvements and a phased implementation approach are presented later in the report.

3.7 On-going Facilities Improvements

Two on-going capital improvements projects are currently planned for the Pequannock WTP. The Residuals Treatment Facility Project addresses residual handling issues resulting from limited available volume in the existing sludge lagoons. The major components of the Residuals Treatment Facility will include a gravity thickener, thickened sludge mixing/equalization basin, and a centrifuge. The Sodium Hypochlorite Generation Facilities Project addresses safety concerns from the use of the existing chlorine gas storage and feed system. The sodium hypochlorite generation and storage facilities will be located at both the pretreatment site and filtration plant.

3.8 Future Raw Water Capacity Consideration

Beyond optimizing the plant for current operations, the City should also consider the following options to aid in preparing PWTP for future raw water capacity. The bascule gate at the Charlotteburg Reservoir should be repaired. It is also recommended that the Farber Brook Diversion Dam be rehabilitated. The current raw water evaluation is based off of consistent raw water data of water from the top of the reservoir. If water from a lower drawdown depth is used, it is highly likely that the plant would need a clarification step, which can be addressed by DAF (dissolved air flotation). Raw water of the reservoir should have jar testing preformed from a variety of water levels to make sure coagulation and polymer dosing requirements are well understood for all raw water conditions. The current rated capacity of the reservoir is approximately 3 billion gallons but if it is limited to a drawdown depth of only the top 730 feet of the reservoir, DEP will consider re-rating the reservoir to approximately 0.8 billion gallons. PWTP should also discontinue the use of gaseous chlorine but there is already an active project addressing this issue. Given recent compliance challenges with disinfection byproducts, the City may additionally consider the possibility of adding ozone as pre-filter oxidant, possibly in tandem with a reservoir management strategy at the Cedar Grove Reservoir facility.

4.0 WATER QUALITY CURRENT AND NEAR FUTURE REGULATORY REQUIREMENTS

4.1 Regulatory Framework

Public water systems (PWS) are regulated under the EPA's Safe Drinking Water Act. A PWS is a system for the provision of water for human consumption, to the public, through pipes or other constructed conveyances, if such system has at least fifteen service connections or regularly serves at least twenty-five individual people.

In the State of New Jersey, NJDEP is the agency with primacy for enforcement of the statutes, regulations, and technical guidance associated with the federal Safe Drinking Water Act.

The following regulations apply to the design, construction, and operation of PWTP:

- Water Quality and Water Supply
 1. NJ Safe Drinking Water Act (NJSDWA) (N.J.S.A. 58:12A-1 et seq.)
 2. NJSDWA Rules (effective 1/4/2011) (N.J.A.C. 7:10)
 3. Certification of Laboratories & Environmental Metrics (N.J.A.C. 7:18)
 4. Licensing of Water/Wastewater Operators (N.J.S.A. 58:11-64 to 73)
 5. Licensing Rules (effective 11/20/2008) (N.J.A.C. 7:10A)
 6. Unapproved Interconnections (N.J.S.A. 58:11-9.1 to 58:11-9.11)
 7. Realty Improvement Sewerage/Facilities Act (N.J.S.A. 58:11-23 et seq.)
 8. Water Supply Management Act (N.J.S.A. 58:1A-1 et seq.)
 9. Water Supply Management Act Rules (N.J.A.C. 7:19 Subchapter 6)
- Water Allocation
 1. Water Supply Management Act (N.J.S.A. 58:1A-1 et seq.)
 2. Water Supply Management Act Rules (N.J.A.C. 7:19 Subchapter 6)
 3. Water Supply Allocation Rules (effective 10/10/2008) (N.J.A.C. 7:19)
- Management and Finance
 1. Water Supply Bond Act of 1981 (P.L. 1981 C.261)
 2. Water Supply Replacement Trust Fund (N.J.S.A. 58:12A-22 et seq.)
 3. Water Supply Privatization (N.J.S.A. 58:26-1 to 58:26-18)
 4. Facilities/Services of Small Water Companies (N.J.S.A. 58:11-59 to 63)
 5. Payments to State or Waters Diverted (N.J.S.A. 58:2-1 et seq.)

4.2 Regulatory Compliance History

The City of Newark's water treatment infrastructure has been characterized by a history of predictable finished water quality, typically in compliance with all primary and secondary regulations as promulgated under the Safe Drinking Water Act and its amendments. Recently (in the past 5-10 years) the City has seen some challenges in managing occasional finished water turbidity excursions at higher overall production rates. The CTA mechanism of operations data review and analysis however, has revealed that such excursions are reliably solvable through a suite of optimization steps for the existing plant treatment processes, and an update of plant instrumentation to a more modern, reliable, and maintainable platform of equipment.

4.2.1 Disinfection By-Products (DBP) Control Investigation

From February to April 2016, a DBP Bench Scale Investigation occurred for the City's distribution system. The City has seen an increase in haloacetic acids (HAAs) and total trihalomethanes (TTHMs), two groups of DBPs, since 2012. Recommendations, from the report by Carollo Engineers entitled "Disinfection By-Product Control, Bench Scale Investigation: February to April 2016", are summarized below.

4.2.1.1 Recommendations

Carollo Engineers in their report has recommended 3 (three) capital improvements:

1. Clarification Step (DAF or sedimentation) – This addition would reduce DBP formation by over 50%. Other benefits of a clarification step include color removal, increased filter production, increased unit filter run volumes, and reduced number of filter backwashes.
2. Ozone – Bench scale testing concluded that raw water ozonation alone reduced DBPs by 20%. If ozone is used alongside enhanced coagulation, DBPs are reduced an additional 20% (for a total of 40% removal).
3. Reservoir Management – Installation of a reservoir management system (i.e. spray nozzle system) at the Cedar Grove Reservoir. Bench scale testing showed a reduction of TTHM formation by over 50%.

4.3 Industry Best Practices

To better characterize the operations at PWTP, the H2M Team reviewed the capacities and operations of similar surface water treatment plants operating in nearby locations, and therefore likely dealing with similar overall constraints in terms of water quality, availability of staff, and cost of treatment commodities (electricity, chemicals, labor, trade services, and professional consulting). The focus was on reviewing operations and, in particular, staffing levels and redundancies:

4.3.1 Findings of Similar Surface Water Plants in the Passaic Valley

4.3.1.1 Benchmarking – Plant 1

In the first plant that was visited in December 2015, with an approximate finished water production capacity of 200 MGD, there was a strong sense of redundancy of both operations and management personnel, and equipment. There was also highly tightened security and up-to-date information technology systems. The director of IT custom-built the entire system to monitor process data and regular reporting. Plant operations data is recorded in 5 minute intervals. Regarding PLCs, no one failure can take a system out of service. Cyber security measures are also in place and have been approved by state and federal Homeland Security. Fencing is maintained all around and security personnel are present 24 hours a day in 3 shifts. The entire facility has cameras all throughout, and was in the process of upgrading the system and adding more cameras. Health and safety are taken very seriously; security responds to all medical issues and all personnel are CPR/first aid trained. There is also a safety/compliance staff member to oversee construction projects. The plant is exceptionally organized with a lot of overlap and collaboration between divisions and management. All personnel work as a team and the following five key principles are followed by all: communicate, involve, measure, recognize, and reward.

4.3.1.2 Benchmarking – Plant 2

At the second Passaic Valley plant, for which information was collected in April 2016, with an approximate finished water treatment capacity of 80 MGD, project operations are headed by a Senior Director of Operations, both to whom a Project Manager and Manager of Systems Maintenance report to. The Manager of Systems Maintenance oversees the Superintendent of Systems Maintenance and Foreman, who supervise

inspectors, sample collectors, utility workers, and heavy equipment operators. The Supervisor of the Watershed who reports to the Project Manager, oversees four utility workers. The Plant Manager, who also reports to the Project Manager, supervises a Maintenance Supervisor, eleven operations and maintenance technicians, and one instrumentation technician. Customer service/metering consists of the following personnel: Senior Director of Customer Service, Manager of Client Services, Manager of Metering Services, Metering Supervisor, Senior Billing and Meter Reading Administrator, eight meter readers, and one inspector. Reflecting the criticality of keeping pace with modern communications technology, it is also noted that the plant's instrumentation and control infrastructure were completely overhauled and replaced in 2011.

4.3.1.3 Conclusion

The general conclusion of operation benchmarking in similar surface water plants in the Passaic Valley indicates a policy of support to the primary operator by redundant teams of declining licensure. It is recommended that the City employ a full-time T-4 operator, supported by two (2) T-3 personnel, and a team of four (4) T-2 personnel, and that this team of managers administer the overall plant operations. The intent is that every manager in a leadership position is always training his or her understudy, in a redundant manner, such that no key operational management positions are ever bottlenecked through a single individual staff member. Also – critically – it puts management of the plant unit processes and administration in the hands of a redundant team of persons who are directly educated (both initially and continuously) to ensure that public health standards are rigorously met. It reduces the risk of critical failure through break in the succession planning process.

Also, in order to expose management employees to a greater understanding of current policies and regulatory trends, it is recommended that the City, at a minimum, sponsor membership for its entire water treatment and distribution staff of license holders (T-1 to T-4) in water industry professional organizations, specifically the American Water Works Association (AWWA), in the interest of securing a framework to ensure operations leadership continuing education, noting that AWWA is the USEPA's primary resource and technical research partner on matters of water quality and distribution system integrity. Further, the NJ State Section management providers an independently-managed framework of scheduling and reminders for continuing education and exposure to trending issues of regulatory compliance and emerging technology. As the drinking water supplier to the largest city in the state, and as a major contributor to management policy

of the Passaic River Watershed, Newark's executive leadership would be welcome to the interactive roundtable of discussion that occurs within the AWWA-NJ structure of committees, particularly the Water Utility Council. Finally, considering its size, scope of operations, and interconnectivity with other public water systems – Newark Water's executive leadership may reasonably consider sending a regular delegate to the meetings of the State's two drinking water advisory boards: The Water Supply Advisory Council and the Drinking Water Quality Institute. Such representation is practiced by both of the utilities benchmarked under this study.

4.3.2 Harmful Algae Blooms & Cyanotoxins

In 2015, the USEPA held a meeting to prepare for potential actions to be taken to respond to cyanotoxins in drinking water. Harmful algae blooms (HABs) are the overgrowth of blue-green algae, or cyanobacteria, which can lead to algal toxins and cyanotoxins in water. Although still unregulated, it is highly likely that in a few years harmful algae blooms and cyanotoxins will be regulated. Recently, there have been a few cases of low-levels of cyanotoxins in finished water, such as in Toledo 2014, which caused a health preventative shutdown. Preventative steps should be taken so that if the situation ever arises, the City is prepared and would not run the risk of having to shut down the plant.

4.3.2.1 Algae Alert & Action Plan

The American Water Works Association (AWWA) and Hazen & Sawyer have provided several resources and tools to aid in preparing for possible future algae regulations. The City should prepare an "Algae Alert & Action Plan" and proactively prepare a public notification plan in case it is ever needed. An example action plan is attached in Appendix 4A. To reduce risks of cyanotoxins in drinking water, the EPA has put together a suggested step-wise approach for utilities. This information is found on a Hazen & Sawyer fact sheet which is attached in Appendix 4B but summarized below:

- Understand vulnerability to HABs in the source water and develop a HAB and cyanotoxin monitoring plan.
- Determine appropriate algal toxin analysis method (Elisa, HPLC/UV, or HPLC/MS).

- Develop action plans to control cyanotoxins if they are detected in the raw or finished water.
- Evaluate treatment process for robustness of barrier(s) to cyanotoxins.
- Understand the implications and proactively set up communication plans related to detecting cyanotoxins in finished water (See Appendix 4B for EPA suggested protocols).

4.3.2.2 Self-Assessment Checklist and Hazen-Adams CyanoTOX tool

In order to aid the City in checking how prepared the system is for potential cyanotoxin events, attached in Appendix 4C is a quick self-assessment checklist prepared by AWWA. The checklist considers three main categories: source water monitoring, source water quality, and cyanobacteria present during the treatment process. Along with these resources, Hazen & Sawyer has developed the Hazen-Adams CyanoTOX tool (which has been reviewed by AWWA) to provide water utilities with as means to assess how changes in their existing treatment (dosing, contact time, etc.) will influence the degradation of cyanotoxins. After using the quick self-assessment checklist and verifying whether the system has low, moderate, or high cyanotoxin concern, the Hazen-Adams CyanoTOX tool can aid in adjusting treatment processes or dosing already available at the plant. With these tools and resources, the City will be able to develop plans and protocols relevant and unique to the Pequannock Watershed and will be prepared for the possible risks associated with HABs and cyanotoxins.

5.0 UNIT PROCESS: FILTRATION AND BACKWASHING

5.1 Filter Evaluation

An on-site inspection and evaluation of the filters at Pequannock WTP was conducted from August 17 to August 20, 2015 using a variety of evaluation techniques. Filter performance information obtained with these techniques was used to determine performance of filter components.

5.2 Existing Conditions

Pequannock WTP has twelve granular media filters with dimensions and operating conditions as shown in Table 5-1. Figure 5-1 contains a cross section of an existing filter. Each filter has two cells which are controlled by an orifice plate on the filtered water line. The original filter media consisted of 24 inches of anthracite and 10 inches of sand over 14 inches of gravel. The filters are equipped with clay block underdrains. Each filter has six rotary arm surface wash sweeps per cell and a center washwater trough.

Table 5-1 Existing Filter Design Criteria

Description	Units	Criteria
Type: Gravity, Granular Media		
Filter Control Mode: Declining Rate		
Underdrain Type: Clay Block Laterals		
Number of Units	No.	12
Cells Per Filter	No.	2
Filter Length	ft	60
Filter Width	ft	10
Filter Surface Area		
Per Filter	ft ²	1,200
Total	ft ²	14,400
Media Depth, Each Filter		
Anthracite	in.	24
Sand	in.	10
Gravel	in.	14
Filter Backwash		
High Backwash Rate (Measured) ⁽¹⁾⁽²⁾⁽³⁾	gpm/ft ²	19.0 - 19.6
Surface Wash Rate (Measured) ⁽¹⁾⁽²⁾	gpm/ft ²	3.2 - 5.0
Notes		
1. Data collected from January 1, 2014 to December 31, 2014 for Filters No. 4, 5, 6, 8, and 10.		
2. Measured flow rates have not been verified through a meter and pump calibration in over 20 years. Actual backwash rates may not be accurate.		
3. Filter media fluidization measurements provided in the 2014 CPE indicated a bed expansion of 1.4 percent.		

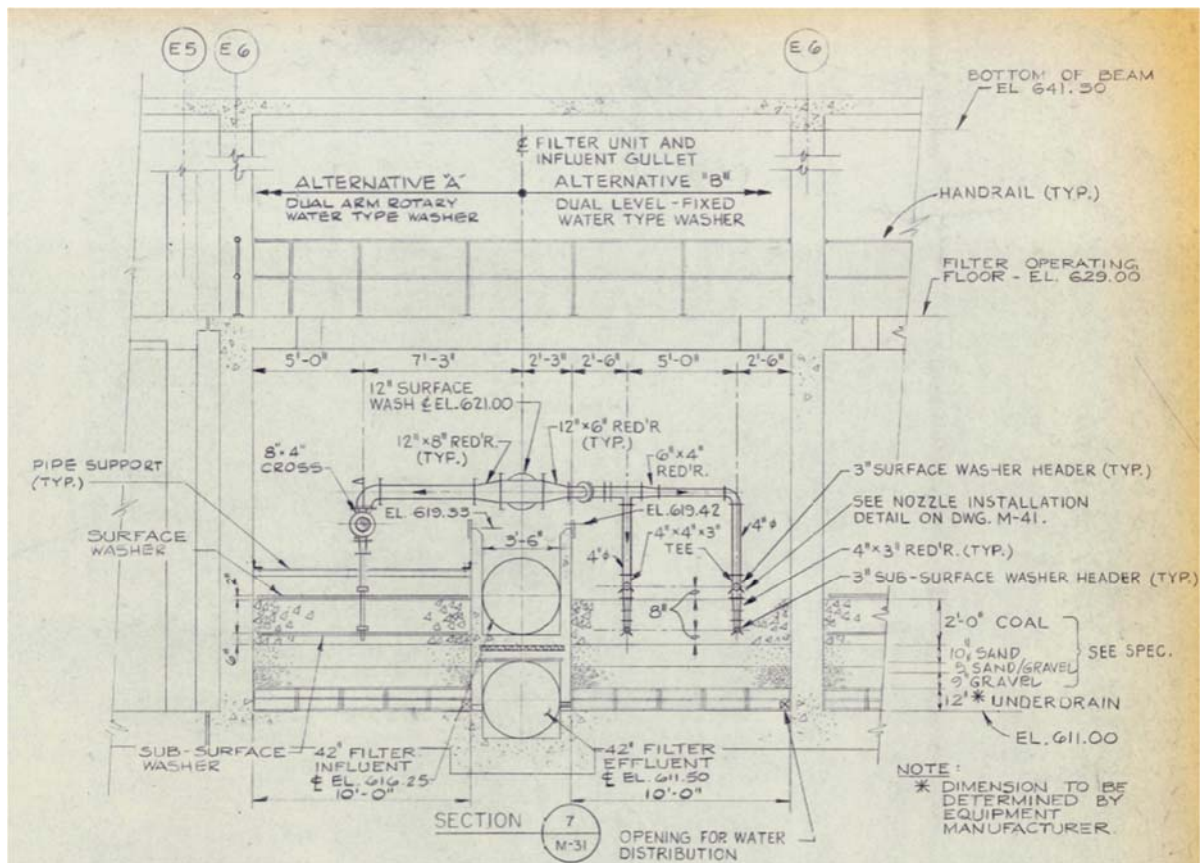


Figure 5-1 Cross Section View of the Existing Filters

A surface crust up to one inch has accumulated on top of the media. A photograph of a drained filter after a backwash is presented in Figure 5-2.

A filter backwash sequence is typically initiated based on in-service time. The current backwash sequence used at the WTP is listed below:

1. Close filter influent valve. Wait 20 to 30 minutes for drawdown.
2. Close filter effluent valve.
3. Open filter drain valve.
4. Start first backwash pump. Let the pump circulate for 20 seconds and then open the master backwash valve (MOV-611) to 35% open.
5. Open filter backwash supply inlet valve to 15% open.
6. Open the master backwash valve (MOV-611) to 100% open.
7. Start surface wash pump with surface wash pump valve 100% open.
8. Start second backwash pump. Open the filter backwash supply inlet valve to 55% open.
9. Close surface wash pump valve. Wait 10 seconds and stop surface wash pump.

10. Open the filter backwash supply inlet valve to 100% open.
11. Hold full backwash for 210 seconds. Close filter backwash supply inlet valve to 15% open.
12. Stop second backwash pump.
13. Close master backwash valve (MOV-611). Close filter backwash supply inlet valve. Stop first backwash pump.
14. Close filter drain valve.
15. Rest filter for two minutes. Open filter influent valve and filter effluent valve. Filter is returned to service.

5.3 Filter Media Characteristics

The existing media in Filter No. 4 was analyzed using sieve results of media obtained during filter coring. Effective size (ES), uniformity coefficient (UC), and specific gravity (SG) were determined for media samples collected after backwash. Results from the sieve analysis are shown in Table 5-2.



Figure 5-2 Drained Filter After Backwash

Table 5-2 Filter No. 4 Media Characteristics⁽¹⁾⁽²⁾

Media Depth (inches)	Effective Size (mm)	Uniformity Coefficient	Specific Gravity
Anthracite (0 - 2)	0.96	1.65	1.70
Anthracite (2 - 6)	0.92	1.67	1.72
Anthracite (6 - 24)	0.88	1.74	1.74
Sand (24 - 34)	0.51	1.67	2.36 ⁽³⁾
Notes			
1. Media sample from August 18, 2015.			
2. Test Method: ASTM C 136, ASTM C 117.			
3. This value is much less than a typical value of 2.65 for sand.			

Observations from the analysis of media in Filter No. 4 are listed below:

1. Analysis of media samples collected during coring events demonstrated acceptable media stratification with little media intermixing.
2. The ES of anthracite is about 10 mm smaller (about 10 percent) than the specified ES of 1.0 mm. The UC of anthracite is greater than the City specified UC of 1.50. A UC of 1.40 or less is now generally specified for media design.
3. The laboratory determined the sand media has a SG of 2.36. A more typical value is 2.65.
4. The effective sizes of the top 6-inches of anthracite is larger than the bulk (6 to 24 inches) anthracite. The discrepancy could be partially attributable to the differences in specific gravities.

5.4 Filter Media L/d Ratio

Filter media characterization in terms of ES, UC, and SG allows for calculation of an L/d ratio. This is an indicator of the adequacy of the size and depth of a filter bed for solids capture and storage. L is the depth of the filter bed (mm) and d is the effective size (mm) of the media. All other things being equal, a fine shallow media will produce equivalent water quality to a coarse deep bed filter if the L/d ratios are equal. The issue of filter run length is also related to the L/d discussion. A filter with a coarser and deeper media design can store more solids and generally achieve a longer run length than a fine shallow bed media design. A compromise between conflicting needs for a high L/d ratio for particulate removal and a coarse deep media for storage capacity led to the development of the dual media filter.

The calculated L/d ratio for Filter No. 4 is 1,180. $[(2 \times 25.4/0.96) + (4 \times 25.4/0.92) + (18 \times 25.4/0.88) + (10 \times 25.4/0.51)]$. This is about 33% lower than recommended L/d ratio for direct or in-line filtration plants of 1,800. A media design with this L/d value provides adequate storage for solids capture, produces excellent water quality, and achieves appropriate filter production efficiencies.

5.5 Unit Filter Run Volume (UFRV)

Traditional optimization criteria for granular filters is optimum water production, which will occur when terminal headloss and specified effluent turbidity standards are reached simultaneously. An additional constraint on optimization criterion is acceptable production efficiency. This criterion can be evaluated using the UFRV. UFRV is the volume of water filtered per unit area of a filter bed during a filter run and is expressed as gal/ft². In general, an in-line or direct filtration plant should have an UFRV of at least 5,000 gal/ft². For comparison, a conventional water treatment plant with a sedimentation process upstream of filtration should achieve a minimum UFRV of 10,000 gal/ft². Filter production and backwash information in 2014 are contained in Tables 10 and 11. In general, a filter run time was 31 hours and headloss accumulation ranged between 2.5 and 3 feet. Minimum, maximum, and average UFRV values for the filters at the Pequannock WTP during 2014 are shown in Table 5-5.

Table 5-3 Pequannock WTP Filter Data

Parameter	Unit	Average	Minimum	Maximum
Filters in Service	-	12	12	12
Filters Washed per Day	-	9	5	10
Filter Run Time	Hours	31	29	58
Note				
1. Data collected from January 1, 2014 to December 31, 2014.				

Table 5-4 Pequannock WTP Filter Backwash Data

Parameter	Filter 4	Filter 5	Filter 6	Filter 8	Filter 10
Before Backwash					
I/S Hours	32	31	32	31	31
Headloss	68	65	67	68	68
NTU	0.06	0.11	0.10	0.09	0.09
MGD	1.3	1.6	1.8	2.9	3.1
After Backwash					
Headloss	28	32	29	33	30
NTU	0.13	0.09	0.14	0.09	0.10
MGD	5.4	5.2	5.6	5.5	5.7
Backwash Flows					
One BW Pump (gpm)	13,200	13,200	13,000	13,300	13,400
Two BW Pumps (gpm)	23,500	22,800	23,400	23,000	23,500
Surface Wash Pump (gpm)	3,800	4,300	4,200	4,700	6,000
Notes					
1. Data collected from January 1, 2014 to December 31, 2014.					
2. Average values are presented in table.					
3. Filter No. 5 is a historically better performing filter in terms of effluent turbidity data.					
4. Filter No. 6 is a historically poor performing filter in terms of effluent turbidity data.					

Table 5-5 Unit Filter Run Volumes⁽¹⁾

Metric	UFRV (gal/ft ²) ⁽²⁾⁽³⁾
Average	3,400
Maximum	3,700
Minimum	2,700
Notes	
1. Data collected from January 1, 2014 to December 31, 2014.	
2. UFRVs were calculated using plant delivered water data and averaging across all filters. Data for individual filter flow rates during declining rate filtration is unavailable.	
3. All UFRVs calculated using an average in-service time of 31 hours.	

The UFRV goal for the Pequannock WTP should be a minimum of 5,000 gal/ft², while still maintaining similar finished water quality in terms of turbidity and particle counts.

5.6 Unit Filter Backwash Volumes

Unit filter backwash volume (UFBV) is the volume of water used to backwash a filter per unit area of a filter bed and is expressed as gal/ft². UFBV values for selected filters at the Pequannock WTP during 2014 are shown in Table 5-6.

Table 5-6 Unit Filter Backwash Volumes⁽¹⁾

	UFBV (gal/ft ²) ⁽²⁾
Filter No. 4	77
Filter No. 5	76
Filter No. 6	78
Filter No. 8	78
Filter No. 10	82
Notes	
1. Data collected from January 1, 2014 to December 31, 2014.	
2. Average values are presented in table.	

A typical range for UFBV is between 200 to 300 gal/ft². A UFBV includes all the water used in a backwashing cycle including drawdown, surface wash, backwash, and filter to waste. To provide perspective, a backwash at 20 gpm/ft² for 6 minutes results in a UFBV of 120 gal/ft². The UFBVs visited in Table 13 are surprisingly low. This suggests either all water associated with a filter backwash is not accounted for and/or the surface and/or backwash rates are lower than reported. This is likely based on the reported 1.4% bed expansion measurements collected during the 2014 CPE report.

5.7 Filter Media Compatibility

The purpose of filter backwashing is to remove captured particles. This is accomplished by fluidizing the filter media. Captured particles have lower settling velocities than the filter media. Thus, during

fluidization, the media will stay in suspension and unwanted material will travel upwards and out of the filter box. Effective backwashing of dual media filters requires hydraulic matching of the two media types.

During effective backwashing of a dual media filter, the different media types are expanded. Appropriate and effective media expansions for anthracite and sand are 20% and 30%, respectively. For perspective, the anthracite in the existing filters was reported to have expanded 1.4% in the 2014 CPE report.

Given the filter media characteristics presented in Table 5-2, appropriate backwash rates at 20°C for the existing sand and anthracite for Filter No. 4 were determined and are presented in Table 5-7 below.

Table 5-7 Appropriate Backwash Rates at 20° C For Filter No. 4

Media	Effective Size (mm)	Specific Gravity	Appropriate Backwash Rate (gpm/ft ²)
Anthracite	0.88	1.74	22.1
Sand	0.51	2.36/2.65 ²	18.5 ¹ /21.0 ²
Notes			
1. Lab results for specific gravity from sample collected from Filter 4. A more standard value is 2.65.			
2. Corresponding backwash rate for a sand with an effective size of 0.5 mm and a specific gravity of 2.65.			

The average backwash rate for Filter No. 4 during 2014 was reported to be 19.6 gpm/ft². However, measured flow rates have not been verified through a meter and pump calibration in over 20 years, and actual backwash rates may not be accurate. If backwash pump flow rates are assumed to be accurate, the current backwash rate is 2.5 gpm/ft² less than the recommended backwash rate for the anthracite media. Backwashing at this rate could result in mudball formation in the anthracite layer. In addition, the calculated UFBV are well below what is normally needed to adequately remove captured solids from a media filter. This may suggest the actual backwash rate is much lower than reported values.

5.8 Floc Retention Profiles

Floc retention profiles were developed for Filter No. 4 for the August 2015 filter corings. The profiles are shown in Figures 5-5 through 5-11. A map of the filter coring locations for the respective floc retention profiles is provided in Figure 5-4. A legend containing classifications regarding turbidity results is shown on the figures. In addition, depths for each media type are on the right side of the axis. Media depth is plotted on the vertical axis and turbidity per 100 grams of filter media is plotted on the horizontal axis. Both before-backwash and after-backwash results are shown on the same chart for comparison purposes.

A floc retention profile for an ideal filter before backwash shows a linear distribution of solids throughout the entire filter media depth with the lowest floc retention at the greatest depth. An ideal filter uses the

entire storage capacity of the media for solids retention prior to termination of the filter run. An effective filter media exhibits a floc retention profile before backwash with five or more times the floc retention at the top of the filter than at the bottom, with a linear distribution in between. The following conditions promote ideal filter operations:

- Filter media must be properly sized and filter floc properly conditioned. This promotes solids penetration into the bed and not filter surface straining.
- Pretreatment of a conditioned floc material must be controlled to prevent turbidity breakthrough before the solids retention capacity of a bed is used.

An ideal filter bed should be uniformly cleaned over the entire media depth following backwash and a floc retention profile should be a straight vertical line over the entire depth. The backwashing procedure should result in media that is not too clean, but is properly ripened to allow for minimum breakthrough during initial filter operations. An ideal floc retention profile is shown in Figure 5-3. Based on experience, the following criteria are used to evaluate a filter floc retention profile:

- A floc retention value of 30 to 60 NTU represents a clean media which can produce acceptable effluent turbidity.
- A floc retention value of 60 to 120 NTU after backwash represents a slightly dirty, less than ideal filter bed. Such a filter will be effective at removing turbidity during the beginning (i.e. maturation) period of the filter run.
- A floc retention value greater than 120 NTU represents a dirty filter. This filter will likely accumulate solids over time.
- A floc retention value greater than 300 NTU after backwash indicates excessive solids in the filter media and an increased likelihood of mudball problems.

Some general observations are listed below based on the floc retention profiles and the media sampling taken during the filter corings.

1. Surface and sub-surface mudballs were discovered in a majority of the filter corings. This indicates a history of inadequate backwash rates, uneven backwash distribution, and an ineffective surface wash. The presence of mudballs in the media results in inactive areas in the filter bed. This leads to an increase in filtration rates where the filter has not been plugged, an increase in headloss across the filter, a decrease in filter run time, and a decrease in filter effluent quality.

2. Floc retention profiles do not follow the ideal linear relationship as depicted in Figure 5-3. Solids loading in the filter media is significantly greater in the upper media layers. This indicates that floc has not been properly conditioned for filtering by the pretreatment processes and filter surface straining is occurring. The entire storage capacity of the filter bed is not being utilized.
3. At two core locations, high levels of floc were measured in deeper media layers. This indicates a history of inefficient backwashing. Unfortunately, our experience at other WTPs with similar conditions has shown that it is not possible to remove accumulated solids from deeper media layers.

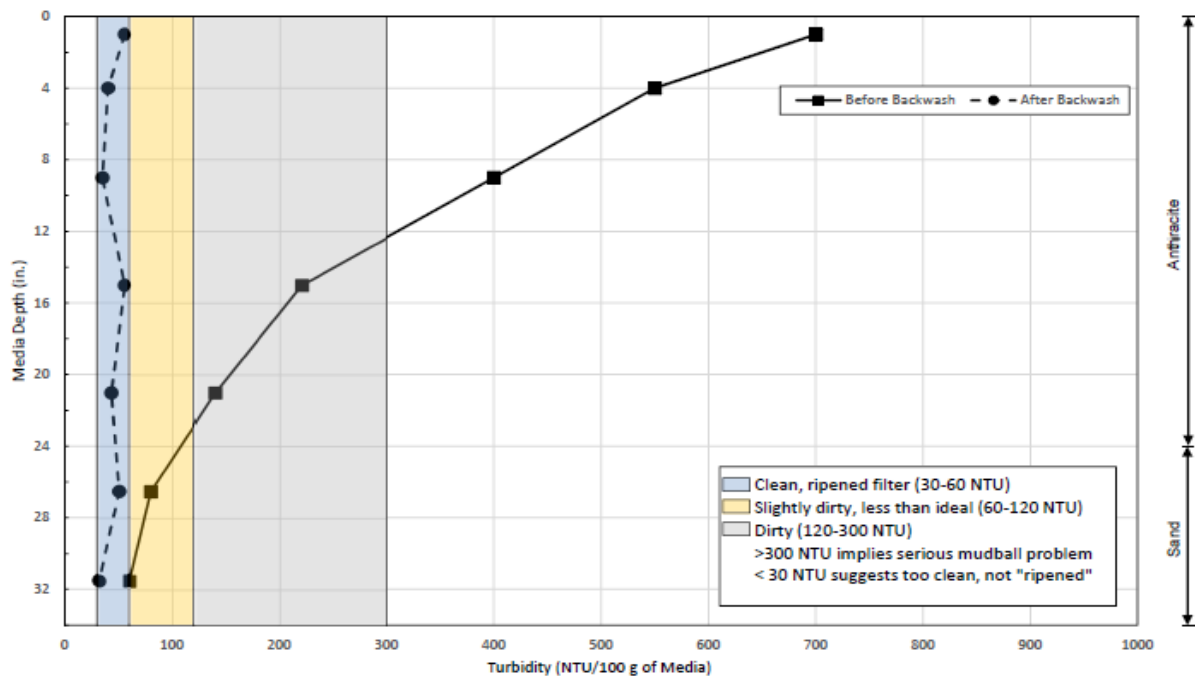


Figure 5-3 Ideal Floc Retention Profile

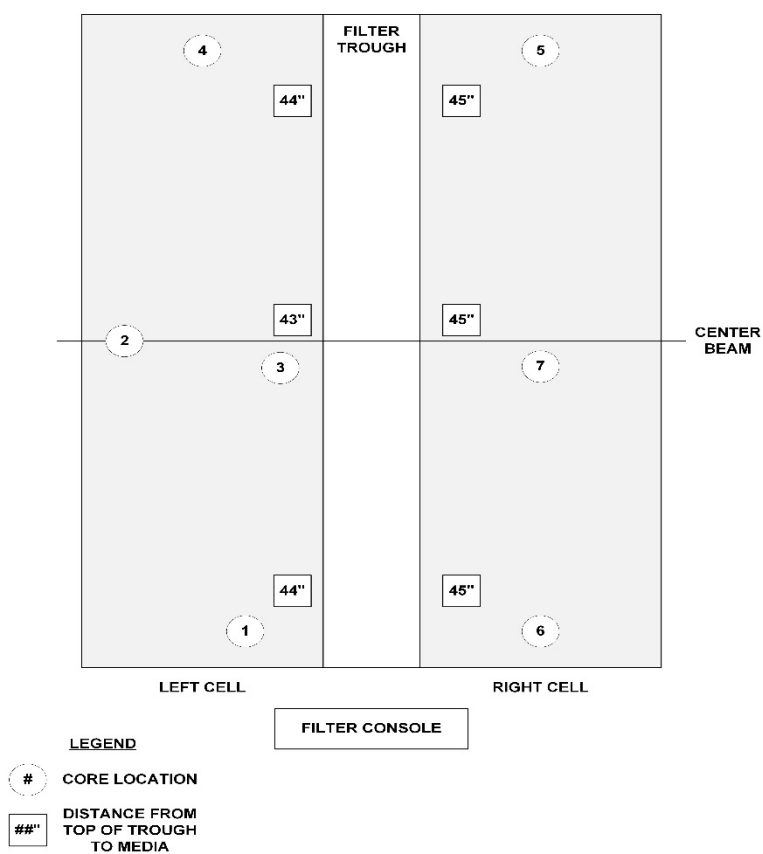


Figure 5-4 Filter Coring Map

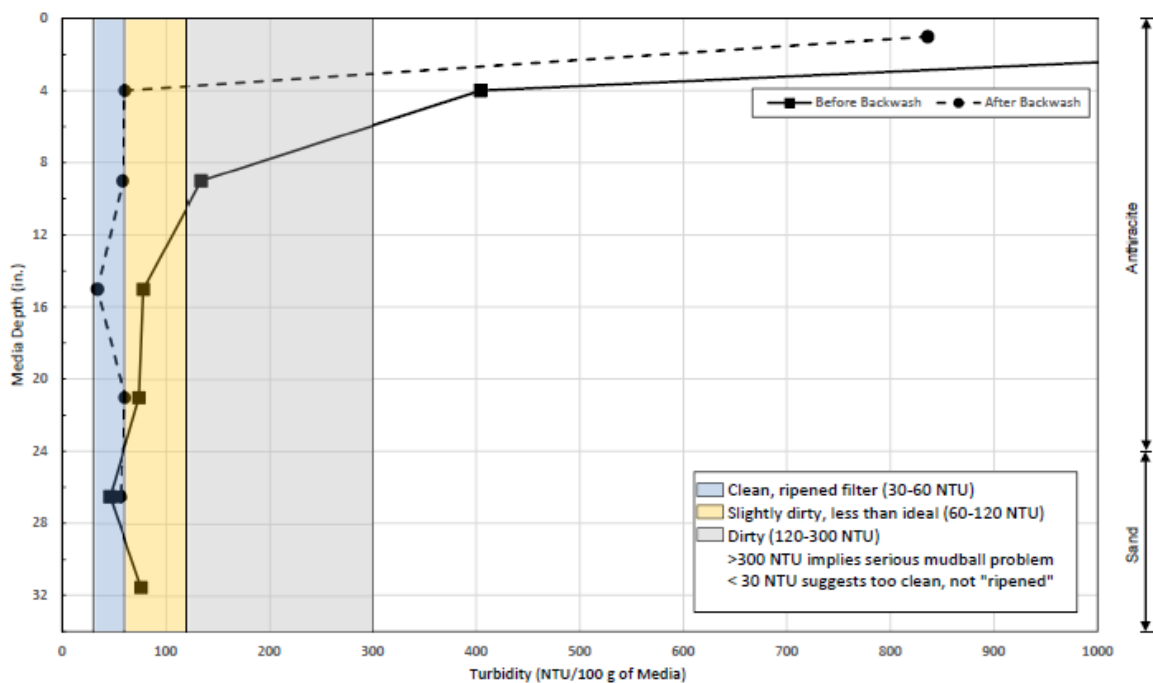


Figure 5-5 Filter No. 4 - Core Location 1 Floc Retention Profile

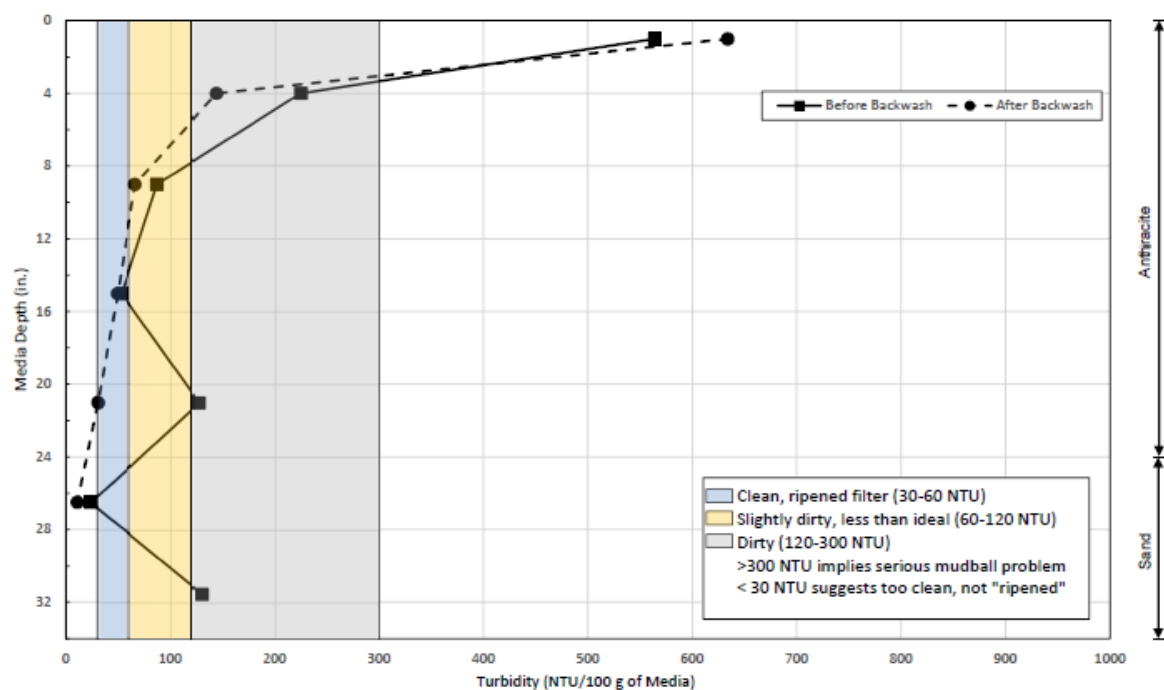


Figure 5-6 Filter No. 4 - Core Location 2 Floc Retention Profile

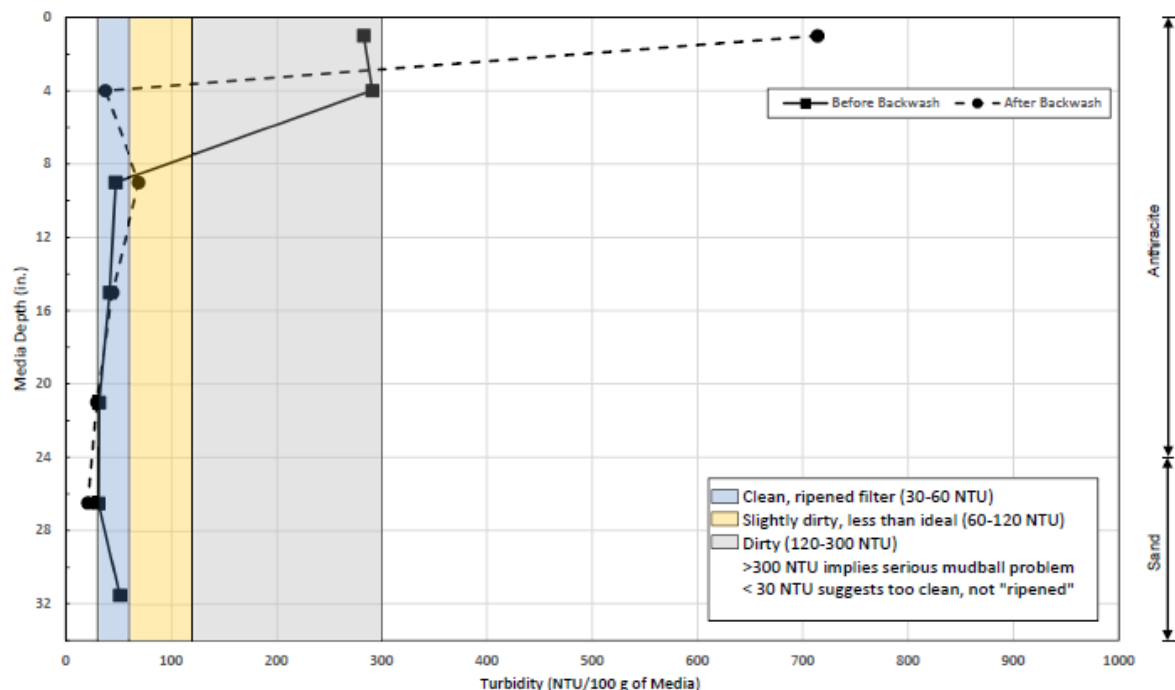


Figure 5-7 Filter No. 4 - Core Location 3 Floc Retention Profile

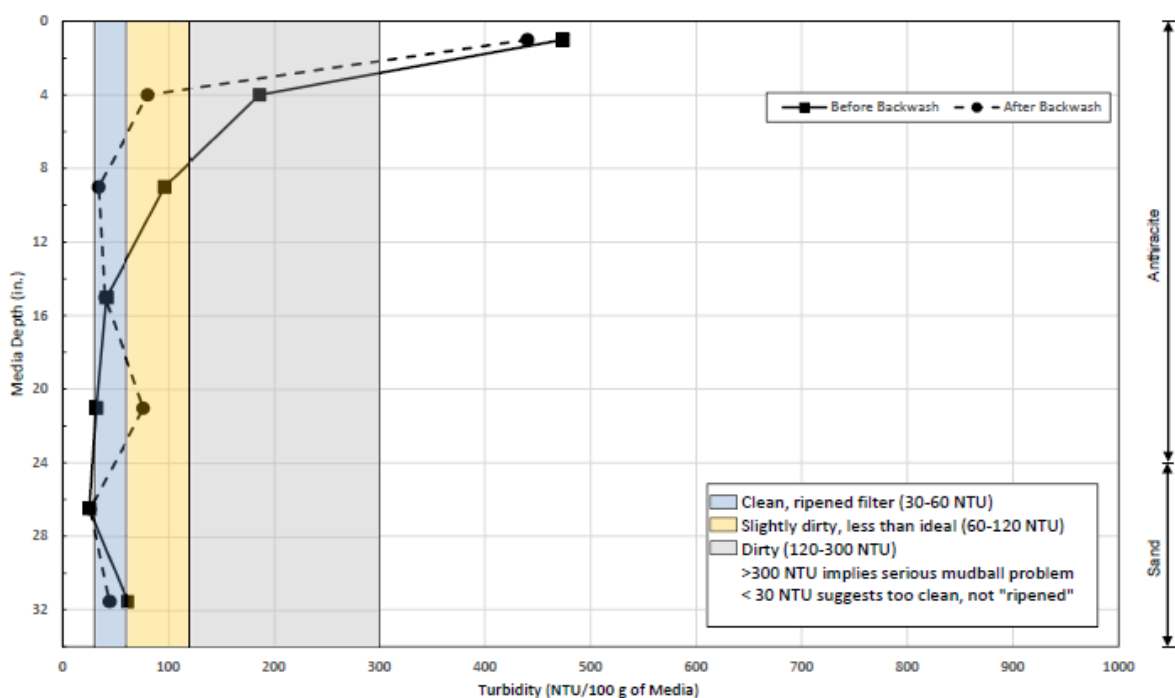


Figure 5-8 Filter No. 4 - Core Location 4 Floc Retention Profile

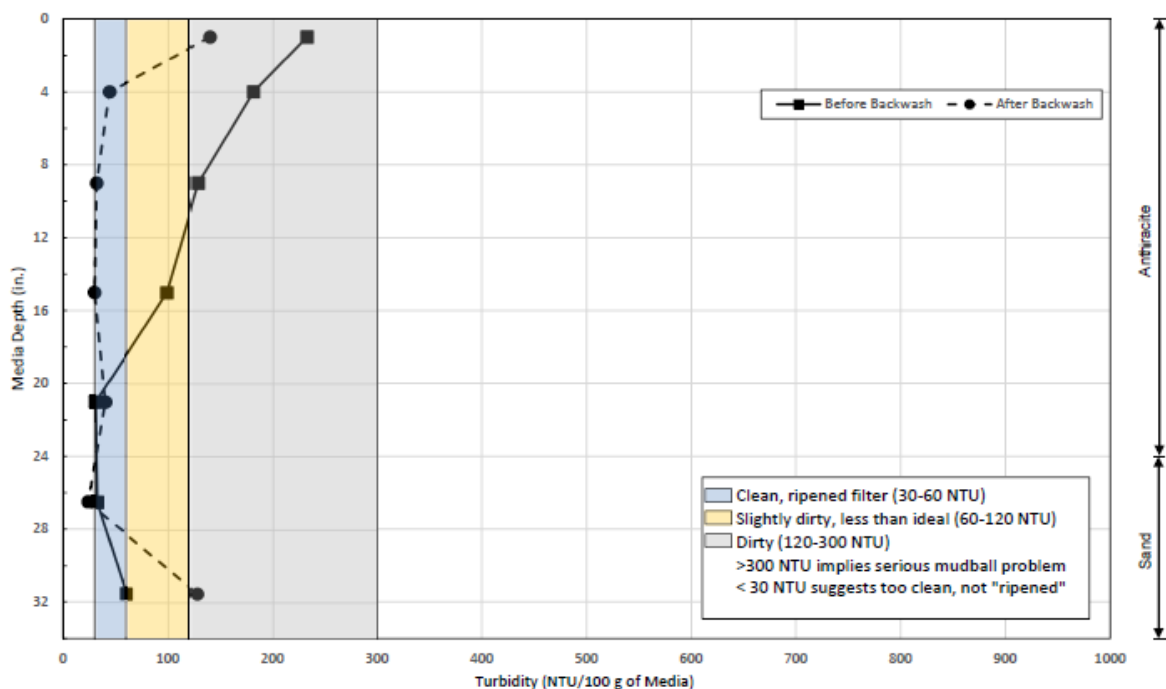


Figure 5-9 Filter No. 4 - Core Location 5 Floc Retention Profile

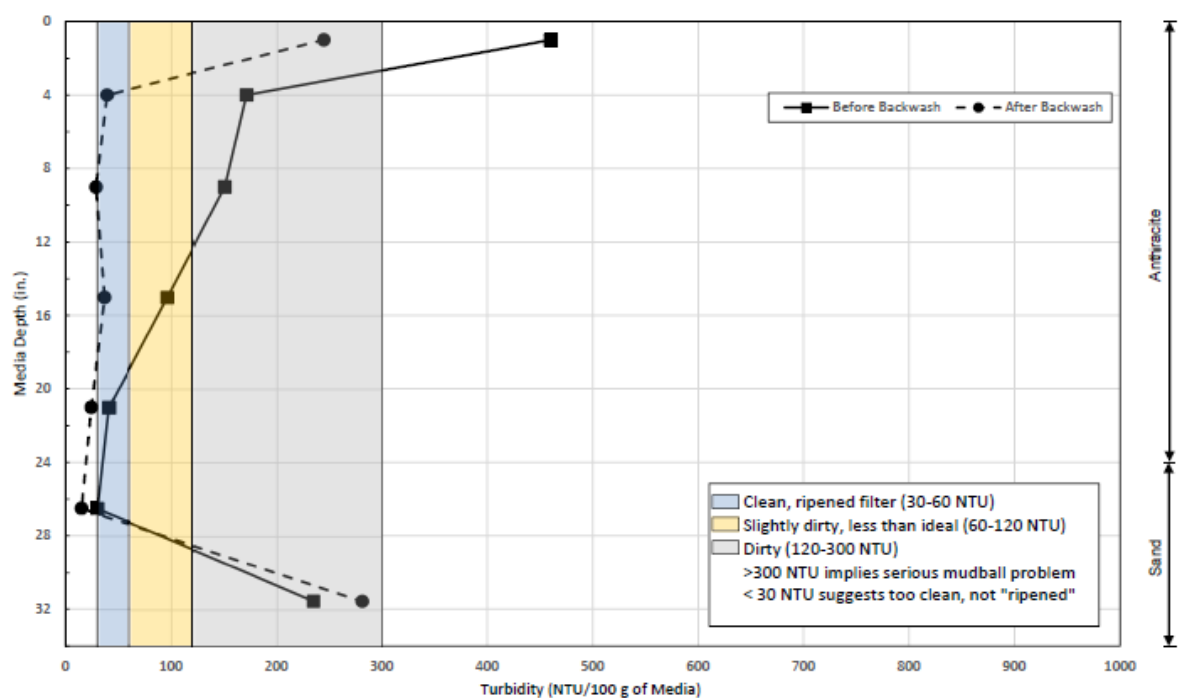


Figure 5-10 Filter No. 4 - Core Location 6 Floc Retention Profile

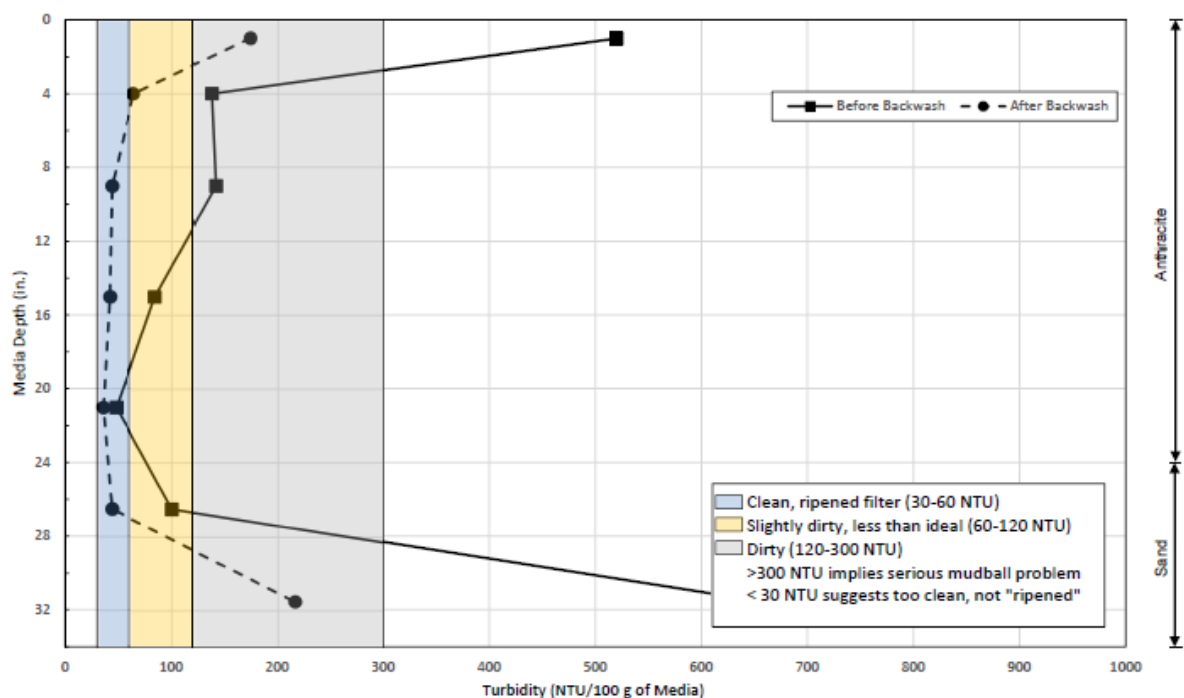


Figure 5-3 Filter No. 4 - Core Location 7 Floc Retention Profile

5.9 Filter Washing Procedures

Profiles of filter waste washwater turbidities were developed by collecting samples from the washwater trough during backwash at various time intervals during a backwash sequence. Time zero (T=0) represents the moment at which the waste washwater flowed over the top of the trough. A waste washwater turbidity profile should show a peak of high solids concentration at the beginning of the backwash and then drop off rapidly. Eventually an inflection point in the curve is reached where continued backwashing results in diminished returns in terms of solids removed. A pronounced high peak dropping to a low curve is characteristic of effective backwashing. A low profile and indistinct peak dropping to a low curve is characteristic of less effective wash. Washwater turbidities less than 15 NTU suggest over cleaning of filter media. Over cleaned media will increase the initial filtered water turbidity breakthrough and result in longer filter ripening and maturation periods. Our recommendation is to terminate the backwash at a turbidity level of approximately 15 NTU.

Filter waste washwater turbidity profiles generated during backwashes of Filters No. 7 and 10 are shown in Figures 15-13 through 5-15. An ideal filter waste washwater turbidity profile is shown in Figure 5-12. As illustrated in the figures, current backwashing procedures do not produce a pronounced peak of solids removal at the beginning of a backwash. However, in general, solids were removed from the filter beds and turbidity dropped below 15 NTU within 5 minutes. Results indicate minimal solids removal after this time period.

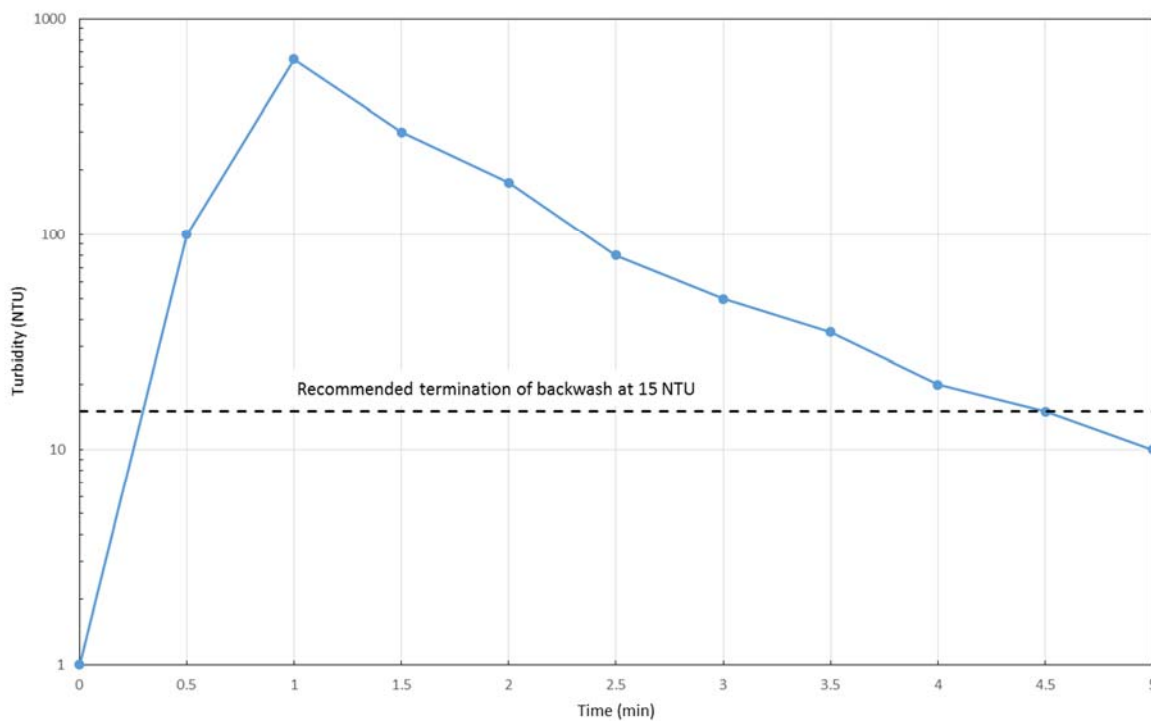


Figure 5-12 Ideal Filter Waste Washwater Profile

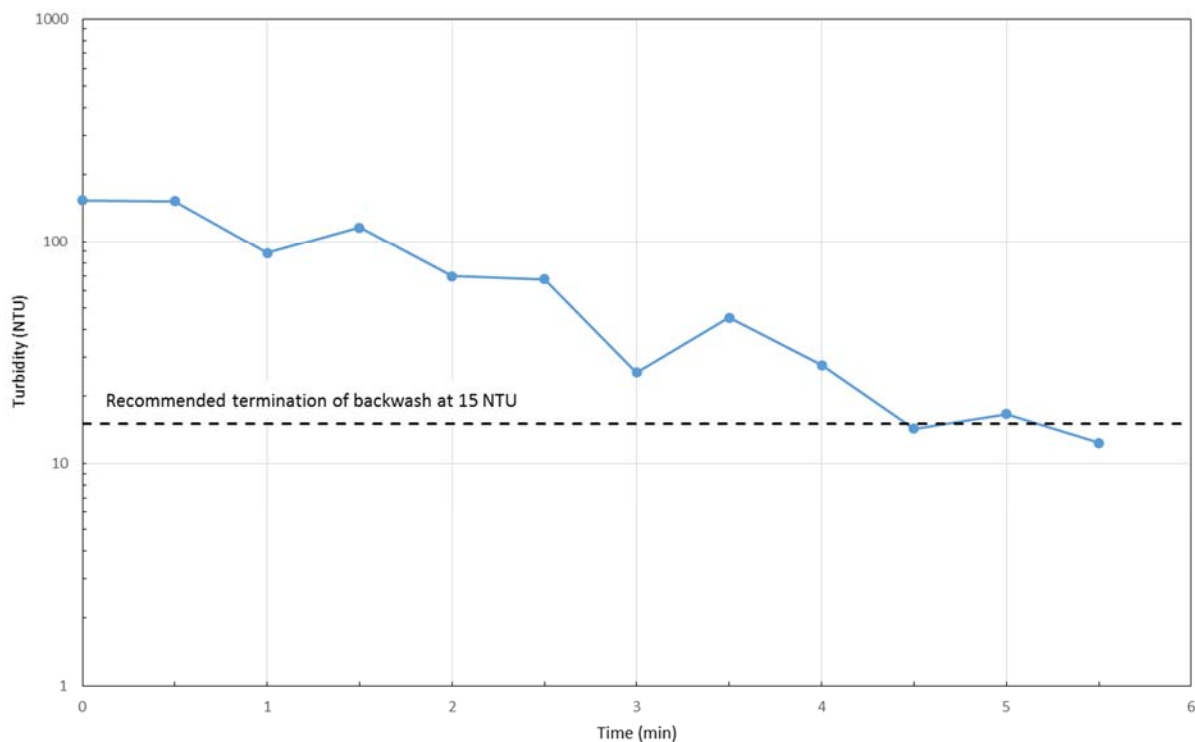


Figure 5-13 Filter Waste Washwater Profile - Filter No. 7 (August 18, 2015)

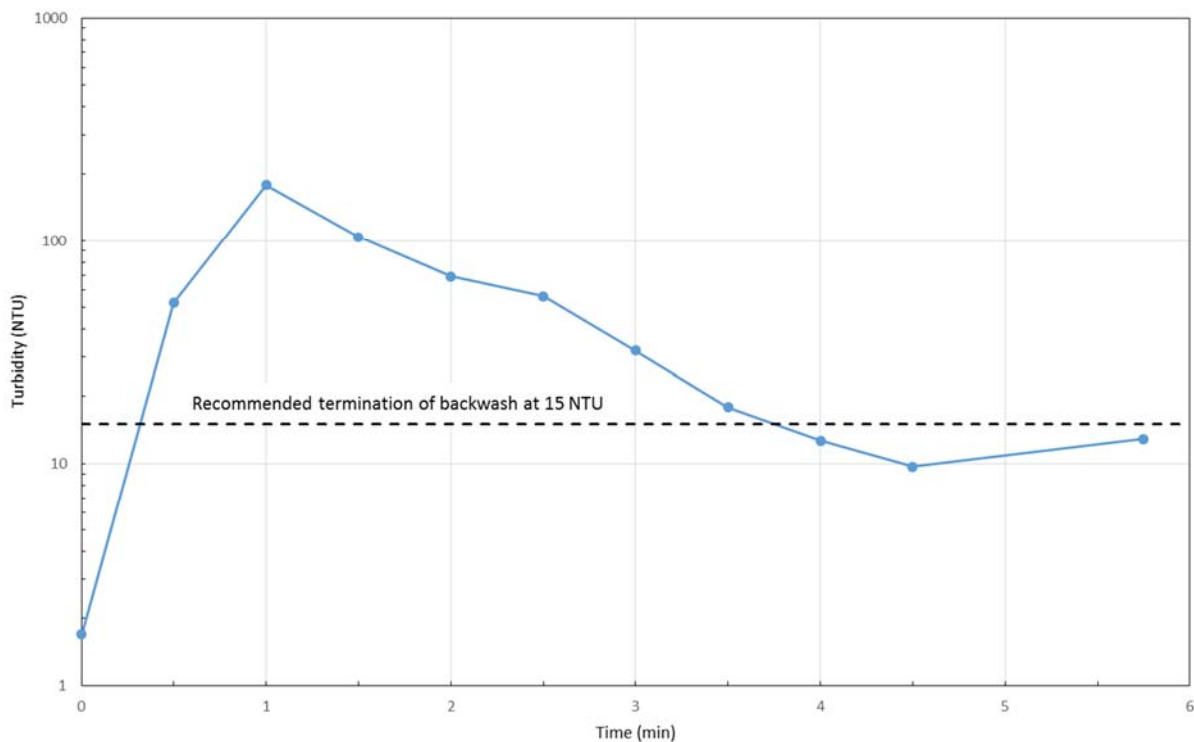


Figure 5-14 Filter Waste Washwater Profile - Filter No. 10 (August 19, 2015)

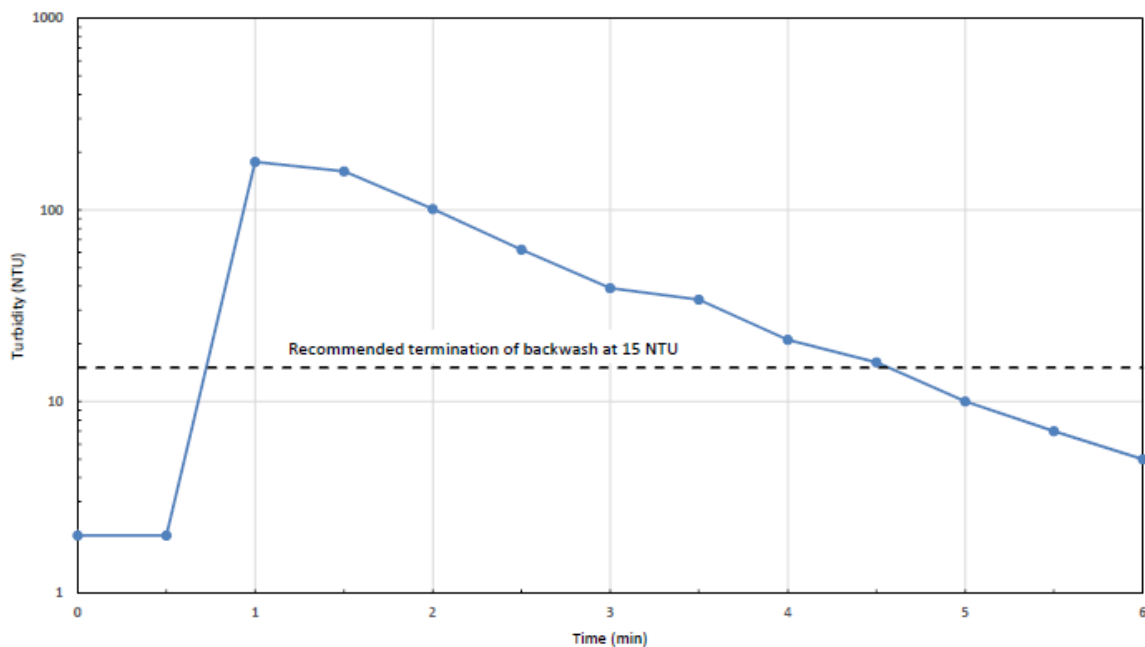


Figure 5-15 Filter Waste Washwater Profile - Filter No. 10 (August 20, 2015)

Based on these profiles, the following suggestions are offered with respect to media backwashing procedures:

1. Backwash duration of about 6 minutes is appropriate.
2. The filter washwater turbidity profiles exhibit either a low peak or an indistinct peak and low profile. Both are indicative of an ineffective backwash. An improved backwash system and sequence would remove turbidity more quickly and provide more effective cleaning of the filter media. As mentioned in the Filter Media Compatibility section, a higher rate backwash than currently available is required to properly expand the anthracite and sand medias. Additionally, features to protect the structural integrity of the filter underdrains from excess pressure, such as a constant head box, are not provided with the current design.
3. Surface wash is being used but in an ineffective manner. Suggestions to improve performance of the surface wash function are listed below.

5.10 Revised Backwash Sequence

In the interim, the current backwash sequence can be optimized prior to installation of a new high rate backwash system. Our recommendation is to revise the backwash sequence as listed below:

1. Drain down water level to approximately 4 inches above the filter bed.
2. Start surface wash and run for 2 minutes.
3. Start backwash pumps and ramp up to maximum flow. Run concurrent surface wash and backwash for 2 minutes.
4. Stop surface wash and continue backwash until washwater turbidity reaches 15 NTU (approximately 3 to 4 additional minutes).
5. Reduce backwash rate to approximately 5 gpm/sf and perform a rinse-to-waste step for a duration equal to the period it takes to replace the volume of the filter (approximately 5 minutes).

This procedure provides several advantages over the existing backwash sequence. Drawing down the water level in the filter and providing time to surface wash at this lower level will allow for a more effective breaking of the filter surface crust on top of the media. The low wash rate has been eliminated from the

sequence. It has been replaced with an immediate ramp up to the high rate wash that will remove more turbidity more quickly. The rinse-to-waste step removes the remaining backwash water from the filter and limits the turbidity breakthrough at the beginning of a filter run. Rinse-to-waste has been shown at other water plants to be an effective replacement to filter-to-waste. Data presented in the 2014 CPE indicated elevated filtered water turbidities upwards of 0.2 NTU occurring during the filter maturation phase. Rinse to waste may be capable of reducing these startup turbidities to less than 0.1 NTU.

The actual durations of the revised backwash sequence will need to be optimized based upon backwash performance. A longer high rate concurrent wash may result in higher media loss. Media accumulation in the backwash wastewater holding tanks should be monitored.

5.11 Filtration Rate Control

The filters are currently operated in a declining rate filtration mode, where the flow rate to each filter varies with head loss. Rate control is provided by an orifice plate on the filter effluent piping that limits the maximum flow through the filter. The maximum filter flow rate occurs after a filter has been backwashed and is in its cleanest state. As a filter accumulates solids, flow rate through the filter declines. However, total plant production remains the same, as the cleaner filters accept more flow to compensate for the dirtier filters.

It is recommended that the filters be operated in level rate-of-flow control. In this control system, flow from the filters is equally divided between the online filters through a flow control valve and meter on the discharge of each filter. If more flow is sent to the filters and the inlet channel water level rises, the control valves and meters will automatically adjust to maintain a new, higher flow to the online filters. In this way, the filter inlet channel water surface will remain within a stable operating range and loadings to the filters will be equally divided. This results in increased production, increased UFRVs, and improved filtered water quality.

5.12 Conclusions and Recommendations – Filters

Based on the above evaluation of the filters at Pequannock WTP, conclusions and recommendations are listed below:

1. Due to the extent of mudballs present in the media, high levels of floc in deeper media layers, and poor hydraulic matching of the media, replacement of the filter media may be necessary. Physical removal of the dirt layer on top of each filter may improve filter performance.

2. The existing filter backwash system should be replaced with a system designed for appropriate backwash rates and control. Additionally, a constant head box should be installed on the backwash supply line to protect the filter underdrains from excess pressure. New magnetic flow meters should be installed on the backwash supply and surface wash supply lines to reliably and accurately measure these flow rates, as well as adjust them accordingly.
3. A surface wash system is appropriate for the depth of media currently installed. However, the existing surface wash system has been ineffective in breaking the surface crust on top of the media. A new fixed nozzle type surface wash is recommended, which offers fewer maintenance requirements when compared to a rotating arm surface wash.
4. The backwash sequence should be revised as presented previously.
5. Improvements to the pretreatment process are recommended to promote development of a properly conditioned and filterable floc. This will promote solids penetration into the filter media bed. Pretreatment improvements are discussed later in the report.
6. Transition from declining rate filtration to rate-of-flow control is recommended. This will increase production, increase UFRVs, and improve filtered water quality.

6.0 RESIDUALS HANDLING

Solids (sludge) are the residuals removed from the raw water by the treatment process. Water treatment solids are composed primarily of the inorganic silts and clays suspended in the raw water with organic material contributed by algae and TOC. The use of chemical coagulants at the Pequannock WTP adds aluminum hydroxide and polymer to the final solids.

Objectives of a residuals handling facility are listed below:

1. Separate solids from the treatment process stream.
2. Store and recycle filter waste washwater to the plant for retreatment.
3. Provide temporary storage for solids which have been removed from the process stream.
4. Dewater solids so that they can be removed from the site for ultimate disposal.

6.1 Existing Conditions

The existing residuals handling facilities consist of two filter backwash wastewater holding tanks, two decant tanks equipped with plate settlers, a sludge lagoon, and pumping facilities. During a filter backwash, the waste washwater is routed to the holding tanks for equalization, and then pumped to the decant tanks for settling and thickening. The clarified water from the decant tanks is recycled to the front of the treatment plant. Table 6-1 contains the quality of the decanted and recycled water. The waste solids from the decant tanks are pumped to the sludge lagoon. Design criteria for the existing solids handling facilities are summarized in Table 6-2.

Table 6-1 Pequannock WTP Combined Decant Water Quality

Parameter	Unit	Average	Minimum	Maximum
pH	-	6.3	5.0	7.8
Turbidity	NTU	2.3	0.1	16.0
Chlorine	mg/L	0.08	0.00	0.42
Note:				
1. Data collected from January 1, 2014 to December 31, 2014.				

Table 6-2 Existing Solids Handling Design Criteria

Description	Units	Criteria
Wastewater Holding Tanks		
Type: Concrete Basins		
Number of Basins	No.	2
Capacity per Basin	gal	275,000
Total Capacity	gal	550,000
Number of Backwashes Stored (120,000 gal/backwash)	No.	4.5
Decant Tanks		
Type: Concrete Basins w/ Plate Settlers		
Number of Basins	No.	2
Length of Basin	ft	48
Width of Basin	ft	48
Maximum Overflow Rate	gpm/ft ²	2.2
Maximum Flow Rate	gpm	5,000

Capacity of the washwater holding tanks is currently reduced due to the significant constant flow from leaking filter drain valves. Refer to the photograph in Figure 6-1 for a visual representation of the constant water flow into the holding tanks. It was not possible to quantify the flow rate of the leaking valves, but it is substantial enough to adversely affect plant performance and reduce production efficiency.

6.2 Solids Production

Sludge production rates can be approximated using empirical formulas and plant operational data. Estimated solids production for the WTP are shown in Table 6-3.



Figure 6-1 Flow From Leaking Filter Drain Valves

Table 6-3 Estimated Solids Production Rate⁽¹⁾

Description	Units	Criteria
Average Raw Water Flow Rate	MGD	38
Average Sludge Flow	gal/day	42,000
Average Percent Solids	%	1.1
Minimum Percent Solids	%	0.6
Daily Dry Sludge Flow Rate	gal/MG treated	12
Sludge Flow Rate (60 MGD @ 1.1% solids)	gal/day	64,000
Sludge Flow Rate (60 MGD @ 0.6% solids)	gal/day	118,000
Note		
1. Production rates based on historical data collected from January 1, 2014 to December 31, 2014.		

6.3 Ongoing Facilities Improvements

Improvements to the Pequannock WTP solids handling facilities are currently under design by Hatch Mott MacDonald (HMM). HMM has proposed a new residuals treatment facility consisting of a gravity thickener, centrifuge, thickened sludge mixing equalization basin, centrifuge feed pumps, a polymer feed system, a screw conveyor system, a centrate/supernatant pump station, and a residuals pump station. Design sludge flows used for the new facility are shown in Table 6-4.

Table 6-4 Design Sludge Flows for the New Residuals Treatment Facility

Description	Units	Criteria
Sludge Production (Current Max)	lbs dry sludge/day	6,300
Sludge Flow at 0.6%	gpd	125,000
Sludge Production (Future Max)	lbs dry sludge/day	8,000
Sludge Flow at 0.6%	gpd	160,000

As noted previously, sludge flow produced at the maximum plant flow rate (60 MGD) and minimum percent solids (0.6 percent) was estimated to be 118,000 gpd. This value is consistent with the design sludge flow of 125,000 gpd at 0.6 percent solids that is used on the residuals treatment facility design project.

7.0 RAW AND FINISHED WATER FLOW MEASUREMENTS

The raw water and finished water flow rates at the Pequannock WTP are monitored by flow measuring devices. A Parshall flume upstream of the filters is utilized to measure raw water flow. Two Venturi meters downstream of the clearwells are utilized to measure finished water flow.

Under ideal conditions, a Parshall flume can demonstrate accuracies to within 3 to 5 percent of actual flow. However, field assessment of Parshall flume measurements often result in actual displayed accuracies of 5 to 8 percent. A Venturi meter can exhibit accuracies to within 0.5 to 1 percent of actual flow if installed without upstream disturbances to the flow profile.

A comparison of the raw and finished water volume indicates that, on average, the volume of finished water measured by the Venturi meters is approximately 0.1 percent less than the volume of raw water measured by the Parshall flume. Approximately 0.1 to 0.5 percent of water treated is typically wasted through solids and other losses such as evaporation and leakage. The 0.1 percent loss between raw and finished water flows seen in the available flow data is consistent with expected measured values.

Plant staff has noted that instrument calibrations have been infrequent. It is recommended that the differential pressure devices on the Venturi meters and the level instruments on the Parshall flume be inspected and calibrated on a consistent and routine basis.

8.0 PLANT OPERABILITY/PROCESS CONTROLLABILITY

The plant's existing electrical and control features are discussed and recommendations to improve plant operations and process control are presented below.

8.1 Electrical Equipment

Pequannock WTP utilizes General Electric 12.4 KV 600 Amp switchgear with 2,000 KVA transformers. This equipment feeds 480 V switch gear that distributes power to the plant motor control centers that feed to power and lighting panels. A majority of the electrical power equipment was installed in 1989. The City has a service contract with General Electric to provide on call maintenance. There is presently no plant electrical staff. As a result, maintenance is not performed on electrical equipment. Arc flash analysis and system studies with proper equipment labels are recommended moving forward to improve safety and meet NFPA (National Fire Protection Association) requirements. The main switchgear and generator synchronizing equipment was identified as needing maintenance or replacement due to past power outage transfer issues. MCCs (motor control centers), transformers, and panels are all nearing their service life and are due for replacement.

8.1.1 Controls and Automation

Pequannock WTP utilizes PLC (programmable logic controller) type/version ABB Symphony on Conductor NT platform version of SCADA HMI (human machine interface) software. This system allows for process monitoring, supervision, alarm reporting, management, data trending, and archiving. The City has a service contract with ABB. A majority of plant instrumentation, including PLCs, was installed in 1997. Instruments have been replaced as needed once they are no longer functioning or become unable to maintain accuracy. Staff noted that most instrument calibration is out of date and documentation of calibration is limited. The plant is shorthanded on electrical, instrumentation, and control staff. They have primarily relied on ABB support for a bulk of their SCADA and instrumentation needs.

8.1.2 Communication Protocols

Pequannock WTP is equipped with redundant multi-mode fiber loop that is routed to each of the PCUs. Ethernet is used for drop links to computer work stations. Wireless communication is used for monitoring the four remote sites: the dam/intake, screen house, pretreatment, and sample house. A separate network is used for cameras and security systems.

8.1.3 Conclusions and Recommendations

Based on the above existing conditions for process controls at Pequannock WTP, conclusions and recommendations are listed below:

1. Replace the generator automatic transfer and synchronizing electrical equipment. This equipment is not only reaching its service life, but is currently requiring manual transfers during emergency power outage that puts process, equipment, and personnel at risk during critical operation periods.
2. Switch gear, motor control centers, transformers, generators, distribution, and lighting panels are nearing their service life. Any equipment over the age of 25 years or the manufacturer's listed life is recommended for replacement. It is recommended that an asset management list be generated to identify criticality, age, reliability, and schedule for replacement. Documentation with a searchable work order database is recommended so that maintenance intensive equipment can be identified and evaluated for improvements.
3. Process control panels over 15 years old or the manufacturer's listed service life be replaced. Panels nearing (or passed) service life and panels that are subject to more humid conditions are exhibiting excessive corrosion that may limit their life short of any recommendations.
4. Instruments are in a wide array of conditions. Some instruments have been replaced due to recent failures, but a majority are nearing their service life or cannot be relied upon for accuracy due to limited calibrations. It is recommended that a certified instrumentation calibration company be contracted or qualified staff identified to list the instruments, perform/document calibration, and schedule lists of instruments in need of replacement. The instruments in need of replacement can be added to an asset management schedule for replacement based on the critical rating of the particular instrument.
5. SCADA systems and associated PLCs should be scheduled for replacement and upgrades. SCADA equipment components are currently able to be replaced by the manufacturer, ABB, but are becoming more difficult to source due to the age of the equipment. Coordinating replacement with phased process area mechanical upgrades would allow for system compatibility to be reviewed during design and construction.

6. Communication systems block diagrams should be updated to identify systems that have been added since construction project documents. A simple existing fiber ring diagram would be very helpful. Expanding this diagram to show each communication component would aid in future maintenance and design. The wireless systems put in place by past employees need to be documented so that future or contracted personnel can efficiently operate and maintain these systems. Maintenance on all communication systems needs to be logged so that problem areas can be identified and scheduled for replacement.

A full evaluation of the current master plan should be updated to identify current conditions, list assets, score assets, populate cost to repair/replace, and schedule/plan future capital improvements.

8.2 Jar Testing

Bench scale testing was performed to evaluate coagulation and a wide variety of chemical addition strategies. A standard jar test apparatus with six rectangular, 2-liter jars was used for the bench scale experiments. This equipment uses previously developed relationships that correlate mixing energy with stirrer speed and water temperature (that is, velocity gradient (G)) at the bench-scale level. The specially designed “gator” jars have a sample tap located at a precise distance from the top of the water to allow the sampling of small quantities of water. Samples were filtered through pre-rinsed filter paper and analyzed for turbidity, color, and pH. A photograph of jar testing experimentation is presented in Figure 8-1.

Jar testing experiments were performed to evaluate the following conditions:

1. Confirm plant jar testing protocol.
2. Determine impacts of filter backwash water on filtered water quality.
3. Determine impacts of prechlorination on filtered water quality.
4. Determine impacts of alternative direct filtration strategies.



Figure 8-1 Jar Testing Experiment

5. Determine effectiveness of Clarion and polyaluminum chloride (PACl) as primary coagulants.
6. Determine effectiveness of alternative coagulants (alum and cationic polymer)

8.2.1 Observations

Data collected during jar testing led to the observations listed below:

1. Adding filter backwash water, 10 percent by volume, to the raw water produced lower filtered water turbidities.
2. Prechlorination had minimal effect on filtered water turbidity after coagulation with Clarion and PACl.
3. Coagulation with alternate direct filtration mixing strategies (flash mix followed by two-stage flocculation) produced lower filtered water turbidities.
4. Coagulation with higher doses of PACl and with equivalently lower doses of Clarion produced lower filtered water turbidities.
5. Coagulation with alternate coagulants (alum with cationic polymer) produced higher filtered water turbidities at equivalent doses.

8.3 CT Tracer Study

To determine the amount of credit a utility can receive through disinfection, the EPA introduced the concept of CT with the Surface Water Treatment Rule (SWTR). CT is the residual concentration of the disinfectant, C (mg/L), multiplied by the time, T (minutes), that the disinfectant is in contact with the water. The EPA has prepared CT tables that relate specific CT values to log inactivation of *Giardia* and viruses at different temperatures and pH.

When determining the T value, the SWTR Guidance Manual states, "The time determined from the tracer study to be used for calculating CT is T_{10} . T_{10} represents the time that 90 percent of the water (and microorganisms within the water) will be exposed to disinfection within the disinfectant contact chamber." This value can be determined either by a tracer study or theoretically. The definition of T_{10} is the time at which the tracer concentration reaches 10 percent of the influent tracer concentration in a step-dose tracer test. Therefore, the probability that a water molecule (or microorganism) stays in the reactor less than T_{10} is 10 percent. A theoretical evaluation requires the use of a baffling factor (T_{10}/T) to account for less than perfect hydraulic conditions within a given structure. For this evaluation, a tracer study was used to determine T_{10} at a specific plant flow rate. From this value, a baffling factor (T_{10}/T) can be determined and applied at other plant flow rates.

The Pequannock WTP uses free chlorination introduced downstream of the filters to achieve CT credits. A tracer study was performed on August 19, 2015 for this disinfection zone. Lithium chloride was used as the tracer, as it is easy to handle, safe, highly soluble in water, and easy to measure in samples. A slug dose of tracer (2.5 kg) was introduced just upstream of the existing chlorine injection location. This location was chosen to take advantage of the weir immediately downstream for mixing of the tracer prior to the clearwells flow split. A photograph of the tracer application location is presented in Figure 8-2. Samples were taken at the outlet of the disinfection zone or the sample house, where plant staff monitors chlorine residual. The plant flow rate was held steady at approximately 31 MGD during the tracer test, and the clearwell water surface elevation was 603 ft MSL. Samples were analyzed at the Eurofins Eaton Analytical Laboratory in South Bend, Indiana.

Test results have been organized by the value of C/C_0 , where C_0 is the applied tracer dosage and C is the tracer concentration in the sample water. The results have been plotted on a graph, with the values of C/C_0 on the vertical axis and T , the detention time, on the horizontal axis. Figure 8-3 presents the instantaneous tracer concentrations during the tracer study. Figure 8-4 presents the cumulative tracer concentrations during the tracer study. The T_{10} value is obtained from Figure 8-4 at $C/C_0 = 0.1$ by drawing a line to the horizontal axis. At a plant flow rate of 31 MGD and a clearwell water surface elevation of 603 ft MSL, T_{10} is 38.4 minutes.



Figure 8-2 Tracer Application Location, Funnel (Cone), and Tracer Mixing Prior to Introduction

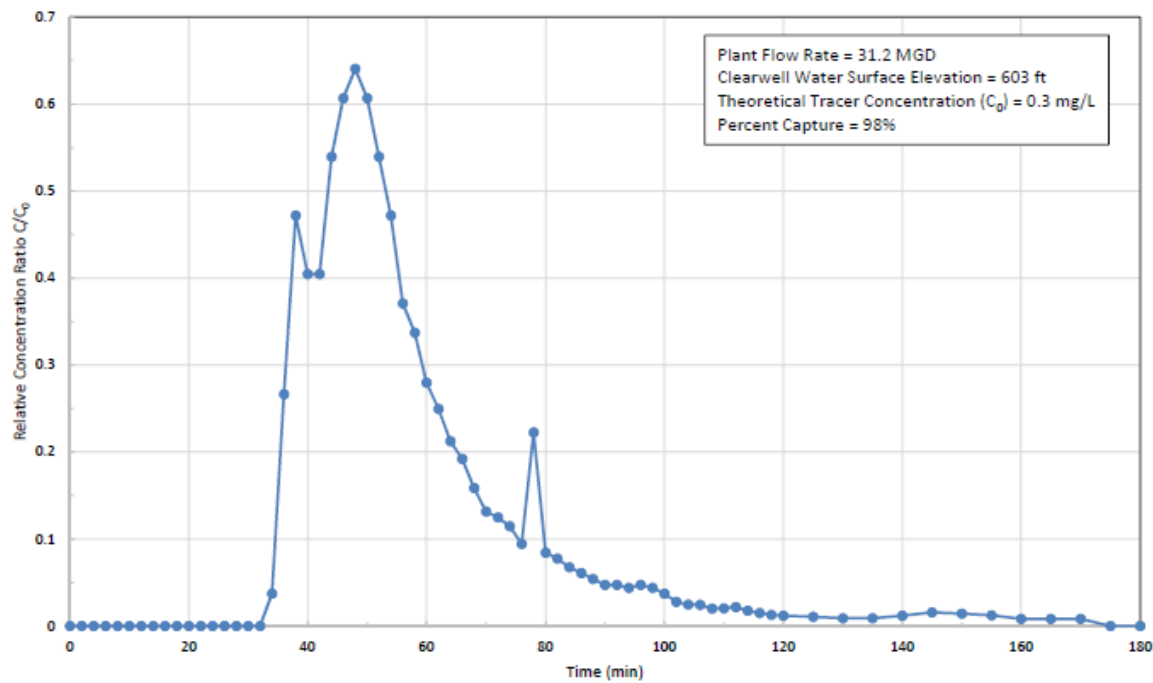


Figure 8-3 Tracer Study Curve - August 19, 2015

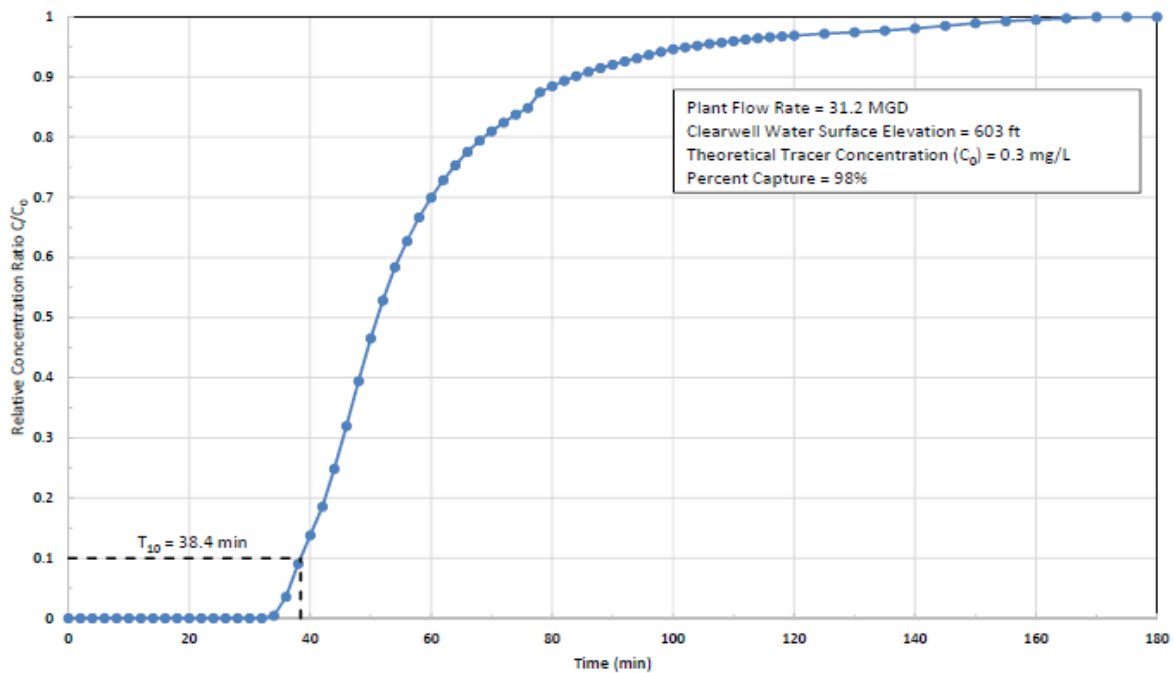


Figure 8-4 Cumulative Tracer Study Curve - August 19, 2015

Ideally, a separate baffling factor for the clearwell disinfection zone and the finished water piping disinfection zone would be generated by tracer study sampling at each location. A sampling location is not available downstream of the clearwells and values have been determined using the sole sampling location at the sample house and assuming a baffling factor of 1.0 for the finished water piping. This results in a calculated baffling factor of 0.2 for the clearwells. Using these baffling factors, T_{10} values for different plant flow rates and clearwell water surface elevations were determined and are presented below in Table 8-1.

Table 8-1 Summary of T_{10} Values (minutes)⁽¹⁾

Clearwell WSE ⁽²⁾	Plant Flow Rate			
	30 MGD	40 MGD	50 MGD	60 MGD
603 ft MSL	39	29	24	20
605 ft MSL	41	30	24	20
607 ft MSL	42	32	25	21
609 ft MSL	43	33	26	22
Note				
1. Calculated using a baffling factor of 0.2 for the clearwells and 1.0 for the finished water pipe, per Tracer Study results on August 19, 2015.				
2. WSE - water surface elevation				

9.0 ANALYSIS OF FUTURE NEEDS/CAPITAL IMPROVEMENT PROGRAM

The following is a summary of findings concerning the management, personnel and financial structure of Pequannock Water Treatment Plant, but also of the water utility as a whole. As noted in the opening comments of the CTA Report, the WTP is one part of a larger system and from a management, personnel and financial standpoint, cannot stand alone. The system as a whole was analyzed and discussed in the TMF report which must be reviewed in conjunction with this CTA Report.

9.1 Highlights of the Managerial and Personnel Examination

- The existing management and licensing structure is adequate but too focused upon one individual in the water system.
- The existing personnel are qualified and licensed as required by law. Permit holder for the entire system is held by one individual
- The system is sufficiently large that future succession plans should consider as an opportunity for pursuing to incorporate separate T-4 for treatment system, and W-4 for distribution system license holders reporting to the Division of Water Supply Director.
- All supervisory staff in the transmission and distribution systems should possess a minimum W-1 license.
- All supervisory staff at the WTP should hold at least a T-2 license
- Security in the watershed and dams should be provided a higher level of priority in accord with existent Homeland Security audits through available technology, target hardening and/or personnel.
- Supervisory staff should be provided with greater authority and accountability.
- An effective and defined succession plan should be identified and implemented.
- The WTP superintendent should possess a T-4 and be separate if possible from the overall license holder/ assistant director to be located centrally in the Little Falls operations center.
- Non-distribution maintenance operations should have centralized effort and location at Little Falls location.
- Vehicle and equipment maintenance efforts require improvement and coordination with central garage.
- There is an immediate need to address staffing and/or improve technological controls to adequately staff WTP.
- There is a need for continued strong central management of water system and advocacy within the city organization and elected leadership
- There is a need to increase personnel resources to the contracts and engineering section to

process bids and contracts for the large capital improvement plans in progress in both the water and sewer utilities.

- There is a need for an added engineer to effectively work and oversee consulting engineer efforts for the large capital improvement plans in progress in both the water and sewer utilities.
- There is a need to improve the qualified applicant process at the Water Treatment Plant.
- The SCADA instrumentation requires significant upgrade and improvement.

9.2 Plant Administrators/Policies

Excerpt from CPE Report dated July 2014, by Aquamize LLC, pg19:

["Plant Administrators/Policies – Administration (A) The policies in place at the Pequannock Water Treatment Plant area "top-down" set of SOPs for the operators and the overall treatment process. There is little to no input accepted from a capable operations staff or the plant supervisor positions despite some staff having been active in their job for over 20 years. There is no clear pathway to accept new insight or innovation from outside of the Public Works Director's position."]

Considerable time was expended in interviews at the WTP and a good understanding of the supervisory communications process was achieved. The supervisory staff under the direction of the Director of Public Works/Licensed Operator Andrew Pappachen does indeed engage in regular operational oriented staff meetings. There was the indication from the senior operators, supervisors and the licensed operator that the constraints of the plant currently mandate an agreed upon safe yield provided the current capital equipment constraints.

The entire senior staff is indeed veteran and experienced; many of the personnel have observed the plant move from post construction phase to private management to the NWCDC, and finally to the City of Newark. All are aware of the operations required daily. However, there is an understanding that any deviation from the specific operational procedures requires the prior approval of the licensed operator; however, many senior operators see this "tradition" as overly restrictive. In many respects, there is belief it stems from the lack of confidence of the licensed operator in the capabilities of some of the senior operators and the inability of some of the supervisors to be available when needed

There is little doubt that the current licensed operator is the most qualified person amongst the staff. However, there is belief that some of the senior operators and the three supervisors are well experienced and knowledgeable, and should have some discretion as to minor operational changes. Although many organizations can lay this claim that the licensed operator is the most qualified, centralized decision making runs contrary to best practices in management and development of personnel. There are supervisory staff on the organizational chart and a chain of command and unity of command, which must

be adhered to in communications situations outside of a circumstance that is truly an emergency or unusual circumstance.

The operations and maintenance manual is available as a reference guide. Although many of these were initially created when the WTP was privately managed, during interviews, none of the senior management took exception to their content (although their organization and codification could be modernized). The plant, as currently constituted does not lend itself to one of innovation or other policy or procedure changes until the existing processes and/or chemical supplements are revised, or until NJDEP safe drinking water standards are revised.

As to the personnel and management policies and procedures, these are in a state of flux due to the absorption of the WTP into the City of Newark's personnel structure. The prior policies and procedures are no longer relevant due to this change.

Finally, as part of any best management practices of dissemination of policies and procedures within any organization, there is the requirement that dissemination of any changes and policies attain an acknowledgement of understanding and receipt by personnel. It does not appear that dissemination is conducted in a proper best practices fashion.

9.2.1 Policy maker name and numbers**Table 9-1: Policy Maker Names & Numbers**

Management & Supervision	Title
Andrea Adebawale	Director of Division of Water Supply
John George, P.E.	Supervising Engineer
Michel Gelin, P.E.	Assistant Director
Andrew Pappachen	Director of Public Works
Kareem Adeem	Water Treatment Plant Superintendent
Mike Awertschenko	Water Treatment Plant Superintendent
Bob Lincoln	Chief Water Treatment Operator
Kevin Greer	Assistant Superintendent of Water Treatment Plant
Marvin Bailey III	Supervising WTP Operator
Edwin Moran	Supervising Lab Tech, WA
Transmission and Cedar Grove Lab	Title
Gus Gosai	Superintendent of Water Intake and Supply Mains

9.2.2 Water System Responsibilities

The City of Newark adheres to the New Jersey Safe Drinking Water Act in providing safe drinking water as defined within N.J.S.A. 7:10-7.2 Recommended upper limits and optimum ranges for physical, chemical and biological characteristics in drinking water.

9.2.3 Plant Administrators/Supervision Plant Administrators/Supervision

Excerpt from CPE Report dated July 2014, by Aquamize LLC.:

["Plant Administration/Supervision – Administration (A) Despite the fact the water treatment plant operators are knowledgeable, capable, and possess a tremendous amount of experience at the Pequannock Water Treatment Plant, even simple decisions such as changing a chemical dose rate up or down by 1 mg/) must still be approved by the Public Works Director. Similarly, process decisions such as the length and duration of a backwash cycle, the increase or decrease of the backwash rate, and other routine maintenance tasks must be approved by the Public Works Director. A controlling supervision style does not allow the plant staff to become innovative and contribute to the operational decisions."]

Per interview with City personnel, it appears that there is currently a demonstrated lack of delegation and accountability on the part of middle management and often times, a general disregard of a structured chain of command. This is in part due to the licensed operator being the "go-to" responsible official for such a long time, in addition to middle management not being willing to accept the obligation and accountability to be responsible for routine tasks and procedures.

In conducting staff interviews it is clear among senior personnel, including the Director of Public Works Mr. Pappachen, that after 5:00pm when the day ends, there is very little chance of others being counted on to respond to the plant 100% of the time. The Director of Public Works Mr. Pappachen has assumed that role and as a result has become the preferred or demanded contact, at times bypassing layers of subordinate management and violating unity of command principles.

The solution to this, in light of the imminent succession that will occur to the WTP in coming years, is that the licensed operator must delegate these responsibilities and middle management must accept and be held accountable for managing personnel in directing and performance of their duties.

In addition, middle management must be answerable to ensuring that staff is supervised, directed, monitored, evaluated, coached, and, if necessary, disciplined to ensure proper operation of such a vital link in the Newark water supply administration.

It was also determined that despite the fact the senior water treatment plant operators are knowledgeable for the plant operation and public safety, the licensed operator must have all final

say on chemical feeds and changes – if the wrong decision is made by a plant operator without his approval, it is the licensed holder not the operator who is held responsible.

9.2.4 Resolution Mechanism for Conflicting Operator Responsibilities

If the person in charge of operation has other responsibilities unrelated to the water system, an explanation as to how the operator will reliably execute his or her responsibilities

- Andrew Pappachen – the Licensed Operator for the Water Treatment Plant and Director of Public Works, also has managerial responsibilities and supervisory authority over the following locations:
 - a. Watershed properties
 - b. Intake and Distribution Rechlorination
 - c. All supply from treatment to distribution

The Licensed Operator/Director of Public Works Mr. Pappachen is currently extremely well informed of the operations and deficiencies within the water system. In view of his multiple responsibilities, his focus is primarily on the water treatment process with less time spent on staff, management, watershed, and distribution issues.

9.2.5 Organizational Structure

The basic management authority for the water utility rests in the Mayor's office pursuant to state law governing the Mayor Council form of government. The Mayor delegates the majority of the authority to his appointed Water and Sewer Department Head (Director), Andrea Adebawale. This delegated authority covers the Newark Watershed and its five (5) reservoirs, the Pequannock Water Treatment Plant, re-chlorination facilities, transmission mains and distribution network within the City proper.

While managerial authority is delegated to the Director from the Mayor and Council, the Chief Operator responsible for compliance with NJDEP and EPA regulations is the Licensed Operator/Director of Public Works Andrew Pappachen. Although he is primarily based at the WTP, he has operational oversight for the entire treatment and distribution system as the licensed operator holding the required W-4 and T-4 licenses.

Although other members of the staff hold various water treatment and distribution licenses, due to the geographic separation of the various functions and activities, other than at the Water Treatment Plant, there is no duplication nor redundancy of licenses. There is concern over the centralization of all operations under one individual. Although this individual is very competent and has successfully operated the water utility for many years, there is no designated succession plan should the current license holder no longer be available. In addition, given the geographic size of the system, there is question as to if it is practical for one person to be responsible for the entire system operation.

9.2.6 Water Treatment Plant Superintendent

The Licensed Operator/Director of Public Works, Andrew Pappachen, has final say as to operational treatment and delivery of the water system. Currently, he operates out of the Water Treatment Plant at Pequannock as well as the more central location of Little Falls. It is recommended that managerially the full management of the Water Supply system should operate out of the Little Falls facility with the Water Plant Superintendent operating from the Water Treatment Plant.

9.2.7 Functional Units

- **Pequannock Water Treatment Plant and Watershed**

On the provided organizational charts, the water provision and supply functions are shown both in a functional alignment as well as a geographic alignment. The various geographic locations in the water system are:

- The watershed in five municipalities,
 - The largest of which are West Milford (Passaic County)
 - Jefferson (Morris County)
 - Hardyston (Sussex County)
- Pequannock Water Treatment Plant (in West Milford)

9.2.8 Pequannock Water Treatment Plant Overview

The water treatment plant runs 24/7, all year round, and comprises of operations, support services, watershed management and the lab testing. The Licensed Operator/Director of Public

Works Andrew Pappachen manages the personnel at the Water Treatment Plant. There are three (3) senior supervisors:

- Michael Awertschenko, Water Treatment Plant Superintendent, who holds the W-4/ T-4 licenses, heads the laboratory function.
- Kevin Greer, Assistant Water Treatment Plant Superintendent who holds a T-2 license, is the head of the support services and maintenance portions.
- Robert Lincoln, Chief Water Treatment Operator, who holds T-2 & W-2 licenses, heads the operations section.

The personnel at the WTP all have lengthy seniority and many have been on site conducting the operations of the plant since its inception in 1990. Given the recent transfer of this operation from the Newark Watershed Conservation and Development Corporation (NWCDC), this report will outline several of the recent issues impacting on the Plant's operation: personnel/civil service status, purchasing, and operations/staffing.

9.2.9 Civil Service

Since mid-2013, operators and personnel at the WTP have been city employees (prior to that date many were employees of the NWCDC). This transition has not come without turbulence. Operators and staff at the WTP were compensated under a different contractual pay plan and classification structure than used by the City of Newark as well as a different retirement system.

Through interviews, it was learned that the transition of personnel into the city organization has caused employee friction that continues to impact on the morale of: the WTP employees, the employees within the City located at City Hall, and employees at the Central Avenue Water Supply and Distribution location. There was an admitted issue with determining the most appropriate civil service titles for the WTP employees. That has been accomplished (to varying degrees of satisfaction/dissatisfaction of the WTP staff).

However, the interviews also showed that many WTP employees are not fully aware of their civil service status nor the civil service guidelines and procedures. Although the City provided information indicating that most of the outstanding issues have been resolved, this was not understood by the affected employees.

Due to this transfer of employees from the NWCDC to the City pay scale and civil service structure, the technical civil service titles of the specific individuals are not necessarily descriptive of the actual work performed. For example, the technical jobs performed at the treatment plant require the extra operator's licenses and technical knowledge to operate and treat raw untreated water in accord with New Jersey Department of Environmental Protection standards. The titles provided by Civil Service do not necessarily reflect these complexities

Under the NWCDC, employees were paid at a different (and often higher rate) than "comparable" employees for the City. Numerous supervisors mentioned during interviews that this pay discrepancy has been the source of said employment issues and the accompanying morale division. More importantly, the transition has resulted in or has been a significant factor in the retirement/resignation of a number of skilled employees, the replacement of which has not taken place. The result has been the creation of a divide between the plant employees and other city employees that seems to impact on how each views the working of the other and the diminished ability of the plant personnel to perform required maintenance tasks.

9.2.10 Operations

A senior operator, teamed with an operator and a maintenance repairer, leads each shift in the plant. In addition, on a daily basis during the daytime shift, there is also a manned laboratory as well as additional maintenance personnel. As staff is currently undermanned relative to its prior operations, it is not uncommon to find any of the three (3) supervisors or other technical personnel from the on-site lab on hand at the control room monitoring the plant. Overtime and the inability to find qualified personnel is a constant concern due to the lack of certified operators on staff. Often there are personnel who routinely work their shift then stay for another eight (8) hours at overtime rate.

Fortunately, the tradition at the plant is that all supervisors and technical personnel are also trained senior operators allowing these people to perform this vital function as well as their other assigned duties. This dual functionality works to the advantage of the City in controlling overtime; however, this is at the expense of the normal assigned tasks of the dual functioning personnel.

Plant managers indicate that maintenance, DEP reporting, and other major items all must be accomplished during the weekdays and ideally the actual control room operations staffing should be outside of these senior operator duties. The evaluation is agreed upon.

9.2.11 WTP Laboratory

The required raw water and treated water analysis is provided on the day shift by the lab personnel with testing required at other times performed by qualified operators. The lab staff is rotated out as well to assist the operations staff of day-to-day operations. Inclusive of this, is often times of covering on evening shifts as scheduled or as overtime. The main laboratory is located at the Cedar Grove facility where more detailed finish water analysis is done. The treatment plant lab staff works closely in conjunction with the main laboratory staff located at Cedar Grove. Lab staff or operators conduct testing every two (2) hours for residual chlorine, turbidity and pH levels. If testing indicates a need to adjust the treatment processes, senior management at the plant would make this decision.

The lab at Cedar Grove conducts more extensive testing outside of the WTP lab. Raw water testing from the reservoirs has been hampered in the past by the lack of operability of the engines in the assigned boats to the unit. Water sampling has been conducted for daily samples from an extended pole and sampling can. This method is to be considered a short-term solution until the purchasing procedures are overcome to repair the long-standing issue of failure to repair the boat engines.

9.2.12 WTP Management

Periodically, staff meetings are held and Standard Operating Procedures (SOPs) are issued. Per interviews with City personnel, it appears that the chain of command and accompanying commensurate authority is not as clearly defined/delegated as needed. On-site inspection indicates that direct supervision and control is deficient, frequently resulting in unaccomplished required tasks.

Standard policies and procedures fixing operational and human resource accountability appear to be in existence but not enforced or executed as needed. It is in the realm of managerial tenets and behaviors affecting the chain of command, span of control, and effective organizational communications, that there is present concern. It appears that this is partially the function of the multiple assignments being handled by the water system's sole licensed operator.

9.2.13 Availability of Management Reserves for Successful Succession Planning

Succession planning is a concerning topic that has been identified and the need for growth in management capabilities requires prioritization. Mike Awertschenko and Michel (Mike) Gelin, the Water Treatment Plant Superintendent and Assistant Director, need experience in supervisory/management roles. Also, there must be more delegated responsibilities with accountability at all levels.

The following as a realistic and do-able succession plan is recommended:

- Andrew Pappachen, Licensed Operator/Director of Public Works, relocating to Little Falls and continues overall responsibility.
- Mike Awertschenko, the Water Treatment Plant Superintendent, currently a T-4/W-4 Plant superintendent and understudy to the Licensed Operator/Director of Public Works Andrew Pappachen, Licensed Operator/Director of Public Works, is given responsibility for WTP under Andrew's guidance. If his technical and management/supervisory performance is adequate, he is appointed permanently to this position.
- Mike Gelin, the Assistant Director, a professional engineer previously in the Highway Division and recently reassigned to the Water Utility, continues role of Division Head Water Supply on a long term basis for overall management of the Water Supply system.
- Mike Gelin the Assistant Director serves as understudy of Andrew for next 2 years for continuity purpose.
- Upon the Licensed Operator/Director of Public Works Andrew Pappachen's retirement, the City enters into a third party contract for technical supervision and assistance for the WTP.

The looming issue is the potential retirement of the Licensed Operator/Director of Public Works Andrew Pappachen and in his absence the technical vision to operate the water treatment plant. Assuming Michel Gelin the Assistant Director is successful in mastering the entire water supply system (including the various interconnects, alternate supply sources, etc.), and the Water Treatment Plant Superintendent Michael Awertschenko can adequately operate the WTP under the guidance of the Little Falls Office, then the issue is having access to technical backup for the treatment plant operation. Even if Michael Awertschenko demonstrates the capability of

mastering the WTP operation and the management of its personnel, the City must avoid a repetition of the current exposure. That exposure is most readily visible by possessing on staff only one knowledgeable person about a complicated system (the water treatment plant and interconnect system) that is essential to the wellbeing of the citizens of the City of Newark and neighboring areas.

Upon the retirement of the Licensed Operator/Director of Public Works Andrew Pappachen, the City should consider entering into a managerial/technical assistance contract with an experienced water treatment provider with similar operational realities. This third party agency would provide general technical and managerial assistance in the water plant and transmission operation if so required by any unforeseen situation. The primary focus of this recommended alternative is that the City of Newark establish and ensure continued redundancy in its critical water operation.

Possible assistance to be provided by this third party agency (all activity to be performed by qualified comparable personnel) includes:

- Weekly, or more frequent if necessary, plant site visits to consult with the Newark Plant Superintendent, review operations, and assist in managerial and technical issues as appropriate.
- Inclusion of the Newark Plant Superintendent in all in-service supervisory plant training conducted at the agency's nearest comparable facility
- Join with the Newark Plant Superintendent in all state and federal meetings and inspections
- Provide technical in-service training at Pequannock Water Treatment Plant comparable to that provided at the agency's plant (or include Newark personnel in the agency in-house technical and safety training)

If it is determined that the Water Treatment Plant Superintendent, Michael Awertschenko, is not able to successfully master the WTP operations or provide suitable personnel and on site management, then the use of the third party agency with direct water treatment experience would be even more critical. In this case, the third party agency may need to have a greater presence at the plant than outlined above.

The second alternate to be considered to the above hybrid plan (using both in house and third party individuals) is to contract out to a responsible public agency (e.g. the New Jersey District Water Supply Commission) or to a knowledgeable and comparable private sector firm (e.g. American Water, Elizabethtown Water, or a similar entity) the full operation of the City Water Supply and transmission/interconnection activities. The City would retain operations of the distribution systems, metering billing, collection, budget, revenue and financial activity, the Central Ave and City Hall facilities, as well as all customer contact and management rights contained in the third party contracts.

In summation, with the retirement or absence of the Licensed Operator/Director of Public Works Andrew Pappachen, the City needs to have both the big picture knowledge of the entire water supply system and the detailed knowledge of the water treat processes. The personnel and operational management of these complex systems must be available in more than one location or individual. The most cost effective approach is having some in-house capability supplemented by knowledgeable and experienced third party agency oversight and limited technical and support assistance as needed.

9.2.14 Field Personnel Productivity

9.2.14.1 Limiting Factors – Morale & Compensation

Through interviews, field personnel have indicated procurement and equipment issues as limiting factors in terms of capital availability of equipment (vehicles, working water craft, etc.).

It has been advised by several field supervisors that since the incorporation of the former NWCDC staff into the City of Newark workforce, the disparity in pay has resulted in a morale issue at the positions outside of the WTP.

Incorporating personnel into City contracts and the development of the civil service system has created some jealousies in terms of compensation by personnel who view their years with the City employ versus what they view as an employee base with little years employed by the City.

It has not been identified that such a viewpoint has translated into a productivity limiting reality. There is no quantitative information to substantiate these statements, however, this was a common theme in many interviews.

9.2.15 Abilities and Capabilities to Conduct an Effective and Efficient Operation

9.2.15.1 Unskilled, Skilled, Technical and Professional Staff

City of Newark staff is recommended to pursue the following opportunities to be capable of operating at a higher rate of performance:

- Ensure additional W-1 or higher licensure of key staff throughout the water system.
- Greater emphasis on capital equipment, which would include vehicles and capital improvements as identified.
- Overcoming the civil service hurdle in terms of recruiting and hiring new employees at the WTP. Current potential replacement workers observed were layoff rehires from another department of the city operation and require tremendous training to operate a water treatment plant process, even assuming that they were willing to accept the commute stress and shift work
- Explore the opportunity to centralize system operation and direction from the Little Falls location
- Examination of the laboratory staff to determine the future need for lab staffing at the WTP as full time staffed or a combination between the Cedar Grove location and the WTP
- Staffing of laborer and operator levels for the distribution system maintenance at Central Ave and the WTP

9.2.16 Overall Management Capabilities

Currently, although the overall water system is led admirably by Andrew Pappachen, the Licensed Operator/Director of Public Works, the City is very seriously exposed in the loss of the institutional knowledge he possesses of the overall system in an intimate fashion should he be not available. It is imperative the succession topic be raised, planned for, and enacted as soon as possible.

The system places tremendous responsibility in one person for a system with significant geographic separation. An alternate and preferred organization frequently used in other operations (particularly the private sector utilities) is to have two license holders – one for the treatment plant (T-4) and another for the transmission and distribution systems (W-4). Ideally, each person would have both licenses and be knowledgeable about the whole operation for redundancy purposes. It is recommended that the City move in this direction as opportunities arise. If this is not possible, then as an alternate, a person with a W-2 or higher license can provide this oversight under the supervision of the sole license holder.

9.2.17 PEOSH (Public Employees Occupational Safety & Health) Concerns

During tours and on-site interviews, on-site constructed platforms in order to access certain large valves were noted. Cautionary and compliant safety signage accompanied the platforms. There is a concern for the platforms as constructed, which were a result of on-site required improvisation due to past-deferred budgetary allocations. It is recommended that the City's risk manager tour the facility and address any required safety upgrades as part of the future budgets.

9.2.18 Review of Training Programs

9.2.18.1 Coverage of All Aspects of Water Utility Operations

Andrew Pappachen the Licensed Operator/Director of Public Works through the Essex County College, has long conducted water licensure classes in preparation for the state examinations. The staff at the WTP and throughout the system have been students of Mr. Pappachen. The training in regard for state treatment and water distribution licenses has, for the most part, been robust. There have been exceptions in the budget as to allocation for funding of these programs, but it is recommended that such training be funded in the future.

Other training, as recommended, such as confined space and other insurance risk management training, appears to be satisfactory.

9.2.19 Review of Standard Operating Procedures for O&M of All Units

There is general acknowledgement on the part of the staff, of a lack of consistent accountability in the performance of routine processes and maintenance. It was noted that originally Public Service Group (PSG) instituted systematic Standard Operating Procedures (SOP) that were

adhered to. Over time many senior operators have noted some of the required activities are not being properly performed and they theorize that this failure is partially the function of the absence of delegation and accountability. The command and command structure being much too heavily reliant on a single individual, that being Mr. Pappachen, the Licensed Operator/Director of Public Works, especially in a 24/7 operation.

The problem starts at the top and is pervasive throughout the operational hierarchy. Mr. Pappachen, the Licensed Operator/Director of Public Works, does not possess the time or span of control to monitor all of these activities required of a licensed holder for the entire water system. Management, especially middle management, needs to demonstrate a consistent commitment to holding all employees accountable for performing their job duties. This commitment must be reinforced by monitoring employee performance, proper counseling of staff, ensuring that all staff are performing job duties and, finally, initiating progressive discipline for employees who fail to respond to management's indication of inadequate performance.

A classic example of this flawed mentality and performance is the maintenance of the WTP lime slaker. Maintenance is inconsistent and poor and exemplifies the "do the minimum" attitude. Employees come into work at the start of their shift, only to find that the required maintenance on the lime slaker was not performed on the previous shift and that the lime slaker has not been serviced properly. This lack of performance is exacerbated by the fact that management does not hold the staff responsible and accountable for non-performance. This concern regarding the emptying of the lime slaker was a constant theme expressed in terms of frustration during personnel interviews

Supervisory Control and Data Acquisition (SCADA) is another good example of problems with SOPs, routine maintenance, and documentation accountability. The system has been "down" for at least six (6) months of 2015. This is due to the fact that a single employee, who has left the employ of the city, designed the unique configuration of the system. There is no operations manual, no backup, and nobody that has the ability to correct the systemic problem. This issue has been acknowledged and is being addressed by the water utility. A new system needs to be designed that corrects all of the operational and redundancy requirements that are so vital to a monitoring system for a potable water supply. It is all well and good that the problem is being addressed, however, it clearly demonstrates the past lack of, and future necessity of, proper system SOPs, training, monitoring and record keeping.

10.0 PREVENTATIVE MAINTENANCE PROGRAM (MATERIALS & EQUIPMENT)

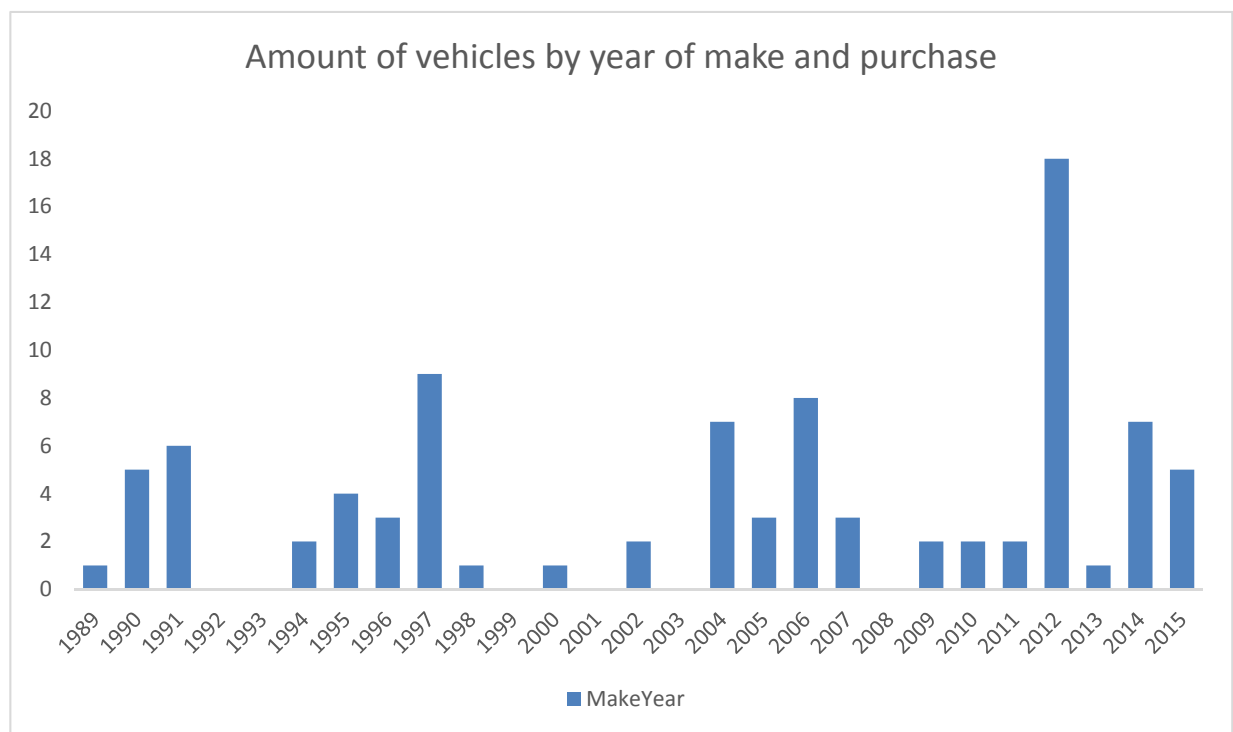
10.1 Condition of Equipment Needed for O&M

10.1.1 Vehicles

The vehicle fleet has been identified as older and in need of upgrades throughout. The average age of vehicles within the entire water and sewer fleet is 13 years (from 2002). There are existent upgrades as noted in the 2015 capital program. The entire fleet as a whole presents an opportunity for improvement in a longer-term vehicle replacement plan as part of the six (6) year capital plan.

The warranty coverage on newer vehicles and lack of deferred maintenance costs are likely to offset current downtime and maintenance costs.

Figure 10-1: Amount of Vehicles by Year of Make and Purchase



10.2 Overall Facility Security

The water utility has a number of facilities spread over a wide geographic area. It begins with a large city owned watershed of over 35,000 acres possessing five (5) reservoirs which supply raw water to the

Pequannock Water Treatment Plant located along Route 23 in West Milford, Passaic County, NJ. From the plant, treated water is sent through an 18-mile long transmission main to a large treated water storage basin in Cedar Grove Township (Essex County). Along this transmission corridor, there are various interconnections to bulk purchasers of the City's treated water. From the treated water storage reservoir, water is sent to the distribution system in the city proper.

Security for this system is handled in various facilities and assignments. Located under the support services branch at the WTP is the existence of one (1) forester and one (1) security guard who each typically work an afternoon/evening shift on a 5-day basis. The understaffing of the security personnel has drawn the concern of oversight authorities in the past. The security personnel on staff is underequipped as well as potentially understaffed. Vehicle availability was identified as a concern, evidenced by the security guard often having to borrow vehicles from other staff to effectively patrol the 34 square miles that provide access to the water supply. The security issue for the water supply has been addressed in the Homeland Security document: Water Critical Infrastructure and Key Resources Sector-Specific Plan as input to the National Infrastructure Protection Plan, May 2007.

Security measures identified on site at the WTP are the existence of cameras and electronic gates as well as vehicle control measures. There is no ease of access to the facility. Beyond the WTP however, is the unfettered access to the raw water reservoirs, dams and related facilities. The Newark Watershed properties encompass over 35,000 acres encompassing portions of Passaic, Morris, and Sussex counties. The sheer size of the security area and magnitude of responsibility are an enormous security task given adequate priority. The security measures at the other locations, in particular the Cedar Grove Reservoir, have been the subject of a Homeland Security audit and is commented as a concern.

The security measures currently in place present opportunities for improvement through various methods the City may consider. Among these options include, but are not limited to:

- Integrated perimeter security (see immediately below)
- Additional personnel
- Combination thereof

10.2.1 Integrated perimeter security

In establishing an integrated perimeter security system, the equipment entails a comprehensive system of RF module transmitters with outdoor motion detectors for comprehensive and real-time perimeter protection. The benefits of such a system provide for around the clock perimeter

monitoring to prevent theft, vandalism and other criminal actions. Systems such as this provide the potential of incorporating into the existing SCADA system monitoring. Security systems have the added benefit of labor cost avoidance as well as the ability to be purchased through capital improvements under the New Jersey Budget process.

10.2.2 Additional security personnel

The option of adding personnel possesses the constraints of shift staffing, such as full-time personnel costs which include medical, FICA, pension, outfitting and time off benefit costs. The potential exorbitant costs of establishing a robust security force must be weighed against the benefits of allocating such yearly operating funds to a longer term fixed capital costs in establishing a target hardening automated technological security solution.

10.2.3 Gate Access

The gate access to the Water Treatment Plant is controlled by access cards as well as entry permission from the plant control room. Other areas of the watershed property are unsecured with the exception of gates with padlocks, which are easily defeated. Other critical areas of the transmission length are similarly unsecured and are open to public access.

10.2.4 Key Access

Access to buildings within the water and sewer utility are secured by a combination of card access and physical key access.

10.2.5 Security Staff

As previously noted, the commitment to security is not as robust as other water supplies visited and the lack of commitment to security was noted in the 2007 Homeland Security report of the City's water supply.

There is an opportunity for improvement for the City of Newark to strengthen security throughout the water supply. As noted previously, there are alternatives to security staff that provide opportunities for improvement.

10.3 Plant Administrators/Planning

Excerpt from CPE Report dated July 2014, by Aquamize LLC, page 19:

["Plant Administrators/Planning – Administration (A) A lack of long range planning as well as short range planning creates a barrier to making improvements at the plant. Without an adequate capital replacement program and an infrastructure maintenance program that is collaboratively planned, documented, and communicated with plant staff and stakeholders within the City, equipment will degrade and eventually fail causing operations maintenance staff to scramble to keep the plant operating. Currently, the plant is in need of repairing or replacing the drain valves on all or most of the filters, replacing the lime slaker, providing separate treatment and/or monitoring of the backwash recycle water line, and improving the water treatment plant residuals handling process beyond the recent addition of plate settlers to the decant tanks. However, there is no immediate plan to accomplish any of these tasks."]

After examination of managerial and financial documentation and extensive interviews, the history of deferred upgrades and maintenance of the WTP has not been one of management at the plant, but has been due to a lack of long-range financial planning.

In determining long range financial planning, the City did not prioritize the WTP in the allocation of financial resources to accomplish the required capital upgrades. In reality, the overcoming of the treated water loss in the transmission and distribution system, as well as the combined sewer overflows, have a priority that equals, if not exceeds, that of the needs at the water treatment plant given the excess treated water capability of the entire water system.

In recent budgets, the City has become aware of the necessity of the long range financial planning as best exemplified by the prior Hatch Mott McDonald report and the NW Financial Rate Analysis study, as well as appropriation ordinances to authorize improvements, even though they could not be implemented due to the absence of revenues.

10.3.1 Water System Owner and Manager Roles, Qualifications, and Expertise

As noted above, the City of Newark, a municipal corporation created under the laws of the State of New Jersey, is the legal owner and operator of the water supply system for the City. The City is managed by the City Council who may or may not have experience in water utility operations. The City does not own any water supply systems other than those reported in this report.

The water utility is managed by an appointed department head who by law, may or may not have any water utility experience. The current department head has many years of experience

in the water utility. The Division head over Water Supply is currently a Professional Engineer; however, this is not a legal requirement for this position. The Water Treatment Plant and related supply functions are managed by the Licensed Operator/Director of Public Works Andrew Pappachen. As a 42-year veteran of the system, the Licensed Operator/Director of Public Works Mr. Pappachen possesses the institutional and expert knowledge of the system, from the treatment and raw water portion to the distribution mains, interconnects and finally the in City distribution system in the City itself.

10.3.2 Training and Experience

The supervisory staff at the WTP has been fairly stable through several forms of ownership. Many personnel have been on-site since the inception of the WTP in the early 1990s. To the credit of the WTP the staff of supervisors, senior operators and operators are highly trained and many hold sufficient licensure.

The balance of the water supply staff possesses diminishing levels of licensing and training through the main transmission lines who hold similar licenses to the supervisors at the WTP but slightly less in advanced licensing. The lowest level of license holding is in the City distribution system, although employees have years of hands-on experience.

10.3.3 Licensed Operators

Licensed Holders of City of Newark Water Supply & Distribution

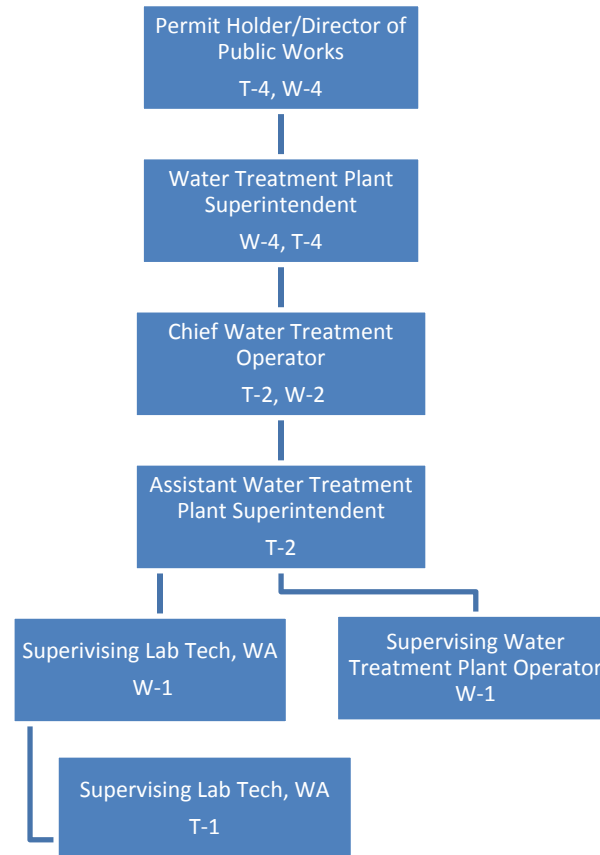


Figure 10-2: Licensed Holders of the City of Newark Water Supply & Distribution

10.3.4 Maintenance Personnel

- **Maintenance** – There are three assignments of “maintenance personnel” in the water utility:
 - WTP Group
 - 1 senior repairer, 1 repairer and 1 laborer
 - Function: Internal activity at the WTP
 - Watershed Group
 - 2 maintenance repairers
 - Function: Watershed activity and maintenance and landscape activity.
 - Intake and Supply Distribution division.

- 2 senior maintenance repairers, 2 water treatment repairers and 1 laborer
- Function: transmission line maintenance and landscape activity

The WTP group, works with the operators inside the plant and may do occasional outside landscape and related activity. The watershed group assigned to the Charlottesville reservoir maintenance facility is also responsible for grass cutting and exterior maintenance at the dams. The Intake and Distribution group does both transmission main maintenance plus landscape maintenance for the various rights of way used by the utility, while the other portion of this group reports to the Cedar Grove facility for maintenance activity at that location and other supply system facilities.

The outside maintenance crews have been hampered somewhat by the lack of capital investment in appropriate mowing equipment, particularly those assigned to the watershed. Personnel reported the importance of maintaining the 5 watershed dams and spillways and their inability to ensure no trees take root to prevent the potential weakening of the berms due to tree growth.

The maintenance leadership, if not entire maintenance staff (excluding those working at the WTP) and function, can be effectively centrally located at the Little Falls location for the water system, providing greater flexibility and supervision in daily assignments and equipment usage.

10.3.5 Description of Procedure for Informing Management Personnel of PWS O&M Regulatory Requirements

The Director of Public Works Andrew Pappachen, as the licensed operator of the water supply function, is responsible for obtaining and disseminating regulatory procedures and various revisions and updates. His name/address has been observed on various NJDEP communications indicating that his position and responsibilities are known to the controlling State agency and is in receipt of required communications.

It was made known in interviews that there is a system for sign off on procedural policies distributed by the licensed operator; however, in practice, there was no evidence of any policy sign off and tracking. Through interviews however, it was readily acknowledged that safety training and regular exercising of the emergency operations plan and potential life threatening situations, such as chlorine gas conditions, were regularly enacted, tested and trained upon.

Information from Public Water Systems (PWS) O&M Regulatory requirements is disseminated by the licensed operator to the supervisors in the system at weekly staff meetings. All the license holders and supervisors report having a staff meeting with the Licensed Operator/Director of Public Works Andrew Pappachen. There are also meetings at the Little Falls location for system disseminations.

10.3.6 Staffing Levels

10.3.6.1 WTP Staffing

The actual operations staffing of the WTP must be accomplished with a minimum of three (3) personnel on duty at all times.

This manning requirement is the result of PEOSH and OSHA safety requirements. For any activity at the chlorine treatment and storage facilities, or for any activity involving confined space entry, there is a minimum requirement of 2 responders. Plus, the treatment plant control room must be constantly monitored resulting in a minimum of 3 trained people on duty at all times.

Plant management as well as Department management understand and have knowledge of the situation and are currently exploring opportunities to improve and address what is identified as a staffing shortage. Solutions may be provided in the form of additional personnel or through the use of available technology in a cost avoidance strategy. However, until this technology is in place and/or the chemical treatment process change, the current requirement is 3 persons per shift, 24 hours a day, 7 days a week, 365 days a year.

As noted above, the prime staffing requirement is the result of PEOSH and OSHA safety requirements, as well as the need to constantly monitor the plant's operation. The issue is one that is recognized and the subject of budgetary concern.

10.3.6.2 Shift Scheduling / Minimum Staffing Requirements

The WTP operates three (3) shifts per day for seven (7) days a week.

Table 10-1: Shift Scheduling

<u>Shifts</u>	<u>Minimum Staffing</u>	<u>Labor Hours Per</u> 24 hour day	<u>Labor Hours Per</u> Week	<u>Labor Hours Per</u> Year
7am-3pm	3	24	168	8,736
3-pm11pm	3	24	168	8,736
11pm-7am	3	24	168	8,736
Total	9	72	504	26,208

An employee working 40 hours per week (2080 per year) on the average is actually at work only 1776 hours per year (assume 13 paid holidays, 15 vacation days and 10 sick days) resulting in the need for 15 man-years to simply operate the WTP without time for required reporting, repair/major maintenance activities, specialized testing, training, security, and a host of other activities.

The 2015 budget for the water treatment plant provided for nineteen (19) full-time personnel and one (1) seasonal employee, including the manager of the plant. This budgeted staffing is not adequate to the long-term operation of the plant and the required ancillary services. The department budget notes that there are at least eight (8) unbudgeted vacancies at the WTP. Since the adoption of this budget, the department has hired 2 additional water treatment plant operators plus several maintenance repairers.

Additionally, within the 2015 budget, there are listed maintenance, forestry and security personnel who report to various locations within the watershed, inclusive of the WTP. As noted under the 10.2 Overall Facility Security section, there is an opportunity for improvement within the security area through technology, target hardening, or increase in personnel.

The lack of available staffing on the operations levels shifts has caused a drain upon other services and responsibilities of the personnel at the WTP. This has been most cited in the reallocation of laboratory personnel and other supervisory staff to cover minimum staffing levels at the WTP. Many of these diverted assignments and

responsibilities are required for the proper operation of the WTP and the assurance that the end product (treated water), is compliant with all regulatory requirements.

According to those interviewed, excessive work hours performed during the course of any given week has resulted in potential excessive overtime and a lowering of morale. Due to a city-wide hiring freeze caused by the City's financial deficits, the division is down in staffing from past years without any corresponding reduction in required activities. This additional staffing is necessary given the current technological capacity of the plant operation. Improvements in technological automation could impact the manpower currently necessary to operate the plant.

10.3.7 Water Supply System

The water supply system for the City of Newark consists of two components:

1. The City-owned and operated water supply treatment and distribution system. This City-owned system consists of a large watershed area and series of five (5) reservoirs located in northern Passaic County, eastern Sussex County and western Morris County, New Jersey, which provide raw untreated water to the City-owned water treatment plant located in West Milford, New Jersey. The plant produces approximately at its current operational capacity, approximately 40 MGD. The City-owned treatment plant then feeds the treated water through a series of city owned and operated water transmission supply mains to the treated water and rechlorination reservoir at Montclair.
2. A partner membership in a regional water supply system entitled the North Jersey District Water Supply Commission, through which the City owns and has the ability to draw a total of 49.4 MGD as per the enabling legislation and NJDEP Master Permit 2015.

This CTA Report concentrates on the City owned and operated water supply as well as its financial income/expense status and capabilities. The water production features of the North District Jersey Water Supply Commission are not included in the report, although the distribution and sale of this water is included in the City's overall operations and financial analysis.

10.3.8 Legal Authority to Operate the Water System

The City of Newark is the sole owner of the watershed and reservoirs constituting the majority of the water supply for the City. In addition, it is the owner of the water treatment plant located in

West Milford Township and owns in fee or has rights by easement, to the supply mains and distribution system located outside of the City including the large treated water storage facility in Cedar Grove, NJ.

The authority for this ownership is contained in the general powers provided to all municipalities in the State of New Jersey by the New Jersey State Statutes. (Safe Drinking Water Act (N.J.S.A. 58:12A)). This direct ownership is in accordance with the requirements of the laws governing municipalities in the State of New Jersey.

The City has obtained the required permits from the NJ Department of Environmental Protection to operate the described water supply and distribution system.

10.3.9 History

The City of Newark has owned and operated a water supply and distribution system since the 19th century. It has a large watershed under its control either by direct ownership or easement right. For many years the management of this watershed was assigned to the Newark Watershed Conservation and Development Corporation (NWCDC), an agency created by the City for this specific purpose. When the City constructed a water treatment facility in the watershed area in the 1980's, the City first contracted with several private firms to operate these new facilities. In the late 1990's, the City contracted with the Watershed Development and Conservation Corporation to manage this operation. In mid-2013, the City discontinued the use of this contract and assumed full operational and management control over the entire system, including the watershed and the production facilities. Since the City historically included the cost of the watershed contract operation within its operating budget, there was little direct impact on the overall financial structure with this contract cancellation and function assumption. This CTA report focuses on the current 2015 status of the system and not its management or operational history, although this history undoubtedly impacts the current condition.

10.3.10 Current Operations

The current water supply and distribution systems are owned outright by the City of Newark either directly (its own watershed and treatment facilities) or through partnership with other municipalities (North Jersey District Water Supply Commission). The City actively manages the supply and distribution systems and they are operated by the employees of the City. Attached to, and made a part of this report are the organizational/functional charts of the Department of Water and Sewer of the City (Appendix 10A). The water operations are managed by the Mayor of the

City through his appointed department director. This director is confirmed by the City Council and serves a term that is coterminous with the mayor.

The current director has a long-term relationship with the City's water system in an appointed capacity. Most operational personnel within the Department are Civil Service appointments within the purview of the New Jersey State Department of Personnel and the administrative code as promulgated within N.J.A.C. 4A:1-1 et seq.,

The Department of Water and Sewer is fully financed by user fees through two separate municipal utilities and these utility budgets include rental and service allocation fees paid to the City for the use of City properties and management and financial services. As noted in the financial section of the TMF report, there is concern over the extent of these rental and service allocation fees and it is recommended that the City cap them at 10% of current utility billing fees to ensure that sufficient funds remain for other improvements needed in the water utility, or in the alternative, the City perform a "BPU style" (Board of Public Utilities) allocation to justify utility payments to the City's current fund.

In reference to the staffing requirements in supply main and distribution system maintenance as shown in the 2015 departmental budget, there is an acknowledged eight (8) unbudgeted vacancies within the Water Treatment Plant operation. Although some of these vacancies relate to landscape and non-critical functions, more than half impact the functioning of the field operations. Since the budget was adopted in late Spring, five (5) of these vacancies have been filled, at least three (3) of which relate to the WTP operations.

This list contains vacancies in the WTP as well as vacancies in other portions of the system.

Table 10-2: Current Water System Job Vacancies (as of 1/1/16)

Title Code	Title
-	Supervising Engineer
16302	Environmental Engineer
16302	Environmental Engineer
4270	Water Inspector
4270	Water Inspector
4270	Water Inspector
4270	Water Inspector
-	Truck Driver, CDL
-	Truck Driver, CDL
-	Truck Driver, CDL
-	Truck Driver, CDL
1733	Engineering Aide
1733	Engineering Aide
3647	Sr. Water Treatment Plant Operator
3647	Sr. Water Treatment Plant Operator
4296	Water treatment Plant Operator
4299	Water treatment Plant Repairer
2248	Laborer
2248	Laborer
2798	Principal Engineer, Hydraulic
2798	Principal Engineer, Hydraulic
2794	Principal Engineer, 40 hours
2794	Principal Engineer, 40 hours
-	Principal Engineer, 40 hours (GIS)
2758	Principal Accountant
7668	Representative Citizens' Complaints

10.3.11 Under/Over Loading of Employees

The personnel located at the WTP are understaffed for the aforementioned reasons.

Currently there are within the budget 19 employees and one (1) seasonal employee. That is inclusive of the Licensed Operator/Director of Public Works Mr. Pappachen, as well as other supervisory personnel.

While there have been attempts to cover with other lab personnel at the plant and supervisors, the fact remains that, given the current technological controls at the plant, three (3) personnel must be active and in work at all times. The shortfall in staff is currently a situation requiring remedy.

Similarly, in the security area, the water supply is in need of a personnel or target hardening, or a technological solution. The current situation is in contrast to the 2007 Homeland Security audit. It is a situation requiring examination and improvement.

It may bear further examination of the possibility of combining the water and overall public works functions in a central combined location, drawing upon commonality of central resources.

10.3.12 Effects on Decision Making

The decision making process has not been identified as an issue as reported by the personnel during interviews. Although there is the serious concern over employee burn out due to excess hours of work and excess overtime requirements, particularly at the WTP, the issue of erroneous decision making, based upon scarcity of personnel, has not been reported nor identified currently.

10.3.13 Contribution to Teamwork

In discussions with staff throughout the water system, while there are always minor complaints over organizational direction and decision making, there did not appear to be deep seated resentments, lack of cooperation, vandalism, intentional misconduct or similar.

11.0 CONCLUSION

11.1 Process Conclusions and Recommendations

Four objectives were identified for the CTA of the Pequannock WTP. Each are listed below:

1. Assess ability of the existing facilities to reliably produce 60 MGD of treated water under all raw water quality conditions:

The existing facilities at the Pequannock WTP cannot reliably produce 60 MGD of treated water under all raw water quality conditions.

2. If the reliable production capacity is not 60 MGD, provide the reliable treatment capacity under all raw water conditions:

The existing facilities at the Pequannock WTP can reliably produce 40 MGD (± 10 percent) of treated water under all raw water quality conditions. However, if no changes are made at the plant, this reliable capacity will decrease over time.

3. Provide recommendations to enhance plant performance utilizing the existing facilities:

Recommendations to improve plant performance are presented below.

4. If necessary, provide recommendations for capital improvements to reliably produce 60 MGD of treated water under all raw water quality conditions:

Recommended capital improvements to reliably produce 60 MGD under all raw water quality conditions are presented below in a phased approach.

11.1.1 Process Optimization of the Existing Facility

Recommendations to enhance plant performance of the existing facility are listed below.

11.1.1.1 Filter Backwash Sequence

The existing backwash sequence should be revised to improve performance and filtered water quality:

1. Drain down water level to approximately 4 inches above the filter bed.
2. Start surface wash and run for 2 minutes.
3. Start backwash pumps and ramp up to maximum flow. Run concurrent surface wash and backwash for 2 minutes.
4. Stop surface wash and continue backwash until washwater turbidity reaches 15 NTU (approximately 2 additional minutes).
5. Reduce backwash rate to approximately 5 gpm/sf and perform a rinse-to-waste step for a duration equal to the period it takes to replace the volume of the filter (approximately 5 minutes).

This procedure provides several advantages over the existing backwash sequence. Drawing down the water level in the filter and providing time to surface wash at this lower level will allow for a more effective breaking of the filter surface crust on top of the media. The low wash rate has been eliminated from the sequence. It has been replaced with an immediate ramp up to the high rate wash that will remove more turbidity more quickly. Inclusion of a rinse-to-waste step at the conclusion of a filter backwash event is likely to reduce or eliminate the elevated filtered water turbidities at the beginning of a filter run. These turbidity spikes up to 0.3 NTU were discussed in the 2014 CPE report. The actual durations of the revised backwash sequence will need to be optimized based upon backwash performance. In addition, the backwash rate should be seasonally adjusted for water temperature changes.

11.1.1.2 Clean Filter Media Surface

A surface crust of up to one inch has accumulated on top of the filter media. Even with the water drawn down closer to the media surface, the existing surface wash may not be able to break the surface crust. Removing this crust layer off the media may improve filter performance.

11.1.1.3 Fix Leaking Valves

The existing filter valves should be repaired and/or replaced. The amount of leakage is substantial and induces a burden on plant operations. The leakage takes up valuable volume in the washwater equalization basins and residuals handling facilities. The lost water also reduces production efficiency of the plant.

11.1.1.4 Filter Backwash Rates

Flow measurement of a filter backwash rate and surface wash rate should be upgraded. These rates need to be reliable and adjustable to allow operators to maximize performance of these filter cleaning tools.

11.1.1.5 Filtration Rate Control

The filters are currently operated in a declining rate filtration mode. The filters should be operated in level rate-of-flow control. In this control system, flow from the filters is equally divided between the online filters through a flow control valve and meter on the discharge of each filter. Rate-of-flow control results in increased production, reduces the number of backwashes per day, and improves filtered water quality.

11.1.1.6 Chemical Dosing

Jar testing results indicate that coagulation with higher doses of PACl and equivalently lower doses of Clarion produced lower filtered water turbidities. The City may consider adjusting the chemical feed doses accordingly, and evaluating plant performance at full scale.

11.1.1.7 Process Controls

A series of recommended improvements to the electrical and control systems at the plant are presented previously. In general, outdated and unsafe electrical gear requires replacement. Process control equipment needs replacement and a commitment to routine and frequent maintenance.

11.2 Recommended Capital Improvements

Reliable treatment performance under all raw water quality conditions at the plant's rated capacity of 60 MGD requires capital improvements to upgrade the Pequannock WTP from an in-line filtration process. Even if the existing plant is optimized to its full potential, an in-line filtration plant is not equipped to treat the high color and TOC present in the plant's source water.

A proposed phasing of projects that will allow the Pequannock WTP to reliably produce 60 MGD of treated water under all raw water quality conditions is presented below, and graphically shown in Figure 11-3.

- Phase 1 - New Coagulation Facilities (Flash Mix).
- Phase 2 - Filter Improvements.
- Phase 3 - New Dissolved Air Flotation (DAF) Trains.
- Phase 4 - New Ozone System.

11.2.1 Phase 1 - New Coagulation Facilities (Flash Mix)

Coagulation is defined as the destabilization of charge on colloids and suspended solids by a coagulant. Flash mixing is an integral part of coagulation. Flash mixing quickly and uniformly disperses treatment chemicals in raw water. Plant staff currently relies on hydraulic energy for mixing of coagulant at the Pequannock WTP. This process produces a floc that has not been properly conditioned for filtering by the pretreatment processes and filter surface straining is occurring.

Several methods are available to provide flash mixing of chemicals. The two systems most prevalent in water treatment plants are pumped diffusion flash mix systems and mechanical flash mixing with vertical shaft mixers. We recommend installation of a pumped diffusion flash mix system to improve the existing coagulation step at the WTP. A pumped diffusion flash mix system is recommended due to the following advantages over mechanical flash mixing with vertical shaft mixers:

1. Higher efficiency resulting in potential for a 20 percent reduction in chemical demand for equivalent coagulation.

2. Typical reduction in power consumption of 20 percent over mechanical mixing.
3. Lower maintenance.
4. Non-proprietary "off the shelf" parts and flexibility in retrofitting and installation.
5. Lower capital costs.

Mechanical requirements of a pumped diffusion flash mix include piping, centrifugal pump, a spray nozzle, and chemical diffuser. A pump diffusion flash mix system will improve downstream processes such as flocculation and filtration and will result in lowered coagulant requirements. Recommended location of the flash mix pump is upstream of the new DAF trains proposed in Phase 3 at the filtration plant site. A schematic of a pumped diffusion flash mix system is shown below in Figure 11-1.

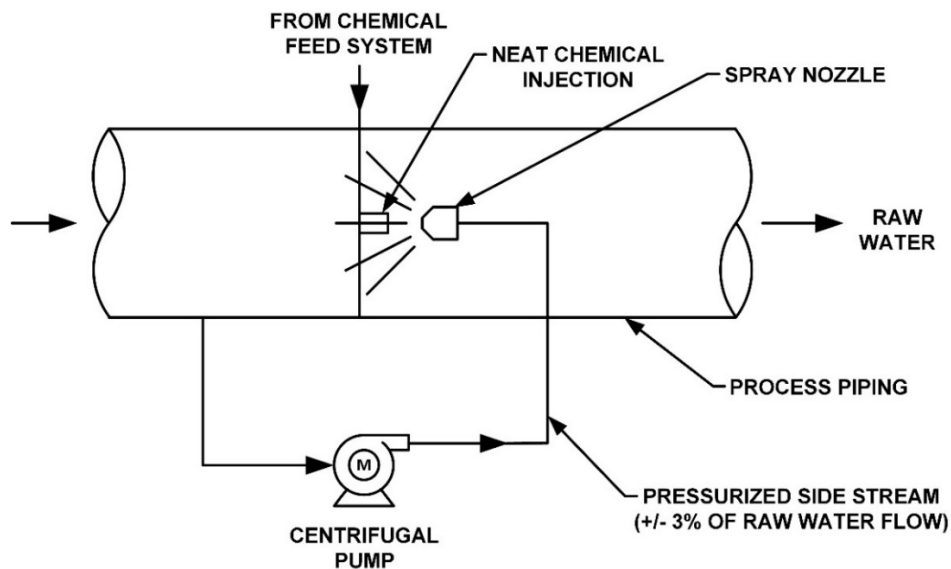


Figure 11-1 Pumped Diffusion Flash Mix Schematic

11.2.2 Phase 2 - Filter Improvements

The existing 12 filters are equipped with dual media (anthracite and sand) filter beds. Due to the extent of mudballs present in the filter media, high levels of floc in deeper media layers, and the existing thick crust layer on the surface, replacement of the filter media may be necessary. Upon replacement of the media, the filter underdrain system should be inspected to confirm its structural integrity. If filter improvements are made, Figure 11-2 contains two options for a new media design and filter underdrains. Both designs result in a more robust filter suitable for current and future turbidity regulations.

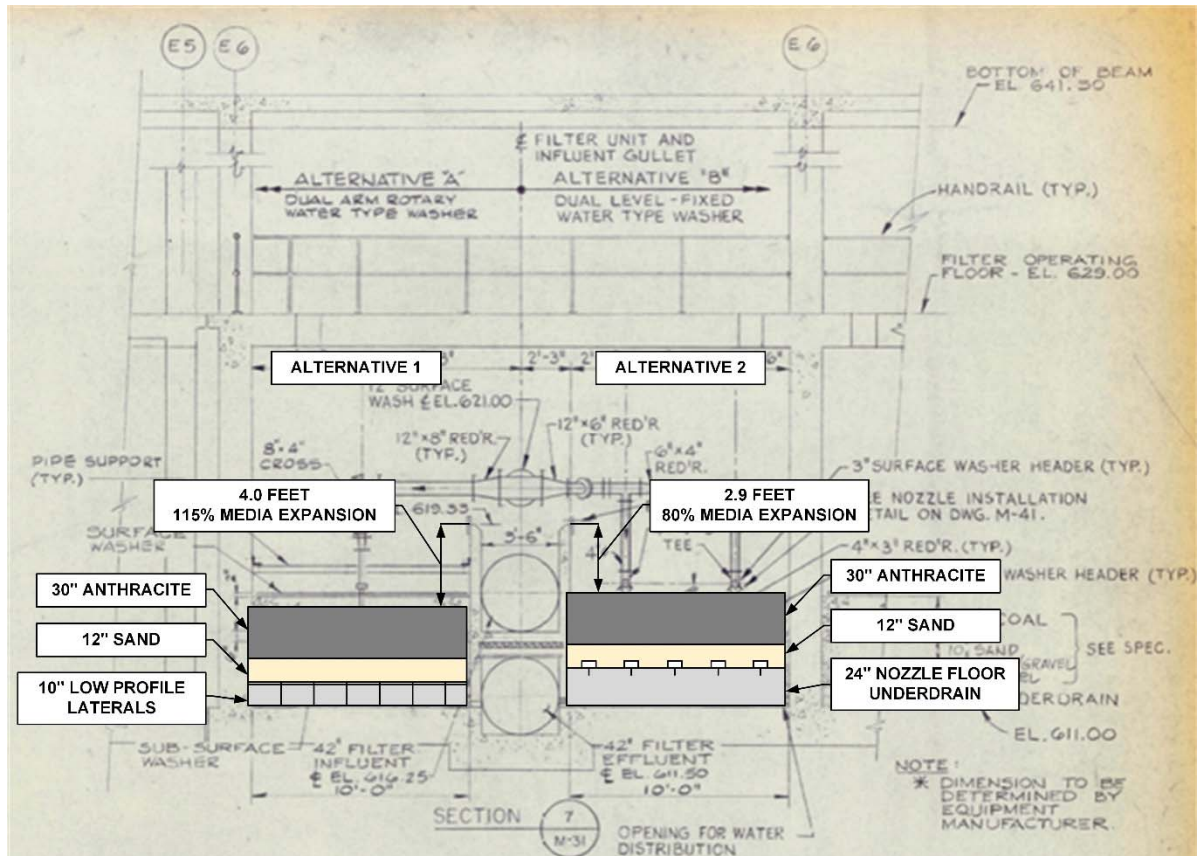


Figure 11-2 Filter Media and Underdrain Alternatives

The recommended filter improvements are broken into two phases: Phase 2a and Phase 2b.

Phase 2a is the addition of two new filters. The primary objective of constructing two new filters first is to eliminate subsequent interruption of plant production when the existing filters are rebuilt.

Phase 2b is the rebuild of the existing 12 filters. It is envisioned two filters would be refurbished at a time. Approximate duration to refurbish two filters is four (4) months. Included in Phase 2b are improvements the existing filter backwash and surface wash systems.

The existing filter backwash facilities should be replaced with a system designed for an appropriate backwash rate for the new filter media design. A constant head box should be installed on the backwash supply line to protect filter underdrains from excess pressure, and new magnetic flow meters should be installed on the backwash supply and surface wash supply lines to allow process control and rate adjustment.

A surface wash system is preferred over an air scour system for the depth of media currently installed. However, the existing surface wash system has been ineffective in breaking the surface crust on top of the media. A new fixed nozzle type surface wash is recommended, which offers fewer maintenance requirements when compared to a rotating arm surface wash.

11.2.3 Phase 3 - New Dissolved Air Flotation (DAF) Trains

Dissolved air flotation (DAF) uses minute air bubbles to float light flocs. The floated solids are skimmed off, leaving clear water near the bottom of the tank. The DAF process is most suited for treatment of algae-laden, highly colored water which also has relatively low turbidity (<50 NTU). DAF is recommended at the Pequannock WTP for the following reasons:

- An in-line filtration process is not robust enough to treat the color present in the raw water. DAF is particularly well-suited to address these issues in a low-turbidity source water. Additionally, incorporation of a clarification process would improve filter performance and production.
- DAF systems have a smaller footprint than that of the conventional flocculation and sedimentation process, which maximizes use of the limited space available at the filtration plant site.
- The solids concentration of the sludge produced is significantly higher (about 3 percent) than that of sludge produced by sedimentation.

Hatch Mott MacDonald (HMM) has prepared preliminary design criteria and site layouts for a DAF system at Pequannock WTP. The system includes three separate trains, each with two stages of flocculation (19 minute detention time) followed by DAF at a loading rate of 8 gpm/ft².

The DAF system could also be installed in two phases. **Phase 3a** would be construction of two stage flocculation. **Phase 3b** would be the actual dissolved air flotation basins and support facilities. Reasons to phase implementation of DAF include:

1. Budget limitations.
2. Interim improved plant performance. A direct filtration process with upgraded filters will perform much better than the existing in-line filtration process.
3. As discussed next, raw water ozonation is recommended in **Phase 4**. If raw water ozone is added upstream of a direct filtration process, it substantially improves a plant's treatment capability.

11.2.4 Phase 4 - New Ozone System

Ozone is a powerful oxidant and disinfectant. It is used in water treatment plants to control algae and associated taste & odor producing compounds, enhance color removal, as an alternative to chlorine for primary disinfection, and to oxidize dissolved metals and synthetic organic chemicals resulting from man-made pollution.

Installation of a pre-ozonation system at the pretreatment facility would provide numerous treatment benefits.

1. Ozone can be used for disinfection while producing a negligible amount of disinfection by-products (DBPs).
2. Improved aesthetic water quality through elimination of undesirable tastes, odors, and color.
3. Reduced coagulant dosage and improved particulate removal from filtration, as evidenced by lower turbidity and lower particle count of the filtered water.
4. Oxidation of unwanted inorganic compounds, such as iron, manganese, nitrate, and hydrogen sulfide.

Ozone cannot be stored. It must be generated continuously onsite. It is anticipated that ozone would be generated using liquid oxygen purchased from a vendor and stored onsite. The main components of an ozone system include liquid oxygen storage, vaporizers, ozone generators, ozone diffusers, and off-gas ozone destruct.

11.2.5 Conceptual Level Cost Estimate

Construction cost estimates for the proposed capital improvements are based on November 2015 costs and the accuracy of costs presented herein is in the range of +/- 30 percent of actual costs, as determined with a master planning level of engineering detail. The project cost estimates included herein are intended to serve as a guideline for preliminary financial planning. Estimated construction costs are presented in Table 11-1 below.

Table 11-1 Construction Cost Estimate for Improvements to Existing WTP⁽¹⁾

Project	November 2015 Estimate ⁽²⁾
Phase 1 - New Pump Diffusion Flash Mix System	\$300,000
Phase 2 - Filter Improvements	
2a: Two New Filters	\$7,500,000
2b: Rebuild Existing 12 Filters	\$15,000,000
Phase 3 - New DAF Trains	
3a: Two Stage Flocculation	\$9,000,000
3b: DAF System	\$12,000,000
Phase 4 - New Ozone System at Pretreatment Building	\$4,000,000
Notes	
1. Expected accuracy between +/- 30 percent of actual costs, as determined with a master planning level of engineering detail.	
2. Costs based on conventional design-bid-build delivery approach.	

A process flow diagram of the Pequannock WTP including the proposed capital improvements is presented in Figure 11-3.

11.3 Prioritization List of Process Recommendations and Capital Improvements

All recommendations not including capital improvements are considered to be short-term optimization strategies, and should be implemented first. Eight (8) short-term recommendations to enhance plant production and finished water quality utilizing the existing facility are presented in the CTA. The recommendations could be initiated for implementation within 2 years and can be categorized as “operations and maintenance” projects. When these recommendations are implemented, the Pequannock WTP should achieve a reliable production capacity of 50 MGD (\pm 10 percent) of treated water.

To further clarify the proposed improvements program, three stages are presented below:

Stage 1

1. A surface crust up to one inch has accumulated on top of the media. Remove the crust layer off the media.
2. Jar testing results indicate that coagulation with higher doses of PACI and equivalently lower doses of Clarion produced lower filtered water turbidities. The City should consider adjusting the chemical feed doses accordingly, and evaluating plant performance at full scale.
3. The backwash sequence should be revised. Our recommendation is to draw the water level in the filters down to 4 inches above the media prior to surface wash, eliminate the low rate wash, and add a rinse-to-waste step to limit turbidity breakthrough at the beginning of a filter run.
4. New Coagulation Facilities (Flash Mix), (Phase 1) - Project includes a new pump diffusion flash mix system. A pump diffusion flash mix system will improve downstream processes such as flocculation and filtration and will result in lowered coagulant requirements.

Stage 2

1. The existing filter valves should be inspected, repaired, and/or replaced. The amount of leakage is substantial and induces a burden on plant operations. The leakage takes up valuable volume in the washwater equalization basins and residuals handling facilities. The lost water also reduces production efficiency of the plant.
2. Flow measurement of a filter backwash rate and surface wash rate should be upgraded. These rates need to be reliable and adjustable to allow operators to maximize performance of these filter cleaning tools.
3. The filters are currently operated in a declining rate filtration mode. It is recommended that the filters be operated in level rate-of-flow control. In this control system, flow from the filters is equally divided between the online filters through a flow control valve and meter on the discharge of each filter. Rate-of-flow control

results in increased production, increased UFRVs, and reduces the number of backwashes per day.

4. A series of recommended improvements to the electrical and control systems at the plant are identified. In general, outdated and unsafe electrical gear requires replacement. Process control equipment needs replacement and a commitment to routine and frequent maintenance.

Stage 3

1. Filter Improvements

- a. Phase 2a is the addition of two new filters. The primary objective of constructing two new filters first is to eliminate subsequent interruption of plant production when the existing filters are rebuilt.
- b. Phase 2b is the rebuild of the existing 12 filters. It is envisioned two filters would be refurbished at a time. Approximate duration to refurbish two filters is four (4) months. Included in Phase 2b are improvements the existing filter backwash and surface wash systems.

2. Dissolved Air Flotation (DAF)

- a. Phase 3a would be the construction of two stage flocculation.
- b. Phase 3b would be the actual dissolved air flotation basins and support facilities. DAF is particularly well-suited to address algae, color, and tastes and odors present in the raw water. Additionally, incorporation of a clarification process would result in increased filter production, increased UFRVs, and reduce the number of backwashes per day.

3. New Ozone System (Phase 4) - Project includes a new ozone generation and feed system. Ozone is a powerful oxidant and disinfectant. It is used in water treatment plants to control algae and associated taste and odor producing compounds, enhance color removal, as an alternative to chlorine for primary disinfection, and to oxidize dissolved metals and synthetic organic chemicals resulting from man-made pollution.

Note: Although a new ozone system is shown as the last recommended capital improvement, it is in the City's best interest to increase its priority due to the ongoing TTHM investigation results. It is understood that the City has already released a request for proposals for ozone improvements for the Pequannock Water Treatment Plant. With ozone improvements possibly beginning in the near future, not only will the City be taking corrective measures to decrease TTHM's, but simultaneously this will help with other issues at PWTP, as stated previously in the report, since ozone has numerous treatment benefits.

A schedule showing project recommendations of the Pequannock Water Treatment Plant is show below in Table 11-2. Items are ranked from highest to lowest priority. Each item also lists the asset category for which it classifies, the primary need for the project, estimated cost, and estimated timeline. Following the table is a timeline with project durations, start dates, and end dates as shown in Figure 11-4.

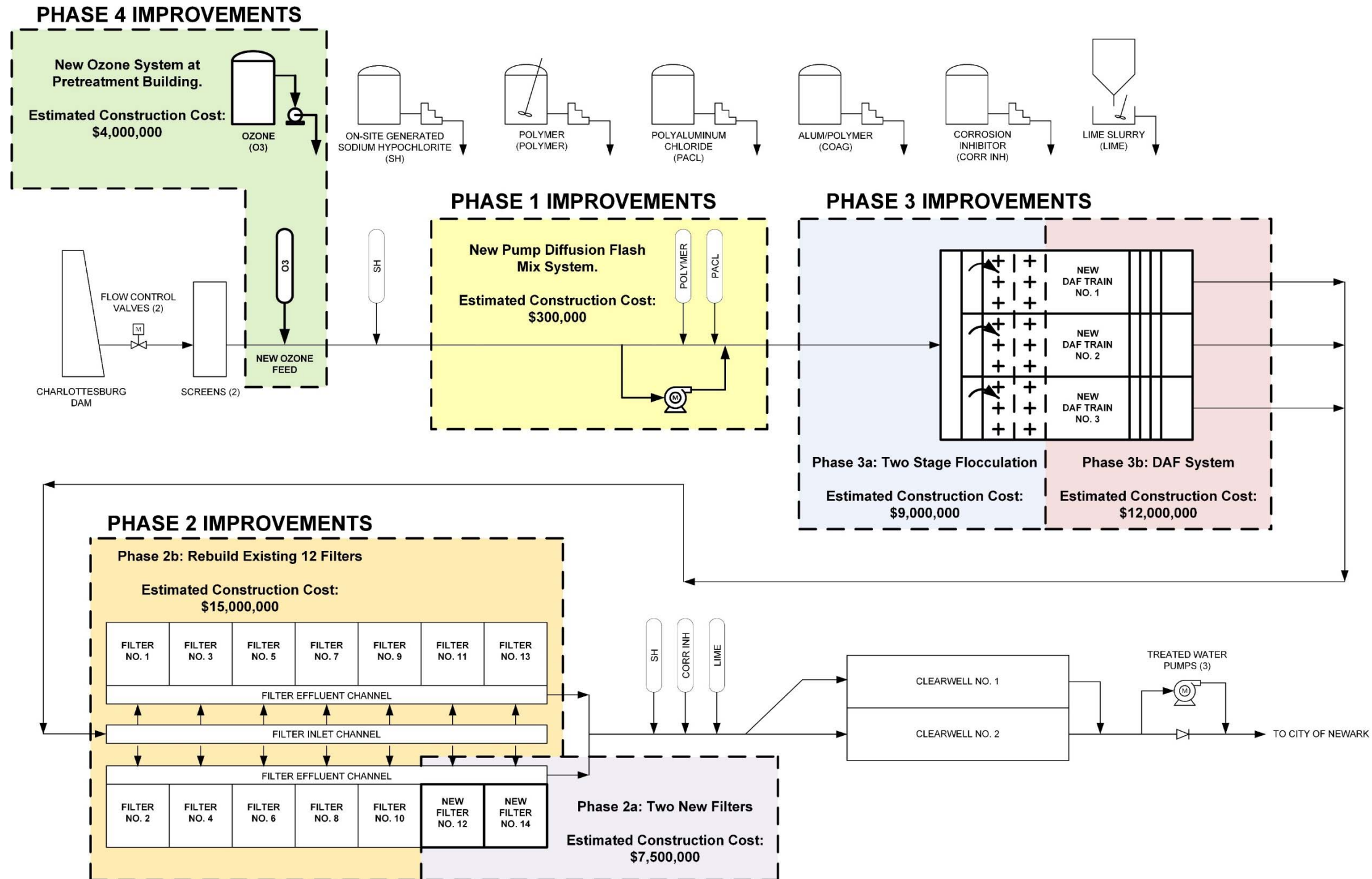
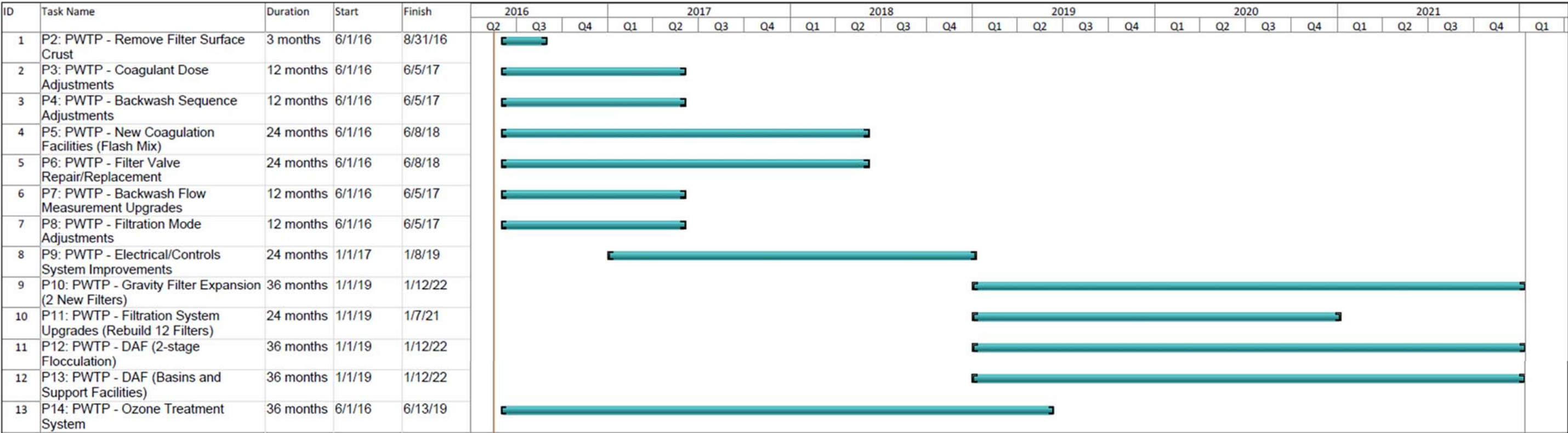


Figure 11-3 Process Flow Diagram

Table 11-2 – Schedule of Comprehensive Technical Assistance Recommendations

						Timeline and Project Cost (2016 Dollars)		
Project No.	Priority Ranking	Asset Class	Primary Need	Risk	Project Description	Immediate (within 1 year)	Short Term (1-3 years)	Near Term (3-5 years)
1	High	Treatment	Process Improvements	Low	Pequannock WTP - Remove Filter Surface Crust	\$50,000		
2	High	Treatment	Process Improvements	Low	Pequannock WTP - Coagulant Dose Adjustments	\$50,000		
3	High	Treatment	Process Improvements	Low	Pequannock WTP - Backwash Sequence Adjustments	\$250,000		
4	High	Treatment	Operational Efficiency	Medium	Pequannock WTP - New Coagulation Facilities (Flash Mix)	\$300,000		
5	High	Treatment	Renewal/Replacement	Medium	Pequannock WTP - Filter Valve Repair/Replacement	\$1,000,000		
6	High	Treatment	Operational Efficiency	Low	Pequannock WTP - Backwash Flow Measurement Upgrades	\$50,000		
7	High	Treatment	Operational Efficiency	Low	Pequannock WTP - Filtration Mode Adjustments	\$50,000		
8	High	Treatment	Renewal/Replacement	Medium	Pequannock WTP - Electrical/Controls Systems Improvements		\$750,000	
9	High	Treatment	Capacity	Low	Pequannock WTP - Gravity Filter Expansion (2 New Filters)			\$7,500,000
10	High	Treatment	Renewal/Replacement	Medium	Pequannock WTP - Filtration System Upgrades (Rebuild 12 Filters)			\$15,000,000
11	High	Treatment	Capacity	Medium	Pequannock WTP - DAF (2-stage flocculation)			\$9,000,000
12	High	Treatment	Capacity	Low	Pequannock WTP - DAF (DAF Basins and Support Facilities)			\$12,000,000
13	High	Treatment	Regulatory	Medium	Pequannock WTP - Ozone Treatment System	\$10,000,000		
TOTALS:						\$11,750,000	\$750,000	\$43,500,000

Figure 11-4: Timeline of Comprehensive Technical Assistance Recommendations



Notes:

- 1. Timeline created on May 19, 2016 using Microsoft Project 2010.
- 2. P#: corresponds to overall capital projects schedule shown in the TMF report
- 3. Each working day consist of 8 hours
- 4. Each week consists of 5 working days
- 5. Each month consists of 22 working days

11.4 Management Summary and Recommendations

As noted in the above detailed section on the management of the Newark Water system, the existing personnel and management systems are able to meet the current requirements of the system, even though there are several dysfunctional issues and personalities. However, the primary issue to be addressed in the management section of this report is the operation of the system in upcoming years when certain specific system resources (personnel) may no longer be available.

By way of background, for many years, the water supply function (water supply, treatment and transmission mains up to the distribution system) was operated by a third party nonprofit corporation created by the City of Newark. The City completely financed this third party operation and theoretically provided oversight through its budgetary processes and appointments to the nonprofit governing board of directors.

Starting approximately in the early 2000's and ending in 2012, the elected officials in the City considered that the best future course of action might be to establish a semi-independent municipal utilities authority to manage the water supply system. During this time period, funding of water improvement and maintenance projects became a low priority resulting in the disinvestment in the water supply system in capital improvements and deferred maintenance issues. For a number of reasons, which are not pertinent to this report, in 2012 the City changed its course of action and decided to reclaim the water supply system as a part of its internal operation. This occurred in 2012 and 2013, and discussions with various affected individuals indicated that the transition from a third party operation to a city run operation was not a smooth process particularly in the purchasing and personnel issues. In reality, the City has not integrated the water supply operation into its existing management systems, rather the water supply system continues to operate as an appendage to the City operation. This is partially due to the distance of the plant from the City, and partially due to a continued perception of separation stemming from its operation as a corporation. Different operating philosophies and traditions of the water supply system and personnel involved also partly play a role.

For a number of years, the key official in the water supply system has been the Licensed Operator/Director of Public Works Andrew Pappachen, the former Superintendent under the nonprofit corporation and now with the title of Director of Public Works. He has over 40 years of experience with the system and appears to be the only person with the big picture perspective of the entire supply operation including the various major interconnections, pumping stations, watershed supply issues and treatment processes. In reality, the current system and its operation are a reflection of his expertise and this involvement has been to the great advantage of the system and the customers of the system.

Currently he reports to the Assistant Director Michel Gelin, who is a professional engineer and who reports to the Director of the Department of Water and Sewer, Andrea Adebawale. Previously to this assignment, the Assistant Director Mr. Gelin's experience has been in highway construction and maintenance and not water supply and sewer collection system. As the licensed operator of the system however, the Director of Public Works, Mr. Andrew Pappachen, is the recognized expert behind the water supply system operation.

The primary management issue facing the City is succession planning and the operation of the system until this succession process is in place. The CTA Report lays out a reasonable succession plan. Currently, the Licensed Operator/Director of Public Works Andrew Pappachen operates from two locations: the water treatment plant in West Milford and the Main Office in Little Falls. However, he primarily focuses on the water treatment plant. The Assistant Director Michel Gelin operates from the Field Operations Center on Central Avenue in Newark. In reality, the command center and operations center for the Water Supply operation should be the Little Falls Center since this location has and should improve the central data system for the entire operation (supply and transmission) as shown on the water supply functional chart. This location would place emphasis on the issues of the entire operation and not just the plant issues (West Milford) or just the distribution issue (City of Newark). Both the plant operation and the distribution maintenance center should be supervised by an on-site superintendent reporting to the Little Falls Operations Center.

In essence, currently there are two (and possibly three) authorities for the supply system: the Licensed Operator/Director of Public Works Andrew Pappachen as the historic leader and knowledge base, the Assistant Director Michel Gelin, as the organizational authority, and the Director Andrea H. Adebawale, as the department head. The management issue is a transition plan for the immediate future until the Licensed Operator/Director of Public Works Andrew Pappachen retires.

As noted above, the Licensed Operator/Director of Public Works Andrew Pappachen should concentrate his presence and activities at the Little Falls Office where he can provide the expertise and guidance needed system wide. Michael Awertschenko, the Water Treatment Plant Superintendent, should assume responsibility for the water plant operation and should replace the Licensed Operator/Director of Public Works Andrew Pappachen in that office at the plant. There is question as to if Mike Awertschenko, the Water Treatment Plant Superintendent, who has the requisite license and plant experience, has all of the required management skills necessary to run the plant or the dedication needed for the 24/7 operation. During interviews, a level of concern was expressed as to his managerial capability to perform this key function. Now is the time to put this management model to the test and assess this capability while the

City has the Licensed Operator/Director of Public Works Andrew Pappachen as the backup person should his presence be needed.

All supervisors in this division have as a minimum the T-2 license to improve their understanding of the dynamics of the water treatment system and potential exposure to the maintenance of water quality standards.

The Assistant Director, Michel Gelin, should relocate his operations to Little Falls to oversee the significant capital program to be undertaken in the next 5 years as well as to gain the overall system knowledge currently possessed by the Licensed Operator/Director of Public Works Andrew Pappachen. The Assistant Director, Michel Gelin, should only accept this assignment if he is to be available to the City for the next 10 + years in this role.

A second major issue is the future role of the City of Newark as a regional water provider. This includes both as a provider to the existing customer base and infrastructure, and as an integral part of the regional water purvey system beyond meeting the present and future needs (and fiscal responsibility/ability) of the municipal water system. Given the water resources available to the City (both in the City plant operation and its allotments from NJDWSC) and with the fiscal assistance of the State of NJ, Newark can become an integral component of a regional water system that provides the needs, in addition to the redundancy, necessary to the existing and future water needs of northeastern NJ. With the integration of the Newark water system into the state regional plan, NJ has the capacity and ability to be a model of effective water supply that is clearly lacking in existing and future management strategies of such a vital resource in the rest of the country. In addition, this involvement should have favorable impact on the City's water utility finances. As a minimum, the City must effectively use the existing water resources that it is currently paying for.

11.4.1 Organizational Recommendations

As shown on the organizational charts in Appendix 10A, within the Department of Water and Sewer there are three (3) main functions:

- Director's Office (Administration),
- Division of Billing and Customer Service Collection of both Water and Sewer User fees (Billing, Collections & Metering), and
- Division of Sewers and Water Supply Water & Sewer (Operations).

The Director of the Water & Sewer Utility, Andrea Hall Adebawale, has duties that are directly related to the overall operations and administrative oversight and works out of Newark City Hall

on Broad Street in Newark. The Director's role is to interact and establish policy in conjunction with the overall City Administration and is part of the executive branch reporting to the City Mayor and Council through the Office of Administration.

The basic management authority for the water utility rests in the Mayor's Office pursuant to state law governing the Mayor Council form of government. The Mayor delegates the majority of the authority to his appointed Water and Sewer Department Director, Andrea Hall Adebowale. This delegated authority covers the Newark Watershed and its five (5) reservoirs through the treatment plant, intake, transmission and distribution then to the city proper and the infrastructure for residential and commercial usage.

The chief operator responsible for adherence to DEP and EPA standards for safe drinking water and holder of the water operator's and distribution license for the entire system is Andrew Pappachen, Director of Public Works for the Water Supply System. Although he is primarily based at the WTP, he has an operational oversight and responsibility for the entire treatment and distribution system as the licensed operator holding the required W-4 and T-4 licenses.

Although other members of the staff hold various water treatment and distribution licenses, due to the geographic separation of the various functions and activities, other than at the WTP, there are not duplication or redundancy of licenses. There is concern over the centralization of all operations in one individual. Although this individual is very competent and has successfully operated the water utility for many years, there is no designated succession plan should the current license holder no longer be available. In addition, given the geographic size of the system, the practicality and prudence of centralizing both operational decision-making and compliance responsibility for both the treatment and distribution systems in a single license-holder is questioned.

11.4.1.1 Director's Office

The City water system is operated first and foremost by the Director's office located in City Hall within the City of Newark. It is at this location that the Director is operating in contact with the necessary upper management of the City of Newark City government. The Mayor's office, administration and finance are necessary complimentary departments of the City water supply.

11.4.1.2 Assistant Director's Office

Currently Michel Gelin, P.E. is the Assistant Director of the department as well as the direct supervisor of the Water Supply Division, and operates out of the Central Avenue Water & Sewer Operations location. The prime focus of the Central Avenue location is the distribution system within the City proper. This end user operation is a far different mission than that of the other locations of treatment, retreatment, transmission and large main distribution areas of the water system. It is recommended that the Assistant Director's location of operations be relocated to the more central location of Little Falls Engineering & Operations location as the logical linchpin between the City of Newark's distribution system and the larger supply mains as well as water treatment supply.

11.4.1.3 Water Treatment Plant Superintendent

As the license holder for the water supply system, Andrew Pappachen has authority regarding treatment operations of the water system. Currently the Director of Public Works/Licensed Operator Mr. Pappachen operates out of the Pequannock Water Treatment Plant in addition to the more centrally located Little Falls. Managerially, it is recommended that the full management of the Water Supply system should operate out of the Little Falls facility with the Water Treatment Plant Superintendent operating from the Pequannock Water Treatment Plant.

11.4.1.4 Little Falls Engineering & Operations Center

Although not a treatment or distribution license holder within the system, John T. George, P.E. as the Supervising Engineer at the Little Falls location accomplishes much of the contractual and specification work that is necessary for future improvement of the system. This operation out of the Little Falls location is the logical central administration for the water supply and the City would be well suited to house the Assistant Director, contractual engineer and the water system license holder as well as maintenance centralization at this location.

Given the limited staffing in this office, there is a concern over the amount of time and personnel resources available to handle the projected extensive capital improvements program envisioned and financed by the City for the next 7 years. Due to attrition of professional employees, the office has experienced significant time delays administrating

the current ongoing capital projects as well as operational contracts, especially in coordinating these contracts with the required reviews/approvals of the central office and administration. It is recommended that additional personnel be added to this office to not only handle the engineering contract management, but also the administrative function of the financing mechanism that will be used, the New Jersey Environmental Infrastructure Trust fund (NJEIT) for the very large capital improvement program in process for both the water and the sewer utilities.

11.4.1.5 Central Avenue Water & Sewer Operations

Public Works Superintendent, Kareem Adeem, is the supervisor for the City distribution system. Responsibilities for this position include overseeing maintenance and minor repairs for the City distribution system, as well as collaborating with the City billing department for water shutoffs and activations.

Currently, while this operation is overseen by the license holder for the entire system, it is recommended that the City consider having the transmission and distribution systems under the direct supervision of a W-4 licensed manager. If this is not possible, then as an alternate a person with a W-2 or higher license can provide this oversight under the supervision of the sole license holder. The safety of the end users is not only a function of the quality of the treated water but the maintenance of this water quality if it is disturbed by required repairs or maintenance.

It is recommended that all field supervisors in this division have as a minimum the W-1 license and division supervisors a W-2 license to improve their understanding of the dynamics of the water system, and to reduce potential customer exposure to health risks, caused by routine maintenance and repairs to the system. There is significant value to the overall operation of the water utility by structuring the maintenance of water quality standards through exposure to the licensure certification and continuing education processes.

Although Mr. Adeem, Water Treatment Plant Superintendent, does not hold a water license, is a capable supervisor with significant system-specific operational knowledge and experience, and positive rapport with both the administrative and operational staff groups. Mr. Adeem should be encouraged to obtain the necessary licenses or be required to work directly under someone who holds them. Given the potential exposure to

the end users of an error in system repair or maintenance, it is important that a responsible licensee be directly active in the distribution office.

As a general premise, the City water supply system is an asset which should not be sold by the City to a third party agency; the City's goals should be to optimize its operation, provide for its continuation in accordance to all state and federal regulations, and to do so in a cost effective manner with built-in redundancy to protect not only the assets, but also the customers it serves. It is recognized that one of the City's goals is to provide as many employment opportunities as possible to its residents and this is admirable and doable as long as the technical needs of the system are given the highest priority and the City has the redundancy to ensure the system's continued operation in accordance with constantly evolving best practices in the water supply industry. The use of contracting for this experience and knowledge redundancy may be the most cost effective means of acquiring and maintaining access to this knowledge base.

11.5 Management & Financials Prioritization List

A prioritization list has been developed to assist the City with implementing the above presented recommendations. Certain items also have a suggested start or end date as recommended by The Canning Group. With the first item being of highest importance, the prioritization list is shown below:

1. Implement the recommended reorganization/succession plan together with the personnel needed to manage the extensive capital improvement plan.
2. Every three years, initiate a review of the revenues due to recent rate increases and monitor revenue/fund balance to afford capital upgrades.
 - a. Commence no later than Fall (September) 2017
3. Management training of all personnel in Principles of Supervision for those designated as senior operators and above.
 - a. Complete by Fall 2016
4. Meet minimum licensure standards for personnel designated to possess licensing
 - a. W-1/W-2

- b. T-1/T-2
 - c. Commence by Fall 2016
5. Initiate the cost replacements/upgrade estimates and coordinate with The City of Newark capital plan to address various safety issues such as:
- a. Elimination of the use of chlorine gas for treatment
 - b. Repair/replacement of key sector valves in the supply and distribution system to allow the emergency shut down of sectors of the distribution system for emergency repairs
 - c. Additional treatment of the treated water stored in Cedar Grove
 - d. Repair/upgrade of treatment plant issues that are limiting plant operations such as sludge management,

11.6 Overall Conclusion

The intent of the CTA is to characterize an existing treatment plant's suitability for optimization, in terms of reliable capacity and finished water quality compliance with regulatory standards. The H2M Team's analysis indicates that, upon implementation of a suggested optimization program, the Pequannock Water Treatment Plant may reasonably be predicted to achieve a reliable treatment capacity of approximately 50 MGD. Further, the CTA requires that the candidate facility be reviewed for adaptability to industry best practices of its management structure and financial support system. The H2M Team has identified the need to restructure and reinforce the operational and executive management hierarchy to provide a more robust and redundant system of leadership. With regard to finance, the City's recent rate restructuring provides a substantial foundation for the program of future capital improvements related to water supply. Assuming the substantive application of the operational and managerial suggestions identified herein, it is reasonable to conclude that the Pequannock facility can be optimized to its target capacity, with finished water quality excursions limited to statistical outliers in future operation. Future capital improvements, particularly the addition of a clarification unit process to the plant's treatment train, will allow the City to reliably advance the facility to a capacity at least equal to the 57 MGD safe yield of the Pequannock Watershed reservoir system.

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APPENDICES

CITY OF NEWARK WATER DEPARTMENT
COMPREHENSIVE TECHNICAL ASSISTANCE
PEQUANNOCK WATER TREATMENT PLANT

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APPENDIX 2A

Newark Revenue Summary

1									
2	WATER DEPT DATA								
3		2007	2008	2009	2010	2011	2012	2013	2014
4	USAGE								2015
5	GALLONS	18,940,160,257	17,618,086,826	17,629,315,729	16,779,008,678	17,755,301,742	17,044,976,113	17,410,595,320	17,600,217,000
6	average daily onsumtion	51,890,850	48,268,731	48,299,495	45,969,887	48,644,662	46,698,565	47,700,261	48,219,773
7									
8	2015 ESTIMACT THRU SEPT	2014 act data for last 3 months		total for above usage comparison					
9	Gallons 13,701,275,609	3,898,942,000		17,600,217,609					
10									
11	WATER DEPARTMENT FINANCIAL DATA FROM INTERNAL FINANCIAL RECORDS (note: different from Audits since interest and other charges are included in collections verses separate headings in audit)								
12									
13	Opening arrears (Jan 1 for unpaid prior year arrears)	7,229,446	9,758,950	8,684,711	11,835,496	7,979,883	8,119,934	10,747,726	9,022,029
14	Prior Dec arrears (est as Total less the opening balance)	2,347,136	2,034,651	1,932,412	15,216	1,362,563	3,749,932	240,735	2,429,301
15	total arrears (Jan 1)	7,539,769	9,576,582	11,793,601	10,617,123	11,850,712	9,342,446	11,869,866	11,451,330
16									
17	annual billing based upon cf used)								
18	city	34,605,395	35,320,971	35,692,356	34,944,652	34,757,757	35,123,832	34,020,387	34,196,029
19	bulk (non City)	8,093,177	8,907,459	8,685,454	9,334,438	9,268,904	10,925,047	11,321,528	12,150,754
20	total	42,698,572	44,228,430	44,377,810	44,279,090	44,026,661	46,048,879	45,341,915	46,346,783
21	monthly average	3,558,214	3,685,703	3,698,151	3,689,924	3,668,888	3,837,407	3,778,493	3,862,232
22									
23	collections (includes interest and oher charges, consequently does not match audit which separates items into different reporting categories)								
24	arrears	6,115,978	6,817,199	9,323,116	7,369,944	8,185,346	6,140,335	7,286,351	6,362,883
25	annual bill	36,892,916	37,228,864	38,163,583	35,690,773	39,712,143	41,131,056	39,177,704	41,950,331
26	total	43,008,894	44,046,063	47,486,699	43,060,717	47,897,489	47,271,391	46,464,055	48,313,214
27	city %	86	84	86	81	90	89	86	91
28	bulk %	81	71	79	69	69	66	61	58
29	year end account status								
30	arrears (prior yr)	1,423,790	2,759,383	2,470,484	3,247,178	3,665,365	3,202,111	4,583,515	4,625,577
31	billing (current yr uncollected)	5,805,655	6,999,567	6,214,226	8,588,318	4,314,518	4,917,823	6,164,211	4,396,452
32	total	7,229,445	9,758,950	8,684,710	11,835,496	7,979,883	8,119,934	10,747,726	9,022,029
33									
34									
35	DATA FROM AUDIT REPORTS								
36									
37	Water Rent Collections base			43,091,381	47,757,169	48,022,818	43,139,316	46,316,460	
38	additional						2,751,390	18,750	
39	non budget: Other water rents e.g. interest etc.			5,872	13,004	418	740,939	1,045,267	
40									
41	total						46,631,645	47,380,477	
42	trand								
43	sferred to liens / cancelled							293176	
44								905970	
45									
46	AUDIT DATA	2007	2008	2009	2010	2011	2012	2013	2014
47									
48	Assets and Deferred Charges (D)								
49	Operating Section:								
50	Cash	10,731,512.59	16,853,867.33	10,455,374.87	13,961,887.83	10,949,122.95	9,402,756.13	11,302,235.35	5,656,372.68
51	Consumer Accounts Receivable	10,193,295.92	12,577,948.42	11,342,776.55	12,757,802.23	10,809,176.04	12,095,775.55	11,320,302.90	11,482,089.37
52	Sundry Accounts Receivable	89,051.92	165,458.46	165,457.54	156,131.19	224,397.79	328,683.11	317,285.13	326,459.17
53	Delinquent Water Rents Receivable	13,190.81	18,203.06	31,399.73	3,794.69	3,794.69	11,612.24	11,612.24	3,667.28
54	Water Liens Receivable	277,967.22	204,368.75	426,774.32	690,851.00	1,163,551.88	1,492,361.19	1,492,361.19	1,785,537.64
55									
56	Revenue and Other Income:								
57	Operating Surplus Anticipated		2,000,000.00	4,564,000.00	4,597,486.00	1,405,000.00	3,704,945.84		854,000.00
58	Water Rents	43,252,453.12	44,066,980.04	47,343,652.57	43,091,381.59	47,757,169.50	48,022,818.12	45,890,706.01	46,316,460.94
59	Miscellaneous Water Rents								18,750.00
60	Non Budget Revenue	924,143.57	29,771.92	125,793.02	5,872.80	13,004.72	4,178.41	740,939.29	1,053,700.51
61									
62									
63	Balance January 1		10,193,295.92	12,577,948.42	11,342,776.55	12,757,802.23	10,809,176.04	12,095,775.55	11,320,302.90
64									
65	Increased by:								
66	Rents and Charges Levied		45,462,036.85	45,679,722.06	44,131,767.80	45,772,783.27	48,886,604.28	45,325,966.90	47,677,394.64
67			55,655,332.77	58,257,670.48	55,474,544.35	58,530,585.50	59,695,780.32	57,421,742.45	58,997,697.54
68									
69	Decreased by:								
70	Collections		42,652,878.95	46,138,473.82	42,073,333.94	46,913,884.90	46,091,740.10	45,675,625.83	46,255,022.31
71	Overpayments Applied		283,965.18	238,566.88	224,054.63	205,595.12	187,822.35	215,080.18	61,438.63
72			42,936,844.13	46,377,040.70	42,297,388.57	47,119,480.02	46,279,562.45	45,890,706.01	46,316,460.94
73	Transferred to Water Rents Receivable		133,184.87	452,889.84	367,490.91	565,887.00	1,210,875.44		293,176.45
74	Cancelled		7,355.35	84,963.39	51,862.64	36,042.44	109,566.88	210,733.54	905,970.78
75									
76			43,077,384.35	46,914,893.93	42,716,742.12	47,721,409.46	47,600,004.77	46,101,439.55	47,515,608.17
77									
78	Balance December 31		12,577,948.42	11,342,776.55	12,757,802.23	10,809,176.04	12,095,775.55	11,320,302.90	11,482,089.37
79									
80	Water Rent Liens (D-10)								
81									
82	Balance January 1		277,967.22	204,368.75	426,774.32	690,851.00	1,163,551.88	1,492,361.19	1,492,361.19
83									
84	Increased by:								
85	Transferred from Delinquent Water Rents		7,958.59	222,405.57	264,076.68	565,887.00	328,809.31		293,176.45
86			285,925.81	426,774.32	690,851.00	1,256,738.00	1,492,361.19	1,492,361.19	1,785,537.64
87									
88									
89	Decreased by:								
90	Collections		10,116.20			93,186.12			
91	Cancelled		71,440.86						
92									
93			81,557.06	-	-	93,186.12	-	-	
94									
95	Balance December 31		204,368.75	426,774.32	690,851.00	1,163,551.88	1,492,361.19	1,492,361.19	

CITY OF NEWARK WATER DEPARTMENT
COMPREHENSIVE TECHNICAL ASSISTANCE
PEQUANNOCK WATER TREATMENT PLANT

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APPENDIX 2B

Newark Expenditure Summary

	2007	2008	2009	2010	2011	2012	2013	2014	2015
BUDGET									
EXPENDITURES									
Personnel services S & W				5,224,917	5,155,697	5,926,353	6,187,283	7,802,721	7,397,573
Personnel services other				4,218,948	3,533,589	3,559,489	4,391,349	4,546,837	4,720,364
subtotal				9,443,865	8,689,286	9,485,842	10,578,632	12,349,558	12,117,937
Services by Contract				17,252,659	16,910,675	18,599,715	12,092,306	9,403,864	9,310,550
Materials & Supplies				569,080	549,780	583,780	1,204,794	1,756,618	2,064,189
Equipment				1,698,684	1,032,684	1,038,684	951,316	981,316	1,355,000
Misc Expenses				23,649,853	23,889,317	24,456,216	24,203,904	23,648,237	23,392,903
subtotal				43,170,276	42,382,456	44,678,395	38,452,320	35,790,035	36,122,642
Grand Total				52,614,141	51,071,742	54,164,237	49,030,952	48,139,593	48,240,579
# of employees				119	128	129	162	162	142
FROM AUDIT	2007	2008	2009	2010	2011	2012	2013	2014	
DIRECTOR'S OFFICE									
Personnel services S & W				188,450	188,497	185,914	252,922	380,895	
BILLING & CUSTOMER SERVICES									
Personnel services S & W				932,724	860,510	886,292	922,396	895,997	
WATER SUPPLY									
Personnel services S & W				3,727,133	3,704,001	3,700,066	4,537,938	4,950,665	
TOTAL				4,848,307	4,753,008	4,772,272	5,713,256	6,227,558	-
Variation of Budget to actual				376,610	402,689	1,154,081	474,027	1,575,163	
FROM AUDIT	2007	2008	2009	2010	2011	2012	2013	2014	
Expenditures:									
Operating	36,145,430.00	38,301,094.45	40,267,036.20	41,353,206.38	39,945,198.59	42,790,969.00	37,289,694.43	39,140,613.00	
Debt Service	3,309,750.52	3,098,562.47	3,176,657.47	3,751,836.13	4,634,398.78	5,036,054.47	4,934,448.92	2,967,316.00	
Deferred Charges and Statute	1,506,188.89	928,596.53	1,425,000.00	1,425,000.00	825,356.95	1,070,000.00	1,093,331.00	4,670,607.48	
Capital Improvements	1,200,000.00	5,342,354.00	6,139,587.17	4,243,684.00	4,085,000.00	5,323,684.00	3,814,512.37	1,099,134.10	
Special Items				1,000,000.00					
	42,161,369.41	47,670,607.45	51,008,280.84	51,773,726.51	49,489,954.32	54,220,707.47	47,131,986.72	47,877,670.58	
Variation from Budget Total to Audit Total				840,414.49	1,581,787.68	(56,470.47)	1,898,965.28	261,922.42	
Appropriation Reserves:									
Unencumbered	2,089,060.45	706,999.43	1,719,331.01	4,097,658.82	276,828.32	3,389,216.19	874,412.89	2,609,499.18	
Encumbered	2,724,418.18	7,236,791.66	7,290,552.77	3,133,605.84	4,718,989.48	3,918,364.38	4,282,291.88	3,536,521.54	
Accounts Payable	826,063.61	1,249,369.59	1,021,400.00	1,449,411.04	1,533,767.45	2,409,511.99	2,901,809.78	4,629,191.33	

CITY OF NEWARK WATER DEPARTMENT
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APPENDIX 2C

Projected Revenue and Expenses (NW Financial Analysis)

*= billed ** = collected, inc interest that is in nonbudget in audit

48,139,593 48,240,579

48,139,593 48,240,579

CITY OF NEWARK WATER DEPARTMENT
COMPREHENSIVE TECHNICAL ASSISTANCE
PEQUANNOCK WATER TREATMENT PLANT

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APPENDIX 2D

Newark Financial Information

	2007	2008	2009	2010	2011	2012	2013	2014
Assets and Deferred Charges (D)								
Operating Section:								
Cash	10,731,512.59	16,853,867.33	10,455,374.87	13,961,887.83	10,949,122.95	9,402,756.13	11,302,235.35	5,656,372.68
Consumer Accounts Receivable	10,193,295.92	12,577,948.42	11,342,776.55	12,757,802.23	10,809,176.04	12,095,775.55	11,320,302.90	11,482,089.37
Sundry Accounts Receivable	89,051.92	165,458.46	165,457.54	156,131.19	224,397.79	328,683.11	317,285.13	326,459.17
Delinquent Water Rents Receivable	13,190.81	18,203.06	31,399.73	3,794.69	3,794.69	11,612.24	11,612.24	3,667.28
Water Liens Receivable	277,967.22	204,368.75	426,774.32	690,851.00	1,163,551.88	1,492,361.19	1,492,361.19	1,785,537.64
Protested Checks	262,882.19	186,201.67	133,887.09	141,524.59	142,678.45	151,197.50	83,288.84	73,649.22
Petty Cash	950.00	950.00	950.00	950.00	950.00	950.00	950.00	950.00
Inventory	607,957.81	607,957.81	607,957.81	607,957.81	607,957.81	607,957.81	607,957.81	607,957.81
Due from Payroll fund	18,069.90							
Interfunds Receivable	2,045,348.25	41,029.02	4,719,946.47	3,127,172.57		869,397.84		9,659,493.43
New Jersey Easement Receivable	86,000.00	86,000.00	86,000.00	86,000.00	86,000.00	86,000.00	86,000.00	86,000.00
	<u>24,326,226.61</u>	<u>30,741,984.52</u>	<u>27,970,524.38</u>	<u>31,534,071.91</u>	<u>23,987,629.61</u>	<u>25,046,691.37</u>	<u>25,221,993.46</u>	<u>29,682,176.60</u>
Capital Section:								
Cash	(606,445.37)	(443,226.30)	1,432,949.31	2,079,647.39	1,231,738.06	(475,836.06)	686,623.19	144,824.49
Interfunds Receivable				2,634.69	2,634.69	15,134.69	15,134.69	2,634.69
Due from State of New Jersey	968,018.74	968,018.74	968,018.74	968,018.74	968,018.74	968,018.74	968,018.74	968,018.74
Due from State of New Jersey - Wastewater Trust Fund	8,292,500.00	19,202,500.00	11,424,028.00	11,440,210.00	4,368,155.00	2,101,997.00	922,942.00	922,942.00
Due from State of New Jersey - ARRA Forgiveness			4,933,138.00	4,645,373.00	2,673,200.00	2,673,200.00	2,673,200.00	2,673,200.00
Deferred Charge - Capitalization of Interest	2,034,834.74	1,886,846.78	1,738,858.95	1,590,870.96	1,442,882.96	1,294,894.96	1,146,906.96	998,918.96
Cost of Bond Issue	50,000.00	50,000.00	57,362.80	57,362.80	57,362.80	57,362.80	57,362.80	
Fixed Capital	121,540,510	126,882,510	133,019,051	135,909,813	138,386,609	142,852,424	146,252,307	149,748,384
Fixed Capital Authorized and Uncompleted	113,313,186	124,313,186	145,113,186	149,623,436	160,623,436	160,623,436	173,873,436	173,873,436
	<u>245,592,604</u>	<u>272,859,835</u>	<u>298,686,593</u>	<u>306,317,367</u>	<u>309,754,037</u>	<u>310,110,633</u>	<u>326,595,932</u>	<u>329,332,359</u>
Total Assets and Deferred Charges	<u>269,918,831</u>	<u>303,601,820</u>	<u>326,657,118</u>	<u>337,851,439</u>	<u>333,741,667</u>	<u>335,157,324</u>	<u>351,817,925</u>	<u>359,014,536</u>
Liabilities, Reserves and Fund Balance								
Operating Section:								
Appropriation Reserves:								
Unencumbered	2,089,060.45	706,999.43	1,719,331.01	4,097,658.82	276,828.32	3,389,216.19	874,412.89	2,609,499.18
Encumbered	2,724,418.18	7,236,791.66	7,290,552.77	3,133,605.84	4,718,989.48	3,918,364.38	4,282,291.88	3,536,521.54
Accounts Payable	826,063.61	1,249,369.59	1,021,400.00	1,449,411.04	1,533,767.45	2,409,511.99	2,901,809.78	4,629,191.33
Belleville Flood Control	994.03	994.03	994.03	994.03	994.03	994.03	994.03	994.03
Accrued Interest on Bonds	195,190.94	182,208.86	171,383.85	158,757.19	158,757.19	188,987.20	173,721.92	158,100.23
Water Rent Overpayments	283,965.18	238,566.88	224,054.63	205,595.12	187,822.35	215,080.18	61,438.63	85,080.50
Interfunds Payable	118.79	2,193,775.99	118.79	6,487,380.99	217,018.29		37,378.39	
Reserve for Water Easement	236,000.00	236,000.00	236,000.00	236,000.00	236,000.00	236,000.00	236,000.00	236,000.00
	<u>6,355,811.18</u>	<u>12,044,706.44</u>	<u>10,663,835.08</u>	<u>15,769,403.03</u>	<u>7,330,177.11</u>	<u>10,358,153.97</u>	<u>8,568,047.52</u>	<u>11,255,386.81</u>
Reserve for:								
Consumer Accounts Receivable	10,193,295.92	12,577,948.42	11,342,776.55	12,757,802.23	10,809,176.04	12,095,775.55	11,320,302.90	11,482,089.37
Sundry Accounts	89,051.92	165,458.46	165,457.54	156,131.19	224,397.79	328,683.11	317,285.13	326,459.17
Delinquent Water Rent Receivable	13,190.81	18,203.06	31,399.73	3,794.69	3,794.69	11,612.24	11,612.24	3,667.28
Inventory	607,957.81	607,957.81	607,957.81	607,957.81	607,957.81	607,957.81	607,957.81	607,957.81
Petty Cash	950.00	950.00	950.00	950.00	950.00	950.00	950.00	950.00
Protested Checks	262,882.19	186,201.67	133,887.09	141,524.59	142,678.45	151,197.50	83,288.84	73,649.22
Water Liens	277,967.22	204,368.75	426,774.32	690,851.00	1,163,551.88	1,492,361.19	1,492,361.19	1,785,537.64
	<u>11,445,295.87</u>	<u>13,761,088.17</u>	<u>12,709,203.04</u>	<u>14,359,011.51</u>	<u>12,952,506.66</u>	<u>14,688,537.40</u>	<u>13,833,758.11</u>	<u>14,280,310.49</u>

61	Fund Balance	6,525,119.47	4,936,189.91	4,597,486.26	1,405,657.37	3,704,945.84	-	2,820,187.83	4,146,479.30
62									
63		24,326,226.52	30,741,984.52	27,970,524.38	31,534,071.91	23,987,629.61	25,046,691.37	25,221,993.46	29,682,176.60
64									
65	Capital Section:								
66	Vouchers Payable			334,089.09					
67	Interfund Payable								
68	Bond Anticipation Notes Payable	3,800,000.00	5,600,000.00	5,490,000.00					1,544,982.87
69	State Water Supply Loan Payable	2,647,680.13	5,523,186.53	7,955,731.53	9,970,655.00	11,840,000.00	11,395,000.00	10,940,000.00	10,460,000.00
70	State Water Supply Bond Loan Payable	6,037,500.00	13,942,500.00	16,409,069.00	20,446,998.64	17,428,336.62	16,440,180.68	15,419,068.26	14,396,186.85
71	Improvement Authorizations:								
72	Encumbered	8,736,200.83	14,785,974.21	18,254,270.75	11,346,282.70	4,529,669.23	1,884,039.01	4,067,136.01	1,721,196.36
73	Funded	1,643,108.26	5,404,373.95	5,347,457.70	5,949,427.65	9,392,221.46	7,880,123.50	7,880,123.50	7,872,623.50
74	Unfunded	4,375,924.04	3,898,424.04	10,009,089.27	12,719,517.10	17,201,199.43	17,397,695.49	28,448,002.74	28,730,763.69
75	Capital Improvement Fund	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87
76	Due to General Capital Fund			46,000.00	46,000.00	46,000.00	46,000.00	46,000.00	46,000.00
77	Reserve for:								
78	Refunds	85,965.67	85,965.67	85,965.67	85,965.67	85,965.67	85,965.67	85,965.67	
79	Deferred Amortization	30,509,667.50	30,509,667.50	30,573,667.50	30,576,667.50	30,576,667.50	30,576,667.50	30,576,667.50	30,576,667.50
80	Amortization	155,153,233	162,331,738	175,260,885	182,752,117	188,195,242	196,001,225	202,744,233	209,580,203
81	Due from State of New Jersey	968,018.74	968,018.74	968,018.74	968,018.74	968,018.74	968,018.74	968,018.74	968,018.74
82	Amortization - Revaluation of Watershed	5,780,431.33	5,780,431.33	5,780,431.33	5,780,431.33	5,780,431.33	5,780,431.33	5,780,431.33	5,780,431.33
83	Serial Bonds Payable	25,840,000.00	23,985,000.00	22,120,000.00	25,622,000.00	23,657,000.00	21,602,000.00	19,587,000.00	17,602,000.00
84	Fund Balance	14,872.70	44,552.70	51,915.50	53,283.63	53,283.63	53,283.63	53,283.63	53,283.63
86		245,592,604	272,859,835	298,686,593	306,317,367	309,754,037	310,110,633	326,595,932	329,332,359
87									
88	Total Liabilities, Reserves and Fund Balance	269,918,830	303,601,820	326,657,118	337,851,439	333,741,667	335,157,324	351,817,925	359,014,536
89	Proof	0.09	-	-	-	-	-	-	-
90									
91	Statement of Operations and Changes in Fund Balance: (D-1)								
92	Revenue and Other Income:								
93	Operating Surplus Anticipated		2,000,000.00	4,564,000.00	4,597,486.00	1,405,000.00	3,704,945.84		854,000.00
94	Water Rents	43,252,453.12	44,066,980.04	47,343,652.57	43,091,381.59	47,757,169.50	48,022,818.12	45,890,706.01	46,316,460.94
95	Miscellaneous Water Rents								18,750.00
96	East Orange Settlement								883,556.60
97	Lien Sale Proceeds					93,186.12			
98	Refund of Prior Year Expenditures								178.88
99	Cancellation of Due to Trust Other Fund								36,799.99
100	NJ Office of Homeland Security						164,000.00		
101	Pequannock River Restoration Project				1,000,000.00				
102	Other Credits to Income:								
103	Non Budget Revenue	924,143.57	29,771.92	125,793.02	5,872.80	13,004.72	4,178.41	740,939.29	1,053,700.51
104	Deficit (General Budget)						788,493.69		
105	Reserve for Protested Checks Cancelled		76,680.52	52,314.58				67,908.66	9,639.62
106	Unexpended Balance of Appropriation Reserves	1,130,809.67	2,082,222.15	600,803.93	4,049,401.04	3,929,298.62	150,881.83	3,328,074.27	1,026,950.76
107	Accounts Payable Cancelled			2,611,901.13	434,775.72		1,401,000.00		
108	Interfunds Settled								85,965.67
109	Accrued Interest on Bonds Cancelled	10,870.41	12,982.08	10,825.01	12,626.66				
111		45,318,276.77	48,268,636.71	55,309,290.24	53,191,543.81	53,197,658.96	54,236,317.89	50,027,628.23	50,286,002.97
112									
113	Expenditures:								
114	Operating	36,145,430.00	38,301,094.45	40,267,036.20	41,353,206.38	39,945,198.59	42,790,969.00	37,289,694.43	39,140,613.00
115	Debt Service	3,309,750.52	3,098,562.47	3,176,657.47	3,751,836.13	4,634,398.78	5,036,054.47	4,934,448.92	2,967,316.00
116	Deferred Charges and Statutory Expenditures	1,506,188.89	928,596.53	1,425,000.00	1,425,000.00	825,356.95	1,070,000.00	1,093,331.00	4,670,607.48
117	Capital Improvements	1,200,000.00	5,342,354.00	6,139,587.17	4,243,684.00	4,085,000.00	5,323,684.00	3,814,512.37	1,099,134.10
118	Special Items				1,000,000.00				

120		42,161,369.41	47,670,607.45	51,008,280.84	51,773,726.51	49,489,954.32	54,220,707.47	47,131,986.72	47,877,670.58
121	Prior Year Refunds	77,768.51	186,958.82	75,713.05	4,522.69	2,262.31	7,091.37	75,453.68	120,466.49
122	Reserve for Protested Checks	164,122.28			7,637.50	1,153.86	8,519.05		107,574.43
124		42,403,260.20	47,857,566.27	51,083,993.89	51,785,886.70	49,493,370.49	54,236,317.89	47,207,440.40	48,105,711.50
125									
126	Statutory Excess to Operating Fund Balance	2,915,016.57	411,070.44	4,225,296.35	1,405,657.11	3,704,288.47	-	2,820,187.83	2,180,291.47
127									
128	Fund Balance, January 1	3,610,102.90	6,525,119.47	4,936,189.91	4,597,486.26	1,405,657.37	3,704,945.84	(0.00)	2,820,187.83
129		6,525,119.47	6,936,189.91	9,161,486.26	6,003,143.37	5,109,945.84	3,704,945.84	2,820,187.83	5,000,479.30
130	Deceased by:								
131	Utilized as Anticipated Revenue	-	2,000,000.00	4,564,000.00	4,597,486.00	1,405,000.00	3,704,945.84	-	854,000.00
133	Fund Balance, December 31	6,525,119.47	4,936,189.91	4,597,486.26	1,405,657.37	3,704,945.84	(0.00)	2,820,187.83	4,146,479.30
134									
135	Schedule of Cash								
136									
137	Operating Section: (D-5)								
138	Balance (Deficit) January 1		10,731,512.59	16,853,867.33	10,455,374.87	13,961,887.83	10,949,122.95	9,402,756.13	11,302,235.35
139	<i>Adjustment from Prior Audit</i>					(570,059.11)			
140									
141	Increased by Receipts:								
142	MRNA		26,190.60	125,793.02	3,153.71	13,004.72	4,178.41	740,939.29	1,045,755.45
143	Refund of Prior Year Expenditures								178.88
144	Consumer Accounts Receivable		42,652,878.95	46,138,473.82	42,073,333.94	46,913,884.90	46,091,740.10	45,675,625.83	46,255,022.31
145	Additional Water Rents								18,750.00
146	East Orange Settlement								883,556.60
147	Sundry Accounts Receivable		1,010,438.69	763,849.48	695,015.26	693,789.86	880,090.28		
148	Water Liens Receivable					93,186.12			
149	Delinquent Accounts Receivable		92,592.59	216,225.59			863,165.39		
150	Protested Checks		148,082.43	337,860.84	87,345.77	144,464.11	141,069.98	122,473.89	45,004.38
151	Due from Payroll Fund		18,069.90						
152	Due from Current Fund			41,029.02					
153	Due from Unemployment			258,937.68					
154	Interfunds Receivable		70,240.62		8,221,418.91	3,701,472.68		869,397.84	49,970,181.59
155	Overpayments - Water Rents		238,566.88	224,054.63	205,595.12	187,822.35	215,080.18	61,438.63	85,080.50
156	Interfunds Payable		53,310,759.61	55,027,724.44	53,106,394.65	54,038,718.73		37,378.39	
158		97,567,820.27	103,133,949	104,392,257	105,786,343	48,195,324.34	47,507,253.87	98,303,529.71	
159		108,299,333	119,987,816	114,847,632	119,178,172	59,144,447.29	56,910,010.00	109,605,765	
160									
161	Decreased by Disbursements:								
162	Prior Year's Refund		186,958.82	75,713.05	4,522.69	2,262.31	7,091.37	75,453.68	120,466.49
163	Refund of Water Consumer Accounts		10,343.07	13,463.20	25,475.72	56,100.38			
164	Appropriations		39,726,816.36	41,998,397.06	43,542,461.85	44,494,136.52	46,718,896.89	41,908,677.63	40,902,542.79
165	Protested Checks		213,396.69	423,654.37	215,588.16	145,617.97	149,589.03	54,565.23	105,036.50
166	Appropriation Reserves		2,278,409.36	4,940,655.70	3,511,071.70	2,495,933.78	2,515,500.54	3,436,739.09	2,396,316.92
167	Accounts Payable		29,541.23	18,399.92	586,624.28	721,675.85	52,690.89	50,469.42	6,055.54
168	Accrued Interest on Bonds							81,869.60	844,728.76
169	Due from Unemployment			258,937.68					
170	Interfunds Receivable				3,000,000.00		80,904.15		
171	Interfunds Payable		49,000,000.00	61,803,220.00	50,000,000.00	60,313,322.43	217,018.29		59,574,245.38
173		91,445,465.53	109,532,441	100,885,744	108,229,049	49,741,691.16	45,607,774.65	103,949,392	
174									
175	Balance (Deficit) December 31	16,853,867.33	10,455,374.87	13,961,887.83	10,949,122.95	9,402,756.13	11,302,235.35	5,656,372.68	
176									
177	Capital Section: (D-5)								

178	Balance (Deficit) January 1	(606,445.37)	(443,226.30)	1,432,949.31	2,079,647.39	1,231,738.06	(475,836.06)	686,623.19
179								
180	Increased by Receipts:							
181	Premium on Sale of Notes	29,680.00	53,362.80	4,368.13				
182	Due from State of New Jersey - Waste Water or ARRA		12,820,041.00	9,087,894.00	9,044,228.00	2,266,158.00	1,179,055.00	
183	Interfunds Receivable							1,528,880.00
184	Deferred Reserve for Amortization		64,000.00					
185	Sale of Bond Anticipation Notes	5,600,000.00	5,490,000.00	5,487,000.00				
186	Sale of Serial Bonds			5,487,000.00				
188		<u>5,629,680.00</u>	<u>18,427,403.80</u>	<u>20,066,262.13</u>	<u>9,044,228.00</u>	<u>2,266,158.00</u>	<u>1,179,055.00</u>	<u>1,528,880.00</u>
189		<u>5,023,234.63</u>	<u>17,984,177.50</u>	<u>21,499,211.44</u>	<u>11,123,875.39</u>	<u>3,497,896.06</u>	<u>703,218.94</u>	<u>2,215,503.19</u>
190								
191	Decreased by Disbursements:							
192	Sale of Bond Anticipation Notes	3,800,000.00	5,600,000.00	10,977,000.00				
193	Cost of Bond Anticipation Notes		7,362.80					
194	Interfunds Receivable			2,634.69		12,500.00		
195	Accounts Payable			334,089.09				
196	Improvement Authorizations	1,666,460.93	10,943,865.39	8,105,840.27	9,892,137.33	3,961,232.12	16,595.75	2,070,678.70
198		<u>5,466,460.93</u>	<u>16,551,228.19</u>	<u>19,419,564.05</u>	<u>9,892,137.33</u>	<u>3,973,732.12</u>	<u>16,595.75</u>	<u>2,070,678.70</u>
199								
200	Balance (Deficit) December 31	<u>(443,226.30)</u>	<u>1,432,949.31</u>	<u>2,079,647.39</u>	<u>1,231,738.06</u>	<u>(475,836.06)</u>	<u>686,623.19</u>	<u>144,824.49</u>
201								
202								
203	Consumer Accounts Receivable: (D-7)							
204								
205	Balance January 1	10,193,295.92	12,577,948.42	11,342,776.55	12,757,802.23	10,809,176.04	12,095,775.55	11,320,302.90
206								
207	Increased by:							
208	Rents and Charges Levied	45,462,036.85	45,679,722.06	44,131,767.80	45,772,783.27	48,886,604.28	45,325,966.90	47,677,394.64
209		<u>55,655,332.77</u>	<u>58,257,670.48</u>	<u>55,474,544.35</u>	<u>58,530,585.50</u>	<u>59,695,780.32</u>	<u>57,421,742.45</u>	<u>58,997,697.54</u>
210								
211	Decreased by:							
212	Collections	42,652,878.95	46,138,473.82	42,073,333.94	46,913,884.90	46,091,740.10	45,675,625.83	46,255,022.31
213	Overpayments Applied	283,965.18	238,566.88	224,054.63	205,595.12	187,822.35	215,080.18	61,438.63
214		<u>42,936,844.13</u>	<u>46,377,040.70</u>	<u>42,297,388.57</u>	<u>47,119,480.02</u>	<u>46,279,562.45</u>	<u>45,890,706.01</u>	<u>46,316,460.94</u>
215	Transferred to Water Rents Receivable	133,184.87	452,889.84	367,490.91	565,887.00	1,210,875.44		293,176.45
216	Cancelled	7,355.35	84,963.39	51,862.64	36,042.44	109,566.88	210,733.54	905,970.78
218		<u>43,077,384.35</u>	<u>46,914,893.93</u>	<u>42,716,742.12</u>	<u>47,721,409.46</u>	<u>47,600,004.77</u>	<u>46,101,439.55</u>	<u>47,515,608.17</u>
219								
220	Balance December 31	<u>12,577,948.42</u>	<u>11,342,776.55</u>	<u>12,757,802.23</u>	<u>10,809,176.04</u>	<u>12,095,775.55</u>	<u>11,320,302.90</u>	<u>11,482,089.37</u>
221								
222	Sundry Accounts Receivable: (D-8)							
223								
224	Balance January 1	89,051.92	165,458.46	165,457.54	156,131.19	224,397.79	328,683.11	317,285.13
225								
226	Increased by:							
227	Charges	1,087,799.84	767,466.99	691,128.16	767,172.54	984,375.60	727,686.42	1,054,441.23
228		<u>1,176,851.76</u>	<u>932,925.45</u>	<u>856,585.70</u>	<u>923,303.73</u>	<u>1,208,773.39</u>	<u>1,056,369.53</u>	<u>1,371,726.36</u>
229								
230	Decreased by:							
231	Collections	1,010,438.69	763,849.48	695,015.26	693,789.86	880,090.28	739,084.40	1,045,267.19
232	Cancelled	954.61	3,618.43	5,439.25	5,116.08			
234		<u>1,011,393.30</u>	<u>767,467.91</u>	<u>700,454.51</u>	<u>698,905.94</u>	<u>880,090.28</u>	<u>739,084.40</u>	<u>1,045,267.19</u>
235								
236	Balance December 31	<u>165,458.46</u>	<u>165,457.54</u>	<u>156,131.19</u>	<u>224,397.79</u>	<u>328,683.11</u>	<u>317,285.13</u>	<u>326,459.17</u>

Delinquent Water Rents Receivable: (D-9)

Balance January 1	13,190.81	18,203.06	31,399.73	3,794.80	3,794.80	11,612.35	11,612.35
Increased by:							
Added Rents	130.19						
Transferred from Consumer Accounts Receivable	133,184.87	452,889.84	367,490.91		1,210,875.44		
	<u>146,505.87</u>	<u>471,092.90</u>	<u>398,890.64</u>	<u>3,794.80</u>	<u>1,214,670.24</u>	<u>11,612.35</u>	<u>11,612.35</u>
Decreased by:							
Collections	92,592.59	216,225.59	124,453.48		863,165.39		
Interfunds Receivable	27,331.50						7,945.06
Overpayments Applied							
Transferred to Water Liens	7,958.59	222,405.57	264,076.68		328,809.31		
Cancelled	420.13	1,062.01	6,565.68		11,083.19		0.01
	<u>128,302.81</u>	<u>439,693.17</u>	<u>395,095.84</u>	<u>-</u>	<u>1,203,057.89</u>	<u>-</u>	<u>7,945.07</u>
Balance December 31	<u>18,203.06</u>	<u>31,399.73</u>	<u>3,794.80</u>	<u>3,794.80</u>	<u>11,612.35</u>	<u>11,612.35</u>	<u>3,667.28</u>

Water Rent Liens (D-10)

Balance January 1	277,967.22	204,368.75	426,774.32	690,851.00	1,163,551.88	1,492,361.19	1,492,361.19
Increased by:							
Transferred from Delinquent Water Rents	7,958.59	222,405.57	264,076.68	565,887.00	328,809.31		293,176.45
	<u>285,925.81</u>	<u>426,774.32</u>	<u>690,851.00</u>	<u>1,256,738.00</u>	<u>1,492,361.19</u>	<u>1,492,361.19</u>	<u>1,785,537.64</u>
Decreased by:							
Collections	10,116.20			93,186.12			
Cancelled	71,440.86						
	<u>81,557.06</u>	<u>-</u>	<u>-</u>	<u>93,186.12</u>	<u>-</u>	<u>-</u>	<u>-</u>
Balance December 31	<u>204,368.75</u>	<u>426,774.32</u>	<u>690,851.00</u>	<u>1,163,551.88</u>	<u>1,492,361.19</u>	<u>1,492,361.19</u>	<u>1,785,537.64</u>

Protested Checks (D-11)

Balance January 1	262,882.19	186,201.67	133,887.09	141,524.59	142,678.45	151,197.50	83,288.84
Increased by:							
Cash Disbursements	213,396.69	423,654.37	215,588.16	145,617.97	149,589.03	54,565.23	105,036.50
	<u>476,278.88</u>	<u>609,856.04</u>	<u>349,475.25</u>	<u>287,142.56</u>	<u>292,267.48</u>	<u>205,762.73</u>	<u>188,325.34</u>
Decreased by:							
Cash Receipts	148,082.43	337,860.84	87,345.77	144,464.11	141,069.98	122,473.89	45,004.38
Transferred to Due from Sewer Utility Operating	141,994.78	138,108.11	120,604.89				69,671.74
	<u>290,077.21</u>	<u>475,968.95</u>	<u>207,950.66</u>	<u>144,464.11</u>	<u>141,069.98</u>	<u>122,473.89</u>	<u>114,676.12</u>
Balance December 31	<u>186,201.67</u>	<u>133,887.09</u>	<u>141,524.59</u>	<u>142,678.45</u>	<u>151,197.50</u>	<u>83,288.84</u>	<u>73,649.22</u>

295	New Jersey Easement Receivable (D-15)							
296								
297	Balance January 1	86,000.00	86,000.00	86,000.00	86,000.00	86,000.00	86,000.00	86,000.00
298								
299	Increased by:							
300	Cash Disbursements	-	-	-	-	-	-	-
301		<u>86,000.00</u>	<u>86,000.00</u>	<u>86,000.00</u>	<u>86,000.00</u>	<u>86,000.00</u>	<u>86,000.00</u>	<u>86,000.00</u>
302								
303	Decreased by:							
304	Cash Receipts	-	-	-	-	-	-	-
305		<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
306								
307								
308	Balance December 31	<u>86,000.00</u>	<u>86,000.00</u>	<u>86,000.00</u>	<u>86,000.00</u>	<u>86,000.00</u>	<u>86,000.00</u>	<u>86,000.00</u>
309								
310								
311	Due from State of New Jersey (D-16)							
312								
313	Balance January 1	968,018.74	968,018.74	968,018.74	968,018.74	968,018.74	968,018.74	968,018.74
314								
315	Increased by:							
316	Cash Disbursements	-	-	-	-	-	-	-
317		<u>968,018.74</u>	<u>968,018.74</u>	<u>968,018.74</u>	<u>968,018.74</u>	<u>968,018.74</u>	<u>968,018.74</u>	<u>968,018.74</u>
318								
319	Decreased by:							
320	Cash Receipts	-	-	-	-	-	-	-
321		<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
322								
323								
324	Balance December 31	<u>968,018.74</u>	<u>968,018.74</u>	<u>968,018.74</u>	<u>968,018.74</u>	<u>968,018.74</u>	<u>968,018.74</u>	<u>968,018.74</u>
325								
326	Analysis of Balance:							
327	Water Treatment Facility	841,612.42	841,612.42	841,612.42	841,612.42	841,612.42	841,612.42	841,612.42
328	Renovation of Reservoirs	<u>126,406.32</u>	<u>126,406.32</u>	<u>126,406.32</u>	<u>126,406.32</u>	<u>126,406.32</u>	<u>126,406.32</u>	<u>126,406.32</u>
329		<u>968,018.74</u>	<u>968,018.74</u>	<u>968,018.74</u>	<u>968,018.74</u>	<u>968,018.74</u>	<u>968,018.74</u>	<u>968,018.74</u>
330								
331								
332	Due from State of New Jersey - Waste Water Trust Fund (D-17)							
333								
334	Balance January 1	8,292,500.00	19,202,500.00	11,424,028.00	11,440,210.00	4,368,155.00	2,101,997.00	922,942.00
335								
336	Increased by:							
337	Water Supply Loan	3,005,000.00	2,575,000.00	2,220,655.00				
338	State Water Supply Bond Loan Payable	<u>7,905,000.00</u>	<u>2,466,569.00</u>	<u>4,375,000.00</u>				
339		<u>19,202,500.00</u>	<u>24,244,069.00</u>	<u>18,019,683.00</u>	<u>11,440,210.00</u>	<u>4,368,155.00</u>	<u>2,101,997.00</u>	<u>922,942.00</u>
340								
341	Decreased by:							
342	Received from State of New Jersey	-	12,820,041.00	6,579,473.00	7,072,055.00	2,266,158.00	1,179,055.00	-
343		<u>-</u>	<u>12,820,041.00</u>	<u>6,579,473.00</u>	<u>7,072,055.00</u>	<u>2,266,158.00</u>	<u>1,179,055.00</u>	<u>-</u>
344								
345								
346	Balance December 31	<u>19,202,500.00</u>	<u>11,424,028.00</u>	<u>11,440,210.00</u>	<u>4,368,155.00</u>	<u>2,101,997.00</u>	<u>922,942.00</u>	<u>922,942.00</u>

CITY OF NEWARK WATER DEPARTMENT
COMPREHENSIVE TECHNICAL ASSISTANCE
PEQUANNOCK WATER TREATMENT PLANT

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APPENDIX 2E

2014 Audit Schedule D Unfunded Appropriations

CITY OF NEWARK
WATER UTILITY FUND

BONDS AND NOTES AUTHORIZED BUT NOT ISSUED

D-40

<u>Ordinance Number</u>		<u>Balance Dec. 31, 2013</u>	<u>Balance Dec. 31, 2014</u>
8701	(A) Renovation of Belleville Reservoir: Complex and Appurtenances and Improvement	\$ 968,018.74	\$ 968,018.74
8801	Various Purposes and Improvements	500.00	500.00
890C	Various Purposes and Improvements	500.00	500.00
930G	Various Purposes and Improvements	500.00	500.00
960A	Improvement of the Pequannock Aqueducts	1,918,000.00	1,918,000.00
A6S00	Installation and Replacement of Old Fire Hydrants with New Hydrants	800,000.00	800,000.00
A6S20	Water/Sewer Billing and Collection Computer Systems	1,425,000.00	1,425,000.00
	Waste Water Improvement Loan	207,500.00	207,500.00
O8A10	Rehabilitation - Cleaning and Lining Mains	90,000.00	90,000.00
O9A91	Rehabilitation and Distribution System	25,293.00	25,293.00
O9A92	Replacement of Water Mains	933,689.00	933,689.00
10W10	Various Improvements	3,507,500.00	3,507,500.00
10W20	Acquisition of Plotter and Scanner	40,250.00	40,250.00
10W30	Acquisition of Mid-Size Sport Utility Vehicle	276,000.00	276,000.00
10W40	Acquisition of Heavy Duty Special Equipment	586,500.00	586,500.00
10W50	Improvements to Cedar Grove Outlet	1,150,000.00	1,150,000.00
11W10	Various Improvements	9,500,000.00	9,500,000.00
11W20	Various Improvements	1,500,000.00	1,500,000.00
13WAO	Improvements to Water Distribution System	11,500,000.00	11,500,000.00
13WBO	Various Improvements	1,750,000.00	1,750,000.00
		<u>\$36,179,250.74</u>	<u>\$36,179,250.74</u>
	<u>Reference</u>	<u>D</u>	<u>D</u>

(A) Note: To be funded by loan and/or grant agreement with the State of New Jersey pursuant to the Water Supply Bond Act of 1981 (C. 261, P.L. 1981).

CITY OF NEWARK WATER DEPARTMENT
COMPREHENSIVE TECHNICAL ASSISTANCE
PEQUANNOCK WATER TREATMENT PLANT

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APPENDIX 2F

SFY 2016 FEIT Application

10777

	PROJECT	NJEIT FUNDING CYCLE	NJEIT LOAN PROJECT #	TOTAL PROJECT COST	CURRENT FUNDING	ADDITIONAL FUNDING REQUEST	BOND ORD. No.	ACTION ITEMS
1	CLEANING AND CEMENT MORTAR LINING, AND STRUCTURAL LINING REHABILITATION OF UP TO 65,000 LINEAR FEET OF 6", 8" AND 12" WATER DISTRIBUTION MAINS LOCATED CITY WIDE. ACCOUNT CODE: 041-13W-13WA0-94710-B2013 CONTRACT 11-WS2011 Justification: Rehabilitation Project has been expanded to include structural lining (by Cured-in-place pipe) of approximately 6,000 LF of distribution mains found to be in an advanced state of deterioration. Mains are old cast iron with heavy tuberculation where flow capacity has been diminished. Project Scope involves mechanically cleaning the interior of the heavily tuberculated cast iron mains and applying a 1/8-inch thick cement mortar lining on the interior surface of the water main. This will prevent further corrosion and improve flow capacity in the mains. Mains that are deteriorated structurally will be cleaned and rehabilitated by installing an epoxy structural liner inside the pipe by inversion lining (CIPP).	SFY 2016	0714001-015	\$17,000,000	\$11,500,000	\$5,500,000	6PSF-C 110713	NEED TO SUBMIT IFP & NEED TO INCREASE BONDING AUTHORIZATION
2	PEQUANNOCK WATER TREATMENT PLANT IMPROVEMENTS: CONTRACT No. 06-WS 2011 (PWTP IMPROVEMENTS PHASE-2/CHLORINE CONVERSION), CONTRACT No. 01-WS2014 (RESIDUAL TREATMENT FACILITY) ACCOUNT Code: 041-11W-11W00-94710-94710, 041-11W-11W10-94710 Justification: Rehabilitation Project has been expanded to include Residual Treatment Facility construction. This project is mandated under the Administrative Consent Order from NJDEP. Project scope includes the onsite residuals management facility construction. The sludge produced at the PWTP is currently being pumped to an open lagoon located several miles north of the PWTP. Since the sludge lagoon is full to its capacity, onsite sludge treatment facility will be constructed to discontinue use of the sludge lagoon. A 40 foot diameter steel thickener tank will be constructed at PWTP and put into operation to produce thickened sludge. This will then be fed to a Centrifuge which will produce dry cake to be removed by roll off containers for appropriate disposal.	SFY 2016	0714001-016	\$11,000,000	\$9,500,000	\$1,500,000	6PSF-B 080311	NEED TO SUBMIT IFP & COMBINE EXISTING BONDING
		N/A	0714001-017	\$0	\$1,500,000	N/A	6PSF-B 080311	

PROJECT	NJEIT FUNDING CYCLE	NJEIT LOAN PROJECT #	TOTAL PROJECT COST	CURRENT FUNDING	ADDITIONAL FUNDING REQUEST	BOND ORD. No.	ACTION ITEMS
3	SFY 2016	S340815-24	\$20,000,000	\$0	\$9,650,000	N/A	
	N/A	S340815-05	\$0	\$ 10,350,000.00	N/A	6PSF-C 080311	NEED TO RE-PROGRAM & NEED TO INCREASE
4	SFY 2016	0714001-500	\$5,000,000	\$0	\$5,000,000	NONE	NEED NEW BONDING AUTHORIZATION

APPENDIX 2G

Bulk Users

NEWARK BULK CUSTOMER HISTORY									
customer	Belleville	Bloomfield	Pequannock	Elizabeth NJ American	E. Orange	Wayne	total	Newark Librty Elizabeth	
allotment mgd	7	9.75	1	8	1	2	28.75	?	
annual	2,555,000,000		365,000,000	2,920,000,000	365,000,000	730,000,000			
2012 annual	1,332,704,186	2,684,129,000	28,538,108	67,378,361	503,961,000			2,102,937,288	
2013 annual	1,172,155,452	2,551,913,000	166,142,653	10,462,227	971,761,000			1,770,538,709	
2014 annual	1,029,853,152	2,123,745,000	183,252,053	7,152,853	1,119,728,000			1,387,739,465	
average annual	1,178,237,597	2,453,262,333	125,977,605	28,331,147	865,150,000	-	4,650,958,682	1,753,738,487	
mgd	3,228,048	6,721,267	345,144	77,620	2,370,274	-	12,742,353	4,804,763	
	3.2	6.7	0.3	0.008	2.3		12.7	4.8	
2015 thru Oct	1,064,295,618	2,154,584,000	224,363,386	501,942	1,025,663,000			1,548,264,437	
		6.51 plus potential 50% increase							

CITY OF NEWARK WATER DEPARTMENT
COMPREHENSIVE TECHNICAL ASSISTANCE
PEQUANNOCK WATER TREATMENT PLANT

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APPENDIX 2H

2013 City of Newark Financial Audit

**CITY OF NEWARK
COUNTY OF ESSEX
NEW JERSEY**

**REPORT ON
EXAMINATION OF ACCOUNTS
FOR THE YEAR 2013**

**SAMUEL KLEIN AND COMPANY
CERTIFIED PUBLIC ACCOUNTANTS**

CITY OF NEWARK
COUNTY OF ESSEX, NEW JERSEY

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PART I
REPORT ON EXAMINATION OF FINANCIAL STATEMENTS
AND SUPPLEMENTARY DATA
YEAR ENDED DECEMBER 31, 2013

SAMUEL KLEIN AND COMPANY
CERTIFIED PUBLIC ACCOUNTANTS

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INDEPENDENT AUDITOR'S REPORT

The Honorable Mayor and Members
of the Municipal Council
City of Newark
City Hall
Newark, New Jersey 07102

Report on the Financial Statements

We have audited the financial statements - regulatory basis of the various funds and account groups of the City of Newark, as of and for the years then ended December 31, 2013 and 2012 and the related notes to the financial statements, as listed in the foregoing table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements - regulatory basis in accordance with accounting principles prescribed by the Division of Local Government Services, Department of Community Affairs, State of New Jersey. Management is also responsible for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements - regulatory basis that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express opinions on these financial statements - regulatory basis based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America, audit requirements prescribed by the Division of Local Government Services, Department of Community Affairs, State of New Jersey and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements - regulatory basis are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements - regulatory basis. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements - regulatory basis, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the City's preparation and fair presentation of the financial statements - regulatory basis in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the City's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by Management, as well as evaluating the overall presentation of the financial statements - regulatory basis.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Basis for Adverse Opinion on U.S. Generally Accepted Accounting Principles

As described in Note 1, these financial statements - regulatory basis have been prepared in conformity with accounting principles prescribed by the Division of Local Government Services, Department of Community Affairs, State of New Jersey, which is a basis of accounting other than accounting principles generally accepted in the United States of America, to demonstrate compliance with the modified accrual basis, with certain exceptions, and the budget laws of New Jersey. The effects on the financial statements - regulatory basis of the variances between the regulatory basis of accounting described in Note 1 and accounting principles generally accepted in the United States of America, although not reasonably determinable, are presumed to be material.

Adverse Opinion on U.S. Generally Accepted Accounting Principles

In our opinion, because of the significance of the matter discussed in the "*Basis for the Adverse Opinion on U.S. Generally Accepted Accounting Principles*" paragraph, the financial statements - regulatory basis referred to in the first paragraph, do not present fairly, in conformity with accounting principles generally accepted in the United States of America, the financial position of the City as of December 31, 2013 and 2012, and the results of its operations for the years then ended.

Basis for Qualified Opinion

We were unable to obtain sufficient appropriate audit evidence about the carrying amount of the City of Newark's cash balances of the various funds, for the year ended December 31, 2013 because of the way the bank reconciliations are prepared and the lack of oversight over the bank reconciliation function. Consequently, we are unable to determine whether any adjustments to these amounts were necessary.

Qualified Opinion

In our opinion, except for the possible effects of the matter described in the Basis for Qualified Opinion paragraph, the financial statements - regulatory basis referred to above present fairly, in all material respects, the financial position of the various funds of the City of Newark at December 31, 2013 and 2012, and the results of operations and changes in fund balance, where applicable, of such funds, thereof for the years then ended, in accordance with accounting principles on the basis of financial reporting provisions prescribed by the Division of Local Government Services, Department of Community Affairs, State of New Jersey, as described in Note 1.

Other Matters

Supplementary Information

Our audit was conducted for the purpose of forming opinions on the financial statements - regulatory basis that collectively comprise the City's financial statements - regulatory basis. The supplementary schedules listed in the table of contents are presented for purposes of additional analysis and are not a required part of the basic financial statements - regulatory basis.

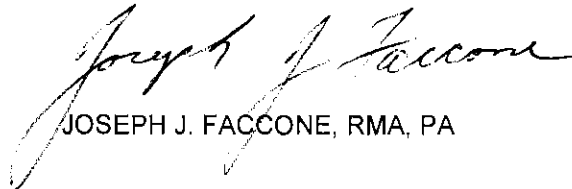
The supplementary schedules are the responsibility of Management and were derived from and relate directly to the underlying accounting and other records used to prepare the financial statements - regulatory basis. Such information has been subjected to the auditing procedures applied in the audit of the financial statements - regulatory basis and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the financial statements - regulatory basis or to the financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the supplementary schedules are fairly stated, in all material respects, in relation to the financial statements - regulatory basis taken as a whole.

Other Reporting Required by Government Auditing Standards

In accordance with *Government Auditing Standards*, we have also issued our report dated January 8, 2015, on our consideration of the City of Newark's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the City of Newark's internal control over financial reporting and compliance.



SAMUEL KLEIN AND COMPANY
CERTIFIED PUBLIC ACCOUNTANTS



JOSEPH J. FACCONI, RMA, PA

Newark, New Jersey
January 8, 2015

CITY OF NEWARK
CURRENT FUND

COMPARATIVE BALANCE SHEET - REGULATORY BASIS

A
Sheet #1

<u>ASSETS AND DEFERRED CHARGES</u>	<u>Ref.</u>	<u>Balance</u> <u>Dec. 31, 2013</u>	<u>Balance</u> <u>Dec. 31, 2012</u>
<u>Regular Fund</u>			
Cash	A-4	\$ 55,514,884.88	\$ 128,456,976.72
Cash - Deposit with State of New Jersey	A-6	9,786,237.89	10,214,648.98
Sub-Total		<u>65,301,122.77</u>	<u>138,671,625.70</u>
Cash - Change Fund	A-7	2,440.00	2,440.00
		<u>65,303,562.77</u>	<u>138,674,065.70</u>
Receivables with Full Reserves:			
Petty Cash Fund	A-8	2,800.00	1,700.00
Delinquent Property Taxes Receivable	A-9	22,453,733.16	1,799,005.32
Tax Title Liens Receivable	A-10	29,045,983.50	27,954,820.15
Property Acquired for Taxes - Assessed Valuations	A-11	131,612,758.28	131,224,637.97
Sales Contracts Receivable	A-12	12,554,477.53	12,544,477.53
Revenue Accounts Receivable	A-13		1,661,364.23
Delinquent Tax Abatement Accounts Receivable	A-14	2,295,793.09	1,228,400.29
Protested Checks	A-15	2,628,278.17	1,817,516.72
Deposit with County Registrar	A-16	2,231.35	2,231.35
Due from Housing for Senior Citizens	A-16	14,905.96	14,905.96
Due from East Orange-Passaic Valley	A-16	90,118.00	63,392.00
Due from Payroll Transfer Account	A-17	267,888.38	238,973.32
Interfunds Receivable	A-18	180,802.00	4,671.48
		<u>201,149,769.42</u>	<u>178,556,096.32</u>
Deferred Charges:			
Hurricane Sandy	A-19	5,200,000.00	6,500,000.00
Liability Payout	A-19	4,200,000.00	5,600,000.00
Revaluation	A-19	800,000.00	1,600,000.00
Deficit in Operations	A-41	30,121,208.59	
		<u>306,774,540.78</u>	<u>330,930,162.02</u>
<u>Federal and State Grant Funds</u>			
Cash	A-4	24,031,601.32	27,848,376.42
Due from Current Fund	A-20		60,462.40
Due from HCDA Trust Fund	A-20	482.00	
Payroll Transfer Account	A-21	515,274.25	587,259.68
Grants Paid Authorized by Commitment Letters	A-22	355,266.02	1,368,960.61
Federal, State and Other Grants Receivable	A-23	153,185,259.55	155,174,062.53
State Law Enforcement Grants	A-24	102.97	102.97
Accounts Receivable	A-25	47,875.41	47,875.41
		<u>178,135,861.52</u>	<u>185,087,100.02</u>
		<u>\$ 484,910,402.30</u>	<u>\$ 516,017,262.04</u>

CITY OF NEWARK
CURRENT FUND

COMPARATIVE BALANCE SHEET - REGULATORY BASIS

A
Sheet #2

<u>LIABILITIES, RESERVES AND FUND BALANCE</u>	<u>Ref.</u>	<u>Balance</u> <u>Dec. 31, 2013</u>	<u>Balance</u> <u>Dec. 31, 2012</u>
<u>Regular Fund</u>			
Expenditure Reserves:			
Appropriation Reserves	A-3,26	\$ 4,130,734.55	\$ 7,420,489.95
Encumbrances and Commitments Payable	A-3,26	31,354,651.53	24,117,710.36
Commitments Payable	A-27	513,984.57	133,331.31
Reserve for Void Check Pending Distribution	A-28	84,629.67	70,429.67
Reserve for Election Workers' Payable	A-29	86,227.72	86,227.72
Due to State of New Jersey Senior Citizens	A-30	152,535.00	128,225.35
Due to State of New Jersey and Public Assistance			
Trust Fund	A-31	212,487.00	196,428.00
Interfunds Payable	A-32	808,376.76	1,554,701.03
Due to Special Improvement Districts	A-33	812,497.48	55,445.43
Due to State of New Jersey - Uniform Construction Fund	A-34	571,798.63	313,400.63
Accounts Payable - Due to Library	A-35	25,000.00	25,000.00
Reserve for Judgments	A-35	1,954.31	1,954.31
Due to Redflex Traffic Systems	A-35	248,948.00	695,436.00
Due to Parking Authority for Municipal Court Fees	A-35	149,979.07	164,667.21
Due to State Waste Water Fund	A-35	25,000.00	25,000.00
Police Overtime	A-35	185,375.50	49,301.69
Reserve for Tax Appeals Pending	A-36		3,986,425.64
Tax Overpayments	A-37	588,706.06	1,165,131.16
Reserve for Hurricane Sandy	A-38	1,736,121.09	5,922,181.81
Prepaid Taxes	A-39	1,839,389.66	39,343,676.28
Prepaid Tax Abatements	A-39	106,666.77	1,248,397.84
Prepaid Improvement Taxes Receivable	A-40	57,897.36	76,192.76
	A-41		
Reserve for Master Plan	A-42	275,656.89	413,531.89
County Taxes Payable	A-43	1,892,153.74	124,392.00
Tax Anticipation Notes Payable	A-45	49,950,000.00	40,000,000.00
		<u>95,810,771.36</u>	<u>127,317,678.04</u>
Emergency Notes Payable - Revaluation - 2009	A-46	800,000.00	1,600,000.00
Emergency Notes Payable - Liability Payout	A-46	4,161,000.00	5,545,000.00
Emergency Notes Payable - Hurricane Sandy	A-46	4,853,000.00	6,500,000.00
Reserve for Other Receivables		201,149,769.42	178,556,096.32
Fund Balance	A-1	<u>306,774,540.78</u>	<u>11,411,387.66</u>
			<u>330,930,162.02</u>
<u>Federal and State Grant Funds</u>			
Appropriation Reserve - State Law Enforcement Grant	A-47	227,443.76	227,443.76
Reserve for Federal, State and Other Grants	A-48	166,113,697.53	171,796,140.10
Due to Insurance Trust Fund	A-49	190,224.31	
Due to Other Trust Fund	A-49	127,729.77	
Due to Capital Fund	A-49	58,877.15	58,877.15
Unallocated Receipts	A-50	282,406.09	274,348.82
Deferred Credits:			
Reserve for Elderly Nutrition	A-51	2,350,787.79	2,398,900.39
Reserve for Safe Housing	A-52	1,579,833.28	1,579,833.28
Unappropriated Grants	A-53	5,989,941.27	7,708,287.46
Due to Federal Funds	A-54	724,718.06	724,718.06
UEZ Loan Repayment	A-55	490,202.51	318,551.00
		<u>178,135,861.52</u>	<u>185,087,100.02</u>
		<u>\$ 484,910,402.30</u>	<u>\$ 516,017,262.04</u>

CITY OF NEWARK
CURRENT FUND

COMPARATIVE STATEMENTS OF OPERATIONS
AND CHANGES IN FUND BALANCE - REGULATORY BASIS

A-1
Sheet #1

	<u>Ref.</u>	<u>Year 2013</u>	<u>Year 2012</u>
<u>Revenue and Other Income</u>			
Surplus Anticipated	A-2	\$ 11,411,387.66	\$ 17,825,000.00
Miscellaneous Revenue Anticipated	A-2	413,041,813.93	382,314,384.86
Receipts from Delinquent Taxes	A-2	9,166,110.21	15,183,933.50
Receipts from Current Taxes	A-2	348,817,914.76	363,216,910.17
Nonbudget Revenue	A-2	2,236,479.45	3,718,730.06
Other Credits to Income:			
Interfunds Receivable Liquidated			25,886.82
Reserve for Revaluation Cancelled			628,000.00
Various Liabilities Funds Cancelled			26,344.88
Appropriation Reserves Cancelled	A-26	3,857,621.76	1,640,438.92
Commitments Payable Cancelled			1,700,000.00
Interfunds Payable Cancelled			0.10
Cancellation of Tax Overpayments	A-37	1,913,461.58	3,229,130.79
	Sheet #2	<u>\$ 790,444,789.35</u>	<u>\$ 789,708,385.47</u>
<u>Expenditures</u>			
<u>Budget and Emergency Appropriations:</u>			
<u>Operations:</u>			
Salaries and Wages		\$ 244,699,293.79	\$ 247,040,796.67
Other Expenses		263,469,903.18	231,226,385.63
Debt Service		52,059,767.70	45,101,700.29
Deferred Charges and Statutory Expenditures		68,396,405.79	70,217,891.55
Judgments		450,000.00	450,000.00
Deficit in Water Utility Fund			788,617.53
Capital Improvements		100,000.00	150,000.00
	A-3	629,175,370.46	594,975,391.67
Prior Year Refund	A-4	458,939.17	38,238.89
Reserve for Petty Cash Fund	A-8	1,100.00	1,700.00
Reserve for Protested Check	A-15	810,761.45	45,207.99
Due from East Orange-Passaic Valley Established	A-16	26,726.00	63,392.00
Due from Payroll Transfer Account Established	A-17	28,915.06	238,973.32
Interfund Receivables Established	A-18	176,130.52	
Prior Year Senior Citizens Deduction Disallowed	A-30	1,803.41	71,676.22
Special District Taxes	A-33	3,870,357.00	3,079,514.24
State Tax Appeals on Delinquent Taxes	A-36	259,582.81	2,320,642.58
Excess School Tax Paid			0.26
County Tax	A-43	74,907,034.81	77,116,428.90
County Share of Added and Omitted Taxes	A-43	1,892,153.75	124,392.00
Local School District Tax	A-44	108,957,123.50	106,768,669.50
	Sheet #2	<u>\$ 820,565,997.94</u>	<u>\$ 784,844,227.57</u>

CITY OF NEWARK
CURRENT FUND

**COMPARATIVE STATEMENTS OF OPERATIONS
AND CHANGES IN FUND BALANCE - REGULATORY BASIS**

A-1
Sheet #2

	<u>Ref.</u>	<u>Year 2013</u>	<u>Year 2012</u>
Revenue and Other Income	Sheet #1	\$ 790,444,789.35	\$ 789,708,385.47
Total Expenditures	Sheet #1	<u>820,565,997.94</u>	<u>784,844,227.57</u>
Excess (Deficit) in Revenue		(30,121,208.59)	4,864,157.90
Adjustments to Income before Fund Balance:			
Expenditures Included Above Which are by			
Statute Deferred Charges to Budget of			
Succeeding Years		<u> </u>	<u>6,500,000.00</u>
Statutory Excess in Fund Balance			11,364,157.90
Deficit in Operations	A-41	<u><u>(30,121,208.59)</u></u>	
<u>Fund Balance</u>			
Balance January 1	A	<u>11,411,387.66</u>	<u>17,872,229.76</u>
		11,411,387.66	29,236,387.66
Decreased by:			
Utilized as Anticipated Revenue	A-2	<u>11,411,387.66</u>	<u>17,825,000.00</u>
Balance December 31	A	<u>\$ -</u>	<u>\$ 11,411,387.66</u>

See accompanying notes to financial statements.

CITY OF NEWARK
CURRENT FUND

STATEMENT OF REVENUE - REGULATORY BASIS

A-2
Sheet #1

	<u>Ref.</u>	<u>Anticipated Budget</u>	<u>Realized</u>	<u>Excess or (Deficit)</u>
Surplus Anticipated	A-1	\$ 12,904,747.74	\$ 11,411,387.66	(1,493,360.08)
Miscellaneous Revenues - Local Revenues:				
Licenses:				
Alcoholic Beverages	A-13	914,000.00	912,238.00	(1,762.00)
Other	A-13	1,434,000.00	1,291,547.69	(142,452.31)
Other:				
City Clerk	A-13	13,500.00	13,520.00	20.00
Bureau of Vital Statistics	A-13	794,000.00	778,573.00	(15,427.00)
Tax Searches	A-13	4,180.00	2,792.00	(1,388.00)
Miscellaneous Fees and Permits	A-13	435,000.00	632,618.94	197,618.94
Fox Lance Limited Dividend Receipts	A-14	16,871,150.00	15,172,226.42	(1,698,923.58)
Port Newark Lease - Port Authority of New York and New Jersey	A-13	84,745,000.00	84,744,312.00	(688.00)
Police Identification	A-13	4,300.00	4,769.50	469.50
Bureau of Sidewalks	A-13	486,000.00	515,718.08	29,718.08
Fines and Costs:				
Municipal Court	A-13	13,516,000.00	13,565,141.00	49,141.00
Interest and Costs on Taxes	A-4	5,800,000.00	4,080,691.91	(1,719,308.09)
Interest on Investments and Deposits	A-13	350,000.00	90,325.44	(259,674.56)
Rents - City-Owned Property	A-13	392,000.00	467,911.80	75,911.80
Total Local Revenues		<u>125,759,130.00</u>	<u>122,272,385.78</u>	<u>(3,486,744.22)</u>
Miscellaneous Revenues - State Aid Without Offsetting				
Appropriations:				
Consolidated Municipal Property Tax Relief Act	A-13	34,939,731.00	34,939,731.00	
Energy Receipts Tax (P.L. 1997, Chapters 162 and 167)	A-13	65,237,979.00	65,237,979.02	0.02
Business Personal Property Replacement Aid - School Portion	A-13	<u>1,112,407.00</u>	<u>1,112,407.00</u>	
Total State Aid Without Offsetting Appropriations		<u>101,290,117.00</u>	<u>101,290,117.02</u>	<u>0.02</u>
Miscellaneous Revenues - Dedicated Uniform Construction				
Code Fees Offset with Appropriations:				
Uniform Construction Code Fees	A-13	<u>2,886,000.00</u>	<u>4,765,692.00</u>	<u>1,879,692.00</u>
Miscellaneous Revenues - Special Items of General Revenue				
Anticipated with Prior Written Consent of Director of Local Government Services - Additional Revenues Offset with Appropriations:				
Local District School Debt Service:				
State Aid - Building Allowance for School	A-13	<u>5,916,458.00</u>	<u>5,916,458.00</u>	
		<u>5,916,458.00</u>	<u>5,916,458.00</u>	
Miscellaneous Revenues - Special Items of General Revenue				
Anticipated with Prior Written Consent of Director of Local Government Services - Public and Private Revenues Offset with Appropriations:				
New Jersey Department of Health and Human Services:				
Sexually Transmitted Diseases Program		138,693.00	138,693.00	
Bio-Terrorism Preparedness Grant		297,494.00	297,494.00	
Women, Infants and Children		1,584,000.00	1,584,000.00	
Childhood Lead Poisoning		481,493.00	481,493.00	
Childhood Lead Poisoning		465,780.00	465,780.00	
Immunization Program		300,000.00	300,000.00	
Immunization Program		325,000.00	325,000.00	
HIV Emergency Relief Program		7,396,358.00	7,396,358.00	
HIV Emergency Relief Program		5,329,803.00	5,329,803.00	
Homeless HRSA Program		2,256,073.00	2,256,073.00	
Homeless HRSA Program - Additional Funding		103,583.00	103,583.00	

CITY OF NEWARK
CURRENT FUND

STATEMENT OF REVENUE - REGULATORY BASIS

A-2
Sheet #2

<u>Ref.</u>	<u>Anticipated Budget</u>	<u>Realized</u>	<u>Excess or (Deficit)</u>
Miscellaneous Revenues - Special Items of General Revenue			
Anticipated with Prior Written Consent of Director of Local			
Government Services - Public and Private Revenues Offset			
with Appropriations:			
United States Environmental Protection Agency:			
Hazardous Discharge Site Remediation	\$ 1,150,000.00	\$ 1,150,000.00	\$
New Jersey Environmental Protection Agency:			
Municipal Tonnage Grant	1,547,510.26	1,547,510.26	
Clean Communities Grant - 2010	327,344.66	327,344.66	
Clean Communities Grant - 2011	327,986.78	327,986.78	
State of New Jersey Office of Homeland Security and Preparedness:			
Urban Areas Security Initiative Grant	1,608,858.66	1,608,858.66	
Urban Areas Security Initiative Grant	200,000.00	200,000.00	
New Jersey Department of Transportation:			
Various Streets (10 Locations ATP-12)	1,501,000.00	1,501,000.00	
Various Streets (7 Locations MA-ATP-2013)	1,501,000.00	1,501,000.00	
Various Streets (10 Locations MA-13)	1,326,370.00	1,326,370.00	
New Jersey Department of Agriculture:			
Summer Food Program - Sun Up	995,048.84	995,048.84	
State of New Jersey Department of Law and Public Safety:			
Body Armor Grant	96,822.31	96,822.31	
Body Armor Grant	94,228.25	94,228.25	
COPS in Shops Grant	16,640.00	16,640.00	
Pedestrian Safety Program Grant	15,000.00	15,000.00	
Targeting Violent Crime	75,440.00	75,440.00	
New Jersey Department of Labor and Workforce Development:			
N.J. DOL and Workforce Development Hurricane Sandy			
Disaster Grant	368,473.00	368,473.00	
N.J. DOL and Workforce Development Learning Grant 2012	75,000.00	75,000.00	
Needy Families, General Assistance, Supplemental Nutrition			
and SNAP	1,216,404.00	1,216,404.00	
Business Development Interdepartmental Funds	11,764.00	11,764.00	
Workforce Learning Link Grant 2013	127,000.00	127,000.00	
WIA - Dislocated Worker Programs, WIA Adults, Needy Families	6,225,880.00	6,225,880.00	
WIA - Dislocated Worker Programs, WIA Adults, Needy Families	5,052,831.00	5,052,831.00	
United States Department of Justice:			
Domestic Violence	207,730.00	207,730.00	
Edward Byrne Memorial Justice Assistance Grant	485,804.00	485,804.00	
United States Department of Housing and Urban Development:			
Emergency Solutions Grant	678,542.00	678,542.00	
Emergency Solutions Grant	483,211.00	483,211.00	
HOME Investment Partnership	1,944,355.00	1,944,355.00	
Neighborhood Stabilization Program II	2,018,637.00	2,018,637.00	
Housing Opportunities for Persons with Aids (HOPWA)	7,218,919.00	7,218,919.00	
Housing Opportunities for Persons with Aids (HOPWA)	6,419,016.00	6,419,016.00	
New Jersey Department of Homeland Security:			
Staffing for Adequate Fire and Emergency Responses (SAFER)	3,171,693.00	3,171,693.00	
Personal Protection Equipment Grant	266,800.00	266,800.00	
Kresge Foundation Non-Profit Organization:			
Advancing Safe and Healthy Home Initiative	500,000.00	500,000.00	

CITY OF NEWARK
CURRENT FUND

STATEMENT OF REVENUE - REGULATORY BASIS

A-2
Sheet #3

	<u>Ref.</u>	<u>Anticipated Budget</u>	<u>Realized</u>	<u>Excess or (Deficit)</u>
Miscellaneous Revenues - Special Items of General Revenue Anticipated with Prior Written Consent of Director of Local Government Services - Public and Private Revenues Offset with Appropriations:				
North Jersey Transportation Planning Authority Inc.:				
Subregional Transportation Planning Grant		\$ 68,942.00	\$ 68,942.00	\$
Local Safety Program (Board and South Streets)		500,000.00	500,000.00	
Local Safety Program (Board and Tichenor Streets)		1,900,000.00	1,900,000.00	
HESS Corporation:				
Various Neighborhood Projects		1,800,000.00	1,800,000.00	
County of Essex - Department of Citizen Services:				
Truancy Alternative Program		66,480.00	66,480.00	
Total Special Items of General Revenue Anticipated with Prior Written Consent of Director of Local Government Services - Public and Private Revenues Offset with Appropriations	A-23	70,269,007.76	70,269,007.76	
Miscellaneous Revenues - Special Items of General Revenue Anticipated with Prior Written Consent of Director of Local Government Services - Other Special Items:				
Revenue from New Taxes - Hotel Taxes:				
Hotel Taxes	A-13	6,080,000.00	6,264,323.68	184,323.68
Payroll Taxes	A-13	44,900,000.00	41,892,052.18	(3,007,947.82)
Parking Lot Revenues	A-13	21,600,000.00	20,669,184.29	(930,815.71)
Fox Lance Limited Dividend Receipts - PILOTS (Additional)		4,278,850.00		(4,278,850.00)
Car Rental Tax	A-13	3,000,000.00	3,000,000.00	
General Capital Surplus	A-13	5,584,000.00	5,584,000.00	
Ticket Tax and Facility Fee		850,000.00		(850,000.00)
Water Utility Operating Fund:				
Reimbursement for Administrative, In-Kind and Operating Expenses	A-13	2,500,000.00	2,500,000.00	
Sewer Utility Operating Fund:				
Reimbursement for Administrative, In-Kind and Operating Expenses	A-13	2,500,000.00	2,500,000.00	
Franchise - Cable Fees	A-13	687,000.00	740,085.07	53,085.07
Reimbursement of Fringe Benefit	A-13	740,000.00	1,249,256.82	509,256.82
Uniform Fire Safety Act (Ch. 383, P.L. 1983):				
Registration Fees	A-13	280,000.00	164,532.29	(115,467.71)
Host Municipality Fees	A-13	7,939,000.00	5,270,765.40	(2,668,234.60)
Reimbursement of Debt Service	A-13	619,000.00	458,394.35	(160,605.65)
Military Park Garage - Excess Profit	A-13	22,400.00	242,169.03	219,769.03

CITY OF NEWARK
CURRENT FUND

STATEMENT OF REVENUE - REGULATORY BASIS

A-2
Sheet #4

	Ref.	Anticipated Budget	Realized	Excess or (Deficit)
Miscellaneous Revenues - Special Items of General Revenue Anticipated with Prior Written Consent of Director of Local Government Services - Other Special Items:				
Payment in Lieu of Taxes PVSC	A-13	\$ 840,000.00	\$ 815,341.91	\$ (24,658.09)
Easement Rights	A-13	7,500.00	45,058.00	37,558.00
Other Miscellaneous Revenues	A-13	1,278,000.00	1,815,990.57	537,990.57
Special Events - City Services	A-13	49,090.25	55,428.62	6,338.37
Certificate of Code Enforcement	A-13	281,000.00	286,135.00	5,135.00
FEMA Reimbursement of Prior Year Expenses (Offset to Hurricane Sandy)	A-13	1,300,000.00	1,596,351.34	296,351.34
Additional Cancellations of 2013 Appropriations:				
Appropriation Reserves	A-26	1,700,000.00	1,700,000.00	
Sale of City-Owned Property - 2012	A-13	3,673,900.00	621,566.50	(3,052,333.50)
Sale of City-Owned Property - 2013		3,000,000.00		(3,000,000.00)
Information Fees	A-13	301,000.00	57,518.32	(243,481.68)
HESS Settlement	A-13	11,000,000.00	11,000,000.00	
Total Special Items of General Revenue Anticipated with Prior Written Consent of Local Government Services - Other Special Items		125,010,740.25	108,528,153.37	(16,482,586.88)
Total Miscellaneous Revenue	A-1	431,131,453.01	413,041,813.93	(18,089,639.08)
Receipts from Delinquent Taxes	A-2 (Sheet #5)	11,300,000.00	9,166,110.21	(2,133,889.79)
Sub-Total General Revenue		455,336,200.75	433,619,311.80	(20,223,528.87)
Amount to be Raised by Taxes for Support of Municipal Budget:				
Local Tax for Municipal Purposes Including Reserves for Uncollected Taxes	A-9	188,803,048.84		
Addition to Local District School Tax	A-9	5,585,160.00		
Minimum Library Tax	A-9	4,907,964.17		
	A-2 (Sheet #5)	199,296,173.01	174,847,245.70	(24,448,927.31)
Total General Revenue		654,632,373.76	608,466,557.50	(46,165,816.26)
Nonbudget Revenue	A-2 (Sheet #5)		2,236,479.45	2,236,479.45
Total		\$ 654,632,373.76	\$ 610,703,036.95	\$ (43,929,336.81)
	Reference	A-3		

CITY OF NEWARK
CURRENT FUND

STATEMENT OF REVENUE - REGULATORY BASIS

A-2
Sheet #5

	<u>Ref.</u>		
<u>Analysis of Miscellaneous Revenue</u>			
Allocation of Current Tax Collection:			
Collection of 2013 Taxes in 2013	A-9	\$ 309,116,800.75	
Collection of 2013 Taxes in 2012	A-9	39,393,524.29	
Senior Citizens' Allowed	A-9	<u>307,589.72</u>	
	A-1		\$ 348,817,914.76
Allocated to:			
Special District Taxes	A-33	3,870,357.00	
County Tax	A-43	76,799,188.56	
Local School District Tax	A-44	<u>108,957,123.50</u>	
			<u>189,626,669.06</u>
Support of Municipal Budget Appropriation			<u>159,191,245.70</u>
Plus: Appropriation Reserve for Uncollected Taxes	A-3		<u>15,656,000.00</u>
Realized for Support of Municipal Budget Appropriations	A-2 (Sheet #4)		<u>\$ 174,847,245.70</u>
Receipts from Delinquent Taxes:			
Taxes Receivable - Collected	A-9		3,077,958.97
Tax Title Lien Collection	A-10		<u>6,088,151.24</u>
Realized on Budget Revenue	A-1, A-2 (Sheet #4)		<u>\$ 9,166,110.21</u>
Miscellaneous Revenue Not Anticipated:			
Telephone Licenses		\$ 2,450.00	
Trade Waste		9,275.00	
Soil Erosion Permit Fees		25,720.00	
Copying Fees		367.85	
Water Permit Little FA		15,649.05	
Food Handlers Fees		18,480.00	
Administrative Fee for Senior Citizens and Vets		6,601.92	
Refund of Prior Year Expenditures		57,012.26	
Non Refundable Deposits		26,840.00	
Premium on Sale of Emergency Notes		169,550.00	
Miscellaneous Adjustments and Interfunds		1,860,077.06	
Other		<u>44,223.91</u>	
	A-4		<u>2,236,247.05</u>
Excess Animal Control Fund Balance	A-18		<u>232.40</u>
	A-1,2 (Sheet #4)		<u>\$ 2,236,479.45</u>

See accompanying notes to financial statements.

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #1

	Appropriations		Expended			
Appropriations	Budget	Modified Budget	Paid or Charged	Encumbered	Reserved	Cancelled
APPROPRIATIONS WITHIN "CAPS"						
OFFICE OF THE MAYOR AND AGENCIES						
Mayor's Office:						
Salaries and Wages:						
Personnel Services	\$ 2,437,928.00	\$ 2,378,928.00	\$ 2,374,118.12	\$	\$	\$ 4,809.88
Other Pay	150,000.00	100,468.00	98,067.34		2,400.00	0.66
Total - Salaries and Wages	2,587,928.00	2,479,396.00	2,472,185.46		2,400.00	4,810.54
Other Expenses:						
Service by Contract or Agreement	161,500.00	131,032.00	101,414.05	3,542.05	13,037.95	13,037.95
Materials and Supplies	36,000.00	36,000.00	12,628.69		2,874.77	20,496.54
Miscellaneous	10,000.00	10,000.00			5,000.00	5,000.00
Total - Other Expenses	207,500.00	177,032.00	114,042.74	3,542.05	20,912.72	38,534.49
Aid to Newark Museum (N.J.S.A. 40:23-6.22)	4,250,000.00	4,500,000.00	4,500,000.00			
Affirmative Action:						
Salaries and Wages:						
Personnel Services	223,546.00	223,546.00	217,484.56			6,061.44
Other Pay	5,000.00	5,000.00	2,431.00		132.00	2,437.00
Total - Salaries and Wages	228,546.00	228,546.00	219,915.56		132.00	8,498.44
Other Expenses:						
Service by Contract or Agreement	3,200.00	3,200.00				3,200.00
Materials and Supplies	4,460.00	4,460.00				4,460.00
Total - Other Expenses	7,660.00	7,660.00				7,660.00
Mayor's Office of Newark Works:						
Salaries and Wages:						
Personnel Services	176,525.00	176,525.00	176,525.00			
Other Pay	13,352.00	13,352.00	13,352.00			
Total - Salaries and Wages	189,877.00	189,877.00	189,877.00			
Other Expenses:						
Service by Contract or Agreement	1,367,500.00	1,367,500.00	1,367,468.75			31.25
Materials and Supplies	7,750.00	7,750.00	7,162.37			587.63
Total - Other Expenses	1,375,250.00	1,375,250.00	1,374,631.12			618.88

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #2

	Appropriations		Expended			
Appropriations	Budget	Modified Budget	Paid or Charged	Encumbered	Reserved	Cancelled
<u>APPROPRIATIONS WITHIN "CAPS"</u>						
<u>OFFICE OF THE MAYOR AND AGENCIES</u>						
Municipal Court:						
Salaries and Wages:						
Personnel Services	\$ 4,901,290.00	\$ 4,652,173.00	\$ 4,618,330.03	\$	\$ 3,842.97	\$ 30,000.00
Other Pay	404,000.00	454,000.00	426,183.36		14,816.64	13,000.00
Total - Salaries and Wages	5,305,290.00	5,106,173.00	5,044,513.39		18,659.61	43,000.00
Other Expenses:						
Service by Contract or Agreement	762,200.00	712,200.00	411,598.58	261,627.34	5,952.83	33,021.25
Materials and Supplies	94,000.00	94,000.00	49,649.16	34,371.89	5,978.95	4,000.00
Equipment	77,300.00	187,740.00	12,742.00	174,372.20	312.90	312.90
Miscellaneous	10,440.00					
Total - Other Expenses	943,940.00	993,940.00	473,989.74	470,371.43	12,244.68	37,334.15
Total - Office of the Mayor and Agencies	15,095,991.00	15,057,874.00	14,389,155.01	473,913.48	54,349.01	140,456.50
<u>CITY CLERK AND MUNICIPAL COUNCIL</u>						
Office of the City Clerk:						
Salaries and Wages:						
Personnel Services	3,390,045.00	3,381,743.00	3,373,287.16			8,455.84
Other Pay	200,000.00	208,302.00	208,301.12			0.88
Total - Salaries and Wages	3,590,045.00	3,590,045.00	3,581,588.28			8,456.72
Other Expenses:						
Service by Contract or Agreement	1,852,769.00	1,852,769.00	641,292.29	552,600.96	15,786.44	643,089.31
Materials and Supplies	144,680.00	144,680.00	100,697.42	33,257.50	5,362.54	5,362.54
Equipment	8,000.00	8,000.00	5,175.36	415.24	1,204.70	1,204.70
Total - Other Expenses	2,005,449.00	2,005,449.00	747,165.07	586,273.70	22,353.68	649,656.55
Municipal Council:						
Salaries and Wages:						
Personnel Services	3,161,239.00	3,158,629.00	3,146,282.45			12,346.55
Other Pay	55,000.00	57,610.00	57,609.80		0.20	
Total - Salaries and Wages	3,216,239.00	3,216,239.00	3,203,892.25		0.20	12,346.55

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #3

	Appropriations		Expended			
<u>Appropriations</u>	<u>Budget</u>	<u>Modified Budget</u>	<u>Paid or Charged</u>	<u>Encumbered</u>	<u>Reserved</u>	<u>Cancelled</u>
<u>APPROPRIATIONS WITHIN "CAPS"</u>						
<u>CITY CLERK AND MUNICIPAL COUNCIL</u>						
Municipal Council:						
Other Expenses:						
Service by Contract or Agreement	\$ 183,100.00	\$ 183,100.00	\$ 131,122.17	\$	\$ 7,438.74	\$ 44,539.09
Materials and Supplies	51,000.00	51,000.00	18,330.20	12,766.27	8,974.50	10,929.03
Equipment	10,000.00	10,000.00	9,488.16		511.84	
Miscellaneous	12,167.00	12,167.00	11,689.70		477.30	
Total - Other Expenses	256,267.00	256,267.00	170,630.23	12,766.27	17,402.38	55,468.12
Elections:						
Primary and General	270,000.00	270,000.00	195,344.71	74,585.15	70.14	
Total - City Clerk and Municipal Council	9,338,000.00	9,338,000.00	7,898,620.54	673,625.12	39,826.40	725,927.94
<u>DEPARTMENT OF ADMINISTRATION</u>						
Office of the Business Administrator:						
Salaries and Wages:						
Personnel Services	1,265,909.00	1,263,909.00	1,253,707.85			10,201.15
Other Pay	8,000.00	8,000.00	2,164.70			5,835.30
Total - Salaries and Wages	1,273,909.00	1,271,909.00	1,255,872.55			16,036.45
Other Expenses:						
Service by Contract or Agreement	544,967.00	244,967.00	113,100.19	89,795.66	22,647.71	19,423.44
Materials and Supplies	13,400.00	3,400.00				3,400.00
Total - Other Expenses	558,367.00	248,367.00	113,100.19	89,795.66	22,647.71	22,823.44
Division of Budget:						
Salaries and Wages:						
Personnel Services	1,537,288.00	1,537,288.00	1,518,805.18		482.82	18,000.00
Other Pay	52,828.00	42,828.00	40,096.35			2,731.65
Total - Salaries and Wages	1,590,116.00	1,580,116.00	1,558,901.53		482.82	20,731.65

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #4

	Appropriations		Expended			
<u>Appropriations</u>	<u>Budget</u>	<u>Modified Budget</u>	<u>Paid or Charged</u>	<u>Encumbered</u>	<u>Reserved</u>	<u>Cancelled</u>
<u>APPROPRIATIONS WITHIN "CAPS"</u>						
<u>DEPARTMENT OF ADMINISTRATION</u>						
Division of Budget:						
Other Expenses:						
Service by Contract or Agreement	\$ 3,637,500.00	\$ 3,637,500.00	\$ 2,264,388.76	\$ 1,357,036.35	\$ 1,086.30	\$ 14,988.59
Materials and Supplies	617,000.00	617,000.00	578,782.13	38,211.06	6.81	
Equipment	400,000.00	400,000.00	399,206.70	793.30		
Total - Other Expenses	4,654,500.00	4,654,500.00	3,242,377.59	1,396,040.71	1,093.11	14,988.59
Division of Central Purchase:						
Salaries and Wages:						
Personnel Services	555,191.00	502,191.00	501,400.52		790.48	
Other Pay	18,022.00	10,022.00	9,983.75		38.25	
Total - Salaries and Wages	573,213.00	512,213.00	511,384.27		828.73	
Other Expenses:						
Service by Contract or Agreement	16,850.00	16,850.00	9,182.62	7,038.10	629.28	
Materials and Supplies	6,500.00	6,500.00		6,412.07	87.93	
Equipment	800.00	800.00		800.00		
Total - Other Expenses	24,150.00	24,150.00	9,182.62	14,250.17	717.21	
Division of Personnel:						
Salaries and Wages:						
Personnel Services	977,385.00	942,385.00	942,092.49			292.51
Other Pay	35,000.00	35,000.00	25,598.92			9,401.08
Total - Salaries and Wages	1,012,385.00	977,385.00	967,691.41			9,693.59
Other Expenses:						
Service by Contract or Agreement	362,576.00	62,576.00	27,011.68	4,019.48	15,772.42	15,772.42
Materials and Supplies	15,000.00	5,000.00	1,419.93		299.00	3,281.07
Total - Other Expenses	377,576.00	67,576.00	28,431.61	4,019.48	16,071.42	19,053.49

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #5

Appropriations	Appropriations		Paid or Charged	Expended		Cancelled
	Budget	Modified Budget		Encumbered	Reserved	
<u>APPROPRIATIONS WITHIN "CAPS"</u>						
<u>DEPARTMENT OF ADMINISTRATION</u>						
Division of Office Services:						
Salaries and Wages:						
Personnel Services	\$ 394,787.00	\$ 374,787.00	\$ 374,090.20	\$	\$	\$ 696.80
Other Pay	2,000.00	2,000.00	153.21			1,846.79
Total - Salaries and Wages	396,787.00	376,787.00	374,243.41			2,543.59
Other Expenses:						
Service by Contract or Agreement	7,051,000.00	6,803,000.00	5,953,625.29	848,096.90	880.18	397.63
Materials and Supplies	162,500.00	126,500.00	103,802.09	16,864.79	2,916.56	2,916.56
Equipment	25,000.00	31,000.00	30,428.58	108.58	231.42	231.42
Total - Other Expenses	7,238,500.00	6,960,500.00	6,087,855.96	865,070.27	4,028.16	3,545.61
Office of Emergency Management:						
Salaries and Wages:						
Personnel Services	270,964.00	212,964.00	212,615.15			348.85
Other Pay	10,000.00					
Total - Salaries and Wages	280,964.00	212,964.00	212,615.15			348.85
Other Expenses:						
Service by Contract or Agreement	3,500.00	3,500.00	2,727.84	727.84	22.16	22.16
Materials and Supplies	14,400.00	14,400.00	7,851.87	5,427.17	560.48	560.48
Equipment	1,000.00	55,000.00	53,276.00		1,724.00	
Total - Other Expenses	18,900.00	72,900.00	63,855.71	6,155.01	2,306.64	582.64
Communications:						
Salaries and Wages:						
Personnel Services	308,437.00	277,565.00	277,311.78		253.22	
Other Pay	15,000.00	10,000.00	3,666.85			6,333.15
Total - Salaries and Wages	323,437.00	287,565.00	280,978.63		253.22	6,333.15

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #6

	Appropriations		Expended			
Appropriations	Budget	Modified Budget	Paid or Charged	Encumbered	Reserved	Cancelled
<u>APPROPRIATIONS WITHIN "CAPS"</u>						
<u>DEPARTMENT OF ADMINISTRATION</u>						
Communications:						
Other Expenses:						
Service by Contract or Agreement	\$ 76,820.00	\$ 76,820.00	\$ 6,035.13	\$	\$ 1,658.65	\$ 69,126.22
Materials and Supplies	61,700.00	26,700.00	4,546.23		3,419.58	18,734.19
Equipment	15,000.00					
Total - Other Expenses	153,520.00	103,520.00	10,581.36		5,078.23	87,860.41
Total - Department of Administration	18,476,324.00	17,350,452.00	14,717,071.99	2,375,331.30	53,507.25	204,541.46
<u>DEPARTMENT OF LAW</u>						
Corporation Counsel's Office:						
Salaries and Wages:						
Personnel Services	3,133,345.00	2,878,345.00	2,858,601.46			19,743.54
Other Pay	34,500.00	34,500.00	30,000.00			4,500.00
Total - Salaries and Wages	3,167,845.00	2,912,845.00	2,888,601.46			24,243.54
Other Expenses:						
Service by Contract or Agreement	2,305,500.00	2,305,500.00	1,779,612.15	514,005.44	350.03	11,532.38
Materials and Supplies	85,000.00	85,000.00	32,666.92	52,309.44		23.64
Total - Other Expenses	2,390,500.00	2,390,500.00	1,812,279.07	566,314.88	350.03	11,556.02
Total - Department of Law	5,558,345.00	5,303,345.00	4,700,880.53	566,314.88	350.03	35,799.56
<u>DEPARTMENT OF FINANCE</u>						
Director's Office:						
Salaries and Wages:						
Personnel Services	444,216.00	408,893.00	408,229.45			663.55
Other Pay	2,500.00	2,823.00	2,822.13			0.87
Total - Salaries and Wages	446,716.00	411,716.00	411,051.58			664.42

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #7

	Appropriations		Expended			
Appropriations	Budget	Modified Budget	Paid or Charged	Encumbered	Reserved	Cancelled
<u>APPROPRIATIONS WITHIN "CAPS"</u>						
<u>DEPARTMENT OF FINANCE</u>						
Director's Office:						
Other Expenses:						
Service by Contract or Agreement	\$ 531,200.00	\$ 143,200.00	\$ 123,259.22	\$	\$ 7,795.26	\$ 12,145.52
Materials and Supplies	4,500.00	4,500.00		1,500.00	1,500.00	1,500.00
Total - Other Expenses	535,700.00	147,700.00	123,259.22	1,500.00	9,295.26	13,645.52
Division of Accounts and Control:						
Salaries and Wages:						
Personnel Services	1,040,314.00	1,004,314.00	1,003,578.53			735.47
Other Pay	20,140.00	10,140.00	9,075.03		444.54	620.43
Total - Salaries and Wages	1,060,454.00	1,014,454.00	1,012,653.56		444.54	1,355.90
Other Expenses:						
Service by Contract or Agreement	2,800.00	2,800.00	758.25			2,041.75
Materials and Supplies	6,500.00	6,500.00	2,443.04	2,820.34	618.31	618.31
Total - Other Expenses	9,300.00	9,300.00	3,201.29	2,820.34	618.31	2,660.06
Division of Revenue Collections:						
Salaries and Wages:						
Personnel Services	1,268,539.00	1,198,539.00	1,192,903.59			5,635.41
Other Pay	20,300.00	20,300.00	10,710.06			9,589.94
Total - Salaries and Wages	1,288,839.00	1,218,839.00	1,203,613.65			15,225.35
Other Expenses:						
Service by Contract or Agreement	271,175.00	231,175.00	153,807.03	58,839.03	9,264.47	9,264.47
Materials and Supplies	9,400.00	9,400.00	6,939.56	1,853.56	303.23	303.65
Equipment	2,000.00					
Total - Other Expenses	282,575.00	240,575.00	160,746.59	60,692.59	9,567.70	9,568.12

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #8

	Appropriations		Expended			
<u>Appropriations</u>	<u>Budget</u>	<u>Modified Budget</u>	<u>Paid or Charged</u>	<u>Encumbered</u>	<u>Reserved</u>	<u>Cancelled</u>
<u>APPROPRIATIONS WITHIN "CAPS"</u>						
<u>DEPARTMENT OF FINANCE</u>						
Division of Treasury:						
Salaries and Wages:						
Personnel Services	\$ 384,089.00	\$ 384,089.00	\$ 383,897.79	\$	\$	\$ 191.21
Other Pay	9,327.00	9,327.00	7,572.55			1,754.45
Total - Salaries and Wages	393,416.00	393,416.00	391,470.34			1,945.66
Other Expenses:						
Service by Contract or Agreement	71,250.00	71,250.00	54,300.00		90.00	16,860.00
Materials and Supplies	2,500.00	2,500.00		2,500.00		
Total - Other Expenses	73,750.00	73,750.00	54,300.00	2,500.00	90.00	16,860.00
Office of Tax Abatement and Special Taxes:						
Salaries and Wages:						
Personnel Services	627,899.00	582,899.00	575,981.83			6,917.17
Other Pay	4,985.00	4,985.00	65.54			4,919.46
Total - Salaries and Wages	632,884.00	587,884.00	576,047.37			11,836.63
Other Expenses:						
Service by Contract or Agreement	116,485.00	100,485.00			50,000.00	50,485.00
Materials and Supplies	6,735.00	6,735.00	1,533.50		67.95	5,133.55
Total - Other Expenses	123,220.00	107,220.00	1,533.50		50,067.95	55,618.55
Employees' Retirement System:						
Salaries and Wages:						
Personnel Services	162,904.00	162,904.00	161,853.83			1,050.17
Other Pay	2,000.00	2,000.00				2,000.00
Total - Salaries and Wages	164,904.00	164,904.00	161,853.83			3,050.17

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

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Sheet #9

	Appropriations		Expended			
Appropriations	Budget	Modified Budget	Paid or Charged	Encumbered	Reserved	Cancelled
<u>APPROPRIATIONS WITHIN "CAPS"</u>						
<u>DEPARTMENT OF FINANCE</u>						
Employees' Retirement System:						
Other Expenses:						
Service by Contract or Agreement	\$ 81,750.00	\$ 81,750.00	\$ 66,046.60	\$ 4,296.60	\$ 5,703.40	\$ 5,703.40
Materials and Supplies	1,400.00	1,400.00				1,400.00
Total - Other Expenses	83,150.00	83,150.00	66,046.60	4,296.60	5,703.40	7,103.40
Office of Assessment:						
Assessor's Office:						
Salaries and Wages:						
Personnel Services	770,596.00	705,596.00	701,150.74			4,445.26
Other Pay	17,000.00	17,000.00	11,808.50			5,191.50
Total - Salaries and Wages	787,596.00	722,596.00	712,959.24			9,636.76
Other Expenses:						
Service by Contract or Agreement	48,300.00	48,300.00	7,916.90		12,348.77	28,034.33
Materials and Supplies	17,800.00	17,800.00	7,568.42		3,430.00	6,781.58
Total - Other Expenses	66,100.00	66,100.00	15,505.32		15,778.77	34,815.91
Total - Department of Finance	5,948,604.00	5,241,604.00	4,894,242.09	71,809.53	91,565.93	183,986.45
<u>DEPARTMENT OF POLICE</u>						
Division of Police:						
Salaries and Wages:						
Personnel Services	113,910,569.00	106,256,486.00	105,724,988.46		31,497.54	500,000.00
Other Pay	15,770,719.00	18,624,802.00	17,705,513.45		919,288.55	
Total - Salaries and Wages	129,681,288.00	124,881,288.00	123,430,501.91		950,786.09	500,000.00
Other Expenses:						
Service by Contract or Agreement	3,449,260.00	3,579,260.00	2,536,526.68	848,476.00	97,290.44	96,966.88
Materials and Supplies	534,000.00	534,000.00	413,000.58	91,769.34	10,575.79	18,654.29
Equipment	680,000.00	520,000.00	243,251.79	261,682.86	15,065.35	
Total - Other Expenses	4,663,260.00	4,633,260.00	3,192,779.05	1,201,928.20	122,931.58	115,621.17

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #10

	Appropriations		Expended			
Appropriations	Budget	Modified Budget	Paid or Charged	Encumbered	Reserved	Cancelled
<u>APPROPRIATIONS WITHIN "CAPS"</u>						
<u>DEPARTMENT OF POLICE</u>						
Taxicab Division:						
Salaries and Wages:						
Personnel Services	\$ 181,396.00	\$ 141,396.00	\$ 137,715.24	\$	\$	\$ 3,680.76
Other Pay	21,500.00	21,500.00	18,974.42			2,525.58
Total - Salaries and Wages	202,896.00	162,896.00	156,689.66			6,206.34
Other Expenses:						
Service by Contract or Agreement	4,845.00	4,845.00		1,768.68	1,538.16	1,538.16
Materials and Supplies	18,600.00	18,600.00		4,410.86	6,956.22	7,232.92
Equipment	2,000.00	2,000.00				2,000.00
Total - Other Expenses	25,445.00	25,445.00		6,179.54	8,494.38	10,771.08
Board of Alcoholic Beverage Control:						
Salaries and Wages:						
Personnel Services	248,066.00	248,066.00	247,033.18			1,032.82
Other Pay	74,000.00	74,000.00	67,689.73		5,738.14	572.13
Total - Salaries and Wages	322,066.00	322,066.00	314,722.91		5,738.14	1,604.95
Other Expenses:						
Service by Contract or Agreement	2,200.00	2,200.00				2,200.00
Materials and Supplies	2,400.00	2,400.00				2,400.00
Total - Other Expenses	4,600.00	4,600.00				4,600.00
Total - Department of Police	134,899,555.00	130,029,555.00	127,094,693.53	1,208,107.74	1,087,950.19	638,803.54

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

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Sheet #11

	Appropriations		Expended			
Appropriations	Budget	Modified Budget	Paid or Charged	Encumbered	Reserved	Cancelled
<u>APPROPRIATIONS WITHIN "CAPS"</u>						
<u>DEPARTMENT OF FIRE</u>						
Director of Fire:						
Salaries and Wages:						
Personnel Services	\$ 57,317,666.00	\$ 57,304,938.00	\$ 57,293,820.79	\$	\$ 1,117.21	\$ 10,000.00
Other Pay	7,169,980.00	7,569,980.00	7,444,694.89		37,959.14	87,325.97
Total - Salaries and Wages	64,487,646.00	64,874,918.00	64,738,515.68		39,076.35	97,325.97
Other Expenses:						
Service by Contract or Agreement	251,157.00	251,157.00	114,031.67	128,722.33	4,482.83	3,920.17
Materials and Supplies	221,325.00	256,325.00	200,720.00	47,005.73	1,962.10	6,637.17
Equipment	491,750.00	457,750.00	437,784.56	14,685.12	1,131.15	4,149.17
Miscellaneous	1,000.00					
Total - Other Expenses	965,232.00	965,232.00	752,536.23	190,413.18	7,576.08	14,706.51
Total - Department of Fire	65,452,878.00	65,840,150.00	65,491,051.91	190,413.18	46,652.43	112,032.48
<u>DEPARTMENT OF ENGINEERING</u>						
Director's Office:						
Salaries and Wages:						
Personnel Services	2,381,781.00	2,331,781.00	2,312,319.45		9,461.55	10,000.00
Other Pay	201,000.00	201,000.00	139,274.81		26,725.19	35,000.00
Total - Salaries and Wages	2,582,781.00	2,532,781.00	2,451,594.26		36,186.74	45,000.00
Other Expenses:						
Service by Contract or Agreement	732,850.00	732,850.00	585,413.28	144,712.01	2,724.04	0.67
Materials and Supplies	21,200.00	21,200.00	6,068.37	3,112.00	7,016.33	5,003.30
Equipment	1,000.00	1,000.00		999.72	0.28	
Total - Other Expenses	755,050.00	755,050.00	591,481.65	148,823.73	9,740.65	5,003.97

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #12

	Appropriations		Expended			
<u>Appropriations</u>	<u>Budget</u>	<u>Modified Budget</u>	<u>Paid or Charged</u>	<u>Encumbered</u>	<u>Reserved</u>	<u>Cancelled</u>
<u>APPROPRIATIONS WITHIN "CAPS"</u>						
<u>DEPARTMENT OF ENGINEERING</u>						
Division of Traffic and Signals:						
Salaries and Wages:						
Personnel Services	\$ 1,477,447.00	\$ 1,455,447.00	\$ 1,445,317.84	\$	\$ 129.16	\$ 10,000.00
Other Pay	90,250.00	90,250.00	73,367.10		6,882.90	10,000.00
Total - Salaries and Wages	1,567,697.00	1,545,697.00	1,518,684.94		7,012.06	20,000.00
Other Expenses:						
Service by Contract or Agreement	3,400,516.00	4,814,516.00	2,464,360.45	2,095,812.59	154,264.79	100,078.17
Materials and Supplies	446,000.00	446,000.00	389,848.80	55,934.57	216.63	
Equipment	5,500.00	5,500.00		4,819.00	681.00	
Total - Other Expenses	3,852,016.00	5,266,016.00	2,854,209.25	2,156,566.16	155,162.42	100,078.17
Division of Motors:						
Salaries and Wages:						
Personnel Services	1,090,949.00	1,030,949.00	1,015,020.55		5,928.45	10,000.00
Other Pay	167,800.00	227,800.00	195,422.99		12,377.01	20,000.00
Total - Salaries and Wages	1,258,749.00	1,258,749.00	1,210,443.54		18,305.46	30,000.00
Other Expenses:						
Service by Contract or Agreement	2,015,000.00	2,215,000.00	2,166,333.65	40,469.64	8,196.71	
Materials and Supplies	4,268,200.00	4,008,200.00	3,546,748.35	460,940.18	511.47	
Equipment	40,000.00	40,000.00	6,717.05	33,279.00	3.95	
Total - Other Expenses	6,323,200.00	6,263,200.00	5,719,799.05	534,688.82	8,712.13	
Division of Public Buildings:						
Salaries and Wages:						
Personnel Services	2,161,794.00	2,175,000.00	2,174,999.47		0.53	
Other Pay	180,000.00	136,000.00	134,929.80		1,070.20	
Total - Salaries and Wages	2,341,794.00	2,311,000.00	2,309,929.27		1,070.73	

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

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Sheet #13

	Appropriations		Expended			
Appropriations	Budget	Modified Budget	Paid or Charged	Encumbered	Reserved	Cancelled
<u>APPROPRIATIONS WITHIN "CAPS"</u>						
<u>DEPARTMENT OF ENGINEERING</u>						
Division of Public Buildings:						
Other Expenses:						
Service by Contract or Agreement	\$ 13,938,213.00	\$ 14,500,007.00	\$ 11,953,912.62	\$ 2,499,977.23	\$ 19,003.28	\$ 27,113.87
Materials and Supplies	380,500.00	380,500.00	136,759.50	173,009.50	35,204.48	35,526.52
Total - Other Expenses	14,318,713.00	14,880,507.00	12,090,672.12	2,672,986.73	54,207.76	62,640.39
Total - Department of Engineering	33,000,000.00	34,813,000.00	28,746,814.08	5,513,065.44	290,397.95	262,722.53
<u>DEPARTMENT OF CHILD AND FAMILY WELL-BEING</u>						
Director's Office:						
Salaries and Wages:						
Personnel Services	864,737.00	844,737.00	841,993.34			2,743.66
Other Pay	500.00	500.00	245.10			254.90
Total - Salaries and Wages	865,237.00	845,237.00	842,238.44			2,998.56
Other Expenses:						
Service by Contract or Agreement	111,390.00	111,390.00	68,958.63	24,612.89	8,909.24	8,909.24
Materials and Supplies	6,600.00	6,600.00	940.47	445.23	2,607.15	2,607.15
Total - Other Expenses	117,990.00	117,990.00	69,899.10	25,058.12	11,516.39	11,516.39
Division of Medical Care Services:						
Salaries and Wages:						
Personnel Services	1,640,585.00	1,541,585.00	1,541,078.89			506.11
Other Pay	21,725.00	43,725.00	17,448.34		12,276.66	14,000.00
Total - Salaries and Wages	1,662,310.00	1,585,310.00	1,558,527.23		12,276.66	14,506.11
Other Expenses:						
Service by Contract or Agreement	1,142,158.00	1,120,158.00	846,723.75	263,577.38	5,856.87	4,000.00
Materials and Supplies	128,783.00	128,783.00	94,149.83	33,555.22	1,077.00	0.95
Total - Other Expenses	1,270,941.00	1,248,941.00	940,873.58	297,132.60	6,933.87	4,000.95

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #14

	Appropriations		Expended			
<u>Appropriations</u>	<u>Budget</u>	<u>Modified Budget</u>	<u>Paid or Charged</u>	<u>Encumbered</u>	<u>Reserved</u>	<u>Cancelled</u>
<u>APPROPRIATIONS WITHIN "CAPS"</u>						
<u>DEPARTMENT OF CHILD AND FAMILY WELL-BEING</u>						
Division of Environmental Health:						
Salaries and Wages:						
Personnel Services	\$ 1,389,972.00	\$ 1,389,972.00	\$ 1,381,140.15	\$	\$	\$ 8,831.85
Other Pay	141,040.00	141,040.00	92,274.77		1,992.23	46,773.00
Total - Salaries and Wages	1,531,012.00	1,531,012.00	1,473,414.92		1,992.23	55,604.85
Other Expenses:						
Service by Contract or Agreement	65,068.00	65,068.00	59,655.68	4,290.10	561.11	561.11
Materials and Supplies	15,750.00	15,750.00	11,258.22	4,083.76	216.20	191.82
Equipment	8,793.00	8,793.00	8,789.22		3.78	
Miscellaneous	631,926.00	631,926.00	526,605.00	105,321.00		
Total - Other Expenses	721,537.00	721,537.00	606,308.12	113,694.86	781.09	752.93
Division of Health Planning:						
Salaries and Wages:						
Personnel Services	138,678.00	138,678.00	138,631.76		46.24	
Other Pay	650.00	650.00			650.00	
Total - Salaries and Wages	139,328.00	139,328.00	138,631.76		696.24	
Other Expenses:						
Service by Contract or Agreement	70,290.00	70,290.00	41,850.75	25,287.20	2,152.05	1,000.00
Materials and Supplies	6,700.00	6,700.00	6,021.89	674.98	3.13	
Total - Other Expenses	76,990.00	76,990.00	47,872.64	25,962.18	2,155.18	1,000.00

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #15

Appropriations	Appropriations		Expended			
	Budget	Modified Budget	Paid or Charged	Encumbered	Reserved	Cancelled
<u>APPROPRIATIONS WITHIN "CAPS"</u>						
<u>DEPARTMENT OF CHILD AND FAMILY WELL-BEING</u>						
Division of Social Services:						
Salaries and Wages:						
Personnel Services	\$ 738,076.00	\$ 710,076.00	\$ 709,298.66	\$	\$ 777.34	\$
Other Pay	2,000.00	2,000.00	1,624.03		375.97	
Total - Salaries and Wages	740,076.00	712,076.00	710,922.69		1,153.31	
Other Expenses:						
Service by Contract or Agreement	367,351.00	367,351.00	255,409.16	94,314.24	9,627.60	8,000.00
Materials and Supplies	10,050.00	10,050.00	6,068.54	3,620.86	360.60	
Miscellaneous	30,000.00	45,250.00	24,842.68	13,860.67	3,546.65	3,000.00
Total - Other Expenses	407,401.00	422,651.00	286,320.38	111,795.77	13,534.85	11,000.00
Division of Surveillance and Prevention:						
Salaries and Wages:						
Personnel Services	735,976.00	735,976.00	733,363.08		2,612.92	
Other Pay	17,554.00	17,554.00	12,647.29		4,014.71	892.00
Total - Salaries and Wages	753,530.00	753,530.00	746,010.37		6,627.63	892.00
Other Expenses:						
Service by Contract or Agreement	123,705.00	123,705.00	78,610.11	21,278.11	11,908.39	11,908.39
Materials and Supplies	39,270.00	39,270.00	33,663.15	4,036.29	963.88	606.68
Total - Other Expenses	162,975.00	162,975.00	112,273.26	25,314.40	12,872.27	12,515.07
Total - Department of Child and Family Well-Being	8,449,327.00	8,317,577.00	7,533,292.49	598,957.93	70,539.72	114,786.86
<u>DEPARTMENT OF ECONOMIC AND HOUSING DEVELOPMENT</u>						
Director's Office:						
Salaries and Wages:						
Personnel Service	562,419.00	562,419.00	561,954.67		464.33	

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #16

<u>Appropriations</u>	<u>Appropriations</u>		<u>Expended</u>			
	<u>Budget</u>	<u>Modified Budget</u>	<u>Paid or Charged</u>	<u>Encumbered</u>	<u>Reserved</u>	<u>Cancelled</u>
<u>APPROPRIATIONS WITHIN "CAPS"</u>						
<u>DEPARTMENT OF ECONOMIC AND HOUSING DEVELOPMENT</u>						
Director's Office:						
Other Expenses:						
Service by Contract or Agreement	\$ 2,500.00	\$ 2,500.00	\$ 1,766.73	\$	\$ 733.27	\$
Materials and Supplies	3,000.00	3,000.00	982.32	234.63	1,783.05	
Total - Other Expenses	<u>5,500.00</u>	<u>5,500.00</u>	<u>2,749.05</u>	<u>234.63</u>	<u>2,516.32</u>	
Property Management:						
Salaries and Wages:						
Personnel Service	<u>307,831.00</u>	<u>293,831.00</u>	<u>293,473.18</u>		<u>357.82</u>	
Other Expenses:						
Service by Contract or Agreement	166,000.00	150,000.00	112,589.78	33,197.02	4,213.20	
Materials and Supplies	<u>66,000.00</u>	<u>82,000.00</u>	<u>74,410.46</u>	<u>1,646.15</u>	<u>3,140.53</u>	<u>2,802.86</u>
Total - Other Expenses	<u>232,000.00</u>	<u>232,000.00</u>	<u>187,000.24</u>	<u>34,843.17</u>	<u>7,353.73</u>	<u>2,802.86</u>
Housing Assistance:						
Salaries and Wages:						
Personnel Service	<u>201,955.00</u>	<u>201,955.00</u>	<u>201,918.73</u>		<u>36.27</u>	
Office of Boards and Commissioners:						
Salaries and Wages:						
Personnel Services	383,357.00	372,357.00	371,751.41			605.59
Other Pay	<u>26,697.00</u>	<u>26,697.00</u>	<u>25,823.51</u>			<u>873.49</u>
Total - Salaries and Wages	<u>410,054.00</u>	<u>399,054.00</u>	<u>397,574.92</u>			<u>1,479.08</u>

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #17

	Appropriations		Expended			
Appropriations	Budget	Modified Budget	Paid or Charged	Encumbered	Reserved	Cancelled
<u>APPROPRIATIONS WITHIN "CAPS"</u>						
<u>DEPARTMENT OF ECONOMIC AND HOUSING DEVELOPMENT</u>						
Office of Boards and Commissioners:						
Other Expenses:						
Service by Contract or Agreement	\$ 160,500.00	\$ 160,500.00	\$ 124,161.67	\$ 29,487.03	\$ 3,425.65	\$ 3,425.65
Materials and Supplies	5,000.00	5,000.00	2,315.10	392.38	1,146.26	1,146.26
Total - Other Expenses	<u>165,500.00</u>	<u>165,500.00</u>	<u>126,476.77</u>	<u>29,879.41</u>	<u>4,571.91</u>	<u>4,571.91</u>
City Planning:						
Salaries and Wages:						
Personnel Services	348,310.00	325,310.00	324,995.01			314.99
Other Pay	1,000.00	1,000.00	1,000.00			
Total - Salaries and Wages	<u>349,310.00</u>	<u>326,310.00</u>	<u>325,995.01</u>			<u>314.99</u>
Other Expenses:						
Service by Contract or Agreement	137,000.00	137,000.00	18,915.32	110,624.15	3,545.05	3,915.48
Materials and Supplies	5,500.00	5,500.00	2,100.36		298.36	3,101.28
Equipment	10,000.00	10,000.00				10,000.00
Total - Other Expenses	<u>152,500.00</u>	<u>152,500.00</u>	<u>21,015.68</u>	<u>110,624.15</u>	<u>3,843.41</u>	<u>17,016.76</u>
Central Planning Board:						
Salaries and Wages:						
Personnel Services	46,843.00	33,843.00	33,543.76			299.24
Other Pay	34,839.00	34,839.00	9,817.36			25,021.64
Total - Salaries and Wages	<u>81,682.00</u>	<u>68,682.00</u>	<u>43,361.12</u>			<u>25,320.88</u>
Board of Adjustments:						
Salaries and Wages:						
Personnel Services	43,343.00	19,343.00	19,191.54			151.46
Other Pay	16,500.00	16,500.00	7,250.00			9,250.00
Total - Salaries and Wages	<u>59,843.00</u>	<u>35,843.00</u>	<u>26,441.54</u>			<u>9,401.46</u>

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

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Sheet #18

Appropriations	Appropriations		Expended			
	Budget	Modified Budget	Paid or Charged	Encumbered	Reserved	Cancelled
<u>APPROPRIATIONS WITHIN "CAPS"</u>						
<u>DEPARTMENT OF ECONOMIC AND HOUSING DEVELOPMENT</u>						
Rent Control Board:						
Salaries and Wages:						
Personnel Services	\$ 29,343.00	\$ 9,343.00	\$ 8,750.00	\$	\$	\$ 593.00
Total - Department of Economic and Housing Development	2,557,937.00	2,452,937.00	2,196,710.91	175,581.36	19,143.79	61,500.94
<u>DEPARTMENT OF NEIGHBORHOOD AND RECREATIONAL SERVICES</u>						
Director's Office:						
Salaries and Wages:						
Personnel Services	308,633.00	224,633.00	224,581.22			51.78
Other Pay	2,000.00					
Total - Salaries and Wages	310,633.00	224,633.00	224,581.22			51.78
Other Expenses:						
Service by Contract or Agreement	3,050.00	335.00	335.00			
Materials and Supplies	3,200.00	3,200.00	2,087.20	907.94	102.43	102.43
Miscellaneous	5,000.00	115.00				115.00
Total - Other Expenses	11,250.00	3,650.00	2,422.20	907.94	102.43	217.43
Inspections and Enforcement:						
Salaries and Wages:						
Personnel Services	1,213,297.00	1,061,297.00	1,060,845.10			451.90
Other Pay	105,800.00	105,800.00	71,558.41		9,914.09	24,327.50
Total - Salaries and Wages	1,319,097.00	1,167,097.00	1,132,403.51		9,914.09	24,779.40
Other Expenses:						
Service by Contract or Agreement	3,000.00	3,000.00			1,400.00	1,600.00
Materials and Supplies	11,000.00	11,000.00	1,554.94	3,299.18	3,073.59	3,072.29
Total - Other Expenses	14,000.00	14,000.00	1,554.94	3,299.18	4,473.59	4,672.29

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #19

	Appropriations		Expended			
<u>Appropriations</u>	<u>Budget</u>	<u>Modified Budget</u>	<u>Paid or Charged</u>	<u>Encumbered</u>	<u>Reserved</u>	<u>Cancelled</u>
<u>APPROPRIATIONS WITHIN "CAPS"</u>						
<u>DEPARTMENT OF NEIGHBORHOOD AND RECREATIONAL SERVICES</u>						
Sanitation:						
Salaries and Wages:						
Personnel Services	\$ 6,469,908.00	\$ 6,069,908.00	\$ 6,069,908.00	\$	\$	\$
Other Pay	670,600.00	1,035,600.00	884,483.32		9,714.18	141,402.50
Total - Salaries and Wages	7,140,508.00	7,105,508.00	6,954,391.32		9,714.18	141,402.50
Other Expenses:						
Service by Contract or Agreement	11,598,900.00	16,354,496.00	11,704,655.85	1,667,858.32	1,507,164.28	1,474,817.55
Materials and Supplies	400,018.00	400,018.00	92,085.94	253,235.26	27,722.80	26,974.00
Total - Other Expenses	11,998,918.00	16,754,514.00	11,796,741.79	1,921,093.58	1,534,887.08	1,501,791.55
Parks and Grounds:						
Salaries and Wages:						
Personnel Services	872,889.00	737,889.00	719,687.41		8,201.59	10,000.00
Other Pay	49,700.00	141,000.00	54,924.56		6,074.64	80,000.80
Total - Salaries and Wages	922,589.00	878,889.00	774,611.97		14,276.23	90,000.80
Other Expenses:						
Service by Contract or Agreement	207,500.00	207,500.00	99,137.43	92,136.41	8,113.08	8,113.08
Materials and Supplies	26,750.00	26,750.00	12,854.26	11,312.92	1,291.41	1,291.41
Total - Other Expenses	234,250.00	234,250.00	111,991.69	103,449.33	9,404.49	9,404.49
Recreation and Cultural Affairs:						
Salaries and Wages:						
Personnel Services	1,217,880.00	1,138,880.00	1,132,939.54			5,940.46
Other Pay	580,332.00	580,332.00	536,714.09			43,617.91
Total - Salaries and Wages	1,798,212.00	1,719,212.00	1,669,653.63			49,558.37
Other Expenses:						
Service by Contract or Agreement	443,750.00	443,750.00	298,685.02		72,311.25	72,753.73
Materials and Supplies	135,350.00	135,350.00	92,385.46	32,352.27	5,232.69	5,379.58
Equipment	2,500.00	2,500.00				2,500.00
Total - Other Expenses	581,600.00	581,600.00	391,070.48	32,352.27	77,543.94	80,633.31

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #20

Appropriations	Appropriations		Expended			
	Budget	Modified Budget	Paid or Charged	Encumbered	Reserved	Cancelled
<u>APPROPRIATIONS WITHIN "CAPS"</u>						
<u>DEPARTMENT OF NEIGHBORHOOD AND RECREATIONAL SERVICES</u>						
Demolition:						
Salaries and Wages:						
Personnel Services	\$ 1,217,343.00	\$ 1,152,343.00	\$ 1,142,048.46	\$	\$	\$ 10,294.54
Other Pay	55,100.00	117,400.00	70,164.93		74.40	47,160.67
Total - Salaries and Wages	1,272,443.00	1,269,743.00	1,212,213.39		74.40	57,455.21
Other Expenses:						
Service by Contract or Agreement	1,190,000.00	1,527,827.00	1,099,424.83	125,411.13	151,495.52	151,495.52
Material and Supplies	6,500.00	6,500.00	2,921.74	3,550.56	13.85	13.85
Total - Other Expenses	1,196,500.00	1,534,327.00	1,102,346.57	128,961.69	151,509.37	151,509.37
Total - Department of Neighborhood and Recreational Services	26,800,000.00	31,487,423.00	25,373,982.71	2,190,063.99	1,811,899.80	2,111,476.50
<u>UNCLASSIFIED PURPOSES</u>						
Salaries and Wages:						
Salary and Wage Personnel Adjustment Program	400,000.00	1,200,272.00	424,674.74		475,597.26	300,000.00
Other Expenses:						
Health Maintenance Organization	35,033,498.00	35,033,498.00	28,247,920.64	6,762,756.64	22,820.72	
City Basic (Hospital/Medical/Surgical)	14,243,496.00	14,243,496.00	11,364,905.43	2,857,999.96		20,590.61
Other Public Employees' Benefits - Contract	100,000.00					
Prescription Insurance	20,608,215.00	20,608,215.00	18,071,600.06	2,536,614.94		
Dental Insurance	2,528,258.00	2,528,258.00	230,902.65	2,297,355.35		
Life Insurance	126,372.00	126,372.00	52,166.40	74,205.60		
General Liability Insurance	6,200,000.00	6,200,000.00	6,200,000.00			
Worker's Compensation Insurance	7,000,000.00	7,000,000.00	7,000,000.00			
Grant Program - Disallowed Cost	200,000.00	200,000.00				200,000.00
Flexible Spending Account	15,050.00	15,050.00			15,050.00	
Medical Services	365,000.00	265,000.00	131,121.58	113,878.42		20,000.00
E.P.O.	523,570.00	523,570.00				523,570.00
Home Ownership Program	75,000.00	75,000.00	30,000.00		5,000.00	40,000.00

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

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Sheet #21

Appropriations	Appropriations		Expended			
	Budget	Modified Budget	Paid or Charged	Encumbered	Reserved	Cancelled
<u>APPROPRIATIONS WITHIN "CAPS"</u>						
<u>UNCLASSIFIED PURPOSES</u>						
Other Expenses:						
E.A.P.	\$ 54,443.00	\$ 54,443.00	\$ 33,951.92	\$ 20,491.08	\$	\$
COBRA	30,000.00	30,000.00				30,000.00
Cash Benefit Waiver	20,000.00	20,000.00				20,000.00
Enterprise Business Solutions - Implementation	1,400,000.00	1,400,000.00	1,257,665.00	142,294.98	20.01	20.01
Settlements - Devils	2,700,000.00	2,700,000.00				2,700,000.00
Essex Vicinage Case Project	45,000.00	45,000.00	32,105.78	12,000.00	894.22	
Bank Fees	465,000.00	465,000.00		465,000.00		
Emergency Medical Services	4,350,000.00	4,350,000.00	3,987,500.00	362,500.00		
Credit Card Fees	960,000.00	960,000.00		960,000.00		
H & L Maintenance	150,000.00	150,000.00	137,500.00	12,500.00		
Rackspace	20,000.00	20,000.00	13,278.20	1,983.46	2,738.34	2,000.00
Accrued Compensatory Time	1,250,000.00	1,403,600.00	1,359,445.59			44,154.41
Settlement - Newark Housing Authority	4,050,000.00	4,050,000.00	4,050,000.00			
Total Unclassified Purposes - Other Expenses	102,512,902.00	102,466,502.00	82,200,063.25	16,619,580.43	46,523.29	3,600,335.03
Total - Unclassified Purposes	102,912,902.00	103,666,774.00	82,624,737.99	16,619,580.43	522,120.55	3,900,335.03
Total Operations	428,489,863.00	428,898,691.00	385,661,253.78	30,656,764.38	4,088,303.05	8,492,369.79
Detail:						
Salaries and Wages	251,813,719.00	246,374,548.00	243,084,736.45		1,614,557.34	1,675,254.21
Other Expenses	176,676,144.00	182,524,143.00	142,576,517.33	30,656,764.38	2,473,745.71	6,817,115.58
Total - Detail	428,489,863.00	428,898,691.00	385,661,253.78	30,656,764.38	4,088,303.05	8,492,369.79
<u>DEFERRED CHARGES AND STATUTORY EXPENDITURES</u>						
Deferred Charges:						
Prior Year's Bills	435,000.00	447,728.00	355,212.14		42,431.50	50,084.36
	435,000.00	447,728.00	355,212.14		42,431.50	50,084.36

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #22

	Appropriations		Expended			
	Budget	Modified Budget	Paid or Charged	Encumbered	Reserved	Cancelled
<u>APPROPRIATIONS WITHIN "CAPS"</u>						
<u>DEFERRED CHARGES AND STATUTORY EXPENDITURES</u>						
Statutory Expenditures:						
Contribution to:						
Public Employees' Retirement System - City	\$ 400,000.00	\$ 400,000.00	\$ 400,000.00	\$	\$	\$
Social Security System (OASI)	8,636,000.00	7,611,000.00	7,292,145.25			318,854.75
Consolidated Police and Firemen's Pension Fund	486,881.00	486,881.00	287,441.76			199,439.24
Police and Firemen's Retirement System of N.J.	45,117,384.00	45,117,384.00	45,117,383.12			0.88
Public Employees' Retirement System - State	9,796,770.00	9,796,770.00	9,174,594.57			622,175.43
Pension - Various Divisions	344,273.00	344,273.00	227,197.45			117,075.55
Unemployment Compensation Insurance - (N.J.S.A. 43:21-3 et seq.)	2,000,000.00	2,000,000.00	2,000,000.00			
Total - Statutory Expenditures	66,781,308.00	65,756,308.00	64,498,762.15			1,257,545.85
Total - Deferred Charges and Statutory Expenditures	67,216,308.00	66,204,036.00	64,853,974.29		42,431.50	1,307,630.21
<u>JUDGMENTS</u>	450,000.00	450,000.00	450,000.00			
Total General Appropriations Within "CAPS"	496,156,171.00	495,552,727.00	450,965,228.07	30,656,764.38	4,130,734.55	9,800,000.00
<u>APPROPRIATIONS EXCLUDED FROM "CAPS"</u>						
Maintenance of Free Public Library	10,080,901.00	10,080,901.00	9,383,013.85	697,887.15		
Refund of Tax Appeals	2,000,000.00	2,000,000.00	2,000,000.00			
Business Personal Property Replacement Aid:						
School Portion	1,112,407.00	1,112,407.00	1,112,407.00			
City Basic (Hospital/Medical/Surgical)	3,384,371.00	3,384,371.00	3,384,371.00			
Sub-Total	16,577,679.00	16,577,679.00	15,879,791.85	697,887.15		

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #23

	Appropriations		Expended			
Appropriations	Budget	Modified Budget	Paid or Charged	Encumbered	Reserved	Cancelled
<u>APPROPRIATIONS EXCLUDED FROM "CAPS"</u>						
PUBLIC AND PRIVATE PROGRAMS OFFSET						
<u>BY REVENUES</u>						
New Jersey Department of Health and Human Services:						
Immunization Program	\$ 300,000.00	\$ 300,000.00	\$ 300,000.00	\$	\$	\$
Women, Infants and Children	1,584,000.00	1,584,000.00	1,584,000.00			
Sexually Transmitted Diseases Program	138,693.00	138,693.00	138,693.00			
Childhood Lead Poisoning Prevention	481,493.00	481,493.00	481,493.00			
Bio-Terrorism Preparedness Grant (N.J.S. 40A:4-87)		297,494.00	297,494.00			
Childhood Lead Poisoning Prevention (N.J.S. 40A:4-87)		465,780.00	465,780.00			
Immunization Program (N.J.S. 40A:4-87)		325,000.00	325,000.00			
State of New Jersey Office of Homeland Security and Preparedness:						
Urban Areas Security Initiative Grant	1,608,858.66	1,608,858.66	1,608,858.66			
Urban Areas Security Initiative Grant	200,000.00	200,000.00	200,000.00			
New Jersey State Department of Transportation:						
Various Streets (10 Locations ATP-12)	1,501,000.00	1,501,000.00	1,501,000.00			
Various Streets (7 Locations MA-ATP-2013)	1,501,000.00	1,501,000.00	1,501,000.00			
Various Streets (10 Locations MA-13) (N.J.S. 40A:4-87)		1,326,370.00	1,326,370.00			
New Jersey Department of Agriculture:						
Summer Food Service Program - Sun Up	995,048.84	995,048.84	995,048.84			
United States Department of Homeland Security:						
Staffing for Adequate Fire and Emergency Response (SAFER) (N.J.S. 40A:4-87)		3,171,693.00	3,171,693.00			
Personal Protection Equipment Grant (N.J.S. 40A:4-87)		266,800.00	266,800.00			
HESS Corporation:						
Various Neighborhood Projects (N.J.S. 40A:4-87)		1,800,000.00	1,800,000.00			
Matching Funds:						
HOT Shots/Prisoner Re-Entry	150,333.00	150,333.00	150,333.00			
COPS Grant	741,606.00	741,606.00	741,606.00			

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #24

	Appropriations		Expended			
<u>Appropriations</u>	<u>Budget</u>	<u>Modified Budget</u>	<u>Paid or Charged</u>	<u>Encumbered</u>	<u>Reserved</u>	<u>Cancelled</u>
<u>APPROPRIATIONS EXCLUDED FROM "CAPS"</u>						
PUBLIC AND PRIVATE PROGRAMS OFFSET						
<u>BY REVENUES</u>						
State of New Jersey, Department of Law and Public Safety:						
Body Armor Grant	\$ 96,822.31	\$ 96,822.31	\$ 96,822.31	\$	\$	\$
Body Armor Grant	94,228.25	94,228.25	94,228.25			
COPS in Shops Grant	16,640.00	16,640.00	16,640.00			
Pedestrian Safety Program Grant	15,000.00	15,000.00	15,000.00			
Targeting Violent Crime	75,440.00	75,440.00	75,440.00			
North Jersey Transportation Planning Authority Inc.:						
Subregional Transportation Planning Grant	68,942.00	68,942.00	68,942.00			
Local Safety Program (Broad Street and South Street)	500,000.00	500,000.00	500,000.00			
Delancy Street Corridor improvements - Right-of-Way Phase Funding	1,900,000.00	1,900,000.00	1,900,000.00			
The Kresge Foundation:						
Advancing Safe and Healthy Homes Initiative (N.J.S. 40A:4-87)		500,000.00	500,000.00			
New Jersey Department of Labor and Workforce Development:						
Business Development Interdepartmental Funds	11,764.00	11,764.00	11,764.00			
Employment and Training Administration:						
WIA - Dislocated Worker Programs, WIA Adults, Needy Families	6,225,880.00	6,225,880.00	6,225,880.00			
WIA - Dislocated Worker Programs, WIA Adults, Needy Families	5,052,831.00	5,052,831.00	5,052,831.00			
Needy Families, General Assistance, Nutrition and SNAP	1,216,404.00	1,216,404.00	1,216,404.00			
Hurricane Sandy Disaster National Emergency Grant	368,473.00	368,473.00	368,473.00			
Learning Grant 2012	75,000.00	75,000.00	75,000.00			
Workforce Learning Link Grant 2013 (N.J.S. 40A:4-87)		127,000.00	127,000.00			

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #25

	Appropriations		Expended			
Appropriations	Budget	Modified Budget	Paid or Charged	Encumbered	Reserved	Cancelled
APPROPRIATIONS EXCLUDED FROM "CAPS"						
PUBLIC AND PRIVATE PROGRAMS OFFSET						
BY REVENUES						
United States Environmental Protection Agency:						
Municipal Tonnage Grant	\$ 1,547,510.26	\$ 1,547,510.26	\$ 1,547,510.26	\$	\$	\$
Clean Communities - 2010	327,344.66	327,344.66	327,344.66			
Clean Communities - 2011	327,986.78	327,986.78	327,986.78			
Hazardous Discharge Site Remediation	1,150,000.00	1,150,000.00	1,150,000.00			
United States Department of Justice:						
Edward Byrne Memorial Justice Assistance Grant (JAG)	485,804.00	485,804.00	485,804.00			
Domestic Violence	207,730.00	207,730.00	207,730.00			
County of Essex - Department of Citizen Services:						
Division on Aging:						
Truancy Alternative Program	66,480.00	66,480.00	66,480.00			
County of Essex, Division of Community Health Services:						
Office of Alcoholism, Drug Abuse and Addiction Services:						
Municipal Alliance Grant - Match	24,250.00	24,250.00	24,250.00			
United States Department of Housing and Urban Development:						
Emergency Solutions Grant	678,542.00	678,542.00	678,542.00			
Home Investment Partnership	1,944,355.00	1,944,355.00	1,944,355.00			
Housing Opportunities for Persons with AIDS (HOPWA)	7,218,919.00	7,218,919.00	7,218,919.00			
Neighborhood Stabilization Program III	2,018,637.00	2,018,637.00	2,018,637.00			
Housing Opportunities for Persons with AIDS (HOPWA) (N.J.S. 40A:4-87)		6,419,016.00	6,419,016.00			
Emergency Solutions Grant (ESG) (N.J.S. 40A:4-87)		483,211.00	483,211.00			
United States Department of Health and Human Services:						
HIV Emergency Relief Program	7,396,358.00	7,396,358.00	7,396,358.00			
HIV Emergency Relief Program	5,329,803.00	5,329,803.00	5,329,803.00			
Homeless HRSA Program	2,256,073.00	2,256,073.00	2,256,073.00			
Homeless HRSA Program - Additional Funding	103,583.00	103,583.00	103,583.00			
Total Grants	56,002,832.76	71,185,196.76	71,185,196.76			

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #26

	Appropriations		Expended			
Appropriations	Budget	Modified Budget	Paid or Charged	Encumbered	Reserved	Cancelled
<u>APPROPRIATIONS EXCLUDED FROM "CAPS"</u>						
Total Operations	\$ 72,580,511.76	\$ 87,762,875.76	\$ 87,064,988.61	\$ 697,887.15	\$	\$
Detail:						
Other Expenses	72,580,511.76	87,762,875.76	87,064,988.61	697,887.15		
DEFERRED CHARGES:						
Special Emergency Authorization	3,500,000.00	3,500,000.00	3,500,000.00			
<u>CAPITAL IMPROVEMENTS</u>						
Capital Improvement Funds	100,000.00	100,000.00	100,000.00			
<u>MUNICIPAL DEBT SERVICE</u>						
Qualified Bonds:						
Principal	13,045,000.00	13,045,000.00	13,045,000.00			
Interest	9,818,009.00	9,818,009.00	9,818,008.29			0.71
Interest on Notes - Tax Anticipation	802,667.00	856,001.00	856,001.00			
Payment of Notes	1,347,200.00	1,810,000.00	1,810,000.00			
Interest on Bond Anticipation Notes	1,282,905.00	1,152,905.00	1,151,904.19			1,000.81
Demolition Bond Loan	109,904.00	109,904.00	109,903.24			0.76
Special Emergency Notes - Interest	234,480.00	250,480.00	250,479.72			0.28
Demolition Bond Loan II	126,250.00	126,250.00	126,250.00			
Newark Housing Authority - Bonds	1,235,000.00	1,235,000.00	1,235,000.00			
Newark Housing Authority - Interest	3,824,269.00	3,824,269.00	3,824,268.76			0.24
Capital Lease Obligations Approved Prior to July 1, 2007:						
Principal	1,610,000.00	1,610,000.00	1,610,000.00			
Interest	902,518.00	902,518.00	902,518.00			
Capital Lease Obligations Approved After to July 1, 2007:						
Principal	1,675,000.00	1,675,000.00	1,675,000.00			
Interest	3,942,507.00	4,013,817.00	4,013,817.00			
Total Municipal Debt Service	39,955,709.00	40,429,153.00	40,428,150.20			1,002.80

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #27

	Appropriations		Expended			
Appropriations	Budget	Modified Budget	Paid or Charged	Encumbered	Reserved	Cancelled
<u>APPROPRIATIONS EXCLUDED FROM "CAPS"</u>						
Total Appropriations	\$ 116,136,220.76	\$ 131,792,028.76	\$ 131,093,138.81	\$ 697,887.15	\$	\$ 1,002.80
<u>FOR LOCAL SCHOOL PURPOSES</u>						
Type I District School Debt Service:						
Principal on New Issue - Qualified - State for Type II School	7,995,000.00	7,995,000.00	7,995,000.00			
Interest on New Issue - Qualified - State for Type II School	3,506,618.00	3,506,618.00	3,506,617.50			0.50
Interest on Notes		130,000.00	130,000.00			
Total - Type I District School Debt Service	11,501,618.00	11,631,618.00	11,631,617.50			0.50
Total Appropriations Excluded from "CAPS"	127,637,838.76	143,423,646.76	142,724,756.31	697,887.15		1,003.30
Sub-Total	623,794,009.76	638,976,373.76	593,689,984.38	31,354,651.53	4,130,734.55	9,801,003.30
Reserve for Uncollected Taxes	15,656,000.00	15,656,000.00	15,656,000.00			
Total Appropriations	\$ 639,450,009.76	\$ 654,632,373.76	\$ 609,345,984.38	\$ 31,354,651.53	\$ 4,130,734.55	\$ 9,801,003.30
Reference		Sheet #28	Sheet #28	A	A	Reserve

CITY OF NEWARK
CURRENT FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

A-3
Sheet #28

	<u>Ref.</u>	<u>Modified Budget</u>	<u>Paid or Charged</u>
Adopted Budget	A-2	\$639,450,009.76	\$
Added by N.J.S. 40A:4-87	A-2	15,182,364.00	
Reserve for Uncollected Taxes	A-2		15,656,000.00
Cash Disbursements	A-4		519,004,787.62
Cash Disbursements - Cash Match	A-4		916,189.00
Deferred Charges	A-19		3,500,000.00
State and Federal Appropriations	A-48		<u>70,269,007.76</u>
	A-3, Sheet #27	<u>\$654,632,373.76</u>	<u>\$609,345,984.38</u>

See accompanying notes to financial statements.

CITY OF NEWARK
TRUST FUND

COMPARATIVE BALANCE SHEET - REGULATORY BASIS

B
Sheet #1

<u>ASSETS</u>	<u>Ref.</u>	<u>Balance</u> <u>Dec. 31, 2013</u>	<u>Balance</u> <u>Dec. 31, 2012</u>
<u>Assessment Fund</u>			
Cash	B-2	\$ 7,254.03	\$ 7,254.03
Interfunds Receivable	B-4	288,154.55	238,768.35
Assessments Receivable	B-5	95,853.75	145,239.95
Assessment Liens	B-6	710,569.47	710,569.47
Assessment Lien Interest and Costs	B-6	59,946.17	59,946.17
		<u>1,161,777.97</u>	<u>1,161,777.97</u>
<u>Animal Control Trust Fund</u>			
Cash	B-2	25,557.80	21,228.04
<u>Other Funds</u>			
Cash - Checking	B-2	15,988,915.11	8,575,713.38
Cash - Money Market	B-3	22,231,851.23	22,231,851.23
Total Cash		<u>38,220,766.34</u>	<u>30,807,564.61</u>
Interfunds Receivable	B-4	265,060.80	19,244.12
Accounts Receivable	B-7	20,151.07	20,151.07
Protested Checks	B-8	427,139.24	427,139.24
Overpayments Receivable	B-9	19,539.47	19,539.47
Reserve for Salary Increase	B-10		140.00
		<u>38,952,656.92</u>	<u>31,293,778.51</u>
<u>Insurance Fund</u>			
Cash	B-2	13,268,349.61	7,748,784.90
Interfunds Receivable	B-4	678,495.15	368,455.52
Protested Checks	B-8	305.00	305.00
		<u>13,947,149.76</u>	<u>8,117,545.42</u>
<u>Grant Fund</u>			
Cash	B-2	4,342,048.85	3,667,937.58
Cash - Money Market Fund	B-3	8,130,896.71	8,089,844.59
Protested Checks	B-8	25,238.00	25,238.00
Accounts Receivable	B-11	120,000.00	120,000.00
Grant Expenditures with Commitment Letters	B-12	75,800.61	655,942.32
		<u>12,693,984.17</u>	<u>12,558,962.49</u>
<u>Payroll Agency Fund</u>			
Cash	B-2	7,888,913.25	2,037,128.71
Interfunds Receivable	B-4	219,255.21	10,326.00
Protested Checks	B-8	7,920.00	7,920.00
		<u>8,116,088.46</u>	<u>2,055,374.71</u>
		<u>\$ 74,897,215.08</u>	<u>\$ 55,208,667.14</u>

CITY OF NEWARK
TRUST FUND

COMPARATIVE BALANCE SHEET - REGULATORY BASIS

B
Sheet #2

<u>LIABILITIES, RESERVES AND FUND BALANCES</u>	<u>Ref.</u>	<u>Balance</u> <u>Dec. 31, 2013</u>	<u>Balance</u> <u>Dec. 31, 2012</u>
<u>Assessment Fund</u>			
Overpayments	B-14	\$ 5,348.50	\$ 5,348.50
Assessment Paid in Advance	B-15	1,029.00	1,029.00
Reserve for Assessments and Liens	B-16	806,423.22	855,809.42
Reserve for Assessment Lien Interest and Costs	B-16	59,946.17	59,946.17
Fund Balance	B-1	289,031.08	239,644.88
		<u>1,161,777.97</u>	<u>1,161,777.97</u>
<u>Animal Control Trust Fund</u>			
Interfunds Payable	B-4	4,671.48	4,671.48
Due to State of New Jersey	B-18	6,416.32	6,992.90
Reserve for Animal Control Expenditures	B-19	14,470.00	9,563.66
		<u>25,557.80</u>	<u>21,228.04</u>
<u>Other Funds</u>			
Reserve for Unidentified Receipts	B-2	1,735,327.73	
Interfunds Payable	B-4	29,342.57	39,668.57
Reserve for Gilbert Media Escrow	B-13	83,911.41	
Reserve For Salary Increases	B-10	5,070.59	0.00
Reserve for Void Checks Pending Distribution	B-20	4,980.59	5,070.59
Reserve for Other Funds	B-21	37,070,068.44	31,210,231.94
Vouchers Payable	B-22	23,954.53	38,806.35
Reserve for Inactive Grants	B-22	0.20	0.20
Fund Balance	B-1	0.86	0.86
		<u>38,952,656.92</u>	<u>31,293,778.51</u>
<u>Insurance Fund</u>			
Interfunds Payable	B-4		4,688.94
Reserve for:			
Workmen's Compensation Fund	B-23	1,614,153.65	646,366.62
State Unemployment Fund	B-23	2,792,298.05	1,011,675.79
Liability Fund	B-23	9,540,698.06	6,454,814.07
		<u>13,947,149.76</u>	<u>8,117,545.42</u>
<u>Grant Fund</u>			
Reserve for Municipal Tonnage Grant	B-24	3,142,203.62	2,962,993.26
Reserve for Balanced Housing Grant	B-25	4,851,798.80	4,828,116.98
Reserve for Demolition Liens	B-26	502,632.34	502,632.34
Reserve for Community Development Block Grant	B-27	1,104,289.16	1,189,529.96
Reserve for Urban Development	B-28	2,203,064.52	2,203,064.52
Reserve for Community Economic Development Trust	B-29	143,239.76	125,869.46
Reserve for Revolving Development Trust Fund	B-29	746,755.97	746,755.97
		<u>12,693,984.17</u>	<u>12,558,962.49</u>
<u>Payroll Agency Fund</u>			
Interfunds Payable	B-4	54,097.49	54,097.49
Reserve for Homestead Rebate	B-31	2,210.08	2,210.08
Payroll Deductions Payable	B-32	8,059,634.06	1,998,920.31
Vouchers Payable	B-17	146.83	146.83
		<u>8,116,088.46</u>	<u>2,055,374.71</u>
		<u>\$ 74,897,215.08</u>	<u>\$ 55,208,667.14</u>

CITY OF NEWARK
TRUST FUND

STATEMENT OF TRUST FUND BALANCE - REGULATORY BASIS

B-1

	<u>Ref.</u>	<u>Assessment Trust Fund</u>	<u>Other Trust Fund</u>
Balance December 31, 2012	B	\$239,644.88	\$ 0.86
Increased by:			
Collections - Unpledged Assessments	B-16	<u>49,386.20</u>	<u> </u>
Balance December 31, 2013	B	<u>\$289,031.08</u>	<u>\$ 0.86</u>

See accompanying notes to financial statements.

CITY OF NEWARK
GENERAL CAPITAL FUND

COMPARATIVE BALANCE SHEET - REGULATORY BASIS

C

<u>ASSETS AND DEFERRED CHARGES</u>	<u>Ref.</u>	<u>Balance Dec. 31, 2013</u>	<u>Balance Dec. 31, 2012</u>
Cash	C-2	\$ 19,122,914.89	\$ 37,302,504.82
Investment in Notes Receivable	C-3	800,000.00	1,600,000.00
Sub-Total	C-4	<u>19,922,914.89</u>	<u>38,902,504.82</u>
Interfunds Receivable	C-5	104,877.15	254,877.15
Due from Essex County Improvement Authority:			
Lease Purchase Agreements	C-6	24,173,539.25	24,173,539.25
Public Safety Communication Center	C-7	434,636.54	434,636.54
Deferred Charges - Cost of Bond/Note Issue	C-8	237,837.83	228,863.13
Due from State of New Jersey for Demolition Bond	C-9	2,500,000.00	2,500,000.00
Deferred Charge - Newark Housing Authority - Guarantee	C-10	63,340,000.00	64,575,000.00
Deferred Charges to Future Taxation - Funded	C-11	306,872,035.25	330,667,711.45
Deferred Charges to Future Taxation - Unfunded	C-12	<u>110,623,379.89</u>	<u>112,666,379.89</u>
		<u>\$ 528,209,220.80</u>	<u>\$ 574,403,512.23</u>
 <u>LIABILITIES, RESERVES AND FUND BALANCE</u>			
General Serial Bonds	C-13	\$ 234,855,035.25	\$ 250,425,035.25
School Serial Bonds	C-14	70,017,000.00	78,012,000.00
State Trust Loan Payable	C-15	2,000,000.00	2,230,676.20
Bond Anticipation Notes Payable - Municipal	C-16	58,764,000.00	59,498,000.00
Capital Improvement Fund	C-17	1,475,543.58	1,375,543.58
Reserve for Refunds	C-18	335,103.76	266,775.90
Due to Current Fund	C-18	24,000.00	
Newark Housing Authority Bond - Guaranteed by Newark	C-19	63,340,000.00	64,575,000.00
Reserve for Improvement Funded by Essex County Improvement Authority:			
Funded - On File	C-20	24,173,539.25	24,173,539.25
Improvement Authorizations:			
Encumbered	C-21	9,934,439.10	14,308,265.86
Funded	C-21	7,545,031.96	10,467,697.89
Funded - School	C-21	7,878,495.93	7,877,814.65
Unfunded	C-21	38,488,657.26	44,691,438.80
Unfunded - School	C-21	9,069,583.85	10,610,654.25
Fund Balance	C-1	<u>308,790.86</u>	<u>5,891,070.60</u>
		<u>\$ 528,209,220.80</u>	<u>\$ 574,403,512.23</u>
 Bonds and Notes Authorized but Not Issued:			
General	C-22	\$ 38,133,379.89	\$ 39,442,379.89
School	C-22	<u>13,726,000.00</u>	<u>13,726,000.00</u>
		<u>\$ 51,859,379.89</u>	<u>\$ 53,168,379.89</u>

See accompanying notes to financial statements.

CITY OF NEWARK
GENERAL CAPITAL FUND

STATEMENT OF FUND BALANCE - REGULATORY BASIS

C-1

	<u>Ref.</u>	
Balance December 31, 2012	C	\$ 5,891,070.60
Increased by:		
Premium on Sale of Notes	C-2	<u>1,720.26</u>
		5,892,790.86
Decreased by:		
Disbursed to Current Fund as a Revenue	C-2	<u>5,584,000.00</u>
Balance December 31, 2013	C	<u>\$ 308,790.86</u>

See accompanying notes to financial statements.

CITY OF NEWARK
WATER UTILITY FUND

COMPARATIVE BALANCE SHEET - REGULATORY BASIS

D
Sheet #1

<u>ASSETS AND DEFERRED CHARGES</u>	<u>Ref.</u>	<u>Balance</u> <u>Dec. 31, 2013</u>	<u>Balance</u> <u>Dec. 31, 2012</u>
<u>Operating Section</u>			
Cash	D-5	\$ 11,302,235.35	\$ 9,402,756.13
Consumers' Accounts Receivable	D-7	11,320,302.90	12,095,775.55
Sundry Accounts Receivable	D-8	317,285.13	328,683.11
Delinquent Water Rents Receivable	D-9	11,612.24	11,612.24
Water Liens Receivable	D-10	1,492,361.19	1,492,361.19
Protested Checks	D-11	83,288.84	151,197.50
Petty Cash	D-12	950.00	950.00
Inventory	D-13	607,957.81	607,957.81
Interfunds Receivable	D-14		869,397.84
New Jersey Easement Receivable	D-15	86,000.00	86,000.00
		<u>25,221,993.46</u>	<u>25,046,691.37</u>
<u>Capital Section</u>			
Cash	D-5	686,623.19	(475,836.06)
Interfunds Receivable	D-14	15,134.69	15,134.69
Due from State of New Jersey	D-16	968,018.74	968,018.74
Due from State of New Jersey - Waste Water Trust Fund	D-17	3,596,142.00	2,101,997.00
Due from State of New Jersey - Waste Water Trust Fund - ARRA Forgiveness	D-17		2,673,200.00
Deferred Charges - Capitalization of Interest	D-18	1,146,906.96	1,294,894.96
Cost of Bond Issue	D-19	57,362.80	57,362.80
Fixed Capital	D-20	146,252,307.30	142,852,424.29
Fixed Capital Authorized and Uncompleted	D-21	173,873,436.24	160,623,436.24
		<u>326,595,931.92</u>	<u>310,110,632.66</u>
		<u>\$351,817,925.38</u>	<u>\$335,157,324.03</u>

CITY OF NEWARK
WATER UTILITY FUND

COMPARATIVE BALANCE SHEET - REGULATORY BASIS

D
Sheet #2

<u>LIABILITIES, RESERVES AND FUND BALANCE</u>	<u>Ref.</u>	<u>Balance</u> <u>Dec. 31, 2013</u>	<u>Balance</u> <u>Dec. 31, 2012</u>
Appropriation Reserves:			
Unencumbered	D-4,22	\$ 874,412.89	\$ 3,389,216.19
Encumbered	D-4,22	4,282,291.88	3,918,364.38
Accounts Payable	D-23	2,901,809.78	2,409,511.99
Belleville Flood Control	D-24	994.03	994.03
Accrued Interest on Bonds	D-25	173,721.92	188,987.20
Water Rent Overpayments	D-26	61,438.63	215,080.18
Interfunds Payable	D-27	37,378.39	
Reserve for Water Easement	D-28	236,000.00	236,000.00
		<u>8,568,047.52</u>	<u>10,358,153.97</u>
Reserve for Receivables:			
Consumers' Accounts Receivable		11,320,302.90	12,095,775.55
Sundry Accounts		317,285.13	328,683.11
Delinquent Water Rents Receivable		11,612.24	11,612.24
Inventory		1,492,361.19	1,492,361.19
Petty Cash		950.00	950.00
Protested Checks		83,288.84	151,197.50
Water Liens		607,957.81	607,957.81
	Reserve	<u>13,833,758.11</u>	<u>14,688,537.40</u>
Fund Balance	D-1	<u>2,820,187.83</u>	
		<u>25,221,993.46</u>	<u>25,046,691.37</u>
Capital Fund			
State Water Supply Loan Payable	D-29	10,940,000.00	11,395,000.00
State Water Supply Bond Loan Payable	D-30	15,419,068.26	16,440,180.68
Improvement Authorizations:			
Encumbered	D-31	4,067,136.01	1,884,039.01
Funded	D-31	7,880,123.50	7,880,123.50
Unfunded	D-31	28,448,002.74	17,397,695.49
Capital Improvement Fund	D-32	1.87	1.87
Reserve for Refunds	D-33	85,965.67	85,965.67
Due to General Capital Fund	D-34	46,000.00	46,000.00
Reserve for Deferred Amortization	D-35	30,576,667.50	30,576,667.50
Reserve for Amortization	D-36	202,744,232.67	196,001,225.24
Reserve for Due from State of New Jersey	D-37	968,018.74	968,018.74
Reserve for Amortization - Revaluation of Watershed	D-38	5,780,431.33	5,780,431.33
Serial Bonds Payable	D-39	19,587,000.00	21,602,000.00
Fund Balance	D-2	53,283.63	53,283.63
		<u>326,595,931.92</u>	<u>310,110,632.66</u>
		<u>\$351,817,925.38</u>	<u>\$335,157,324.03</u>
Bonds and Notes Authorized but Not Issued	D-40	<u>\$ 36,179,250.74</u>	<u>\$ 22,929,250.74</u>

See accompanying notes to financial statements.

CITY OF NEWARK
WATER UTILITY FUND

STATEMENT OF OPERATIONS
AND CHANGES IN FUND BALANCE
OPERATING SECTION - REGULATORY BASIS

D-1

	<u>Ref.</u>	<u>Year 2013</u>	<u>Year 2012</u>
<u>Revenue and Other Income</u>			
Operating Surplus Anticipated	D-3	\$	\$ 3,704,945.84
Water Rents	D-3	45,890,706.01	48,022,818.12
N.J. Office of Homeland Security and Preparedness	D-3		164,000.00
Other Credits to Income:			
Nonbudget Revenue	D-3	740,939.29	4,178.41
Deficit (General Budget)	D-14		788,493.69
Unexpended Balance of Appropriation			
Reserves	D-22	3,328,074.27	150,881.83
Reserve for Protested Checks	D-11	67,908.66	
Accounts Payable Cancelled			1,401,000.00
		<u>50,027,628.23</u>	<u>54,236,317.89</u>
<u>Expenditures</u>			
Operating		37,289,694.43	42,790,969.00
Debt Service		4,934,448.92	5,036,054.47
Deferred Charges and Statutory Expenditures		1,093,331.00	1,070,000.00
Capital Improvements		<u>3,814,512.37</u>	<u>5,323,684.00</u>
	D-4	47,131,986.72	54,220,707.47
Prior Year Refunds	D-5	75,453.68	7,091.37
Reserve for Protested Checks			8,519.05
		<u>47,207,440.40</u>	<u>54,236,317.89</u>
Statutory Excess to Operating Fund Balance		2,820,187.83	
<u>Fund Balance</u>			
Balance January 1	D	<u>2,820,187.83</u>	<u>3,704,945.84</u>
			3,704,945.84
Decreased by:			
Utilized as Anticipated Revenue	D-3		<u>3,704,945.84</u>
Balance December 31	D	<u>\$ 2,820,187.83</u>	<u>\$ -</u>

See accompanying notes to financial statements.

CITY OF NEWARK
WATER UTILITY FUND

STATEMENT OF CAPITAL FUND BALANCE
CAPITAL SECTION - REGULATORY BASIS

D-2

	<u>Ref.</u>	
Balance December 31, 2012	D	<u>\$53,283.63</u>
Balance December 31, 2013	D	<u>\$53,283.63</u>

See accompanying notes to financial statements.

CITY OF NEWARK
WATER UTILITY FUND

STATEMENT OF REVENUE - REGULATORY BASIS

D-3

	<u>Ref.</u>	<u>Anticipated Budget</u>	<u>Realized</u>	<u>Excess (Deficit)</u>
Rents	D-1,Below	\$46,279,562.00	\$43,139,316.01	\$(3,140,245.99)
Additional Water Rents		<u>2,751,390.00</u>	<u>2,751,390.00</u>	<u>-</u>
		49,030,952.00	45,890,706.01	(3,140,245.99)
Nonbudget Revenue	D-1,Below	<u> </u>	<u>740,939.29</u>	<u>740,939.29</u>
	D-4	<u>\$49,030,952.00</u>	<u>\$46,631,645.30</u>	<u>\$(2,399,306.70)</u>
 <u>Nonbudget Revenue</u>				
Other Water Rents			\$ 739,084.40	
Interest on Investments			17.89	
Miscellaneous			<u>1,837.00</u>	
	D-5,Above		<u>\$ 740,939.29</u>	

See accompanying notes to financial statements.

CITY OF NEWARK
WATER UTILITY FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

D-4
Sheet #1

<u>Appropriations</u>	<u>Appropriations</u>		<u>Expended</u>			<u>Unexpended Balance Cancelled</u>
	<u>Adopted Budget</u>	<u>Modified Budget</u>	<u>Paid or Charged</u>	<u>Encumbered</u>	<u>Reserved</u>	
Director's Office:						
Salaries and Wages:						
Personnel Services	\$ 320,844.00	\$ 320,844.00	\$ 252,922.11	\$	\$ 67,921.89	\$
Other Pay	1,000.00	1,000.00				1,000.00
Total Salaries and Wages	<u>321,844.00</u>	<u>321,844.00</u>	<u>252,922.11</u>		<u>67,921.89</u>	<u>1,000.00</u>
Other Expenses:						
Service by Contract or Agreement	103,133.00	103,133.00	44,199.99	32,466.67	25,416.34	1,050.00
Materials and Supplies	2,000.00	2,000.00	504.52			1,495.48
Total Other Expenses	<u>105,133.00</u>	<u>105,133.00</u>	<u>44,704.51</u>	<u>32,466.67</u>	<u>25,416.34</u>	<u>2,545.48</u>
Operating:						
Water Billing and Customer Service:						
Salaries and Wages:						
Personnel Services	1,031,745.00	1,031,745.00	922,396.17			109,348.83
Other Pay	25,600.00	25,600.00	9,292.44			16,307.56
Total Salaries and Wages	<u>1,057,345.00</u>	<u>1,057,345.00</u>	<u>931,688.61</u>			<u>125,656.39</u>
Other Expenses:						
Service by Contract or Agreement	739,220.00	739,220.00	308,482.07	3,908.81	0.79	426,828.33
Materials and Supplies	46,980.00	46,980.00	26,499.38	431.72	160.80	19,888.10
Total Other Expenses	<u>786,200.00</u>	<u>786,200.00</u>	<u>334,981.45</u>	<u>4,340.53</u>	<u>161.59</u>	<u>446,716.43</u>
Division of Water Supply:						
Salaries and Wages:						
Personnel Services	4,834,694.00	4,834,694.00	4,537,938.71		296,755.29	
Other Pay	286,625.00	286,625.00	228,717.21		57,907.79	
Total Salaries and Wages	<u>5,121,319.00</u>	<u>5,121,319.00</u>	<u>4,766,655.92</u>		<u>354,663.08</u>	

CITY OF NEWARK
WATER UTILITY FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

D-4
Sheet #2

<u>Appropriations</u>	<u>Appropriations</u>		<u>Expended</u>			<u>Unexpended Balance Cancelled</u>
	<u>Adopted Budget</u>	<u>Modified Budget</u>	<u>Paid or Charged</u>	<u>Encumbered</u>	<u>Reserved</u>	
Operating:						
Division of Water Supply:						
Other Expenses:						
Service by Contract or Agreement	\$ 8,258,934.00	\$ 8,258,934.00	\$ 7,409,885.43	\$ 769,354.23	\$ 33,583.38	\$ 46,110.96
Materials and Supplies	1,155,814.00	1,155,814.00	666,706.75	440,137.98	12,054.32	36,914.95
Miscellaneous	3,691,309.00	3,691,309.00	2,404,233.21	174,009.93	0.50	1,113,065.36
Equipment	25,000.00	25,000.00	4,202.00	12,498.00		8,300.00
Total Other Expenses	<u>13,131,057.00</u>	<u>13,131,057.00</u>	<u>10,485,027.39</u>	<u>1,396,000.14</u>	<u>45,638.20</u>	<u>1,204,391.27</u>
Wanaque-Ramapo Maintenance and Operations:						
Contract for Newark Share	10,367,954.00	10,367,954.00	10,367,953.00			1.00
Workmen's Compensation Insurance	287,618.00	287,618.00	287,618.00			
Medical, Dental, Prescription and Life	2,624,389.00	2,624,389.00	1,681,648.15	940,935.85	1,805.00	
General Liability, Auto, Property	603,248.00	603,248.00	603,248.00			
Wanaque South	4,567,781.00	4,567,781.00	4,567,781.00			
	<u>18,450,990.00</u>	<u>18,450,990.00</u>	<u>17,508,248.15</u>	<u>940,935.85</u>	<u>1,805.00</u>	<u>1.00</u>
Unclassified:						
Salary and Wages and Personnel Adjustment Program	96,117.00	96,117.00	38,194.68		57,922.32	
Total Operating	<u>39,070,005.00</u>	<u>39,070,005.00</u>	<u>34,362,422.82</u>	<u>2,373,743.19</u>	<u>553,528.42</u>	<u>1,780,310.57</u>
Capital Outlay:						
Service by Contract or Agreement	2,991,019.00	2,991,019.00	1,268,589.28	1,721,933.69	496.03	
Equipment	926,316.00	926,316.00	634,102.37	186,615.00	2,776.00	102,822.63
	<u>3,917,335.00</u>	<u>3,917,335.00</u>	<u>1,902,691.65</u>	<u>1,908,548.69</u>	<u>3,272.03</u>	<u>102,822.63</u>

CITY OF NEWARK
WATER UTILITY FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

D-4
Sheet #3

Appropriations	Appropriations		Expended			Unexpended Balance Cancelled
	Adopted Budget	Modified Budget	Paid or Charged	Encumbered	Reserved	
Debt Service:						
Qualified Bonds - Water:						
Principal	\$ 2,015,000.00	\$ 2,015,000.00	\$ 2,015,000.00	\$	\$	\$
Interest	898,374.00	898,374.00	898,374.00			
NJEIT - Principal	1,476,113.00	1,476,113.00	1,476,112.42			0.58
NJEIT - Interest	544,963.00	544,963.00	544,962.50			0.50
Total Debt Service	4,934,450.00	4,934,450.00	4,934,448.92			1.08
Deferred Charges:						
Prior Year Bills	39,162.00	39,162.00	23,331.00			15,831.00
Statutory Expenditures:						
Contribution to:						
Public Employees' Retirement System	300,000.00	300,000.00	87,500.70		212,499.30	
Social Security System (OASI)	415,000.00	415,000.00	414,886.86		113.14	
Unemployment Compensation Insurance (N.J.S.A. 43:21-3 et seq.)	250,000.00	250,000.00	250,000.00			
Noncontributory Pensions	55,000.00	55,000.00			55,000.00	
Public Employees' Retirement System - State	50,000.00	50,000.00			50,000.00	
Total Deferred Charges and Statutory Expenditures	1,109,162.00	1,109,162.00	775,718.56		317,612.44	15,831.00
Total Water Utility Appropriations	\$49,030,952.00	\$49,030,952.00	\$41,975,281.95	\$4,282,291.88	\$874,412.89	\$1,898,965.28
Reference		D-3	Below	D	D	Reserve

Ref.

Cash Disbursed	D-5	\$41,908,677.63
Accrued Interest on Bonds	D-25	66,604.32
	Above	\$41,975,281.95

CITY OF NEWARK
SEWER UTILITY FUND

COMPARATIVE BALANCE SHEET - REGULATORY BASIS

E
Sheet #1

<u>ASSETS</u>	<u>Ref.</u>	<u>Balance</u> <u>Dec. 31, 2013</u>	<u>Balance</u> <u>Dec. 31, 2012</u>
<u>Operating Section</u>			
Cash	E-4	\$ 2,957,199.30	\$ 3,723,508.21
Consumers' Accounts Receivable	E-6	9,527,231.30	9,151,157.17
Sewer Connection - Arrears	E-7	4,940.00	4,940.00
Delinquent Sewer Rents Receivable	E-8	11,908.97	11,908.97
Sewer Liens Receivable	E-9	3,167,456.34	3,167,456.34
Due from Sewer Capital Fund	E-10	145,971.40	145,971.40
		<u>15,814,707.31</u>	<u>16,204,942.09</u>
<u>Sewer Capital Section</u>			
Cash	E-4	610,645.99	(5,138,497.81)
Due from State of New Jersey	E-11	19,851,073.00	32,391,012.00
Fixed Capital	E-12	2,009,661.82	732,329.50
Fixed Capital Authorized and Uncompleted	E-13	166,547,206.00	144,876,750.00
State Grant Receivable	E-14	1,397,959.91	1,397,959.91
		<u>190,416,546.72</u>	<u>174,259,553.60</u>
		<u>\$206,231,254.03</u>	<u>\$190,464,495.69</u>

CITY OF NEWARK
SEWER UTILITY FUND

COMPARATIVE BALANCE SHEET - REGULATORY BASIS

E
Sheet #2

<u>LIABILITIES, RESERVES AND FUND BALANCE</u>	<u>Ref.</u>	<u>Balance Dec. 31, 2013</u>	<u>Balance Dec. 31, 2012</u>
<u>Operating Section</u>			
Appropriation Reserves:			
Encumbered	E-3,15	\$ 1,304,038.09	\$ 2,019,236.52
Appropriation Reserves	E-3,15	976,225.77	846,137.07
Due to Trust - Other Funds	E-16	4,848.00	
Due to Payroll Fund	E-16	3,184.23	
Due to Water Operating Fund	E-16		80,899.10
Due to Tax Collector (Current Fund)	E-17	7.67	7.67
Commitments Payable	E-18	620,478.30	65,918.02
Sewer Rent Overpayments	E-19	154,946.69	551,393.54
Accrued Payroll	E-20	28,737.10	28,737.10
		<u>3,092,465.85</u>	<u>3,592,329.02</u>
Reserve for:			
Consumers' Accounts Receivable		9,527,231.30	9,151,157.17
Delinquent Sewer Rents Receivable		11,908.97	11,908.97
Sewer Liens Receivable		3,167,456.34	3,167,456.34
Sewer Connection Arrears		4,940.00	4,940.00
		<u>12,711,536.61</u>	<u>12,335,462.48</u>
Fund Balance	E-1	<u>10,704.85</u>	<u>277,150.59</u>
		<u>15,814,707.31</u>	<u>16,204,942.09</u>
<u>Sewer Capital Fund</u>			
Due to Sewer Operating Fund	E-16	145,971.40	145,971.40
Due to Water Capital Fund	E-16	2,634.69	2,634.69
Reserve for State Grant:			
Sewer Improvement	E-21	1,137,500.72	1,291,806.94
Vouchers Payable	E-22	0.77	0.77
Deferred Reserve for Amortization	E-23	50,501,826.89	44,967,862.59
Reserve for Amortization	E-24	2,009,661.82	732,329.50
State Loan Payable - Waste Water Treatment Fund:			
Trust Loan	E-25	25,227,025.95	27,529,878.51
Fund Loan	E-25	44,473,143.16	47,704,254.90
Improvement Authorizations:			
Funded	E-27	13,398,296.82	14,402,295.82
Unfunded	E-27	44,427,206.75	22,756,751.75
Encumbrances	E-27	9,093,277.75	14,725,766.73
		<u>190,416,546.72</u>	<u>174,259,553.60</u>
		<u>\$206,231,254.03</u>	<u>\$190,464,495.69</u>
Bonds and Notes Authorized but Not Issued	E-28	<u>\$ 46,345,210.00</u>	<u>\$ 24,674,754.00</u>

CITY OF NEWARK
SEWER UTILITY FUND

STATEMENT OF OPERATIONS
OPERATING SECTION - REGULATORY BASIS

E-1

	<u>Ref.</u>	<u>Year 2013</u>	<u>Year 2012</u>
<u>Revenue and Other Income</u>			
Operating Surplus Anticipated	E-2	\$ 277,150.00	\$ 1,780,000.00
Sewer Rents	E-2	51,977,345.95	48,028,151.88
East Orange-Passaic Valley Sewerage Commission	E-2	2,422,877.71	2,445,681.07
Lien Sale Proceeds			1,201,265.82
Other Credits to Income:			
Nonbudget Revenue	E-2	52,471.27	45,032.54
Appropriation Reserves Lapsed	E-15	849,107.42	382,695.21
Commitments Payable Cancelled			601,417.95
		<u>55,578,952.35</u>	<u>54,484,244.47</u>
<u>Expenditures</u>			
Operating	E-3	47,877,507.00	43,951,031.34
Capital Outlay	E-3	550,000.00	1,334,500.00
Debt Service	E-3	6,584,741.09	6,083,803.38
Statutory Expenditures	E-3	556,000.00	506,000.00
		<u>55,568,248.09</u>	<u>51,875,334.72</u>
Statutory Excess in Operations		10,704.26	2,608,909.75
<u>Fund Balance</u>			
Balance January 1	E	<u>277,150.59</u>	<u>1,782,540.84</u>
		<u>287,854.85</u>	<u>4,391,450.59</u>
Decreased by:			
Operating Surplus Anticipated	E-2	277,150.00	1,780,000.00
Transferred to General Fund as a Revenue			2,334,300.00
		<u>277,150.00</u>	<u>4,114,300.00</u>
Balance December 31	E	<u>\$ 10,704.85</u>	<u>\$ 277,150.59</u>

See accompanying notes to financial statements.

CITY OF NEWARK
SEWER UTILITY FUND

STATEMENT OF REVENUE - REGULATORY BASIS

E-2

<u>Source</u>	<u>Ref.</u>	<u>Anticipated Budget</u>	<u>Realized</u>	<u>Excess (Deficit)</u>
Operating Surplus Anticipated	E-1	\$ 277,150.00	\$ 277,150.00	\$
Rents	E-1,6	48,028,151.00	51,977,345.95	3,949,194.95
East Orange-Passaic Valley				
Sewerage Commission	E-1,4	2,445,681.00	2,422,877.71	(22,803.29)
Additional Sewer Rents		<u>5,042,656.00</u>	<u></u>	<u>(5,042,656.00)</u>
Total Sewer Utility Revenues	E-3	55,793,638.00	54,677,373.66	(1,116,264.34)
Nonbudget Revenue	E-1,4	<u></u>	<u>52,471.27</u>	<u>52,471.27</u>
		<u>\$ 55,793,638.00</u>	<u>\$ 54,729,844.93</u>	<u>\$ (1,063,793.07)</u>

See accompanying notes to financial statements.

CITY OF NEWARK
SEWER UTILITY FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

E-3
Sheet #1

Appropriations	Ref.	Appropriations		Expended			Unexpended Balance Cancelled
		Adopted Budget	Modified Budget	Paid or Charged	Encumbered	Reserved	
<u>Operating</u>							
Billings and Customer Service:							
Salaries and Wages:							
Personnel Services		\$ 491,698.00	\$ 491,698.00	\$ 450,443.27	\$	\$ 41,254.73	\$
Other Pay		16,400.00	16,400.00	2,135.27		14,264.73	
Total - Salaries and Wages		<u>508,098.00</u>	<u>508,098.00</u>	<u>452,578.54</u>		<u>55,519.46</u>	
Other Expenses:							
Services by Contract or Agreement		243,840.00	243,840.00	94,135.90	121,926.00	27,778.10	
Materials and Supplies		12,500.00	12,500.00	664.72	219.21	11,616.07	
Total - Other Expenses		<u>256,340.00</u>	<u>256,340.00</u>	<u>94,800.62</u>	<u>122,145.21</u>	<u>39,394.17</u>	
Sewer Supply:							
Salaries and Wages:							
Personnel Service		667,475.00	667,475.00	257,654.69		409,820.31	
Other Pay		33,200.00	33,200.00	10,656.65		22,543.35	
Total - Salaries and Wages		<u>700,675.00</u>	<u>700,675.00</u>	<u>268,311.34</u>		<u>432,363.66</u>	
Other Expenses:							
Service by Contract or Agreement		4,051,074.00	4,051,074.00	3,267,892.36	704,490.83	78,690.81	
Materials and Supplies		40,000.00	40,000.00	15,992.34	19,978.20	4,029.46	
Total - Other Expenses		<u>4,091,074.00</u>	<u>4,091,074.00</u>	<u>3,283,884.70</u>	<u>724,469.03</u>	<u>82,720.27</u>	
Unclassified:							
Miscellaneous Ch. 10, P.L. 1977:							
Passaic Valley Sewer Maintenance		39,495,786.00	39,495,786.00	39,495,302.50		483.50	
Joint Meeting Sewer Maintenance		2,131,545.00	2,131,545.00	2,131,543.84		1.16	
General Liability Insurance		100,000.00	100,000.00	100,000.00			
Hospital/Medical/Surgical Insurance		541,901.00	541,901.00	316,854.06	110,526.19	114,520.75	
Workmen's Compensation		52,088.00	52,088.00	52,088.00			
		<u>42,321,320.00</u>	<u>42,321,320.00</u>	<u>42,095,788.40</u>	<u>110,526.19</u>	<u>115,005.41</u>	
Total Operating Expenditures	E-1	<u>47,877,507.00</u>	<u>47,877,507.00</u>	<u>46,195,363.60</u>	<u>957,140.43</u>	<u>725,002.97</u>	

CITY OF NEWARK
SEWER UTILITY FUND

STATEMENT OF EXPENDITURES - REGULATORY BASIS

E-3
Sheet #2

Appropriations	Ref.	Appropriations		Expended			Unexpended Balance Cancelled
		Adopted Budget	Modified Budget	Paid or Charged	Encumbered	Reserved	
Capital Outlay:							
Service by Contract or Agreement	E-1	\$ 550,000.00	\$ 550,000.00	\$ 453,102.34	\$ 96,897.66	\$	\$
Debt Service:							
Sewer Utility State Loans:							
Principal - Trust Loan		5,533,965.00	5,533,965.00	5,383,748.66			150,216.34
Interest - Trust Loan		1,276,166.00	1,276,166.00	1,200,992.43			75,173.57
Total Debt Service	E-1	6,810,131.00	6,810,131.00	6,584,741.09			225,389.91
Statutory Expenditures:							
Contribution to:							
Public Employees' Retirement System		200,000.00	200,000.00			200,000.00	
Social Security System (OAS)		56,000.00	56,000.00	54,777.20		1,222.80	
Unemployment Compensation Insurance		250,000.00	250,000.00		250,000.00		
Employees' Retirement Fund		50,000.00	50,000.00			50,000.00	
	E-1	556,000.00	556,000.00	54,777.20	250,000.00	251,222.80	
Total Sewer Utility Appropriations		\$55,793,638.00	\$55,793,638.00	\$53,287,984.23	\$1,304,038.09	\$976,225.77	\$225,389.91
Reference			E-2	Below	E	E	
			Ref.				
Cash Disbursed			E-4	\$53,283,136.23			
Interfunds Payable			E-16	4,848.00			
			Above	\$53,287,984.23			

See accompanying notes to financial statements.

NOTES TO FINANCIAL STATEMENTS

CITY OF NEWARK

**NOTES TO FINANCIAL STATEMENTS
YEAR ENDED DECEMBER 31, 2013**

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

A. Reporting Entity

The City of Newark is organized as a Mayor-Council form of government pursuant to the Optional Municipal Charter Law Plan C under the provisions of N.J.S. 40:69A-1 et seq., commonly known as the Faulkner Act. Under this system, the Mayor functions as the chief executive and the nine member Municipal Council functions as the legislative body. The Mayor and Council are elected at the regular municipal election for a term of four years. One council member is elected from each of the City's five wards and four council members are elected at large.

Governmental Accounting Standards Board (GASB) Statement 14 establishes certain standards for defining and reporting on the financial reporting entity. In accordance with these standards, the reporting entity should include the primary government and those component units which are fiscally accountable to the primary government. The financial statements of the City of Newark include every board, body, officer or commission supported and maintained wholly or in part by funds appropriated by the City, as required by the provisions of N.J.S. 40A:5-5. The financial statements, however, do not include the operations of the Newark Board of Education, Library, Museum, Technical Schools, Newark Housing Authority and Newark Parking Authority, which are separate entities subject to separate examinations.

B. Description of Funds

The Governmental Accounting Standards Board (GASB) is the recognized standard setting body for establishing governmental accounting and financial reporting principles. The GASB establishes seven fund types and two account groups to be used by governmental units when reporting financial position and results of operations in accordance with generally accepted accounting principles (GAAP).

The accounting policies of the City of Newark conform to the accounting principles applicable to municipalities which have been prescribed by the Division of Local Government Services, Department of Community Affairs, State of New Jersey. Such principles and practices are designed primarily for determining compliance with legal provisions and budgetary restrictions and as a means of reporting on the stewardship of public officials with respect to public funds. Under this method of accounting, the City of Newark accounts for its financial transactions through the following separate funds which differ from the fund structure required by generally accepted accounting principles.

Current Fund - Encompasses resources and expenditures for basic governmental operations. Fiscal activity of Federal and State grant programs are reflected in a segregated section of the Current Fund.

Trust Funds - The records of receipts, disbursements and custodianship of monies in accordance with the purpose for which each account was created are maintained in Trust Funds. These include the Assessment Trust Fund, Animal Control Trust Fund, Other Trust Funds, Insurance Trust Fund, Grant Fund and Payroll Agency Trust Fund.

General Capital Fund - The receipts and expenditure records for the acquisition of general infrastructure and other capital facilities, other than those acquired in the Current Fund, are maintained in this Fund, as well as, related long-term debt accounts.

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (Continued)

B. Description of Funds (Continued)

Utilities Funds - Water and Sewer Utilities are treated as separate entities. Each maintains its own Operating and Capital Funds which reflect revenue, expenditures, stewardship, acquisitions of utility infrastructure and other capital facilities, debt service, long-term debt and other related activity.

Capital Fixed Assets - These accounts reflect estimated valuations of land, buildings and certain movable fixed assets of the City as discussed under the caption of "Basis of Accounting".

C. Basis of Accounting

The accounting principles and practices prescribed for municipalities by the Division of Local Government Services, Department of Community Affairs, State of New Jersey, differ in certain respects from generally accepted accounting principles. The accounting system is maintained on the modified accrual basis with certain exceptions. Significant accounting policies in New Jersey are summarized as follows:

Property Taxes and Other Revenue

Property taxes and other revenue are realized when collected in cash or approved by regulation for accrual from certain sources of the State of New Jersey and the Federal Government. Accruals of taxes and other revenue are otherwise deferred as to realization by the establishment of offsetting reserve accounts. GAAP requires such revenue to be recognized in the accounting period when they become susceptible to accrual, reduced by an allowance for doubtful accounts.

Grant Revenue

Federal and State grants, entitlements or shared revenue received for purposes normally financed through the Current Fund are recognized when anticipated in the City of Newark. GAAP requires such revenue to be recognized in the accounting period when they become susceptible to accrual.

Expenditures

Expenditures for general and utility operations are generally recorded on the accrual basis. Unexpended appropriation balances, except for amounts which may have been cancelled by the governing body or by statutory regulation, are automatically recorded as liabilities at December 31st of each year, under the title of "Appropriation Reserves". Amounts unexpended at the end of the second year are lapsed and are recorded as income.

Grant appropriations are charged upon budget adoption to create separate spending reserves.

Budgeted transfers to the Capital Improvement Fund are recorded as expenditures to the extent permitted by law.

Expenditures from Trust and Capital Funds are recorded upon occurrence and charged to accounts statutorily established for specific purposes.

Budget Appropriations for interest on General Capital Long-Term Debt is raised on the cash basis and is not accrued on the records; interest on Utility Debt is raised on the accrual basis and so recorded.

GAAP requires expenditures to be recognized in the accounting period in which the fund liability is incurred, if measurable, except for unmatured interest on general long-term debt, which should be recognized when due.

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (Continued)

C. Basis of Accounting (Continued)

Encumbrances

As of January 1, 1986 all local units were required by Technical Accounting Directive No. 85-1, as promulgated by the Division of Local Government Services, to maintain an encumbrance accounting system. The directive states that contractual orders outstanding at December 31st are reported as expenditures through the establishment of an encumbrance payable. Encumbrances do not constitute expenditures under GAAP.

Appropriation Reserves

Appropriation reserves are available, until lapsed at the close of the succeeding year, to meet specific claims, commitments or contracts incurred during the preceding year. Lapsed appropriation reserves are recorded as additions to income. Appropriation reserves do not exist under GAAP.

Compensated Absences

Expenditures relating to obligations for unused vested accumulated sick, vacation and compensatory pay are not recorded until paid. GAAP requires that the amount that would normally be liquidated with expendable available financial resources be recorded as an expenditure in the operating funds and the remaining obligations be recorded as a long-term obligation.

Property Acquired for Taxes

Property Acquired for Taxes (Foreclosed Property) should be recorded in the Current Fund at the assessed valuation during the year when such property was acquired by deed or foreclosure and is offset by a corresponding reserve account. GAAP requires such property to be recorded in the capital fixed assets at market value on the date of acquisition.

Self-Insurance Contributions

Contributions to self-insurance funds are charged to budget appropriations. GAAP requires that payments be accounted for as an operating transfer and not as an expenditure.

Interfunds Receivable

Interfunds Receivable in the Current Fund are generally recorded with offsetting reserves which are established by charges to operations. Collections are recognized as income in the year that the receivables are realized. Interfunds Receivable of all other funds are recorded as accrued and are not offset with reserve accounts. Interfunds Receivable of one fund are offset with Interfunds Payable of the corresponding fund. GAAP does not require the establishment of an offsetting reserve.

Inventories of Supplies

Materials and supplies purchased by all funds are recorded as expenditures.

An annual inventory of materials and supplies for the Water and Sewer Utility Funds are required, by regulation, to be prepared by City personnel for inclusion on the Water and Sewer Operating Fund balance sheets. Annual changes in valuations, offset with a Reserve Account, are not considered as affecting results of operations. Materials and supplies of other funds are not inventoried nor included on their respective balance sheets.

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (Continued)

C. Basis of Accounting (Continued)

Capital Fixed Assets

General:

In accordance with Technical Accounting Directive No. 85-2, Accounting for Governmental Capital Fixed Assets, as promulgated by the Division of Local Government Services, which differs in certain respects from generally accepted accounting principles, the City of Newark has developed a capital fixed asset accounting and reporting system.

GAAP requires that capital fixed assets be capitalized at historical or estimated historical cost if actual historical cost is not available. Depreciation on utility capital fixed assets should also be recorded.

Capital Fixed Assets used in governmental operations (capital fixed assets) are accounted for in the Capital Fixed Assets. Public domain ("infrastructure") capital fixed assets consisting of certain improvements other than buildings, such as roads, bridges, curbs and gutters, streets and sidewalks and drainage systems are not capitalized.

Acquisitions of land, buildings, machinery, equipment and other capital assets are recorded on a perpetual fixed asset record.

Vehicles, furniture, equipment and other items are reflected at replacement values at time of inventory preparation. Additions to the established capital fixed assets are valued at cost.

Depreciation of assets is not recorded as an operating expense of the City.

Utilities:

Capital acquisitions, including utility infrastructure costs of the Water and Sewer Utility Funds, are recorded at cost upon purchase or project completion in the Fixed Capital Account of the utilities. The Fixed Capital Accounts are adjusted for dispositions or abandonments. The accounts include movable fixed assets of the Utilities but are not specifically identified and are considered as duplicated in the Capital Fixed Assets. The duplication is considered as insignificant on its effect on the financial statements taken as a whole.

Utility improvements that may have been constructed by developers are not recorded as additions to Fixed Capital.

Fixed Capital of the Utility is offset by accumulations in Amortization Reserve Accounts. The accumulations represent costs of fixed assets purchased with budgeted funds or acquired by gift as well as grants, developer contributions or liquidations of related bonded debt and other liabilities incurred upon capital fixed asset acquisition.

The Fixed Capital Accounts reflected herein are as recorded in the records of the municipality and do not necessarily reflect the true condition of such Fixed Capital. The records consist of a control account only. Detailed records are not maintained.

D. Basic Financial Statements

The GASB Codification also defines the financial statements of a governmental unit to be presented in the general purpose financial statements to be in accordance with GAAP. The City of Newark presents the financial statements listed in the table of contents which are required by the Division of Local Government Services and which differ from the financial statements required by GAAP. In addition, the Division requires the financial statements listed in the table of contents to be referenced to the supplementary schedules. This practice differs from GAAP.

2. CASH, CASH EQUIVALENTS AND INVESTMENTS

A. Cash and Cash Equivalents

New Jersey statutes permit the deposit of public funds in institutions located in New Jersey, which are insured by the Federal Deposit Insurance Corporation (FDIC) or any other agencies of the United States that insures deposits or the State of New Jersey Cash Management Fund.

The State of New Jersey Cash Management Fund is authorized by statute and regulations of the State Investment Council to invest in fixed income and debt securities which mature or are redeemed within one year. Twenty-five percent of the Fund may be invested in eligible securities which mature within two years provided, however, the average maturity of all investments in the Fund shall not exceed one year. Collateralization of Fund investments is generally not required.

In addition, by regulation of the Division of Local Government Services, municipalities are allowed to deposit funds in the Municipal Bond Insurance Association (MBIA) through their investment management company, the Municipal Investors Service Corporation.

In accordance with the provisions of the Governmental Unit Deposit Protection Act of New Jersey, public depositories are required to maintain collateral for deposits of public funds that exceed insurance limits as follows:

The market value of the collateral must equal five percent of the average daily balance of public funds, or

If the public funds deposited exceed 75 percent of the capital funds of the depository, the depository must provide collateral having a market value equal to 100 percent of the amount exceeding 75 percent.

All collateral must be deposited with the Federal Reserve Bank, The Federal Home Loan Bank Board or a banking institution that is a member of the Federal Reserve System and has capital funds of not less than \$25,000,000.00.

B. Investments

New Jersey statutes permit the City to purchase the following types of securities:

- Bonds or other obligations of the United States of America or obligations guaranteed by the United States of America. This includes instruments such as Treasury bills, notes and bonds.
- Government money market mutual funds.
- Any federal agency or instrumentality obligation authorized by Congress that matures within 397 days from the date of purchase, and has a fixed rate of interest not dependent on any index or external factors.
- Bonds or other obligations of the local unit or school districts of which the local unit is a part.
- Any other obligations with maturities not exceeding 397 days, as permitted by the Division of Investments.
- Local government investment pools, such as New Jersey CLASS, and the New Jersey Arbitrage Rebate Management Program.
- New Jersey State Cash Management Fund.
- Repurchase agreements of fully collateralized securities subject to special conditions.

2. CASH, CASH EQUIVALENTS AND INVESTMENTS (Continued)

B. Investments (Continued)

In addition, a variety of State laws permit local governments to invest in a wide range of obligations issued by State Governments and its agencies.

As of December 31, 2013, the City had funds on deposit in checking and New Jersey Cash Management Accounts, Certificates of Deposit and Repurchase Agreements. These funds constitute "deposits with financial institutions" as defined by GASB Statement No. 3 and amended by GASB Statement No. 40. There were no securities categorized as investments as defined by GASB Statement No. 40.

3. TAXES AND TAX TITLE LIENS RECEIVABLE

Property assessments are determined on true values and taxes are assessed based upon these values. The residential tax bill includes the levies for the City, County and School purposes. Certified adopted budgets are submitted to the County Board of Taxation by each taxing district. The tax rate is determined by the board upon the filing of these budgets.

The tax bills are mailed by the Tax Collector annually and are payable in four quarterly installments due the first of August and November of the current year and a preliminary billing due the first of February and May of the subsequent year. The August and November billings represent the third and fourth quarter installments and are calculated by taking the total year tax levy less the preliminary first and second quarter installments due February and May. The preliminary levy is based on one-half of the current year's total tax.

The Tax Collector's balances include items which were not in the tax sale. The report includes taxes billed for added, omitted and added/omitted items in bankruptcy, installment agreements, appeals and other items which were not subject to be included in the tax sale.

Tax installments not paid by the above due dates are subject to interest penalties determined by a resolution of the governing body. The rate of interest in accordance with the aforementioned resolution is 8% per annum on the first \$1,500 of delinquency and 18% on any delinquency in excess of \$1,500. The resolution also sets a grace period of ten days before interest is calculated. In addition, any delinquency in excess of \$10,000 at the end of the calendar year is subject to a 6% penalty on the unpaid balance.

Taxes unpaid on the 11th day of the eleventh month in the fiscal year when the taxes became in arrears are subject to the tax sale provisions of the New Jersey statutes. The municipality may institute in rem foreclosure proceedings after six months from the date of the sale if the lien has not been redeemed.

The following is a five year comparison of certain statistical information relative to property taxes and property tax collections for the current and previous four years:

Comparative Tax Rate Information

<u>Year</u>	<u>Assessed Valuation</u>	<u>Tax Rate</u>	<u>Apportionment of Tax Rate</u>			
			<u>Municipal</u>	<u>County</u>	<u>Local School</u>	<u>Library</u>
2013	\$ 12,979,522,245.00	\$2.953	\$ 1.455	\$ 0.578	\$ 0.882	\$ 0.038
2012	10,871,953,866.00	3.452	1.649	0.709	1.044	0.050
2011	10,839,929,709.00	3.328	1.607	1.688	1.033	
2010	10,763,710,300.00	3.180	1.487	0.696	0.997	
2009	11,001,329,400.00	2.739	1.140	0.652	0.947	

3. TAXES AND TAX TITLE LIENS RECEIVABLE (Continued)

Comparison of Tax Levies

<u>Year</u>	<u>Tax Levy</u>	<u>Cash Collections</u>	<u>Percentage of Collections</u>
2013	\$ 377,472,385.47 *	\$ 348,817,914.76	92.41 %
2012	378,379,362.53 *	364,231,244.43	96.26
2011	365,247,783.34 *	348,166,900.86	95.32
2010	344,941,358.38 *	313,978,927.62	91.02
2009	299,254,875.45 *	275,442,779.05	92.04

*Adjusted for reductions due to tax appeals in accordance with R.S. 54:3-21.

Delinquent Taxes and Tax Title Liens

<u>Year</u>	<u>Tax Title Liens</u>	<u>Amount of Delinquent Taxes</u>	<u>Total Delinquent Taxes</u>	<u>Percentage of Tax Levy</u>
2013	\$ 29,045,983.50	\$ 22,454,342.05	\$ 51,500,325.55	13.64 %
2012	27,954,820.15	683,874.16	28,638,694.31	7.56
2011	38,862,258.05	3,412,749.61	42,275,007.66	11.57
2010	27,844,215.19	24,879,957.42	52,724,172.61	15.28
2009	23,941,189.70	24,998,531.86	48,939,721.56	16.35

4. PROPERTY ACQUIRED BY TAX TITLE LIEN LIQUIDATION

The value of property acquired by purchase, gift, deed and liquidation of tax title liens, on the basis of the last assessed valuation of such properties in the year of acquisition, was as follows:

<u>Year</u>	<u>Amount</u>
2013	\$ 131,612,758.28
2012	131,224,637.97
2011	81,491,737.97
2010	81,491,737.97
2009	81,491,737.97

5. WATER RENTS ACCOUNTS RECEIVABLE

The City of Newark maintains a Utility Fund for the billing and collection of water rents. A comparison of water rent billings and collections for the past five years are as follows:

<u>Year</u>	<u>Billings</u>	<u>Collections</u>
2013	\$ 45,325,966.90	\$ 45,890,706.01
2012	48,886,604.28	46,279,562.45
2011	45,772,783.27	47,119,480.02
2010	44,131,767.80	42,421,842.05
2009	45,679,722.06	46,377,040.70

The sums of billings and collections include interest penalties. Realization of prior year unpaid balances are also included in the collections above.

6. SEWER CHARGES ACCOUNTS RECEIVABLE

The City of Newark maintains a Utility Fund for the billing and collection of sewer rents. A comparison of sewer rent billings and collections for the past five years are as follows:

<u>Year</u>	<u>Billings</u>	<u>Collections</u>
2013	\$ 52,508,092.14	\$ 51,977,345.95
2012	48,298,467.01	48,028,151.88
2011	52,861,705.54	53,727,960.95
2010	54,942,128.40	53,082,382.33
2009	54,330,557.96	54,869,595.09

The sums of billings and collections include interest penalties. Realization of prior year unpaid balances are also included in the collections above.

7. FUND BALANCE APPROPRIATED

	<u>Year</u>	<u>Balance December 31</u>	<u>Utilized in Budget of Succeeding Year</u>
Current Fund:	2013	\$ -	\$ -
	2012	11,411,387.66	12,904,747.74
	2011	17,872,229.76	17,825,000.00
	2010	25,756,766.82	25,750,000.00
	2009	10,130,901.04	10,130,901.00
Water Utility Operating Fund:	2013	2,820,187.83	854,000.00
	2012	2,753,607.41	-
	2011	3,704,945.84	3,705,000.00
	2010	1,405,657.37	1,405,000.00
	2009	4,597,486.26	4,597,486.00
Sewer Utility Operating Fund:	2013	10,704.85	77,200.00
	2012	277,150.59	277,150.00
	2011	1,782,540.84	1,780,000.00
	2010	1,199,390.80	385,842.00
	2009	2,020,490.62	569,783.00

8. PENSION PLANS

Description of Systems

Substantially all of the City's employees participate in one of the following contributory defined benefit public employee retirement systems which have been established by State statute: the Public Employees' Retirement System (PERS) or the Police and Firemen's Retirement System (PFRS). In addition, the City contributes to the Consolidated Police and Firemen's Pension Fund (CPFPPF). These systems are sponsored and administered by the New Jersey Division of Pensions and Benefits. The Public Employees' Retirement System and the Police and Firemen's Retirement System is considered a cost sharing multiple-employer plan.

8. PENSION PLANS (Continued)

Description of Systems (Continued)

Public Employees' Retirement System:

The Public Employees' Retirement System (PERS) was established in January, 1955 under the provisions of N.J.S.A. 43:15A to provide coverage including post-retirement health care to substantially all full-time employees of the State or any county, municipality, school district or public agency provided the employee is not a member of another State-administered retirement system. Membership is mandatory for such employees and vesting occurs after 8 to 10 years of service and 25 years for health care coverage. Members are eligible for retirement at age 60 with an annual benefit generally determined to be 1/55th of the average annual compensation for the highest three fiscal years' compensation for each year of membership during years of creditable service. Early retirement is available to those under age 60 with 25 or more years of credited service. Anyone who retires early and is under age 55 receives retirement benefits as calculated in the above mentioned formula but at a reduced rate (one quarter of one percent for each month the member lacks of attaining age 55).

Police and Firemen's Retirement System:

The Police and Firemen's Retirement System (PFRS) was established in July, 1944 under the provisions of N.J.S.A. 43:16A to provide coverage to substantially all full-time county and municipal police or firemen and State firemen appointed after June 30, 1944. Membership is mandatory for such employees. Members may opt for Service Retirement if over age 55 or Special Retirement at any age if they have a minimum of 25 years of service or 20 years of service if enrolled in the PFRS as of January 18, 2000. Retirement benefits vary depending on age and years of service.

Chapter 428, Public Law of 1999, effective January 18, 2000, allows a member, age 55 and older with 20 or more years of service, to retire with a benefit equaling 50% of final compensation, in lieu of the regular retirement allowance available to the member. Final compensation means the compensation received by the member in the last twelve months of creditable service preceding retirement.

In addition, a member of the system as of the effective date of this law may retire with 20 or more years of service with a retirement allowance of 50% of final compensation, regardless of age, and, if required to retire because of attaining the mandatory retirement age of 65, an additional 3% of final compensation for every additional year of creditable service up to 25 years.

Consolidated Police and Firemen's Pension Fund:

The Consolidated Police and Firemen's Pension Fund (CPFPF) is a closed system with no active members and was established in January 1952 to provide coverage to municipal police and firemen who were appointed prior to July 1, 1944.

Employees' Retirement System:

The Employees' Retirement System was created in November 1954 by Ch. 218, P.L. 1954 by the merger of the former Newark Municipal Employees' Pension Fund, Newark Board of Health Pension Fund and Newark Board of Workers' Pension Fund as at January 1, 1955.

Additional legislation effective August 26, 1966, provides that in the fiscal year 1979, "the City shall increase its contributions by 13% of the amount of the salaries paid to all members of the Pension Fund in 1978 and in each fiscal year thereafter the contribution of the City shall be increased over the previous percentage by an additional 1% of the salaries paid to all members of the Pension Fund in the immediate preceding year until the actuary shall certify to the City that the total of the contributions made by the City, together with the contributions of the members and all earnings, is sufficient to meet the liabilities of the fund on a fully funded, reserve basis".

8. PENSION PLANS (Continued)

Description of Systems (Continued)

Employees' Retirement System: (Continued)

The plan provides a method for a permanent employee of the City to receive credit for all or part of the time served prior to joining the Retirement System by payment into the fund of an amount computed in the manner prescribed by the statute. The payment may be made in one lump sum or payroll deductions over a maximum of ten years. In accordance with Senate Bill 332 effective February 21, 1969, the employer is required to match the employee's total prior service time purchase, without interest, as soon as the employee enters into the contract.

Effective January 1, 1972 (P.L. 1971, Ch. 277) a "cost of living" increase was granted to all retirees who were receiving a pension for at least three calendar years. The "ratio of increase", which will apply to the pension originally granted, is based on the Consumer Price Index for Urban Wage Earners and Clerical Workers of the United States Department of Labor. The "ratio of increase" will be reviewed annually by the Director of the Division of Pensions of the State Department of the Treasury to determine if there will be any changes to the "cost of living" increase originally granted. The employer shall bear the cost of the increase in the pensions payable to retirees who retired from the employ of such employer.

Additional legislation (P.L. 1981, Ch. 565), effective May 30, 1982, provided for the creation of a special account in the Pension Fund for all elected officials of the City of Newark. Elected officials must contribute at a rate of 5% of their salaries with the City contributing at a rate of 20% of their salaries.

The allocation of members' contributions between current and prior years' service payments is reflected on the basis of the allocations made by Administrators of the Fund.

The membership voted to join the State Pension Fund. The Commissioner approved the Social Security Referendum Certification number of 974 members who opted to go into the State Pension Fund on September 6, 1990.

To fund the future retirees we hereby quote N.J. Statute Section E of 43:13-22.29:

(E) All moneys required to meet the City contributions provided for under this and all other sections of this act shall be appropriated annually in the City budget of the Governing Body. If at any time there is not sufficient money to meet the requirements of this system and pay the pensions or other benefits provided for herein, the Governing Body shall, from time to time, include in any tax levy a sum sufficient to meet the said requirements and payments of the retirement system, provided, however that no insufficiency of funds shall be made up by the City unless and until the commission shall have required deductions from employees at the maximum rates set forth in subsection (A) of this section L. 1954, c. 218, p. 824,27.

Significant Legislation

P.L. 2011, c. 78, effective June 28, 2011, made various changes to the manner in which PERS operates and to the benefit of that system.

This new legislation's provisions impacting employee pension and health benefits include:

- New members of PERS hired on or after June 28, 2011 (Tier 5 members), will need 30 years of creditable service and age 65 for receipt of the early retirement benefit without a reduction of 1/4 to 1 percent for each month that the member is under age 65.
- The eligibility age to qualify for a service retirement in the PERS is increased from age 62 to 65 for Tier 5 members.

8. PENSION PLANS (Continued)

Significant Legislation (Continued)

- The annual benefit under special retirement for new PERS members enrolled after June 28, 2011 (Tier 3 members), will be 60 percent instead of 65 percent of the member's final compensation plus 1 percent for each year of creditable service over 25 years but not to exceed 30 years.
- Active member contribution rates will increase. PERS active member rates increase from 5.5 percent of annual compensation to 6.5 percent plus an additional 1 percent phased-in over 7 years. For Fiscal Year 2012, the member contribution rates increased in October 2011. The phase-in of the additional incremental member contributions for PERS members will take place in July of each subsequent fiscal year.
- The payment of automatic cost-of-living adjustment (COLA) additional increases to current and future retirees and beneficiaries is suspended until reactivated as permitted by this law.

In addition, this new legislation changes the method for amortizing the pension systems' unfunded accrued liability (from a level percent of pay method to a level dollar of pay).

Contributions Required and Made

In accordance with the provisions of Chapter 78, P.L. 2011, employee pension contribution rates will be increased for PERS from 5.5% to 6.5% and for PFRS from 8.5% to 10% of their base wages, respectfully. These increases will be effective with the first payroll amount to be paid on or after October 1, 2011.

Employee Contributions for PERS employees will be increased from 6.5% to 7.5% to be phased in equally over a 7 year period beginning July 2012. The contribution rate will increase by 0.14% each year with the first payroll of July until the 7.5% contribution rate is reached in July 2018. Employer contributions are actuarially determined on an annual basis by the Division of Pensions. All other employees are enrolled in the Newark Municipal Employees' Pension Fund. Contributions to the plan for the past three (3) years are as follows:

<u>Year</u>	<u>PERS</u>		<u>PFRS</u>	
	<u>City</u>	<u>Employees</u>	<u>City</u>	<u>Employees</u>
2013	\$ 9,262,095.27	\$ *	\$ 45,117,383.12	\$ *
2012	10,732,471.58	*	45,324,660.00	*
2011	9,899,847.34	*	48,413,779.00	*
Newark Municipal Employees				
<u>Year</u>	<u>CPERS</u>		<u>City</u>	
	<u>City</u>		<u>City</u>	
2013	\$ 287,441.76		\$ 400,000.00	
2012	434,884.81		400,000.00	
2011	619,253.33		460,000.00	

*Not Available - See Notes and Comments.

9. DEFINED CONTRIBUTION RETIREMENT PROGRAM

Description of System

The Defined Contribution Retirement Program (DCRP) was established on July 1, 2007 for certain public employees under the provisions of Chapter 92, P.L. 2007 and Chapter 103, P.L. 2007. The program provides eligible members, with a minimum base salary of \$1,500.00 or more, with a tax-sheltered, defined contribution retirement benefit, in addition to life insurance and disability coverage. As of May 21, 2010, the municipal base salary required for eligibility in the DCRP was increased to \$5,000.00. The DCRP is jointly administered by the Division of Pensions and Benefits and Prudential Financial.

If the eligible elected or appointed official will earn less than \$5,000.00 annually, the official may choose to waive participation in the DCRP for that office or position. This waiver is irrevocable.

This retirement program is a new pension system where the value of the pension is based on the amount of the contribution made by the employee and employer and through investment earnings. It is similar to a Deferred Compensation Program where the employee has a portion of tax deferred salary placed into an account that the employee manages through investment options provided by the employer.

The law requires that three classes of employees enroll in the DCRP, detailed as follows:

- All elected officials taking office on or after July 1, 2007, except that a person who is reelected to an elected office held prior to that date without a break in service may remain in the Public Employees' Retirement System (PERS).
- A Governor appointee with the advice and consent of the Legislature or who serves at the pleasure of the Governor only during that Governor's term of office.
- Employees enrolled in the PERS on or after July 1, 2007 or employees enrolled in the PERS after May 21, 2010 who earn salary in excess of established "maximum compensation" limits.
- Employees otherwise eligible to enroll in the PERS on or after November 2, 2008 who do not earn the minimum salary for PERS Tier 3, but who earn salary of at least \$5,000.00.
- Employees otherwise eligible to enroll in the PERS after May 21, 2010, who do not work the minimum number of hours per week required for PERS Tier 4 or Tier 5 enrollment (32 hours per week) but who earn salary of at least \$5,000.00 annually.

Notwithstanding the foregoing requirements other employees who hold a professional license or certificate or meet other exceptions are permitted to remain to join or remain in PERS.

Contributions Required and Made

Contributions made by employees for DCRP are currently at 5.5% of their base wages. Member contributions are matched by a 3.0% employer contribution.

During the year 2013, there were no officials or employees enrolled in the DCRP.

10. MUNICIPAL DEBT

The Local Bond Law governs the issuance of bonds and notes to finance general capital expenditures. All bonds are retired in serial installments within the statutory period of usefulness. Bonds issued by the City are general obligation bonds, backed by the full faith and credit of the City. Pursuant to N.J.S.A. 40A:2-8, bond anticipation notes, which are issued to temporarily finance capital projects, cannot be renewed past the third anniversary unless an amount equal to at least the first legal requirement is paid prior to each anniversary and must be paid off within ten years and five months or retired by the issuance of bonds. Bond anticipation notes, which are issued to temporarily finance capital projects, must be paid off within ten years and five months or retired by the issuance of bonds.

Summary of Municipal Debt (Excluding Current and Operating Debt) (and School if Applicable)

	<u>Year 2013</u>	<u>Year 2012</u>	<u>Year 2011</u>
<u>Issued</u>			
General:			
Bonds and Notes	\$ 293,619,035.25	\$ 309,923,035.25	\$ 299,043,035.25
Guaranteed Bonds	63,340,000.00	64,575,000.00	65,770,000.00
State Loan	2,000,000.00	2,230,676.20	2,461,352.40
Water Utility:			
Bonds and Notes	19,587,000.00	21,602,000.00	23,657,000.00
State Water Loan	26,359,068.26	27,835,180.68	29,268,336.62
Sewer Utility:			
State Sewer Loan	<u>69,850,384.75</u>	<u>75,234,133.41</u>	<u>82,725,723.89</u>
Total Issued	<u>474,755,488.26</u>	<u>501,400,025.54</u>	<u>502,925,448.16</u>
<u>Authorized but Not Issued</u>			
General:			
Bonds and Notes	38,204,379.89	39,442,379.89	53,371,379.89
Water Utility:			
Bonds and Notes	36,179,250.74	22,929,250.74	22,929,250.74
Sewer Utility:			
Bonds and Notes	<u>46,345,210.00</u>	<u>24,674,754.00</u>	<u>27,217,070.00</u>
Total Unauthorized but Not Issued	<u>120,728,840.63</u>	<u>87,046,384.63</u>	<u>103,517,700.63</u>
	<u>\$ 595,484,328.89</u>	<u>\$ 588,446,410.17</u>	<u>\$ 606,443,148.79</u>

10. MUNICIPAL DEBT (Continued)

Summary of Statutory Debt Condition (Annual Debt Statement)

The summarized statement of debt condition which follows is prepared in accordance with the required method of setting up the Annual Debt Statement and indicates a statutory net debt of 2.081%.

	<u>Gross Debt</u>	<u>Deductions</u>	<u>Net Debt</u>
Local School District Debt	\$ 70,017,000.00	\$ 70,017,000.00	\$
Water Utility Debt	82,125,319.00	82,125,319.00	
Sewer Utility Debt	116,195,594.75	110,427,531.55	5,768,063.20
General Debt	397,163,415.14	95,847,035.25	301,316,379.89
	<u>\$ 665,501,328.89</u>	<u>\$ 358,416,885.80</u>	<u>\$ 307,084,443.09</u>

Net Debt, \$307,084,443.09 divided by Equalized Valuation Basis \$14,756,335,968.00 per N.J.S. 40A:2-2, as amended, equals 2.081%.

Borrowing Power Under N.J.S. 40A:2-6 as Amended

3 1/2% of Equalized Valuation of Real Property	\$ 516,471,758.88
Net Debt	<u>307,084,443.09</u>
Remaining Borrowing Power	<u>\$ 209,387,315.79</u>

Calculation of "Self-Liquidating Purpose" Water Utility per N.J.S.A. 40A:2-4

Fund Balance and Cash Receipts from Fees, Rents or Other Charges for Year Including Surplus and Interest on Investments (Per P.L. 1991, Ch. 196)		\$ 46,631,645.30
Deductions:		
Operating and Maintenance Costs	\$ 37,289,694.43	
Debt Service per Water Accounts	<u>4,934,448.92</u>	
		<u>42,224,143.35</u>
Excess in Revenue		<u>\$ 4,407,501.95</u>

There being an excess in revenue, all Water Utility Debt is deductible for debt statement purposes.

10. MUNICIPAL DEBT (Continued)

Calculation of "Self-Liquidating Purpose" Sewer Utility per N.J.S.A. 40A:2-4

Fund Balance and Cash Receipts from Fees, Rents or Other Charges for Year Including Surplus and Interest on Investments (Per P.L. 1991, Ch. 196)			\$ 54,729,844.93
Deductions:			
Operating and Maintenance Costs	\$ 48,433,507.00		
Debt Service per Sewer Accounts	<u>6,584,741.09</u>		
			<u>55,018,248.09</u>
Deficit in Revenue			<u>\$ (288,403.16)</u>

There being a deficit in revenue, all Sewer Utility Debt is not deductible for debt statement purposes.

The deficit is capitalized at 5% and therefore the sum of \$5,768,063.20 is included as net debt.

The foregoing debt information is in agreement with the amended Annual Debt Statement as filed by the Chief Financial Officer.

10. MUNICIPAL DEBT (Continued)

As of December 31, 2013, the City's long-term debt is as follows:

General Obligation Bonds

\$40,747,035.25, 2003 Pension Refunding Bonds due in annual installments of \$890,704 to \$1,960,000 through April 2033, interest at 5.13% to 5.75%.	\$ 14,882,035.25
\$22,660,000, 2008 Pension Refunding Bonds due in annual installments of \$1,420,000 to \$2,575,000 through April 2022, interest at 5.603% to 5.853%.	17,625,000.00
\$4,450,000, 2005 Redevelopment Refunding Bonds due in annual installments of \$240,000 to \$450,000 through October 2022, interest at 5.00%.	3,040,000.00
\$120,670,000, 2010 General Improvement Bonds due in annual installments of \$790,000 to \$14,500,000 through June 2028, interest at 3.00% to 5.00%.	116,960,000.00
\$5,283,000, 2010 Taxable General Improvement Bonds due in annual installments of \$2,560,000 to \$2,723,000 through June 2030, interest at 6.20% to 6.30%.	5,283,000.00
\$24,890,000, 2010 General Refunding Bonds due in annual installments of \$3,430,000 to \$3,990,000 through October 2018, interest at 3.38% to 4.00%.	18,560,000.00
\$8,855,000, 2010 General Taxable Refunding Bonds due in annual installments of \$2,015,000 through October 2014, interest at 3.933%.	2,015,000.00
\$36,235,000, 2013 General Improvement Refunding Bonds due in annual installments of \$4,945,000 to \$7,130,000 through July 2018, interest at 4.00% to 5.00%.	32,420,000.00
\$4,550,000, 2013 General Taxable Improvement Refunding Bonds due in annual installments of \$675,000 to \$850,000 through July 2018, interest at 1.498% to 2.340%.	4,050,000.00
\$20,505,000, 2013 Pension Taxable Refunding Bonds due in annual installments of \$295,000 to \$4,060,000 through April 2021, interest at 1.498% to 3.305%.	20,020,000.00
	<u>\$ 234,855,035.25</u>

State Trust Loan

\$2,500,000 for a Demolition Loan with the State of New Jersey. The loan is repayable in 20 annual installments from 2009 to 2029.	<u>\$ 2,000,000.00</u>
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10. MUNICIPAL DEBT (Continued)

State Trust Loan (Continued)

A schedule of annual debt service for the repayment of the State Trust Loan is as follows:

<u>Year</u>	<u>Total</u>	<u>State Demolition Bond</u>
2014	\$ 125,000.00	\$ 125,000.00
2015	125,000.00	125,000.00
2016	125,000.00	125,000.00
2017	125,000.00	125,000.00
2018	125,000.00	125,000.00
2019	125,000.00	125,000.00
2020	125,000.00	125,000.00
2021	125,000.00	125,000.00
2022	125,000.00	125,000.00
2023	125,000.00	125,000.00
2024	125,000.00	125,000.00
2025	125,000.00	125,000.00
2026	125,000.00	125,000.00
2027	125,000.00	125,000.00
2028	125,000.00	125,000.00
2029	125,000.00	125,000.00
	<u>\$2,000,000.00</u>	<u>\$2,000,000.00</u>

Water Utility Bonds

\$23,160,000, 2005 Water Refunding Bonds due in annual installments of \$635,000 to \$1,600,000 through October 2021, interest at 3.40% to 5%. \$ 8,735,000.00

\$7,737,000, 2005 General Water Bonds due in annual installments of \$325,000 to \$360,000 through December 2019, interest at 4.10% to 4.50%. 5,585,000.00

\$5,487,000, 2010 General Water Bonds due in annual installments of \$110,000 to \$363,000 through June 2039, interest at 4.00% to 5.00% 5,267,000.00

\$ 19,587,000.00

Waste Water Treatment Loan Payable - Water Utility Fund

Loan agreements were entered into by the City of Newark with the Department of Environmental Protection for the purpose of improvements to the Water Treatment Plant. Loans outstanding at December 31, 2013 are detailed as follows:

Trust Loan	\$10,940,000.00
Fund Loan	15,419,068.26

It is noted that the Fund Loan was issued interest-free.

10. MUNICIPAL DEBT (Continued)

General Capital and Water Utility Bonds

A schedule of annual debt service for principal and interest for bonded debt is as follows:

Year	General Capital*		Water Utility	
	Principal	Interest	Principal	Interest
2014	\$ 14,715,000.00	\$ 9,552,568.10	\$ 1,985,000.00	\$ 844,728.75
2015	15,095,000.00	8,934,228.25	1,660,000.00	774,408.75
2016	16,690,000.00	8,262,725.65	1,640,000.00	713,808.75
2017	19,015,000.00	7,565,482.70	1,620,000.00	652,683.75
2018	20,340,000.00	6,800,040.10	1,615,000.00	591,665.00
2019	20,370,000.00	5,927,837.70	1,630,000.00	514,912.50
2020	19,445,000.00	4,950,435.03	1,140,000.00	437,627.50
2021	18,055,000.00	4,012,802.88	1,135,000.00	384,880.00
2022	13,438,217.30	5,652,606.70	510,000.00	332,420.00
2023	11,976,810.65	5,377,983.35	515,000.00	311,195.00
2024	11,967,831.35	5,156,962.65	525,000.00	289,487.50
2025	10,262,922.20	4,946,871.80	530,000.00	267,175.00
2026	10,722,049.60	4,815,544.40	540,000.00	244,470.00
2027	11,212,321.65	4,684,272.35	550,000.00	220,890.00
2028	11,743,532.85	4,516,373.65	560,000.00	195,640.00
2029	3,480,525.55	4,344,743.45	570,000.00	169,800.00
2030	3,635,112.00	4,489,437.00	220,000.00	143,100.00
2031	903,130.80	4,636,869.20	235,000.00	132,100.00
2032	896,877.30	4,973,122.70	245,000.00	120,350.00
2033	890,704.00	5,329,296.00	260,000.00	108,100.00
2034			275,000.00	95,100.00
2035			290,000.00	81,350.00
2036			307,000.00	66,850.00
2037			324,000.00	51,500.00
2038			343,000.00	35,300.00
2039			363,000.00	18,150.00
	<u>\$ 234,855,035.25</u>	<u>\$ 114,930,203.66</u>	<u>\$ 19,587,000.00</u>	<u>\$ 7,797,692.50</u>

*Includes Capital Appreciation Bonds.

The above schedule does not include interest on the Essex County Improvement Authority Pool Loan Program Bonds which is calculated by the Authority on a monthly basis.

10. MUNICIPAL DEBT (Continued)

General Capital and Water Utility Bonds (Continued)

Certain maturities of the \$40,747,035.25 General Obligation Refunding Bonds (Pension Refunding) were sold as Capital Appreciation Bonds which are not subject to optional redemption. Interest is paid upon maturity. Below is the debt service schedule:

<u>Year</u>	<u>Principal</u>	<u>Interest</u>	<u>Total</u>
2022	\$ 988,217.30	\$ 2,301,782.70	\$ 3,290,000.00
2023	976,810.65	2,508,189.35	3,485,000.00
2024	967,831.35	2,727,168.65	3,695,000.00
2025	957,922.20	2,957,077.80	3,915,000.00
2026	947,049.60	3,197,950.40	4,145,000.00
2027	937,321.65	3,457,678.35	4,395,000.00
2028	928,532.85	3,726,467.15	4,655,000.00
2029	920,525.55	4,014,474.45	4,935,000.00
2030	912,112.00	4,317,888.00	5,230,000.00
2031	903,130.80	4,636,869.20	5,540,000.00
2032	896,877.30	4,973,122.70	5,870,000.00
2033	890,704.00	5,329,296.00	6,220,000.00
	<u>\$ 11,227,035.25</u>	<u>\$ 44,147,964.75</u>	<u>\$ 55,375,000.00</u>

Waste Water Treatment Loan Payable - Sewer Utility Fund

Loan agreements were entered into by the City of Newark with the Department of Environmental Protection for the purpose of improvements to the Waste Water Treatment Plant. Loans outstanding at December 31, 2013 are detailed as follows:

Trust Loan	\$ 25,227,025.95
Fund Loan	<u>44,473,143.16</u>
	<u>\$ 69,700,169.11</u>

It is noted that the fund loan was issued interest-free.

10. MUNICIPAL DEBT (Continued)

Waste Water Treatment Loan Payable - Sewer Utility Fund (Continued)

A schedule of principal and interest on the loans is as follows:

Cash Basis				
<u>Year</u>	<u>Total</u>	<u>Principal</u>	<u>Interest</u>	<u>Fund Loan Principal</u>
2014	\$ 6,802,955.82	\$ 2,422,025.95	\$ 1,150,975.01	\$ 3,229,954.86
2015	6,209,899.33	1,940,000.00	1,041,168.76	3,228,730.57
2016	5,496,690.00	1,325,000.00	945,687.52	3,226,002.48
2017	5,495,773.11	1,390,000.00	882,781.26	3,222,991.85
2018	5,493,088.13	1,450,000.00	816,768.76	3,226,319.37
2019	5,488,314.40	1,520,000.00	746,981.26	3,221,333.14
2020	5,497,819.89	1,590,000.00	681,756.26	3,226,063.63
2021	5,409,757.21	1,600,000.00	612,218.76	3,197,538.45
2022	5,432,092.00	1,690,000.00	537,993.75	3,204,098.25
2023	5,374,646.29	1,730,000.00	460,768.76	3,183,877.53
2024	5,369,050.40	1,805,000.00	385,075.00	3,178,975.40
2025	5,307,458.37	1,860,000.00	304,318.76	3,143,139.61
2026	3,811,840.39	1,430,000.00	221,837.50	2,160,002.89
2027	3,778,450.22	1,485,000.00	157,400.00	2,136,050.22
2028	1,567,736.05	755,000.00	92,250.00	720,486.05
2029	1,568,536.34	790,000.00	58,050.00	720,486.34
2030	714,342.52	445,000.00	22,250.00	247,092.52
	<u>\$ 78,818,450.47</u>	<u>\$ 25,227,025.95</u>	<u>\$ 9,118,281.36</u>	<u>\$ 44,473,143.16</u>

Capital Lease Program

The City has entered into various agreements with the Essex County Improvement Authority to be a participant in the Capital Equipment Lease Program and the Sportsplex Program. Funds were allocated to the City which are detailed as follows:

<u>Date</u>	<u>Description</u>	<u>Amount</u>
March 15, 1994	Guarantee Lease Revenue Bond	\$ 1,500,000.00
June 1, 1997	Sportsplex Revenue Bonds	11,170,000.00
2010	Building Capital Lease Program	74,080,000.00
		<u>\$86,750,000.00</u>

10. MUNICIPAL DEBT (Continued)

Capital Lease Program (Continued)

A schedule of principal and interest payments for the leases as of December 31, 2013 are as follows:

<u>Year</u>	<u>Total Debt Service</u>	<u>Principal</u>	<u>Interest</u>
2014	\$ 2,504,660.50	\$ 1,685,000.00	\$ 819,660.50
2015	1,551,708.13	795,000.00	756,708.13
2016	1,549,623.13	835,000.00	714,623.13
2017	1,555,760.63	885,000.00	670,760.63
2018	1,554,285.63	930,000.00	624,285.63
2019	1,550,460.63	975,000.00	575,460.63
2020	1,549,285.63	1,025,000.00	524,285.63
2021	1,260,498.13	790,000.00	470,498.13
2022	1,238,377.50	810,000.00	428,377.50
2023	1,244,629.38	860,000.00	384,629.38
2024	1,238,326.88	900,000.00	338,326.88
2025	1,554,737.50	1,265,000.00	289,737.50
2026	1,599,686.88	1,375,000.00	224,686.88
2027	1,599,195.63	1,445,000.00	154,195.63
2028	895,043.75	815,000.00	80,043.75
2029	891,346.88	855,000.00	36,346.88
	<u>\$ 23,337,626.81</u>	<u>\$ 16,245,000.00</u>	<u>\$ 7,092,626.81</u>

The above-mentioned leases are not reflected on the financial statements herein.

Bond Anticipation Notes

Outstanding Bond Anticipation Notes were issued at various rates and are summarized as follows:

	<u>Original Issue</u>	<u>Amount</u>
General Capital Fund:		
Tax Appeal Refunding Bond	12-03-08	\$ 2,677,575.00
Various Capital Improvements	12-14-11	33,328,000.00
Tax Appeal Refunding Bond	12-29-11	2,441,425.00
Various Capital Improvements	06-28-12	19,079,000.00
Various Capital Improvements	06-27-13	1,238,000.00
		<u>\$ 58,764,000.00</u>

Statutory requirements for providing sums equivalent to legally payable installments for the redemption of notes (Budget Appropriations) and permanent funding (Bond Issues) are summarized as follows:

<u>Original Note Issued</u>	<u>Legal Installment Due</u>	<u>Permanent Funding Required as of May 1</u>
2008	2011 - 2018	2019
2011	2014 - 2022	2023
2012	2015 - 2023	2024
2013	2016 - 2024	2025

10. MUNICIPAL DEBT (Continued)

Bonds and Notes Authorized but Not Issued

There were Bonds and Notes Authorized but Not Issued in the following amounts:

	Balance Dec. 31, 2013
General Capital Fund:	
General Improvements	<u>\$ 38,133,379.89</u>
Water Utility Capital Fund:	
General Improvements	<u>\$ 36,179,250.74</u>
Sewer Utility Capital Fund:	
General Improvement	<u>\$ 46,345,210.00</u>

11. SCHOOL DEBT

The Board of Education of the City of Newark was a Type I School District and the school debt, authorized by the Board of School Estimate, are obligations of the City and school debt service is raised as part of the school tax levy. School debt is reported on the balance sheet of the General Capital Fund and is detailed as follows:

\$20,390,000, 2008 Refunding School Bonds due in annual installments of \$4,655,000 to \$5,340,000 through September 2017, interest at 4.00% to 5.00%	\$ 20,020,000.00
\$82,555,000, 2002 Refunding School Bonds due in annual installments of \$3,050,000 to \$7,850,000 through March 2015, interest at 5.375%	6,080,000.00
\$43,917,000, 2010 General School Bonds due in annual installments of \$1,000,000 to \$6,095,000 through June 2025, interest at 3.00% to 5.00%	<u>43,917,000.00</u>
	<u>\$ 70,017,000.00</u>

The Board of Education of the City of Newark is presently a Type II School District. The members of the Board of Education are elected by the voters of the school district on the third Tuesday in April. At each annual school election the Board of Education shall submit to the voters of the district the amount of money fixed and determined in its budget, excluding interest and debt redemption charges, to be voted upon for use of the public schools of the district for the ensuing school year.

School debt is deductible up to the extent of 8.0% of the Average Equalized Assessed Valuations of real property for the Local School Debt.

Bonds and Notes Authorized but Not Issued

There were Bonds and Notes Authorized but Not issued in the following amount:

	Balance Dec. 31, 2013
School	<u>\$ 13,726,000.00</u>

11. SCHOOL DEBT (Continued)

Bond Anticipation Notes

There were no outstanding Bond Anticipation Notes as of December 31, 2013.

12. INTERFUND RECEIVABLES AND PAYABLES

As of December 31, 2013, interfund receivables and payables that resulted from various interfund transactions were as follows:

	<u>Due from Other Funds</u>	<u>Due to Other Funds</u>
Current Fund	\$ 180,802.00	\$ 808,376.76
Federal and State Grant Fund		376,831.23
Assessment Trust Fund	288,154.55	
Animal Control Trust Fund		4,671.48
Other Funds	265,060.80	29,342.57
Insurance Fund	678,495.15	
Payroll Agency Fund	219,255.21	54,097.49
General Capital Fund	104,877.15	24,000.00
Water Operating Fund		37,378.39
Water Capital Fund	15,134.69	46,000.00
Sewer Operating Fund	145,971.40	8,039.90
Sewer Capital Fund		148,606.09
	<u>\$1,897,750.95</u>	<u>\$1,537,343.91</u>

13. DEFERRED CHARGES TO BE RAISED IN SUCCEEDING YEARS BUDGETS

Certain expenditures are required to be deferred to budgets of succeeding years. The deferred charges as of December 31, 2013 are as follows:

	<u>Balance Dec. 31, 2013</u>	<u>Required for 2014 Budget</u>
Liability Payout	\$ 4,200,000.00	\$ 1,400,000.00
Revaluation	800,000.00	800,000.00
Hurricane Sandy Costs	5,200,000.00	1,300,000.00
	<u>\$ 10,200,000.00</u>	<u>\$ 3,500,000.00</u>
Deficit in Operations	<u>\$ 30,121,208.59</u>	<u>\$ 3,012,121.00 *</u>

*The City received approval from the State Local Finance Board for a ten (10) year amortization.

14. DEFERRED COMPENSATION PLAN

The City of Newark offers its employees a Deferred Compensation Plan created in accordance with the provisions of N.J.S. 43:15B-1 et seq., and the Internal Revenue Code, Section 457. The plan, available to all municipal employees, permits them to defer a portion of their salary until future years. The deferred compensation is not available to employees until termination, retirement, death, or unforeseeable emergency.

Statutory and regulatory requirements governing the establishment and operation of Deferred Compensation Plans have been codified in the New Jersey Administrative Code under the reference N.J.A.C. 5:37.

The "Small Business Job Protective Act of 1996" revised several provisions of Section 457 of the Internal Revenue Code. A provision of the act required that all existing plans be modified to provide that the funds be held for the exclusive benefit of the participating employees and their beneficiaries. The City of Newark authorized such modifications to their plan by resolution of the City Council.

The Administrators for the City of Newark Deferred Compensation Plan is the Great-West Life Assurance Company and the MetLife Companies.

15. RISK MANAGEMENT

The City of Newark maintains self-insurance programs for General Liability, Automobile and Worker's Compensation. These programs are funded through budget appropriations from the Current, Water and Sewer Utility Funds.

In addition, the City is self-insured with respect to State Unemployment Compensation. A summary of activity is detailed as follows:

	Balance Dec. 31, 2012	Increase	Decrease	Balance Dec. 31, 2013
Worker's Compensation	\$ 646,366.62	\$ 9,165,609.44	\$ 8,197,822.41	\$ 1,614,153.65
Liability Fund	6,454,814.07	7,025,091.87	3,939,207.88	9,540,698.06
State Unemployment	1,011,675.79	2,614,960.34	834,338.08	2,792,298.05

16. CONTINGENT LIABILITIES

A. Arbitrage Rebate Calculation

In 1986, under the Tax Reform Act, the arbitrage rebate law went into effect requiring issuers of tax exempt debt obligations to rebate to the Federal Government all of the earnings in excess of the yield on investments of proceeds of such debt issuances (the "rebate arbitrage"). During 1989 the City issued tax exempt debt obligations subject to arbitrage rebate. The Rebate Regulations require the calculation of rebatable arbitrage by analyzing the cash flows of the proceeds of an issue and "future valuing" the investment cash flows at an interest rate equal to the yield on the issue. The Rebate Regulations apply to obligations issued after August 31, 1986. The arbitrage rebate liability must be calculated every installment computation date (last day of the fifth bond year) or earlier if the bonds are retired, defeased or refunded and pay at least 90% of the rebatable arbitrage (plus any earnings thereon) within 60 days after such date. The City does not calculate their arbitrage rebate liability each year. However, during 2008, the City authorized a contract with an outside consultant to perform arbitrage calculations and several reports have been filed during 2008.

16. CONTINGENT LIABILITIES (Continued)

B. Compensated Absences

The City's policy for accrued sick and vacation benefits is as follows:

Every permanent employee is granted a maximum of 23 vacation days per year based on years of service. An employee applying for retirement is entitled to vacation time in the current year and vacation accrued from the preceding year. Vacation time, with approval, may be carried over only one year. If not used, it is then lost.

Every permanent employee is granted one (1) day of sick leave for each month of service up to December 31st for the first year of employment, and fifteen (15) days per year after that. Unused sick leave can be accumulated and may be converted into cash upon retirement, depending upon labor contract provisions of the job title.

A separate contract exists with the Police and Fire personnel for vacation and sick time.

Generally, the City requires employees with accumulated vacation, holiday, personal and compensatory leave credits to extend their separation dates beyond their last working day in order to exhaust all such accumulated time. Replacement personnel are hired only after position is no longer encumbered. Where circumstances warrant lump sum payment (for such accumulated credits) at time of separation, position remains unavailable for hiring until such time as that expenditure is amortized over the period had the employee remained on the payroll beyond his last working day as above. Sole general exception is payment for unused sick leave which is distributed to eligible nonuniformed employees only upon retirement.

City officials have determined that the sum of \$50,289,568.49 has accumulated for unused sick and vacation pay and would be due to employees upon their retirements. This amount has not been verified by audit.

The sum, considered as a contingent liability, is not carried on the Financial Statements of the City.

C. Tax Appeals

As at December 31, 2013, there were tax appeals pending before the New Jersey Tax Court which are in an undetermined amount.

Judgments, adverse to the City, would apply to the year of appeal plus at least two subsequent years. Refunds or tax credits, including statutory interest thereon, would be chargeable to operations or future budget appropriations.

County taxes paid on the reductions in assessed valuations are subject to credits against the County Tax Levy of the year subsequent to the year in which appeals were adjudicated.

D. Federal and State Awards

The City participates in several federal and state grant programs which are governed by various rules and regulations of the grantor agencies; therefore to the extent that the City has not complied with the rules and regulations governing the grants, refunds of any money received may be required and the collectibility of any related receivable at December 31, 2013 may be impaired.

E. Litigation

The following is based on the opinion of legal counsel (Corporation Counsel):

Negligence Actions:

There are presently lawsuits alleging tortious conduct and claiming damages against the City.

Contract Actions/Public Bidding:

There are presently lawsuits based upon breach of contractual obligations against the City.

Labor and Employment Matters:

There are various labor and employment matters against the City.

16. CONTINGENT LIABILITIES (Continued)

E. Litigation (Continued)

For all cases above, the City is self-insured and there are appropriate reserves sufficient to cover losses based on experience and to the knowledge of the Corporation Counsel there is no threat of exposure outside of the self-insured program.

Prerogative Writ Cases:

There are prerogative writ cases challenging municipal action against the City. It does not appear that any of these actions will have a material adverse impact on the City.

Tax Foreclosures:

The City conducted an In Rem Tax Foreclosure in 2007, 2011 and 2014. The City is defending a few cases arising out of the 2007, 2011 and 2014 In Rem Tax Foreclosure. At this time it does not appear that any of these actions would have a materially adverse impact upon the City.

Water and Sewer Utility:

The City is not a defendant in any suit concerning requirements for the installation or financing or operating of the water and sewer utilities or other improvements or with respect to any land use questions whereby the outcome would have any materially adverse effect upon the financial status of the City.

Tax Appeals:

There are property tax appeals pending in the Tax Court of New Jersey against the City involving commercial, industrial and residential properties. At this point it is impossible to specifically quantify the extent of any potential exposure to the City relating to these appeals. There should be no substantial additional impact upon the financial status of the City.

The Office of Corporation Counsel is currently unaware of any litigation presently pending or threatened in any manner questioning the austerity or the proceedings for the levy or the collection of taxes and neither the corporate existence over the boundaries of the City nor the title of any of the present officers thereof to their respective officers is being contested.

17. POTENTIAL LIABILITY

In the City's Memorandum of Understanding (MOU) with the State of New Jersey, under the caption **"Required to Reimburse the State Under Certain Conditions"**, it states "that to ensure that aid provided in 2012 is not again in excess of the Municipality's needs and the Municipality shall be required to appropriate as a repayment to the State in its 2013 Budget all funds above \$10,000,000.00 that are available to be used as revenue in support of the 2013 Budget according to the 2012 Annual Unaudited Financial Statement". The City's 2012 Annual Unaudited Financial Statement indicated a Fund Balance of \$12,959,747.74 and the City anticipated the sum of \$12,904,747.74 in the 2013 Budget as revenue. We did not see the amount of \$2,959,747.74 set up in the 2012 Annual Unaudited Financial Statement as a liability or in the 2013 Budget as an appropriation in accordance with MOU.

The 2012 Audit reflects a Fund Balance of \$11,411,387.66. The sum of \$1,411,387.66 has not been set up as a liability as of December 31, 2012 since the State approved the 2013 Budget without an appropriation or a liability for the amount in excess of \$10,000,000.00. No provision has been made in the 2013 Audit for the above amount.

CITY OF NEWARK
CURRENT FUND

CASH RECEIPTS AND DISBURSEMENTS

A-4
Sheet #1

	<u>Ref.</u>	<u>Regular Fund</u>	<u>State and Federal Grant Funds</u>
Balance December 31, 2012	A	\$ 128,456,976.72	\$ 27,848,376.42
Increased by Receipts:			
Operations	A-1		\$
Interest and Costs on Taxes and Assessments	A-2	4,080,691.91	
Miscellaneous Revenue Not Anticipated	A-2	2,236,247.05	
Budget Refund	A-5	979,957.71	
Transferred from Cash on Deposit with State	A-6	10,194,057.38	
Petty Cash Funds Returned	A-8	4,800.00	
Property Taxes Receivable	A-9	312,194,759.72	
Tax Title Liens Receivable	A-10	6,088,151.24	
Revenue Accounts Receivable	A-13	312,054,241.55	
Delinquent Tax Abatement Accounts Receivable	A-14	13,923,828.58	
Protested Checks	A-15	200.00	
State and Federal Grants Receivable	A-22		69,347,801.85
Void Check Pending Distribution	A-28	14,200.00	
Due from State of New Jersey	A-30	330,095.96	
Due to State for Marriage Licenses	A-31	47,209.00	
Interfunds Payable	A-32	272,092.95	
Due to State of New Jersey - Construction Fees	A-34	565,295.00	
Various Liabilities Funds	A-35	5,562,139.16	
Tax Overpayments	A-37	2,397,532.48	
Prepaid Taxes	A-39	1,839,389.66	
Prepaid Tax Abatements	A-39	106,666.77	
Prepaid Improvement Taxes Receivable	A-40	31,552.61	
Tax Anticipation Note Issued	A-45	54,950,000.00	
Emergency Note Payable	A-46	9,814,000.00	
Budget Appropriation Transferred - State and Federal Grants	A-48		916,189.00
Interfunds Payable	A-49		195,727.94
Unallocated Receipts	A-50		8,057.27
Unapplied Federal Grants	A-53		1,214,495.37
UEZ Loan Repayment	A-55		171,651.51
		<u>737,687,108.73</u>	<u>71,853,922.94</u>
Total (Carried Forward)		<u>866,144,085.45</u>	<u>99,702,299.36</u>

CITY OF NEWARK
CURRENT FUND

CASH RECEIPTS AND DISBURSEMENTS

A-4
Sheet #2

	<u>Ref.</u>	<u>Regular Fund</u>	<u>State and Federal Grant Funds</u>
Total (Brought Forward)		\$ 866,144,085.45	\$ 99,702,299.36
Decreased by Disbursements:			
Prior Year Refund	A-1	\$ 458,939.17	
Appropriation Expenditures	A-3	519,004,787.62	
Local Match for Grant	A-3	916,189.00	
Budget Refund	A-5	979,957.71	
Petty Cash Funds Established	A-6	5,900.00	
Protested Checks	A-15	810,961.45	
Due from East Orange-Passaic Valley	A-16	26,726.00	
Due from Payroll Transfer Account	A-17	28,915.06	
Interfunds Receivable	A-18,20	175,898.12	482.00
State and Federal Grants Receivable	A-23		20,889.92
Appropriation Reserves	A-26	25,289,771.05	
Commitments Payable	A-27	310,154.24	
Due to State for Marriage License	A-31	31,150.00	
Interfunds Payable	A-32	1,018,417.22	
Due to Special District Fund	A-33	3,113,304.95	
State of New Jersey - Construction Fund	A-34	306,897.00	
Various Liabilities Funds	A-35	5,887,241.49	
Reserve for Tax Appeals Pending	A-36	4,246,008.45	
Tax Overpayments	A-37	1,060,496.00	
Reserve for Hurricane Sandy	A-38	4,186,060.72	
Reserve for Master Plan	A-42	137,875.00	
County Taxes Payable	A-43	75,031,426.82	
Local School District Tax Payable	A-44	108,957,123.50	
Tax Anticipation Notes Paid	A-45	45,000,000.00	
Emergency Note Paid	A-46	13,645,000.00	
State and Federal Grants	A-48		75,601,213.52
Interfunds Payable	A-49		
Reserve for Elderly Nutrition	A-51		48,112.60
Unapplied Federal Grants	A-53		
		<u>810,629,200.57</u>	<u>75,670,698.04</u>
Balance December 31, 2013	A	<u>\$ 55,514,884.88</u>	<u>\$ 24,031,601.32</u>

CITY OF NEWARK
CURRENT FUND

BUDGET REFUNDS

A-5

	<u>Ref.</u>	
Increased by:		
Cash Receipts	A-4	\$ 979,957.71
Decreased by:		
Cash Disbursed	A-4	<u>979,957.71</u>
		<u>\$ -</u>

CASH RECEIPTS AND DISBURSEMENTS
DEPOSIT WITH STATE OF NEW JERSEY

A-6

	<u>Ref.</u>	
Balance December 31, 2012	A	\$10,214,648.98
Increased by:		
Cash Receipt Deposited with State for Qualified Bonds	A-13	<u>9,765,646.29</u> <u>19,980,295.27</u>
Decreased by:		
Cash Receipt in Current Fund	A-4	<u>10,194,057.38</u>
Balance December 31, 2013	A,Below	<u>\$ 9,786,237.89</u>
<u>Analysis of Balance</u>		
Qualified Bond Act - To Pay Six Months of Debt and Excess for Refunding Bonds		<u>\$ 9,765,646.29</u> <u>20,591.60</u>
Excess Funding		
	Above	<u>\$ 9,786,237.89</u>

CITY OF NEWARK
CURRENT FUND

CHANGE FUNDS

A-7

	<u>Ref.</u>	
Balance December 31, 2012	A	<u>\$ 2,440.00</u>
Balance December 31, 2013	A	<u><u>\$ 2,440.00</u></u>
<u>Analysis of Balance</u>		
Tax Receiver's Office		\$ 1,500.00
Dog License Control		25.00
Electrical Bureau		100.00
Vital Statistics		50.00
Municipal Court		50.00
Change Fund		<u>715.00</u>
		<u><u>\$ 2,440.00</u></u>

PETTY CASH FUNDS

A-8

	<u>Ref.</u>	
Balance December 31, 2012	A	\$ 1,700.00
Increased by:		
Petty Cash Funds Established	A-4	<u>5,900.00</u>
		7,600.00
Decreased by:		
Petty Cash Funds Returned	A-4	<u>4,800.00</u>
Balance December 31, 2013	A	<u><u>\$ 2,800.00</u></u>
<u>Net Debit to Operations</u>		
Balance December 31, 2013	Above	\$ 2,800.00
Balance December 31, 2012	Above	<u>1,700.00</u>
Net Debit to Operations	A-1	<u><u>\$ 1,100.00</u></u>

CITY OF NEWARK
CURRENT FUND

TAXES RECEIVABLE AND ANALYSIS OF 2013 PROPERTY TAX LEVY

A-9

Year	Balance Dec. 31, 2012	2013 Levy	Added Taxes	Collections by Cash		Cancelled and Remitted	Transferred to Foreclosed Property	Transferred to Tax Title Liens	Due State of New Jersey Senior Citizen	Balance Dec. 31, 2013
				2012	2013					
1997	\$ 1,101.47	\$	\$	\$	\$	\$	\$	\$	\$	\$ 1,101.47
1998			6,880.88		1,160.39			6,880.88		(1,160.39)
1999	5,512.33		9,370.46					9,370.46		5,512.33
2000	888.82		9,341.93					9,341.92		888.83
2001	373.58		10,325.99			374.60		10,325.99		(1.02)
2002	7,630.85		10,226.51			994.15		10,226.51		6,636.70
2003	22,612.64		4,505.56			13,943.87		4,505.56		8,668.77
2004	4.85		1,284.73					1,284.73		4.85
2005	5,675.03		639.15		3,306.15	2,357.54		3,624.41		(2,973.92)
2006	12,369.12		2,980.96			13,081.90		5,201.61		(2,933.43)
2007	37,429.34		9,769.39		1,916.88	8,601.58		5,201.61		31,478.66
2008	17,694.26		11,698.10			13,764.23		5,429.31		10,198.82
2009	25,726.12		15,067.24		17,629.35	26,277.37		5,721.77		(8,835.13)
2010	32,134.23		56,152.96		51,721.05	22,160.51		6,643.02		7,762.61
2011	93,755.75		144,835.86		67,756.84	60,907.94		6,952.19		86,039.40
2012	1,536,096.93		6,429,317.52		2,934,468.31	2,133,002.05	16,935.24	623,298.31		2,304,800.24
	1,799,005.32		6,722,397.24		3,077,958.97	2,295,465.74	(30,154.46)	714,008.28		2,447,168.79
2013		390,899,245.25		39,393,524.29	309,116,800.75	15,777,003.95	(13,219.22)	6,181,683.56	307,589.72	20,006,544.37
	<u>\$ 1,799,005.32</u>	<u>\$ 390,899,245.25</u>	<u>\$ 6,722,397.24</u>	<u>\$ 39,393,524.29</u>	<u>\$ 312,194,759.72</u>	<u>\$ 18,072,469.69</u>	<u>\$ 102,879.39</u>	<u>\$ 6,895,691.84</u>	<u>\$ 307,589.72</u>	<u>\$ 22,453,733.16</u>
	A	Below	Reserve	A-2,39,40	A-2,4	Reserve	A-11	A-10	A-2,30	A

ANALYSIS OF 2013 PROPERTY TAX LEVY

Ref.		Ref.	
<u>Tax Yield</u>		<u>Tax Levy</u>	
General Purpose Tax	\$ 383,666,620.97	Local School District Tax	A-44 \$ 108,957,123.50
Special District Taxes	3,870,357.00	Addition to Local District	A-2 5,585,160.00
Added and Omitted Taxes	3,362,267.28		\$ 114,542,283.50
		County Taxes	A-43 76,799,188.56
		Minimum Library Tax	A-2 4,907,964.17
		Local Purpose Tax (Abstract)	A-2 188,803,048.84
		Plus: Additional Tax Levied	Reserve 1,976,403.18
			190,779,452.02
		Special District Tax	A-33 3,870,357.00
Above	<u>\$ 390,899,245.25</u>	Local Tax for Municipal Purpose Levies	Above \$ 390,899,245.25

CITY OF NEWARK
CURRENT FUND

TAX TITLE LIENS

A-10

	<u>Ref.</u>		
Balance December 31, 2012	A		\$27,954,820.15
Increased by:			
Transfers from Taxes Receivable	A-9	\$ 6,895,691.84	
Transfers from Delinquent Tax			
Abatements	A-14	393,391.13	
Interest and Costs on Tax Sales - 2013	Reserve	<u>175,472.54</u>	
			<u>7,464,555.51</u>
			35,419,375.66
Decreased by:			
Collections	A-2,4	6,088,151.24	
Transferred to Foreclosed Property	A-11	<u>285,240.92</u>	
			<u>6,373,392.16</u>
Balance December 31, 2013	A		<u>\$29,045,983.50</u>

CITY OF NEWARK
CURRENT FUND

PROPERTY ACQUIRED FOR TAXES
ASSESSED VALUATIONS

A-11

	<u>Ref.</u>		
Balance December 31, 2012	A		\$131,224,637.97
Increased by:			
Transferred from Taxes Receivable	A-9	\$ 116,098.61	
Transferred from Tax Title Liens	A-10	<u>285,240.92</u>	
			<u>401,339.53</u>
			131,625,977.50
Decreased by:			
Transferred to Taxes Receivable	A-9		<u>13,219.22</u>
Balance December 31, 2013	A		<u><u>\$131,612,758.28</u></u>

SALES CONTRACTS RECEIVABLE
SALE OF PROPERTY

A-12

	<u>Ref.</u>		
Balance December 31, 2012	A		<u>\$ 12,544,477.53</u>
Balance December 31, 2013	A		<u><u>\$ 12,544,477.53</u></u>

CITY OF NEWARK
CURRENT FUND

REVENUE ACCOUNTS RECEIVABLE

A-13
Sheet #1

	<u>Ref.</u>	<u>Balance Dec. 31, 2012</u>	<u>2013 Charges</u>	<u>Collected by Treasurer</u>	<u>Balance Dec. 31, 2013</u>
<u>Office of the Mayor and Agencies</u>					
Municipal Court Fines	A-2	\$ 1,661,364.23	\$ 11,903,776.77	\$ 13,565,141.00	\$
<u>City Clerk and Municipal Council</u>					
City Clerk - Licenses	A-2		13,520.00	13,520.00	
<u>Department of Finance</u>					
Energy Receipts Tax	A-2		65,237,979.02	65,237,979.02	
Consolidated Municipal Property Relief Act	A-2		34,939,731.00	34,939,731.00	
Business Personal Property Replacement Aid - School	A-2		1,112,407.00	1,112,407.00	
FEMA Reimbursement of Prior Year Expenses (offset to Hurricane Sandy)	A-2		1,596,351.34	1,596,351.34	
Host Municipal Agreement	A-2		5,270,765.40	5,270,765.40	
Car Rental Tax	A-2		3,000,000.00	3,000,000.00	
Special Events - City Services	A-2		55,428.62	55,428.62	
Sale of City Owned Property - 2012	A-2		621,566.50	621,566.50	
HESS Settlement	A-2		11,000,000.00	11,000,000.00	
Port Newark Lease - Port of New York and New Jersey Authority	A-2		84,744,312.00	84,744,312.00	
Rent - City-Owned Property	A-2		467,911.80	467,911.80	
Interest on Investments	A-2		90,325.44	90,325.44	
Reimbursement - In-Kind Water	A-2		2,500,000.00	2,500,000.00	
Reimbursement - In-Kind Sewer	A-2		2,500,000.00	2,500,000.00	
Reimbursement of Fringe Benefits	A-2		1,249,256.82	1,249,256.82	
Reimbursement of Debt Service	A-2		458,394.35	458,394.35	
Military Park Garage - Excess Profit	A-2		242,169.03	242,169.03	
Other Miscellaneous Revenue - Finance	A-2		1,815,990.57	1,815,990.57	
Franchise Tax - Cablevision Fee	A-2		740,085.07	740,085.07	
Easement Rights	A-2		45,058.00	45,058.00	
Payment in Lieu of Taxes - PVSC	A-2		815,341.91	815,341.91	
Information Fees	A-2		57,518.32	57,518.32	
General Capital Surplus	A-2		5,584,000.00	5,584,000.00	
State Aid - Building Allowance for School	A-2		5,916,458.00	5,916,458.00	
<u>Tax Collector</u>					
Tax Searches	A-2		2,792.00	2,792.00	
<u>Division of Tax Abatement and Special Taxes</u>					
Payroll Taxes - Including Interest and Penalties	A-2		41,892,052.18	41,892,052.18	
Parking Tax - Including Interest and Penalties	A-2		20,669,184.29	20,669,184.29	
Hotel Occupancy Tax	A-2		6,264,323.68	6,264,323.68	
<u>Department of Police</u>					
Bureau of Identification	A-2		4,769.50	4,769.50	
Alcoholic Beverage Control	A-2		912,238.00	912,238.00	
<u>Department of Fire</u>					
Fire Safety Fees Including State Registration Fees	A-2		164,532.29	164,532.29	
<u>Department of Health</u>					
Bureau of Vital Statistics	A-2		778,573.00	778,573.00	
<u>Department of Licenses and Permits</u>					
Division of Inspections	A-2		1,291,547.69	1,291,547.69	
Certificate of Code Enforcements	A-2		286,135.00	286,135.00	
<u>Construction Code</u>					
Fees and Permits	A-2		4,765,692.00	4,765,692.00	

CITY OF NEWARK
CURRENT FUND

REVENUE ACCOUNTS RECEIVABLE

A-13
Sheet #2

	<u>Ref.</u>	<u>Balance Dec. 31, 2012</u>	<u>2013 Charges</u>	<u>Collected by Treasurer</u>	<u>Balance Dec. 31, 2013</u>
<u>Other Departments</u>					
Miscellaneous Fees and Permits	A-2	\$	\$ 632,618.94	\$ 632,618.94	\$
<u>Department of Engineering</u>					
Bureau of Sidewalks - Street and Sidewalk Paving	A-2		515,718.08	515,718.08	
		<u>\$ 1,459,402.83</u>	<u>\$ 320,158,523.61</u>	<u>\$ 321,819,887.84</u>	<u>\$</u>

Reference

Reserve

Below

A

Ref.

Cash	A-4	\$ 312,054,241.55
Deposit with State of New Jersey - Qualified Bonds	A-6	<u>9,765,646.29</u>
	Above	<u>\$ 321,819,887.84</u>

CITY OF NEWARK
CURRENT FUND

DELINQUENT TAX ABATEMENT ACCOUNTS RECEIVABLE

A-14

	<u>Ref.</u>		
Balance December 31, 2012	A		\$ 1,228,400.29
Increased by:			
Billing	Reserve		<u>22,027,357.69</u>
			23,255,757.98
Decreased by:			
Collection	A-4	\$ 13,923,828.58	
Prepaid Applied	A-39	<u>1,248,397.84</u>	
	A-2	<u>15,172,226.42</u>	
Transferred to Tax Title Liens	A-10	393,391.13	
Land Tax Credits	Reserve	<u>5,394,347.34</u>	
			<u>20,959,964.89</u>
Balance December 31, 2013	A,Below		<u>\$ 2,295,793.09</u>
<u>Analysis of Balance</u>			
Detail on File with Tax Collector on New System	Above		<u>\$ 2,295,793.09</u>

The detail includes credit balance which should be adjusted.

CITY OF NEWARK
CURRENT FUND

PROTESTED CHECKS

A-15

	<u>Ref.</u>	
Balance December 31, 2012	A	\$1,817,516.72
Increased by:		
Protested Bank Charges	A-4	<u>810,961.45</u>
		2,628,478.17
Decreased by:		
Cash Receipts	A-4	<u>200.00</u>
Balance December 31, 2013	A	<u>\$2,628,278.17</u>
<u>Analysis of Net Debit to Operations</u>		
Balance December 31, 2013	Above	\$2,628,278.17
Balance December 31, 2012	Above	<u>1,817,516.72</u>
Net Credits to Operations	A-1	<u>\$ 810,761.45</u>

CITY OF NEWARK
CURRENT FUND

OTHER RECEIVABLES

A-16

Deposits with County Registrar

Ref.

Balance December 31, 2012	A	\$ 2,231.35
Balance December 31, 2013	A	<u>\$ 2,231.35</u>

Analysis of Balance

Account
Number

Law Department	1036	\$ (42.50)
Code Enforcement	1406	2.10
Foreclosure Account	1421	792.05
Demolition	1480	744.20
Real Property	1482	322.50
Development	1525	79.00
Water	1736	2.00
Sanitation	1170	332.00
		<u>\$ 2,231.35</u>

Due from Housing for Senior Citizen Funds
from State of New Jersey

Ref.

Balance December 31, 2012	A	\$14,905.96
Balance December 31, 2013	A	<u>\$14,905.96</u>

Due from East Orange-Passaic Valley

Ref.

Balance December 31, 2012	A	\$63,392.00
Increased by:		
Cash Disbursed	A-4	<u>26,726.00</u>
Balance December 31, 2013	A	<u>\$90,118.00</u>
Balance December 31, 2013		\$90,118.00
Balance December 31, 2012		<u>63,392.00</u>
Net Charge to Operations	A-1	<u>\$26,726.00</u>

CITY OF NEWARK
CURRENT FUND

DUE FROM PAYROLL TRANSFER ACCOUNT

A-17

	<u>Ref.</u>	
Balance December 31, 2012	A	\$238,973.32
Increased by:		
Cash Disbursed	A-4	<u>28,915.06</u>
Balance December 31, 2013	A	<u>\$267,888.38</u>
Balance December 31, 2013		\$267,888.38
Balance December 31, 2012		<u>238,973.32</u>
Net Charge to Operations	A-1	<u>\$ 28,915.06</u>

CITY OF NEWARK
CURRENT FUND

INTERFUNDS RECEIVABLE

A-18

	<u>Ref.</u>	<u>Totals</u>	<u>Current Fund</u>		
			<u>Due from Animal Control Fund</u>	<u>Due from Grant Trust Fund</u>	<u>Due from Water Utility Fund</u>
Balance December 31, 2012	A	\$ 4,671.48	\$4,671.48		
Increased by:					
Excess Fund Balance	A-2	232.40	232.40		
Cash Disbursed	A-4	<u>175,898.12</u>		<u>175,319.72</u>	<u>578.40</u>
Balance December 31, 2013	A	<u>\$180,802.00</u>	<u>\$4,903.88</u>	<u>\$175,319.72</u>	<u>\$578.40</u>
<u>Analysis of Net Debit to Operations</u>					
Balance December 31, 2013	Above	\$180,802.00	\$4,903.88	\$175,319.72	\$578.40
Balance December 31, 2012	Above	<u>4,671.48</u>	<u>4,671.48</u>		
Additional Debit to Operation	A-1	<u>\$176,130.52</u>	<u>\$ 232.40</u>	<u>\$175,319.72</u>	<u>\$578.40</u>

CITY OF NEWARK
CURRENT FUND

DEFERRED CHARGES - EMERGENCY APPROPRIATION

A-19

	<u>Ref.</u>	<u>Liability Payout</u>	<u>Revaluation</u>	<u>Hurricane Sandy</u>
Balance December 31, 2012	A	\$ 5,600,000.00	\$ 1,600,000.00	\$6,500,000.00
Decreased by:				
Budget Appropriation - Master Plan - Revaluation	A-3	<u>1,400,000.00</u>	<u>800,000.00</u>	<u>1,300,000.00</u>
Balance December 31, 2013	A	<u>\$ 4,200,000.00</u>	<u>\$ 800,000.00</u>	<u>\$ 5,200,000.00</u>

INTERFUNDS RECEIVABLE - STATE AND FEDERAL GRANT FUNDS

A-20

	<u>Ref.</u>	<u>Due from Current Fund</u>	<u>Due from HCDA Trust Fund</u>
Balance December 31, 2012	A	\$ 60,462.40	\$
Increased by:			
Cash Disbursed	A-4	<u>60,462.40</u>	<u>482.00</u>
			<u>482.00</u>
Decreased by:			
Reserve for Federal, State and Other Grants	A-48	<u>60,462.40</u>	
	A-4	<u>\$ -</u>	<u>\$ 482.00</u>

CITY OF NEWARK
CURRENT FUND

PAYROLL TRANSFER ACCOUNT

A-21

	<u>Ref.</u>	
Balance December 31, 2012	A	\$ 587,259.68
Decreased by:		
Applied to Reserve for Federal and State Grants	A-48	<u>71,985.43</u>
Balance December 31, 2013	A	<u>\$ 515,274.25</u>

STATE AND FEDERAL GRANT FUNDS

A-22

	<u>Ref.</u>	<u>Grants Paid Authorized by Commitment Letters</u>
Balance December 31, 2012	A	\$1,368,960.61
Decreased by:		
Applied to Reserve for Federal and State Grants	A-48	<u>1,013,694.59</u>
Balance December 31, 2013	A	<u>\$ 355,266.02</u>

CITY OF NEWARK
CURRENT FUNDFEDERAL AND STATE GRANTS RECEIVABLEA-23
Sheet #1

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Received	Adjustment	Balance Dec. 31, 2013
1985-193	New Jersey State Department of Transportation: Force Account Agreement	\$ 93,446.97	\$	\$	\$	\$ 93,446.97
1985-191	Municipal Aid Program	11,240.00				11,240.00
	Total - 1985 to 1987 Grants	104,686.97				104,686.97
293	New Jersey State Department of Community Affairs: Balanced Housing Neighborhood Rehabilitation Program	64,569.00				64,569.00
304	Balanced Housing Neighborhood Rehabilitation Program	61,479.00				61,479.00
334	Neighborhood Preservation Program	85,000.00				85,000.00
	Total - 1988 Grants	211,048.00				211,048.00
368	Neighborhood Preservation Balanced Housing Program: Peoples Community Corporation Housing Demonstration Program	8,547.00				8,547.00
	Sidewalk Construction	8,000.00				8,000.00
396	New Jersey Department of Transportation: Municipal Aid Program	596,827.67				596,827.67
397	Resurfacing and Reconstruction: Wilson Avenue	300,000.00				300,000.00
400	Design Work for Reconstruction of Doremus Avenue	48,247.02				48,247.02
	Total - 1989 Grants	961,621.69				961,621.69
E1YC	New Jersey State Department of Transportation: Resurfacing and Reconstruction of Woodside Avenue and Right-of-Way Acquisition of Doremus Avenue	300,000.00				300,000.00
1EYI	Street Resurfacing and Reconstruction	11,210.48				11,210.48
E1YE	Designing Traffic Signage for Raymond Boulevard	125,000.00				125,000.00
	Resurfacing and Reconstruction of Foundry and Ferry Streets	279,000.00				279,000.00

CITY OF NEWARK
CURRENT FUNDFEDERAL AND STATE GRANTS RECEIVABLEA-23
Sheet #2

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Received	Adjustment	Balance Dec. 31, 2013
E1YF	New Jersey State Department of Transportation: Resurfacing and Reconstruction of Market Street, Hawthorne Avenue and Peddie Avenue	\$ 315,941.09	\$	\$	\$	\$ 315,941.09
D51C	Regional Contribution Agreement: Victory Gardens	760,310.00				760,310.00
	Total - 1990 Grants	1,791,461.57				1,791,461.57
M80A	Port Authority of New York and New Jersey, Newark Board of Education, Newark Housing Authority: Affirmative Action Study	188,807.98				188,807.98
E52F	Newark Recycling Program - 1991	12,405.70				12,405.70
	Total - 1991 Grants	201,213.68				201,213.68
E12N	New Jersey State Department of Transportation: Resurfacing and Reconstruction of Wilson Avenue	109,705.53				109,705.53
E12K	Resurfacing of Wilson Avenue	175,842.30				175,842.30
M72B	New Jersey Administrative Office of the Courts: Speedy Trial Program	14,296.00				14,296.00
H62G	PSE&G - Safe Passage	7,500.00				7,500.00
	Total - 1992 Grants	307,343.83				307,343.83
H23S	Homeless Health Care	53,037.59				53,037.59
	National Endowment of the Arts	16,500.00				16,500.00
E13R	Automatic Traffic Recorders	10,100.00				10,100.00
D131	Hope 2	116,939.78				116,939.78
D13F	University Heights Science Park Projects	193,716.00				193,716.00
	Total - 1993 Grants	390,293.37				390,293.37
D14E	Balanced Housing - Prince Hall Urban Development	41,045.82				41,045.82
H24UV	New Jersey State Department of Health: Women, Infants and Children's Supplemental Food Program	99,265.60				99,265.60
H54B/C	SunUp Operation	280,750.06				280,750.06

CITY OF NEWARK
CURRENT FUNDFEDERAL AND STATE GRANTS RECEIVABLEA-23
Sheet #3

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Received	Adjustment	Balance Dec. 31, 2013
E14A	New Jersey State Department of Transportation: Resurfacing of 13th Street and Various Other Streets	\$ 330,611.95	\$	\$	\$	\$ 330,611.95
E14B	Urban Traffic Control System Extension Project	28,000.00				28,000.00
	United States Department of Housing and Urban Development:					
D14B	International Trade Center	273,318.81				273,318.81
D14C	Lead Painting Abatement Program	13,232.35				13,232.35
D14H	Home Investment Partnership Program	6,350.81				6,350.81
	Port Authority of New York and New Jersey:					
H24S	Homeless Health Care Project	31,172.69				31,172.69
	Total - 1994 Grants	1,103,748.09				1,103,748.09
D15K	Downtown Improvement	1,484,910.91				1,484,910.91
D15M	Balanced Housing - Society Hill	66,150.00				66,150.00
D15N	Deteriorated Urban	10,136.64				10,136.64
D15S	RCA Funds - Bowser	491,940.00				491,940.00
D15U	University Heights Science Park	53,643.25				53,643.25
D25N	Balanced Housing - Jasmin House	66,820.00				66,820.00
H15A	Housing Opportunity for People with AIDS	118,806.26				118,806.26
H55BC	Summer Food Service Program for Children (SunUp)	80,687.10				80,687.10
H55G	Nutrition Project for the Elderly - Meals on Wheels	41,608.92				41,608.92
	Total - 1995 Grants	2,414,703.08				2,414,703.08
H16A	Home Ownership Partnership Work	657,219.45				657,219.45
H162	HIV Supplemental Aid	59,669.75				59,669.75
H26U/V	Women, Infants and Children	87,988.08				87,988.08
H26Y	Aids Prevention Education	14,468.00				14,468.00
P16R	COPS More	49,413.37				49,413.37
	Total - 1996 Grants	868,758.65				868,758.65

CITY OF NEWARK
CURRENT FUND

FEDERAL AND STATE GRANTS RECEIVABLE

A-23
Sheet #4

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Received	Adjustment	Balance Dec. 31, 2013
A17A	Newark Enterprise Zone	\$ 218,734.12	\$	\$	\$	\$ 218,734.12
E17F	Newark Economic Land Use	70,906.29				70,906.29
E17H	Subregional Planning	7,584.26				7,584.26
H27E	Women, Infants and Children	58,435.57				58,435.57
H57B	Summer Food SunUp - Operational	318,571.01				318,571.01
2H72	HIV Supplemental	23,503.76				23,503.76
	Total - 1997 Grants	697,735.01				697,735.01
D18W	Home Investment	27,693.84			27,693.84	
E18L	UTC Extension Project	1,200.73				1,200.73
E18O	U.S. Postal Facility Remediation	25,030.00				25,030.00
H38B	Childhood Lead Abatement	2,012.00				2,012.00
P18G	Enterprise Zone	204,755.13				204,755.13
	Total - 1998 Grants	260,691.70			27,693.84	232,997.86
D19C	UEZ Facade Improvement Project	256,406.22				256,406.22
D19E	Balanced Housing E.T. Bowser	140,000.00				140,000.00
D19F	J.G.M. Passaic River Waterfront	2,069,676.00				2,069,676.00
D19G	Home Investment Partnership	186,652.21		(708.03)	187,360.24	
E19B	West Kinney Site Remediation	7,925.00				7,925.00
E19G	Royalty Recovery Site Program	500.00				500.00
E19H	Hudsar Inc Site Remediation	500.00				500.00
E19I	NSC Plating Site Remediation	500.00				500.00
P19G	New Jersey Urban Enterprise Zone Authorization	616,367.33				616,367.33
P19M	Local Law Enforcement	30,366.23				30,366.23
2H9D	Project Respect II	59,705.61				59,705.61
2H9F	Municipal Alliance	520.88				520.88
2H94	HOPWA	809.70				809.70
	Total - 1999 Grants	3,369,929.18		(708.03)	187,360.24	3,183,276.97

CITY OF NEWARK
CURRENT FUND

FEDERAL AND STATE GRANTS RECEIVABLE

A-23
Sheet #5

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Received	Adjustment	Balance Dec. 31, 2013
D10A	Macedonia Heights Balanced Housing Grant	\$ 19,000.00	\$	\$	\$	\$ 19,000.00
D10B	Housing Services Project - West Side Village	115,534.00				115,534.00
D10C	Urban Planning Assistance Grant	100,000.00				100,000.00
D10G	Home Investment Part Act Program	25,043.70		201,731.30	(201,301.30)	24,613.70
D10I	Smart Growth Planning Grant	20,000.00				20,000.00
E10A	Doremus Avenue Drainage Outfall	2,420,127.04		9,031.68		2,411,095.36
E10D	Urban Traffic Control System	191,164.50				191,164.50
E10F	Urban Traffic Control System	93,446.97				93,446.97
E10G	Pedestrian School Safety Program	146,853.32				146,853.32
E10H	McClellan Street Underpass	181,545.33				181,545.33
E10K	Avenue P Bridge Project	39,949.00				39,949.00
E10L	Y2K Support for Existing UTCS	27,629.61				27,629.61
H20Y	Women and HIV/Risk Reduction	14,040.00				14,040.00
H20I	Public Health Priority Funding	0.55				0.55
H30D	Childhood Lead Poisoning	16,891.00				16,891.00
H30E	Childhood Lead Poisoning	12,027.00				12,027.00
H50D	Childcare Food Program	20,067.87				20,067.87
P10N	COPS More Grant Program	163,551.48				163,551.48
P10N	Gun Buy-Back Violence Reduction	319,000.00				319,000.00
W10A	Charlotteberg and Camoster Dam	231,835.62				231,835.62
W10B	Queens Ditch Improvement	402,191.12				402,191.12
2HOC	Immunization Grant	8,277.26				8,277.26
2H01	HIV	21,085.62				21,085.62
2H04	HOPWA	53,406.08				53,406.08
M10/A-Z	WIA/WFJ	1,993,232.76				1,993,232.76
	Total - 2000 Grants	6,635,899.83		210,762.98	(201,301.30)	6,626,438.15
D11G	HUD - HOME	476,143.04		374,188.00		101,955.04
D11K	White Chemical Site Superfund	12,041.48				12,041.48
D11N	Balanced Housing Program	106,494.06				106,494.06
E11A	Syntax Site Remediation Project	500.00				500.00
E11F	Newark Greenway Network	86,080.65				86,080.65

CITY OF NEWARK
CURRENT FUNDFEDERAL AND STATE GRANTS RECEIVABLEA-23
Sheet #6

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Received	Adjustment	Balance Dec. 31, 2013
E11G	Resurfacing Fourteen Streets	\$ 24,512.72	\$ -	\$ -	\$ -	\$ 24,512.72
E11H	New Jersey Economic Development	6,695.00				6,695.00
H21X/Y	Women, Infants and Children	23,753.00				23,753.00
H31G	Childhood Lead Poisoning Project	10,807.18				10,807.18
2H11	HIV Emergency Program	487,319.63				487,319.63
2H15	HOPWA	464,076.47				464,076.47
E11L	Central Steel Drum Site Remediation	500.00				500.00
E11M	Boyd Street/Former GE Site Remediation	500.00				500.00
H21C	HU-ESG	15,792.47				15,792.47
	Total - 2001 Grants	1,715,215.70		374,188.00		1,341,027.70
A12B	Urban Enterprise Zone FY 2002 Administration	501,269.05				501,269.05
D12G	Home Investment Program	34,378.26		11,816.19		22,562.07
D12N	Wyonna Lipman Arms Balanced Housing Project	29,000.00				29,000.00
D12P	Economic Development, Brownfield's Redevelopment	178,874.38				178,874.38
E12N	Norfolk Street, Jones Street and Irvine Turner					
E12N	Boulevard	15,000.00				15,000.00
E12R	Pedestrian Safety Program	26,334.10				26,334.10
E12T	Wilson Avenue	525,000.00				525,000.00
H12E	Bio-Terrorism Health Alert Network	32,661.00				32,661.00
H32G	Childhood Lead Poisoning Prevention Program	10,084.77				10,084.77
H52B/C	SunUp Administration	109,287.02				109,287.02
H52D	Child and Adult Food Care Program	16,130.07				16,130.07
L12A	Victim/Witness Advocacy Program	1,619.00				1,619.00
P12V	2001 Libeg. Match	899.51				899.51
W12A	Vulnerability Assessment	10,000.00				10,000.00
	Total - 2002 Grants	1,490,537.16		11,816.19		1,478,720.97
A13B	Homeland Security, Police	116,986.45				116,986.45
A13D	Homeland Security, HHS	145.80				145.80
A13F	Homeland Security, Water/Sewer	14,956.06				14,956.06
E13B	Central Street Drum Site Remediation	500.00				500.00
E13K	Resurfacing of Market Street and Elizabeth Avenue	556,568.85				556,568.85
E13L	Preliminary Assessment - Arts Metal	10,453.00				10,453.00

CITY OF NEWARK
CURRENT FUND

FEDERAL AND STATE GRANTS RECEIVABLE

A-23
Sheet #7

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Received	Adjustment	Balance Dec. 31, 2013
E13M	Raymond Boulevard Resurfacing	\$ 95,534.40	\$	\$	\$	\$ 95,534.40
F13A	FEMA	38,150.00				38,150.00
F13J	State Domestic Preparedness Equipment	5,276.88				5,276.88
H23X	WIC Program	917.00				917.00
H236	Tuberculosis Control Grant	45.00				45.00
H33F	Childhood Lead Poisoning Prevention Program	20,750.00				20,750.00
H53B/C	SunUp Administration	63,287.74				63,287.74
H53F	Nutrition for the Elderly	9,460.78				9,460.78
M13F	Go Newark Website	135,000.00				135,000.00
P13N	Law Enforcement Block Grant (INT)	39,347.61				39,347.61
2H35	HOPWA Program	531,836.94				531,836.94
M13A-Z	JTPA Program	711,427.29				711,427.29
	Total - 2003 Grants	2,350,643.80				2,350,643.80
2H430	HIV Counseling, Testing and Referral Service	60,527.00				60,527.00
2H4P0	West Nile Virus	8,200.00				8,200.00
2H4S0	Homeless Health Care (Air Port)	66,844.75			12,151.05	54,693.70
A14H0	Urban Areas Security Program	370,917.51				370,917.51
A14J0	Urban Areas Security Program	5,291.15				5,291.15
A14N0	Newark Urban Enterprise Zone	276,065.63				276,065.63
D14Mo	Home Investment Partnership Act	355,643.22		33,630.51		322,012.71
E14Eo	Newark Greenway Network	250,000.00				250,000.00
E14Go	Pedestrian Safety Program	30,483.68				30,483.68
E14Ho	Warren Street and Summit Street Traffic Signs	100,000.00				100,000.00
E14Ko	Conrail Railroad Bridge Over Avenue P	69,465.08				69,465.08
E14So	Remedial Investigation Red Raven	500.00				500.00
E14To	School Speed Display Sign Program	44,680.36				44,680.36
H14E0	Bio-Terrorism	60,625.00				60,625.00
H2460	Smallpox Preparedness Planning	10,000.00				10,000.00
H24M0	Homeless Health Care	63,334.73				63,334.73
H24X0	Women, Infants and Children	12,612.00				12,612.00
H54D0	Childcare Food Program	148,826.37				148,826.37
L14A0	Victim/Witness Advocacy	50,613.00				50,613.00

CITY OF NEWARK
CURRENT FUND

FEDERAL AND STATE GRANTS RECEIVABLE

A-23
Sheet #8

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Received	Adjustment	Balance Dec. 31, 2013
P14So	Interoperable Communication - Tech	\$ 132,427.12	\$	\$	\$	\$ 132,427.12
W14Bo	Relocation of Water Aqueduct	75,000.00				75,000.00
M14Ao/Zo	Job Training Partnership Act - Administration Program	4,594,613.15				4,594,613.15
	Total - 2004 Grants	6,786,669.75		33,630.51	12,151.05	6,740,888.19
2H530	Metropolitan Medical Response System FY 2005 (MMRS)	227,592.00				227,592.00
	County of Essex, Office of Alcoholism, Drug Abuse and Addiction Services:					
2H5B0	Municipal Alliance Program	110,000.00				110,000.00
2H5K0	Homeless Service Enhancement	33,600.00				33,600.00
	Port Authority of New York and New Jersey:					
5H5B/C	Summer Food Service Program (SunUp)	270,470.40				270,470.40
5H5D0	Child and Adult Food Program	276,384.93				276,384.93
	County of Essex - Department of Citizen Services:					
	Division on Aging:					
5H5F0	Nutrition Project for the Elderly	4,979.00				4,979.00
A15M0	Urban Areas Security Initiative Grant	66,818.74				66,818.74
	New Jersey Department of Commerce and Economic Development:					
A15T0	VEZ Communication Tools	1,827.24				1,827.24
	Department of State - State Archives and Record Management:					
D15J0	Brownfield's Redevelopment Initiative Project	25,000.00				25,000.00
D15M0	Home Investment Partnership Act Program	1,819,524.27		(8,959.00)		1,828,483.27
D15N0	American Dream Down Payment Initiative	9,348.25				9,348.25
	New Jersey Department of Community Affairs:					
D15X0	Cross Acceptance Grant	15,000.00				15,000.00
E15J0	Raymond Boulevard Resurfacing	64,670.32				64,670.32
	New Jersey Transportation Trust Fund Act N.J.S.A. 27:1B-1 et seq.:					
E15P0	Delancy Street Corridor Improvements	3,825.99				3,825.99
F15B0	Firefighters Grant Program	102,770.85				102,770.85
H2570	STD Clinic	1,456.00				1,456.00

CITY OF NEWARK
CURRENT FUND

FEDERAL AND STATE GRANTS RECEIVABLE

A-23
Sheet #9

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Received	Adjustment	Balance Dec. 31, 2013
	New Jersey Transportation Trust Fund Act N.J.S.A. 27:1B-1 et seq.:					
H25Q0	Homeless Health Care Project - SAMSHA	\$ (6.93)	\$	\$	\$	\$ (6.93)
H35F0	Childhood Lead Poisoning Prevention Control	16,240.00				16,240.00
K85A0	TOPOFF (T-3) Grant	20,000.00				20,000.00
L15D0	Victim/Witness Advocacy Program	46,368.37				46,368.37
	New Jersey Transportation Trust Fund Act N.J.S.A. 27:1B-1 et seq.:					
P15Q0	COPS Universal Hiring Program	750,000.00				750,000.00
	New Jersey Department of Labor and Workforce Development:					
	Employment and Training Administration:					
M15A0-Z0	Workforce Investment Act (JTPA)	1,495,038.41				1,495,038.41
W15A0	Engineering Route 21 - Sewer Utility	374,716.00				374,716.00
W15B0	Cedar Grove Rehabilitation - Water Utility	1,409,350.70				1,409,350.70
	Total - 2005 Grants	<u>7,144,974.54</u>		<u>(8,959.00)</u>		<u>7,153,933.54</u>
5H6B/C	SunUp - Administration/Operation	218,498.17				218,498.17
5H6H0	Childcare Food Program	135,070.78				135,070.78
A16A0	N.J. Urban Enterprise Zone Authority	105,942.43				105,942.43
A16N0	N.J. Urban Enterprise Zone Authority	268,337.49				268,337.49
D16C0	American Dream Down Payment Initiative	3,996.34				3,996.34
E16B0	Resurfacing of Various Streets	6.23				6.23
E16E0	Urban Traffic Control System	50,373.50				50,373.50
E16Q0	Various Streets - 2006 Newark	1,477.48				1,477.48
F16A0	N.J. Department of Law and Public Safety	80.00				80.00
F16B0	Juvenile Fire Setters Program	21,529.65				21,529.65
H2620	WIC	16,500.00				16,500.00
M36A0	Newark Library Data Center Construction Project	25,000.00				25,000.00
P16H0	Local Law Enforcement Block Grant	13,046.50				13,046.50
M96A0-Z0	WIA/WFJNJ	121,627.45				121,627.45
	Total - 2006 Grants	<u>981,486.02</u>				<u>981,486.02</u>

CITY OF NEWARK
CURRENT FUND

FEDERAL AND STATE GRANTS RECEIVABLE

A-23
Sheet #10

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Received	Adjustment	Balance Dec. 31, 2013
2H780	Housing Opportunities for Persons with Aids	\$ 192,075.08	\$	\$	\$	\$ 192,075.08
2H760	Housing Opportunities for Persons with Aids	75,047.13				75,047.13
2H7A0	HIV Counseling Test and Referrals	16,419.00				16,419.00
2H7B0	Municipal Alliance Program	97,000.00				97,000.00
2H7H0	HIV Emergency Relief	100,428.43				100,428.43
5H7G0	SunUp Administration/Operational	33,270.98				33,270.98
5H7H0	Nutrition for the Elderly	88,472.00				88,472.00
A17B0	Meals on Wheels	11,411.00				11,411.00
A17C0	Child and Adult Care Food Program	284,848.38				284,848.38
A17F0	Nat Turner Park Development Project	1,277.00				1,277.00
A17N0	Urban Arrear Security Initiative	133,857.64				133,857.64
A17R0	Newark Downtown Corridor Revitalization	20,388.00				20,388.00
C17B0	Cable TV Projects	250,000.00				250,000.00
D17M0	Home Investment Partnership	600,970.15		72,720.48		528,249.67
D17P0	Crest Community Development	865,500.00				865,500.00
D17T0	HOME	15.99		13,752.58	(13,752.58)	15.99
E17J0	Newark Conservancy Environment (Green)	500,000.00				500,000.00
E17K0	Site Remediation Nat Turner Park	19,528.50				19,528.50
E17L0	Subregional Transportation	0.01				0.01
E17S0	Pedestrian Safety Programs	720.34				720.34
F17B0	Hazardous Waste Materials	850,000.00				850,000.00
H2760	Infant Mortality Reduction Program	920.00				920.00
H2770	Black Infant Mortality Reduction	102.00				102.00
H2780	STD Program	6.00				6.00
H27C0	ESG	94,041.98				94,041.98
H27D0	Homeless Health Care Projects	(12,151.05)			(12,151.05)	-
H37C0	Emergency Lead Poisoning	15,111.00				15,111.00
H37D0	Childhood Lead Poison Prevention	2,824.26				2,824.26
H47C0	Health Emergency Preparedness and Response	705.00				705.00
L17D0	Victim Witness Advocacy Program	5,942.46				5,942.46
P17U0	Domestic Violence Training Reimbursement Grant	6,545.72				6,545.72
	Total - 2007 Grants	4,255,277.00		86,473.06	(25,903.63)	4,194,707.57

CITY OF NEWARK
CURRENT FUNDFEDERAL AND STATE GRANTS RECEIVABLEA-23
Sheet #11

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Received	Adjustment	Balance Dec. 31, 2013
2H860	HOPWA	\$ 405,227.44	\$	\$	\$	\$ 405,227.44
2H8E0	Immunization Program	196,278.00				196,278.00
2H8G0	Homeless Port Authority Program	183,434.56				183,434.56
4H8LAO	Welfare Consolidation Funding	150,000.00				150,000.00
5H8CO	SunUp Administration/Operational	692,154.36				692,154.36
A18NO	Newark Urban Enterprise Zone	515,466.13				515,466.13
A18R0	GAP Analysis of Newark Response Plan	56,760.00				56,760.00
A18T0	Acquisition of City/County Surveillance Monitor	968.12				968.12
A18U0	Prisoner Re-Entry Program	255,191.98				255,191.98
A18V0	Site Investigation and Report Prep at Nat Turner Park	4,094.00				4,094.00
A18W0	Remedial Investigation and Report Pret at Nat Turner Park	962,479.00				962,479.00
A18X0	Restoration of St. Peter's Park Project	110,038.68				110,038.68
A18Y0	Urban Area Securities Initiative Program	79,525.97				79,525.97
A18Z0	Downtown Safety Program	72,000.00				72,000.00
C18B0	Pubic Archives and Records Management (PARIS)	20.00				20.00
D18H0	Former Humble Oil Site Grant	7,641.00				7,641.00
D18MO	Home Investment Partnership	706,698.11		3,342.47		703,355.64
E18DO	UTCS Extension Section 4	14,650.33		195,116.56		(180,466.23)
E18FO	Resurfacing of Various Streets Program	600.77				600.77
E18HO	Resurfacing of Various Streets	109,565.22		175,250.00		(65,684.78)
E18WO	Street and Sidewalk Repair	150,000.00				150,000.00
E18PO	Restoration Ironbound Ballfield	219,780.62				219,780.62
E18RO	Newark Pedestrian Improvements	10,780.00				10,780.00
E18SO	Restoration of Boy's Park	141,466.06				141,466.06
F18CO	Hazardous Waste Materials	130,000.00				130,000.00
H288O	STD Program	8,647.31				8,647.31
H28HO	Black Infant Mortality Reduction	107.00				107.00
H28PO	Emergency Shelter Grant	151,315.55		12,762.20		138,553.35
H38FO	Childhood Lead Poison Prevention	1,104.00				1,104.00
H38HO	Lead Education and Outreach	7,801.77				7,801.77
M28BO	Truancy Alternative Program	28,319.75				28,319.75
P18JO	COPS in Shop	11,100.00				11,100.00
P18KO	2007 Paul Coverdell Program	60,205.00				60,205.00
M98AO-SO	WIA/WFJN	806,772.48				806,772.48
W18AO	N.J. Waste Water Treatment Grant Fund	1,480,163.00		1,480,163.00		
	Total - 2008 Grants	7,730,356.21		1,866,634.23		5,863,721.98

CITY OF NEWARK
CURRENT FUNDFEDERAL AND STATE GRANTS RECEIVABLEA-23
Sheet #12

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Received	Adjustment	Balance Dec. 31, 2013
2H920	Immunization Program	\$ 472.00	\$	\$	\$	\$ 472.00
2H960	HOPWA	324,172.68				324,172.68
2H9B0	Municipal Alliance	57,000.00				57,000.00
5H9A0	Social Services Homeless	31,250.00				31,250.00
5H9B0	SunUp Program	822,466.13				822,466.13
5H9F0	Nutrition Project	27,712.00				27,712.00
5H9H0	Child Care Food	242,571.13				242,571.13
A19C0	NWK Riverfront Park	225,000.00		225,000.00		
A19D0	NWK Riverfront Park	1,715,000.00				1,715,000.00
A19J0	Institute Entrepreneur Le	29.55				29.55
A19L0	Newark Prisoner Re-Entry	29,297.31				29,297.31
A19M0	Liberty International	6,404.05				6,404.05
A19Q0	Hayes Park East	1,000,000.00				1,000,000.00
A19Y0	UASI	462,975.68				462,975.68
D1910	Sustainability Action Plan	5,000.00				5,000.00
D1930	HOME	2,009,068.11		231,664.34		1,777,403.77
D1940	Neighborhood Stabilization	245,000.76		250,000.76		(5,000.00)
D1950	Neighborhood Preservation	117,860.00				117,860.00
D19J0	Hazardous Discharge Site	2,901.00				2,901.00
D19L0	Hazardous Discharge Site	8,117.00				8,117.00
D19N0	Hazardous Discharge Site	30,052.00		27,931.65		2,120.35
D19P0	NSP	486,362.47		330,873.21		155,489.26
D19Q0	Strategic Housing - Central Ward	273,228.00				273,228.00
D19R0	Strategic Housing - East Ward	308,593.00				308,593.00
D19S0	Hazardous Discharge Site	54,973.00				54,973.00
D19T0	Strategic Housing - North Ward	221,302.00				221,302.00
D19U0	Hazardous Discharge Site	21,419.00				21,419.00
D19V0	Brownfield's Assess for Hazardous Discharge Site	78,244.35		24,758.77		53,485.58
D19W0	Strategic Housing South Ward	259,450.07				259,450.07
D19X0	Strategic Housing West Ward	342,037.00				342,037.00
D49A0	Hazardous Discharge Site Remediation	14,381.00				14,381.00
D49B0	Hazardous Discharge Site Remediation	7,235.00				7,235.00
E19Q0	Restoration of Jessie Allen Park	500,000.00		399,767.20		100,232.80
E19U0	McClellan Street Underpass NJTPA	181,563.00				181,563.00
E19V0	Various Street Projects	412,761.75		412,761.75		
E19W0	Street Lighting	26,000.00				26,000.00

CITY OF NEWARK
CURRENT FUNDFEDERAL AND STATE GRANTS RECEIVABLEA-23
Sheet #13

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Received	Adjustment	Balance Dec. 31, 2013
E19Y0	Safe Routes to School Program	\$ 225,000.00	\$	\$	\$	\$ 225,000.00
H19K0	Bio-Terrorism Grant	926.86				926.86
H2990	STD Health Services	53.04				53.04
H29D0	Homeless HRSA	33.55				33.55
H29E0	Homeless HRSA	8.64				8.64
H29G0	ESG	110,998.73		39,340.94	71,657.79	
H29N0	Electronic Medical Records	(136,622.00)			(136,622.00)	
H39E0	Childhood Lead Poisoning	165,667.00				165,667.00
N19B0	Clean Communities Program	(0.19)				(0.19)
P19F0	Crime Control Program	165,000.00				165,000.00
P19K0	2008 Byrne Memorial Jag	133,305.50		49,041.59		84,263.91
P19S0	Buffer Zone Protector	189,289.08				189,289.08
P19T0	Buffer Zone Protector	13,700.44				13,700.44
M19H0	Homeless Prevention	161,673.80				161,673.80
M19J0	Library	(0.20)				(0.20)
	2009 WIA WFNJ M99 A - Z:					
M99B0	WIA Adult	6.00				6.00
M99G0	WFNJ FS/GA	184.00				184.00
	Total - 2009 Grants	11,579,123.29		1,991,140.21	(64,964.21)	9,652,947.29
1D01O	Gluck Legal Services	400,000.00				400,000.00
1D02O	Public Trust Rights	59,500.00				59,500.00
1D03O	HOME	2,175,007.15		143,315.96		2,031,691.19
1D04O	Hazardous Discharge	3,130.00				3,130.00
2H02O	Metropolitan Med Response 2009	503.90				503.90
2H03O	Metropolitan Med Response 2008	2,994.35				2,994.35
2H05O	HIV Emergency Relief Program	5,064.54				5,064.54
2H06O	Homeless Port Authority Program	172,905.69				172,905.69
2H07O	Ryan White Special Care Program	504.00				504.00
2H0B0	Municipal Alliance Program	39,501.00				39,501.00
2H0E0	Immunization	1,165.00				1,165.00
2H0H0	Minority AIDS Initiative Program	0.57				0.57
2HOM0	HOPWA	506,241.70		100,425.48		405,816.22

CITY OF NEWARK
CURRENT FUND

FEDERAL AND STATE GRANTS RECEIVABLE

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Sheet #14

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Received	Adjustment	Balance Dec. 31, 2013
3H0E0	Childhood Lead Poisoning	\$ 2,236.00	\$	\$	\$	\$ 2,236.00
3H0F0	Childhood Lead Poisoning	347,189.00				347,189.00
5H0B	SunUp Administration	303,720.14				303,720.14
5H0C0	SunUp Administration	54,514.44				54,514.44
5H0F0	Nutrition Project for the Elderly	65,983.00				65,983.00
5H0G0	Meals on Wheels	36,796.00				36,796.00
A10C0	USAIFY 2009	786,945.79		1,242,902.40	(455,956.61)	
A10D0	USAIFY 2009	2,606,444.00		1,908,302.97	698,141.03	
A10E0	Riverfront Park Lister Avenue	767,918.87				767,918.87
A10F0	Riverfront Park Lister Avenue	398,439.79				398,439.79
C20A0	PARIS Grant 2010	4,880.32				4,880.32
D1010	Energizing Newark Community-Wide	134,003.73		54,289.55	79,714.18	
D1020	Green Neighborhood Pilot	3,417.00				3,417.00
D1040	Climate Prosperity Initiative	-			3,417.00	(3,417.00)
D1080	1 Boat Project - Cash from Baykeeper	127,140.00				127,140.00
D1090	Unified Planning Program	1,768.95				1,768.95
D10F0	Beyond the Box	25,000.00				25,000.00
D10K0	UEZ	330,246.87				330,246.87
D10N0	Brownfield's Clean-Up Revolving Loan	1,000,000.00		105,187.00		894,813.00
D10P0	Hazardous Discharge Site Remediation	7,036.00				7,036.00
D10R0	Hazardous Discharge Site Remediation	4,588.00				4,588.00
D10S0	Brownfield's Stimulus - ARRA	41,790.70			41,790.70	
D10T0	Hazardous Discharge Site Remediation	4,142.00				4,142.00
D10U0	Brownfield's Stimulus - ARRA - West	130,166.69		112,200.06		17,966.63
D10V0	Neighborhood Stabilization Program II	6,203,711.20		6,130,597.57		73,113.63
D10V0	Brownfield's Stimulus - ARRA - East	22,509.66			6,999.90	15,509.76
D10Y0	UEZ 2010 - 2011 Administration	342,054.54				342,054.54
E1020	Improvements to Various Streets	468,084.57				468,084.57
E1030	Norfolk Street, Jones Street and Irvine Turner Boulevard	1,236,562.18		359,113.84		877,448.34
E1040	Retrofit and Renewable Energy	163,826.41		246,957.66	(83,131.18)	(0.07)
E1050	Improvements to Various Streets - 5 Locations	442,322.88				442,322.88
E1060	Extension of Traffic Signal Control	2,417.59				2,417.59
E1070	Roadway Resurfacing Program - ARRA	1,473,739.34		725,811.58		747,927.76
E10P0	Various Streets - 5 Locations	409,604.35				409,604.35
E10Q0	Broad Streetscape	1,470,675.58		422,218.75		1,048,456.83
E10T0	Broad Street Station Transit Fund	50,000.00				50,000.00

CITY OF NEWARK
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FEDERAL AND STATE GRANTS RECEIVABLE

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Sheet #15

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Received	Adjustment	Balance Dec. 31, 2013
E10V0	2011 Local Safety Program - Wilson Avenue	\$ 500,000.00	\$	\$	\$	\$ 500,000.00
H10L0	Bio-Terrorism	140,297.22				140,297.22
H2030	Pandemic H1N1	5.00				5.00
H2080	ARRA - Facility Investment Program	3,425,841.68		3,228,994.05		196,847.63
H20B0	Homeless Health Care Project Hirs	10.62				10.62
H20P0	ESG Program	89,998.08			64,964.21	25,033.87
H20T0	STD Program	8.00				8.00
H50H0	Child and Adult Food Program	492,496.03				492,496.03
H7040	Public Health Priority Funding	101,135.00				101,135.00
M10E0	11A - Youth Training	32,000.00				32,000.00
M10V0	Parking Offense Adjudication	128,461.00				128,461.00
M20V0	Truancy Alternative Program	50.16				50.16
N10B0	Keep 6 Municipal Pool Open	160,000.00				160,000.00
P10H0	JAG Grant - ARRA	350,604.20		183,250.53		167,353.67
P10K0	JAG Grant - ARRA	1,299,017.21		545,585.83		753,431.38
P10L0	Sex Offenders AID Cash Match	53,075.00		15,894.64		37,180.36
P10M0	Crime Control - Grant	165,000.00				165,000.00
P10Q0	Juvenile Accountable Grant	5,318.00				5,318.00
P10R0	Law Enforcement Training and Equipment	15,000.00				15,000.00
P10S0	Paul Coverdell Program	97,957.00				97,957.00
P10T0	Paul Coverdell Program	4,193.00				4,193.00
W10C0	NJDEP PEQ River Restoration	750,000.00				750,000.00
M10S0	Prisoner Re-Entry Demo Project	170,174.00				170,174.00
M10H0	Workforce Learning Link	100,960.00				100,960.00
M10X0	WFNJ TANF	101,635.00				101,635.00
M10Y0	WFNJ FS/GA	232,595.00				232,595.00
	Total - 2010 Grants	31,252,224.69		15,525,047.87	355,939.23	15,371,237.59
2H13	MMRS 2011	317,419.00		263,282.18		54,136.82
2H16	HIV Emergency Relief	272.52				272.52
2H17	Ryan White Special Care	5.72				5.72
2H1B	Municipal Alliance DARE	22,459.32				22,459.32
2H1E	Immunization Program	157.00				157.00
2H1M	HOPWA	3,231,190.38		3,163,347.70		67,842.68
3H1F	Childhood Lead Poisoning	111,083.00		96,372.00		14,711.00
5H1A	Social Services Homeless Grant	135.00				135.00
5H1B	SunUp Administration	44,860.00				44,860.00

CITY OF NEWARK
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FEDERAL AND STATE GRANTS RECEIVABLE

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Sheet #16

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Received	Adjustment	Balance Dec. 31, 2013
5H1C	SunUp Operational	\$ 546,189.39	\$	\$	\$	\$ 546,189.39
A11B	2010 UASI Grant	1,311,845.00		1,622,770.46	(310,925.46)	
D116	Brownfield's Clean-Up Grant	184,085.38		3,324.00		180,761.38
D117	Local Energy Assurance Plan	188,471.95		181,864.47		6,607.48
D11D	HOME	3,716,178.00				3,716,178.00
D11R	Hazard Site	20,731.00				20,731.00
E11P	UTCS Extension, Traffic Signal	180,466.23				180,466.23
E11Q	McClellan Street Underpass Local	81,289.19				81,289.19
E11R	FY 2011 Subregional	23,550.61				23,550.61
E11T	Delancy Street Roadway	811,106.16		113,693.17		697,412.99
E11U	Resurfacing of Various Streets	1,501,000.00		1,125,750.00		375,250.00
E11V	MUCTD Traffic Sign Inventory	133,000.00		71,502.77		61,497.23
E11W	Various Streets	403,924.50				403,924.50
F11C	FEMA '10	399,994.00				399,994.00
F11D	SAFER	6,238,804.92		3,733,323.55		2,505,481.37
H11D	Bio-Terrorism	29,022.00				29,022.00
H212	Homeless Healthcare	14.59				14.59
H217	ESG	234,322.32		182,595.77		51,726.55
H21R	Women, Infants and Children	63,161.00				63,161.00
H31K	Lead Hazard Reduction Program	3,746,599.74		701,359.82		3,045,239.92
H31L	Healthy Homes Production	853,717.13		468,996.57		384,720.56
N61A	Make A Splash Grant	18,850.00				18,850.00
911J	JAG Grant	806,344.00				806,344.00
P11L	COPS in Shop	813.24				813.24
P11M	COPS Technology	500,000.00		234,061.34		265,938.66
P11N	Body Armor Replacement Grant	(0.06)				(0.06)
P11P	Drunk Driving Enforcement	32,676.00				32,676.00
P11Q	COPS in Shop	7,197.12		6,207.36		989.76
P11T	Great Grant	49,687.00				49,687.00
P11U	2011 Jag Grant	637,443.00				637,443.00
P11W	N.J. Law Enforcement Technology	500,000.00		184,671.80		315,328.20
P11Y	Targeting Violent Crimes Initiative	92,000.00		92,000.00		
	Sub-Total for 2011 Grants	27,040,065.35		12,245,122.96	(310,925.46)	15,105,867.85
	2011 WIA/WFNJ					
M111	The Shelter Plus Care for the Chronically Homeless Grant	810,600.00				810,600.00
M112	The Shelter Plus Care for the Post Incarcerated Homeless Grant	843,720.00				843,720.00

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FEDERAL AND STATE GRANTS RECEIVABLE

A-23
Sheet #17

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Received	Adjustment	Balance Dec. 31, 2013
M113	WIA - Adult	\$ 607,108.00	\$	\$ 607,099.00	\$	\$ 9.00
M114	WIA - Youth	650,501.00		650,497.00		4.00
M115	WIA - Dislocated Workers	129,707.00		129,692.00		15.00
M11E	Public Sector Mini-NEG (Rapid Response)	461,140.00				461,140.00
M11G	Workforce Learning Link	171,801.00		171,798.00		3.00
M11Z	Workforce Investment Board	81.00				81.00
Sub-Total for Year 2011 WIA/WFNU		3,674,658.00		1,559,086.00		2,115,572.00
Total - 2011 Grants		30,714,723.35		13,804,208.96	(310,925.46)	17,221,439.85
2H230	MMRS	281,693.00				281,693.00
2H260	HIV '11/12	7,764,833.15		7,764,728.91		104.24
2H270	HIV Special Care	108,721.37		108,716.88		4.49
2H2E0	Immunization	645,893.00		572,846.00		73,047.00
2H2K0	Dental Rehabilitation Grant	498,800.00		1,650.00		497,150.00
2M200	Hurricane Sandy Disaster Relief	185,221.00		185,221.00		
5H2B0	SunUp Administration	32,536.00		14,582.24		17,953.76
5H2C0	SunUp Operational	664,150.00		256,361.32	(15,426.94)	423,215.62
A12C0	Emergency Solutions Grant Program	213,307.00		38,943.99		174,363.01
D1230	Comprehensive Anti-Violence Program	1,537,222.00				1,537,222.00
D12B0	Prisoner Re-Entry Legal Services	300,000.00				300,000.00
D12D0	Hazardous Discharge Site Remediation Grant - 123-129 Riverside Avenue	10,782.20				10,782.20
D12E0	Hazardous Discharge Site Remediation Grant - 2052-2070 and 2078/2090 McCarter Highway	208,560.00				208,560.00
D12H0	Newark Prisoner Re-Entry	750,000.00				750,000.00
D12T0	Hazardous Substance	194,339.72		17,136.57		177,203.15
D12U0	Petroleum Assessment	193,016.44		63,131.13		129,885.31
D12V0	Prisoner Care and Management Job Placement	100,000.00		1,856.50		98,143.50
D12W0	Hazardous Discharge Site Remediation Grant - McCarter Highway	197,391.50		3,142.34		194,249.16
D12X0	Hazardous Discharge Site Remediation Grant - 704 Doremus Avenue	198,731.00		103,602.70		95,128.30
D12Y0	Hazardous Discharge Site Remediation Grant - 411 Wilson Avenue	199,201.00		13,951.97		185,249.03
D12Z0	Hazardous Discharge Site Remediation Grant - Wilson Avenue	375,175.00				375,175.00
E1210	Various Streets - 2012 Newark Project	1,358,400.00		1,018,800.00		339,600.00
E12C0	FY 2012 Subregional Transportation	359.44				359.44

CITY OF NEWARK
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FEDERAL AND STATE GRANTS RECEIVABLE

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Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Received	Adjustment	Balance Dec. 31, 2013
E12F0	McClellan Street Underpass Drainage	\$ 1,099,003.00	\$	\$ 231,188.68	\$	867,814.32
F12C0	Port Security Grant	829,261.00				829,261.00
F12D0	Port Security Grant	56,250.00				56,250.00
H12E0	Bio-Terrorism Grant - 2011	167,688.00		116,455.00		51,233.00
H12F0	Bio-Terrorism - 2012	320,926.00		318,413.00		2,513.00
H22A0	STD-2011	8.00				8.00
H22F0	Homeless HRSA	406,186.55		329,887.04		76,299.51
H22G0	Health Care Emergency	3.00				3.00
H72R0	WIC	650,120.00		604,984.00		45,136.00
M2210	Truancy Alternative - 2008	3,467.00				3,467.00
M2220	Truancy Alternative - 2011	10,565.00				10,565.00
M2230	Truancy Alternative - 2012	42,189.00		13,507.00		28,682.00
P12K0	COPS Hiring Program	6,028,700.00		2,560,052.87		3,468,647.13
P12Q0	Urban Areas Security Initiative Grant	1,888,537.00		765,753.04	68,741.04	1,054,042.92
P12R0	Emergency Operations Center Grant	1,000,000.00				1,000,000.00
P12T0	Comprehensive Anti-Violence	658,863.00				658,863.00
W12D0	Target Hardening - Pequannock River	164,000.00		163,996.00		4.00
	Sub-Total for Year 2012 Grants	29,344,099.37		15,268,908.18	53,314.10	14,021,877.09
	<u>2012 WIA/WFNI</u>					
M1210	General Assistance for Needy Families (TANF)	44,954.00		44,948.00		6.00
M1220	General Nutrition Assistance Program (SNAP)	75,886.00		75,879.00		7.00
M1280	Workforce Learning Link	115,064.00		90,016.00		25,048.00
M1290	WIA - Adult - 2011	189,897.00		189,892.00		5.00
M12F0	WIA - Dislocated Workers	83,796.00		83,792.00		4.00
	Sub-Total for Year 2012 WIA/WFNI	509,597.00		484,527.00		25,070.00
	Total - 2012 Grants	29,853,696.37		15,753,435.18	53,314.10	14,046,947.09
	HIV Emergency Relief		12,394,925.00	3,243,490.42		9,151,434.58
	Ryan White Special Care Clinic		331,236.00	149,047.79		182,188.21
	Immunization Program		625,000.00	78,208.00		546,792.00
	Advancing Safe and Healthy Homes Initiative		500,000.00			500,000.00
	Childhood Lead Poisoning		481,493.00	419,581.00		61,912.00
	Childhood Lead Poisoning		465,780.00			465,780.00
	Municipal Tonnage 2006		84,236.82		84,236.00	0.82

CITY OF NEWARK
CURRENT FUND

FEDERAL AND STATE GRANTS RECEIVABLE

A-23
Sheet #19

Account Number	Balance Dec. 31, 2012	2013 Budget Revenue Realized	Received	Adjustment	Balance Dec. 31, 2013
Municipal Tonnage 2007	\$	\$ 82,658.66	\$	\$ 82,658.00	\$ 0.66
Municipal Tonnage 2008		232,709.57		232,709.00	0.57
Municipal Tonnage 2008B		255,648.41		255,648.00	0.41
Municipal Tonnage 2009		269,447.46		269,447.00	0.46
Municipal Tonnage 2010		299,903.76		299,903.76	
Municipal Tonnage 2011		322,905.58		322,905.58	
2011 Clean Communities		327,986.78		327,986.78	
2010 Clean Communities		327,344.66		327,344.66	
SunUp Administration		77,163.36	63,774.11		13,389.25
SunUp Operational		917,885.48	748,950.00		168,935.48
ESG (Emergency Solutions Grant)		678,542.00	260,982.28		417,559.72
HOPWA		7,218,919.00	3,265,293.70		3,953,625.30
HOPWA		6,419,016.00			6,419,016.00
Emergency Solutions Grant (ESG)		483,211.00			483,211.00
Neighborhood Stabilization Program11		2,018,637.00	988,671.23		1,029,965.77
HDSR - McCarter Highway		200,000.00	332.50		199,667.50
HDSR - Empire Street		200,000.00	213.75		199,786.25
HDSR - Emmet Street		200,000.00	237.50		199,762.50
HDSR - Mt. Pleasant Avenue		550,000.00	308.75		549,691.25
2012 Home Investment Partnership		1,944,355.00			1,944,355.00
Hess - North Ward		500,000.00	500,000.00		
Hess - South Ward		500,000.00	500,000.00		
Hess - Central Ward		500,000.00	500,000.00		
Hess - Youth Community Court		300,000.00	300,000.00		
Various Streets - 2013-7 Locations		1,501,000.00			1,501,000.00
Various Streets - 2012-10 Locations		1,501,000.00			1,501,000.00
Various Streets - 2013-10 Locations		1,326,370.00			1,326,370.00
Delancy Street Easement		1,900,000.00			1,900,000.00
Subregional Transportation		68,942.00	68,941.99		0.01
2013 Local Safety Program		500,000.00			500,000.00
SAFER Grant		3,171,693.00			3,171,693.00
Personal Protection Equipment		266,800.00			266,800.00
Bio-Terrorism		297,494.00			297,494.00
STD		138,693.00	124,626.00	14,061.00	6.00
Homeless Health Care (HRSA)		2,359,656.00	1,383,989.82		975,666.18
WIC		1,584,000.00	1,361,046.00		222,954.00
Truancy Alternative Program		66,480.00			66,480.00
Body Armor Grant		96,822.31			96,822.31
COPS in Shop Grant		16,640.00			16,640.00

CITY OF NEWARK
CURRENT FUND

FEDERAL AND STATE GRANTS RECEIVABLE

A-23
Sheet #20

Account Number	Balance Dec. 31, 2012	2013 Budget Revenue Realized	Received	Adjustment	Balance Dec. 31, 2013
Pedestrian Safety Program Grant	\$	\$ 15,000.00	\$ 12,400.00	\$	\$ 2,600.00
Targeting Violent Crimes Initiative		75,440.00			75,440.00
Body Armor Grant		94,228.25		94,228.25	
Justice Assistance Grant (JAG)		485,804.00			485,804.00
2011 Domestic Violence		207,730.00			207,730.00
UASI		200,000.00			200,000.00
UASI		1,608,858.66	749,414.85		859,443.81
Sub-Total for Year 2013 Grants		57,191,655.76	14,719,509.69	2,311,128.03	40,161,018.04
<u>2013 WIA/WFNI</u>					
WIA - ADULT		2,040,793.00	335,991.00		1,704,802.00
WIA - YOUTH		2,055,012.00	318,502.00		1,736,510.00
WIA - Dislocated Workers		870,416.00	106,941.00		763,475.00
GA/SNAP		662,853.00	90,265.00		572,588.00
TANF		596,806.00	107,000.00		489,806.00
WIA - Adult		2,131,383.00	1,339,614.00	197,672.00	594,097.00
WIA - Youth		2,087,149.00	1,151,972.00	172,396.00	762,781.00
WIA - Dislocated Workers		834,299.00	451,872.00	86,687.00	295,740.00
TANF		662,853.00	358,029.00	61,720.00	243,104.00
GA/SNAP		553,551.00	310,738.00	47,042.00	195,771.00
Learning Link		75,000.00	29,461.00		45,539.00
Hurricane Sandy National Disaster Emergency		368,473.00	368,473.00		
2011 Business Development Interdepartmental Funds		11,764.00	11,764.00		
Workforce Learning Link		127,000.00			127,000.00
Sub-Total for Year 2013 WIA/WFNI		13,077,352.00	4,980,622.00	565,517.00	7,531,213.00
Total - 2013 Grants		70,269,007.76	19,700,131.69	2,876,645.03	47,692,231.04
Grand Total	<u>\$ 155,174,062.53</u>	<u>\$ 70,269,007.76</u>	<u>\$ 69,347,801.85</u>	<u>\$ 2,910,008.89</u>	<u>\$ 153,185,259.55</u>
Reference	A	A-2	A-4	A-48	A
			Ref.		
		Cash Disbursed	A-4	\$ (20,889.92)	
		Reserve for Federal, State and			
		Other Grants	A-48	(1,942.75)	
		Unappropriated Reserves Applied	A-53	2,932,841.56	
			Above	\$ 2,910,008.89	

CITY OF NEWARK
CURRENT FUND

ACCOUNTS RECEIVABLE - STATE LAW ENFORCEMENT
PLANNING AGENCY AND LAW ENFORCEMENT ASSISTANCE
ADMINISTRATION GRANTS

A-24

	Balance Dec. 31, 2012	Balance Dec. 31, 2013
Multi-Jurisdictional Narcotics Task Force	\$ 36.00	\$ 36.00
Central Juvenile Processing	66.97	66.97
	<u>\$ 102.97</u>	<u>\$ 102.97</u>
<u>Reference</u>	<u>A</u>	<u>A</u>

ACCOUNTS RECEIVABLE - UNALLOCATED DISBURSEMENTS

A-25

	<u>Ref.</u>	
Balance December 31, 2012	A	<u>\$ 47,875.41</u>
Balance December 31, 2013	A	<u>\$ 47,875.41</u>

2012 APPROPRIATION RESERVES

A-26

	<u>Ref.</u>		
Balance December 31, 2012:			
Encumbered	A	\$ 7,420,489.95	
Reserved	A	<u>24,117,710.36</u>	
			\$ 31,538,200.31
Decreased by:			
Cancelled to Operation	A-1	3,857,621.76	
Anticipated as Revenue	A-2	1,700,000.00	
Cash Disbursed	A-4	25,289,771.05	
Transfer to Commitment Payables	A-27	<u>690,807.50</u>	
			<u>31,538,200.31</u>
			<u>\$ -</u>

CITY OF NEWARK
CURRENT FUND

COMMITMENTS PAYABLE

A-27

	<u>Ref.</u>	
Balance December 31, 2012	A	\$ 133,331.31
Increased by:		
Transferred from 2012 Appropriation Reserves	A-26	<u>690,807.50</u>
		824,138.81
Decreased by:		
Cash Disbursed	A-4	<u>310,154.24</u>
Balance December 31, 2013	A	<u><u>\$ 513,984.57</u></u>

CITY OF NEWARK
CURRENT FUND

RESERVE FOR VOID CHECKS PENDING DISTRIBUTION

A-28

	<u>Ref.</u>	
Balance December 31, 2012	A	\$70,429.67
Increased by:		
Cash Receipts	A-4	<u>14,200.00</u>
Balance December 31, 2013	A	<u>\$84,629.67</u>

RESERVE FOR DUE TO ELECTION WORKERS

A-29

	<u>Ref.</u>	
Balance December 31, 2012	A	<u>\$86,227.72</u>
Balance December 31, 2013	A	<u>\$86,227.72</u>

CITY OF NEWARK
CURRENT FUND

DUE FROM/TO STATE OF NEW JERSEY
PER CHAPTER 20, P.L. 1971

A-30

	<u>Ref.</u>		
Balance December 31, 2012	A		\$128,225.35
Increased by:			
Senior Citizen Disallowed Prior Year	A-1	\$ 1,803.41	
Cash Receipts	A-4	<u>330,095.96</u>	
			<u>331,899.37</u>
			460,124.72
Decreased by:			
Senior Citizens' and Veterans' per			
Tax Billing		\$ 319,250.00	
Add - Allowed by Tax Collector		<u>13,500.00</u>	
		<u>332,750.00</u>	
Less - Disallowed by Tax Collector		<u>25,160.28</u>	
	A-9		<u>307,589.72</u>
Balance December 31, 2013	A		<u>\$ 152,535.00</u>

CITY OF NEWARK
CURRENT FUND

MARRIAGE LICENSE FEES DUE TO STATE OF NEW JERSEY
AND PUBLIC ASSISTANCE TRUST FUND

A-31

	<u>Ref.</u>	<u>Total</u>	<u>Due to State</u>	<u>Due to Public Assistance</u>
Balance December 31, 2012	A	\$196,428.00	\$ 70,722.00	\$125,706.00
Increased by:				
Collections - Marriage License				
Receipts from City Clerk:				
Due to Public Assistance Trust	A-4	<u>47,209.00</u>	<u>41,700.00</u>	<u>5,509.00</u>
		<u>209,393.00</u>	<u>112,422.00</u>	<u>96,971.00</u>
Decreased by:				
Cash Disbursements	A-4	<u>31,150.00</u>	<u>31,150.00</u>	<u> </u>
Balance December 31, 2013	A	<u><u>\$212,487.00</u></u>	<u><u>\$ 81,272.00</u></u>	<u><u>\$131,215.00</u></u>

CITY OF NEWARK
CURRENT FUND

INTERFUNDS PAYABLE

A-32

	<u>Ref.</u>	<u>Totals</u>	<u>State and Federal Grant Fund</u>	<u>Assessment Fund</u>	<u>Water Utility Fund</u>	<u>Other Trust Fund</u>	<u>Insurance Trust Fund</u>	<u>Capital Fund</u>	<u>Water Capital Fund</u>
Balance December 31, 2012	A	\$1,554,701.03	\$60,462.40	\$238,768.35	\$788,860.16	\$19,094.66	\$285,015.46	\$150,000.00	\$12,500.00
Increased by:									
Cash Receipts	A-4	<u>272,092.95</u>		<u>49,386.20</u>			<u>222,706.75</u>		
		1,826,793.98	60,462.40	288,154.55	788,860.16	19,094.66	507,722.21	150,000.00	12,500.00
Decreased by:									
Cash Disbursements	A-4	<u>1,018,417.22</u>	<u>60,462.40</u>		<u>788,860.16</u>	<u>19,094.66</u>		<u>150,000.00</u>	
Balance December 31, 2013	A	<u>\$ 808,376.76</u>	<u>\$ -</u>	<u>\$288,154.55</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$507,722.21</u>	<u>\$ -</u>	<u>\$12,500.00</u>

CITY OF NEWARK
CURRENT FUND

DUE TO SPECIAL IMPROVEMENT DISTRICT

A-33

	<u>Ref.</u>	<u>Central Special Improvement District</u>	<u>Total of Improvement Districts</u>
Balance December 31, 2012	A	\$ 55,445.43	\$ 55,445.43
Increased by:			
Central (Downtown)	A-1,2,9	<u>3,870,357.00</u>	<u>3,870,357.00</u>
		3,925,802.43	3,925,802.43
Decreased by:			
Cash Disbursed	A-4	<u>3,113,304.95</u>	<u>3,113,304.95</u>
Balance December 31, 2013	A	<u><u>\$ 812,497.48</u></u>	<u><u>\$ 812,497.48</u></u>

CITY OF NEWARK
CURRENT FUND

DUE TO STATE OF NEW JERSEY - CONSTRUCTION FEES

A-34

	<u>Ref.</u>	
Balance December 31, 2012	A	\$313,400.63
Increased by:		
Due to State of New Jersey -		
Construction Fees	A-4	<u>565,295.00</u>
		878,695.63
Decreased by:		
Cash Disbursements	A-4	<u>306,897.00</u>
Balance December 31, 2013	A	<u><u>\$571,798.63</u></u>

CITY OF NEWARK
CURRENT FUND

VARIOUS LIABILITIES FUNDS

A-35

	<u>Balance</u> <u>Dec. 31, 2012</u>	<u>Increased</u> <u>by</u> <u>Cash Receipts</u>	<u>Decreased</u> <u>by</u> <u>Disbursements</u>	<u>Balance</u> <u>Dec. 31, 2013</u>
Due to Library	\$ 25,000.00	\$	\$	\$ 25,000.00
Reserve for Judgments	1,954.31			1,954.31
Due to Redflex Traffic Control	695,436.00	3,280,694.00	3,727,182.00	248,948.00
Due to Parking Authority from Municipal Court	164,667.21	2,145,371.35	2,160,059.49	149,979.07
Due to State Waste Water Fund	25,000.00			25,000.00
Police Overtime	<u>49,301.69</u>	<u>136,073.81</u>	<u></u>	<u>185,375.50</u>
	<u>\$961,359.21</u>	<u>\$5,562,139.16</u>	<u>\$5,887,241.49</u>	<u>\$636,256.88</u>
<u>Reference</u>	<u>A</u>	<u>A-4</u>	<u>A-4</u>	<u>A</u>

CITY OF NEWARK
CURRENT FUND

RESERVE FOR TAX APPEALS PENDING

A-36

	<u>Ref.</u>	
Balance December 31, 2012		\$ 3,986,425.64
Increased by:		
Charge to Operations	A-1	<u>259,582.81</u>
		4,246,008.45
Decreased by:		
Cash Disbursed	A-4	<u>4,246,008.45</u>
		<u>\$ -</u>

CITY OF NEWARK
CURRENT FUND

TAX OVERPAYMENTS

A-37

	<u>Ref</u>		
Balance December 31, 2012			\$1,165,131.16
Increased by:			
Cash Receipts	A-4		<u>2,397,532.48</u>
			3,562,663.64
Decreased by:			
Cancelled	A-1	\$1,913,461.58	
Cash Disbursements	A-4	<u>1,060,496.00</u>	
			<u>2,973,957.58</u>
Balance December 31, 2013	A		<u>\$ 588,706.06</u>

RESERVE FOR EMERGENCY FUND FOR HURRICANE SANDY

A-38

	<u>Ref</u>		
Balance December 31, 2012	A		\$5,922,181.81
Decreased by:			
Cash Disbursements	A-4		<u>4,186,060.72</u>
Balance December 31, 2013	A		<u>\$1,736,121.09</u>
Detail:			
Reserve for Encumbrances - Special			
Emergency - Hurricane Sandy			\$ 913,763.49
Reserve for Hurricane Sandy			<u>822,357.60</u>
			<u>\$1,736,121.09</u>

CITY OF NEWARK
CURRENT FUND

PREPAID TAXES AND PREPAID TAX ABATEMENTS

A-39

	<u>Ref.</u>	<u>Prepaid Taxes</u>	<u>Prepaid Tax Abatements</u>
Balance December 31, 2012	A	\$39,343,676.28	\$1,248,397.84
Increased by:			
2014 Taxes Prepaid	A-4	<u>1,839,389.66</u>	<u>106,666.77</u>
		41,183,065.94	1,355,064.61
Decreased by:			
Applied to 2013 Taxes Receivable	A-9,14	<u>39,343,676.28</u>	<u>1,248,397.84</u>
Balance December 31, 2013	A	<u>\$ 1,839,389.66</u>	<u>\$ 106,666.77</u>

CITY OF NEWARK
CURRENT FUND

PREPAID SPECIAL IMPROVEMENT DISTRICT

A-40

	<u>Ref.</u>	<u>Total</u>	<u>Central</u>	<u>Ironbound</u>	<u>Mount Prospect</u>
Balance December 31, 2012	A	\$76,192.76	\$15,458.74	\$49,848.01	\$10,886.01
Increased by:					
Cash Receipts	A-4	<u>31,552.61</u>	<u>10,453.21</u>	<u>20,833.10</u>	<u>266.30</u>
		107,745.37	25,911.95	70,681.11	11,152.31
Decreased by:					
Applied to Taxes Receivable	A-9	<u>49,848.01</u>		<u>49,848.01</u>	
Balance December 31, 2013	A	<u><u>\$57,897.36</u></u>	<u><u>\$25,911.95</u></u>	<u><u>\$20,833.10</u></u>	<u><u>\$11,152.31</u></u>

CITY OF NEWARK
CURRENT FUND

DEFICIT IN OPERATIONS

A-41

	<u>Ref.</u>	
Increased by:		
Transfer from Fund Balance	A-1	<u>\$ 30,121,208.59</u>
Balance December 31, 2013	A	<u><u>\$ 30,121,208.59</u></u>

CITY OF NEWARK
CURRENT FUND

RESERVE FOR MASTER PLAN

A-42

	<u>Ref.</u>	
Balance December 31, 2012	A	\$ 413,531.89
Decreased by:		
Cash Disbursements	A-4	<u>137,875.00</u>
Balance December 31, 2013	A	<u>\$ 275,656.89</u>

COUNTY TAXES PAYABLE

A-43

	<u>Ref.</u>	
Balance December 31, 2012	A	\$ 124,392.00
Increased by:		
2013 Levy		\$74,907,034.81
Added Taxes - Prior Year		<u>1,892,153.75</u>
	A-1,2,9	<u>76,799,188.56</u>
		<u>76,923,580.56</u>
Decreased by:		
Cash Disbursements	A-4	<u>75,031,426.82</u>
Balance December 31, 2013	A	<u>\$ 1,892,153.74</u>

CITY OF NEWARK
CURRENT FUND

LOCAL SCHOOL DISTRICT TAX PAYABLE

A-44

	<u>Ref.</u>	
Increased by:		
2013 Tax Levy	A-1,2,9	\$108,957,123.50
Decreased by:		
Cash Disbursements	A-4	<u>108,957,123.50</u>
		<u>\$ -</u>

TAX ANTICIPATION NOTES PAYABLE

A-45

	<u>Ref.</u>	
Balance December 31, 2012	A	\$ 40,000,000.00
Increased by:		
Cash Receipts	A-4	<u>54,950,000.00</u>
		<u>94,950,000.00</u>
Decreased by:		
Cash Disbursements	A-4	<u>45,000,000.00</u>
Balance December 31, 2013	A	<u>\$ 49,950,000.00</u>

CITY OF NEWARK
CURRENT FUND

EMERGENCY NOTES PAYABLE

A-46

	<u>Ref.</u>	<u>Revaluation</u>	<u>Hurricane Sandy</u>	<u>Liability Payout</u>
Balance December 31, 2012	A	\$ 1,600,000.00	\$ 6,500,000.00	\$ 5,545,000.00
Increased by:				
Cash Receipts	A-4	<u>800,000.00</u>	<u>4,853,000.00</u>	<u>4,161,000.00</u>
		2,400,000.00	11,353,000.00	9,706,000.00
Decreased by:				
Cash Disbursed	A-4	<u>1,600,000.00</u>	<u>6,500,000.00</u>	<u>5,545,000.00</u>
Balance December 31, 2013	A	<u>\$ 800,000.00</u>	<u>\$ 4,853,000.00</u>	<u>\$ 4,161,000.00</u>

CITY OF NEWARK
CURRENT FUND

APPROPRIATION RESERVES FOR
STATE LAW ENFORCEMENT PLANNING AGENCY AND
LAW ENFORCEMENT ASSISTANCE ADMINISTRATION GRANTS

A-47

	Balance <u>Dec. 31, 2012</u>	Balance <u>Dec. 31, 2013</u>
Delinquency Prevention for Youth at Risk	\$ 2,792.00	\$ 2,792.00
Delinquency Prevention for Youth at Risk	7,073.00	7,073.00
Juvenile Prevention and Diversion Project	1,412.70	1,412.70
Multi-Jurisdictional Narcotic Task Force:		
1992 TA-22	12,934.02	12,934.02
TA-32	184,254.46	184,254.46
1994 TA-37	17,474.04	17,474.04
Central Juvenile Processing	<u>1,503.54</u>	<u>1,503.54</u>
	<u>\$ 227,443.76</u>	<u>\$ 227,443.76</u>
<u>Reference</u>	<u>A</u>	<u>A</u>

CITY OF NEWARK
CURRENT FUNDRESERVE FOR FEDERAL, STATE AND OTHER GRANTSA-48
Sheet #1

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
	<u>State and Federal Revenues Offset with Appropriations</u>					
	New Jersey State Department of Transportation:					
S4W4	Municipal Road Aid	\$ 300,000.00	\$	\$	\$	\$ 300,000.00
S4W0	Resurfacing and Reconstruction: Wilson Avenue	383,639.73				383,639.73
	Totals for Year 1989 Grants	683,639.73				683,639.73
N4Y0	Relocation Assistance	113,858.00				113,858.00
S4W2	Design Work for Reconstruction	48,247.02				48,247.02
S4Y0	Street Resurfacing and Reconstruction	64,315.94				64,315.94
S4Y1	Clean Communities	7,991.72				7,991.72
S4Y2	Design Traffic Signage	125,000.00				125,000.00
S4Y3	Landscaping of Route 21	278,917.64				278,917.64
S4Y4	Market and Peddie Street	318,295.15				318,295.15
S4Y5	Right-of-Way Acquisition	300,000.00				300,000.00
VoYo-VO	Summer Food Program	6,216.72				6,216.72
	Totals for Year 1990 Grants	1,262,842.19				1,262,842.19
UN10	Hazardous Waste Upon Completion	35,194.84				35,194.84
	Totals for Year 1991 Grants	35,194.84				35,194.84
	New Jersey State Department of Transportation:					
E12K	Resurfacing of Wilson Avenue	206,960.77				206,960.77
	Totals for Year 1992 Grants	206,960.77				206,960.77
E43A	Sewer Overflow	5,067.64				5,067.64
E56E	Truck Route Signs					
D13L	Recycling Education Grant	(13,316.66)				(13,316.66)
D131	Hope 2	91,279.46				91,279.46
	Totals for Year 1993 Grants	83,030.44				83,030.44

CITY OF NEWARK
CURRENT FUNDRESERVE FOR FEDERAL, STATE AND OTHER GRANTSA-48
Sheet #2

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
	<u>State and Federal Revenues Offset with Appropriations</u>					
E14A	Tree Planting	\$ 22,800.00	\$	\$	\$	\$ 22,800.00
	New Jersey State Department of Health:					
H241	Public Health Priority Funding	84,931.56				84,931.56
H242	Public Health Priority Funding	34,201.12				34,201.12
H24UV	Women, Infants and Children's Supplemental Food Program	111,320.21				111,320.21
H34B	Childhood Lead Program	146,703.44				146,703.44
H54B/C	SunUp Operation	522,017.84				522,017.84
2H4C	Immunization Grant	167,516.04				167,516.04
	New Jersey State Department of Transportation:					
1E4A	Resurfacing of 13th Street and Various Other Streets	392,705.61				392,705.61
N34A	Clean Community	10,504.35				10,504.35
2H4F	Municipal Alliance Substance Abuse	15,615.97				15,615.97
	Five Percent Gross Receipts:					
F24A	Tax Trust Fund for Hazardous Waste Facilities:					
	Hazardous Materials Emergency Response Training Equipment Specification and Procurement Project	28,134.12				28,134.12
	United States Department of Housing and Urban Development:					
D14B	International Trade Center	253,686.01				253,686.01
D14C	Lead Painting Abatement Program	73,593.62				73,593.62
D14H	Home Investment Partnership Program	14,593.14				14,593.14
	Port Authority of New York and New Jersey:					
H24S	Homeless Health Care Project	64,115.69				64,115.69
	Totals for Year 1994 Grants	1,942,438.72				1,942,438.72
D15H	Home Investment Partnership Program	7,059.49				7,059.49
D15K	Downtown Improvement	1,190,278.20				1,190,278.20
D15M	Balanced Housing - Society Hill	84,446.73				84,446.73
D15N	Deteriorated Urban	325,606.26				325,606.26
D15S	RCA Funds - Bowser	716,750.00				716,750.00
D15U	University Heights Science Park	3.01				3.01
D25N	Balanced Housing - Jasmin House	87,003.00				87,003.00
E15A	SBA Tree Planting Program	22,500.00				22,500.00
E15F	Remediation Activity at Various Sites	35,233.83				35,233.83
H15A	Housing Opportunity for People with AIDS	163,340.47				163,340.47
H251	Public Health Priority Funding	6,210.29				6,210.29

CITY OF NEWARK
CURRENT FUNDRESERVE FOR FEDERAL, STATE AND OTHER GRANTSA-48
Sheet #3

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
	<u>State and Federal Revenues Offset with Appropriations</u>					
H55BC	Summer Food Service Program for Children (SunUp)	\$ 234,571.94	\$	\$	\$	\$ 234,571.94
H55G	Nutrition Project for the Elderly - Meals on Wheels	6.84				6.84
N35F	Municipal Tonnage	(63,023.20)			(63,023.20)	
N35G	Municipal Tonnage	(9,782.84)			(9,782.84)	
P15P	COPS Ahead	142,667.90				142,667.90
S65A	Combined Sewer Overflow	9,121.32				9,121.32
	Totals for Year 1995 Grants	2,951,993.24			(72,806.04)	3,024,799.28
D16W	Home Investment Partnership Act	9,927.37				9,927.37
D16Y	South Ward Industrial Park Project	21,712.48				21,712.48
F16H	Fire Cadets	7,521.72				7,521.72
H16A	Home Ownership Partnership Work	14,337.48				14,337.48
H162	HIV Supplemental Aid	72,269.19				72,269.19
H26Y	Aids Prevention Education	82.32				82.32
H261	Public Health Priority Funding	18,029.45				18,029.45
H36D	Relocation Assistance	127,585.91				127,585.91
P16R	COPS More	37,788.47				37,788.47
P16T	Police Cadets	1,038,683.93				1,038,683.93
P16V	Law Enforcement Block Grant	243,013.00				243,013.00
	Totals for Year 1996 Grants	1,590,951.32				1,590,951.32
A17A	Newark Enterprise Zone	29,805.81				29,805.81
E17F	Newark Economic Land Use	1,000.00				1,000.00
E17H	Subregional Planning	5.00				5.00
H27U/V	Women, Infants and Children	34,195.65				34,195.65
H57B/C	Summer Food SunUp - Operational	428,392.90				428,392.90
P17P	COPS Ahead	(194,178.99)				(194,178.99)
P17R	COPS More	50,469.30				50,469.30
1P7C	Safe and Secure Communities	17,203.96				17,203.96
2H72	HIV Supplemental	29,707.51				29,707.51
2H74	HOPWA	14,532.18				14,532.18
	Totals for Year 1997 Grants	411,133.32				411,133.32

CITY OF NEWARK
CURRENT FUNDRESERVE FOR FEDERAL, STATE AND OTHER GRANTSA-48
Sheet #4

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
	<u>State and Federal Revenues Offset with Appropriations</u>					
E18L	UTC Extension Project	\$ (0.28)	\$	\$	\$	\$ (0.28)
E18O	U.S. Postal Facility Remediation	2,344.77				2,344.77
H28B	Emergency Shelter	2.75				2.75
H28E	Women, Infants and Children	5,583.10				5,583.10
H38B	Childhood Lead Abatement	7,099.41				7,099.41
P18G	Enterprise Zone	219,213.03				219,213.03
N38C	Recycling	131,346.96				131,346.96
2H84	HOPWA	26,781.52				26,781.52
	Totals for Year 1998 Grants	392,371.26				392,371.26
C19A	BCBS Community Service Award	245,110.99				245,110.99
D19C	UEZ Facade Improvement Project	239,578.60				239,578.60
D19F	J.G.M. Passaic River Waterfront	2,542,055.00				2,542,055.00
D19G	Home Investment Partnership	26,605.02				26,605.02
E19B	West Kinney Site Remediation	20,485.92				20,485.92
E19D	Broad Street Resurfacing Project	46,400.37				46,400.37
E19G	Royalty Recovery Site Program	22,708.13				22,708.13
E19H	Hudsar Inc Site Remediation	7,269.90				7,269.90
E19I	NSC Plating Site Remediation	17,354.17				17,354.17
E19K	Resurfacing of Fifteen Various Streets	31,691.62				31,691.62
H29A	Comic Relief	5,427.75				5,427.75
H29U-V	WIC Administration/Education	22,720.80				22,720.80
H29I	Public Health Priority	12,526.75				12,526.75
P19G	New Jersey Urban Enterprise Zone Authorization	571,258.92				571,258.92
P19H	COPS Universal Hiring	7,132.28				7,132.28
P19M	Local Law Enforcement	14,207.00				14,207.00
S69A	Combine Sewer Overflow	34,320.90				34,320.90
2H9D	Project Respect II	7,724.60				7,724.60
2H9F	Municipal Alliance	6,043.69				6,043.69
2H94	HOPWA	53,020.14				53,020.14
	Totals for Year 1999 Grants	3,933,642.55				3,933,642.55

CITY OF NEWARK
CURRENT FUNDRESERVE FOR FEDERAL, STATE AND OTHER GRANTSA-48
Sheet #5

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
	<u>State and Federal Revenues Offset with Appropriations</u>					
D10A	Macedonia Heights Balanced Housing Grant	\$ 98,450.00	\$	\$	\$	\$ 98,450.00
D10B	Housing Services Project - West Side Village	63,000.00				63,000.00
D10G	Home Investment Part Act Program	254,211.12		201,731.30		52,479.82
E10A	Doremus Avenue Drainage Outfall	2,643,449.80		269,193.56		2,374,256.24
E10E	16th Avenue and Various Street Resurfacing	11,255.07				11,255.07
E10F	Urban Traffic Control System	93,446.97				93,446.97
E10G	Pedestrian School Safety Program	6,010.05				6,010.05
E10H	McClellan Street Underpass	19,732.38				19,732.38
E10K	Avenue P Bridge Project	52,363.24				52,363.24
E10L	Y2K Support for Existing UTCS	23.21				23.21
H20E	WIC Administration	24,311.51				24,311.51
H20L	Homeless Health Care Project	50,290.51				50,290.51
H20Y	Women and HIV/Risk Reduction	2.20				2.20
H201	Public Health Priority Funding	38,951.01				38,951.01
H30D	Childhood Lead Poisoning	340.36				340.36
H30E	Childhood Lead Poisoning	309.13				309.13
H50D	Childcare Food Program	75,119.66				75,119.66
P10F	Weed and Seed Program Housing	44,836.42				44,836.42
P10I	Bulletproof Vest Program	26,339.00				26,339.00
P10J	COPS More Grant Program	10,226.86				10,226.86
P10N	Gun Buy Back Violence Reduction	349,300.00				349,300.00
P10V	Law Enforcement Block Grant	7,949.52				7,949.52
W10A	Charlotteberg and Camoster Dam	223,301.49				223,301.49
W10B	Queens Ditch Improvement	257,129.37		75,004.25		182,125.12
2HOC	Immunization Grant	45,881.09				45,881.09
M10A/Z	WIA/WFNFJ	915,787.31				915,787.31
2H01	HIV	10,688.90				10,688.90
2H04	HOPWA	17,511.58				17,511.58
	Totals for Year 2000 Grants	5,340,217.76		545,929.11		4,794,288.65
D11G	HUD - HOME	498,584.11		371,188.00		127,396.11
D11K	White Chemical Site Superfund	24,082.96				24,082.96
E11A	Syntax Site Remediation Project	17,046.07				17,046.07
E11B	Broad Street Resurfacing Project	25,672.83				25,672.83
E11F	Newark Greenway Network	86,892.09				86,892.09

CITY OF NEWARK
CURRENT FUND

RESERVE FOR FEDERAL, STATE AND OTHER GRANTS

A-48
Sheet #6

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
	<u>State and Federal Revenues Offset with Appropriations</u>					
E11G	Resurfacing Fourteen Streets	\$ 5,543.24	\$	\$	\$	\$ 5,543.24
E11H	New Jersey Economic Development	39,863.84				39,863.84
E11J	Orbis Products Corporation	14,898.00				14,898.00
E11K	Boylan Street Recreation Center	17,920.81				17,920.81
H21C	Emergency Shelter Grant	1.97				1.97
H21M	Homeless Health Care Project	7,761.65				7,761.65
H21U/V	WIC Administration and Education	72,139.77				72,139.77
H21W	WIC Administration	125,474.56				125,474.56
H31E	Lead Based Paint Hazard Control	46,630.98				46,630.98
H31F	Childhood Lead Cola	0.50				0.50
H31G	Childhood Lead Poisoning Project	2,514.55				2,514.55
H51A	Child and Adult Food Care Program	38,160.45				38,160.45
N11F	Municipal Tonnage	38,938.62				38,938.62
1PiA	Safe and Secure Community Program	32,817.13				32,817.13
2H11	HIV Emergency Program	271,419.34				271,419.34
2H15	HOPWA	23,217.88				23,217.88
	Totals for Year 2001 Grants	1,389,581.35		371,188.00		1,018,393.35
A12B	Urban Enterprise Zone FY 2002 Administration	493,136.02				493,136.02
D12G	Home Investment Program	16,923.30		11,816.19		5,107.11
D12P	Economic Development, Brownfield's Redevelopment	166,624.22				166,624.22
E12A	Newark Greenway Network Phase Five	4,605.95				4,605.95
E12B	Resurfacing of Twelve Various Streets	10,016.06				10,016.06
E12N	Norfolk Street, Jones Street and Irvine Turner Boulevard	15,000.00				15,000.00
E12R	Pedestrian Safety Program	2,784.30				2,784.30
E12T	Wilson Avenue	24,214.44				24,214.44
E12X	Design Surface Market Street and Elizabeth Avenue	12,449.46				12,449.46
H12E	Bio-Terrorism Health Alert Network	1,274.98				1,274.98
H22W	WIC Program	62,475.95				62,475.95
H221	Public Health Priority Funding	34,628.99				34,628.99
H32G	Childhood Lead Poisoning Prevention Program	74.22				74.22
H32H	Childhood Lead Poisoning Prevention Program	14,336.42				14,336.42
H52B/C	SunUp Administration	99,001.89				99,001.89
H52D	Child and Adult Food Care Program	207,704.26				207,704.26
L12A	Victim/Witness Advocacy Program	9,013.87				9,013.87

CITY OF NEWARK
CURRENT FUND

RESERVE FOR FEDERAL, STATE AND OTHER GRANTS

A-48
Sheet #7

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
	<u>State and Federal Revenues Offset with Appropriations</u>					
P12B	Partners Against Crime (PAC)	\$ 12,231.02	\$	\$	\$	\$ 12,231.02
P12V	Local Law Enforcement Block Grant	142,352.24				142,352.24
2H25	HOPWA Program	25,539.57				25,539.57
	Totals for Year 2002 Grants	1,354,387.16		11,816.19		1,342,570.97
A13B	Homeland Security, Police	72,718.68				72,718.68
A13C	Homeland Security, Fire	46,542.07				46,542.07
A13D	Homeland Security, HHS	12,750.46				12,750.46
A13F	Homeland Security, Water/Sewer	4,674.26				4,674.26
E13B	Central Street Drum Site Remediation	18,842.00				18,842.00
E13K	Resurfacing of Market Street and Elizabeth Avenue	545,344.91				545,344.91
E13L	Preliminary Assessment - Arts Metal	35,173.77				35,173.77
E13M	Raymond Boulevard Resurfacing	141,326.21				141,326.21
F13A	FEMA	2.00				2.00
F13B	City Match - Firefighters	11,714.00				11,714.00
F13J	State Domestic Preparedness Equipment	5,276.88				5,276.88
H23N	Homeless Health Care Project - PHS	14,740.35				14,740.35
H23X	WIC Program	95,612.92				95,612.92
H236	Tuberculosis Control Grant	29,016.90				29,016.90
H239	STD Clinic	29,186.14				29,186.14
H33H	Childhood Lead Poisoning	43,165.72				43,165.72
H53D	Child and Adult Food Care	145,000.44				145,000.44
H53F	Nutrition for the Elderly	15,420.40				15,420.40
N13E	Clean Communities Program	6,341.20				6,341.20
P13H	Safe School and Community Police	95,844.18				95,844.18
P13N	Law Enforcement Block Grant (INT)	7,975.31				7,975.31
P13P	Improvements to Nineteen Streets	43,748.99				43,748.99
P13W	Law Enforcement Block Grant	73,118.32				73,118.32
2H35	HOPWA Program	31,490.95				31,490.95
	Totals for Year 2003 Grants	1,525,027.06				1,525,027.06
2H430	HIV Counseling, Testing and Referral Service					
2H440	Infant Mortality Reduction Program	6,832.93				6,832.93
2H410	HIV Emergency Relief Program	36,594.03				36,594.03
2H450	HOPWA Program	18,955.75				18,955.75

CITY OF NEWARK
CURRENT FUND

RESERVE FOR FEDERAL, STATE AND OTHER GRANTS

A-48
Sheet #8

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
	<u>State and Federal Revenues Offset with Appropriations</u>					
2H4CO	Emergency Shelter Grant	\$ 46,696.44	\$	\$	\$	\$ 46,696.44
2H4P0	West Nile Virus	146.06				146.06
2H4S0	Homeless Health Care (Air Port)	13.57				13.57
A14H0	Urban Areas Security Program	5,901.02				5,901.02
A14J0	Urban Areas Security Program	16,900.59				16,900.59
A14N0	Newark Urban Enterprise Zone	263,013.66				263,013.66
D14M0	Home Investment Partnership Act	414,244.79		(2,843.86)		417,088.65
E14D0	Various Streets SA2004 Projects	12,925.00				12,925.00
E14E0	Newark Greenway Network	29,126.23				29,126.23
E14G0	Pedestrian Safety Program	164.04				164.04
E14H0	Warren Street and Summit Street Traffic Signs	100,000.00				100,000.00
E14M0	Conrail Railroad Bridge Over Avenue P	34,478.32				34,478.32
E14S0	Remedial Investigation Red Raven	13,625.00				13,625.00
E14W0	Livable Community Program Phase II	60,000.00				60,000.00
H14E0	Bio-Terrorism	771.33				771.33
H2460	Smallpox Preparedness Planning	3,576.06				3,576.06
H24M0	Homeless Health Care	155,596.19				155,596.19
H24W0	Women, Infants and Children	22,268.26				22,268.26
H24X0	Women, Infants and Children	126,937.66				126,937.66
H34H0	Childhood Lead Poisoning	9,041.52				9,041.52
H54B/C0	SunUp Food Administration	7,712.35				7,712.35
H54D0	Childcare Food Program	375,588.92				375,588.92
L14A0	Victim/Witness Advocacy	24,126.51				24,126.51
N14E0	Clean Communities Program	15,021.53				15,021.53
P14B0	Partners Against Crime (PAC)	337,949.20				337,949.20
P14C0	Law Enforcement Training	272,500.00				272,500.00
P14PO	Safe and Secure Communities	66,785.63		5,509.76		61,275.87
P14S0	Interoperable Communication - Tech	1.16				1.16
P14V0	Body Armor Replacement Fund	23.14				23.14
W14B0	Relocation of Water Aqueduct	40,675.34				40,675.34
M14-94Ao/Z0	Job Training Partnership Act - Administration Program	4,547,207.72				4,547,207.72
	Totals for Year 2004 Grants	7,065,399.95		2,665.90		7,062,734.05

CITY OF NEWARK
CURRENT FUND

RESERVE FOR FEDERAL, STATE AND OTHER GRANTS

A-48
Sheet #9

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
	State and Federal Revenues Offset with Appropriations					
2H530	Metropolitan Medical Response System FY 2005 (MMRS)	\$ 301.14	\$	\$	\$	\$ 301.14
2H550	Housing Opportunities for People with Aids	14,780.48				14,780.48
2H5B0	Municipal Alliance Program	9,253.04				9,253.04
2H5E0	Immunization Program	19,114.63				19,114.63
2H5K0	Homeless Service Enhancement	82.27				82.27
5H5B/C0	Summer Food Service Program (SunUp)	144,124.87				144,124.87
5H5D0	Child and Adult Food Program	284,546.62				284,546.62
5H5F0	Nutrition Project for the Elderly	18,081.69				18,081.69
A15M0	Urban Areas Security Initiative Grant	40,711.01				40,711.01
A15P0	Redevelopment Project - South Ward	274,563.25		75,998.19		198,565.06
A15Q0	Redevelopment Project - East Ward	62,570.54				62,570.54
A15R0	Redevelopment Project - West Ward	607,619.70		143,820.50		463,799.20
A15S0	Redevelopment Project - Central Ward	288,957.33				288,957.33
A15T0	Newark Office Urban Enterprise Zone	32,335.84				32,335.84
D15J0	Brownfield's Redevelopment Initiative Project	4,819.60				4,819.60
D15M0	Home Investment Partnership Act Program	1,549,546.70				1,549,546.70
D15X0	Cross Acceptance Grant	6,031.00				6,031.00
E15J0	Raymond Boulevard Resurfacing	53,886.72				53,886.72
E15P0	Delancy Street Corridor Improvements	5,200.00				5,200.00
E15R0	Newark Greenway Network	60,411.87				60,411.87
E15T0	Redevelopment Project - North Ward	65,901.62				65,901.62
F15B0	Firefighters Grant Program	26,914.00				26,914.00
F15F0	Assistance to Firefighters	88,411.00				88,411.00
H2570	STD Clinic	9,247.55				9,247.55
H25Q0	Homeless Health Care Project - SAMSHA	2.07				2.07
H25T0	Emergency Shelter Grant Program	1.62				1.62
H35F0	Childhood Lead Poisoning Prevention Control	0.87				0.87
L15D0	Victim/Witness Advocacy Program	27,643.98				27,643.98
P15B0	Partners Against Crime	117,693.81				117,693.81
P15C0	Gang Resistance Education and Training	272.75				272.75
P15Q0	COPS Universal Hiring Program	1,284,232.94				1,284,232.94
M15A-Z	Workforce Investment Act (JTPA)	3,550,174.11				3,550,174.11
W15A0	Engineering Route 21 - Sewer Utility	266,427.26				266,427.26
W15B0	Cedar Grove Rehabilitation - Water Utility	1,750,000.00				1,750,000.00
	Totals for Year 2005 Grants	10,663,861.88		219,818.69		10,444,043.19

CITY OF NEWARK
CURRENT FUNDRESERVE FOR FEDERAL, STATE AND OTHER GRANTSA-48
Sheet #10

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
	<u>State and Federal Revenues Offset with Appropriations</u>					
2H6B0	Municipal Alliance	\$ 5,237.95	\$	\$	\$	\$ 5,237.95
5H6B/C	SunUp - Administration/Operation	135,188.07				135,188.07
5H6H0	Childcare Food Program	62,174.44				62,174.44
A16A0	N.J. Urban Enterprise Zone Authority	105,942.57				105,942.57
A16C0	N.J. Urban Enterprise Zone Authority	104,630.95				104,630.95
A16D0	N.J. Urban Enterprise Zone Authority	587,825.25				587,825.25
A16E0	Joseph Minish Passaic Riverfront	2,275,000.00		764,984.99		1,510,015.01
A16N0	N.J. Urban Enterprise Zone Authority	232,816.47				232,816.47
D16A0	Home Investment Partnership Act	48,948.13				48,948.13
D16C0	American Dream Down Payment Initiative	13.00				13.00
D16E0	American Dream Down Payment Initiative	11,168.62				11,168.62
E16B0	Resurfacing of Various Streets	6.23				6.23
E16E0	Urban Traffic Control System	30,018.00				30,018.00
E16Q0	Various Streets - 2006 Newark	1,477.47				1,477.47
F16A0	N.J. Department of Law and Public Safety	80.00				80.00
F16B0	Juvenile Firesetters Program	2,998.82				2,998.82
H16F0	Bio-Terrorism			(15,300.00)		15,300.00
H2620	WIC	1.10				1.10
N16F0	Municipal Tonnage Grant - 2005	8,992.22				8,992.22
P16B0	Partners Against Crime	310,305.98				310,305.98
P16C0	Body Armor Replacement Program	464.47				464.47
P16H0	Local Law Enforcement Block Grant	0.50				0.50
P16PO	Safe and Secure Communities	52,166.84				52,166.84
U16B0	Emergency Medical Services	375,000.00				375,000.00
M96A0-Z0	WIA/WFNJ	1,979,505.98				1,979,505.98
	Totals for Year 2006 Grants	6,329,963.06		749,684.99		5,580,278.07
2H760	HOPWA	109,724.66				109,724.66
2H780	HOPWA	179,790.27				179,790.27
2H7A0	HIV Counseling Test and Referral	32.05				32.05
2H7E0	Immunization Program	5,290.87				5,290.87
2H7H0	HIV Emergency Relief	98,288.43				98,288.43
2H7J0	HIV Emergency Relief - Special Care	0.59				0.59
5H7B0	SunUp Summer Food Program - Administration	3,194.79				3,194.79
5H7C0	SunUp Summer Food Program - Operation	133.82				133.82
5H7FO	Nutrition for the Elderly	38,876.18				38,876.18

CITY OF NEWARK
CURRENT FUND

RESERVE FOR FEDERAL, STATE AND OTHER GRANTS

A-48
Sheet #11

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
	<u>State and Federal Revenues Offset with Appropriations</u>					
5H7GO	Meals on Wheels	\$ 2.00	\$	\$	\$	\$ 2.00
5H7HO	Child and Adult Care Food Program	208,916.85				208,916.85
A17CO	Nat Turner Park Development Program	1,277.00				1,277.00
A17DO	Urban Arena Security Initiative	(125,852.91)				(125,852.91)
A17PO	Trail Blazer Grant	8,593.52				8,593.52
A17QO	Newark Arena Demolition Grant	556,123.50				556,123.50
A17SO	Newark Downtown Corridor Revitalization	178,416.00		4,560.00		173,856.00
C17AO	PARIS Grant	305.80				305.80
C17BO	Cable TV Project	1,311.53				1,311.53
D17EO	Newark Alliance	13,339.39				13,339.39
D17MO	Home Investment Partnership	787,288.03		86,557.08		700,730.95
D17PO	Crest Community Development	865,500.00				865,500.00
D17RO	Rental Rehabilitation Project	287,285.42		93,788.00		193,497.42
D17TO	Home	26,748.35		15,491.58		11,256.77
E17JO	Newark Conservancy Environment	500,000.00				500,000.00
E17KO	Site Remediation Nat Turner Park	25,527.18				25,527.18
E17LO	Subregional Transportation	68,942.00				68,942.00
E17SO	Pedestrian Safety Program	15,524.34				15,524.34
F17BO	Hazardous Waste Materials	23.92				23.92
H276O	Infant Mortality Reduction Project	920.94				920.94
H277O	Black Infant Mortality Reduction	144.37				144.37
H278O	STD Program	5.97				5.97
H27CO	ESG	2.06				2.06
H27DO	Homeless Health Care Project	2,328.06				2,328.06
H27JO	Emergency Shelter Program	8,246.84				8,246.84
H27XO	Asthma Collaborative Grant	5.86				5.86
H37CO	Emergency Lead Poison Relocation	15,111.00				15,111.00
H37DO	Childhood Lead Poison Prevention	1.88				1.88
H47CO	Health Emergency Preparedness and Response	705.87				705.87
H772O	Public Health Priority Funding Program	5.04				5.04
H773O	Diabetes Collaborative Program	55.17				55.17
L17DO	Victim Witness Advocacy Program	18,008.55				18,008.55
N17BO	Clean Communities - Rollovers	6,751.87				6,751.87
N17EO	Clean Communities	27,007.26				27,007.26
P17AO	Safe and Secure Communities	48,783.54				48,783.54

CITY OF NEWARK
CURRENT FUNDRESERVE FOR FEDERAL, STATE AND OTHER GRANTSA-48
Sheet #12

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
	<u>State and Federal Revenues Offset with Appropriations</u>					
P17UO	Domestic Violence Training	\$ 35.89	\$	\$	\$	\$ 35.89
P17WO	Comprehensive Traffic Safety Program	49,000.00				49,000.00
U17EO	Other Matching Grants	241,363.00				241,363.00
M97AP-EO	WIA/WFNJ	1,342,572.63		5,000.00		1,337,572.63
	Totals for Year 2007 Grants	5,615,659.38		205,396.66		5,410,262.72
2H820	Minority Aids Initiative Ryan White Program	18,233.82				18,233.82
2H860	Housing Opportunities for Persons with Aids (HOPWA)	237,264.70				237,264.70
2H8EO	Immunization Program	200,982.88				200,982.88
2H8GO	Homeless Port Authority Program	173,324.05				173,324.05
5H8B/CO	Summer Food Service Program (SunUp)	438,920.69				438,920.69
5H8FO	Congregate Meals	25,685.02				25,685.02
A18NO	UEZ Fiscal Administration Costs	512,320.13				512,320.13
A18TO	Acquisition of City/County Surveillance Monitoring System	968.12				968.12
A18UO	Newark Prisoner Re-Entry Program	133,202.01		42,204.03		90,997.98
A18VO	Nat Turner Park	4,094.00				4,094.00
A18WO	Nat Turner Park	591,032.98		5,295.45		585,737.53
A18XO	Restoration of St. Peter's Park Project	60,038.94				60,038.94
A18YO	2007 Urban Areas Security Initiative	114,011.67				114,011.67
A18ZO	Downtown Safety Program Phase 1	360,000.00				360,000.00
C18BO	Imaging/Electronic Access (PARIS) Grant 2007	490.88				490.88
D18GO	Prisoner - Entry Initiative	40,744.71				40,744.71
D18HO	Former Humble Oil Site Grant Program	29,051.00				29,051.00
D18MO	Home Investment Partnership Act Program	572,648.63		1,821.78		570,826.85
D18PO	Arena Circulation Project	155,136.00				155,136.00
E18DO	UTCS Extension Traffic Signal Centralization	424,178.03		424,178.03		
E18FO	Resurfacing of Various Streets	600.77				600.77
E18HO	Resurfacing of Various Streets	1.59				1.59
E18PO	Restoration of the Ironbound "B" Field	219,780.62				219,780.62
E18RO	Newark Pedestrian Improvements	10,780.00				10,780.00
E18SO	Restoration of Boy's Park	114,744.71				114,744.71
E18TO	Restoration of First Street - Park 1-11 and Thomas Silk Park	80,657.40				80,657.40
E18WO	Street and Sidewalk Repairs and Maintenance	4,142.00		1,931.40		2,210.60
F18CO	Hazardous Materials Projects	384.72				384.72

CITY OF NEWARK
CURRENT FUNDRESERVE FOR FEDERAL, STATE AND OTHER GRANTSA-48
Sheet #13

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
	<u>State and Federal Revenues Offset with Appropriations</u>					
H288O	STD Program	\$ 6.84	\$	\$	\$	\$ 6.84
H28HO	Newark Black Infant Mortality Reduction Project	106.62				106.62
H28MO	Women, Infants and Children	74,708.81				74,708.81
H28PO	Emergency Shelter Grant	62,045.93				62,045.93
H38FO	Childhood Lead Poisoning Prevention Control	642.15				642.15
H38HO	Lead Education and Outreach Program	7,801.77				7,801.77
H783O	Diabetes Collaborative	28.86				28.86
M18DO	Newark Work's Program	225,040.40				225,040.40
M28BO	Truancy Alternative Program	33,326.69				33,326.69
M98FO	Comprehensive Center for Fathers	5,031.95				5,031.95
M98GO	General Assistance (GA) and Food Stamps (FS) Recipients	56,051.82				56,051.82
M98KO	Temporary Assistance for Needy Families (TANF)	684,495.64				684,495.64
N18CO	Municipal Tonnage	(55,759.92)			(55,759.92)	
N18FO	10 Park Redevelopment Green Space	287,937.00				287,937.00
P18AO	Safe and Secure Communities Program	456,335.68				456,335.68
P18JO	COPS in Shop	1,482.50				1,482.50
S18AO	Storm Water Regulation	20,619.00				20,619.00
S18BO	N.J. Waste Water Treatment Grant	1,837,512.00		1,837,512.00		
	Totals for Year 2008 Grants	8,220,833.81		2,312,942.69	(55,759.92)	5,963,651.04
1D950	Ironbound Recreation Center	75,000.00				75,000.00
1D990	Grace Reformed Baptist Church	20,000.00				20,000.00
1D9C0	Apira	50.00				50.00
1D9D0	Brick City Development Corporation	115,260.12				115,260.12
1D9M0	Greater Newark Housing Partner	150.00				150.00
1D9P0	Hecker Street Project	15,050.00				15,050.00
1D9Q0	Ironbound Improvement Business District	25,000.00				25,000.00
1D9R0	Jewish Renaissance Medical Center	120,000.00				120,000.00
2H920	Immunization Program	8,455.79				8,455.79
2H960	HOPWA	589,877.67				589,877.67
2H9A0	Getting the Lead Out	209,004.75		199,000.00		10,004.75
2H9B0	Municipal Alliance	58,165.70				58,165.70
2H9H0	HIV Emergency Relief Program	15,463.54				15,463.54
2H9J0	Ryan White Special Care	4.86				4.86
3H9E0	Childhood Lead Poisoning	2,086.21				2,086.21
5H9B0	SunUp Program Administration	28,846.45				28,846.45

CITY OF NEWARK
CURRENT FUNDRESERVE FOR FEDERAL, STATE AND OTHER GRANTSA-48
Sheet #14

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
	<u>State and Federal Revenues Offset with Appropriations</u>					
5H9C0	SunUp Program Operational	\$ 874,146.93	\$	\$	\$	\$ 874,146.93
5H9F0	Nutrition Project	13,799.85				13,799.85
5H9G0	Meals on Wheels	0.25				0.25
5H9H0	Child Care Food	254,623.43				254,623.43
A19A0	Neighborhood Streetscape	8,488,418.42		1,694,399.46		6,794,018.96
A19B0	UEZ-GAP Financing Program	1,700,000.00				1,700,000.00
A19C0	Newark Riverfront Park	225,000.00		225,000.00		
A19D0	Newark Riverfront Park	1,715,000.00				1,715,000.00
A19G0	Science Program	4,500.00				4,500.00
A19J0	Institute Entrepreneur Le	105,848.55				105,848.55
A19L0	Newark Prisoner Re-Entry	31,419.13				31,419.13
A19M0	Liberty International	318,622.02		318,622.02		
A19PO	Ferry Streetscape Phase	11,197.58		11,197.58		
A19Q0	Hayes Park East	279,152.38		218,119.28		61,033.10
A19R0	City-Wide Commercial Corporation	3,766,789.75		223,190.04		3,543,599.71
A19Y0	UASI	1,014,920.08				1,014,920.08
D1910	Sustainability Action Plan	5,000.00				5,000.00
D1930	HOME	994,284.30		244,794.35		749,489.95
D1940	Neighborhood Stabilization	600,917.76		600,917.76		
D1950	Neighborhood Preservation	125,000.00				125,000.00
D19J0	Hazardous Discharge Site	2,901.00				2,901.00
D19K0	Hazardous Discharge Site	39,910.40		(76,397.08)		116,307.48
D19L0	Hazardous Discharge Site	8,408.28		140.10		8,268.18
D19N0	Hazardous Discharge Site	2,120.35				2,120.35
D19P0	NSP	461,261.55		458,039.70		3,221.85
D19Q0	Strategic Housing - Central Ward	124,267.46				124,267.46
D19R0	Strategic Housing - East Ward	10,684.51				10,684.51
D19S0	Hazardous Discharge Site	26,988.11				26,988.11
D19T0	Strategic Housing - North Ward	221,302.00				221,302.00
D19U0	Hazardous Discharge Site	21,419.00				21,419.00
D19V0	Brownfield's Assessment for Hazardous Discharge Site	7,010.21				7,010.21
D19W0	Strategic Housing - South Ward	1,000.00				1,000.00
D19X0	Strategic Housing - West Ward	342,037.00				342,037.00
D19Y0	Brownfield's Assessment for Petroleum	30,243.40		309.07		29,934.33
D19Z0	Tri-State Transportation	1.64				1.64
D49AO	Hazardous Discharge Site Remediation	14,381.00				14,381.00
D49B0	Hazardous Discharge Site Remediation	7,235.00				7,235.00

CITY OF NEWARK
CURRENT FUND

RESERVE FOR FEDERAL, STATE AND OTHER GRANTS

A-48
Sheet #15

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
	<u>State and Federal Revenues Offset with Appropriations</u>					
E19P0		\$	\$	\$ (58,727.65)	\$	\$ 58,727.65
E19Q0	Restoration of Jessie Allen Park	500,000.00				500,000.00
E19T0	Subregional Transportation Grant	63,580.81				63,580.81
E19U0	McClellan Street Underpass NJTPA	12,655.12				12,655.12
E19V0	Various Streets Project	86,564.25		86,562.00		2.25
E19W0	Street Lighting	6,350.00		5,720.00		630.00
E19Y0	Safe Routes to School Program	225,000.00				225,000.00
H19K0	Bio-Terrorism Grant	927.86				927.86
H2920	Newark Black Infant Mortality	1.61				1.61
H2960	WIC	303.74				303.74
H2970	Women, Infants and Children	1,141.85				1,141.85
H2990	STD Health Services	72.17		1,942.75	(1,942.75)	72.17
H29D0	Homeless HRSA	33.55				33.55
H29E0	Homeless HRSA	8.64				8.64
H29G0	ESG	20,689.92		(16,000.00)		36,689.92
H29H0	ESG	129,791.41		39,340.94		90,450.47
H29P0	Homeless SAMSHA	2,016.96				2,016.96
H29Q0	Uncompensated Care Practice	3.00				3.00
H29Z0	Homeless SAMSHA	8,479.16				8,479.16
H39B0	Lead Free Safe House	0.52				0.52
H39E0	Childhood Lead Poisoning	51,957.67				51,957.67
H39F0	Lead Identification and Field	0.86				0.86
H7940	Public Health Priority Fund	34.32				34.32
N19B0	Clean Communities Program 2007	76,909.68				76,909.68
N19C0	Clean Communities Program 2008	8,211.14				8,211.14
N19D0	Clean Communities Program 2009	127,807.56				127,807.56
P19J0	Body Armor Replacement	312.70				312.70
P19K0	2008 Byrne Memorial JAG	84,263.91				84,263.91
P19N0	Safe and Secure Community Police	194,039.91				194,039.91
P19S0	Buffer Zone Protector	153,374.08				153,374.08
P19T0	Buffer Zone Protector	15,975.64				15,975.64
	Sub-Totals for Year 2009 Grants	24,902,734.47		4,176,170.32	(1,942.75)	20,728,506.90
	<u>2009 WIA/WFNI</u>					
M19H0	Homeless Prevention and Rapid Re	113,348.21				113,348.21
M99B0	WIA Adult	6.47				6.47

CITY OF NEWARK
CURRENT FUND

RESERVE FOR FEDERAL, STATE AND OTHER GRANTS

A-48
Sheet #16

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
	<u>State and Federal Revenues Offset with Appropriations</u>					
	<u>2009 WIA/WFNI</u>					
M99E0	WFNI - TANF	\$ 553.71	\$	\$	\$	\$ 553.71
M99G0	WFNI FS/GA	183.91				183.91
	Total WIA/WFNI	<u>114,092.30</u>				<u>114,092.30</u>
	Totals for Year 2009 Grants	<u>25,016,826.77</u>		<u>4,176,170.32</u>	<u>(1,942.75)</u>	<u>20,842,599.20</u>
1D010	Gluck - Legal Services	109,424.19				109,424.19
1D020	Public Trust Rights	59,500.00		59,500.00		-
1D030	Home	2,941,970.99		84,584.88		2,857,386.11
1D040	Hazardous Discharge	6,596.68		4,320.30		2,276.38
2H020	Metropolitan Med Response	503.90				503.90
2H030	Metropolitan Med Response	130.85				130.85
2H050	HIV Emergency Relief Program	1,061.67				1,061.67
2H060	Homeless Port Authority Program	195,279.37				195,279.37
2H070	Ryan White Special Care Program	504.00				504.00
2H0B0	Municipal Alliance	39,503.05				39,503.05
2H0E0	Immunization Grant	1,165.10				1,165.10
2H0H0	Minority Aids Initiative Program	5,113.57				5,113.57
2H0M0	HOPWA	426,593.92		104,294.90		322,299.02
3H0E0	Childhood Lead Poisoning	0.01				0.01
3H0F0	Childhood Lead Poisoning Prevention	2,566.10				2,566.10
5H0A0	Social Services Homeless Grant	6.40				6.40
5H0B0	SunUp Administration/Operation	19,753.38				19,753.38
5H0C0	SunUp Administration/Operation	154,728.95				154,728.95
5H0F0	Nutrition PRJ for the Elderly	40,392.77				40,392.77
5H0G0	Meals on Wheels	1,281.30				1,281.30
A10C0	USAIFY 2009	346,025.38		340,675.00		5,350.38
A20D0	USAIFY 2009	877,220.20		875,156.40		2,063.80
A10E0	Newark Riverfront Park Project	840,653.91		434,914.73		405,739.18
A10F0	Newark Riverfront Park Project	391,234.72		114,467.96		276,766.76
C10A0	PARIS Grant	567.32				567.32
D1010	Energizing Newark Community Wide	(25,733.45)		22,109.15	47,842.60	
D1020	Green Neighborhood Pilot	10,849.00			(10,849.00)	
D1080	1 Boat Project - Cash from Baykeeper	135,760.65		135,760.65		
D1090	Unified Planning Program	1,768.95				1,768.95
D10F0	Beyond the Box	25,000.00				25,000.00

CITY OF NEWARK
CURRENT FUND

RESERVE FOR FEDERAL, STATE AND OTHER GRANTS

A-48
Sheet #17

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
	<u>State and Federal Revenues Offset with Appropriations</u>					
D10K0	UEZ Program	\$ 327,350.37	\$	\$	\$	\$ 327,350.37
D10N0	Brownfield's Clean-Up Revolving Loan Fund - ARRA	1,000,000.00		105,187.00		894,813.00
D10P0	Hazardous Discharge Site Remediation	2,821.72				2,821.72
D10Q0	Centerpoint Terminal Newark Grant	150,000.00				150,000.00
D10R0	Hazardous Discharge Site Remediation	1,184.73		574.40		610.33
D10S0	Brownfield's Stimulus Clean-Up Grant	0.06				0.06
D10T0	Hazardous Discharge Site Remediation	17,507.37		13,350.30		4,157.07
D10V0	Neighborhood Stabilization Program II	6,118,692.32		6,110,809.76		7,882.56
D10X0	Ryan White Special Care Program	433,034.37		114,308.86		318,725.51
D10Y0	UEZ 2010 - 11 Administration Budget	309,058.40				309,058.40
D10U0	Brownfield's Stimulus Clean-Up - ARRA - West	32,700.06		32,700.00		0.06
D10Z0	Homeownership Stabilization	100,000.00				100,000.00
E1020	Improvements to Various Streets	9,663.85				9,663.85
E1030	Norfolk Street, Jones Street and Irvine Turner Boulevard	417,263.94		417,254.02		9.92
E1040	Retrofit and Renewable Energy	263,354.05		225,637.30	(36,993.60)	723.15
E1050	Improvements to Various Streets - 5 Local	170,848.86		41,641.26		129,207.60
E1060	Extension of Traffic Signal Control	2,417.59				2,417.59
E1070	Roadway Resurfacing Program ARRA	1,051,520.59				1,051,520.59
E1080	Subregional Transportation	2,785.15				2,785.15
E10P0	Various Streets - 2010 (5 Locations)	30,999.18				30,999.18
E10Q0	Broad Street Streetscape - Phase 3	805,463.34		163,622.00		641,841.34
E10T0	Broad Street Station Transit Funds	50,000.00				50,000.00
E10V0	2011 Local Safety Wilson	500,000.00		276,655.14		223,344.86
H10B0	Bio-Terrorism Program	123.34				123.34
H10L0	Bio-Terrorism Grant	218,525.22				218,525.22
H2030	Pandemic H1N1	5.15				5.15
H2080	ARRA - Facility Investment Program	2,963,149.82		2,845,982.02		117,167.80
H20B0	Homeless Health Care Project HIRSA	10.62				10.62
H20P0	ESG	58,098.30				58,098.30
H20T0	STD Program	8.78				8.78
H50H0	Child and Adult Food Program	626,066.02				626,066.02
H7040	Public Health Priority Funding	0.08				0.08
H10B0	To Keep Municipal Pools Open	160,000.00				160,000.00
P10H0	JAG Grant - ARRA	386,453.79		147,160.23		239,293.56
P10K0	JAG Grant - ARRA	1,227,566.47		943,353.15		284,213.32
P10L0	Sex Offender Aid - Cash Match	70,766.00		52,445.28		18,320.72

CITY OF NEWARK
CURRENT FUNDRESERVE FOR FEDERAL, STATE AND OTHER GRANTSA-48
Sheet #18

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
	<u>State and Federal Revenues Offset with Appropriations</u>					
P10M0	Crime Control Grant	\$ 120,312.50	\$	\$	\$	\$ 120,312.50
P10P0	Juvenile Accountability Grant	27,648.00				27,648.00
P10Q0	Juvenile Accountability Grant	26,512.00				26,512.00
P10R0	Law Enforcement Training and Equipment	8,460.55				8,460.55
P10S0	Paul Covedell Program	97,957.00				97,957.00
P10T0	Paul Covedell Program	1,717.80				1,717.80
P10U0	Safe and Secure Communities	190,762.00				190,762.00
W10C0	NJDEP Pequannock River Restoration	527,995.10		17,020.00		510,975.10
	Sub-Totals for Year 2010 Grants	25,118,227.37		13,683,484.69		11,434,742.68
	<u>2010 WIA/WFNI</u>					
M10H0	Workforce Learn Link	100,960.56				100,960.56
M10E0	11A Youth - Training	32,000.00				32,000.00
M10S0	Prisoner Re-Entry Demo Project	168,757.88				168,757.88
M10V0	Parking Offense Adjudication Act (POAA)	39,885.45				39,885.45
M10X0	Temporary Assistance for Needy Families	101,635.77				101,635.77
M10Y0	General Assistance and Food Stamps (GA/FS)	232,595.37				232,595.37
	Sub-Totals for Year 2010 WIA/WFNI	675,835.03				675,835.03
	Totals for Year 2010 Grants	25,794,062.40		13,683,484.69		12,110,577.71
2H130	MMRS 2011	116,640.23		116,557.87		82.36
2H160	HIV Ryan White	48,156.52		47,784.00		372.52
2H170	HIV Special Care Unit	5.72				5.72
2H1B0	Municipal Alliance Dare	22,887.36				22,887.36
2H1E0	Immunization Program	157.42				157.42
2H1M0	HOPWA	3,231,398.06		2,836,082.59		395,315.47
3H1F0	Childhood Lead Poisoning	16,544.18		1,833.00		14,711.18
5H1A0	Social Services Program	2,066.98				2,066.98
5H1B0	SunUp Administration	42,539.46		3,874.00		38,665.46
5H1C0	SunUp Operational Costs	581,600.40				581,600.40
A11A0	Newark Riverfront Park	0.54				0.54
A11B0	2010 USAI Grant	706,062.10		628,907.22		77,154.88
D1160	Brownfield's Clean-Up	164,558.25		730.92		163,827.33
D1170	Local Energy Assurance Plan	98,222.64		91,615.16		6,607.48
D11D0	HOME	3,716,178.00		32,308.08		3,683,869.92

CITY OF NEWARK
CURRENT FUNDRESERVE FOR FEDERAL, STATE AND OTHER GRANTSA-48
Sheet #19

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
	<u>State and Federal Revenues Offset with Appropriations</u>					
D11R0	Hazard Site 411	\$ 20,731.00	\$	\$	\$	\$ 20,731.00
E11P0	UTCS Extension Traffic Signal	180,466.23		180,466.23		
E11Q0	McClellan Street Underpass Local	85,000.00				85,000.00
E11R0	Subregional Transportation Grant	0.64				0.64
E11T0	Delancy Street Resurfacing Project	729,842.85		136,481.64		593,361.21
E11U0	Resurfacing of Various Streets	1,485,341.73		1,063,340.47		422,001.26
E11V0	MUCTD Traffic Sign Invention	133,000.00		133,000.00		
E11W0	Various Streets	1,610,569.37		1,609,976.91		592.46
F11B0	FEMA 2010	499,992.00				499,992.00
F11D0	SAFER	5,133,485.94		3,825,120.55		1,308,365.39
H11D0	Bio-Terrorism Program	1,649.51				1,649.51
H2120	Homeless Health HRSA	5,757.59		5,743.00		14.59
H2170	Emergency Shelter Grant	230,144.17		181,372.48		48,771.69
H21R0	WIC 2010 2011	65,926.23				65,926.23
H31K0	HUD Lead Hazard Program	3,721,346.64		752,931.78		2,968,414.86
H31L0	Healthy Homes Production	824,988.96		448,559.66		376,429.30
N61A0	Make-A-Splash	32,149.99				32,149.99
P11A0	Safe and Secure Communities	304,381.82				304,381.82
P11B0	Policing Grant Cash Match	800,000.00				800,000.00
P11J0	JAG	437,208.15		7,525.89		429,682.26
P11L0	COPS in Shop	9,012.71				9,012.71
P11M0	COPS Technology Grant	265,938.66				265,938.66
P11N0	Body Armor Replacement Grant	4,103.80				4,103.80
P11P0	Drunk Driving Enforcement	32,676.00				32,676.00
P11Q0	COPS in Shop	770.27				770.27
P11R0	Targeting Violent Crimes Grant	920.41				920.41
P11T0	Great Grant	28,522.20		4,978.00		23,544.20
P11U0	Justice Assistance	439,366.12		138,192.55		301,173.57
P11W0	N.J. Law Enforcement Technology Grant	392,124.00		198,287.54		193,836.46
P11Y0	Targeting Violent Crimes Grant	1,536.67		1,241.96		294.71
	Sub-Totals for Year 2011 Grants	26,223,971.52		12,446,911.50		13,777,060.02
	<u>2011 WIA/WFNI</u>					
M1110	Shelter Grant - Homelessness	810,600.00				810,600.00
M1120	Shelter Grant - Incarcerated	843,720.00				843,720.00
M1130	WIA Adult	388,848.60		388,848.60		

CITY OF NEWARK
CURRENT FUND

RESERVE FOR FEDERAL, STATE AND OTHER GRANTS

A-48
Sheet #20

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
<u>State and Federal Revenues Offset with Appropriations</u>						
	<u>2011 WIA/WFNI</u>					
M1140	WIA Youth	\$ 571,752.98	\$	\$ 571,752.98	\$	\$
M1150	WIA Dislocated Worker	112,008.96		110,648.96		1,360.00
M11E0	Public Sector Mini Neg R	461,140.11				461,140.11
M11G0	Workforce Learning Link	171,800.85		171,798.00		2.85
M11Z0	Workforce Investment Board	80.57				80.57
	Sub-Totals for Year 2011 WIA/WFNI	3,359,952.07		1,243,048.54		2,116,903.53
	Totals for Year 2011 Grants	29,583,923.59		13,689,960.04		15,893,963.55
2H230	MMRS	281,558.17		64,452.11		217,106.06
2H260	HIV '11/12	7,422,575.37		7,374,415.13		48,160.24
2H270	HIV Special Care	103,551.66		103,547.17		4.49
2H2E0	Immunization	277,539.75		201,579.61		75,960.14
2H2J0	Getting the Lead Out - Kresge	43,000.00		43,000.00		
2H2K0	Dental Rehabilitation Grant	498,800.00		1,650.00		497,150.00
2H2N0	Municipal Alliance	24,250.00				24,250.00
5H2B0	SunUp Administration	1,310.88		1,169.50		141.38
5H2C0	SunUp Operational	473,187.73		7,750.30		465,437.43
A12C0	Emergency Solutions Grant	213,307.00		47,319.20		165,987.80
D1230	Comprehensive Anti-Violence Program	1,537,222.00		56,333.10		1,480,888.90
D12A0	UEZ	3,703,231.59		410,734.12		3,292,497.47
D12B0	Prisoner Re-Entry Legal Services	55,052.00		55,052.00		
D12D0	Hazardous Discharge Site Remediation Grant - 123-129 Riverside Avenue	96,543.40		9,952.18		86,591.22
D12E0	Hazardous Discharge Site Remediation Grant - 2052-2070 and 2078/2090 McCarter Highway	209,094.60		4,815.90		204,278.70
D12F0	Hazardous Discharge Site Remediation - 86-92 Lister Avenue	31,184.10		31,184.10		0.00
D12H0	Newark Prisoner Re-Entry	717,460.57		348,578.37		368,882.20
D12T0	Hazardous Substance	151,671.22		17,800.90		133,870.32
D12U0	Petroleum Assessment	191,253.94		6,086.50		185,167.44
D12V0	Prisoner Care and Management Job Placement	100,000.00		85,187.83		14,812.17
D12W0	Hazardous Discharge Remediation - McCarter Highway	195,746.50		1,551.74		194,194.76
D12X0	Hazardous Discharge Site Remediation - 704 Doremus Avenue	196,733.66		140,517.89		56,215.77
D12Y0	Hazardous Discharge Remediation - 411 Wilson Avenue	193,515.08		19,542.02		173,973.06
D12Z0	Hazardous Discharge Site Remediation - Wilson Avenue	375,175.00				375,175.00
E1210	Various Streets - 2012 Newark Project	1,354,756.51		1,305,223.51		49,533.00

CITY OF NEWARK
CURRENT FUND

RESERVE FOR FEDERAL, STATE AND OTHER GRANTS

A-48
Sheet #21

Account Number		Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
	<u>State and Federal Revenues Offset with Appropriations</u>					
E12C0	FY 2012 Subregional Transportation	\$ 89.45	\$	\$	\$	\$ 89.45
E12F0	McClellan Street Underpass Final Design	1,099,003.00		256,876.31		842,126.69
F12B0	Assistant to Firefighter	22,531.25				22,531.25
F12C0	Port Security Grant	829,261.00		613,212.26		216,048.74
F12D0	Port Security Grant	37,500.00				37,500.00
H12E0	Bio-Terrorism Grant	255.99				255.99
H12F0	Bio-Terrorism	233,132.71		230,618.09		2,514.62
H22A0	STD	7.76				7.76
H22F0	Homeless HRSA	480,532.97		139,779.01		340,753.96
H22G0	Health Care Emergency	3.11				3.11
H72R0	WIC	56,997.00		5,386.00		51,611.00
M2210	Truancy Alternative 08-09	66,480.00				66,480.00
M2220	Truancy Alternative 10-11	56,550.03				56,550.03
M2230	Truancy Alternative 11-12	28,954.01		9,686.73		19,267.28
P12K0	COPS Hiring Program	4,678,180.45		2,604,493.63		2,073,686.82
P12P0	Safe and Secure Communities	952,060.12				952,060.12
P12Q0	UASI Grant - 2011-2014	944,302.41		115,688.19		828,614.22
P12R0	Emergency Operations Center Grant	1,000,000.00		968,973.07		31,026.93
P12T0	Comprehensive Anti-Violence	658,863.00		150,375.85		508,487.15
W12D0	Target Hardening - Pequannock River	164,000.00		163,996.00		4.00
	Sub-Totals for Year 2012 Grants	29,756,424.99		15,596,528.32		14,159,896.67
	<u>2012 WIA/WFNJ</u>					
2M200	2012 Hurricane Sandy Disaster Relief	170,752.84		170,752.84		
M1210	General Assistance for Needy Families (TANF)	48,382.60		48,376.20		6.40
M1220	General Nutrition Assistance Program (SNAP)	47,528.39		45,881.10		1,647.29
M1280	Workforce Learning Link	105,415.73		105,411.83		3.90
M1290	WIA - Adult	189,897.00		189,897.00		
M12F0	WIA - Dislocated Workers	83,796.00		83,796.00		
	Sub-Totals for Year 2012 WIA/WFNJ	645,772.56		644,114.97		1,657.59
	Totals for Year 2012 Grants	30,402,197.55		16,240,643.29		14,161,554.26
	HIV Emergency Relief		12,394,925.00	5,829,338.26		6,565,586.74
	Ryan White Special Care Clinic		331,236.00	186,941.97		144,294.03

CITY OF NEWARK
CURRENT FUND

RESERVE FOR FEDERAL, STATE AND OTHER GRANTS

A-48
Sheet #22

Account Number	Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
<u>State and Federal Revenues Offset with Appropriations</u>					
Immunization Program	\$	\$ 625,000.00	\$ 408,143.44	\$	\$ 216,856.56
Advancing Safe and Healthy Homes Initiative		500,000.00			500,000.00
Municipal Alliance Program - Cash Match		24,250.00			24,250.00
Childhood Lead Poisoning		481,493.00	479,262.68		2,230.32
Childhood Lead Poisoning		465,780.00	156,584.78		309,195.22
Municipal Tonnage 2006		84,236.82		84,236.82	-
Municipal Tonnage 2007		82,658.66		44,329.14	38,329.52
Municipal Tonnage 2008		232,709.57			232,709.57
Municipal Tonnage 2008B		255,648.41			255,648.41
Municipal Tonnage 2009		269,447.46			269,447.46
Municipal Tonnage 2010		299,903.76			299,903.76
Municipal Tonnage 2011		322,905.58	6,500.00		316,405.58
2011 Clean Communities		327,986.78	75,542.52		252,444.26
2010 Clean Communities		327,344.66	133,391.51		193,953.15
SunUp Administration		77,163.36	61,094.36		16,069.00
SunUp Operational		917,885.48	587,406.01		330,479.47
ESG (Emergency Solutions Grant)		678,542.00	308,477.61		370,064.39
HOPWA		7,218,919.00	4,384,148.76		2,834,770.24
HOPWA		6,419,016.00	14,819.39		6,404,196.61
Emergency Solutions Grant (ESG)		483,211.00			483,211.00
Neighborhood Stabilization Program11		2,018,637.00	1,071,919.61		946,717.39
HDSR - McCarter Highway		200,000.00	3,610.00		196,390.00
HDSR - Empire Street		200,000.00	1,543.75		198,456.25
HDSR - Emmet Street		200,000.00	1,068.75		198,931.25
HDSR - Mt. Pleasant Avenue		550,000.00	1,852.50		548,147.50
2012 Home Investment Partnership		1,944,355.00	22,128.25		1,922,226.75
Hess - North Ward		500,000.00			500,000.00
Hess - South Ward		500,000.00			500,000.00
Hess - Central Ward		500,000.00			500,000.00
Hess - Youth Community Court		300,000.00			300,000.00
Various Streets - 2013-7 Locations		1,501,000.00			1,501,000.00
Various Streets - 2012-10 Locations		1,501,000.00	13,072.28		1,487,927.72
Various Streets (10 Locations MA-13)		1,326,370.00			1,326,370.00
Delancy Street Easement		1,900,000.00			1,900,000.00
Subregional Transportation		68,942.00	68,936.67		5.33
2013 Local Safety Program		500,000.00			500,000.00
Staffing for Adequate Fire and Emergency Response (SAFER)		3,171,693.00	104,782.62		3,066,910.38
Local Safety Program (Broad Street and South Street)		266,800.00			266,800.00

CITY OF NEWARK
CURRENT FUND

RESERVE FOR FEDERAL, STATE AND OTHER GRANTS

A-48
Sheet #23

Account Number	Balance Dec. 31, 2012	2013 Budget Revenue Realized	Expenditures	Adjustments	Balance Dec. 31, 2013
<u>State and Federal Revenues Offset with Appropriations</u>					
Bio-Terrorism	\$	\$ 297,494.00	\$ 99,529.56	\$	\$ 197,964.44
STD		138,693.00	138,686.81		6.19
Homeless Health Care (HRSA)		2,359,656.00	1,542,812.72		816,843.28
WIC		1,584,000.00	1,475,037.24		108,962.76
Truancy Alternative Program		66,480.00	43,798.50		22,681.50
Body Armor Grant		96,822.31	95,619.15		1,203.16
Cops in Shop Grant		16,640.00	16,640.00		
Pedestrian Safety Program Grant		15,000.00	5,744.66		9,255.34
Targeting Violent Crimes Initiative		75,440.00	74,869.42		570.58
Body Armor Grant		94,228.25			94,228.25
Justice Assistance Grant (JAG)		485,804.00	1,547.72		484,256.28
Cops Grant-Cash Match		741,606.00	62,336.16		679,269.84
HOTSHOTS/Prisoner Reentry-Cash Match		150,333.00			150,333.00
Domestic Violence Grant		207,730.00	16,544.79		191,185.21
UASI		200,000.00	199,893.03		106.97
UASI		1,608,858.66	749,414.85		859,443.81
Sub-Total for Year 2013 Grants		58,107,844.76	18,443,040.33	128,565.96	39,536,238.47
<u>2013 WIA/WFNI</u>					
WIA - ADULT		2,040,793.00	435,417.48		1,605,375.52
WIA - YOUTH		2,055,012.00	327,736.67		1,727,275.33
WIA - Dislocated Workers		870,416.00	145,063.36		725,352.64
GA/SNAP		662,853.00	111,173.10		551,679.90
TANF		596,806.00	133,825.30		462,980.70
WIA - Adult		2,131,383.00	1,576,313.48		555,069.52
WIA - Youth		2,087,149.00	1,340,879.24		746,269.76
WIA - Dislocated Workers		834,299.00	540,064.28		294,234.72
TANF		662,853.00	608,569.09		54,283.91
GA/SNAP		553,551.00	516,244.83		37,306.17
Learning Link		75,000.00	74,195.34		804.66
Hurricane Sandy National Disaster Emergency		368,473.00	368,472.19		0.81
2011 Business Development Interdepartmental Funds		11,764.00	11,764.00		-
Workforce Learning Link		127,000.00	27,122.82		99,877.18
Sub-Total for Year 2013 WIA/WFNI		13,077,352.00	6,216,841.18		6,860,510.82
Total for Year 2013 Grants		71,185,196.76	24,659,881.51	128,565.96	46,396,749.29
Grand Total	\$ 171,796,140.10	\$71,185,196.76	\$76,869,582.08	\$ (1,942.75)	\$ 166,113,697.53

Reference

A

A-48, Sheet #24

A-48, Sheet #24

A-23

A

CITY OF NEWARK
CURRENT FUND

RESERVE FOR FEDERAL, STATE AND OTHER GRANTS

A-48
Sheet #24

	<u>Ref.</u>	2013 Budget Revenue <u>Realized</u>	<u>Expenditures</u>
Budget Appropriations:			
Current Fund	A-3	\$70,269,007.76	\$
Local Cash Match	A-4	916,189.00	
Cash Disbursed	A-4		75,601,213.52
Interfunds Receivable	A-20		60,462.40
Payroll Transfer Account	A-21		71,985.43
Grants Paid Authorized by			
Commitment Letters	A-22		1,013,694.59
Interfunds Payable	A-49		122,226.14
		<hr/>	<hr/>
	A-48, Sheet #23	<u>\$71,185,196.76</u>	<u>\$76,869,582.08</u>

CITY OF NEWARK
CURRENT FUND

INTERFUNDS PAYABLE - FEDERAL AND STATE GRANT FUNDS

A-49

	<u>Ref.</u>	<u>Total</u>	<u>Due to Insurance Trust</u>	<u>Due to Other Trust Fund</u>	<u>Due to Capital Fund</u>
Balance December 31, 2012	A	\$ 58,877.15	\$	\$	\$58,877.15
Increased by:					
Cash Receipts	A-4	195,727.94	180,952.54	14,775.40	
Reserve for Federal and State Grant Funds	A-48	<u>122,226.14</u>	<u>9,271.77</u>	<u>112,954.37</u>	
		<u>317,954.08</u>	<u>190,224.31</u>	<u>127,729.77</u>	
Balance December 31, 2013	A	<u>\$376,831.23</u>	<u>\$190,224.31</u>	<u>\$ 127,729.77</u>	<u>\$58,877.15</u>

CITY OF NEWARK
CURRENT FUND

UNALLOCATED RECEIPTS
FEDERAL AND STATE GRANT FUNDS

A-50

	<u>Ref.</u>	
Balance December 31, 2012	A	\$ 274,348.82
Increased by:		
Cash Receipts	A-4	<u>8,057.27</u>
Balance December 31, 2013	A	<u>\$ 282,406.09</u>

RESERVE FOR ELDERLY NUTRITION FUND - CASH

A-51

	<u>Ref.</u>	
Balance December 31, 2012	A	\$2,398,900.39
Decreased by:		
Cash Disbursed	A-4	<u>48,112.60</u>
Balance December 31, 2013	A	<u>\$2,350,787.79</u>

RESERVE FOR SAFE HOUSING

A-52

	<u>Ref.</u>	
Balance December 31, 2012	A	<u>\$1,579,833.28</u>
Balance December 31, 2013	A	<u>\$1,579,833.28</u>

CITY OF NEWARK
CURRENT FUND

RESERVE FOR UNAPPROPRIATED GRANTS

A-53
Sheet #1

	<u>Ref.</u>	
Balance December 31, 2012	A	\$ 7,708,287.46
Increased by:		
Cash Received	A-4	<u>1,214,495.37</u>
		8,922,782.83
Decreased by:		
Applied to Federal and State Grants Receivable	A-23	<u>2,932,841.56</u>
Balance December 31, 2013	A,A-53,Sheet #2	<u>\$ 5,989,941.27</u>

Analysis of Balance

UASI Fire Department Rescue Training - Police	\$ 81,474.00
2007 Recycling Tonnage Grant	272,037.17
Alcohol Education Rehabilitation	82,846.35
American Water Works	80.00
Body Armor Fund	262,145.89
Community Agencies Corp./Police Department	102,868.96
Consumer Affairs; Weights and Measures	150,251.50
Council on Arts Grant	2,667.50
Division of Criminal Justice - 99, Newark Police	2,500.00
Division of Criminal Justice	27,440.75
Division of Highway Traffic - Safety - PS 104	116,703.41
Division of Medical Assistance Health Service (KIDCARE)	325.00
Division of Highway Traffic Safety	63,106.69
Division of Family Development - ECGZX7C	188,928.12
Division of Motor Vehicles - Inspection Fines	442,823.27
Epidemiology Division	810.60
Exclusive Bus Line - 2000-2002	52,408.44
FFHR Grant (Fire Department)	69,177.35
Health - Infectious and Zoonotic Program	8,053.94
Highway Construction - Rt. 46/3 Valley Road	34,324.66
Hurricane Floyd - Federal Share	11,494.02
Hartz Mountain Industries Inc.	516.00
LINCS Information Technology Development	19,925.00
Monitoring Surveillance	11,835.90
Municipal Court Education/Rehabilitation	91.23
Nellie Grier Senior Citizen Center	100.00
NERL Project - N.J. Transit	138,622.28
New Jersey State Police/Newark Fire Hazard	212,623.10
Newark Arts Council of Essex Area	20,260.29
New Jersey State Police	304,559.33

CITY OF NEWARK
CURRENT FUND

RESERVE FOR UNAPPROPRIATED GRANTS

A-53
Sheet #2

Analysis of Balance

Nextel Blackberry PDA Grant	\$ 345.00
N.J. Case Management - Criminal	11,120.69
NJIT	3,349.42
PNE Media, Inc. Bus Shelters	22,783.68
Rental Rehabilitation	102,535.49
Safe and Secure 04/05	200,000.00
2008 Recycling Tonnage Grant	0.57
Solid Waste Administrative Recycling Tonnage	0.82
Solid Waste Administrative Recycling Account	126,947.07
Weed and Seed Program	25,000.00
LEOTEF 2010	3,533.41
2009 Recycling Tonnage Grant	0.46
Drunk Driver Education	13,912.54
N.J. Transit Reimbursement	1,349,827.04
N.J. Transit Reimbursement	235,088.96
2012 Body Armor	96,822.31
2013 Clean Communities	379,117.21
Safe and Secure	112,877.00
Alcohol Education and Rehabilitation	158.32
Kresge Grant	250,000.00
Drunk Driver Education	21,059.29
2013 Body Armor	126,081.60
2011 Recycling Tonnage Grant	228,379.64
	<hr/>
	<u>\$ 5,989,941.27</u>

CITY OF NEWARK
CURRENT FUND

RESERVE FOR DUE TO VARIOUS FEDERAL AND STATE GRANT PROGRAMS

A-54

	<u>Ref.</u>	
Balance December 31, 2012	A	<u>\$724,718.06</u>
Balance December 31, 2013	A,Below	<u>\$724,718.06</u>

Analysis of Balance

	<u>Date</u>	<u>Amount</u>
Other		\$ 2.25
Model Cities	Prior to 1978	576.30
Rape Analysis	Prior to 1978	2,741.13
Housing Community Development Act - Hotel Multi-Dwelling		45,135.00
Work Study	1978	197.06
Subregional Transportation	1978	76,823.79
Building Inspector	1978	2,725.00
Building Inspection	1982	8,965.00
Transportation Planning Grant	1982	34,976.84
Building Inspector	1982	14,715.00
Transportation Study	1982	2,500.00
Newark Project R-6	1983	393,939.60
Subregional Transportation	1984	9,858.36
Newark City-Wide Transportation	1985	100.00
Subregional Transportation	1985	15,504.00
Family Day Care	1986	923.00
Family Day Care - 1985	1986	100.00
Demolition - 1983	1986	14,053.00
Neighborhood Preservation - 1985	1986	8,500.00
Contract '88 - Narcotic Task Force	1987	19,100.00
Family Day Care	1988	36.00
Communicable Disease	1988	8,864.00
Distressed Cities	1989	2,887.50
Newark Homeless - Health	1990	17,582.63
Emergency Shelter	1990	275.59
Facilities to Help Homeless	1991	2.00
Prudential Foundation Aids Control	1991	1,000.00
Hazardous Waste	1991	30,872.26
Homeless Health Care	1991	10.00
1992/1993 Family Day Care	1992	8,601.31
Social Caseworker	1992	3,151.06
Clean Communities	1993	0.38
		<u>\$724,718.06</u>

Reference

Above

CITY OF NEWARK
CURRENT FUND

UEZ LOAN REPAYMENT

A-55

	<u>Ref.</u>	
Balance December 31, 2012	A	\$318,551.00
Increased by:		
Cash Receipt	A-4	<u>171,651.51</u>
Balance December 31, 2013	A	<u><u>\$490,202.51</u></u>

CITY OF NEWARK
TRUST FUND

CASH RECEIPTS AND DISBURSEMENTS - TREASURER

B-2
Sheet #1

	Ref.	Assessment Fund	Animal Control Fund	Other Funds	Insurance Fund	Grant Fund
Balance December 31, 2012	B	\$ 7,254.03	\$ 21,228.04	\$ 8,575,713.38	\$ 7,748,784.90	\$ 3,667,937.58
Increased by Receipts:						
Assessments Receivable	B-5	49,386.20	\$	\$	\$	\$
Interfunds	B-4			67,908.96	150.00	
Reserve for Gilbert Media Escrow	B-13			83,911.41		
Reserve for Unidentified Receipts	B			1,735,327.73		
Reserve for Salary Increases	B-10			5,210.59		
Reserve for Other Funds	B-21			32,861,231.75		
Reserve for Various Insurance Funds	B-23				18,805,661.65	
Reserve for Municipal Tonnage Grant	B-24					179,210.36
Reserve for Community Development Block Grant	B-27					10,882,902.09
Dog License Collection	B-30		9,976.40			
		<u>49,386.20</u>	<u>9,976.40</u>	<u>34,753,590.44</u>	<u>18,805,811.65</u>	<u>11,062,112.45</u>
		56,640.23	31,204.44	43,329,303.82	26,554,596.55	14,730,050.03
Decreased by Disbursements:						
Interfunds	B-4	49,386.20		324,051.64	314,878.57	
Due to State of New Jersey	B-18		2,597.60			
Expenditures N.J.S.A. 4:19-15	B-19		3,049.04			
Vouchers Payable	B-22			14,851.82		
Reserve for Checks	B-20			90.00		
Reserve for Other Funds	B-21			27,001,395.25		
Reserve for Various Insurance Funds	B-23				12,971,368.37	
Reserve for Community Development Block Grant	B-27					10,388,001.18
		<u>49,386.20</u>	<u>5,646.64</u>	<u>27,340,388.71</u>	<u>13,286,246.94</u>	<u>10,388,001.18</u>
Balance December 31, 2013	B	\$ 7,254.03	\$ 25,557.80	\$ 15,988,915.11	\$ 13,268,349.61	\$ 4,342,048.85

CITY OF NEWARK
TRUST FUND

CASH RECEIPTS AND DISBURSEMENTS - TREASURER

B-2
Sheet #2

	<u>Ref.</u>	<u>Payroll Agency Fund</u>	
Balance December 31, 2012	B		\$ 2,037,128.71
Increased by Receipts:			
Interfunds	B-4	\$ 10,326.00	
Payroll Deductions Withheld	B-32	<u>139,351,279.51</u>	
			<u>139,361,605.51</u>
			141,398,734.22
Decreased by Disbursements:			
Interfunds	B-4	219,255.21	
Payroll Deductions Paid	B-32	<u>133,290,565.76</u>	
			<u>133,509,820.97</u>
Balance December 31, 2013	B		<u><u>\$ 7,888,913.25</u></u>

CITY OF NEWARK
TRUST FUND

CASH - MONEY MARKET FUND

B-3

	<u>Ref.</u>	<u>Total Grant Fund</u>	<u>Grant Fund</u>		<u>Other Trusts</u>
			<u>Community Development Block Grant Trust Fund</u>	<u>Balanced Housing Neighborhood Preservation</u>	
Balance December 31, 2012	B	\$ 8,089,844.59	\$ 3,409,091.79	\$ 4,680,752.80	\$ 22,231,851.23
Increased by:					
Interest Earned	B-25,29	<u>41,052.12</u>	<u>17,370.30</u>	<u>23,681.82</u>	<u> </u>
Balance December 31, 2013	B	<u>\$ 8,130,896.71</u>	<u>\$ 3,409,091.79</u>	<u>\$ 4,704,434.62</u>	<u>\$ 22,231,851.23</u>

CITY OF NEWARK
TRUST FUND

INTERFUNDS

B-4

<u>Ref.</u>	<u>Assessment</u>	<u>Animal</u>	<u>Other Trust Fund</u>				<u>Insurance Fund</u>				<u>Payroll Agency Fund</u>			
	<u>Trust Fund</u>	<u>Control</u>	<u>Current</u>	<u>State and</u>	<u>Insurance</u>	<u>Payroll</u>	<u>Current</u>	<u>State and</u>	<u>Other</u>	<u>Payroll</u>	<u>Current</u>	<u>State and</u>	<u>Trust</u>	<u>Insurance</u>
	<u>Fund</u>	<u>Fund</u>	<u>Fund</u>	<u>Fund</u>	<u>Trust Fund</u>	<u>Agency</u>	<u>Fund</u>	<u>Fund</u>	<u>Trust</u>	<u>Agency</u>	<u>Fund</u>	<u>Fund</u>	<u>Other</u>	<u>Trust</u>
Balance December 31, 2012														
Due From:	B	238,768.35		\$ 19,094.66	\$ 149.46		\$ 285,015.46		\$ 29,342.57	\$ 54,097.49	\$	\$	\$ 10,326.00	
Due To	B		\$ 4,671.48			\$ 10,326.00		\$ 4,688.94						\$ 54,097.49
Cash Receipts	B-2				67,908.96				150.00				10,326.00	
		238,768.35	4,671.48	19,094.66	68,058.42	29,342.57	10,326.00	285,015.46	4,688.94	29,492.57	54,097.49			54,097.49
Decreased by:														
Cash Disbursements	B-2	49,386.20		118,990.89	194,734.75	10,326.00	222,706.75	92,171.82			219,040.44	214.77		
Balance December 31, 2013														
Due From	B	\$ 288,154.55		\$ 138,085.53	\$ 126,975.27		\$ 285,015.46	\$ 87,482.88	\$ 29,492.57	\$ 54,097.49	\$ 219,040.44	\$ 214.77	\$ -	\$ 54,097.49
Due To	B		\$ 4,671.48			\$ 29,342.57	\$ -							

CITY OF NEWARK
TRUST FUND

ASSESSMENTS RECEIVABLE

B-5

	<u>Ref.</u>	
Balance December 31, 2012	B	\$145,239.95
Decreased by:		
Collections	B-2	<u>49,386.20</u>
Balance December 31, 2013	B	<u>\$ 95,853.75</u>

CITY OF NEWARK
TRUST FUND

ASSESSMENT LIENS

B-6

	<u>Ref.</u>	<u>Assessment Liens</u>	<u>Assessment Lien Interest and Costs</u>
Balance December 31, 2012	B	<u>\$ 710,569.47</u>	<u>\$ 59,946.17</u>
Balance December 31, 2013	B, Below	<u><u>\$ 710,569.47</u></u>	<u><u>\$ 59,946.17</u></u>
<u>Analysis of Balance</u>			
Tax Collector HTE File - No Control	Above	<u><u>\$ 710,569.47</u></u>	<u><u>\$ 59,946.17</u></u>

ACCOUNTS RECEIVABLE

B-7

	<u>Ref.</u>	<u>Other</u>
Balance December 31, 2012	B	<u>\$ 20,151.07</u>
Balance December 31, 2013	B	<u><u>\$ 20,151.07</u></u>

CITY OF NEWARK
TRUST FUND

PROTESTED CHECKS

B-8

	<u>Ref.</u>	<u>Grant Funds</u>	<u>Other Funds</u>	<u>Liability Insurance Fund</u>	<u>Payroll Agency Fund</u>
Balance December 31, 2012	B	<u>\$25,238.00</u>	<u>\$427,139.24</u>	<u>\$305.00</u>	<u>\$ 7,920.00</u>
Balance December 31, 2013	B	<u>\$25,238.00</u>	<u>\$427,139.24</u>	<u>\$305.00</u>	<u>\$ 7,920.00</u>

CITY OF NEWARK
TRUST FUND

OVERPAYMENTS RECEIVABLE

B-9

	<u>Ref.</u>	
Balance December 31, 2012	B	<u>\$ 19,539.47</u>
Balance December 31, 2013	B	<u><u>\$ 19,539.47</u></u>

RESERVE FOR SALARY INCREASE

B-10

	<u>Ref.</u>	
Balance December 31, 2012	B	\$ 140.00
Decrease By: Receipts	B-2	<u>5,210.59</u>
Balance December 31, 2013	B	<u><u>\$ 5,070.59</u></u>

ACCOUNTS RECEIVABLE
GRANT FUND

B-11

	<u>Ref.</u>	
Balance December 31, 2012	B	<u>\$120,000.00</u>
Balance December 31, 2013	B	<u><u>\$120,000.00</u></u>

CITY OF NEWARK
TRUST FUND

GRANT EXPENDITURES WITH COMMITMENT LETTERS

B-12

	<u>Ref.</u>	
Balance December 31, 2012	B	\$655,942.32
Decreased by:		
Transferred to Reserve	B-27	<u>580,141.71</u>
Balance December 31, 2013	B	<u>\$ 75,800.61</u>

RESERVE FOR GILBERT MEDIA ESCROW

B-13

	<u>Ref.</u>	
Increased by:		
Cash Receipts	B-2	<u>\$ 83,911.41</u>
Balance December 31, 2013	B-2	<u>\$ 83,911.41</u>

CITY OF NEWARK
TRUST FUND

ASSESSMENT OVERPAYMENTS

B-14

	<u>Ref.</u>	
Balance December 31, 2012	B	<u>\$ 5,348.50</u>
Balance December 31, 2013	B	<u>\$ 5,348.50</u>

PREPAID ASSESSMENTS

B-15

	<u>Ref.</u>	
Balance December 31, 2012	B	<u>\$ 1,029.00</u>
Balance December 31, 2013	B	<u>\$ 1,029.00</u>

Analysis of Balance

<u>Block</u>	<u>Lot</u>	<u>Year</u>	<u>Amount</u>
243	18	1977	<u>\$ 1,029.00</u>

CITY OF NEWARK
TRUST FUND

RESERVE FOR ASSESSMENTS, LIENS AND
ASSESSMENT LIENS INTEREST AND COSTS

B-16

	<u>Ref.</u>	<u>Assessments and Liens</u>	<u>Assessment Liens Interest and Costs</u>
Balance December 31, 2012	B	\$ 855,809.42	\$59,946.17
Decreased by:			
Revenue Realized:			
Assessment Receivable	B-1	<u>49,386.20</u>	<u> </u>
Balance December 31, 2013	B,Below	<u>\$ 806,423.22</u>	<u>\$59,946.17</u>
<u>Analysis of Balance</u>			
Assessments Receivable		\$ 95,853.75	\$
Assessment Liens		<u>710,569.47</u>	<u>59,946.17</u>
	Above	<u>\$ 806,423.22</u>	<u>\$59,946.17</u>

CITY OF NEWARK
TRUST FUND

VOUCHERS PAYABLE

B-17

	<u>Ref.</u>	<u>Payroll Agency</u>
Balance December 31, 2012	B	<u>\$ 146.83</u>
Balance December 31, 2013	B	<u><u>\$ 146.83</u></u>

CITY OF NEWARK
TRUST FUND

DUE TO STATE OF NEW JERSEY -
ANIMAL CONTROL TRUST FUND

B-18

	<u>Ref.</u>	<u>Total</u>
Balance December 31, 2012	B	\$ 6,992.90
Increased by:		
Fees Collected	B-30	<u>2,021.02</u>
		9,013.92
Decreased by:		
Cash Disbursements	B-2	<u>2,597.60</u>
Balance December 31, 2013	B	<u>\$ 6,416.32</u>

CITY OF NEWARK
TRUST FUND

RESERVE FOR ANIMAL CONTROL EXPENDITURES

B-19

	<u>Ref.</u>	
Balance December 31, 2012	B	\$ 9,563.66
Increased by:		
Cash Receipts	B-30	7,955.38
		<u>17,519.04</u>
Decreased by:		
Expenditures Under R.S. 4:19-15-11	B-2	3,049.04
		<u>3,049.04</u>
Balance December 31, 2013	B	<u>\$ 14,470.00</u>

Analysis of Maximum Reserve for Animal Control

License Fees Collected

<u>Year</u>	
2012	\$ 5,831.00
2013	7,955.38
	<u>13,786.38</u>
Maximum Statutory Reserve	<u>\$ 13,786.38</u>

RESERVE FOR VOID CHECKS PENDING DISTRIBUTION

B-20

	<u>Ref.</u>	<u>Other Trust</u>
Balance December 31, 2012	B	\$ 5,070.59
Decreased by:		
Reissued Checks	B-2	90.00
		<u>90.00</u>
Balance December 31, 2013	B	<u>\$ 4,980.59</u>

CITY OF NEWARK
TRUST FUND

RESERVE FOR OTHER FUNDS

B-21

Account Number	Reserve Accounts	Balance Dec. 31, 2012 Reserve	Receipts	Disbursed	Balance Dec. 31, 2013 Reserve
2122	Police Overtime Reimbursements	\$ 4,917.92	\$ 46,223.66	\$	\$ 51,141.58
2127	NEDC Settlement	0.41			0.41
3031	Payroll Transfers Account	53.12	3,223,463.39	3,223,232.28	284.23
3035	Tax Abatement Affordable Trust Deposit	313,857.45	297,148.68		611,006.13
3207	Hess Trust Economic Development		6,800,000.00	2,223,421.23	4,576,578.77
3210	Community and Economic Development				
	Special Deposits	551,418.74	3,419,127.61	2,818,662.44	1,151,883.91
3220	Greater Newark Tourism Improvement				
3220	District		136,704.67		136,704.67
3221	Greater Newark Tourism Improvement				
	District Administration		1,380.86		1,380.86
4408	Prudential		475,000.00	77,434.93	397,565.07
4045	Reserve for Emergency Medical Service			333.20	(333.20)
3604	Reserve for Ironbound Recreation Site	713.47			713.47
3874	Motor Vehicle Rental Tax	18,387,012.63	9,946,130.03	11,867,234.09	16,465,908.57
3882	Deposit on Bid - Sale of Property	150,403.00		7,412.00	142,991.00
3887	Trust Service Fees	0.99			0.99
4125	Public Defender Fees	22,975.00	14,425.00		37,400.00
4205	Deposit on Development Fund - Escrow	208,234.56	50,000.00	127,047.84	131,186.72
4502	Developer's Escrow	6,236.45	2,213.63		8,450.08
4603	Deposit on Badges - Special Police	4,091.50			4,091.50
4605	Reserve for Dairy Inspection	2,362.00			2,362.00
4606	Reserve for Vacating of Street	(971.00)			(971.00)
4617	Performance Bond Deposit	666,924.51	88,552.11		755,476.62
4621	Funds Deposited in Trust with City	2,382,343.71	605,739.78	185,733.56	2,802,349.93
46214	Reserve for Premium on Tax Sale	758,791.13	269,000.00	341,204.19	686,586.94
46216	Redemption of Tax Sales Outside Buyers	243,041.85	107,136.14	91,621.77	258,556.22
4625	Fence Deposit	5,038.00		3,970.00	1,068.00
46155	Police Outside Employment Reimbursements	656,566.54	4,179,256.99	3,631,346.09	1,204,477.44
4658	Reserve for Water Austerity	(85.00)			(85.00)
4674	Local Development Corporation	154.74			154.74
4677	Street Permits - PSE&G	97.76			97.76
4680	Alcohol Beverage Control - Retirement Fund	108,400.29	52,800.00		161,200.29
3875	Street Construction Fund	249,239.31	415,684.00	147,202.00	517,721.31
3876	Telecommunication Fees	241,208.96	231,492.00		472,700.96
3880	Sale of Abandoned Vehicles	37,643.69	250.00	279.00	37,614.69
3881	POAA	1,156,337.69	191,202.50	4,864.18	1,342,676.01
3888	Newark Economic Development Corp.	581,854.26		220,108.82	361,745.44
3E02	Reserve for Encumbrance	6,401.85			6,401.85
4123	Environmental County Health Energy	52,263.73			52,263.73
4621	City of Newark - Gil Media TV	307,272.85			307,272.85
4351	Childhood Lead Poisoning Program	(8,921.74)	2.00		(8,919.74)
4501	Ryan White Trust Fund	14,939.00			14,939.00
4609	Police Department - Confiscated Monies	276,412.08	5,869.09		282,281.17
4610	Newark Watershed Conservation	89.04	100,000.00	100,000.00	89.04
4612	Law Enforcement	457,803.53	173,265.28	119,903.60	511,165.21
4616	Recreation - Cultural Affairs	237,566.10			237,566.10
4626	Elevator Inspection Fees	537,437.16	722,532.00	469,933.20	790,035.96
4627	Redevelopment	111,187.07	81,872.62	86,326.77	106,732.92
4630	Hazardous Material Permits	74,883.34	63,740.00	5,297.41	133,325.93
4631	Reserve for Clean and Lien	70,518.57			70,518.57
4633	Reserve for HCDA	(3,000.00)			(3,000.00)
4638	Reserve for Settlement Fees	174,077.68	83,920.91		257,998.59
4647	City-Owned Property	298.99	1.86		300.85
4648	Division of Health and Labor	435,480.88	575,270.08	445,949.17	564,801.79
4654	Homeless Health Care	973,829.75	196,412.07	240,223.00	930,018.82
4655	Rental/Lease of Municipal Property - Artist	1,500.00			1,500.00
4656	Law Enforcement	446,781.45	234,426.87	412,221.37	268,986.95
4657	Law Enforcement	254,063.05	70,987.92	150,433.11	174,617.86
4672	Balanced Housing	(57,994.32)			(57,994.32)
4673	Newark Economic Development Corp.	0.46			0.46
4684	Tree/Flower Trust Fund	112,500.00			112,500.00
4981	Prior Year Revenue Reimbursement	(5,000.00)			(5,000.00)
4685	Municipal Forensic Fees	977.74			977.74
		<u>\$ 31,210,231.94</u>	<u>\$ 32,861,231.75</u>	<u>\$ 27,001,395.25</u>	<u>\$ 37,070,068.44</u>

Reference

B

B-2

B-2

B

CITY OF NEWARK
TRUST FUND

RESERVE FOR OTHER LIABILITIES

B-22

	<u>Ref.</u>	<u>Vouchers Payable</u>	<u>Inactive Grants</u>
Balance December 31, 2012	B	\$ 38,806.35	\$ 0.20
Decreased by:			
Cash Disbursements	B-2	<u>14,851.82</u>	<u> </u>
Balance December 31, 2013	B	<u>\$ 23,954.53</u>	<u>\$ 0.20</u>

CITY OF NEWARK
TRUST FUND

RESERVE FOR VARIOUS INSURANCE FUNDS

B-23

	<u>Ref.</u>	<u>Totals</u>	<u>Workmen's Compensation Insurance</u>	<u>Unemployment Insurance</u>	<u>Other Insurance</u>
Balance December 31, 2012	B	\$ 8,112,856.48	\$ 646,366.62	\$ 1,011,675.79	\$ 6,454,814.07
Increased by:					
Receipts	B-2	<u>18,805,661.65</u>	<u>9,165,609.44</u>	<u>2,614,960.34</u>	<u>7,025,091.87</u>
		26,918,518.13	9,811,976.06	3,626,636.13	13,479,905.94
Decreased by:					
Disbursements	B-2	<u>12,971,368.37</u>	<u>8,197,822.41</u>	<u>834,338.08</u>	<u>3,939,207.88</u>
Balance December 31, 2013	B	<u>\$ 13,947,149.76</u>	<u>\$ 1,614,153.65</u>	<u>\$ 2,792,298.05</u>	<u>\$ 9,540,698.06</u>

CITY OF NEWARK
TRUST FUND

RESERVE FOR MUNICIPAL TONNAGE GRANT

B-24

	<u>Ref.</u>	
Balance December 31, 2012	B	\$ 2,962,993.26
Increased by:		
Collections	B-2	<u>179,210.36</u>
Balance December 31, 2013	B	<u>\$ 3,142,203.62</u>

RESERVE FOR BALANCED HOUSING GRANT

B-25

	<u>Ref.</u>	
Balance December 31, 2012	B	\$ 4,828,116.98
Increased by:		
Interest Earned	B-3	<u>23,681.82</u>
Balance December 31, 2013	B	<u>\$ 4,851,798.80</u>

RESERVE FOR DEMOLITION LIENS

B-26

	<u>Ref.</u>	
Balance December 31, 2012	B	<u>\$ 502,632.34</u>
Balance December 31, 2013	B	<u>\$ 502,632.34</u>

CITY OF NEWARK
TRUST FUND

RESERVE FOR COMMUNITY DEVELOPMENT BLOCK GRANT

B-27

	<u>Ref.</u>		
Balance December 31, 2012	B		\$ 1,189,529.96
Increased by:			
Cash Receipts	B-2		<u>10,882,902.09</u>
			12,072,432.05
Decreased by:			
Cash Disbursements	B-2	\$ 10,388,001.18	
Grant Expenditures with Commitment Letters	B-12	<u>580,141.71</u>	
			<u>10,968,142.89</u>
Balance December 31, 2013	B		<u>\$ 1,104,289.16</u>

RESERVE FOR URBAN DEVELOPMENT

B-28

	<u>Ref.</u>		
Balance December 31, 2012	B		<u>\$ 2,203,064.52</u>
Balance December 31, 2013	B		<u>\$ 2,203,064.52</u>

RESERVE FOR REVOLVING DEVELOPMENT TRUST FUND

B-29

	<u>Ref.</u>	<u>Community Economic Development Trust</u>	<u>Revolving Development Trust Fund</u>
Balance December 31, 2012	B	\$ 125,869.46	\$ 746,755.97
Increased by:			
Interest Earned	B-3	<u>17,370.30</u>	
Balance December 31, 2013	B	<u>\$ 143,239.76</u>	<u>\$ 746,755.97</u>

CITY OF NEWARK
TRUST FUND

DUE FROM DOG LICENSE COLLECTOR

B-30

	<u>Ref.</u>	
Increased by:		
Dog License Fee - State Share	B-18	\$ 2,021.02
Municipal Share		<u>7,955.38</u>
	B-19	9,976.40
Decreased by:		
Collections	B-2	<u>9,976.40</u>
		<u>\$ -</u>

RESERVE FOR HOMESTEAD REBATE

B-31

	<u>Ref.</u>	
Balance December 31, 2012	B	<u>\$ 2,210.08</u>
Balance December 31, 2013	B	<u>\$ 2,210.08</u>

CITY OF NEWARK
TRUST FUND

PAYROLL DEDUCTIONS PAYABLE
ALL FUNDS

B-32

	<u>Ref.</u>	
Balance December 31, 2012	B	\$ 1,998,920.31
Increased by:		
Payroll Deductions and Cash		
Collected	B-2	<u>139,351,279.51</u>
		141,350,199.82
Decreased by:		
Disbursements	B-2	<u>133,290,565.76</u>
Balance December 31, 2013	B	<u>\$ 8,059,634.06</u>

CITY OF NEWARK
GENERAL CAPITAL FUND

CASH RECEIPTS AND DISBURSEMENTS - TREASURER

C-2

	<u>Ref.</u>		
Balance December 31, 2012	C		\$ 37,302,504.82
Increased by Receipts:			
Premium on Sale of Bond Anticipation Notes	C-1	\$ 1,720.26	
Investments Matured	C-3	800,000.00	
Interfunds Receivable	C-5	250,000.00	
Premium to Pay Bond Anticipation Notes	C-12	233,000.00	
Budget Appropriation to Pay Bond Anticipation Notes	C-12	1,810,000.00	
Sale of Bond Anticipation Notes:			
New	C-16	1,238,000.00	
Renewed	C-16	52,407,000.00	
Interfunds Payable	C-18	24,000.00	
Budget Refunds	C-18	<u>68,327.86</u>	
			<u>56,832,048.12</u>
			94,134,552.94
Decreased by Disbursements:			
Appropriated as a 2013 Budget Revenue	C-1	5,584,000.00	
Cost of Bond Issue	C-8	8,974.70	
Bond Anticipation Notes - Renewed	C-16	52,407,000.00	
Bond Anticipation Notes - Paid	C-16	1,972,000.00	
Improvement Authorizations	C-21	<u>15,039,663.35</u>	
			<u>75,011,638.05</u>
Balance December 31, 2013	C		<u><u>\$ 19,122,914.89</u></u>

CITY OF NEWARK
GENERAL CAPITAL FUND

INVESTMENT IN NOTE RECEIVABLE

C-3

	<u>Ref.</u>	<u>General</u>
Balance December 31, 2012	C	\$1,600,000.00
Decreased by:		
Investments Matured	C-2	<u>800,000.00</u>
Balance December 31, 2013	C	<u>\$ 800,000.00</u>

CITY OF NEWARK
GENERAL CAPITAL FUND

ANALYSIS OF CAPITAL CASH AND INVESTMENTS

C-4
Sheet #1

New	Old	Description	Balance Dec. 31, 2012	Receipts		Disbursements		Transfers (From)/To	Balance Dec. 31, 2013
				Bond Anticipation Notes Issued	Reappropriated Other	Other	Improvement Authorizations		
90-C6		Rehabilitation of the North End Branch Library	\$ (152,880.90)	\$	\$	\$	\$	\$	\$ (152,880.90)
93-A5		Restoration of City Hall	6,955.00				6,955.00		
93-A8		Removal and Replacement	37,304.21				37,304.21		
		Sub-Total	44,259.21				44,259.21		
93-C2		Purchase of Computers - Phase II	0.93						0.93
		Sub-Totals 1970 to 94-B8	(108,620.76)				44,259.21		(152,879.97)
95-A6		City Hall Restoration	29,599.75				29,599.75		
95-B5		City Hall Complex Restoration and Renovation	7,109.00				7,109.00		
95-B7		Sidewalk Reconstruction City-Owned Properties	(499.65)						(499.65)
95-B9		Design and Renovation of Police Precincts City-Wide	39,316.36						39,316.36
95-C4		Acquisition of Vehicles	(4,753.00)						(4,753.00)
95-C8		Police Facility Building Police Ward Precincts	6,989.99				6,989.99		
95-D0		Hand Held Police Radios	(256.00)						(256.00)
95-D1		Newark Museum Renovation of Science Department Building, Plaza and Sidewalk in Front of Main Building	(150.00)						(150.00)
96-A1		Rehabilitation and Improvement of the Military Park Garage	(500,778.10)						(500,778.10)
		Sub-Total	(423,421.65)				43,698.74		(467,120.39)
96-A7		Design and Construction of Firehouse Renovations	40,721.54						40,721.54
		Sub-Totals 95-AZ to 96-A9	(382,700.11)				43,698.74		(426,398.85)
		Refunding Tax Overpayments - 1992	99,274.75						99,274.75
		Improvement Funded by ECIA - 1994	8,777.66						8,777.66
97-B1		Renovation to City Hall	6,470.03				6,470.03		
		Sub-Total	6,470.03				6,470.03		

CITY OF NEWARK
GENERAL CAPITAL FUND

ANALYSIS OF CAPITAL CASH AND INVESTMENTS

C-4
Sheet #2

New	Old	Description	Balance Dec. 31, 2012	Receipts		Disbursements		Transfers (From)/To	Balance Dec. 31, 2013
				Bond Anticipation Notes Issued	Reappropriated Other	Other	Improvement Authorizations		
98-A1		Construction of Public Safety Communication Center	\$ 349,450.23	\$	\$	\$	\$ 13,928.99	\$	\$ 335,521.24
99-A1		Newark Public Safety Communication Center - ECIA	(66,452.59)				18,697.59		(85,150.18)
		Total of All Improvements	(93,800.79)				127,054.56		(220,855.35)
99-A0		Removal of Underground Storage Tanks	30,208.41				33,440.00		(3,231.59)
99-A1		Restoration of City-Owned Cemetery	(103.66)						(103.66)
99-A5		Construction of City Park at Hayes West	5,574.98				5,574.98		
99-A8		Furnishing and Equipment, Various City Departments	10,682.38				7,214.99		3,467.39
			46,362.11				46,229.97		132.14
01-A3		Restoration of Newark Library (Repair/Reconstruction)					388.50		(388.50)
01-A5		Demolition of Buildings City-Wide	12,936.10						12,936.10
01-A8		Tree Removal and Planting City-Wide	6,251.00						6,251.00
2002		Pension Refunding Bond	34,682.79						34,682.79
			53,869.89				388.50		53,481.39
04A4		Streetscape - Broad Street	30.00						30.00
01030		Refunding Improvement Authorization	36,476.68						36,476.68
05A13		OBM Technology Infrastructure Design and Implementation Computers and Information Systems	200,367.31						200,367.31
05A17		Technology Improvement, Including Exchange Migration Consultant, New Servicers, Storage, Exchange 2003 to 2007	680,254.66	833,561.00			79,955.50		1,433,860.16
05A18		Purchase of 4 Sanitation Trucks and Sanitation Frame Loader	538,359.55						538,359.55
			1,418,981.52	833,561.00			79,955.50		2,172,587.02
05S02		Local Share of State Construction Projects	7,883,669.95				5,174.02		7,878,495.93
05S04		Emergency Health and Safety Projects	(99,998.53)						(99,998.53)
05S05		Stadium and Field Renovation	(1,151,000.00)						(1,151,000.00)
05S06		Robotics Facility	(1,500,000.00)						(1,500,000.00)
05S08		Purchase Control-Kitchen Equipment		24,000.00		24,000.00	5,174,000.00		(5,174,000.00)
05S09		Insurance Costs	(360,343.14)						(360,343.14)
			4,772,328.28	24,000.00		24,000.00	5,179,174.02		(406,845.74)

CITY OF NEWARK
GENERAL CAPITAL FUND

ANALYSIS OF CAPITAL CASH AND INVESTMENTS

C-4
Sheet #3

New	Old	Description	Balance Dec. 31, 2012	Receipts		Disbursements		Transfers (From)/To	Balance Dec. 31, 2013
				Bond Anticipation Notes Issued	Reappropriated Other	Other	Improvement Authorizations		
06A05		Demolition Douglas - Harrison Apartments	\$ (2,461,371.96)	\$	\$	\$	\$ 33,634.72	\$	\$ (2,495,006.68)
06A06		Military Park Restoration	1,978,826.11				1,988,969.11		(10,143.00)
			(482,545.85)				2,022,603.83		(2,505,149.68)
07A00 and 01		Newark Circulation and Market Street Plaza Projects	32,622.17						32,622.17
07A02		Triangle Park Project	4,130,000.01						4,130,000.01
07A05		Hotel Site Acquisition Project	707,000.00						707,000.00
			4,869,622.18						4,869,622.18
07B00	07A06	(1) Street Resurfacing and Sidewalk Replacement	5,890.23						5,890.23
07B1	07A07	(2) The Wilson Avenue Project (East Phase)	2,755,929.69				63,710.66		2,692,219.03
07B2	07A08	(3) Street Resurfacing and Sidewalk Replacement of Delancy Street Located in the East Ward	1,875,738.97				435,933.98		1,439,804.99
07B3	07A09	(4) Irving Turner Boulevard Traffic Calming Project	1,320,532.71				617,634.55		702,898.16
07B4	07A10	(5) Broad Street Streetscape - Phase II, III and IV	498,358.86				495,873.86		2,485.00
07B5	07A11	(6) Traffic Signal Construction at Warren Street and Summit Street Located in the Central Ward	16,244.12						16,244.12
07B6	07A12	(7) Traffic Signal Construction at West Market and Warren/ Hudson Streets Located in the Central Ward	15,962.63						15,962.63
07B7	07A13	(8) Paving, Patching Program in All Wards of the City	131.50					(131.50)	
07B8	07A14	(9) Tree Planting Program for All Wards of the City	(345.76)					131.50	(214.26)
07B9	07A15	(10) Phase III of the Way Finding Sign Program for All Wards of the City	589,152.09				98,439.00		490,713.09
07BA0	07A16	(11) Sign Management and Inventory System for All Wards of the City	205,100.00				104,032.28		101,067.72
07BB0	07A17	(12) Pavement Marking Program for All Wards of the City	0.38						0.38
07BD0	07A19	(14) Design and Construction of Repairs and Renovations to Central Avenue Bridge	83,351.30						83,351.30
07BE0	07A20	(15) Renovations of the City's 16th Avenue Police Department Facility Located in the West Ward	1,193.45		(1,193.45)				
07BF0	07A21	(16) Renovations of the City's Irvington Avenue Police Department Facility Located in the West Ward	200.28		(200.27)				0.01

CITY OF NEWARK
GENERAL CAPITAL FUND

ANALYSIS OF CAPITAL CASH AND INVESTMENTS

C-4
Sheet #4

New	Old	Description	Balance Dec. 31, 2012	Receipts		Disbursements		Transfers (From)/To	Balance Dec. 31, 2013
				Bond Anticipation Notes Issued	Reappropriated Other	Other	Improvement Authorizations		
07BH0	07A23	(18) Preliminary Planning for the Construction of the New South Precinct to be Located at Clinton Avenue and Hunterdon Street	\$ 0.19	\$	\$	\$	\$	\$	\$ 0.19
07BI0	07A24	(19) Renovation to the East Precinct Located in the East Ward of the City	45,521.38	404,439.00	55,487.00				505,447.38
07BL0	07A27	(22) Exterior Renovation and Structural Repairs of Firehouse for Engine 26, Truck 12 Located at 420 Sanford Avenue in the West Ward	560,750.00		(41,304.72)			(519,445.28)	
07BN0	07A29	(24) Renovation of Firehouse for Engine 13, Truck 6 Located at 714 Mt. Prospect Avenue	63,675.42						63,675.42
0700	07A30	(25) Renovation of Firehouse for Engine 27, Truck 4 Located at 87 Elm Road in the East Ward	2,771,744.99				2,634,966.81		136,778.18
07BR0	07A33	(28) Demolition of Existing Buildings and Construction of a New Park at Douglas Park	92,750.00				47,162.50		45,587.50
07BS0	07A34	(29) Demolition of Existing Buildings and Construction of a New Park at Harrison Park	305,100.00						305,100.00
07BV0	07A37	(32) Construction of the Ironbound Recreation Center (SAC Site) to Include a New Building	369.07						369.07
07BX0	07A39	(34) Construction of a New Training Building and Renovation of Fields at the Ironbound Little League Field (Ironbound Park)	10,334.96						10,334.96
07BY0	07A40	(35) Renovation of the Existing Building and Construction of a New Pool, Soccer Field and Playground at Hayes Park East	5,528,903.30				273,411.54		5,255,491.76
07C10	07A43	(38) Renovation to St. Peter's Park	0.39						0.39
07C50	07A47	(42) Installation of a New Field Turf at Kasberger Field (Benedict's Park)	(13,014.80)						(13,014.80)
07C60	07A48	(43) Renovation of the Playing Field at Jessie Allen Park (AR-6 Park) Located at 41-57 Avon Avenue	2,547,235.34				1,612,354.35		934,880.99
07CG0	07A58	(53) Phase I of the Interior Restoration of the City Hall, Including Various Renovations and Repairs	854,525.01				871.25		853,653.76
07CH0	07A59	(54) Repairs to City Welfare Building Located at 311 University Avenue	292,826.06				54,444.69		238,381.37

CITY OF NEWARK
GENERAL CAPITAL FUND

ANALYSIS OF CAPITAL CASH AND INVESTMENTS

C-4
Sheet #5

New	Old	Description	Balance Dec. 31, 2012	Receipts		Disbursements		Transfers (From)/To	Balance Dec. 31, 2013
				Bonds/Bond Anticipation Notes Issued	Reappropriated Other	Other	Improvement Authorizations		
07C10	07A60	(55) Installation of New Roof and Fire Escapes at the Newark Symphony Hall	\$ 146,413.84	\$	\$ (0.40)	\$	\$	\$	\$ 146,413.44
07CJ0	07A61	(56) Various Building Renovations to Public Buildings/Repairs to City Welfare Building	5,371.32		42,698.44		14,945.43	519,445.28	552,569.61
07CL0	07A63	(58) Improvement to the City Public Access TV Studio and Acquisition of New Equipment	5,469.70						5,469.70
07CM0	07A64	(59) Completion of the City Archives Building	255,100.00				13,062.50		242,037.50
07CN0	07A65	(60) City-Wide Technology Infrastructure Improvement	115,534.94						115,534.94
07CS0		(65) Construction of New Playground, Multi-Purpose Playing Court and Site Improvement to the David L. Warner Park					110,649.99		(110,649.99)
07CT0	07CT0	(66) NRS Sanitation Department Purchase of 4 Sanitation Trucks and Sanitation Frame Loader	747,763.14						747,763.14
07CU0	07CU0	(67) Technology Improvements, Including Exchange Migration Consultant, New Servers, Storage, Exchange 2003 to 2007	862.00		15,513.00				16,375.00
07CV0	07CV0	(68) Renovation of Old Clinton Place Fire Station into Nonprofit Business Incubator, Interior Design Work, Painting	44,021.81						44,021.81
07CW0	07CW0	(69) Renovation and Conversion of Vince Lombardi Center into a Community Center, Design Work, Asbestos Removal	53,874.32				35,941.30		17,933.02
07CX0	07CX0	(70) Restoration of Ironbound Recreation Center Field to be Used for Soccer, Baseball, and Football - Design Work	212,414.42				105,087.31		107,327.11
07CY0	07CY0	(71) Implementation of a Traffic Study on South Munn Avenue, Isabelle Avenue, West End Avenue, North Munn Avenue and 18th Avenue and Columbia Avenue	72,404.89						72,404.89
07DA0		(73) Building New Baseball Dugout, Batting Cage and Bleachers, Restore Baseball Diamond, New Signage, Replanting Grass	46,485.00						46,485.00
07DB0		(74) Implementation of a Traffic Study on Newark Street, Orange Street, Washington Street, Bergen Street and Spruce Street	5,736.89				3,887.43		1,849.46
07DC0		(75) Art Funding	440,304.00				53,887.41		386,416.59
		New Parks/Recreation Renovations			0.40				0.40
			<u>22,579,918.03</u>	<u>404,439.00</u>	<u>71,000.00</u>		<u>6,776,296.84</u>		<u>16,279,060.19</u>

CITY OF NEWARK
GENERAL CAPITAL FUND

ANALYSIS OF CAPITAL CASH AND INVESTMENTS

C-4
Sheet #6

New	Old	Description	Balance Dec. 31, 2012	Receipts		Disbursements		Transfers (From)/To	Balance Dec. 31, 2013
				Bonds/Bond Anticipation Notes Issued	Reappropriated Other	Other	Improvement Authorizations		
08A00		Pension Refund	\$ 33,570.75	\$	\$	\$	\$	\$	\$ 33,570.75
08A01		Demolition of Buildings	179,924.54						179,924.54
08A02		Tax Appeal Refunding Bond	1.30	1,344,342.00		1,344,342.00			1.30
08A03		Preliminary Expenses	1.30						1.30
			<u>213,497.89</u>	<u>1,344,342.00</u>		<u>1,344,342.00</u>			<u>213,497.89</u>
11A0		Tax Appeal Refunding Bond	(1,061,884.92)	491,658.00		491,658.00			(1,061,884.92)
12A00		Street Resurfacing and Sidewalk Replacement	1,000,000.00				600,760.78		399,239.22
12A10		Various Building Renovations City-Wide	1,000,000.00				207,199.35		792,800.65
			<u>2,000,000.00</u>				<u>807,960.13</u>		<u>1,192,039.87</u>
		<u>Other Accounts</u>							
		Bond Anticipation Notes Renewed		50,547,000.00		50,547,000.00			
		Fund Balance	5,891,070.60		1,720.26	5,584,000.00			308,790.86
		Capital Improvement Fund	1,375,543.58		100,000.00				1,475,543.58
		Due from Current Fund	(150,000.00)		174,000.00				24,000.00
		Due from State of New Jersey - Demolition Bond	(2,500,000.00)						(2,500,000.00)
		Cost of Bond Issue	(228,863.13)			8,974.70			(237,837.83)
		Refund to be Applied	266,775.90		68,327.86				335,103.76
		Due from Water Capital	(46,000.00)						(46,000.00)
		Due from State and Federal Funds	(58,877.15)						(58,877.15)
			<u>4,549,649.80</u>	<u>50,547,000.00</u>	<u>344,048.12</u>	<u>56,139,974.70</u>			<u>(699,276.78)</u>
			<u>\$36,902,504.82</u>	<u>\$53,645,000.00</u>	<u>\$415,048.12</u>	<u>\$57,999,974.70</u>	<u>\$15,039,663.35</u>	<u>\$ -</u>	<u>\$19,922,914.89</u>
		Reference		C-2	C-2	C-2	C-2		C

CITY OF NEWARK
GENERAL CAPITAL FUND

INTERFUNDS RECEIVABLE

C-5

	<u>Ref.</u>	<u>Total</u>	<u>Due from Current Fund</u>	<u>State and Federal Fund</u>	<u>Water Capital Fund</u>
Balance December 31, 2012: Due From	C	\$254,877.15	\$150,000.00	\$ 58,877.15	\$46,000.00
Increased by:					
Capital Improvement Fund	C-17	<u>100,000.00</u>	<u>100,000.00</u>		
		354,877.15	250,000.00	58,877.15	46,000.00
Decreased by:					
Cash Receipt	C-2	<u> </u>	<u>250,000.00</u>	<u> </u>	<u> </u>
Balance December 31, 2013: Due From	C	<u>\$104,877.15</u>	<u>\$ -</u>	<u>\$ 58,877.15</u>	<u>\$46,000.00</u>

CITY OF NEWARK
GENERAL CAPITAL FUND

DUE FROM ESSEX COUNTY IMPROVEMENT AUTHORITY

C-6

	<u>Ref.</u>	<u>Total</u>	<u>Open Projects for 1991 to 1996 on File</u>	<u>Lease Purchase for Series 2010 Paid by E.C.I.A.</u>
Balance December 31, 2012	C	<u>\$ 24,173,539.25</u>	<u>\$ 2,473,539.25</u>	<u>\$ 21,700,000.00</u>
Balance December 31, 2013	C	<u><u>\$ 24,173,539.25</u></u>	<u><u>\$ 2,473,539.25</u></u>	<u><u>\$ 21,700,000.00</u></u>

CITY OF NEWARK
GENERAL CAPITAL FUND

DUE FROM ESSEX COUNTY IMPROVEMENT AUTHORITY
PUBLIC SAFETY COMMUNITY CENTER

C-7

	<u>Ref.</u>	
Balance December 31, 2012	C	<u>\$ 434,636.54</u>
Balance December 31, 2013	C	<u><u>\$ 434,636.54</u></u>

DEFERRED CHARGES
COST OF BOND/NOTE ISSUE

C-8

	<u>Ref.</u>	
Balance December 31, 2012	C	\$ 228,863.13
Increased by:		
Cost of Bond Issue	C-2	<u>8,974.70</u>
Balance December 31, 2013	C	<u><u>\$ 237,837.83</u></u>

CITY OF NEWARK
GENERAL CAPITAL FUND

DUE FROM STATE OF NEW JERSEY FOR DEMOLITION BOND

C-9

	<u>Ref.</u>	
Balance December 31, 2012	C	<u>\$ 2,500,000.00</u>
Balance December 31, 2013	C	<u><u>\$ 2,500,000.00</u></u>

DEFERRED CHARGE - NEWARK HOUSING AUTHORITY - GUARANTEE

C-10

	<u>Ref.</u>	
Balance December 31, 2012	C	\$ 64,575,000.00
Decreased by:		
Improvements Guaranteed by City of Newark - Paid in 2013	C-19	<u>1,235,000.00</u>
Balance December 31, 2013	C	<u><u>\$ 63,340,000.00</u></u>

CITY OF NEWARK
GENERAL CAPITAL FUND

SUMMARY OF DEFERRED CHARGES TO FUTURE TAXATION - FUNDED

C-11

	<u>Ref.</u>	<u>Total</u>	<u>General</u>	<u>State Loan Payable</u>	<u>School Issued for Type II School</u>	<u>State Loan Demolition</u>
Balance December 31, 2012	C	\$ 330,667,711.45	\$ 250,425,035.25	\$ 105,676.20	\$ 78,012,000.00	\$ 2,125,000.00
Increased by:						
Sale of Refunding Bonds	C-13	<u>61,290,000.00</u>	<u>61,290,000.00</u>			
		<u>391,957,711.45</u>	<u>311,715,035.25</u>	<u>105,676.20</u>	<u>78,012,000.00</u>	<u>2,125,000.00</u>
Decreased by:						
2013 Budget Appropriation						
to Pay Bonds/Loans	C-13,14,15	21,270,676.20	13,045,000.00	105,676.20	7,995,000.00	125,000.00
Bonds Redeemed	C-13	<u>63,815,000.00</u>	<u>63,815,000.00</u>			
		<u>85,085,676.20</u>	<u>76,860,000.00</u>	<u>105,676.20</u>	<u>7,995,000.00</u>	<u>125,000.00</u>
Balance December 31, 2013	C	<u>\$ 306,872,035.25</u>	<u>\$ 234,855,035.25</u>	<u>\$ -</u>	<u>\$ 70,017,000.00</u>	<u>\$ 2,000,000.00</u>

CITY OF NEWARK
GENERAL CAPITAL FUNDDEFERRED CHARGES TO FUTURE TAXATION
UNFUNDED - GENERAL PROJECTSC-12
Sheet #1

		Analysis of Balance Dec. 31, 2013							
Improvement Number	Improvement Description	Balance Dec. 31, 2012	Authorizations Reappropriated	Premium Applied/Budget Appropriation	Balance Dec. 31, 2013	Bond Anticipation Notes	Unfinanced Expenditures		Unexpended Improvement Authorization
							Expended	Encumbered	
90-C6	Rehabilitation of the North End Branch Public Library	\$ 152,880.90	\$	\$	\$ 152,880.90	\$	\$ 152,880.90	\$	\$
95-B3	Design and Construction of Renovation to Firehouses City-Wide	500.00			500.00				500.00
95-B7	Sidewalk Reconstruction City-Owned Properties	499.65			499.65		499.65		
95-C4	Acquisition of Vehicles	4,785.00			4,785.00		4,753.00		32.00
95-D0	Hand Held Police Radios	256.00			256.00		256.00		
95-D1	Newark Museum Renovation of Science Department Building, Plaza and Sidewalk in Front of Main Building	150.00			150.00		150.00		
		<u>6,190.65</u>			<u>6,190.65</u>		<u>5,658.65</u>		<u>532.00</u>
96-A1	Rehabilitation and Improvement of the Military Park Garage	500,778.10			500,778.10		500,778.10		
99A0	Removal of Underground Storage Tanks	13,530.00			13,530.00		3,231.59		10,298.41
99A1	Restoration of City-Owned Cemetery	103.66			103.66		103.66		
		<u>13,633.66</u>			<u>13,633.66</u>		<u>3,335.25</u>		<u>10,298.41</u>
01A2	Elevator Restoration City Hall and Green Street	26.50			26.50				26.50
01A3	Restoration of Newark Public Library (Repair/ Reconstruction)	388.50			388.50		388.50		
		<u>415.00</u>			<u>415.00</u>		<u>388.50</u>		<u>26.50</u>
04B9	Renovations to and Installation of New Artificial Turf Baseball Field at Tichenor (Skull Park) Located at Route 21/Parkhurst	305,306.59			305,306.59				305,306.59
05A17	Technology Improvement Including Exchange Migration Consultant, New Servers, Storage, Exchange 2003 to 2007	2,438,750.00			2,438,750.00	2,438,492.40			257.60
05A18	Purchase of 4 Sanitation Trucks and Sanitation Frame Loader	518,597.00			518,597.00	515,967.00			2,630.00
05A19	Installation of Security Cameras at 15 Park Locations in City	950,000.00			950,000.00				950,000.00
05A20	A Diesel Powered Truck Equipped with a Pump, an On- Board Water Tank and a Storage Area to Carry Fire Hose	807,500.00			807,500.00	799,236.00		5,855.00	2,409.00
		<u>4,714,847.00</u>			<u>4,714,847.00</u>	<u>3,753,695.40</u>		<u>5,855.00</u>	<u>955,296.60</u>
05S02	Local Share of State Construction Projects	403,653.00			403,653.00				403,653.00
05S04	Emergency Health and Safety Projects	100,000.00			100,000.00		99,998.53	1.47	
05S05	Stadium and Field Renovations	6,325,000.00		24,000.00	6,301,000.00	5,150,000.00	1,151,000.00		
05S06	Robotics Facility	1,500,000.00			1,500,000.00		1,500,000.00		
05S08	Purchase Control - Kitchen Warehouse	10,200,000.00			10,200,000.00		5,174,000.00		5,026,000.00
05S09	Insurance Costs	371,347.00			371,347.00		360,343.14	4,003.01	7,000.85
		<u>18,900,000.00</u>		<u>24,000.00</u>	<u>18,876,000.00</u>	<u>5,150,000.00</u>	<u>8,285,341.67</u>	<u>4,004.48</u>	<u>5,436,653.85</u>
06A05	Demolition Douglas - Harrison Apartments	2,500,000.00			2,500,000.00		2,495,006.68		4,993.32
06A06	Military Park Restoration	2,000,000.00			2,000,000.00	1,989,857.00	10,143.00		
		<u>4,500,000.00</u>			<u>4,500,000.00</u>	<u>1,989,857.00</u>	<u>2,505,149.68</u>		<u>4,993.32</u>

CITY OF NEWARK
GENERAL CAPITAL FUNDDEFERRED CHARGES TO FUTURE TAXATION
UNFUNDED - GENERAL PROJECTSC-12
Sheet #2

Analysis of Balance Dec. 31, 2013									
Improvement Number	Improvement Description	Balance Dec. 31, 2012	Authorizations Reappropriated	Premium Applied/Budget Appropriation	Balance Dec. 31, 2013	Bond Anticipation Notes	Unfinanced Expenditures		Unexpended Improvement Authorization
							Expended	Encumbered	
07A00 and 01	Newark Circulation and Market Street Plaza Projects	\$ 89,000.00	\$	\$	\$ 89,000.00	\$	\$	\$	\$ 89,000.00
07A02	Triangle Park Project	139,985.50			139,985.50	5,837.00			134,148.50
07A03	Mulberry Linear Park Project	2,000.00			2,000.00				2,000.00
07A04	Edison Place Improvement Project	6,931.71			6,931.71	2,000.00			4,931.71
07A05	Hotel Site Acquisition Project	32,000.00			32,000.00				32,000.00
		<u>269,917.21</u>			<u>269,917.21</u>	<u>7,837.00</u>			<u>262,080.21</u>
07B0	(1) Street Replacement and Sidewalk Replacement	854,845.00	1,680,000.00		2,534,845.00	854,845.00			1,680,000.00
07B1	(2) The Wilson Avenue Project (East Phase)	854,845.00			854,845.00	854,845.00			
07B2	(3) Street Replacement and Sidewalk Replacement of Delancy Street Located in the East Ward	1,404,845.00			1,404,845.00	1,404,845.00			
07B3	(4) Irving Turner Boulevard Traffic Calming Project	1,404,845.00			1,404,845.00	1,404,845.00			
07B4	(5) Broad Street Streetscape - Phase II, III and IV	1,179,845.00			1,179,845.00	1,179,845.00			
07B5	(6) Traffic Signal Construction at Warren Street and Summit Street Located in the Central Ward	289,845.00			289,845.00	289,845.00			
07B6	(7) Traffic Signal Construction at West Market - Warren/Hudson Streets Located in the Central Ward	194,845.00			194,845.00	194,845.00			
07B7	(8) Paving, Patching Program in All Wards of the City	1,204,845.00	(1,804.40)		1,203,040.60	1,203,036.10		4.50	
07B8	(9) Tree Planting in Programs for All Wards of the City	234,845.00	(798.54)		234,046.46	233,832.17	214.26	0.03	
07B9	(10) Phase III of the Way Finding Sign Program for All Wards	1,599,845.00			1,599,845.00	1,599,845.00			
07BA0	(11) Sign Management and Inventory System for All Wards of the City	194,845.00			194,845.00	194,845.00			
07BB0	(12) Pavement Marking Program for All Wards of the City	248,845.00			248,845.00	248,845.00			
07BD0	(14) Design and Construction of Repairs and Renovations to Central Avenue Bridge	356,095.00			356,095.00	356,095.00			
07B10	(19) Renovation to the East Precinct Located in the East Ward	486,768.00		55,487.00	431,281.00	404,439.00			26,842.00
07BJ0	(20) Renovation to the Firehouse for Engine 29, Truck 10 Located at 1028 Bergen Street Firehouse	17,345.00			17,345.00	17,345.00			
07BL0	(22) Exterior Renovations and Structural Repairs of Firehouse for Engine 26, Truck 12, Located at 420 Sanford Avenue in the West Ward of the City	2,129,845.00	(2,129,845.00)						
07BM0	(23) Exterior Renovations of Firehouse for Engine 7, BC 2 Located at 241 West Market Street in the Central Ward	2,129,845.00			2,129,845.00				2,129,845.00
07BN0	(24) Renovation of Firehouse for Engine 13, Truck 6 Located at 714 Mt. Prospect Avenue	1,124,845.00			1,124,845.00				1,124,845.00
07B00	(25) Renovation of Firehouse for Engine 27, Truck 4 Located at 87 Elm Road in the East Ward of the City	3,127,512.99			3,127,512.99	3,116,618.00		10,894.99	
07BT0	(30) Improvement to the Preschool Park at Garden Spires Located at 201 First Street	68,518.00			68,518.00	68,517.40			0.60
07BV0	(32) Construction of the Ironbound Recreation Center (SCC Site) Including a New Building	275,428.00			275,428.00	275,428.00			
07BX0	(34) Construction of a New Training Building and Renovation of Fields at Ironbound Little League Field (Ironbound Park)	1,983,693.50			1,983,693.50	1,983,693.50			
07BY0	(35) Renovation of the Existing Building and Construction of a New Pool, Soccer Field and Playground at Hayes Park East	6,192,182.00			6,192,182.00	6,191,610.99			571.01

CITY OF NEWARK
GENERAL CAPITAL FUNDDEFERRED CHARGES TO FUTURE TAXATION
UNFUNDED - GENERAL PROJECTSC-12
Sheet #3

						Analysis of Balance Dec. 31, 2013			
Improvement Number	Improvement Description	Balance Dec. 31, 2012	Authorizations Reappropriated	Premium Applied/Budget Appropriation	Balance Dec. 31, 2013	Bond Anticipation Notes	Unfinanced Expenditures		Unexpended Improvement Authorization
							Expended	Encumbered	
07C10	(38) Renovation to St. Peter's Park	\$ 1,179,845.00	\$ (631.56)	\$	\$ 1,179,213.44	\$ 1,179,213.44	\$	\$	\$
07C20	(39) Installation of New Retaining Wall at Mildred Helms Park	226,158.00	(1,333.55)		224,824.45	224,824.45			
07C40	(41) Development of a New Park to be Located at 100-104 West End Avenue in the West Ward	95,118.00	(23,472.60)		71,645.40	71,645.40			
07C50	(42) Installation of New Field Turf at Kasberger Field (Benedict Park)	3,706,194.00	(172,177.97)		3,534,016.03	3,519,914.23	13,014.80	1,087.00	
07C60	(43) Renovation of the Playing Field at Jessie Allen Park (AR-6) Located at 41-57 Avon Avenue	2,666,102.25	(235,071.06)		2,431,031.19	2,431,031.19			
07C70	(44) Renovation of Basketball Court and Installation of New Landscape at First Street Park	632,266.00	(16,110.19)		616,155.81	616,155.81			
07C80	(45) Renovation of Thomas Silk Park	449,727.25	(220,046.23)		229,681.02	229,681.02			
07C90	(46) Renovation of First Street Park	38,661.00	(37,484.51)		1,176.49	1,176.49			
07CAB0	(48) Improvement to the Nat Turner Park (Hayes Park West R-32 Hayes Park West Pool and Recreation Center)	354,845.00			354,845.00				354,845.00
07CG0	(53) Phase 1 of the Interior Restoration of the City Hall, Including Various Renovations and Repairs	6,299,149.00	(1,939,193.00)		4,359,956.00	4,359,956.00			
07CH0	(54) Repair to City Welfare Building Located at 311 University Avenue	454,845.00			454,845.00	454,845.00			
07CI0	(55) Installation of New Roof and Fire Escapes at the Newark Symphony Hall	429,845.00	(381,415.63)		48,429.37	48,429.37			
07CJ0	(56) Various Building Renovations to Public Buildings	904,845.00	2,298,093.68	112,000.00	3,090,938.68	1,424,290.28			1,666,648.40
07CL0	(58) Renovations to the City Public Access TV Studio and Acquisition of New Equipment	49,845.00			49,845.00	49,845.00			
07CM0	(59) Completion of New Archives Building	242,345.00			242,345.00	242,345.00			
07CN0	(60) City-Wide Technology Infrastructure Improvements	904,845.00			904,845.00	904,844.00			1.00
07CO0	(61) Installation of New Fire Alarm Systems to Public Buildings Throughout the City	1,904,845.00	(1,118,094.86)		786,750.14	786,750.14			
07CP0	(62) Renovation to Public Buildings Throughout the City and Acquisition of Equipment to Ensure ADA Compliance	379,845.00	(370,175.73)		9,669.27	9,669.27			
07CR0	(64) Renovation to Site and Installation of New Artificial Turf Baseball Field at Tichenor (Skull Park) Located at Route 21	473,718.00			473,718.00				473,718.00
07CS0	(65) Construction of New Playground, Multi-Purpose Playing Court and Site Improvement to the David L. Warner Park	637,318.00	(26,923.45)		610,394.55	499,744.56	110,649.99		
07CT0	(66) NRS (Sanitation Department) Purchase of 4 Sanitation Trucks and Sanitation Frame Loader	710,374.00			710,374.00	710,374.00			
07CU0	(67) Technology Improvements, Including Exchange Migration Consultant, New Server, Storage Exchange 2003 to Exchange 2007	16,375.00		15,513.00	862.00				862.00
07CV0	(68) Renovation of Old Clinton Place Fire Station to Transform Into Nonprofit Business Incubator	712,500.00			712,500.00	712,500.00			
07CW0	(69) Renovation and Conversion of Vince Lombardi Center Into a Community Center	712,500.00			712,500.00	712,500.00			
07CX0	(70) Restoration of Ironbound Recreation Center to be Used for Soccer, Baseball and Football	712,500.00			712,500.00	712,500.00			

CITY OF NEWARK
GENERAL CAPITAL FUND

DEFERRED CHARGES TO FUTURE TAXATION
UNFUNDED - GENERAL PROJECTS

C-12
Sheet #4

						Analysis of Balance Dec. 31, 2013			
Improvement Number	Improvement Description	Balance Dec. 31, 2012	Authorizations Reappropriated	Premium Applied/Budget Appropriation	Balance Dec. 31, 2013	Bond Anticipation Notes	Unfinanced Expenditures		Unexpended Improvement Authorization
							Expended	Encumbered	
07CY0	(71) Implementation of a Traffic Study on South Munn Avenue, Isabella Avenue, Columbia Avenue, West End Avenue, North Munn Avenue and Eighteenth Avenue	\$ 547,582.79	\$	\$	\$ 547,582.79	\$ 547,582.79	\$	\$	\$
07CZ0	(72) Expansion of Police Surveillance Camera Program Into the Central Ward	285,000.00			285,000.00				285,000.00
07DA0	(73) Building New Baseball Dugout, Batting Cages and Bleachers, Restore Baseball Diamond	237,500.00	(203,515.00)		33,985.00	33,985.00			
07DB0	(74) Implementation of a Traffic Study on Newark Street, Orange Street, Washington Street, Bergen Street and Spruce Street	332,500.00			332,500.00	293,743.00	30,097.54	8,659.46	
	(76) New Parks/Recreation Renovation		1,499,999.60		1,499,999.60				1,499,999.60
	(77) Improvements to Various City-Owned Buildings and Buildings Subject to Lease with the Essex County Improvement Authority		400,000.00		400,000.00				400,000.00
	(78) Ironbound Stadium Renovation		1,000,000.00		1,000,000.00				1,000,000.00
		<u>53,856,410.78</u>	<u>-</u>	<u>163,000.00</u>	<u>53,673,410.78</u>	<u>42,855,610.60</u>	<u>153,976.59</u>	<u>20,645.98</u>	<u>10,643,177.61</u>
08A20	Tax Appeal Refunding Bond	<u>4,021,917.00</u>		<u>1,344,342.00</u>	<u>2,677,575.00</u>	<u>2,677,575.00</u>			
09A0	Morris Lister Avenue Association Urban Renewal	<u>20,000,000.00</u>			<u>20,000,000.00</u>				<u>20,000,000.00</u>
2011	Tax Appeal Refunding Bond (11-22-2011)	<u>5,424,083.00</u>		<u>491,658.00</u>	<u>4,932,425.00</u>	<u>2,441,425.00</u>	<u>1,061,884.92</u>		<u>1,429,115.08</u>
		<u>\$ 112,666,379.89</u>	<u>\$ -</u>	<u>\$ 2,043,000.00</u>	<u>\$ 110,623,379.89</u>	<u>\$ 58,876,000.00</u>	<u>\$ 12,669,394.26</u>	<u>\$ 30,505.46</u>	<u>\$ 39,047,480.17</u>
	Reference	C		Below	C	C-16	Reserve	Below	C-22
			Ref.				Ref.		
	Budget Appropriation - Payment of Bond Anticipation Notes		C-2	\$ 1,810,000.00	Improvement Authorizations		C-21	\$ 47,558,241.11	
	Premium on Sale of Bond Anticipation Notes - Applied to Deferred Charge		C-2	<u>233,000.00</u>	Unexpended Improvement Authorizations - Encumbered		C-21	<u>9,934,419.10</u>	
			Above	<u>\$ 2,043,000.00</u>	Unexpended Improvement Authorizations - Unexpended		Above	39,047,480.17	\$ 57,492,660.21
					Unexpended Improvement Authorizations - Encumbered		Above	<u>30,505.46</u>	
									<u>39,077,985.63</u>
					Net Cash from Note Issues				<u>\$ 18,414,674.58</u>

CITY OF NEWARK
GENERAL CAPITAL FUND

GENERAL SERIAL BONDS

C-13
Sheet #1

	<u>Date of Issue</u>	<u>Amount of Original Issue</u>	<u>Maturities of Bonds Outstanding Dec. 31, 2013</u>		<u>Interest Rate</u>	<u>Balance Dec. 31, 2012</u>	<u>Increase</u>	<u>Decrease</u>	<u>Refunded</u>	<u>Balance Dec. 31, 2013</u>
			<u>Date</u>	<u>Amount</u>						
Pension Refunding Bond	4-01-03	\$ 40,747,035.25	4-01-2014	\$ 1,695,000.00	5.13 %					
			4-01-2015	1,960,000.00	5.13					
			4-01-2022	988,217.30	*					
			4-01-2023	976,810.65	*					
			4-01-2024	967,831.35	*					
			4-01-2025	957,922.20	*					
			4-01-2026	947,049.60	*					
			4-01-2027	937,321.65	*					
			4-01-2028	928,532.85	*					
			4-01-2029	920,525.55	*					
			4-01-2030	912,112.00	*					
			4-01-2031	903,130.80	*					
			4-01-2032	896,877.30	*					
			4-01-2033	890,704.00	*					
				<u>14,882,035.25</u>		\$ 35,657,035.25	\$	\$ 1,445,000.00	\$ 19,330,000.00	\$ 14,882,035.25
Pension Refunding Bond	4-01-08	22,660,000.00	2014	1,420,000.00	5.603					
			2015	1,550,000.00	5.603					
			2016	1,690,000.00	5.603					
			2017	1,840,000.00	5.603					
			2018	2,000,000.00	5.603					
			2019	2,180,000.00	5.853					
			2020	2,370,000.00	5.853					
			2021	2,575,000.00	5.853					
			2022	2,000,000.00	5.853					
				<u>17,625,000.00</u>		18,925,000.00		1,300,000.00		17,625,000.00
General Improvements	7-15-03	82,552,000.00 ECIA-155,000				44,485,000.00			44,485,000.00	

*Capital Appreciation Bonds - See Notes to Financial Statements.

CITY OF NEWARK
GENERAL CAPITAL FUND

GENERAL SERIAL BONDS

C-13
Sheet #2

	Date of Issue	Amount of Original Issue	Maturities of Bonds Outstanding Dec. 31, 2013		Interest Rate	Balance Dec. 31, 2012	Increase	Decrease	Refunded	Balance Dec. 31, 2013
			Date	Amount						
Qualified General Improvement Bonds, Series 2010A Maturity 10-1	6-16-10	\$ 120,670,000.00 ECIA-2015-1,000,000 ECIA-2016-2,710,000	2016	\$ 790,000.00	3.00 %					
			2017	2,500,000.00	3.50					
			2018	3,000,000.00	4.00					
			2019	14,500,000.00	5.00					
			2020	13,000,000.00	5.00					
			2021	11,000,000.00	4.00					
			2022	10,000,000.00	4.00					
			2023	11,000,000.00	4.00					
			2024	11,000,000.00	4.00					
			2025	9,305,000.00	4.00					
			2026	9,775,000.00	4.00					
			2027	10,275,000.00	4.25					
			2028	10,815,000.00	4.25					
				<u>116,960,000.00</u>		\$ 116,960,000.00	\$	\$	\$	\$ 116,960,000.00
Qualified General Improvement Bonds, Series 2010B (Taxable) Maturity 10-1	6-16-10	5,283,000.00	2029	2,560,000.00	6.20					
			2030	<u>2,723,000.00</u>	6.30					
				<u>5,283,000.00</u>		<u>5,283,000.00</u>				<u>5,283,000.00</u>
			Total Serial Bonds						<u>221,310,035.25</u>	<u>2,745,000.00</u>
Redevelopment Refunding Bonds	3-10-05	4,450,000.00	10-01-2014	240,000.00	5.00					
			10-01-2015	<u>260,000.00</u>	5.00					
				<u>500,000.00</u>						
			10-01-2016	280,000.00	5.00					
			10-01-2017	310,000.00	5.00					
			10-01-2018	330,000.00	5.00					
			10-01-2019	360,000.00	5.00					
			10-01-2020	390,000.00	5.00					
			10-01-2021	420,000.00	5.00					
			10-01-2022	<u>450,000.00</u>	5.00					
				<u>2,540,000.00</u>						
					3,040,000.00	3,265,000.00		225,000.00		3,040,000.00

CITY OF NEWARK
GENERAL CAPITAL FUND

GENERAL SERIAL BONDS

C-13
Sheet #3

	Date of Issue	Amount of Original Issue	Maturities of Bonds Outstanding Dec. 31, 2013		Interest Rate	Balance Dec. 31, 2012	Increase	Decrease	Refunded	Balance Dec. 31, 2013
			Date	Amount						
Qualified Refunding Bonds, Series 2010A Maturity 10-1	7-13-10	ECIA-2012-1,310,000	10-01-2014	\$ 3,430,000.00	4.00 %					
			10-01-2015	3,570,000.00	4.00					
			10-01-2016	3,710,000.00	4.00					
			10-01-2017	3,860,000.00	3.38					
			10-01-2018	3,990,000.00	4.00					
				<u>18,560,000.00</u>		\$ 21,890,000.00	\$	\$ 3,330,000.00	\$	\$ 18,560,000.00
Qualified Refunding Bonds, Series 2010B (Taxable) Maturity 10-1		ECIA-2011-205,000	10-01-2014	<u>2,015,000.00</u>	3.93	3,960,000.00		1,945,000.00		2,015,000.00
Qualified General Improvement Refunding Bonds, Series 2013A		36,235,000.00	7-15-2014	4,945,000.00	4.00					
			7-15-2015	6,605,000.00	5.00					
			7-15-2016	6,845,000.00	5.00					
			7-15-2017	6,895,000.00	5.00					
			7-15-2018	7,130,000.00	5.00					
				<u>32,420,000.00</u>			36,235,000.00	3,815,000.00		32,420,000.00
Qualified General Improvement Refunding Bonds, Series 2013B (Federally Taxable)		4,550,000.00	7-15-2014	675,000.00	1.498					
			7-15-2015	850,000.00	1.916					
			7-15-2016	850,000.00	2.000					
			7-15-2017	835,000.00	2.000					
			7-15-2018	840,000.00	2.340					
				<u>4,050,000.00</u>			4,550,000.00	500,000.00		4,050,000.00
Qualified Pension Refunding Bonds, Series 2013C (Federally Taxable)		20,505,000.00	4-01-2014	295,000.00	1.498					
			4-01-2015	300,000.00	1.916					
			4-01-2016	2,525,000.00	2.000					
			4-01-2017	2,775,000.00	2.000					
			4-01-2018	3,050,000.00	2.308					
			4-01-2019	3,330,000.00	2.698					
			4-01-2020	3,685,000.00	3.057					
			4-01-2021	4,060,000.00	3.305					
				<u>20,020,000.00</u>			20,505,000.00	485,000.00		20,020,000.00
Total Refunding Bonds						<u>29,115,000.00</u>	<u>61,290,000.00</u>	<u>10,300,000.00</u>		<u>80,105,000.00</u>
Total General Serial Bonds						<u>\$ 250,425,035.25</u>	<u>\$ 61,290,000.00</u>	<u>\$ 13,045,000.00</u>	<u>\$ 63,815,000.00</u>	<u>\$ 234,855,035.25</u>

Reference

C

C11

C-11

C-11

C

CITY OF NEWARK
GENERAL CAPITAL FUND

SCHOOL SERIAL BONDS

C-14

<u>Date of Issue</u>	<u>Amount of Original Issue</u>	<u>Maturities of Bonds Outstanding Dec. 31, 2013</u>		<u>Interest Rate</u>	<u>Balance Dec. 31, 2012</u>	<u>Decrease</u>	<u>Balance Dec. 31, 2013</u>
		<u>Date</u>	<u>Amount</u>				
3-20-02	\$82,555,000.00	2014	\$ 3,030,000.00	5.375 %	\$ 13,930,000.00	\$ 7,850,000.00	\$ 6,080,000.00
		2015	3,050,000.00	5.375			
			<u>6,080,000.00</u>				
9-01-08	20,390,000.00	2014	4,655,000.00	4.000	20,165,000.00	145,000.00	20,020,000.00
		2015	4,875,000.00	5.000			
		2016	5,150,000.00	5.000			
		2017	5,340,000.00	5.000			
			<u>20,020,000.00</u>				
6-16-10 Maturity -10-1	43,917,000.00	2016	1,000,000.00	3.000	43,917,000.00		43,917,000.00
		2017	1,000,000.00	3.000			
		2018	4,490,000.00	4.000			
		2019	4,675,000.00	4.000			
		2020	4,875,000.00	4.000			
		2021	5,087,000.00	4.000			
		2022	5,315,000.00	4.000			
		2023	5,560,000.00	4.000			
		2024	5,820,000.00	4.000			
		2025	6,095,000.00	5.000			
			<u>43,917,000.00</u>				
					<u>43,917,000.00</u>		<u>43,917,000.00</u>
					<u>\$ 78,012,000.00</u>	<u>\$ 7,995,000.00</u>	<u>\$ 70,017,000.00</u>
<u>Reference</u>					<u>C</u>	<u>C-11</u>	<u>C</u>

CITY OF NEWARK
GENERAL CAPITAL FUND

STATE TRUST LOAN PAYABLE

C-15

	<u>Ref.</u>		
Balance December 31, 2012	C		\$2,230,676.20
Decreased by:			
Budget Appropriation:			
Payment of Principal - Demolition Loan	C-11	\$ 105,676.20	
Payment of Principal - Demolition Loan II	C-11	<u>125,000.00</u>	
			<u>230,676.20</u>
Balance December 31, 2013	C		<u>\$2,000,000.00</u>
<u>Analysis of Balance</u>			
State Demolition Loan	16 Years @\$125,000.00		<u>\$2,000,000.00</u>

CITY OF NEWARK
GENERAL CAPITAL FUND

BOND ANTICIPATION NOTES

C-16

<u>Purpose</u>	<u>Original Date of Issue</u>	<u>Maturity Date</u>	<u>Balance Dec. 31, 2012</u>	<u>Cash Received</u>	<u>Cash Disbursed</u>	<u>Raised by Budget Appropriation</u>	<u>Balance Dec. 31, 2013</u>
Tax Appeal Refunding Bonds	12-03-08	12-11-14	\$ 4,021,917.00	\$ -	\$ -	\$ 1,344,342.00	\$ 2,677,575.00
Tax Appeal Refunding Bonds	12-29-11	12-11-14	2,933,083.00			491,658.00	2,441,425.00
			<u>6,955,000.00</u>			<u>1,836,000.00</u>	<u>5,119,000.00</u>
Various Capital Improvements	12-14-11	12-11-14	2,564,214.00	2,555,626.00	2,564,214.00		2,555,626.00
Various Capital Improvements	12-14-11	12-11-14	7,837.00	7,811.00	7,837.00		7,811.00
Various Capital Improvements	12-14-11	12-11-14	30,867,949.00	30,764,563.00	30,755,949.00	112,000.00	30,764,563.00
			<u>33,440,000.00</u>	<u>33,328,000.00</u>	<u>33,328,000.00</u>	<u>112,000.00</u>	<u>33,328,000.00</u>
Sub-Total for December			<u>40,395,000.00</u>	<u>33,328,000.00</u>	<u>33,328,000.00</u>	<u>1,948,000.00</u>	<u>38,447,000.00</u>
Technology Improvement	6-13-13	6-26-14		833,561.00			833,561.00
Purchase of Sanitation Truck	6-28-12	6-26-14	515,967.00	515,967.00	515,967.00		515,967.00
			<u>515,967.00</u>	<u>1,349,528.00</u>	<u>515,967.00</u>		<u>1,349,528.00</u>
Military Park Restoration	6-28-12	6-26-14	1,989,857.00	1,989,857.00	1,989,857.00		1,989,857.00
Renovation to East Precinct	6-28-13	6-26-14		404,439.00			404,439.00
Various Capital Improvements	6-28-12	6-26-14	11,423,176.00	11,423,176.00	11,423,176.00		11,423,176.00
			<u>11,423,176.00</u>	<u>11,827,615.00</u>	<u>11,423,176.00</u>		<u>11,827,615.00</u>
Various School Improvements	6-28-12	6-26-14	5,174,000.00	5,150,000.00	5,150,000.00	24,000.00	5,150,000.00
Sub-Total for June			<u>19,103,000.00</u>	<u>20,317,000.00</u>	<u>19,079,000.00</u>	<u>24,000.00</u>	<u>20,317,000.00</u>
			<u>\$ 59,498,000.00</u>	<u>\$ 53,645,000.00</u>	<u>\$ 52,407,000.00</u>	<u>\$ 1,972,000.00</u>	<u>\$ 58,764,000.00</u>
<u>Reference</u>			<u>C</u>	<u>C-2,Below</u>	<u>C-2,Below</u>	<u>C-2</u>	<u>C,Below</u>
			<u>Ref.</u>				
Bond Anticipation Notes - New			C-2	\$ 1,238,000.00	\$	Municipal	\$ 53,614,000.00
Bond Anticipation Notes - Renewed			C-2	52,407,000.00	52,407,000.00	School	5,150,000.00
			Above	<u>\$ 53,645,000.00</u>	<u>\$ 52,407,000.00</u>		<u>\$ 58,764,000.00</u>

Reference

Above

CITY OF NEWARK
GENERAL CAPITAL FUND

CAPITAL IMPROVEMENT FUND

C-17

	<u>Ref.</u>	
Balance December 31, 2012	C	\$1,375,543.58
Increased by:		
Cash Receipt	C-5	<u>100,000.00</u>
Balance December 31, 2013	C	<u>\$1,475,543.58</u>

CITY OF NEWARK
GENERAL CAPITAL FUND

OTHER LIABILITIES

C-18

	<u>Ref.</u>	<u>Due to Current Fund</u>	<u>Reserve for Refunds</u>
Balance December 31, 2012	C	\$	\$266,775.90
Increased by:			
Cash Received	C-2	<u>24,000.00</u>	<u>68,327.86</u>
Balance December 31, 2013	C	<u>\$ 24,000.00</u>	<u>\$ 335,103.76</u>

CITY OF NEWARK
GENERAL CAPITAL FUND

NEWARK HOUSING AUTHORITY BOND
GUARANTEED BY CITY OF NEWARK

C-19

	<u>Ref.</u>	
Balance December 31, 2012	C	\$64,575,000.00
Decreased by:		
Improvements Guaranteed by		
City of Newark - Paid by		
Budget Appropriation	C-10	<u>1,235,000.00</u>
Balance December 31, 2013	C	<u>\$63,340,000.00</u>

CITY OF NEWARK
GENERAL CAPITAL FUND

IMPROVEMENT AUTHORIZATIONS FUNDED BY ESSEX COUNTY IMPROVEMENT AUTHORITY
STATEMENT OF EXPENDITURES

C-20

Description	Old Ordinance	New Ordinance	Original Ordinance Date	Ordinance	Expended Prior	Balance Dec. 31, 2013	
						Encumbered	Funded
Lease Revenue Improvement	494		3/15/94	\$ 11,170,000.00	\$ 8,735,212.53	\$	\$ 2,434,787.47
Guaranteed Lease Revenue Bonds - Police Vehicles	495		3/15/94	1,500,000.00	1,461,248.22		38,751.78
Newark Symphony Hall - Bonded	496			600,000.00	591,222.34	8,777.66	
Lease Vehicles Upon Completion	498	96K1		5,000,000.00	5,000,000.00		
				18,270,000.00	15,787,683.09	8,777.66	2,473,539.25
Less: Newark Symphony Hall Bonded Transferred to Improvement Authorization				(600,000.00)	(591,222.34)	(8,777.66)	
Prior Authorizations				17,670,000.00	15,196,460.75	-	2,473,539.25
Series 2010A							
Disbursed to City Current Fund				39,635,750.88	39,635,750.88		
Cost of Issuance				1,791,508.87	1,791,508.87		
Net Original Issue Discount				757,740.25	757,740.25		
				42,185,000.00	42,185,000.00		
Series 2010B							
Funds to be Applied to Cost of Improvements				17,500,000.00			17,500,000.00
Funds to be Applied to Cost of Environmental Remediation Work				4,200,000.00			4,200,000.00
Deposit to Escrow to Advance Refund Qualified General Improvement Bonds, Series 2010A				6,830,126.00	6,830,126.00		
Cost of Issuance				1,424,228.45	1,424,228.45		
New Original Issue Discount				300,645.55	300,645.55		
				30,255,000.00	8,555,000.00		21,700,000.00
Series 2010C							
Deposit to Escrow to Advance Refund Qualified General Improvement Bonds, Series 2010B				1,585,273.12	1,585,273.12		
Cost of Issuance				54,726.88	54,726.88		
				1,640,000.00	1,640,000.00		
Current Authorizations				74,080,000.00	52,380,000.00		21,700,000.00
Totals				\$ 91,750,000.00	\$ 67,576,460.75	\$ -	\$ 24,173,539.25

Reference

C

CITY OF NEWARK
GENERAL CAPITAL FUND

IMPROVEMENT AUTHORIZATIONS

C-21
Sheet #1

Ordinance Number	Description	Original Authorizations	Balance Dec. 31, 2012			2013 Authorizations Reappropriated	Paid	Balance Dec. 31, 2013		
			Encumbered	Funded	Unfunded			Encumbered	Funded	Unfunded
93A5	Restoration of City Hall	\$ 2,000,000.00		\$ 6,955.00		\$	\$ 6,955.00			
93A8	Removal and Replacement	500,000.00		37,304.21			37,304.21			
	Sub-Total			44,259.21			44,259.21			
93C2	Purchase of Computers - Phase II	902,252.93		0.93					0.93	
	Sub-Total			0.93					0.93	
				44,260.14			44,259.21		0.93	
95A6	City Hall Restoration	105,000.00		29,599.75			29,599.75			
95B3	Design and Construction of Renovation to Firehouses City-Wide	750,000.00			500.00					500.00
95B5	City Hall Complex Restoration and Renovation	2,000,000.00		7,109.00			7,109.00			
95B9	Design and Renovation of Police Precincts City-Wide	800,000.00		39,316.36					39,316.36	
95C4	Acquisition of Vehicles	2,910,300.00			32.00					32.00
95C8	Police Facility Building Police Ward Precincts	500,000.00		6,989.99			6,989.99			
				63,015.10	532.00		43,698.74		39,316.36	532.00
96A7	Design and Construction of Firehouse Renovations	500,000.00		40,721.54					40,721.54	
				40,721.54					40,721.54	
97D1	Renovation to City Hall	1,025,000.00		6,470.03			6,470.03			
				6,470.03			6,470.03			
98L10	Newark Public Safety Communication Center - ECIA	5,500,000.00		368,183.95			18,697.59		349,486.36	
98A1	Construction of a Public Safety Communications Center	5,794,000.00		349,450.23			13,928.99	0.01	335,521.23	
				647,840.85	532.00		82,795.35	0.01	765,045.49	532.00

CITY OF NEWARK
GENERAL CAPITAL FUND

IMPROVEMENT AUTHORIZATIONS

C-21
Sheet #2

Ordinance Number	Description	Original Authorizations	Balance Dec. 31, 2012			2013 Authorizations Reappropriated	Paid	Balance Dec. 31, 2013		
			Encumbered	Funded	Unfunded			Encumbered	Funded	Unfunded
99A0	Removal of Underground Storage Tanks	\$ 3,075,000.00	\$	\$ 30,208.41	\$ 13,530.00	\$	\$ 33,440.00	\$	\$	\$ 10,298.41
99A5	Construction of City Park at Hayes West	1,537,000.00		5,574.98			5,574.98			
99A8	Furnishing and Equipment, Various City Departments	325,100.00	3,300.00	7,382.38			7,214.99	0.01	3,467.38	
			3,300.00	43,165.77	13,530.00		46,229.97	0.01	3,467.38	10,298.41
01A2	Elevator Restoration City Hall and Green Street	1,281,250.00			26.50					26.50
01A3	Restoration of Newark Library (Repair/ Reconstruction)	1,331,988.00			388.50		388.50			
01A5	Demolition of Buildings - City-Wide	1,537,499.87		12,936.10					12,936.10	
01A8	Tree Removal and Planting - City-Wide	204,185.00		6,251.00					6,251.00	
				19,187.10	415.00		388.50		19,187.10	26.50
01030	Pension Refunding Ordinance	40,750,000.00		34,682.79					34,682.79	
	Tax Overpayment (1992)			99,274.75					99,274.75	
	Improvement ECIA Prior to 1994			8,777.66					8,777.66	
04A4	Streetscape - Broad Street	3,000,000.00		30.00				8.30	21.70	
04B9	Renovations to and Installation of New Artificial Turf Baseball Field at Tichenor (Skull Park) Located at Route 22 and Parkhurst Street	643,854.41		30.00	305,306.59			8.30	21.70	305,306.59
					305,306.59					305,306.59
	Refunding Improvement Authorization	41,500,000.00		36,476.68					36,476.68	
05A13	OMB Technology Infrastructure Design and Implementation Computers and Information Systems	2,500,000.00	199,865.06	502.25				199,865.06	502.25	
05A17 (1)	Technology Improvements, Including Exchange Migration Consultant, New Servers, Storage, Exchange 2003 to Exchange 2007	2,567,105.63	1,004,231.14		509,842.12		79,955.50	1,136,712.38		297,405.38
05A18 (2)	NRS (Sanitation Department) Purchase of 4 Sanitation Trucks and Sanitation Frame Loader	545,891.87		22,392.55	518,587.00			470,492.00		70,497.55
05A19 (3)	Installation of Security Cameras at 15 Park Locations Throughout All the City Wards	1,000,000.00			950,000.00					950,000.00
05A20 (4)	A Diesel Powered Truck Equipped with a Pump, an On-Board Water Tank and Storage Area to Carry Fire Hose	850,000.00			8,264.00			5,855.00		2,409.00
			1,204,096.20	22,894.80	1,986,703.12		79,955.50	1,812,924.44	502.25	1,320,311.93

CITY OF NEWARK
GENERAL CAPITAL FUND

IMPROVEMENT AUTHORIZATIONS

C-21
Sheet #3

Ordinance Number	Description	Original Authorizations	Balance Dec. 31, 2012			2013 Authorizations Reappropriated	Paid	Balance Dec. 31, 2013		
			Encumbered	Funded	Unfunded			Encumbered	Funded	Unfunded
06A05	Demolition Douglas - Harrison Apartments	\$ 2,500,000.00	\$ 0.79	\$	\$ 38,627.25	\$	\$ 33,634.72	\$	\$	\$ 4,993.32
06A06	Military Park Restoration	2,000,000.00	1,988,969.11				1,988,969.11			
			1,988,969.90		38,627.25		2,022,603.83			4,993.32
	<u>School Projects</u>									
05S02	Local Share of State Construction Projects	8,328,653.00	5,855.30	7,877,814.65	403,653.00		5,174.02		7,878,495.93	403,653.00
05S04	Emergency Health and Safety Projects	2,000,000.00	1.47					1.47		
05S08	Purchase Control - Kitchen Warehouse	10,200,000.00			10,200,000.00		5,174,000.00			5,026,000.00
05S09	Insurance Costs	371,347.00	4,000.00		7,003.86			4,003.01		7,000.85
			9,856.77	7,877,814.65	10,610,656.86		5,179,174.02	4,004.48	7,878,495.93	5,436,653.85
07A00	Newark Circulation Project	11,895,000.00	0.02	32,622.15	89,000.00			0.02	32,622.15	89,000.00
07A02	Triangle Park Project	19,490,000.00	0.01	4,130,000.00	134,148.50			0.01	4,130,000.00	134,148.50
07A03	Mulberry Linear Park Project	327,000.00			2,000.00					2,000.00
07A04	Edison Place Improvement Project	1,042,000.00			4,931.71					4,931.71
07A05	Hotel Site Acquisition Project	5,439,000.00		707,000.00	32,000.00				707,000.00	32,000.00
			0.03	4,869,622.15	262,080.21			0.03	4,869,622.15	262,080.21
07B0 (1)	Street Resurfacing and Sidewalk Replacement	3,005,100.00			5,890.23	1,680,000.00				1,685,890.23
07B10 (2)	The Wilson Avenue Project (East Phase)	3,005,100.00	470,725.64	1,430,359.05	854,845.00		63,710.66	1,289,605.24	547,768.79	854,845.00
07B20 (3)	Street Resurfacing and Sidewalk Replacement of Delancy Street Located in the East Ward	2,005,100.00	1,875,736.97				435,933.96	1,323,774.29		116,030.70
07B30 (4)	Irving Turner Boulevard Traffic Calming Project	2,005,100.00	833,773.32		486,759.39		617,634.55	702,898.16		
07B40 (5)	Broad Street Streetscape - Phase II, III and IV	1,505,100.00	498,358.86				495,873.86	2,485.00		
07B50 (6)	Traffic Signal Construction at Warren Street and Summit Street Located in the Central Ward	305,100.00	16,244.12					16,244.12		
07B60 (7)	Traffic Signal Construction at West Market and Warren/Hudson Streets Located in Central Ward	205,100.00	15,962.63					15,962.63		
07B70 (8)	Paving Patching Program in All Wards of the City	2,005,100.00	4.50		1,804.40	(1,804.40)		4.50		
07B80 (9)	Tree Planting Program for All Wards of the City	405,100.00	0.03		798.54	(798.54)		0.03		
07B90 (10)	Phase III of the Way Finding Sign Program for All Wards of the City	2,105,100.00	48,064.70		541,087.39		98,439.00	180,304.64		310,408.45
07BA0 (11)	Sign Management and Inventory System for All Wards of the City	205,100.00	205,100.00				104,032.28	101,067.72		
07BB0 (12)	Pavement Marking Program for All Wards of the City	405,100.00	0.38					0.38		
07BD0 (13)	Design and Construction of Repairs and Renovations to Central Avenue Bridge	480,100.00	2,000.06		81,351.24			2,000.06		81,351.24
07BE0 (14)	Renovations of the City's 16th Avenue Police Department Facility Located in the West Ward	155,100.00		1,193.45		(1,193.45)				
07BF0 (15)	Renovations of the City's Irvington Avenue Police Department Facility Located in the West Ward	155,100.00	0.01	200.27		(200.27)		0.01		

CITY OF NEWARK
GENERAL CAPITAL FUND

IMPROVEMENT AUTHORIZATIONS

C-21
Sheet #4

Ordinance Number	Description	Original Authorizations	Balance Dec. 31, 2012			2013 Authorizations Reappropriated	Paid	Balance Dec. 31, 2013		
			Encumbered	Funded	Unfunded			Encumbered	Funded	Unfunded
07BH0 (16)	Preliminary Planning for the Construction of the New South Precinct to be Located at Clinton Avenue and Hunterdon Street	\$ 755,100.00	\$ 0.19	\$	\$	\$	\$	\$ 0.19	\$	\$
07BI0 (17)	Renovation to the East Precinct Located in the East Ward of the City	536,830.00	10,959.38	34,562.00	486,768.00				45,521.36	486,768.00
07BL0 (19)	Exterior Renovation and Structural Repairs of Firehouse for Engine 26, Truck 12 Located at 420 Sanford Avenue in the West Ward	2,505,100.00		41,304.72	2,129,845.00	(2,171,149.72)				
07BM (20)	Exterior Renovation of Firehouse for Engine 7, BC 2 Located at 241 West Market Street in the Central Ward of the City	2,505,100.00			2,129,845.00					2,129,845.00
07BN0 (21)	Renovation of Firehouse for Engine 13, Truck 6 Located at 714 Mt. Prospect Avenue	1,605,100.00		63,675.42	1,124,845.00				63,675.42	1,124,845.00
07BO0 (22)	Renovation of Firehouse for Engine 27, Truck 4 Located at 87 Elm Road in the East Ward	3,605,100.00	2,476,403.51		306,236.47		2,634,966.81	147,673.17		
07BR0 (23)	Demolition of Existing Buildings and Construction of a New Park at Douglas Park	305,100.00	5,000.00	87,750.00			47,162.50		45,587.50	
07BS0 (24)	Demolition of Existing Buildings and Construction of a New Park at Harrison Park	305,100.00		305,100.00					305,100.00	
07BT0 (25)	Improvement to the Preschool Park at Garden Spires Located at 201 First Street	117,224.60			0.60					0.60
07BV0 (26)	Construction of the Ironbound Recreation Center (SCC Site) to Include a New Building	2,132,030.00	0.20		368.87			0.20		368.87
07BX0 (27)	Construction of a New Training Building and Renovation of Fields at the Ironbound Little League Field (Ironbound Park)	2,161,784.50	10,334.46		0.50			4,428.86		5,806.10
07BY0 (28)	Renovation of the Existing Building and Construction of a New Pool, Soccer Field, and Playground at Hayes Park East	7,044,403.00	318,712.75		5,210,761.58		273,411.54	134,425.49		5,121,637.28
07C10 (29)	Renovation to St. Peter's Park	1,505,100.00	0.39		631.56	(631.56)		0.39		
07C20 (30)	Installation to New Retaining Wall at Mildred Helms Park	764,377.50			1,333.55	(1,333.55)				
07C40 (31)	Development of a New Park to be Located at 100-104 West End Avenue in the West Ward	626,440.60			23,472.60	(23,472.60)				
07C50 (32)	Installation of a New Field Turf at Kasberger Field (Benedict's Park)	3,901,258.00	1,087.00		172,177.97	(172,177.97)		1,087.00		
07C60 (33)	Renovation of the Playing Field at Jessie Allen Park (AR-6 Park) Located at 41-57 Avon Avenue	3,644,725.00	2,547,235.34		235,071.06	(235,071.06)	1,612,354.35	934,880.99		
07C70 (34)	Renovation of Basketball Court and Installation of New Landscaping at First Street Park	1,270,644.10			16,110.19	(16,110.19)				

CITY OF NEWARK
GENERAL CAPITAL FUND

IMPROVEMENT AUTHORIZATIONS

C-21
Sheet #5

Ordinance Number	Description	Original Authorizations	Balance Dec. 31, 2012			2013 Authorizations Reappropriated	Paid	Balance Dec. 31, 2013		
			Encumbered	Funded	Unfunded			Encumbered	Funded	Unfunded
07C80 (35)	Renovation of Thomas Silk Park	\$ 903,883.63	\$	\$	\$ 220,046.23	\$ (220,046.23)	\$	\$	\$	\$
07C90 (36)	Renovation of First Street Park	77,695.97			37,484.51	(37,484.51)				
07CB0 (37)	Improvements to the Nat Turner Park (Hayes Park West) R32/Hayes Park West Pool and Recreation Center)	1,005,100.00			354,845.00					354,845.00
07CG0 (38)	Phase I of the Interior Restoration of the City Hall, Including Various Renovations and Repairs	7,683,315.00	854,525.01		1,939,193.00	(1,939,193.00)	871.25	802,079.01		51,574.75
07CH0 (39)	Repairs to City Welfare Building Located at 311 University Avenue	1,005,100.00	0.02		292,826.04		54,444.69	0.02		238,381.35
07CI0 (40)	Installation of New Roof and Fire Escapes at the Newark Symphony Hall	1,505,100.00	146,413.44	0.40	381,415.63	(381,416.03)		146,413.44		
07CJ0 (41)	Various Building Renovations to Public Buildings and Repairs to City Welfare Building	2,005,100.00	3,564.00		1,767.32	2,372,739.12	14,945.43	3,584.00	42,698.64	2,316,882.17
07CL0 (42)	Improvement to the City Public Access TV Studio and Acquisition of New Equipment	1,105,100.00	0.04		5,469.66			0.04		5,469.66
07CM0 (43)	Completion of the City Archives Building	255,100.00		12,755.00	242,345.00		13,062.50	241,937.50		100.00
07CN0 (44)	City-Wide Technology Infrastructure Improvement	2,005,100.00	115,535.94					108,206.94		7,329.00
07CO0 (45)	Installation of New Fire Alarm Systems to Public Buildings Throughout the City	2,005,100.00			1,118,094.86	(1,118,094.86)				
07CP0 (46)	Renovations to Public Buildings Throughout the City and Acquisition of Equipment to Ensure ADA Compliance	505,100.00			370,175.73	(370,175.73)				
07CR0 (47)	Renovation to Site and Installation of New Artificial Turf Baseball Field at Tichenor Skull Park Located at Route 21	498,650.99			473,718.00					473,718.00
07CS0 (48)	Construction of New Playground, Multi-Purpose Playing Court and Site Improvement to the David L. Warner Park	670,661.52	50,126.10		87,447.34	(26,923.45)	110,649.99			
07CT0 (49)	NRS (Sanitation Department) Purchase of 4 Sanitation Trucks and Sanitation Frame Loader	747,763.14		37,389.14	710,374.00			726,613.00		21,150.14
07CU0 (50)	Technology Improvements, Including Exchange Migration Consultant, New Server, Storage Exchange 2003 to Exchange 2007	17,237.00		862.00	16,375.00				16,375.00	662.00
07CV0 (51)	Renovation of Old Clinton Place Fire Station to Transform into Nonprofit Business Incubator	750,000.00	44,021.81					4,624.96		39,396.85
07CW0 (52)	Renovation and Conversion of Vince Lombardi Center into a Community Center	750,000.00	53,874.32				35,941.30	4,433.02		13,500.00
07CX0 (53)	Restoration of Ironbound Recreation Center to be Used for Soccer, Baseball and Football	750,000.00	195,236.74		17,177.68		105,067.31	394.70		106,932.41
07CY0 (54)	Implementation of a Traffic Study on South Munn Avenue, Isabella Avenue, Columbia Avenue, West End Avenue, North Munn Avenue and Eighteenth Avenue	750,000.00	16,519.07		55,885.82			16,519.07		55,885.82

CITY OF NEWARK
GENERAL CAPITAL FUND

IMPROVEMENT AUTHORIZATIONS

C-21
Sheet #6

Ordinance Number	Description	Original Authorizations	Balance Dec. 31, 2012			2013 Authorizations Reappropriated	Paid	Balance Dec. 31, 2013		
			Encumbered	Funded	Unfunded			Encumbered	Funded	Unfunded
07CZ0 (55)	Expansion of Police Surveillance Camera Program into the Central Ward	\$ 300,000.00	\$	\$	\$ 285,000.00	\$	\$	\$	\$	\$ 285,000.00
07CD0 (56)	Building New Baseball Dugout, Batting Cages and Bleachers, Restore Baseball Diamond	250,000.00	46,485.00		203,515.00	(203,515.00)		46,485.00		
07D10 (57)	Implementation of a Traffic Study on Newark Street, Orange Street, Washington Street, Bergen Street and Spruce Street	350,000.00 832,763.00	12,546.89 47,541.00	392,763.00	31,947.00	(31,947.00)	3,887.43 53,887.41	8,659.46 127,004.00	259,412.59 0.40	1,499,999.60
07D20 (58)	Art Funding	1,500,000.00				1,500,000.00				
(76)	New Parks/Recreation Renovation									
(77)	Improvements to Various City Owned Buildings and Buildings Subject to Lease with the Essex County Improvement Authority	400,000.00				400,000.00				400,000.00
(78)	Ironbound Stadium Renovation	1,000,000.00				1,000,000.00				1,000,000.00
			<u>10,922,115.82</u>	<u>2,407,914.45</u>	<u>20,655,126.94</u>	<u>-</u>	<u>6,776,296.84</u>	<u>7,083,797.23</u>	<u>1,326,139.92</u>	<u>18,788,923.22</u>
08A00	Pension Refund	23,200,000.00		33,570.75					33,570.75	
08A40	Demolition of Buildings	2,500,000.00	179,924.54						179,924.54	
08A20	Tax Appeal Refunding Bond	9,430,000.00	1.30					1.30		
08A30	Preliminary Expenses	1,539,500.00	1.30					1.30		
			<u>179,927.14</u>	<u>33,570.75</u>				<u>2.60</u>	<u>213,495.29</u>	
099A0	Morris Lister Avenue Association Urban Renewal	20,000,000.00			20,000,000.00					20,000,000.00
11A0	Tax Appeal Refunding Bond (11-22-2011)	5,930,000.00			1,429,115.08					1,429,115.08
12A00	Street Resurfacing and Sidewalk Replacement	1,000,000.00		1,000,000.00			600,760.78	399,239.22		
12A10	Various Building Renovations City-Wide	1,000,000.00		1,000,000.00			207,199.35	624,462.78	168,337.87	
				<u>2,000,000.00</u>			<u>807,960.13</u>	<u>1,023,702.00</u>	<u>168,337.87</u>	
			<u>\$ 14,308,265.86</u>	<u>\$ 18,345,512.54</u>	<u>\$ 55,302,093.05</u>	<u>\$ -</u>	<u>\$ 15,039,663.35</u>	<u>\$ 9,934,439.10</u>	<u>\$ 15,423,527.89</u>	<u>\$ 47,558,241.11</u>
Reference			C	C	C	Reserve	C-2	C	C Below	Below
									Ref.	
									Municipal Improvements	C \$ 7,545,031.96 \$ 38,488,657.26
									School Improvements	C 7,878,495.93 9,069,583.85
									Above	\$ 15,423,527.89 \$ 47,558,241.11

CITY OF NEWARK
GENERAL CAPITAL FUND

BONDS AND NOTES AUTHORIZED BUT NOT ISSUED
GENERAL PROJECTS

C-22

<u>Improvement Number</u>		<u>Balance Dec. 31, 2012</u>	<u>Bond Anticipation Notes Issued</u>	<u>Premium on Bond Anticipation Notes Applied</u>	<u>Balance Dec. 31, 2013</u>
90-C6	Rehabilitation of the North End Branch Public Library	\$ 152,880.90	\$	\$	\$ 152,880.90
95-B3	Design and Construction of Renovation to Firehouses City-Wide	499.65			499.65
95-B7	Sidewalk Reconstruction City-Owned Properties	500.00			500.00
95-C4	Acquisition of Vehicles	4,785.00			4,785.00
95-D0	Hand Held Police Radios	256.00			256.00
95-D1	Newark Museum Renovation of Science Department Building, Plaza and Sidewalk in Front of Main Building	150.00			150.00
		<u>6,190.65</u>			<u>6,190.65</u>
96A1	Various Purposes and Improvements	500,778.10			500,778.10
99A0	Removal of Underground Storage Tanks	13,530.00			13,530.00
99A1	Restoration of City-Owned Cemetery	103.66			103.66
01A2	Elevator Restoration City Hall and Green Street (Repair Reconstruction)	26.50			26.50
01A3	Restoration of Newark Library (Repair Reconstruction)	388.50			388.50
04A0-04B9	General Obligation	305,306.59			305,306.59
05A-05A20	General Obligation	1,794,712.60	1,238,000.00		556,712.60
05S02/05S09	Various School Project for Type II School	13,726,000.00			13,726,000.00
06A05	Demolition Douglas - Harrison Apartments	2,500,000.00			2,500,000.00
06A06	Military Park Restoration	10,143.00			10,143.00
07A00/01	Newark Circulation and Market Street Plaza Projects	89,000.00			89,000.00
07A02	Triangle Park Project	134,148.50			134,148.50
07A03	Mulberry Linear Park Project	2,000.00			2,000.00
07A04	Edison Place Improvement Project	4,931.71			4,931.71
07A05	Hotel Site Acquisition Project	32,000.00			32,000.00
07A06 to 07A75	Various Purposes and Improvements	11,405,239.18		71,000.00	11,334,239.18
09A0	Morris Lister Avenue Association Urban Renewal	20,000,000.00			20,000,000.00
08A20	Tax Appeal Refunding Authorization				
011A01	Tax Appeal Refunding Authorization	2,491,000.00			2,491,000.00
		<u>\$ 53,168,379.89</u>	<u>\$ 1,238,000.00</u>	<u>\$ 71,000.00</u>	<u>\$ 51,859,379.89</u>

Reference

C

C,Below

Ref.

School Purposes
Municipal Purposes

C

C

Above

\$ 13,726,000.00

38,133,379.89

\$ 51,859,379.89

CITY OF NEWARK
WATER UTILITY FUND

CASH - TREASURER

D-5

	<u>Ref.</u>	<u>Operating Section</u>	<u>Capital Section</u>
Balance December 31, 2012	D	\$ 9,402,756.13	\$ (475,836.06)
Increased by Receipts:			
Miscellaneous Revenue Not Anticipated	D-3	\$ 740,939.29	\$
Consumers' Accounts Receivable -			
Water	D-7	45,675,625.83	
Protested Checks	D-11	122,473.89	
Interfunds Receivable	D-14	869,397.84	
Due from State of New Jersey for			
Waste Water	D-17		1,179,055.00
Overpayments - Water Rents	D-26	61,438.63	
Interfunds Payable	D-27	37,378.39	
		<u>47,507,253.87</u>	<u>1,179,055.00</u>
		56,910,010.00	703,218.94
Decreased by Disbursements:			
Prior Years' Refund	D-1	75,453.68	
Appropriations	D-4	41,908,677.63	
Protested Checks	D-11	54,565.23	
Appropriation Reserves	D-22	3,436,739.09	
Accounts Payable	D-23	50,469.42	
Accrued Interest on Bonds	D-25	81,869.60	
Improvement Authorizations	D-31		16,595.75
		<u>45,607,774.65</u>	<u>16,595.75</u>
Balance December 31, 2013	D	<u>\$11,302,235.35</u>	<u>\$ 686,623.19</u>

CITY OF NEWARK
WATER UTILITY FUND

CAPITAL CASH

D-6

<u>Description</u>	<u>Ordinance Number</u>	<u>Balance Dec. 31, 2012</u>	<u>Cash Receipts</u>	<u>Expended</u>	<u>Balance Dec. 31, 2013</u>
Interfunds		\$ (15,134.69)	\$	\$	\$ (15,134.69)
Cost of Bond Issue		(57,362.80)			(57,362.80)
Capital Improvement Fund		1.87			1.87
Fund Balance		53,283.63			53,283.63
Reserve for Refunds		85,965.67			85,965.67
Belleville 87-01		(968,018.74)			(968,018.74)
Due from State of New Jersey for Waste Water Fund - 2012		2,266,158.00	1,179,055.00		3,445,213.00
Reconstruction of Cedar Grove Reservoir Fence	880G	246.07			246.07
Water Meters	930G	11.51			11.51
Replacement of Water Valves	950B	0.56			0.56
Improvements of the Pequannock Aqueducts	960A	(39,521.19)			(39,521.19)
Water System Equipment	02C4	0.19			0.19
Acquisition of Water Meters	02C6	500,000.00			500,000.00
Water System Construction	03A01	350,433.00			350,433.00
Data Processing Equipment	03A01	100,000.00			100,000.00
New Hydrants	A6S00	(797,385.54)			(797,385.54)
Replacement of Water Mains, Valves and Connectors	A6S10	36.55			36.55
Water/Sewer Billing and Collection Computer Systems	A6S20	356,011.25			356,011.25
Rehabilitation of the Pequannock Aqueducts 1 and 2	O7WOA	(570,192.05)			(570,192.05)
Rehabilitation of Distribution System Water Mains	O7WOB	123,308.67			123,308.67
Rehabilitation of Cleaning and Lining Mains	O8A10	1,247,254.64			1,247,254.64
Rehabilitation and Distribution System	O9a901	(531,356.08)			(531,356.08)
Replacement of Water Mains	O9A902	(179,212.35)			(179,212.35)
Replacement of Water Mains	10A1	29,401.07			29,401.07
Various Improvements	10W10	(1,189,844.49)		2,208.75	(1,192,053.24)
Acquisition of Plotter and Scanner	10W20	(39,990.00)			(39,990.00)
Acquisition of Mid-Size Sport Utility Vehicles	10W30	(267,704.00)		8,296.00	(276,000.00)
Acquisition of Heavy Duty Special Equipment	10W40			6,091.00	(6,091.00)
Improvement to Cedar Grove Outlet	10W50	(932,226.81)			(932,226.81)
		<u>\$ (475,836.06)</u>	<u>\$ 1,179,055.00</u>	<u>\$16,595.75</u>	<u>\$ 686,623.19</u>

Reference

D

D-5

D-5

D

CITY OF NEWARK
WATER UTILITY FUND

CONSUMERS' ACCOUNTS RECEIVABLE - OPERATING SECTION

D-7

	<u>Ref.</u>	
Balance December 31, 2012	D	\$ 12,095,775.55
Increased by:		
Rents and Charges Levied - Net	Reserve	45,325,966.90
		<u>57,421,742.45</u>
Decreased by:		
Collections	D-5	\$45,675,625.83
Overpayments Applied	D-26	215,080.18
	D-3	<u>45,890,706.01</u>
Cancelled	Reserve	210,733.54
		<u>46,101,439.55</u>
Balance December 31, 2013	D	<u>\$ 11,320,302.90</u>

SUNDRY ACCOUNTS RECEIVABLE - OPERATING SECTION

D-8

	<u>Ref.</u>	
Balance December 31, 2012	D	\$ 328,683.11
Increased by:		
Charges - Net	Reserve	727,686.42
		<u>1,056,369.53</u>
Decreased by:		
Collections	D-3	<u>739,084.40</u>
Balance December 31, 2013	D	<u>\$ 317,285.13</u>

CITY OF NEWARK
WATER UTILITY FUND

DELINQUENT WATER RENTS RECEIVABLE
OPERATING SECTION

D-9

	<u>Ref.</u>	
Balance December 31, 2012	D	\$ 11,612.24
Balance December 31, 2013	D	<u>\$ 11,612.24</u>
<u>Analysis of Tax Collector File Summary</u>		
Wa-98		\$ 182.08
Wa-07		3,485.20
Wa-08		(0.10)
Wa-10		<u>7,945.06</u>
		<u>\$ 11,612.24</u>

WATER RENT LIENS - OPERATING SECTION

D-10

	<u>Ref.</u>	
Balance December 31, 2012	D	<u>\$1,492,361.19</u>
Balance December 31, 2013	D	<u>\$1,492,361.19</u>

CITY OF NEWARK
WATER UTILITY FUND

PROTESTED CHECKS - OPERATING SECTION

D-11

	<u>Ref.</u>	
Balance December 31, 2012	D	\$151,197.50
Increased by:		
Cash Disbursements	D-5	<div style="display: flex; justify-content: space-between;"> 54,565.23 <u>205,762.73</u> </div>
Decreased by:		
Cash Receipts	D-5	<div style="display: flex; justify-content: space-between;"> 122,473.89 <u>122,473.89</u> </div>
Balance December 31, 2013	D	<div style="display: flex; justify-content: space-between;"> \$ 83,288.84 <u><u>\$ 83,288.84</u></u> </div>
<u>Analysis of Net Credit to Operations</u>		
Balance December 31, 2012	Above	\$151,197.50
Balance December 31, 2013	Above	<div style="display: flex; justify-content: space-between;"> 83,288.84 <u>83,288.84</u> </div>
Net Credit to Operations	D-1	<div style="display: flex; justify-content: space-between;"> \$ 67,908.66 <u><u>\$ 67,908.66</u></u> </div>

PETTY CASH

D-12

	<u>Ref.</u>	
Balance December 31, 2012	D	<div style="display: flex; justify-content: space-between;"> \$ 950.00 <u>\$ 950.00</u> </div>
Balance December 31, 2013	D	<div style="display: flex; justify-content: space-between;"> \$ 950.00 <u><u>\$ 950.00</u></u> </div>

CITY OF NEWARK
WATER UTILITY FUND

INVENTORY - OPERATING SECTION

D-13

	<u>Ref.</u>	
Balance December 31, 2012	D	<u>\$607,957.81</u>
Balance December 31, 2013	D	<u>\$607,957.81</u>

CITY OF NEWARK
WATER UTILITY FUND

INTERFUNDS RECEIVABLE

D-14

	<u>Ref.</u>	<u>Water Operating Fund</u>			<u>Water Capital Fund</u>		
		<u>Total</u>	<u>Current Fund</u>	<u>Sewer Operating Fund</u>	<u>Total</u>	<u>Sewer Capital Fund</u>	<u>Current Fund</u>
Balance December 31, 2012	D	\$869,397.84	\$788,498.74	\$80,899.10	\$15,134.69	\$2,634.69	\$12,500.00
Decreased by:							
Cash Receipts	D-5	<u>869,397.84</u>	<u>788,498.74</u>	<u>80,899.10</u>	<u> </u>	<u> </u>	<u> </u>
Balance December 31, 2013	D	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$15,134.69</u>	<u>\$2,634.69</u>	<u>\$12,500.00</u>

CITY OF NEWARK
WATER UTILITY FUND

NEW JERSEY EASEMENT RECEIVABLE

D-15

	<u>Ref.</u>	
Balance December 31, 2012	D	<u>\$ 86,000.00</u>
Balance December 31, 2013	D	<u><u>\$ 86,000.00</u></u>

DUE FROM STATE OF NEW JERSEY

D-16

	<u>Ref.</u>	
Balance December 31, 2012	D	<u>\$968,018.74</u>
Balance December 31, 2013	D, Below	<u><u>\$968,018.74</u></u>
<u>Analysis of Balance</u>		
Water Treatment Facility		<u>\$841,612.42</u>
Renovation of Reservoirs		<u>126,406.32</u>
	Above	<u><u>\$968,018.74</u></u>

CITY OF NEWARK
WATER UTILITY FUND

DUE FROM STATE OF NEW JERSEY - WASTE WATER TRUST FUND

D-17

	<u>Ref.</u>	<u>Municipal Share</u>	<u>State Share for ARRA Principal Forgiveness</u>
Balance December 31, 2012	D	\$2,101,997.00	\$2,673,200.00
Decreased by:			
Received from State of New Jersey	D-5	<u>1,179,055.00</u>	<u> </u>
Balance December 31, 2013	D	<u>\$ 922,942.00</u>	<u>\$2,673,200.00</u>

CITY OF NEWARK
WATER UTILITY FUND

DEFERRED CHARGES

D-18

	<u>Ref.</u>	<u>Refunding Issue 1993</u>
Balance December 31, 2012	D	\$ 1,294,894.96
Decreased by:		
Raised by Budget Appropriation:		
Capitalization of Interest	D-39	<u>147,988.00</u>
Balance December 31, 2013	D	<u>\$ 1,146,906.96</u> (1)
(1) Capitalized Interest Remaining 93 Months @ \$12,332.33.		<u>\$ 1,146,906.69</u>

COST OF BOND ISSUE

D-19

	<u>Ref.</u>	
Balance December 31, 2012	D	<u>\$ 57,362.80</u>
Balance December 31, 2013	D	<u>\$ 57,362.80</u>

CITY OF NEWARK
WATER UTILITY FUNDFIXED CAPITAL - CAPITAL SECTION

D-20

	Balance Dec. 31, 2012	Increased by Capital Outlay	Balance Dec. 31, 2013
Belleville Reservoir Complex	\$ 4,928,238.68	\$	\$ 4,928,238.68
Construction of Filtration Facility at Pequannock			
Water Supply	1,600,000.00		1,600,000.00
Building at Little Falls	531,057.49		531,057.49
Water Diversion Rights	1,500.00		1,500.00
Reservation Land	2,810,029.19		2,810,029.19
Storage Reservoir Land	11,588.76		11,588.76
Other Distribution System Land	34,240.35		34,240.35
Reservation Structures	436,211.01		436,211.01
Water Diversion - Impounding Reservoirs	9,304,879.67		9,304,879.67
Wanaque System - Impounding Reservoirs	17,464,130.46		17,464,130.46
Intakes and Supply Mains	7,787,114.63		7,787,114.63
Setting Basement - Belleville	1.00		1.00
Chemical Treatment Plant	87,363.49		87,363.49
Storage Reservoir Tanks and Stand Pipes	1,831,505.05		1,831,505.05
Distribution Mains and Accessories	24,705,565.72		24,705,565.72
Fire Hydrants and Cisterns	570,759.38		570,759.38
General Structures	262,340.76		262,340.76
Automotive Equipment	523,838.02		523,838.02
Accounting Machines	4,500.00		4,500.00
Charlotteberg System - Impounding Reservoirs	9,936,066.39		9,936,066.39
Dunkers Pond Reservoir	1,477,198.36		1,477,198.36
Acquisition of Right-of-Way - Susquehanna and Western Railway	322,693.75		322,693.75
Water Meters	2,084,020.94		2,084,020.94
Recreation Facilities at Echo Lake Park	249,800.00		249,800.00
Equipment	6,988,021.82		6,988,021.82
Geographic Information System	360,000.00		360,000.00
Canister Reservoir Out Valve	1,249,000.00		1,249,000.00
Improvements and Equipment	18,831,848.08		18,831,848.08
Improvements and Equipment	675,580.00		675,580.00
Improvements and Equipment	907,695.00		907,695.00
Improvements and Equipment	220,432.86		220,432.86
Improvements and Equipment	373,514.80		373,514.80
Improvements and Equipment	373,120.62		373,120.62
Improvements	455,300.00		455,300.00
Improvements	32,476.00		32,476.00
Water System Construction	227,202.00		227,202.00
Improvements - 2004	801,546.76		801,546.76
Improvements - 2005	942,599.31		942,599.31
Improvements - 2006	937,529.21		937,529.21
Improvements - 2007	1,200,000.00		1,200,000.00
Improvements - 2008	5,342,000.00		5,342,000.00
Improvements - 2009	8,291,152.35		8,291,152.35
Improvements - 2010	2,265,841.33		2,265,841.33
Improvements - 2011	2,190,985.02		2,190,985.02
Improvements - 2012	3,221,936.03	1,497,191.36	4,719,127.39
Improvements - 2013		1,902,691.65	1,902,691.65
	<u>\$142,852,424.29</u>	<u>\$3,399,883.01</u>	<u>\$146,252,307.30</u>

Reference

D

D-36

D

CITY OF NEWARK
WATER UTILITY FUND

FIXED CAPITAL AUTHORIZED AND UNCOMPLETED - CAPITAL SECTION

D-21
Sheet #1

	<u>Ordinance Number</u>	<u>Balance Dec. 31, 2012</u>	<u>2013 Authorizations</u>	<u>Balance Dec. 31, 2013</u>
Acquisition and Installation of a 12 Inch High Pressure Water Main at Frelinghuysen Avenue		\$ 27,000.00	\$	\$ 27,000.00
Construction of a 94 MGD Water Treatment Facility	840B	41,845,530.00		41,845,530.00
Acquisition and Installation of Remote Water Meter Reading Devices	840A	837,000.00		837,000.00
Rehabilitation of Clinton Dam Reservoir	850A	2,000,000.00		2,000,000.00
Rehabilitation and Renovation of the Belleville Reservoir Complex	870A	5,071,761.32		5,071,761.32
New Computer System - Billing	880A	650,000.00		650,000.00
Automated Meter by Telephone	880B	70,000.00		70,000.00
Rehabilitation of Macopin Reservoir	880C	44,800.00		44,800.00
Rehabilitation of Canister Reservoir Out Valve	880E	700,565.00		700,565.00
Rehabilitation of Oak Ridge Outlet Con Valve	880F	360,000.00		360,000.00
Reconstruction of Cedar Grove Reservoir Fence	880G	42,500.00		42,500.00
Reconstruction of Echo Lake Reservoir Spillway	880H	250,000.00		250,000.00
Cleaning and Lining Water Mains	880I	1,312,700.00		1,312,700.00
Additional Funding Water Treatment Facilities	890D	1,000,000.00		1,000,000.00
Replace Water Valve - City-Wide		1,000,000.00		1,000,000.00
Cleaning and Lining Water Mains - City-Wide		1,170,000.00		1,170,000.00
Repair 24 Inch Water Main - Route 22	890C	400,000.00		400,000.00
Water Treatment Facility	890D	3,700,000.00		3,700,000.00
Replace Water Valves - Phase II	900A	1,000,000.00		1,000,000.00
Cleaning and Lining Water Mains - Phase II	900B	2,500,000.00		2,500,000.00
Cleaning and Lining Water Mains	930A	3,500,000.00		3,500,000.00
Rehabilitation of Oak Ridge Reservoir	930B	1,000,000.00		1,000,000.00
Rehabilitation of Echo Lake Reservoir Dam	930C	1,000,000.00		1,000,000.00
Acquisition of Vehicles and Equipment	930D	260,000.00		260,000.00
Water Treatment Plant Improvement	930E	330,000.00		330,000.00
Rehabilitation of Little Falls Facilities	930F	421,000.00		421,000.00
Water Meters	930G	2,000,000.00		2,000,000.00
Rehabilitation of Oak Ridge Reservoir	940A	1,000,000.00		1,000,000.00
Cleaning and Lining Water Mains	940B	3,500,000.00		3,500,000.00
Charlotteberg Dam - Seal and Paint	940C	300,000.00		300,000.00
Design and Construction of Treatment Facilities for Lead/Copper Corrosion	940D	150,000.00		150,000.00
Replacing Standby Diesel Generator at Charlotteberg Dam	940E	85,000.00		85,000.00
D.C.E. Bruning Engineering Copier	940F	16,000.00		16,000.00
Acquisition of Vehicles and Construction Equipment	940G	424,500.00		424,500.00
Acquisition of Vehicles and Construction Equipment	940H	70,000.00		70,000.00
Purchase and Installation of Water Meters	950A	4,300,000.00		4,300,000.00
Cleaning and Lining of Water Mains and Replacement of Water Valves	950B	1,500,000.00		1,500,000.00
Rehabilitation of Macopin Dam	950C	1,500,000.00		1,500,000.00
Removal of Underground Storage Tanks at Pequannock Treatment Plant	950D	100,000.00		100,000.00

CITY OF NEWARK
WATER UTILITY FUND

FIXED CAPITAL AUTHORIZED AND UNCOMPLETED - CAPITAL SECTION

D-21
Sheet #2

	<u>Ordinance Number</u>	<u>Balance Dec. 31, 2012</u>	<u>2013 Authorizations</u>	<u>Balance Dec. 31, 2013</u>
Upgrading Aluminum Storage Tanks at Pequannock Treatment Plant	950E	\$ 400,000.00	\$	\$ 400,000.00
Improvement of the Pequannock Aqueducts	950A	3,000,000.00		3,000,000.00
Cleaning/Lining Water Mains and Replace Water Valves	960B	1,500,000.00		1,500,000.00
Rehabilitation of Cedar Grove Reservoir Dams	960C	1,000,000.00		1,000,000.00
Rehabilitation of Charlotteberg Dam	960D	1,000,000.00		1,000,000.00
Rehabilitation of Water Facilities Roofs	960F	100,000.00		100,000.00
Underground Storage Tanks Removal and Replacement at the Watershed	960G	500,000.00		500,000.00
Wanaque North Capital	O2C0	559,225.22		559,225.22
Wanaque South Capital	O2C1	272,229.70		272,229.70
Water System Construction	O2C2	600,000.00		600,000.00
Regulatory Equipment	O2C3	125,000.00		125,000.00
Water System Equipment	O2C4	425,000.00		425,000.00
Architectural and Engineering Services	O2C5	125,000.00		125,000.00
Acquisition of Water Meters	O2C6	500,000.00		500,000.00
Wanaque North Capital		239,543.00		239,543.00
Wanaque South Capital		253,399.00		253,399.00
Water System Construction	03A20	350,433.00		350,433.00
Regulatory Equipment	03A30	500,000.00		500,000.00
Data Processing Equipment	03A40	100,000.00		100,000.00
Installation and Replacement of Old Fire Hydrants with New Hydrants	A6S00	1,800,000.00		1,800,000.00
Replacement of Water Mains, Valves and Connectors	A6S10	3,800,000.00		3,800,000.00
Water/Sewer Billing and Collection Computer Systems	A6S20	2,225,000.00		2,225,000.00
Rehabilitation of Pequannock Aqueducts 1 and 2	O7WOA	4,250,000.00		4,250,000.00
Rehabilitation of Distribution System Water Mains	O7WOB	4,250,000.00		4,250,000.00
Rehabilitation - Cleaning and Lining Mains	O8A10	11,000,000.00		11,000,000.00
Rehabilitation and Distribution System	O9A91	12,000,000.00		12,000,000.00
Replacement of Water Mains	O9A92	7,750,000.00		7,750,000.00
Various Improvements	10W10	3,507,500.00		3,507,500.00
Acquisition of Plotter and Scanner	10W20	40,250.00		40,250.00
Acquisition of Mid-Size Sport Utility Vehicles	10W30	276,000.00		276,000.00
Acquisition of Heavy Duty Special Equipment	10W40	586,500.00		586,500.00
Improvement to Cedar Grove Outlet	10W50	1,150,000.00		1,150,000.00
Various Improvements	11W10	9,500,000.00		9,500,000.00
Various Improvements	11W20	1,500,000.00		1,500,000.00
Improvements to Water Distribution System	13WAO		11,500,000.00	11,500,000.00
Various Improvements	13WBO		1,750,000.00	1,750,000.00
		<u>\$ 160,623,436.24</u>	<u>\$13,250,000.00</u>	<u>\$173,873,436.24</u>
<u>Reference</u>	<u>D</u>		<u>D-31</u>	<u>D</u>

CITY OF NEWARK
WATER UTILITY FUND

2012 APPROPRIATION RESERVES

D-22
Sheet #1

	Balance Dec. 31, 2012		Modified Balance	Paid	Accounts Payable	Balance Lapsed
	<u>Encumbered</u>	<u>Reserve</u>				
<u>Operating</u>						
Salaries and Wages:						
Personnel Services	\$	\$ 61,530.48	\$ 61,530.48	\$	\$	\$ 61,530.48
Other Pay		1,000.00	1,000.00			1,000.00
Other Expenses:						
Service by Contract or Agreement		1,050.00	1,050.00			1,050.00
Materials and Supplies	392.14	1,607.86	2,000.00	392.14		1,607.86
<u>Water Billing and Customer Service</u>						
Salaries and Wages:						
Personnel Services		119,619.16	119,619.16			119,619.16
Other Pay	177.00	20,118.27	20,295.27	15.00	162.00	20,118.27
Other Expenses:						
Service by Contract or Agreement	120,951.90	235,069.07	356,020.97	89,138.45	27,737.50	239,145.02
Materials and Supplies	478.20	29,931.21	30,409.41	478.20		29,931.21
<u>Division of Water Supply</u>						
Salaries and Wages:						
Personnel Services		972,929.21	972,929.21			972,929.21
Other Pay		57,929.12	57,929.12			57,929.12
Other Expenses:						
Service by Contract or Agreement	1,490,248.60	659,998.83	2,150,247.43	1,185,754.22	302,788.87	661,704.34
Materials and Supplies	144,629.06	109,854.06	254,483.12	68,010.93	76,485.64	109,986.55
Miscellaneous	65,540.00	253,813.50	319,353.50	59,422.24		259,931.26
Equipment	170.47	14,829.53	15,000.00	170.47		14,829.53
Medical, Dental, Prescription and Life Insurance	471,431.11	215,000.00	686,431.11	536,166.08	8,438.66	141,826.37
Wanaque South		0.40	0.40			0.40

CITY OF NEWARK
WATER UTILITY FUND

2012 APPROPRIATION RESERVES

D-22
Sheet #2

	Balance Dec. 31, 2012		Modified		Accounts	Balance
	<u>Encumbered</u>	<u>Reserve</u>	<u>Balance</u>	<u>Paid</u>	<u>Payable</u>	<u>Lapsed</u>
Unclassified:						
Salary and Wages:						
Adjustment Account	\$	\$ 16,088.00	\$ 16,088.00	\$	\$	\$ 16,088.00
<u>Capital Outlay</u>						
Service by Contract or Agreement	1,456,613.90	425,759.27	1,882,373.17	1,329,459.36	127,154.54	425,759.27
Equipment	167,732.00	51,642.80	219,374.80	167,732.00		51,642.80
Statutory Expenditures:						
Social Security System		36,445.42	36,445.42			36,445.42
Noncontributory Pensions		55,000.00	55,000.00			55,000.00
Public Employees' Retirement System - State		50,000.00	50,000.00			50,000.00
	<u>\$ 3,918,364.38</u>	<u>\$ 3,389,216.19</u>	<u>\$ 7,307,580.57</u>	<u>\$ 3,436,739.09</u>	<u>\$ 542,767.21</u>	<u>\$ 3,328,074.27</u>
<u>Reference</u>	<u>D</u>	<u>D</u>		<u>D-5</u>	<u>D-23</u>	<u>D-1</u>

CITY OF NEWARK
WATER UTILITY FUND

ACCOUNTS PAYABLE - OPERATING AND CAPITAL SECTIONS

D-23

	<u>Ref.</u>	<u>Operating Accounts Payable</u>
Balance December 31, 2012	D	\$ 2,409,511.99
Increased by:		
Appropriation Reserves	D-22	<u>542,767.21</u>
		2,952,279.20
Decreased by:		
Cash Disbursements	D-5	<u>50,469.42</u>
Balance December 31, 2013	D	<u>\$ 2,901,809.78</u>

BELLEVILLE FLOOD CONTROL

D-24

	<u>Ref.</u>	
Balance December 31, 2012	D	<u>\$ 994.03</u>
Balance December 31, 2013	D	<u>\$ 994.03</u>

CITY OF NEWARK
WATER UTILITY FUND

ACCRUED INTEREST ON BONDS
OPERATING SECTION

D-25

	<u>Ref.</u>	
Balance December 31, 2012	D	\$188,987.20
Increased by:		
Accrued Interest from Budget Appropriation	D-4	<div style="display: flex; justify-content: flex-end;"> <div style="text-align: right; margin-right: 10px;">66,604.32</div> <div style="border-top: 1px solid black; text-align: right;">255,591.52</div> </div>
Decreased by:		
Cash Disbursements	D-5	<div style="display: flex; justify-content: flex-end;"> <div style="text-align: right; margin-right: 10px;">81,869.60</div> <div style="border-top: 1px solid black; text-align: right;">81,869.60</div> </div>
Balance December 31, 2013	D,Below	<div style="display: flex; justify-content: flex-end;"> <div style="text-align: right; margin-right: 10px;">\$173,721.92</div> <div style="border-top: 1px solid black; border-bottom: 3px double black; text-align: right;">\$173,721.92</div> </div>

Analysis of Accrued Interest on Bonds - Operating Section

<u>Serial</u> <u>Bonds</u>	<u>Date</u> <u>of Issue</u>	<u>Interest</u> <u>Rate</u>	<u>From</u>	<u>Actual</u> <u>Period</u> <u>Months</u>	<u>2013</u> <u>Amount</u>
Water	1-15-05	Various	12-01-12	1	\$ 20,636.25
Water	3-10-05	Various	10-01-12	3	103,094.69
Water	6-16-10	Various	10-01-12	3	<div style="display: flex; justify-content: flex-end;"> <div style="text-align: right; margin-right: 10px;">63,406.25</div> <div style="border-top: 1px solid black; text-align: right;">63,406.25</div> </div>
					<div style="display: flex; justify-content: flex-end;"> <div style="text-align: right; margin-right: 10px;">\$187,137.19</div> <div style="border-top: 1px solid black; border-bottom: 3px double black; text-align: right;">\$187,137.19</div> </div>

The difference will be adjusted in the 2014 Operating Budget.

CITY OF NEWARK
WATER UTILITY FUND

WATER RENT OVERPAYMENTS

D-26

	<u>Ref.</u>	
Balance December 31, 2012	D	\$215,080.18
Increased by:		
Collections	D-5	<u>61,438.63</u>
		276,518.81
Decreased by:		
Applied to Consumer Accounts	D-7	<u>215,080.18</u>
Balance December 31, 2013	D	<u><u>\$ 61,438.63</u></u>

CITY OF NEWARK
WATER UTILITY FUND

INTERFUNDS PAYABLE

D-27

	<u>Ref.</u>	<u>Water Operating Fund</u>		
		<u>Total</u>	<u>Current Fund</u>	<u>Trust Fund</u>
Increased by:				
Cash Receipts	D-5	<u>\$ 37,378.39</u>	<u>\$ 578.40</u>	<u>\$ 36,799.99</u>
Balance December 31, 2013		<u><u>\$ (37,378.39)</u></u>	<u><u>\$ (578.40)</u></u>	<u><u>\$ (36,799.99)</u></u>

RESERVE FOR WATER EASEMENT

D-28

	<u>Ref.</u>	
Balance December 31, 2012	D	<u>\$ 236,000.00</u>
Balance December 31, 2013	D	<u><u>\$ 236,000.00</u></u>

CITY OF NEWARK
WATER UTILITY FUND

STATE OF NEW JERSEY
WATER SUPPLY BOND

D-29
Sheet #1

	<u>Ref.</u>	
Balance December 31, 2012	D	\$ 11,395,000.00
Decreased by:		
Payment	D-36	<u>455,000.00</u>
Balance December 31, 2013	D	<u>\$ 10,940,000.00</u>

CITY OF NEWARK
WATER UTILITY FUND

STATE OF NEW JERSEY
WATER SUPPLY BONDS

D-29
Sheet #2

Analysis of Water Supply Loans Payable
2007 NJEIT Drinking Water Fund:

<u>Year</u>	<u>Interest February and August</u>	<u>Principal August</u>
2014	\$ 85,687.50	\$ 100,000.00
2015	82,087.50	105,000.00
2016	76,837.50	110,000.00
2017	71,337.50	115,000.00
2018	65,587.50	120,000.00
2019	59,587.50	125,000.00
2020	54,587.50	130,000.00
2021	49,387.50	135,000.00
2022	42,637.50	140,000.00
2023	35,637.50	150,000.00
2024	29,262.50	155,000.00
2025	22,287.50	160,000.00
2026	15,087.50	170,000.00
2027	7,437.50	175,000.00
	<u>\$ 786,462.50</u>	<u>\$1,985,000.00</u>

2008 New Jersey Environmental Infrastructure Trust - Series 2008A

<u>Year</u>	<u>Interest February and August</u>	<u>Principal August</u>
2014	\$ 137,737.50	\$ 120,000.00
2015	131,737.50	130,000.00
2016	125,237.50	135,000.00
2017	118,487.50	140,000.00
2018	111,487.50	150,000.00
2019	103,987.50	155,000.00
2020	95,850.00	165,000.00
2021	86,775.00	175,000.00
2022	77,150.00	185,000.00
2023	66,975.00	195,000.00
2024	56,250.00	205,000.00
2025	46,000.00	215,000.00
2026	35,250.00	225,000.00
2027	24,000.00	235,000.00
2028	12,250.00	245,000.00
	<u>\$1,372,662.50</u>	<u>\$2,790,000.00</u>

CITY OF NEWARK
WATER UTILITY FUND

STATE OF NEW JERSEY
WATER SUPPLY BONDS

D-29
Sheet #3

Analysis of Water Supply Loans Payable

2009 New Jersey Environmental Infrastructure Trust - Series 2009A:

<u>Year</u>	<u>Interest February/ November</u>	<u>Principal February/ November</u>
2014	\$ 96,212.50	\$ 100,000.00
2015	91,212.50	105,000.00
2016	85,962.50	110,000.00
2017	80,462.50	115,000.00
2018	74,712.50	125,000.00
2019	68,462.50	130,000.00
2020	63,262.50	135,000.00
2021	57,862.50	140,000.00
2022	52,262.50	145,000.00
2023	47,187.50	150,000.00
2024	41,187.50	155,000.00
2025	34,987.50	165,000.00
2026	28,800.00	170,000.00
2027	22,000.00	175,000.00
2028	15,000.00	185,000.00
2029	7,600.00	190,000.00
	<u>\$ 968,137.50</u>	<u>\$ 2,390,000.00</u>

CITY OF NEWARK
WATER UTILITY FUND

STATE OF NEW JERSEY
WATER SUPPLY BONDS

D-29
Sheet #4

Analysis of Water Supply Loans Payable

2010 New Jersey Environmental Infrastructure Trust - Series 2010B:

<u>Year</u>	<u>Interest February/ August</u>	<u>Principal February/ August</u>
2014	\$ 204,000.00	\$ 160,000.00
2015	196,000.00	165,000.00
2016	187,750.00	175,000.00
2017	179,000.00	185,000.00
2018	169,750.00	190,000.00
2019	160,250.00	200,000.00
2020	150,250.00	210,000.00
2021	139,750.00	220,000.00
2022	128,750.00	235,000.00
2023	117,000.00	245,000.00
2024	104,750.00	255,000.00
2025	92,000.00	270,000.00
2026	78,500.00	285,000.00
2027	64,250.00	300,000.00
2028	49,250.00	310,000.00
2029	33,750.00	330,000.00
2030	17,250.00	345,000.00
	<u>\$ 2,283,750.00</u>	<u>\$ 4,230,000.00</u>

CITY OF NEWARK
WATER UTILITY FUND

STATE WATER SUPPLY LOAN FUND PAYABLE

D-30
Sheet #1

	<u>Ref.</u>	
Balance December 31, 2012	D	\$ 16,440,180.68
Decreased by:		
Payment	D-36	<u>1,021,112.42</u>
Balance December 31, 2013	D	<u>\$ 15,419,068.26</u>

2007 New Jersey Environmental Infrastructure Trust "Drinking Water"

<u>Year</u>	<u>Semiannual Principal</u>
2/01/14	\$ 77,644.84
8/01/14	258,872.78
2/01/15	74,382.74
8/01/15	264,672.07
2/01/16	69,625.50
8/01/16	268,976.23
2/01/17	64,641.73
8/01/17	273,053.86
2/01/18	59,431.43
8/01/18	276,904.96
2/01/19	53,994.59
8/01/19	280,529.52
2/01/20	49,463.90
8/01/20	285,060.21
2/01/21	44,751.97
8/01/21	289,409.68
2/01/22	38,635.53
8/01/22	292,354.64
2/01/23	32,292.55
8/01/23	304,134.45
2/01/24	26,515.91
8/01/24	307,419.21
2/01/25	20,195.58
8/01/25	310,160.28
2/01/26	13,671.38
8/01/26	321,758.87
2/01/27	6,739.41
8/01/27	<u>323,888.49</u>
	<u>5,022,664.35</u>

CITY OF NEWARK
WATER UTILITY FUND

STATE WATER SUPPLY BOND FUND PAYABLE

D-30
Sheet #2

2007 New Jersey Environmental Infrastructure Trust - Series A

<u>Year</u>	<u>Semiannual Principal</u>
8/01/13	\$ 315,369.54
2/01/14	116,304.32
8/01/14	318,958.20
2/01/15	111,237.97
8/01/15	330,779.67
2/01/16	105,749.43
8/01/16	333,735.04
2/01/17	100,049.79
8/01/17	336,479.32
2/01/18	94,139.05
8/01/18	347,456.40
2/01/19	87,806.12
8/01/19	349,567.38
2/01/20	80,934.89
8/01/20	359,583.97
2/01/21	73,272.04
8/01/21	368,808.94
2/01/22	65,144.77
8/01/22	377,569.50
2/01/23	56,553.09
8/01/23	385,865.64
2/01/24	47,497.00
8/01/24	393,697.37
2/01/25	38,841.99
8/01/25	401,930.18
2/01/26	29,764.78
8/01/26	409,740.80
2/01/27	20,265.38
8/01/27	417,129.23
2/01/28	10,343.79
8/01/28	424,095.64
	<u>7,029,830.80</u>

CITY OF NEWARK
WATER UTILITY FUND

STATE WATER SUPPLY BOND FUND PAYABLE

D-30
Sheet #3

2009 New Jersey Environmental Infrastructure Trust - Series 2009A

<u>Year</u>	<u>Semiannual Principal</u>
2/01/14	\$ 44,045.87
8/01/14	88,091.75
2/01/15	44,045.87
8/01/15	88,091.75
2/01/16	44,045.87
8/01/16	88,091.75
2/01/17	44,045.87
8/01/17	88,091.75
2/01/18	44,045.87
8/01/18	88,091.75
2/01/19	44,045.87
8/01/19	88,091.75
2/01/20	44,045.87
8/01/20	88,091.75
2/01/21	44,045.87
8/01/21	88,091.75
2/01/22	44,045.87
8/01/22	88,091.75
2/01/23	44,045.87
8/01/23	88,091.75
2/01/24	44,045.87
8/01/24	88,091.75
2/01/25	44,045.87
8/01/25	88,091.75
2/01/26	44,045.87
8/01/26	88,091.75
2/01/27	44,045.87
8/01/27	88,091.75
2/01/28	44,045.87
8/01/28	88,091.75
2/01/29	44,045.87
8/01/29	88,091.84
	<u>2,246,339.63</u>

CITY OF NEWARK
WATER UTILITY FUND

STATE WATER SUPPLY BOND FUND PAYABLE

D-30
Sheet #4

2010 New Jersey Environmental Infrastructure Trust - Series 2010B

<u>Year</u>	<u>Semiannual Principal</u>
8/01/13	\$ 79,309.10
2/01/14	39,654.55
8/01/14	79,309.10
2/01/15	39,654.55
8/01/15	79,309.10
2/01/16	39,654.55
8/01/16	79,309.10
2/01/17	39,654.55
8/01/17	79,309.10
2/01/18	39,654.55
8/01/18	79,309.10
2/01/19	39,654.55
8/01/19	79,309.10
2/01/20	39,654.55
8/01/20	79,309.10
2/01/21	39,654.55
8/01/21	79,309.10
2/01/22	39,654.55
8/01/22	79,309.10
2/01/23	39,654.55
8/01/23	79,309.10
2/01/24	39,654.55
8/01/24	79,309.10
2/01/25	39,654.55
8/01/25	79,309.10
2/01/26	39,654.55
8/01/26	79,309.10
2/01/27	39,654.55
8/01/27	79,309.10
2/01/28	39,654.55
8/01/28	79,309.10
2/01/29	39,654.55
8/01/29	79,309.10
2/01/30	39,654.55
8/01/30	79,309.30
	<u>2,141,345.90</u>
Total	<u>\$16,440,180.68</u>

Reference

Sheet #1

CITY OF NEWARK
WATER UTILITY FUND

IMPROVEMENT AUTHORIZATIONS

D-31

Ordinance Number	Amount of Original Ordinance	Balance Dec. 31, 2012			2013 Authorizations	Expended Paid	Balance Dec. 31, 2013		
		Encumbered	Funded	Unfunded			Encumbered	Funded	Unfunded
890G	Reconstruction of Cedar Grove Reservoir Fence	\$ 42,500.00	\$ 246.07	\$	\$	\$	\$	\$ 246.07	\$
880I	Cleaning and Lining Water Mains	1,312,700.00		500.00					500.00
890C	Repair 24 Inch Water Main - Route 22	400,000.00		500.00					500.00
930G	Water Meters	2,000,000.00	11.51	500.00			11.51		500.00
950B	Cleaning and Lining of Water Mains and Replacement of Water Valves	1,500,000.00	0.56				0.56		
960A	Improvements of the Pequannock Aqueducts	3,000,000.00		1,878,478.81					1,878,478.81
02C4	Water System Equipment	425,000.00	0.19				0.19		
02C6	Acquisition of Water Meters	500,000.00	500,000.00				500,000.00		
03A20	Water System Construction	350,433.00	350,433.00				350,433.00		
03A40	Data Processing Equipment	100,000.00					100,000.00		
06S00	Installation and Replacement of Old Fire Hydrants	1,800,000.00	2,400.00	214.46			2,400.00		214.46
06S10	Replacement of Water Mains, Valves and Connectors	3,800,000.00	0.01	36.54			0.01	36.54	
06S20	Water/Sewer Billing and Collection Computer Systems	2,225,000.00	1,165,846.00	615,165.25			1,417,876.00		363,135.25
07W0B	Rehabilitation of Distribution System Water Mains	4,250,000.00	3,116.62				3,116.62		
06A10	Rehabilitation of Cleaning and Lining Main	11,000,000.00	0.01	4,063,558.63			0.01	4,063,558.63	90,000.00
09A90	Joint Meetings	1,050,000.00							
09A91	Rehabilitation and Distribution System	10,000,000.00	1,374,300.92	25,293.00			1,374,300.92		25,293.00
09A92	Replacement of Water Mains	9,750,000.00	306,145.12	1,591,535.53			306,145.12	1,591,535.53	933,690.00
10W10	Various Improvements	3,507,500.00	267,639.54	2,050,015.97		2,208.75	1,915,139.54		400,307.22
10W20	Acquisition of Plotter and Scanner	40,250.00		260.00					260.00
10W30	Acquisition of Mid-Size Sport Utility Vehicle	276,000.00		8,296.00		8,296.00			
10W40	Acquisition of Heavy Duty Special Equipment	586,500.00	6,081.00	580,409.00		6,091.00	289,658.00		290,751.00
10W50	Improvements to Cedar Grove Outlet	1,150,000.00	3,400.19	214,373.00			3,400.19		214,373.00
10W60	Replacement of Water Mains	1,024,684.55	29,400.52	0.55			29,400.52	0.55	
11W10	Various Improvements	9,500,000.00		9,500,000.00					9,500,000.00
11W20	Various Improvements	1,500,000.00		1,500,000.00					1,500,000.00
13WAO	Improvements to Water Distribution System	11,500,000.00			11,500,000.00				11,500,000.00
13WBO	Various Improvements	1,750,000.00			1,750,000.00				1,750,000.00
		<u>\$1,884,039.01</u>	<u>\$7,880,123.50</u>	<u>\$17,397,695.49</u>	<u>\$13,250,000.00</u>	<u>\$16,595.75</u>	<u>\$4,067,136.01</u>	<u>\$7,880,123.50</u>	<u>\$28,448,002.74</u>
	Reference	D	D	D	D-21	D-5	D	D	D

CITY OF NEWARK
WATER UTILITY FUND

CAPITAL IMPROVEMENT FUND
CAPITAL SECTION

D-32

	<u>Ref.</u>	
Balance December 31, 2012	D	\$ 1.87
Balance December 31, 2013	D	<u>\$ 1.87</u>

RESERVE FOR REFUNDS

D-33

	<u>Ref.</u>	<u>Water Capital Fund</u>
Balance December 31, 2012	D	\$ 85,965.75
Balance December 31, 2013	D	<u>\$ 85,965.75</u>

DUE TO GENERAL CAPITAL FUND

D-34

	<u>Ref.</u>	<u>Water Capital Fund</u>
Balance December 31, 2012	D	\$ 46,000.00
Balance December 31, 2013	D	<u>\$ 46,000.00</u>

CITY OF NEWARK
WATER UTILITY FUND

DEFERRED RESERVE FOR AMORTIZATION
CAPITAL SECTION

D-35

	<u>Date of Ordinance</u>	<u>Balance Dec. 31, 2012</u>	<u>Balance Dec. 31, 2013</u>
High Pressure Water Main on Frelinghuysen Avenue	1983	\$ 27,000.00	\$ 27,000.00
Construction of a 94 MGD Water Treatment Facility	1984	21,949,272.58	21,949,272.58
Acquisition and Installation of Remote Water Meter Reading Devices	1984	837,000.00	837,000.00
Rehabilitation and Renovation of the Belleville Reservoir Complex	1987	190,000.00	190,000.00
New Computer System - Billing	1988	32,500.00	32,500.00
Automated Meter by Telephone	1988	3,500.00	3,500.00
Rehabilitation of Macopin Reservoir	1988	2,240.00	2,240.00
Rehabilitation of Wayne Pumping Station	1988	100,000.00	100,000.00
Rehabilitation of Canister Reservoir Out Valve	1988	130,565.00	130,565.00
Rehabilitation of Oak Ridge Outlet Con Valve	1988	18,000.00	18,000.00
Reconstruction of Cedar Grove Reservoir Fence	1988	2,125.00	2,125.00
Reconstruction of Echo Lake Reservoir Spillway	1988	12,500.00	12,500.00
Cleaning and Lining Water Mains		65,635.00	65,635.00
Additional Funding Water Treatment Facilities	1988	50,000.00	50,000.00
Replace Water Valve - City-Wide	1988	50,000.00	50,000.00
Cleaning and Lining Water Mains - City-Wide	1988	58,500.00	58,500.00
Repair 24 Inch Water Mains - Route 22	1989	20,000.00	20,000.00
Water Treatment Facility	1989	185,000.00	185,000.00
Purchase and Installation of Water Meters	1990	2,000,000.00	2,000,000.00
Various Purposes	1995	288,000.00	288,000.00
Purchase and Installation of Water Meters	1995	215,000.00	215,000.00
Clean/Lining Water Mains and Replace Water Valves	96OB	75,000.00	75,000.00
Rehabilitation of Cedar Grove Reservoir Dams	96OC	50,000.00	50,000.00
Rehabilitation of Charlotteburg Dam	96OD	50,000.00	50,000.00
Geographic Information Systems	96OE	18,000.00	18,000.00
Rehabilitation of Water Facilities Roofs	96OF	5,000.00	5,000.00
Underground Storage Tanks Removal and Replacement at the Watershed	96OG	25,000.00	25,000.00
Wanaque North Capital	02C0	559,225.22	559,225.22
Wanaque South Capital	02C1	272,229.70	272,229.70
Water System Construction	02C2	600,000.00	600,000.00
Regulatory Equipment	02C3	125,000.00	125,000.00
Water System Equipment	02C4	425,000.00	425,000.00
Architectural and Engineering Services	02C5	125,000.00	125,000.00
Acquisition of Water Meters	02C6	500,000.00	500,000.00
Wanaque North Capital		239,543.00	239,543.00
Wanaque South Capital		253,399.00	253,399.00
Water System Construction	03A20	350,433.00	350,433.00
Regulatory Equipment	03A30	500,000.00	500,000.00
Data Processing Equipment	03A40	100,000.00	100,000.00
Various Purposes		64,000.00	64,000.00
Various Purposes		3,000.00	3,000.00
		<u>\$30,576,667.50</u>	<u>\$30,576,667.50</u>

Reference

D

D

CITY OF NEWARK
WATER UTILITY FUND

RESERVE FOR AMORTIZATION - CAPITAL SECTION

D-36

	<u>Ref.</u>		
Balance December 31, 2012	D		\$ 196,001,225.24
Increased by:			
Capital Outlay	D-20	\$ 3,399,883.01	
Paid by Operating Budget:			
Water Supply Loan	D-29	455,000.00	
Water Supply Bond Fund	D-30	1,021,112.42	
Serial Bonds	D-39	<u>1,867,012.00</u>	
			<u>6,743,007.43</u>
Balance December 31, 2013	D		<u>\$ 202,744,232.67</u>

RESERVE FOR DUE FROM STATE OF NEW JERSEY

D-37

	<u>Ref.</u>		
Balance December 31, 2012	D		<u>\$ 968,018.74</u>
Balance December 31, 2013	D		<u>\$ 968,018.74</u>

RESERVE FOR AMORTIZATION - REVALUATION OF WATERSHED

D-38

	<u>Ref.</u>		
Balance December 31, 2012	D		<u>\$ 5,780,431.33</u>
Balance December 31, 2013	D		<u>\$ 5,780,431.33</u>

CITY OF NEWARK
WATER UTILITY FUND

SERIAL BONDS PAYABLE

D-39
Sheet #1

<u>Purpose</u>	<u>Date of Issue</u>	<u>Amount of Original Issue</u>	<u>Maturities of Bonds Outstanding Dec. 31, 2013</u>		<u>Interest Rate</u>	<u>Balance Dec. 31, 2012</u>	<u>Decrease</u>	<u>Balance Dec. 31, 2013</u>
			<u>Date</u>	<u>Amount</u>				
Water Refunding	3-10-05	\$ 23,160,000.00	10-01-2014	\$ 1,565,000.00	3.40 %	\$	\$	\$
			10-01-2015	1,225,000.00	3.50			
			10-01-2016	1,200,000.00	3.60			
			10-01-2017	1,175,000.00	3.625			
			10-01-2018	1,150,000.00	4.070			
			10-01-2019	1,140,000.00	4.070			
			10-01-2020	645,000.00	4.070			
			10-01-2021	635,000.00	4.070		10,335,000.00	8,735,000.00
General Obligations	1-15-05	7,737,000.00	12-01-2014	310,000.00	4.10			
			12-01-2015-2017	325,000.00	4.10			
			12-01-2018	340,000.00	4.10			
			12-01-2019-2021	360,000.00	4.10			
			12-01-2022	360,000.00	4.125			
			12-01-2023	360,000.00	4.20			
			12-01-2024	360,000.00	4.25			
			12-01-2025-2026	360,000.00	4.30			
			12-01-2027	360,000.00	4.375			
			12-01-2028	360,000.00	4.40			
			12-01-2029	360,000.00	4.50		5,895,000.00	5,585,000.00
General Obligations	6-16-10	5,487,000.00	10-01-2014	110,000.00	4.00			
			10-01-2015	110,000.00	4.00			
			10-01-2016	115,000.00	4.00			

CITY OF NEWARK
WATER UTILITY FUND

SERIAL BONDS PAYABLE

D-39
Sheet #2

Purpose	Date of Issue	Amount of Original Issue	Maturities of Bonds Outstanding Dec. 31, 2013		Interest Rate	Balance Dec. 31, 2012	Decrease	Balance Dec. 31, 2013
			Date	Amount				
General Obligations	6-16-10	\$ 5,487,000.00	10-01-2017	\$ 120,000.00	4.25 %	\$	\$	\$
			10-01-2018	125,000.00	4.25			
			10-01-2019	130,000.00	4.25			
			10-01-2020	135,000.00	4.25			
			10-01-2021	140,000.00	4.25			
			10-01-2022	150,000.00	4.25			
			10-01-2023	155,000.00	4.25			
			10-01-2024	165,000.00	4.25			
			10-01-2025	170,000.00	4.25			
			10-01-2026	180,000.00	4.50			
			10-01-2027	190,000.00	5.00			
			10-01-2028	200,000.00	5.00			
			10-01-2029	210,000.00	5.00			
			10-01-2030	220,000.00	5.00			
			10-01-2031	235,000.00	5.00			
			10-01-2032	245,000.00	5.00			
			10-01-2033	260,000.00	5.00			
			10-01-2034	275,000.00	5.00			
			10-01-2035	290,000.00	5.00			
			10-01-2036	307,000.00	5.00			
			10-01-2037	324,000.00	5.00			
			10-01-2038	343,000.00	5.00			
			10-01-2039	363,000.00	5.00			
						5,372,000.00	105,000.00	5,267,000.00
						<u>\$ 21,602,000.00</u>	<u>\$ 2,015,000.00</u>	<u>\$ 19,587,000.00</u>
						<u>Reference</u>	<u>D</u>	<u>Below</u>
						<u>Ref.</u>		<u>D</u>
						Deferred Charges - Capitalization of Interest	D-18	\$ 147,988.00
						Reserve for Amortization	D-36	<u>1,867,012.00</u>
						Above		<u>\$ 2,015,000.00</u>

CITY OF NEWARK
WATER UTILITY FUND

BONDS AND NOTES AUTHORIZED BUT NOT ISSUED

D-40

<u>Ordinance Number</u>		<u>Balance Dec. 31, 2012</u>	<u>Authorizations</u>	<u>Balance Dec. 31, 2013</u>
8701	Renovation of Belleville Reservoir: Complex and Appurtenances and Improvement	\$ 968,018.74	\$ (A)	\$ 968,018.74
880I	Various Purposes and Improvements	500.00		500.00
890C	Various Purposes and Improvements	500.00		500.00
930G	Various Purposes and Improvements	500.00		500.00
960A	Improvement of the Pequannock Aqueducts	1,918,000.00		1,918,000.00
A6S00	Installation and Replacement of Old Fire Hydrants with New Hydrants	800,000.00		800,000.00
A6S20	Water/Sewer Billing and Collection Computer Systems	1,425,000.00		1,425,000.00
	Waste Water Improvement Loan	207,500.00		207,500.00
O8A10	Rehabilitation - Cleaning and Lining Mains	90,000.00		90,000.00
O9A91	Rehabilitation and Distribution System	25,293.00		25,293.00
O9A92	Replacement of Water Mains	933,689.00		933,689.00
10W10	Various Improvements	3,507,500.00		3,507,500.00
10W20	Acquisition of Plotter and Scanner	40,250.00		40,250.00
10W30	Acquisition of Mid-Size Sport Utility Vehicle	276,000.00		276,000.00
10W40	Acquisition of Heavy Duty Special Equipment	586,500.00		586,500.00
10W50	Improvements to Cedar Grove Outlet	1,150,000.00		1,150,000.00
11W10	Various Improvements	9,500,000.00		9,500,000.00
11W20	Various Improvements	1,500,000.00		1,500,000.00
13WAO	Improvements to Water Distribution System		11,500,000.00	11,500,000.00
13WBO	Various Improvements		1,750,000.00	1,750,000.00
		<u>\$22,929,250.74</u>	<u>\$13,250,000.00</u>	<u>\$36,179,250.74</u>
	<u>Reference</u>	<u>D</u>	<u>Reserve</u>	<u>D</u>

(A) Note: To be funded by loan and/or grant agreement with the State of New Jersey pursuant to the Water Supply Bond Act of 1981 (C. 261, P.L. 1981).

CITY OF NEWARK
SEWER UTILITY FUND

CASH RECEIPTS AND DISBURSEMENTS - TREASURER

E-4

	<u>Ref.</u>	<u>Operating Section</u>	<u>Capital Section</u>
Balance (Deficit) December 31, 2012	E	\$ 3,723,508.21	\$ (5,138,497.81)
Increased by Receipts:			
Nonbudget Revenue	E-2	\$ 52,471.27	\$
East Orange-Passaic Valley Sewerage Commission	E-2	2,422,877.71	
Interfunds Receivable	E-10	51,580,899.10	
Due from State of New Jersey	E-11		12,539,939.00
Interfunds Payable	E-16	<u>3,184.23</u>	
		54,059,432.31	12,539,939.00
		<u>57,782,940.52</u>	<u>7,401,441.19</u>
Decreased by Disbursements:			
Budget Appropriations	E-3	53,283,136.23	
Appropriation Reserves	E-15	1,452,132.20	
Interfunds Payable	E-16	80,899.10	
Commitments Payable	E-18	9,573.69	
Reserve for State Grants	E-21		154,306.22
Improvement Authorizations	E-27		6,636,488.98
		<u>54,825,741.22</u>	<u>6,790,795.20</u>
Balance December 31, 2013	E	<u>\$ 2,957,199.30</u>	<u>\$ 610,645.99</u>

CITY OF NEWARK
SEWER UTILITY FUND

ANALYSIS OF CAPITAL CASH

E-5
Sheet #1

<u>Description</u>		<u>Balance</u> <u>Dec. 31, 2012</u>	<u>Receipts</u>	<u>Expended</u>	<u>Balance</u> <u>Dec. 31, 2013</u>
Due to Sewer Operating Fund		\$ 145,971.40	\$	\$	\$ 145,971.40
Due to Water Capital Fund		2,634.69			2,634.69
Vouchers Payable		0.77			0.77
Due from State of New Jersey for Loan:					
Sewer Rehabilitation - Project 94WW	1	(169,179.13)			(169,179.13)
Sewer Rehabilitation - Project 95WW	2	(4,334,555.87)			(4,334,555.87)
Rehabilitation of Mt. Vernon Place - 00WW	3	(1,144,281.00)			(1,144,281.00)
Combined Sewer Overflow	4	(7,614,396.00)	7,614,396.00		
Sewer Rehabilitation - S0210	5	(673,603.00)			(673,603.00)
Sewer Rehabilitation - O7SOA	6	(660,947.00)	78,043.00		(582,904.00)
Sewer Rehabilitation - O7SOB	7	(6,852,877.00)	234,129.00		(6,618,748.00)
Phase 3 Construction - O8BI - S340815-13	9	(2,553,393.00)	2,553,393.00		
Phase 6 Additional Priority Brick Sewer Rehabilitation Program S340815-17	10	(4,883,908.00)	153,707.00		(4,730,201.00)
Phase 6 Additional Priority Brick Sewer Rehabilitation Program S340815-17 - With ARRA Principal Forgiveness	10	(496,462.00)			(496,462.00)
Contribution to Joint Meeting - 2010	11	(470,646.00)			(470,646.00)
Rehabilitation Cured in Place Pipe - 10S4	12	(2,240,547.00)	557,122.00		(1,683,425.00)
Catch Basin Cleaner Vacuum Jet - S340815.4	13	(296,217.00)	296,217.00		
Unallocated Cash Receipts from State of New Jersey			1,052,932.00		1,052,932.00
		<u>(32,391,012.00)</u>	<u>12,539,939.00</u>		<u>(19,851,073.00)</u>
Improvement Authorizations:					
Sewer System Rehabilitation Project:					
94WW - State Funded	1	135,158.29			135,158.29
95WW - State Funded	2	5,239,639.82			5,239,639.82
Rehabilitation of Mt. Vernon Place	3	1,150,375.11			1,150,375.11
Combined Sewer Overflow	4	5,261,247.46		3,865,583.96	1,395,663.50
Brick Rehabilitation - Project S65Bo-qo	4A	8,093.30			8,093.30

CITY OF NEWARK
SEWER UTILITY FUND

ANALYSIS OF CAPITAL CASH

E-5
Sheet #2

<u>Description</u>		<u>Balance</u> <u>Dec. 31, 2012</u>	<u>Receipts</u>	<u>Expended</u>	<u>Balance</u> <u>Dec. 31, 2013</u>
Improvement Authorizations:					
Sewer System Rehabilitation Project:					
Sewer Rehabilitation - S0210	5	\$ 741,762.04	\$	\$	\$ 741,762.04
Cleaning Sewer by Removal Dis - 07SOA	6	73,013.88			73,013.88
Construction of Phase III CSO - 07SOB	7	6,805,570.18		951,582.15	5,853,988.03
Heavy Cleaning of Brick Sewer - 07SOC	8	911,224.84		161,000.00	750,224.84
Phase 3 Construction - 08BI - S340815-13	9	2,502,134.02		1,084,206.42	1,417,927.60
Phase 6 Additional Priority Brick Sewer Rehabilitation Program S340815-17 -					
With ARRA Principal Forgiveness	10	4,167,706.78		276,669.37	3,891,037.41
Contribution to Joint Meeting - 2010	11	468,011.31			468,011.31
Rehabilitation Cured in Place Pipe - S340815.7	12	899,972.40		192,879.08	707,093.32
Catch Basin Cleaner Vacuum Jet - S340815.4	13	66,517.00			66,517.00
		<u>28,430,426.43</u>		<u>6,531,920.98</u>	<u>21,898,505.45</u>
Design of CSO Funds Equating City's 10% Match for Grant		(353,500.00)			(353,500.00)
Geographic Information System		(230,618.81)			(230,618.81)
Contribution to Essex County Joint Meeting		2,087.05			2,087.05
Infiltration Investigation		66,548.63			66,548.63
Acquisition of Light Duty Vehicles - 10S20		(120,658.00)			(120,658.00)
Acquisition of Heavy Duty Specialty Vehicles - 10S30		(584,225.00)		104,568.00	(688,793.00)
		<u>(1,220,366.13)</u>		<u>104,568.00</u>	<u>(1,324,934.13)</u>
State Grant Receivable		(1,397,959.91)			(1,397,959.91)
Reserve for State Grant - Sewer Improvement		<u>1,291,806.94</u>		<u>154,306.22</u>	<u>1,137,500.72</u>
		<u>\$ (5,138,497.81)</u>	<u>\$ 12,539,939.00</u>	<u>\$ 6,790,795.20</u>	<u>\$ 610,645.99</u>

Reference

E

E-4

E-4

E

CITY OF NEWARK
SEWER UTILITY FUND

CONSUMERS' ACCOUNTS RECEIVABLE

E-6

	<u>Ref.</u>	
Balance December 31, 2012	E	\$ 9,151,157.17
Increased by:		
Rents and Charges Levied - Net	Reserve	52,508,092.14
		<u>61,659,249.31</u>
Decreased by:		
Collections in Water Utility Fund	E-10	\$ 51,425,952.41
Overpayments Applied	E-19	551,393.54
	E-2	<u>51,977,345.95</u>
Cancelled	Reserve	<u>154,672.06</u>
		<u>52,132,018.01</u>
Balance December 31, 2013	E	<u>\$ 9,527,231.30</u>

SEWER CONNECTIONS - ARREARS

E-7

	<u>Ref.</u>	
Balance December 31, 2012	E	<u>\$ 4,940.00</u>
Balance December 31, 2013	E	<u>\$ 4,940.00</u>

Ref.

Arrears

CITY OF NEWARK
SEWER UTILITY FUND

DELINQUENT SEWER RENTS RECEIVABLE
OPERATING SECTION

E-8

	<u>Ref.</u>	
Balance December 31, 2012	E	<u>\$ 11,908.97</u>
Balance December 31, 2013	E,Below	<u>\$ 11,908.97</u>
 <u>Summary of Tax Collector's File</u>		
Year 2007		\$ 4,969.25
Year 2010		<u>6,939.72</u>
	Above	<u>\$ 11,908.97</u>

CITY OF NEWARK
SEWER UTILITY FUND

SEWER LIENS RECEIVABLE

E-9

	<u>Ref.</u>	
Balance December 31, 2012	E	<u>\$ 3,167,456.34</u>
Balance December 31, 2013	E	<u><u>\$ 3,167,456.34</u></u>

CITY OF NEWARK
SEWER UTILITY FUND

INTERFUNDS RECEIVABLE

E-10

	<u>Ref.</u>	<u>Total Sewer Operating Fund</u>	<u>Sewer Operating Fund</u>	
			<u>Due from Water Operating Fund</u>	<u>Due from Sewer Capital Fund</u>
Balance December 31, 2012	E	<u>\$ 145,971.40</u>	\$	<u>\$ 145,971.40</u>
Increased by:				
Consumer Accounts Receivable	E-6	51,425,952.41	51,425,952.41	
Collected in Water Utility Fund	E-19	154,946.69	154,946.69	
Sewer Rent Overpayments		<u>51,580,899.10</u>	<u>51,580,899.10</u>	
		51,726,870.50	51,580,899.10	145,971.40
Decreased by:				
Cash Receipts	E-4	<u>51,580,899.10</u>	<u>51,580,899.10</u>	
Balance December 31, 2013	E	<u>\$ 145,971.40</u>	<u>\$ -</u>	<u>\$ 145,971.40</u>

CITY OF NEWARK
SEWER UTILITY FUND

DUE FROM STATE OF NEW JERSEY

E-11

	<u>Ref.</u>	
Balance December 31, 2012	E	\$ 32,391,012.00
Decreased by:		
Cash Received	E-4	<u>12,539,939.00</u>
Balance December 31, 2013	E	<u>\$ 19,851,073.00</u>

FIXED CAPITAL
CAPITAL SECTION

E-12

	<u>Ref.</u>	
Balance December 31, 2012	E	\$ 732,329.50
Increased by:		
Capital Outlay:		
Year 2012	E-24	\$ 824,229.98
Year 2013	E-24	<u>453,102.34</u>
		<u>1,277,332.32</u>
Balance December 31, 2013	E	<u>\$ 2,009,661.82</u>

CITY OF NEWARK
SEWER UTILITY FUND

FIXED CAPITAL AUTHORIZED AND UNCOMPLETED
CAPITAL SECTION

E-13

	<u>Ref.</u>	<u>Sewer System Rehabilitation Project</u>
Balance December 31, 2012	E	\$ 144,876,750.00
Increased by:		
2013 Authorizations	E-27	<u>21,670,456.00</u>
Balance December 31, 2013	E	<u>\$ 166,547,206.00</u>

STATE GRANT RECEIVABLE

E-14

	<u>Ref.</u>	
Balance December 31, 2012	E	<u>\$ 1,397,959.91</u>
Balance December 31, 2013	E	<u>\$ 1,397,959.91</u>

CITY OF NEWARK
SEWER UTILITY FUND

APPROPRIATION RESERVES

E-15

	Balance Dec. 31, 2012		Modified	Paid or	Accounts	Unexpended
	<u>Encumbered</u>	<u>Reserve</u>	<u>Budget</u>	<u>Charged</u>	<u>Payable</u>	<u>Balance Lapsed</u>
<u>Operating</u>						
Billing and Customer Service:						
Salaries and Wages:						
Personnel Services	\$	\$ 76,637.07	\$ 76,637.07	\$	\$	\$ 76,637.07
Other Pay		4,500.00	4,500.00			4,500.00
Other Expenses:						
Service by Contract or Agreement	20,450.00	65,000.00	85,450.00	12,573.90	7,876.10	65,000.00
Materials and Supplies	5,043.41		5,043.41	5,043.41		
Sewer Supply:						
Other Expenses:						
Service by Contract or Agreement	945,015.51	500,000.00	1,445,015.51	619,687.64	323,612.04	501,715.83
Materials and Supplies	14,241.65		14,241.65	969.15	13,245.00	27.50
Unclassified:						
Hospital/Medical/Surgical Insurance	209,028.95		209,028.95	105,689.47	103,339.48	
Capital Outlay:						
Service by Contract or Agreement	825,457.00	200,000.00	1,025,457.00	708,168.63	116,061.35	201,227.02
Total Sewer Utility Appropriations	<u>\$2,019,236.52</u>	<u>\$846,137.07</u>	<u>\$2,865,373.59</u>	<u>\$1,452,132.20</u>	<u>\$564,133.97</u>	<u>\$849,107.42</u>
<u>Reference</u>	<u>E</u>	<u>E</u>		<u>E-4</u>	<u>E-18</u>	<u>E-1</u>

CITY OF NEWARK
SEWER UTILITY FUND

INTERFUNDS PAYABLE

E-16

	Ref.	Total Sewer Operating Fund	Sewer Operating			Total Sewer Operating Fund	Sewer Capital	
			Due to Trust - Other Funds	Due to Payroll Fund	Due to Water Operating Fund		Due to Sewer Operating Fund	Due to Water Capital Fund
Balance December 31, 2012	E	\$80,899.10	\$	\$	\$80,899.10	\$148,606.09	\$145,971.40	\$2,634.69
Increased by:								
Budget Appropriation	E-3	4,848.00	4,848.00					
Advances	E-4	3,184.23		3,184.23				
		88,931.33	4,848.00	3,184.23	80,899.10	148,606.09	145,971.40	2,634.69
Decreased by:								
Cash Disbursed	E-4	80,899.10			80,899.10			
Balance December 31, 2013	E	<u>\$ 8,032.23</u>	<u>\$4,848.00</u>	<u>\$3,184.23</u>	<u>\$ -</u>	<u>\$148,606.09</u>	<u>\$145,971.40</u>	<u>\$2,634.69</u>

CITY OF NEWARK
SEWER UTILITY FUND

DUE TO TAX COLLECTOR (CURRENT FUND)

E-17

	<u>Ref.</u>	
Balance December 31, 2012	E	\$ 7.67
Balance December 31, 2013	E	<u>\$ 7.67</u>

COMMITMENTS PAYABLE

E-18

	<u>Ref.</u>	
Balance December 31, 2012	E	\$ 65,918.02
Increased by:		
Transferred from Appropriation Reserves	E-15	564,133.97
		<u>630,051.99</u>
Decreased by:		
Payments	E-4	9,573.69
Balance December 31, 2013	E	<u>\$ 620,478.30</u>

SEWER RENT OVERPAYMENTS

E-19

	<u>Ref.</u>	
Balance December 31, 2012	E	\$ 551,393.54
Increased by:		
Collected in Water Utility Fund	E-10	154,946.69
		<u>706,340.23</u>
Decreased by:		
Overpayments Applied	E-6	551,393.54
Balance December 31, 2013	E	<u>\$ 154,946.69</u>

CITY OF NEWARK
SEWER UTILITY FUND

ACCRUED PAYROLL

E-20

	<u>Ref.</u>	
Balance December 31, 2012	E	<u>\$ 28,737.10</u>
Balance December 31, 2013	E	<u>\$ 28,737.10</u>

RESERVE FOR STATE GRANT - SEWER IMPROVEMENT

E-21

	<u>Ref.</u>	
Balance December 31, 2012	E	\$1,291,806.94
Decreased by:		
Cash Disbursements	E-4	<u>154,306.22</u>
Balance December 31, 2013	E	<u>\$1,137,500.72</u>

CITY OF NEWARK
SEWER UTILITY FUND

VOUCHERS PAYABLE

E-22

	<u>Ref.</u>	
Balance December 31, 2012	E	\$ 0.77
Balance December 31, 2013	E	<u>\$ 0.77</u>

DEFERRED RESERVE FOR AMORTIZATION

E-23

	<u>Ref.</u>	
Balance December 31, 2012	E	\$ 44,967,862.59
Increased by:		
Payment of Bond Principal - Trust Loan	E-25	\$ 2,302,852.56
Payment of Bond Principal - Fund Loan	E-25	<u>3,231,111.74</u>
		<u>5,533,964.30</u>
Balance December 31, 2013	E	<u>\$ 50,501,826.89</u>

RESERVE FOR AMORTIZATION

E-24

	<u>Ref.</u>	
Balance December 31, 2012	E	\$ 732,329.50
Increased by:		
Capital Outlay:		
Year 2012	E-12	\$ 824,229.98
Year 2013	E-12	<u>453,102.34</u>
		<u>1,277,332.32</u>
Balance December 31, 2013	E	<u>\$ 2,009,661.82</u>

CITY OF NEWARK
SEWER UTILITY FUND

STATE OF NEW JERSEY
WASTE WATER TREATMENT LOANS

E-25

	<u>Ref.</u>		
Balance December 31, 2012	E		\$ 75,234,133.41
Decreased by:			
Paid to State of New Jersey:			
Trust Loan	E-23	\$ 2,302,852.56	
Fund Loan	E-23	<u>3,231,111.74</u>	
			<u>5,533,964.30</u>
Balance December 31, 2013	E		<u>\$ 69,700,169.11</u>

Analysis of Loans

<u>Trust Loan</u> <u>Schedule A</u>			<u>Fund Loan</u> <u>Schedule B</u>		
<u>Date</u>	<u>Rate</u>	<u>Amount</u>	<u>Date</u>	<u>Rate</u>	<u>Amount</u>
See E-25			See E-26		
1994		\$ 567,025.95	2000		\$ 245,430.48
1995		1,310,000.00	2002		173,132.20
2000		330,000.00	2005		11,733,657.89
2002		215,000.00	2006		383,845.60
2005		4,745,000.00	2007		19,797,707.33
2006		160,000.00	2009		3,379,410.01
2007		8,085,000.00	2009		3,989,871.44
2009		1,225,000.00	2010		364,500.05
2009		2,995,000.00	2010		205,018.68
2010		125,000.00	2010		4,200,569.48
2010		220,000.00			
2010		<u>5,250,000.00</u>			
		<u>\$ 25,227,025.95</u>			<u>\$ 44,473,143.16</u>
<u>Reference</u>	<u>E</u>		<u>Reference</u>	<u>E</u>	

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 1994A BORROWER) (REFUNDING BONDS, SERIES 1998G)
DEBT SERVICE SCHEDULE - TRUST LOAN

E-25
Sheet #1

<u>Date</u>	<u>Original Principal</u>	<u>Refunding</u>	
		<u>Principal</u>	<u>Interest</u>
3-01-14	<u>\$ 670,000.00</u>	<u>\$ 567,025.95</u>	<u>\$ 21,356.25</u>
<u>Reference</u>		<u>E-25</u>	

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 1995B BORROWER)
DEBT SERVICE SCHEDULE - TRUST LOAN

E-25
Sheet #2

<u>Date</u>	<u>Principal</u>	<u>Coupon</u>	<u>Interest</u>
2-01-14			\$ 34,387.50
8-01-14	\$ 640,000.00	5.250%	34,387.50
2-01-15			17,587.50
8-01-15	<u>670,000.00</u>	5.250%	<u>17,587.50</u>
	<u>\$ 1,310,000.00</u>		<u>\$ 103,950.00</u>
<u>Reference</u>	<u>E-25</u>		

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 2000B BORROWER)
DEBT SERVICE SCHEDULE - TRUST LOAN

E-25
Sheet #3

<u>Date</u>	<u>Principal</u>	<u>Interest</u>
8-01-14	\$ 40,000.00	\$ 17,112.50
8-01-15	45,000.00	15,112.50
8-01-16	45,000.00	12,806.26
8-01-17	45,000.00	10,500.00
8-01-18	50,000.00	8,137.50
8-01-19	50,000.00	5,512.50
8-01-20	55,000.00	2,887.50
	<u>\$ 330,000.00</u>	<u>\$ 72,068.76</u>

Reference

E-25

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 2002 BORROWER)
DEBT SERVICE SCHEDULE - TRUST LOAN

E-25
Sheet #4

<u>Date</u>	<u>Principal</u>	<u>Interest</u>
8-01-14	\$ 20,000.00	\$ 10,725.00
8-01-15	20,000.00	9,675.00
8-01-16	20,000.00	8,675.00
8-01-17	25,000.00	7,675.00
8-01-18	25,000.00	6,425.00
8-01-19	25,000.00	5,175.00
8-01-20	25,000.00	3,925.00
8-01-21	25,000.00	2,675.00
8-01-22	30,000.00	1,425.00
	<u>\$ 215,000.00</u>	<u>\$ 56,375.00</u>

Reference

E-25

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 2005 BORROWER)
DEBT SERVICE SCHEDULE - TRUST LOAN

E-25
Sheet #5

<u>Date</u>	<u>Principal</u>	<u>Interest</u>
2-01-14	\$	\$ 102,646.88
8-01-14	310,000.00	102,646.88
2-01-15		94,896.88
8-01-15	325,000.00	94,896.88
2-01-16		88,396.88
8-01-16	340,000.00	88,396.88
2-01-17		81,596.88
8-01-17	350,000.00	81,596.88
2-01-18		74,596.88
8-01-18	365,000.00	74,596.88
2-01-19		66,840.63
8-01-19	380,000.00	66,840.63
2-01-20		58,765.63
8-01-20	400,000.00	58,765.63
2-01-21		49,765.63
8-01-21	415,000.00	49,765.63
2-01-22		40,687.50
8-01-22	435,000.00	40,687.50
2-01-23		31,171.88
8-01-23	455,000.00	31,171.88
2-01-24		21,218.75
8-01-24	475,000.00	21,218.75
2-01-25		10,828.13
8-01-25	<u>495,000.00</u>	<u>10,828.13</u>
	<u>\$ 4,745,000.00</u>	<u>\$ 1,442,825.10</u>

Reference

E-25

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 2006 BORROWER)
DEBT SERVICE SCHEDULE - TRUST LOAN

E-25
Sheet #6

<u>Date</u>	<u>Principal</u>	<u>Coupon</u>	<u>Interest</u>
2-01-14	\$		\$ 3,500.00
8-01-14	10,000.00	5.00%	3,500.00
2-01-15			3,250.00
8-01-15	10,000.00	5.00%	3,250.00
2-01-16			3,000.00
8-01-16	10,000.00	5.00%	3,000.00
2-01-17			2,750.00
8-01-17	10,000.00	4.00%	2,750.00
2-01-18			2,550.00
8-01-18	10,000.00	4.00%	2,550.00
2-01-19			2,350.00
8-01-19	10,000.00	4.00%	2,350.00
2-01-20			2,150.00
8-01-20	10,000.00	4.00%	2,150.00
2-01-21			1,950.00
8-01-21	15,000.00	4.13%	1,950.00
2-01-22			1,640.63
8-01-22	15,000.00	4.13%	1,640.62
2-01-23			1,331.25
8-01-23	15,000.00	4.25%	1,331.25
2-01-24			1,012.50
8-01-24	15,000.00	5.00%	1,012.50
2-01-25			637.50
8-01-25	15,000.00	4.25%	637.50
2-01-26			318.75
8-01-26	<u>15,000.00</u>	4.25%	<u>318.75</u>
	<u>\$ 160,000.00</u>		<u>\$ 52,881.25</u>

Reference E-25

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 2007 BORROWER)
DEBT SERVICE SCHEDULE - TRUST LOAN

E-25
Sheet #7

<u>Date</u>	<u>Principal</u>	<u>Coupon</u>	<u>Administration Fee</u>	<u>Interest</u>
2-01-14	\$		\$ 13,905.00	\$ 183,237.50
8-01-14	425,000.00	3.60%	13,905.00	183,237.50
2-01-15			13,905.00	175,587.50
8-01-15	440,000.00	5.00%	13,905.00	175,587.50
2-01-16			13,905.00	164,587.50
8-01-16	460,000.00	5.00%	13,905.00	164,587.50
2-01-17			13,905.00	153,087.50
8-01-17	485,000.00	5.00%	13,905.00	153,087.50
2-01-18			13,905.00	140,962.50
8-01-18	510,000.00	5.00%	13,905.00	140,962.50
2-01-19			13,905.00	128,212.50
8-01-19	535,000.00	4.00%	13,905.00	128,212.50
2-01-20			13,905.00	117,512.50
8-01-20	555,000.00	4.00%	13,905.00	117,512.50
2-01-21			13,905.00	106,412.50
8-01-21	580,000.00	5.00%	13,905.00	106,412.50
2-01-22			13,905.00	91,912.50
8-01-22	610,000.00	5.00%	13,905.00	91,912.50
2-01-23			13,905.00	76,662.50
8-01-23	640,000.00	4.25%	13,905.00	76,662.50
2-01-24			13,905.00	63,062.50
8-01-24	665,000.00	4.25%	13,905.00	63,062.50
2-01-25			13,905.00	48,100.00
8-01-25	695,000.00	4.50%	13,905.00	48,100.00
2-01-26			13,905.00	32,462.50
8-01-26	725,000.00	4.50%	13,905.00	32,462.50
2-01-27			13,905.00	16,150.00
8-01-27	<u>760,000.00</u>	4.25%	<u>13,905.00</u>	<u>16,150.00</u>
	<u>\$ 8,085,000.00</u>		<u>\$ 389,340.00</u>	<u>\$ 2,995,900.00</u>

Reference E-25

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 2009 BORROWER)
PROJECT (CW) (S340815.13)
DEBT SERVICE SCHEDULE - TRUST LOAN

E-25
Sheet #8

<u>Date</u>	<u>Principal</u>	<u>Coupon</u>	<u>Administration Fee</u>	<u>Interest</u>
2-01-14	\$		\$ 6,571.00	\$ 25,693.75
8-01-14	55,000.00	5.00 %		25,693.75
2-01-15				24,318.75
8-01-15	55,000.00	5.00		24,318.75
2-01-16				22,943.75
8-01-16	60,000.00	5.00		22,943.75
2-01-17				21,443.75
8-01-17	65,000.00	5.00		21,443.75
2-01-18				19,818.75
8-01-18	65,000.00	5.00		19,818.75
2-01-19				18,193.75
8-01-19	70,000.00	4.00		18,193.75
2-01-20				16,793.75
8-01-20	70,000.00	4.00		16,793.75
2-01-21				15,393.75
8-01-21	75,000.00	4.00		15,393.75
2-01-22				13,893.75
8-01-22	80,000.00	3.50		13,893.75
2-01-23				12,493.75
8-01-23	80,000.00	4.00		12,493.75
2-01-24				10,893.75
8-01-24	85,000.00	4.00		10,893.75
2-01-25				9,193.75
8-01-25	85,000.00	3.75		9,183.75
2-01-26				7,600.00
8-01-26	90,000.00	4.00		7,600.00
2-01-27				5,800.00
8-01-27	95,000.00	4.00		5,800.00
2-01-28				3,900.00
8-01-28	95,000.00	4.00		3,900.00
2-01-29				2,000.00
8-01-29	100,000.00	4.00		2,000.00
	<u>\$ 1,225,000.00</u>		<u>\$ 6,571.00</u>	<u>\$ 460,740.00</u>

Reference E-25 Loan subject to a yearly \$4,135.00 NJEIT Fee.

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 2009 BORROWER)
PROJECT (CW) (S340815.17)
DEBT SERVICE SCHEDULE - TRUST LOAN

E-25
Sheet #9

<u>Date</u>	<u>Principal</u>	<u>Coupon</u>	<u>Administration Fee</u>	<u>Interest</u>
2-01-14	\$		\$ 16,091.38	\$ 62,812.50
8-01-14	130,000.00	5.00 %		62,812.50
2-01-15				59,562.50
8-01-15	140,000.00	5.00		59,562.50
2-01-16				56,062.50
8-01-16	145,000.00	5.00		56,062.50
2-01-17				52,437.50
8-01-17	155,000.00	5.00		52,437.50
2-01-18				48,562.50
8-01-18	160,000.00	5.00		48,562.50
2-01-19				44,562.50
8-01-19	170,000.00	4.00		44,562.50
2-01-20				41,162.50
8-01-20	175,000.00	4.00		41,162.50
2-01-21				37,662.50
8-01-21	180,000.00	4.00		37,662.50
2-01-22				34,062.50
8-01-22	190,000.00	3.50		34,062.50
2-01-23				30,737.50
8-01-23	195,000.00	4.00		30,737.50
2-01-24				26,837.50
8-01-24	205,000.00	4.00		26,837.50
2-01-25				22,737.50
8-01-25	210,000.00	3.75		22,737.50
2-01-26				18,800.00
8-01-26	220,000.00	4.00		18,800.00
2-01-27				14,400.00
8-01-27	230,000.00	4.00		14,400.00
2-01-28				9,800.00
8-01-28	240,000.00	4.00		9,800.00
2-01-29				5,000.00
8-01-29	250,000.00	4.00		5,000.00
	<u>\$ 2,995,000.00</u>		<u>\$ 16,091.38</u>	<u>\$ 1,130,400.00</u>

Reference E-25 Loan subject to a yearly \$10,080.00 NJEIT Fee.

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 2010 BORROWER)
PROJECT (CW) ()
DEBT SERVICE SCHEDULE - TRUST LOAN

E-25
Sheet #10

<u>Date</u>	<u>Principal</u>	<u>Coupon</u>	<u>Administration Fee</u>	<u>Interest</u>
2-01-14	\$		\$ 810.00	\$ 2,750.00
8-01-14	10,000.00	5.00 %		2,750.00
2-01-15				2,500.00
8-01-15	10,000.00	5.00		2,500.00
2-01-16				2,250.00
8-01-16	10,000.00	5.00		2,250.00
2-01-17				2,000.00
8-01-17	10,000.00	5.00		2,000.00
2-01-18				1,750.00
8-01-18	10,000.00	5.00		1,750.00
2-01-19				1,500.00
8-01-19	10,000.00	4.00		1,500.00
2-01-20				1,300.00
8-01-20	10,000.00	5.00		1,300.00
2-01-21				1,050.00
8-01-21	10,000.00	3.00		1,050.00
2-01-22				900.00
8-01-22	15,000.00	4.00		900.00
2-01-23				600.00
8-01-23	15,000.00	4.00		600.00
2-01-24				300.00
8-01-24	15,000.00	4.00		300.00
	<u>\$ 125,000.00</u>		<u>\$ 810.00</u>	<u>\$ 33,800.00</u>

Reference E-25 Loan subject to a yearly \$465.00 NJEIT Fee.

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 2010A BORROWER)
PROJECT (CW) ()
DEBT SERVICE SCHEDULE - TRUST LOAN

E-25
Sheet #11

<u>Date</u>	<u>Principal</u>	<u>Coupon</u>	<u>Administration Fee</u>	<u>Interest</u>
2-01-14	\$		\$ 1,153.25	\$ 4,612.50
8-01-14	10,000.00	5.00 %		4,612.50
2-01-15				4,362.50
8-01-15	10,000.00	5.00		4,362.50
2-01-16				4,112.50
8-01-16	10,000.00	5.00		4,112.50
2-01-17				3,862.50
8-01-17	10,000.00	5.00		3,862.50
2-01-18				3,612.50
8-01-18	10,000.00	5.00		3,612.50
2-01-19				3,362.50
8-01-19	10,000.00	4.00		3,362.50
2-01-20				3,162.50
8-01-20	15,000.00	5.00		3,162.50
2-01-21				2,787.50
8-01-21	15,000.00	3.00		2,787.50
2-01-22				2,562.50
8-01-22	15,000.00	4.00		2,562.50
2-01-23				2,262.50
8-01-23	15,000.00	4.00		2,262.50
2-01-24				1,962.50
8-01-24	15,000.00	4.00		1,962.50
2-01-25				1,662.50
8-01-25	15,000.00	4.00		1,662.50
2-01-26				1,362.50
8-01-26	15,000.00	3.50		1,362.50
2-01-27				1,100.00
8-01-27	15,000.00	4.00		1,100.00
2-01-28				800.00
8-01-28	20,000.00	4.00		800.00
2-01-29				400.00
8-01-29	20,000.00	4.00		400.00
	<u>\$ 220,000.00</u>		<u>\$ 1,153.25</u>	<u>\$ 83,975.00</u>

Reference E-25 Loan subject to a yearly \$720.00 NJEIT Fee.

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 2010C BORROWER)
PROJECT (CW) ()
DEBT SERVICE SCHEDULE - TRUST LOAN

E-25
Sheet #12

<u>Date</u>	<u>Principal</u>	<u>Coupon</u>	<u>Administration Fee</u>	<u>Interest</u>
2-01-14	\$		\$ 16,020.63	\$ 131,250.00
8-01-14	205,000.00	5.00 %	16,020.63	131,250.00
2-01-15			16,020.63	126,125.00
8-01-15	215,000.00	5.00		126,125.00
2-01-16				120,750.00
8-01-16	225,000.00	5.00		120,750.00
2-01-17				115,125.00
8-01-17	235,000.00	5.00		115,125.00
2-01-18				109,250.00
8-01-18	245,000.00	5.00		109,250.00
2-01-19				103,125.00
8-01-19	260,000.00	4.00		103,125.00
2-01-20				96,625.00
8-01-20	275,000.00	5.00		96,625.00
2-01-21				89,750.00
8-01-21	285,000.00	3.00		89,750.00
2-01-22				82,625.00
8-01-22	300,000.00	4.00		82,625.00
2-01-23				75,125.00
8-01-23	315,000.00	4.00		75,125.00
2-01-24				67,250.00
8-01-24	330,000.00	4.00		67,250.00
2-01-25				59,000.00
8-01-25	345,000.00	4.00		59,000.00
2-01-26				50,375.00
8-01-26	365,000.00	3.50		50,375.00
2-01-27				41,250.00
8-01-27	385,000.00	4.00		41,250.00
2-01-28				31,625.00
8-01-28	400,000.00	4.00		31,625.00
2-01-29				21,625.00
8-01-29	420,000.00	4.00		21,625.00
2-01-30				11,125.00
8-01-30	445,000.00	5.00		11,125.00
	<u>\$ 5,250,000.00</u>		<u>\$ 48,061.89</u>	<u>\$ 2,664,000.00</u>

Reference E-25 Loan subject to a yearly \$16,890.00 NJEIT Fee.

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 2000B BORROWER)
DEBT SERVICE SCHEDULE - FUND LOAN

E-26
Sheet #1

<u>Date</u>	<u>Annual Principal</u>
8-01-14	\$ 34,862.53
8-01-15	36,693.79
8-01-16	35,286.02
8-01-17	33,878.23
8-01-18	35,488.22
8-01-19	33,885.86
8-01-20	35,335.83
	<u>\$ 245,430.48</u>

Reference

E-25

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 2002 BORROWER)
DEBT SERVICE SCHEDULE - FUND LOAN

E-26
Sheet #2

<u>Date</u>	<u>Annual Principal</u>
8-01-14	\$ 19,601.96
8-01-15	18,932.08
8-01-16	18,294.10
8-01-17	20,846.03
8-01-18	20,048.55
8-01-19	19,251.07
8-01-20	18,453.59
8-01-21	17,656.11
8-01-22	20,048.71
	<u>\$ 173,132.20</u>
<u>Reference</u>	<u>E-25</u>

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 2005 BORROWER)
DEBT SERVICE SCHEDULE - FUND LOAN

E-26
Sheet #3

<u>Date</u>	<u>Semiannual Principal</u>
2-01-14	\$ 194,644.04
8-01-14	782,481.25
2-01-15	179,948.11
8-01-15	796,229.06
2-01-16	167,622.49
8-01-16	812,347.18
2-01-17	154,727.99
8-01-17	818,415.17
2-01-18	141,454.25
8-01-18	833,585.17
2-01-19	126,746.47
8-01-19	847,321.12
2-01-20	111,434.26
8-01-20	869,933.89
2-01-21	94,368.02
8-01-21	881,311.39
2-01-22	77,153.63
8-01-22	902,021.98
2-01-23	59,109.63
8-01-23	921,902.97
2-01-24	40,236.03
8-01-24	940,954.34
2-01-25	20,532.82
8-01-25	959,176.63
	<u>\$11,733,657.89</u>
<u>Reference</u>	<u>E-25</u>

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 2006 BORROWER)
DEBT SERVICE SCHEDULE - FUND LOAN

E-26
Sheet #4

<u>Date</u>	<u>Semiannual Principal</u>
2-01-14	\$ 6,310.83
8-01-14	24,341.81
2-01-15	5,860.06
8-01-15	23,891.03
2-01-16	5,409.29
8-01-16	23,440.26
2-01-17	4,958.51
8-01-17	22,989.48
2-01-18	4,597.89
8-01-18	22,628.86
2-01-19	4,237.27
8-01-19	22,268.24
2-01-20	3,876.65
8-01-20	21,907.62
2-01-21	3,516.03
8-01-21	30,562.49
2-01-22	2,958.20
8-01-22	30,004.66
2-01-23	2,400.37
8-01-23	29,446.82
2-01-24	1,825.63
8-01-24	28,872.09
2-01-25	1,149.47
8-01-25	28,195.93
2-01-26	574.73
8-01-26	27,621.38
	<u>\$ 383,845.60</u>

Reference

E-25

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 2007 BORROWER)
DEBT SERVICE SCHEDULE - FUND LOAN

E-26
Sheet #5

<u>Date</u>	<u>Semiannual Principal</u>
2-01-14	\$ 327,381.56
8-01-14	1,086,708.48
2-01-15	313,713.68
8-01-15	1,099,840.36
2-01-16	294,060.51
8-01-16	1,115,920.23
2-01-17	273,514.02
8-01-17	1,140,040.02
2-01-18	251,850.87
8-01-18	1,163,043.16
2-01-19	229,071.06
8-01-19	1,184,929.65
2-01-20	209,953.89
8-01-20	1,201,545.50
2-01-21	190,122.05
8-01-21	1,226,379.96
2-01-22	164,215.61
8-01-22	1,254,073.06
2-01-23	136,969.17
8-01-23	1,280,426.17
2-01-24	112,670.71
8-01-24	1,300,794.00
2-01-25	85,937.94
8-01-25	1,327,660.77
2-01-26	57,999.17
8-01-26	1,353,321.56
2-01-27	28,854.42
8-01-27	1,386,709.75
	<u>\$19,797,707.33</u>

Reference

E-25

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 2009A BORROWER)
DEBT SERVICE SCHEDULE - FUND LOAN

E-26
Sheet #6

<u>Date</u>	<u>Semiannual Principal</u>
2-01-14	\$ 70,404.37
8-01-14	140,808.75
2-01-15	70,404.37
8-01-15	140,808.75
2-01-16	70,404.37
8-01-16	140,808.75
2-01-17	70,404.37
8-01-17	140,808.75
2-01-18	70,404.37
8-01-18	140,808.75
2-01-19	70,404.37
8-01-19	140,808.75
2-01-20	70,404.37
8-01-20	140,808.75
2-01-21	70,404.37
8-01-21	140,808.75
2-01-22	70,404.37
8-01-22	140,808.75
2-01-23	70,404.37
8-01-23	140,808.75
2-01-24	70,404.37
8-01-24	140,808.75
2-01-25	70,404.37
8-01-25	140,808.75
2-01-26	70,404.37
8-01-26	140,808.75
2-01-27	70,404.37
8-01-27	140,808.75
2-01-28	70,404.37
8-01-28	140,808.75
2-01-29	70,404.37
8-01-29	140,808.84
	<u>\$ 3,379,410.01</u>

Reference

E-25

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 2009A BORROWER)
DEBT SERVICE SCHEDULE - FUND LOAN

E-26
Sheet #7

<u>Date</u>	<u>Semiannual Principal</u>
2-01-14	\$ 83,122.32
8-01-14	166,244.64
2-01-15	83,122.32
8-01-15	166,244.64
2-01-16	83,122.32
8-01-16	166,244.64
2-01-17	83,122.32
8-01-17	166,244.64
2-01-18	83,122.32
8-01-18	166,244.64
2-01-19	83,122.32
8-01-19	166,244.64
2-01-20	83,122.32
8-01-20	166,244.64
2-01-21	83,122.32
8-01-21	166,244.64
2-01-22	83,122.32
8-01-22	166,244.64
2-01-23	83,122.32
8-01-23	166,244.64
2-01-24	83,122.32
8-01-24	166,244.64
2-01-25	83,122.32
8-01-25	166,244.64
2-01-26	83,122.32
8-01-26	166,244.64
2-01-27	83,122.32
8-01-27	166,244.64
2-01-28	83,122.32
8-01-28	166,244.64
2-01-29	83,122.32
8-01-29	166,244.72
	<u>\$ 3,989,871.44</u>

Reference

E-25

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 2010A BORROWER)
DEBT SERVICE SCHEDULE - FUND LOAN

E-26
Sheet #8

<u>Date</u>	<u>Semiannual Principal</u>
2-01-14	\$ 11,045.45
8-01-14	22,090.90
2-01-15	11,045.45
8-01-15	22,090.90
2-01-16	11,045.45
8-01-16	22,090.90
2-01-17	11,045.45
8-01-17	22,090.90
2-01-18	11,045.45
8-01-18	22,090.90
2-01-19	11,045.45
8-01-19	22,090.90
2-01-20	11,045.45
8-01-20	22,090.90
2-01-21	11,045.45
8-01-21	22,090.90
2-01-22	11,045.45
8-01-22	22,090.90
2-01-23	11,045.45
8-01-23	22,090.90
2-01-24	11,045.45
8-01-24	22,091.10
	<u>\$ 364,500.05</u>

Reference

E-25

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 2010A BORROWER)
DEBT SERVICE SCHEDULE - FUND LOAN

E-26
Sheet #9

<u>Date</u>	<u>Semiannual Principal</u>
2-01-14	\$ 4,271.22
8-01-14	8,542.44
2-01-15	4,271.22
8-01-15	8,542.44
2-01-16	4,271.22
8-01-16	8,542.44
2-01-17	4,271.22
8-01-17	8,542.44
2-01-18	4,271.22
8-01-18	8,542.44
2-01-19	4,271.22
8-01-19	8,542.44
2-01-20	4,271.22
8-01-20	8,542.44
2-01-21	4,271.22
8-01-21	8,542.44
2-01-22	4,271.22
8-01-22	8,542.44
2-01-23	4,271.22
8-01-23	8,542.44
2-01-24	4,271.22
8-01-24	8,542.44
2-01-25	4,271.22
8-01-25	8,542.44
2-01-26	4,271.22
8-01-26	8,542.44
2-01-27	4,271.22
8-01-27	8,542.44
2-01-28	4,271.22
8-01-28	8,542.44
2-01-29	4,271.22
8-01-29	8,542.56
	<u>\$ 205,018.68</u>

Reference

E-25

CITY OF NEWARK
SEWER UTILITY FUND

NEW JERSEY WASTE WATER TREATMENT TRUST FINANCING
NEWARK CITY (SERIES 2010A BORROWER)
DEBT SERVICE SCHEDULE - FUND LOAN

E-26
Sheet #10

<u>Date</u>	<u>Semiannual Principal</u>
2-01-14	\$ 82,364.10
8-01-14	164,728.21
2-01-15	82,364.10
8-01-15	164,728.21
2-01-16	82,364.10
8-01-16	164,728.21
2-01-17	82,364.10
8-01-17	164,728.21
2-01-18	82,364.10
8-01-18	164,728.21
2-01-19	82,364.10
8-01-19	164,728.21
2-01-20	82,364.10
8-01-20	164,728.21
2-01-21	82,364.10
8-01-21	164,728.21
2-01-22	82,364.10
8-01-22	164,728.21
2-01-23	82,364.10
8-01-23	164,728.21
2-01-24	82,364.10
8-01-24	164,728.21
2-01-25	82,364.10
8-01-25	164,728.21
2-01-26	82,364.10
8-01-26	164,728.21
2-01-27	82,364.10
8-01-27	164,728.21
2-01-28	82,364.10
8-01-28	164,728.21
2-01-29	82,364.10
8-01-29	164,728.21
2-01-30	82,364.10
8-01-30	164,728.42
	<u>\$ 4,200,569.48</u>

Reference

E-25

CITY OF NEWARK
SEWER UTILITY FUND

IMPROVEMENT AUTHORIZATIONS

E-27
Sheet #1

Description	Balance Dec. 31, 2012			2013 Authorizations	Expended	Balance Dec. 31, 2013		
	Funded	Unfunded	Encumbered			Funded	Unfunded	Encumbered
Sewer System Rehabilitation Project:								
94 WW 94W10	\$	\$ 5,688,013.56	\$ 267,621.73	\$	\$	\$	\$ 5,688,013.56	\$ 267,621.73
95 WW 95W20	4,715,657.24	1,104,093.00	523,981.58			4,715,658.24	1,104,092.00	523,981.58
Rehabilitation of Mount Vernon Place:								
00WW0	651,708.28	53,255.00	498,666.83			651,708.28	53,255.00	498,666.83
Combined Sewer Overflow - 00W05S00	1,347.15	3,920,456.00	5,259,900.31	420,456.00	3,865,583.96	1,347.15	4,340,912.00	1,394,316.35
Brick Rehabilitation Project - S6SBo-Oo	7,023.81		1,069.49	1,000,000.00		7,023.81	1,000,000.00	1,069.49
Contribution to Essex County Joint								
Meeting - Waste Water - S0210	741,762.04	54,285.00				741,762.04	54,285.00	
	<u>6,117,498.52</u>	<u>10,820,102.56</u>	<u>6,551,239.94</u>	<u>1,420,456.00</u>	<u>3,865,583.96</u>	<u>6,117,499.52</u>	<u>12,240,557.56</u>	<u>2,685,655.98</u>
Geographic Information System - 96S20		9,381.19					9,381.19	
Contribution to Essex County Joint								
Meeting - 99S10	2,087.05					2,087.05		
	<u>2,087.05</u>	<u>9,381.19</u>				<u>2,087.05</u>	<u>9,381.19</u>	
Cleaning Sewer by Removal - D 07SOA			73,013.88					73,013.88
Construction of Phase IIC - CSO 07SOB	5,180,160.70	300,000.00	1,625,409.48		951,582.15	4,176,160.70	300,000.00	1,677,827.33
Heavy Cleaning of Brick Sewer - 07SOC			1,303,194.84		161,000.00			1,142,194.84
	<u>5,180,160.70</u>	<u>300,000.00</u>	<u>3,001,618.20</u>		<u>1,112,582.15</u>	<u>4,176,160.70</u>	<u>300,000.00</u>	<u>2,893,036.05</u>
Phase III Construction CSO - 08B10	464,265.00	2,682,355.00	2,037,869.02		1,084,206.42	464,265.00	2,682,355.00	953,662.60
Phase VI Additional Priority Brick Sewer								
Rehabilitation Program - S340815-7	1,727,017.61	2,485,150.00	2,440,689.17		276,669.37	1,727,017.61	2,485,150.00	2,164,019.80
Purchase of Sewer Maintenance Vehicles,								
Including Truck Mounted Jet/Vacuum Sewer								
Clearer and/or Truck Mounted Jet/Bucket								
Catch Basin Cleaner - S340815-4	66,517.00	109,000.00				66,517.00	109,000.00	
	<u>1,793,534.61</u>	<u>2,594,150.00</u>	<u>2,440,689.17</u>		<u>276,669.37</u>	<u>1,793,534.61</u>	<u>2,594,150.00</u>	<u>2,164,019.80</u>
Various Improvements (the "Joint Meeting")	468,011.31	579,354.00				468,011.31	579,354.00	

CITY OF NEWARK
SEWER UTILITY FUND

IMPROVEMENT AUTHORIZATIONS

E-27
Sheet #2

Description	Balance Dec. 31, 2012			2013 Authorizations	Expended	Balance Dec. 31, 2013		
	Funded	Unfunded	Encumbered			Funded	Unfunded	Encumbered
Infiltration Investigation - 10S70	\$ 66,548.63	\$	\$	\$	\$	\$ 66,548.63	\$	\$
Various Improvements to City's Sewer Utility Including Preliminary Engineering Infiltration Study - 10S10		2,012,500.00					2,012,500.00	
Acquisition of Light Duty Vehicles - 10S20		92.00					92.00	
Acquisition of Heavy Duty Vehicles - 10S30		1,207.00	104,568.00		104,568.00		1,207.00	
		<u>2,013,799.00</u>	<u>104,568.00</u>		<u>104,568.00</u>		<u>2,013,799.00</u>	
Rehabilitation Cured in Place Pipe - S340815-20	310,190.00	3,757,610.00	589,782.40		192,879.08	310,190.00	3,757,610.00	396,903.32
CSO Floatables - 6PSF				2,500,000.00			2,500,000.00	
Sewer Utility Improvements - 13SA0				5,250,000.00			5,250,000.00	
Brick Combined Sewer - 13SB0				12,500,000.00			12,500,000.00	
				<u>20,250,000.00</u>			<u>20,250,000.00</u>	
	<u>\$ 14,402,295.82</u>	<u>\$ 22,756,751.75</u>	<u>\$ 14,725,766.73</u>	<u>\$ 21,670,456.00</u>	<u>\$ 6,636,488.96</u>	<u>\$ 13,398,296.82</u>	<u>\$ 44,427,206.75</u>	<u>\$ 9,093,277.75</u>
Reference	E	E	E	E-13, 28	E-4	E	E	E

CITY OF NEWARK
SEWER UTILITY FUND

BONDS AND NOTES AUTHORIZED BUT NOT ISSUED

E-28

<u>Date</u>	<u>Ordinance Number</u>	<u>Description</u>	<u>Balance Dec. 31, 2012</u>	<u>2013 Authorizations</u>	<u>Balance Dec. 31, 2013</u>
8-14-94	94WW	A. Sewer System Rehabilitation Project	\$ 5,820,477.00	\$	A. \$ 5,820,477.00
8-17-95	95WW	Sewer System Rehabilitation Project	1,104,092.00		1,104,092.00
8-09-00	00WW0	Rehabilitation of Mount Vernon Place Sanitary Sewer	53,255.00		53,255.00
4-16-97	96S10	Design of CSO City's Match	353,500.00		353,500.00
4-16-97	96S20	Geographic Information System	240,000.00		240,000.00
7-05, 2013	00W05S00	Combined Sewer Overflow and Brick Rehabilitation Project	3,920,456.00	420,456.00	4,340,912.00
		Contribution to Essex County Joint Meeting - Waste Water - S0210	54,285.00		54,285.00
11-05-07		Construction of Phase III - CSO-O7SOB	300,000.00		300,000.00
11-05-07		Heavy Cleaning of Brick Sewer - O7SOC	391,970.00		391,970.00
2008	08B10	Phase III Construction CSO	2,682,355.00		2,682,355.00
2009	S340815-7	Phase VI Additional Priority Brick Sewer Rehabilitation Program	2,485,150.00		B. 2,485,150.00
2009	S340815-4	Purchase of Sewer Maintenance Vehicles, Including Truck Mounted Jet/Vacuum Sewer Clearer and/or Truck Mounted Jet/Bucket Catch Basin Cleaner	109,000.00		109,000.00
2010		Various Improvements (the "Joint Meeting")	579,354.00		579,354.00
2010	S-10S10	Various Improvements to City's Sewer Utility Including Preliminary Engineering Infiltration Study	2,012,500.00		2,012,500.00
2010	S-10S20	Acquisition of Light Duty Vehicles	120,750.00		120,750.00
2010	S-10S30	Acquisition of Heavy Duty Vehicles	690,000.00		690,000.00
2010	S340815-20	Rehabilitation Cured in Place Pipe - 10S60	3,757,610.00		3,757,610.00
2013	6PSF	CSO Floatables		2,500,000.00	2,500,000.00
2013	13SA0	Sewer Utility Improvements		5,250,000.00	5,250,000.00
2013	13SB0	Brick Combined Sewer		12,500,000.00	12,500,000.00
2013	S65Bo-Qo	Brick Rehabilitation Project		1,000,000.00	1,000,000.00
			<u>\$24,674,754.00</u>	<u>\$ 21,670,456.00</u>	<u>\$46,345,210.00</u>

Reference

E

E-27

E

A. Project is complete and should be cancelled by ordinance by Council.

B. Adjustment for Year 2009 - \$5,000,000.00 went to Deferred Reserve for Amortization for ARRA.

PART II

**INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL
OVER FINANCIAL REPORTING**

ROSTER OF OFFICIALS

REPORT ON SURETY BONDS

LETTER OF TRANSMITTAL, COMMENTS AND RECOMMENDATIONS

(MANAGEMENT LETTER)

DECEMBER 31, 2013

SAMUEL KLEIN AND COMPANY
CERTIFIED PUBLIC ACCOUNTANTS

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**INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING
AND ON COMPLIANCE AND OTHER MATTERS BASED ON AN AUDIT OF FINANCIAL
STATEMENTS PERFORMED IN ACCORDANCE WITH GOVERNMENT AUDITING STANDARDS**

The Honorable Mayor and Members
of the Municipal Council
City of Newark
City Hall
Newark, New Jersey 07102

We have audited, in accordance with the auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the financial statements of the governmental activities, each major fund, and the aggregate remaining fund information of the City of Newark, State of New Jersey, as of and for the year ended December 31, 2013, and the related notes to the financial statements, which collectively comprise the City of Newark, State of New Jersey's basic financial statements and have issued our report thereon dated January 8, 2015.

Internal Control Over Financial Reporting

In planning and performing our audit of the financial statements - regulatory basis, we considered the City of Newark, State of New Jersey's internal control over financial reporting (internal control) to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinions on the financial statements - regulatory basis, but not for the purpose of expressing an opinion on the effectiveness of the City of Newark, State of New Jersey's internal control. Accordingly, we do not express an opinion on the effectiveness of the City of Newark, State of New Jersey's internal control.

Our consideration of internal control was for the limited purpose described in the preceding paragraph and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies and therefore, material weaknesses or significant deficiencies may exist that were not identified. However, as described in the accompanying schedule of comments and recommendations, we identified certain deficiencies in internal control that we consider to be material weaknesses and significant deficiencies.

A *deficiency in internal control* exists when the design or operation of a control does not allow Management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis. We consider the deficiencies described in the accompanying schedule of comments and recommendations to be material weaknesses as Items 2013-02, 03, 08, 09, 11, 15 and 38.


A *significant deficiency* is a deficiency, or combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance. We consider the deficiencies described in the accompanying schedule of comments and recommendations to be significant deficiencies as Items 2013-04, 06, 10, 12, 22, 23, 39, 40, 46, 48, 50-53, 56 and 68.

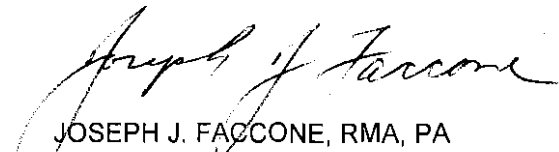
Compliance and Other Matters

As part of obtaining reasonable assurance about whether the City of Newark, State of New Jersey's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards* and which are described in the accompanying schedule of comments and recommendations as Items 2013-01, 05, 07, 13-14, 16-21, 24-37, 41-45, 47, 49, 54-55, 57-67 and 69-78.

Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the entity's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the entity's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.


SAMUEL KLEIN AND COMPANY
CERTIFIED PUBLIC ACCOUNTANTS


JOSEPH J. FACCONI, RMA, PA

Newark, New Jersey
January 8, 2015

ROSTER OF OFFICIALS FOR THE YEAR 2013

The following officials were in office during the period under review as of December 31, 2013:

GOVERNING BODY

Cory A. Booker From January 1, 2013 to October 21, 2013	Mayor
Luis A. Quintana From January 1, 2013 to September 17, 2013 From September 18, 2013 to November 4, 2013 From October 21, 2013 to November 3, 2013 From November 4, 2013 to December 31, 2013	Council Member Council President Acting Mayor Mayor
Mildred C. Crump From January 1, 2013 to November 17, 2013 From November 18, 2013 to December 31, 2013	Council Member Council President
Anibal Ramos, Jr. From January 1, 2013 to November 3, 2013 From November 4, 2013 to December 31, 2013	Council Vice-President Council Member
Augusto Amador From January 1, 2013 to November 3, 2013 From November 4, 2013 to December 31, 2013	Council Member Council Vice-President
Carlos M. Gonzalez	Council Member
Ras J. Baraka	Council Member
Ronald C. Rice	Council Member
Darrin S. Sharif	Council Member
Vacancy From January 1, 2013 to November 13, 2013	Council Member
John Sharpe James From November 14, 2013 to December 31, 2013	Council Member

OTHER OFFICIALS

Julien X. Neals	Business Administrator
Robert P. Marasco	City Clerk
Kenneth Louis	Deputy City Clerk
Susan Jacobucci From January 1, 2013 to December 1, 2013	Finance Director
Danielle Smith From December 2, 2013 to December 31, 2013	Acting Finance Director
Anna P. Pereira	Corporation Counsel

REPORT ON SURETY BONDS

The City provided Blanket Surety Bond Coverage for all employees except the City Clerk, Deputy City Clerk, Director of Finance and the Tax Collector, who carry individual bonds. The Blanket Bonds are listed as follows:

City of Newark, its Subdivisions and Commissioners - Faithful Performance Bond excluding employees of the Municipal Court and the Police and Fire Departments (\$50,000.00 Deductible)	\$500,000.00
City of Newark Police and Fire Departments - Honesty Blanket Bond (\$50,000.00 Deductible)	500,000.00
City of Newark Municipal Court System - Faithful Performance Bond (\$50,000.00 Deductible)	500,000.00

Separate Surety Bond Coverage was carried on the following officials:

Robert P. Marasco, City Clerk	75,000.00
Kenneth Louis, Deputy City Clerk	75,000.00
Michelle R. Jones, Tax/Utility Collector	947,000.00

All of the above Bonds were available for examination.

Finding 2013-01:

The surety bond for the Tax/Utility Collector was below the minimum amount prescribed by the New Jersey Administrative Code.

It is recommended that the Surety Bond amount for the Tax/Utility Collector adhere to the minimum amounts prescribed by the New Jersey Administrative Code.

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The Honorable Mayor and Members
of the Municipal Council
City of Newark
City Hall
Newark, New Jersey 07102

Madam and Gentlemen:

We have audited the regulatory basis financial statements and supplemental schedules and data of the

**CITY OF NEWARK
COUNTY OF ESSEX**

for the years ended December 31, 2013 and December 31, 2012 and have issued our report thereon.

As part of our examination, we reviewed and tested the municipality's system of internal accounting control to the extent we considered necessary to evaluate the system as required by auditing standards generally accepted in the United States of America; by the Division of Local Government Services of the Department of Community Affairs, State of New Jersey and by the *Government Auditing Standards*, issued by the U.S. General Accounting Office.

Due to the large volume of Federal and State Financial Assistance Grants and Programs, specialized audit procedures required in their implementations, and conditions contributing to impediments to readily auditing certain accounts, "single audit" reports, supporting schedules, and the "comments, findings, questioned costs, and recommendations" thereon are being filed as a separate but integral part of this Report of Audit.

Our comments with respect to the examination, internal control, and any error, omission, irregularity, violation of law, discrepancy or other nonconformity to the law or regulation found during the examination and not noted nor heretofore commented upon are herewith set forth.

Contracts and Agreements Required to be Advertised for (N.J.S.A. 40A:11-4)

N.J.S.A. 40A:11-4a states "Every contract awarded by the contracting agent for the provision or performance of any goods or services, the cost of which in the aggregate exceeds the bid threshold, shall be awarded only by resolution of the governing body of the contracting unit to the lowest responsible bidder after public advertising for bids and bidding therefore, except as is provided otherwise in this act or specifically by any other law. The governing body of a contracting unit may, by resolution approved by a majority of the governing body, disqualify a bidder who would otherwise be determined to be the lowest responsible bidder, if the governing body finds that it has had prior negative experience with the bidder."

It is pointed out that the City Council has the responsibility of determining whether the expenditures in any category will exceed the threshold set for the fiscal year and, where question arises as to whether any contract or agreement might result in violation of the statute, the opinion of the Corporation Counsel should be sought before a commitment is made.

The bidding threshold for the year 2013 was the sum of \$36,000.00 effective January 1, 2013.

Bids for public works construction contracts and related materials, supplies, services, furnishings and equipment are received in the Office of the Director of the Department of Engineering. All other bids for materials, supplies, services, furnishings, equipment and other needs of the City are received in the Division of Central Purchasing.

Reports of contracts prepared by the Purchasing Agent and approved by the Business Administrator are submitted to the City Council for acceptance and filed in the Office of the City Clerk on a monthly basis. These contracts are actually awarded through the Division of Central Purchasing.

Purchase and service contracts are generally made for periods of twelve (12) months effective with the month of award.

The minutes indicate that bids were requested by public advertising in accordance with statutory requirements and on file in the City Clerk's Office.

Notwithstanding N.J.S.A. 40A:11-3a, P.L. 2005, Chapter 51 and N.J.S.A. 19:44a-20.5, known as the "Pay to Play Law", provides that a municipality is prohibited from executing any contract in excess of \$17,500.00, on or after January 1, 2006, to a business entity that made certain reportable contributions to any municipal committee of a political party if a member of that party is in office as a member of the governing body of the municipality when the contract is awarded unless proposals or qualifications are solicited through a fair and open process.

It is further noted that contracts between \$17,500.00 and the municipal bidding threshold known as "window contracts", can be issued by resolution of the governing body without competitive bidding if a non-fair and open process is implemented which prohibits reportable contributions by the business entity.

Inasmuch as the system of records did not provide for an accumulation of payments for categories of materials and supplies or related work or labor, the results of such an accumulation could not reasonably be ascertained. Disbursements were reviewed, however, to determine whether any clear cut violations existed.

In verifying expenditures, test computations were made on claims approved and paid. No attempt was made in this connection to establish proof of rendition, character or extent of services, nor quantities, nature, propriety of prices or receipt of materials, these elements being left necessarily to internal review in connection with approval of claims.

Examination of expenditures did not reveal any individual payments, contracts or agreements in excess of the threshold "for the performance of any work, or the furnishing or hiring of any materials or supplies," other than those where bids had been previously adopted under the provisions of N.J.S.A. 40A:11-6.

Collection of Interest on Delinquent Taxes, Assessments and Utility Charges

N.J.S.A. 54:4-67, as amended and supplemented, provides that the Governing Body shall fix the rate of interest for the nonpayment of taxes and further shall determine the period after the date upon which taxes shall be payable during which period there shall be no charge made for interest.

The Municipal Council, on April 5, 1995, amended Resolution 7RBE February 2, 1994 authorizing interest to be charged on delinquent taxes and assessments:

"BE IT RESOLVED BY THE MUNICIPAL COUNCIL OF THE CITY OF NEWARK, NEW JERSEY:

Per Resolution 7RBE20294:

That the rate of interest to be charged on delinquent taxes or assessments be and is hereby fixed at 8% per annum on the first \$1,500.00 of the delinquency and 18% on the remaining balance until paid in full, pursuant to Chapter 75, Laws of 1991, N.J.S.A. 54:4-66. This interest shall not be charged if payment of any installment is made within the tenth calendar day following the date upon which the same became payable.

NOW, THEREFORE, BE IT RESOLVED BY THE MUNICIPAL COUNCIL OF THE CITY OF NEWARK, NEW JERSEY THAT:

In addition to the interest rates established pursuant to 7RBE020294, that a penalty of 6% be charged on any balance exceeding \$10,000.00 (inclusive of interest and penalties) pursuant to Chapter 75 of the Law of 1991, N.J.S.A. 54:4-66 and 67.

Be it further resolved that the interest and penalties established herein shall take effect for the calendar year of 1995 and thereafter.

Similar rates of interest, established by Ordinance #GFC 121609 of the City of Newark, apply to delinquent payments of Water and Sewer Rents. Additional penalties, varying with size of meters or water taps, are also assessed by ordinance on each water account not paid within 30 days of the due date.

It appears from an examination of the Collector's records that interest charges and penalties were generally collected in accordance with the provisions of the aforementioned resolution and ordinance for taxes. See notes and comments concerning utility funds.

Significant Matters

Management must rely on the financial information generated by the accounting and treasury functions to make decisions that affect the City's strategy in developing and meeting short-term and long-term financial goals. Consequently, Management must be confident that the information they base their decisions on is complete and accurate. This confidence is gained when there is reasonable assurance that the internal control structure over cash, revenues and expenditures is of sound design and is functioning as intended.

Each of the functions noted above plays a key role in the development and monitoring of a sound internal control structure. These roles are summarized as follows:

- The accounting function is responsible for establishing and maintaining procedures to assure that 1) all City's receipts and disbursements are properly authorized and accurately and timely recorded in the general ledger and 2) all journal entries are properly recorded and all have complete supporting documentation.
- The Treasury function is responsible for establishing and maintaining procedures to 1) properly safeguard the City's cash and investments and 2) assure that all receipts and disbursements are reported accurately and timely.

During our audit we became aware of several matters that, individually or collectively, we consider to be material weaknesses in the City's system of internal controls. As detailed below, these matters include the absence of sound cash reconciliation procedures, material uncorrected and unidentified accounting errors, and a lack of proper segregation of duties.

Absence of Cash Reconciliation Procedures

- The reconciled cash balance of the various Funds are not in agreement with the amount in the General Ledger as of December 31, 2013, as detailed below.

Current Fund:	
Balance per Bank Reconciliation	\$ 51,868,226.77
Balance per General Ledger	<u>51,836,341.20</u>
Variance	<u>\$ (31,885.57)</u>
Trust Fund:	
Balance per Bank Reconciliation	\$ 71,858,228.79
Balance per General Ledger	<u>72,428,627.76</u>
Variance	<u>\$ 570,398.97</u>
Water Operating Fund:	
Balance per Bank Reconciliation	\$ 10,488,550.36
Balance per General Ledger	<u>11,054,589.01</u>
Variance	<u>\$ 566,038.65</u>
Sewer Operating Fund:	
Balance per Bank Reconciliation	\$ 2,959,210.30
Balance per General Ledger	<u>2,957,199.30</u>
Variance	<u>\$ (2,011.00)</u>
Sewer Capital Fund:	
Balance per Bank Reconciliation	\$ 604,634.99
Balance per General Ledger	<u>610,645.99</u>
Variance	<u>\$ 6,011.00</u>

Water Operating Fund:	
Wells Fargo Bank A/C #xxxxxx566	<u>\$ 15,363,336.09</u>
Additions:	
Deposits-in-Transit	24,227,185.93
Miscellaneous	19,241.18
Due from Current Fund - Net	766,453.10
Current Fund CC Allocations	3,961,930.15
Due from Dog Fund	14,320.49
Prepaid GSA	11,527.80
Due from Bank - Return Item Fees	134,105.64
MM Interest	17.89
WT Seq.	22,967.48
Due from Sewer Utility	1,271,448.93
CSTAR Adj.	940.75
	<u>30,430,139.34</u>
	<u>45,793,475.43</u>
Less:	
O/s Checks and EFT's	4,827,592.54
Payroll Transfers Not Made	6,408,719.70
Deposits Not in Book	24,099,238.94
Debit Memo	39,097.28
Unidentified Deposit	19,216.89
Miscellaneous	2,350.13
	<u>35,396,215.48</u>
Wells Fargo Bank:	
Adjusted Bank Balance December 31, 2013	10,397,259.95
City National Bank A/C # xxxxxxx909	81,905.54
City National Bank A/C # xxxxxxx712:	
Balance per Bank December 31, 2013	<u>9,384.87</u>
	10,488,550.36
Balance per General Ledger December 31, 2013	<u>11,054,589.01</u>
Difference	<u>\$ (566,038.65)</u>

Sewer Operating Cash Reconciliation:

Wells Fargo Bank #066:

Bank Balance December 31, 2013

\$ 3,816,015.09

Additions:

Deposits-in-Transit \$ 6,298,607.53

Due from Sewer Capital 1,800,000.00

Due from Current Fund 387,940.01

Interest Due from Sewer Capital 455.43

CK PT 45.46

Due from Water Account #1611712 1,203,194.58

9,690,243.01

13,506,258.10

Less:

Outstanding Checks 1,493,244.21

Deposits Not in Book 9,053,759.92

Interest Earned 43.67

10,547,047.80

\$ 2,959,210.30

Balance per F/S

\$ 2,957,199.30

Difference

\$ 2,011.00

Sewer Capital Cash Reconciliation:

Wells Fargo Bank #161:

Bank Balance December 31, 2013 \$ 4,192,174.61

Additions:

Due from Sewer Operating	\$ 1,250,000.00	
EFTS Due from Current	583,716.11	
		<u>1,833,716.11</u>
		<u>6,025,890.72</u>

Less:

Outstanding Checks	87,300.00	
Outstanding EFT - Municipal	4,058,463.04	
Interest Due to Sewer Operating	476.69	
Due to Newark City	1,250,000.00	
Due to Trust	7,762.00	
Due to State of New Jersey	17,254.00	
		<u>5,421,255.73</u>
		<u>\$ 604,634.99</u>

Balance per F/S	\$ 610,645.99
-----------------	---------------

Difference	\$ (6,011.00)
------------	---------------

- The City has an agreement with the various banks to prepare bank reconciliations. The City provides a list of all checks issued during a month and the bank reports what was paid, and assembles an outstanding checklist for those checks that have not been paid. Any adjustments, void checks, reissue checks, etc. would have to be reported to the bank by the City so the proper adjustment can be reflected. The City Treasurer prepares his own outstanding checklist and does not use the one that the bank prepared, and they are not in agreement with each other.
- It appears that bank reconciliations for the various Funds are not being prepared in a timely manner. The City's 2013 Annual (Unaudited) Financial Statement filed on June 30, 2014 indicated that these reconciliations were not completed as of that date. See comments on Sheet 1A of the 2013 Annual (Unaudited) Financial Statement.
- The Net Payroll Account was not reconciled as of December 31, 2013.

Material Uncorrected and Unidentified Accounting Errors

- There are adjustments on the bank reconciliations of the various Funds that are identified as reconciling items that should be reviewed. Among those adjustments are "interfund transfers" which represent cash that should be recorded in other funds. The actual cash is not transferred until several months later. These adjustments should be omitted from the cash reconciliations by reflecting them in the general ledger as interfunds.
- The bank reconciliation, as prepared for the Current Fund Wachovia account, indicated that the sum of \$50,677,054.39 was a deposit-in-transit. A review of these deposits reveals that the amount of \$398,819.79 was from December 31, 2010 for the sale of the parking garage. This was also a finding in the 2011 and 2012 audits.
- The General Ledgers as presented to us were not in agreement with the Annual (Unaudited) Financial Statement that was filed. Journal entries to bring the balances in the City's 2013 Annual (Unaudited) Financial Statement in agreement with the City's General Ledger were not recorded as of the date of our audit.

Lack of Proper Segregation of Duties

While reviewing the City's internal controls, we noted several instances where proper segregation of duties do not exist. A lack of proper segregation of duties indicates a weakness in the system of internal controls and increases the likelihood that material errors may occur and go undetected.

- The Assistant Treasurer routinely makes deposits, authorizes and executes transfers, prepares checks and prepares bank reconciliations.
- Incoming and outgoing wire transfers which are initiated by the Assistant Treasurer are not approved by anyone else in the Finance Department prior to execution.

In summary, the objectives of an internal control structure are to safeguard the assets of the City and provide reasonable assurance that transactions are executed in accordance with Management's authorization and recorded properly in the City's ledgers. The omission of one or more elements of internal control can compromise the City's ability to obtain these objectives. We have concluded that the deficiencies noted above, individually and collectively, represent material weaknesses in the City's system of internal control under standards established by the American Institute of Certified Public Accountants. These deficiencies constitute being classified as material weaknesses because they represent significant deficiencies in the design or operation of the internal control structure that, in our judgment, could adversely affect the City's ability to record, process, summarize, and report financial data consistent with the assertions of Management in the financial statements. Furthermore, we believe that the design or operation of one or more of the internal control structure elements does not reduce to a relatively low level the risk that errors or irregularities in amounts that would be material in relation to the financial statements being audited may occur and not be detected within a timely period by employees in the normal course of performing their assigned functions.

Finance Office

As discussed in prior year Reports of Audit, it was noted that throughout the year there were deficits in cash and bank accounts which appear to have resulted from activity of the investment program of the City. Title 2:7-11 of the revised ordinances of the City of Newark states, in part, that "All monies of the City not immediately required for current operations shall be invested pursuant to law or shall be deposited, so far as practicable, in interest bearing accounts". Based on a recommendation contained in a prior Report of Audit, an opinion was obtained from the Corporation Counsel as to the City's investment practices. It appears that the opinion would not prohibit the creation of a Fund (book) cash deficit providing cash is on deposit in the bank accounts in amounts sufficient to meet checks when presented for payment regardless of amounts that may be outstanding.

Finding 2013-02:

There are adjustments on the bank reconciliations of the various Funds that are identified as reconciling items that should be reviewed. Among those adjustments are "interfund transfers" which represent cash that should be recorded in other funds. The actual cash is not transferred until several months later. These adjustments should be omitted from the cash reconciliations by reflecting them in the general ledger as interfunds.

Some of the other interfund reconciling items appearing on the bank reconciliation are as follows:

Current Fund:

Unapplied D/D Activity	\$ (601,896.59)
Due to Grant Fund Void EFT	(4,938.59)
Taxes	10,807,837.20
Police EFT Credits Not Posted	(239,472.20)
Due to Sewer Fund	(387,940.01)
Due to Trust	(15,336,000.00)
June 22, 2013 - Duplicate Deposit	402,579.60
March 15, 2013 - Due To/From Trust	(241,578.65)
July 9, 2013 - Due to Water - Duplicate Transfer	(210,993.34)
February 9, 2011 - Release of Levy	(25,626.46)
April 25, 2011 - Release of Levy	(47,335.67)
December 31, 2012 - Special Emergency Note/ Due to General Capital Fund	1,600,000.00
November 19, 2009 - Deposit Not Posted	(77,498.61)
April 20, 2012 - Due to Grant Fund	(1,723,328.00)
February 29, 2012 - Deposits Not Posted	(166,315.78)
May 2, 2013 - BCDC Wire	(200,000.00)
March 31, 2013 - Unreimbursed Wires - Schedule CC Due to Water Fund	57,671.00 (4,493,191.36)

Water Operating Fund:

5/31/13 Due from Sewer Utility Fund	1,271,448.93
2/28/13 Due from Current Fund	1,008.21
3/31/13 Due from Current Fund	180.46
4/30/13 Due to Current Fund	(1,799.00)
5/31/13 Due from Current Fund	210,993.34
6/06/13 Due to Current Fund	(2,642.74)
8/22/13 Due from Current Fund	10,000.00
3/15/12 Due from Current Fund	540,886.17
Void EFT #009 Due from Current Fund	219.80
4/25/12 Due from Current Fund	18,655.32
Current Fund CC Allocations	2,339,348.87
Current Fund CC Allocations	1,091,689.20
5/21/12 Due from Dog Fund	14,320.49

Sewer Operating Fund:

Interest Due from Sewer Capital	455.43
Due from Water Account	1,203,194.58

Due from Sewer Operating	12,500,000.00
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Sewer Capital:

Due from Sewer Operating	12,500,000.00
EFTS Due from Current	583,716.11
Interest Due to Sewer Operating	(476.69)
Due to Newark City	(1,250,000.00)
Due to Trust	(7,762.00)

A review of these "interfund" adjustments between the various funds indicates that corresponding offsetting amounts are not found.

It is recommended that all reconciling items on the bank reconciliations be reviewed and those items reflecting interfund transfers be properly recorded in the General Ledger.

Finding 2013-03:

The bank reconciliation, as prepared for the Current Fund Wachovia account, indicated that the sum of \$50,677,054.39 was a deposit-in-transit. A review of these deposits reveals that the amount of \$398,819.79 was from December 31, 2010 for the sale of the parking garage. This was also noted in the 2011 and 2012 audits.

It is recommended that all deposits-in-transit be current and liquidated in a timely manner.

Finding 2013-04:

The bank reconciliation for the Current Fund reflects the amount of \$370,691.17 as a reconciling item for bank service charges and \$960,000.00 for credit card charges. These amounts should have been charged to the budget.

It is recommended that all bank and credit card charges be properly charged as an expense to the current year budget.

Finding 2013-05:

The bank reconciliation for the Current Fund is not in agreement with the General Ledger as of December 31, 2013 in the amount of \$31,885.57. The General Ledger is reflecting \$51,836,841.20 while the bank reconciliation is \$51,868,226.77. The two should be in agreement.

It is recommended that the cash balance, as reflected in the General Ledger, be in agreement with the bank reconciliation on a monthly basis.

Finding 2013-06:

The Current Fund bank reconciliations are being prepared by the Assistant Treasurer. The Assistant Treasurer also routinely makes deposits, authorizes transfers and prepares checks. They should be reviewed by someone other than the Assistant Treasurer who prepares them.

It is recommended that all bank reconciliations be reviewed by someone other than the preparer.

Finding 2013-07:

The City has an agreement with the various banks to prepare bank reconciliations. The City provides a list of all checks issued during a month and the bank reports what was paid, and assembles an outstanding checklist for those checks that have not been paid. Any adjustments, void checks, reissue checks, etc. would have to be sent to the bank. Checks are issued after the end of the month and are back dated. These checks are not being reflected by the bank.

It is recommended that the City Treasurer stop back dating checks.

Finding 2013-08:

There are numerous incoming and outgoing wire transfers that are initiated by the Assistant Treasurer. The Treasurer also reconciles all of the bank accounts and posts receipts. A control log should be maintained for all of the transfers and all outgoing transfers should be approved by someone other than the Treasurer.

It is recommended that a deposit summary (FD #3) should be prepared for all incoming wire transfers and be recorded in the general ledger. A control log should be prepared to identify all outgoing wire transfers. The entry should identify the purpose of the wire transfer and give supporting information in the same manner as any other warrant presented for payment. All wires should then be approved by someone other than the one who initiates the transaction.

Finding 2013-09:

The bank reconciliation as of December 31, 2013, as prepared by the Assistant Treasurer, commingles all of the City's Current Fund bank accounts into one master reconciliation. This format does not provide for a proper audit trail. Separate reconciliations should be prepared for each bank account indicating what reconciling item relates to what bank account.

It is recommended that separate bank reconciliations for all accounts be proven individually to the General Ledger on a monthly basis.

Finding 2013-10:

The bank reconciliation, as prepared by the Assistant Treasurer, shows deposits that are not being recorded in the General Ledger.

It is recommended that all postings to the City's records be made in a timely manner.

Finding 2013-11:

It appears that bank reconciliations for the Current Fund are not being prepared in a timely manner. The City's 2013 Annual Financial Statement (Unaudited) filed on June 30, 2014 indicated that these reconciliations were not completed as of this date.

It is recommended that bank reconciliations for all funds be prepared in a timely manner and that all bank reconciliations be forwarded to the Director of Finance for approval.

Finding 2013-12:

It appears that the daily cash deposits (FD #3 Forms) are not reconciled to the bank deposits on a daily basis.

It is recommended that the Finance Department reconcile daily the cash receipts deposits (FD #3 Forms) to the actual bank deposit.

Finding 2013-13:

The General Capital Fund is paying debt service which is not being reflected in the City's Budget at the time of payment. These expenditures are being shown as reconciling items until being posted.

It is recommended that all debt service payments be promptly posted into the City's Budget and that all interfunds, if applicable, be settled in a timely manner.

Finding 2013-14:

The City of Newark was not in compliance with statutory deadlines for submission of the following documents:

	<u>Date Due</u>	<u>Date Filed</u>
Annual Debt Statement	January 31, 2014	March 28, 2014
Annual Unaudited Financial Statement	February 10, 2014	June 30, 2014
Annual Audit	June 30, 2014	January 2015*

*Audit was not started until September 25, 2014 when the City's financial records were provided to us. We also received a Revised Annual Unaudited Financial Statement on November 21, 2014.

In addition, Local Finance Notice 2013-04 set forth the dates of the 2013 Municipal Budgets as follows:

	<u>Date Due</u>	<u>Date Filed</u>
Introduction of Budget	March 15, 2013	July 11, 2013
Adoption of Budget	April 26, 2013	September 10, 2013

It is recommended that the City comply with certain statutory due dates as it relates to its financial statements.

Finding 2013-15:

The General Ledgers, as presented to us, were not in agreement with the Annual Unaudited Financial Statement that was filed.

It is recommended that year end General Ledgers be in agreement with the Annual Unaudited Financial Statement that is filed.

Finding 2013-16:

The Budget Activity Reports for the 2012 Appropriation Reserves indicated that the amount to be lapsed into surplus was \$5,646,924.06. However, the City's records show the following:

Lapsed to Surplus	\$ 3,857,621.76
Anticipated as Revenue	<u>1,700,000.00</u>
	<u>\$ 5,557,621.76</u>

The Budget Activity Report difference is \$89,302.30.

It is recommended that all Budget Activity Reports reflect all activity that occurred throughout the year.

Finding 2013-17:

The City anticipated the following revenues and no cash was realized:

Ticket Tax and Facility Fee	\$ 850,000.00
Fox Lance Limited Dividend Receipts - PILOTS (Additional)	4,278,850.00
Sale of City-Owned Property - 2013 Sale	3,000,000.00

The following revenue collection was in a deficit:

	<u>Anticipated</u>	<u>Realized</u>
Reimbursement of Debt Service	\$ 619,000.00	\$ 458,394.35

In addition, the sum of \$2,325,360.94 for Homestead Rebates was improperly recorded to Interest and Cost on Taxes instead of Taxes Receivable during 2012, as disclosed in the 2012 Audit. This contributed to a \$1,719,308.09 deficit in revenue in 2013.

It is recommended that greater care be taken to ensure collection of all anticipated revenues.

Tax Collection System

The Tax Collection System commenced March 23, 1995. The purpose of this system was to interface the Tax Collector Division with the General Ledger System maintained by the Finance Office.

The following conditions were observed when the General Ledger of the Finance Office was interfaced with the Tax Collector's System (HTE):

1. Cash receipts and various adjustments including but not limited to County Boards, tax levy, cash corrections and transfer journals were netted but not separately identified by transaction code.
2. Tax overpayments refunded in the current year are not recorded in the Tax Collector's System on a timely basis.
3. Subsidiary ledgers are being maintained in the Tax Collector's Division for all financial transactions that pertain to taxes and all other municipal charges. However, not all financial transactions recorded in the subsidiary ledgers of the Tax Collector's Division are being identified when interfaced with the General Ledger System.

Sales Contracts Receivable - Sales of Property Acquired for Taxes

Finding 2013-18:

The General Ledger Control Account for Sales Contracts Receivable does not reflect activity in the areas of new contracts, collections, cancellations, forfeitures, and refunds of deposits.

Our analysis by year of origin for Sales Contracts Receivable (Exhibit A-12), in the sum of \$12,544,477.53, is summarized as follows:

<u>Year</u>	<u>Balance Dec. 31, 2012</u>	<u>Balance Dec. 31, 2013</u>
1991	\$ 39,600.00	\$ 39,600.00
1993	199,900.00	199,900.00
1994	580,684.99	580,684.99
1995	541,069.78	541,069.78
1996	26,530.00	26,530.00
1997	265,946.00	265,946.00
1998	294,914.79	294,914.79
1999	965,217.69	965,217.69
2000	328,880.00	328,880.00
2001	1,044,940.00	1,044,940.00
2002	2,522,240.00	2,522,240.00
2003	1,836,809.00	1,836,809.00
2004	1,879,795.28	1,879,795.28
2005	<u>2,017,950.00</u>	<u>2,017,950.00</u>
	<u>\$12,544,477.53</u>	<u>\$12,544,477.53</u>

The purpose of this resolution was for the acquisition of City-Owned property by the NJSCC to construct six new schools.

It is recommended that all sales contracts receivable be reviewed by the Department of Economic and Housing Development for compliance with the approved authorization of sale and either be collected and/or be cancelled by resolution which also includes the sale of property to the New Jersey School's Construction Corporation.

On April 6, 2005, the City adopted Ordinance No. 6S&FE authorizing the sale of land at an appraised value of \$4,308,100.00 to the New Jersey Schools Construction Corporation (NJSCC).

The sum of \$3,393,370.00 was received by the City from the New Jersey Schools Construction Corporation leaving a balance of \$913,730.00 as a receivable. The City should review this transaction to ascertain why the full amount was not received.

Finding 2013-19:

The following receivable transactions or taxes and other municipal charges should be coded so they may be identified in the general ledger:

- A. Cash Receipts
- B. Cash Correction of Current Year Collection
- C. Cancellation of Taxes
- D. Transfer to Tax Title Liens
- E. Transfer to Tax Overpayments:
 - 1. Coded as Current Cash Collections
 - 2. Coded as Prior Collections - i.e. Charged to Tax Appeal Account of Budget Operation
- F. Overpayment Applied
- G. Unallocated Cash Applied
- H. Protested Checks Charged Back to Taxes
- I. Tax Levy:
 - 1. Current
 - 2. Added or Omitted

Taxes receivable and tax overpayments in the general ledger account do not agree with the detailed list of tax overpayments and trial balances for all individual tax years, tax title liens, overpayments, assessment receivable and assessment liens. In addition, they were not proved on a monthly basis.

It is recommended that a detail list of taxes receivable and tax overpayments be reconciled to the General Ledger.

It is also recommended that all entries be identified by transaction code when interfaced with the General Ledger.

Division of Tax Abatement and Special Tax

Finding 2013-20:

The Tax Collector and the Manager of the Division of Special Tax shall provide the Municipal Council with annual reports as to the status of all tax abated projects, together with reports on the revenue collection efforts in the parking and payroll tax area. A copy of all annual audits received by the Division of Tax Abatement and Special Tax shall be filed with the Office of the City Clerk. Not all reports were filed with the City Clerk's office in 2013.

It is recommended that annual reports showing the status of all tax abated projects, and revenue collection efforts for the parking and payroll taxes, be filed with the Office of the City Clerk.

Interfunds

Finding 2013-21:

There are interfund balances open at December 31, 2013 on the various balance sheets of the City. As a general rule, all interfund balances should be closed out before the end of the year. Transactions invariably occur in one fund, which results in a corresponding entry to be made in another fund, thus creating interfund balances.

It is noted that the Interfunds were not in agreement, as reflected in Note 12 to the Financial Statements.

It is recommended that all interfunds be in agreement and liquidated by December 31st.

General Ledger Accounting System

A new computerized financial management system was purchased from Peoplesoft in 2003. All the financial records were converted to the system for 2003.

The purpose of this system is to provide the City with a single integrated financial system which will serve as the City's official books of account.

Finding 2013-22:

The following conditions were noted in the records maintained on the System during the year 2013:

- a. The general ledgers were not in agreement with the various subsidiary ledgers and bank reconciliations.
- b. All expenditures for commitments payable are being paid in the commitments payable (3015) account. However, individual payments were not verified to the amounts originally established.
- c. Budget Expenditure Reports for appropriations and appropriation reserves should be prepared monthly and proved to the general ledger. The current general ledger cannot be used to prove out the current budget appropriations and appropriation reserves. The general ledger should be able to tell the users what the available balance is and that amount should prove to the detailed subsidiary ledger on a monthly basis.
- d. The general ledger currently in use breaks out the General Capital Fund into three (3) separate components or funds. These three (3) funds should be merged into one General Capital Fund that conforms to the format that is prescribed by the Division of Local Government Services.
- e. The Federal and State Programs are controlled by a separate Budget Activity Report. However, these reports are not proven to the general ledger on a monthly basis in regards to Revenue, Receipts, Appropriations and Expenditures.
- f. English titles (ALPHA) should be placed on the General Ledger.

The Division of Local Government Services issued Technical Accounting Directive No. 85-3 "General Ledger Accounting System":

"The general ledger is the official permanent financial record of the local unit which provides a summary of all financial transactions as they have been recorded in the books of original entry utilizing a "double entry" accounting system. A general ledger accounting system supports the "fund" basis of accounting as required by the Division of Local Government Services. Accordingly, each fund must provide for the continuous identification of its assets, liabilities, revenues, expenditures and fund balance. This is usually accomplished by providing a self-balancing set of accounts for each fund, through the use of a general ledger accounting system which will facilitate the preparation of the financial statements. The general ledger, together with the books of original entry, and supporting subsidiary ledgers, constitute the complete accounting system".

It is recommended that the City continue to improve the new general ledger accounting system.

Finding 2013-23:

Budget Expenditure Reports for appropriations and appropriation reserves should be prepared monthly and proved to the General Ledger. The current General Ledger cannot be used to prove budget appropriations and appropriation reserves.

It is recommended that changes be made to the General Ledger so that budget appropriations and appropriation reserves can be proved to the General Ledger on a monthly basis.

Federal and State Grant Fund (Public and Private Programs)

Finding 2013-24:

"Exhibit A-23" lists amounts that are due from Federal and State Governments that are outstanding receivables over several years old and the City's financial records show several grant programs with unexpended balances that are over several years old, as reflected on "Exhibit A-48".

There are several grants under Reserve for Federal, State and Other Grants, as detailed on "Exhibit A-48" that have deficit balances. These grants should be examined and appropriate action be taken based upon the review.

It is recommended that the appropriate City officials review the current status of all Federal and State Grants and also the deficit balances be reviewed and appropriate action be taken on both of them.

Finding 2013-25:

Unappropriated Grants, as detailed on "Exhibit A-53", indicates that there is an amount of \$5,989,941.27. There are funds available that are over several years old which should be appropriated or cancelled.

It is recommended that the Unappropriated Grants in the Federal and State Grant Fund be reviewed and either appropriated or cancelled, based upon these findings.

Finding 2013-26:

The City is in receipt of grants from the same funding agency. The City properly anticipates the revenue and appropriations as separate grants. However, when they are recorded in the Federal and State Grant Fund, they are combined and listed as one grant or broken out by different spending categories. This could present a problem when requests are made for reimbursements or proper accounting as to what was charged to each individual grant.

It is recommended that all grants be individually posted in the records of the Federal and State Grant Funds as anticipated and not combined into one line item.

Property Acquired for Taxes

Finding 2013-27:

During 2013, the general ledger control account for Property Acquired for Taxes was not adjusted for taxes and assessed valuations for properties foreclosed and for properties sold for the prior years.

In 2012, the sum of \$3,083,900.00 was recorded as Miscellaneous Revenue Not Anticipated in the City's records as Reserve for Sale of Foreclosed Property. However, no adjustments were made to the Foreclosed Property Schedule to reflect these proceeds.

It is recommended that adjustments be made to the Foreclosed Property Schedule to reflect any cash collections.

Overpayments Receivable - Trust Fund

Finding 2013-28:

An overpayment receivable in the amount of \$19,539.47, as detailed on Exhibit B-9, has been on the balance sheet for the past several years. This amount should be researched and all attempts should be made to collect said amount or be raised in subsequent budgets.

It is recommended that the overpayments receivable in the Trust Fund be researched for collection or cancellation.

Assessment Trust Fund

Finding 2013-29:

An assessment overpayment in the amount of \$5,348.50 and prepaid assessments in the amount of \$1,029.00, as reflected by Exhibits B-14 and B-15, respectfully, have been on the City records for the past five years. These amounts should be reviewed by City Officials and either cancelled, applied or refunded based on the results.

It is recommended that the Assessment Overpayments and Prepaid Assessments be reviewed and either cancelled, applied or refunded.

Finding 2013-30:

The Assessments Receivable and Assessment Liens, as detailed on Exhibit B-5 and Exhibit B-6, indicates the sum of \$95,853.75 for Assessments Receivable and the sum of \$710,569.47 for Assessment Liens and \$59,946.17 for Assessment Liens Interest and Cost. The City should attempt to collect these funds or make them part of the next tax sale for the Assessments Receivable.

It is recommended that the City attempt to collect all outstanding Assessments Receivable and Assessment Liens.

Accounts Receivable - Trust Fund

Finding 2013-31:

An accounts receivable in the amount of \$20,151.07, as detailed on Exhibit B-7, has been on the balance sheet for the past several years. This amount should be researched and all attempts should be made to collect said amount or be raised in subsequent budgets.

It is recommended that the accounts receivable in the Trust Fund be researched for collection or cancellation.

Finding 2013-32:

There has been a receivable in the amount of \$120,000.00 in the Trust Grant Fund for the past several years as reflected on "Exhibit B-11". This amount should be reviewed and appropriate action be taken based on that review.

It is recommended that the accounts receivable in the Trust Grant Fund be reviewed and appropriate action be taken based on that review.

Reserve for Other Funds - Trust Fund

Finding 2013-33:

Various types of security deposits, performance bonds and other restricted items appear in the "Reserve for Other Funds" maintained in the City's General Trust Fund. The balances at December 31, 2013 are shown in detail on "Exhibit B-21" by control categories. The detailed listings of individual accounts were in agreement with controls. The City does not have on file written approval from the Director of the Division of Local Government Services permitting the expenditure of various trust funds as dedicated revenue.

It is recommended that the detailed account balances be reviewed, and written approval be obtained from the Director of the Division of Local Government Services for all funds expended as dedicated revenues and determinations made as to future need and either be refunded, applied to revenue or cancelled by City Council resolution.

Finding 2013-34:

The Premium on Tax Sale Account as reflected on "Exhibit B-21" does not have a detailed listing by block and lot.

It is recommended that a detailed listing by block and lot be maintained to support the Premium of Tax Sale Account in the Trust Fund.

Finding 2013-35:

The "Reserve for Other Funds", as detailed on "Exhibit B-21", revealed that there are accounts with deficit balances.

These amounts should be reviewed and either raised in subsequent budgets or applied from other resources.

It is recommended that the deficits in the Reserve for Other Funds be reviewed and appropriate action be taken based upon those findings.

Finding 2013-36:

All funds collected from the Tax Title Lien sale and amounts received from taxpayers for the redemption of the Tax Title Lien Certificates held by third parties are commingled and shown on "Exhibit B-21" under Account #4621, Reserve for Funds Deposited in Trust. A detail listing is maintained by the City, however, amounts collected for the Tax Title Lien sale and amounts to be remitted to outside lienholders are not separately recorded.

It is recommended that funds collected from a Tax Title Lien sale be deposited and recorded in the Current Fund and that amounts received from taxpayers for the redemption of Tax Title Lien Certificates held by third parties be deposited and recorded in the Trust Fund.

Finding 2013-37:

Vouchers payable in the amount of \$23,954.53, as reflected on Exhibit B-22, indicates that the amount of has been on the City records for the past five years. This should be investigated and either paid or cancelled.

It is recommended that the vouchers payable be investigated and either paid or cancelled.

Payroll Agency Fund

Finding 2013-38:

The general ledger indicated that the sum of \$8,059,634.06 represents payroll deductions payable. A detailed list of these payables was unavailable for audit.

The Net Payroll Account was not reconciled as of December 31, 2013.

It is recommended that the payroll deductions payable account in the general ledger be proven each month and that a detailed list of unpaid deductions be in agreement with the general ledger and that the Net Payroll Account be reconciled on a monthly basis.

Finding 2013-39:

The current procedure for the recording of payroll in the subsidiary ledgers appears to be convoluted and time consuming. Each payroll transaction appears as debits on one report while others appear as credits. They are never matched against each other. Payroll should be a zero balance account. Gross payroll consists of net payroll to employees, taxes that are mandated, for example, federal, pension, state, etc. and voluntary deductions that are elected by the employees. These can consist of savings bonds, credit unions, etc. Whatever money is deposited to cover gross payroll should also be disbursed out in the same amounts leaving a zero balance. The ledgers maintained do not show each deposit for those accounts with the corresponding disbursement against it. Also, these amounts being recorded might not represent the amounts that are being paid by the Treasurer in the main General Ledger. One reason might be a timing difference in posting the transactions.

It is recommended that greater care be initiated in the posting of the payroll to the subsidiary ledger to ensure proper accounting of each transaction and that the subsidiary ledger be in agreement with the General Ledger.

Finding 2013-40:

It appears that there is no reconciliation of employee's deductions every month to what is being paid. Pension contributions to the State of New Jersey were the same for several months. These payments should be reconciled to what was actually withheld from the City's employees.

It is recommended that disbursements made for statutory and voluntary deductions be reconciled to actual withholdings on a monthly basis.

Animal Control Fund

Finding 2013-41:

The Due to State of New Jersey, as reflected on "Exhibit B-18" indicates that these are amounts due prior to 2011. These amounts should be paid monthly to the State of New Jersey. The City should confirm with the State to verify the amount of delinquencies, if any and record all amounts that are received for licenses collected accurately.

It is recommended that amounts owed to the State of New Jersey in the Animal Control Fund be reviewed and any adjustments made based upon the review and amounts collected for dog licenses, which are due to the State of New Jersey, be accurately recorded.

General Capital Fund, Water Utility Capital Fund and Sewer Utility Capital Fund

The general ledgers for all Capital Funds, as established, should conform with the requirements of audit as promulgated by the Division of Local Government Services.

Finding 2013-42:

There are Improvement Authorizations in the Capital Funds that were originally authorized in prior years. There has been no activity on these authorizations for several years. The City should review all Improvement Authorizations as to status and they should either be cancelled or reauthorized for new purposes.

It is recommended that all Improvement Authorizations be reviewed and either cancelled or reauthorized for new purposes.

Finding 2013-43:

There are several Deferred Charges - Unfunded in the General Capital Fund which have deficit cash balances that are over five (5) years old. These amounts should be included in the next bond sale or raised by subsequent budget appropriation.

It is recommended that all Deferred Charges - Unfunded be reviewed and action taken to include in the next bond sale or raised in subsequent budgets.

Finding 2013-44:

The City had several note sales during 2013. There were costs associated with these note sales. The City had charged these costs to General Capital Surplus. However, General Capital Surplus may only be utilized by ordinance appropriation for bondable capital purposes or for the payment of capital debt as a special item of revenue in the annual budget. Also, N.J.S.A. 40A:4-57 states that "No officer, board, body or commission shall, during any fiscal year, expend any money, incur any liability, or enter into any contract which by its terms involves the expenditure of money for any purpose for which no appropriation is provided."

It is recommended that all Capital Expenditures be properly charged to an ordinance or budget appropriation.

Finding 2013-45:

The City received premiums from the sale of their Bond Anticipation Notes and Special Emergency Notes. Much of these premiums were used to pay down a portion of the Notes at the time of closing. These transactions were not reflected in the City's records nor were the pay downs budgeted.

It is recommended that the City stop using premiums at the time of sale to reduce debt without properly budgeting these funds.

Finding 2013-46:

A Deferred Charge - Cost of Bond/Note Issue in the amount of \$237,837.83, as reflected on "Exhibit C-8", has been on the balance sheet for the past several years. This amount should be either raised in the next Municipal Budget or applied to existing Improvement Authorizations.

"Exhibit D-19" includes \$57,362.80 of bond issuance costs that have not been charged to any improvement authorizations whereby the City has permanently financed the improvement.

It is recommended that the Deferred Charge - Cost of Bond/Note Issue in the General Capital Fund and the Bond Issuance Costs in the Water Utility Fund be either raised in the next Municipal Budget or applied to existing Improvement Authorizations.

Finding 2013-47:

The sum of \$335,103.76, as reflected on "Exhibit C-18", and the sum of \$85,965.75, as reflected on "Exhibit D-33" for Reserve for Refunds, has been on the balance sheets for the past several years. These refunds should be researched and applied to the appropriate Improvement Authorizations.

It is recommended that the Reserve for Refunds in the General Capital Fund be researched and applied to the appropriate Improvement Authorizations.

Finding 2013-48:

The City's records indicated that the sum of \$2,500,000.00 for Due from State of New Jersey for Demolition Bond, as reflected on "Exhibit C-9" has been on the records for the past several years. This amount should be reviewed and a claim for reimbursement be made or raised by other means.

It is recommended that the Due from State of New Jersey for Demolition Bond be reviewed and a claim for reimbursement be made.

Finding 2013-49:

Fixed Capital Authorized and Uncompleted in the Water Utility Fund is \$173,873,436.24. There are unexpended funds in the amount of \$40,395,262.25, as reflected on the Improvement Authorization "Exhibit D-31". The Fixed Capital Authorized and Uncompleted account should be reviewed and appropriate transfers to Fixed Capital be made based on completed projects.

Fixed Capital Authorized and Uncompleted in the Sewer Utility Fund is \$166,547,206.00. There are unexpended funds in the amount of \$66,918,781.32, as reflected on the Improvement Authorizations "Exhibit E-27". The Fixed Capital Authorized and Uncompleted account should be reviewed and appropriate transfers to Fixed Capital be made based on completed projects.

It is recommended that appropriate adjustments be made between the Fixed Capital and Fixed Capital Authorized and Uncompleted accounts in the Water and Sewer Utility Funds.

State Receivables

Finding 2013-50:

There is a receivable from the State of New Jersey in the Water Capital Fund in the amount of \$968,018.74, as reflected on "Exhibit D-16", which is several years old, summarized as follows:

Water Treatment Facility	\$ 841,612.42
Renovations of Reservoirs	<u>126,406.32</u>
	<u>\$ 968,018.74</u>

An Analysis of Capital Cash in the Water Utility Fund indicates that the sum of \$968,018.74 has been spent on Ordinance #8701 - Renovation of Belleville Reservoir. This amount has been authorized to be funded by either a loan and/or grant agreement with the State of New Jersey pursuant to the Water Supply Bond Act of 1981 (C. 261, P.L. 1981).

It is recommended that the City cancel this receivable as they have already been denied reimbursement due to insufficient documentation to support the charges and also the City fund Ordinance #8701 by either subsequent operating budgets or by the issuance of notes/bonds.

Finding 2013-51:

There are receivables in the Sewer Capital Fund that are Due from the State of New Jersey, as reflected on "Exhibit E-5" that are several years old, as detailed below:

Sewer Rehabilitation - Project 94ww	\$ 169,179.13
Sewer Rehabilitation - Project 95ww	4,334,555.87
Rehabilitation of Mt. Vernon Place - Project 00ww	1,144,281.00
Sewer Rehabilitation - S0210	673,603.00
Sewer Rehabilitation - 07SOA	582,904.00
Sewer Rehabilitation - 07SOB	6,618,748.00
Phase VI Additional Priority Brook Sewer Rehabilitation Program - S340815-17	4,730,201.00
Phase VI Additional Priority Brick Sewer Rehabilitation Program S340815-17 - With ARRA Principal Forgiveness	496,462.00
Contribution to Joint Meeting - 2010	470,646.00
Rehabilitation Cured in Place Pipe - 1054	<u>1,683,425.00</u>
	<u>\$20,904,005.00</u>

It is recommended that these receivables should be reviewed to determine if funds are still available from the sponsoring agency for their intended uses. Also, if any eligible expenses have been spent, request should be made to obtain the appropriate funds.

Finding 2013-52:

There is a State Grant Receivable as reflected on "Exhibit E-14" in the amount of \$1,397,959.91 in the Sewer Capital Fund. This grant should be identified as to which ordinance it pertains to. This receivable should be reviewed to determine if funds are still available from the State Sponsoring Agency. Also, if any eligible expenses have been spent, request should be made to obtain the appropriate funds.

It is recommended that all State Receivables in the Water and Sewer Utility Funds be reviewed to determine if funds are still existing from the State and that any eligible expenditures be requested for reimbursement.

Finding 2013-53:

The City received the amounts of \$1,052,932.00 in the Sewer Capital Fund and \$1,179,055.00 in the Water Capital Fund under Due from State of New Jersey. We were not able to allocate these amounts to any particular project. On the Analysis of Capital Cash, "Exhibit E-5" and "Exhibit D-6" respectively, it is recorded as Unallocated Cash Receipts from the State of New Jersey.

It is recommended that the amount received from the State of New Jersey in the Sewer and Water Capital Funds be properly applied to the project to the extent of collections.

Finding 2013-54:

The Capital Funds - Fund #45 Capital, Fund #46 Lease Purchase and Fund #61 School Capital Fund should be reviewed and reprogrammed to establish one capital fund.

It is recommended that the General Capital Funds be reviewed and programmed to establish one capital fund.

Water/Sewer Utility Funds

Delinquent Water and Sewer Rents Receivable

Finding 2013-55:

There is still a balance of \$11,612.24 on Water Rents and \$4,969.25 in Sewer Rents that are being reflected as a receivable. The amounts mentioned above pertain to the years 1998 - 2007. These receivables should be investigated and appropriate action be taken based upon these findings.

It is recommended that the balances in the Delinquent Water and Sewer Rents be investigated and either collected, cancelled or transferred to liens, depending on the findings of the review.

Finding 2013-56:

The detail list of Water Rents Receivable indicates a balance of \$14,971,512.44 while the General Ledger has a balance of \$11,320,302.90.

It is recommended that the difference between the outstanding water rents receivable balance in the General Ledger and the detail outstanding water rents receivable balance provided by the Water Utility Collector be investigated.

Finding 2013-57:

The detail list of water rent overpayments indicates a balance of \$154,946.69 while the General Ledger has a balance of \$61,438.63.

It is recommended that the difference between the outstanding water rent overpayments balance in the General Ledger and the detail outstanding water rent overpayment balance provided by the Water Utility Collector be investigated.

Finding 2013-58:

The bank reconciliation for the water operating bank account reflects the amount of \$134,105.64 as bank service charges.

It is recommended that all bank and credit card charges be properly charged as an expense to the current year budget.

Finding 2013-59:

A detailed list for consumers' accounts receivable, sewer connection - arrears, delinquent sewer rents receivable and sewer liens receivable were not available for audit review.

It is recommended that detailed lists for all sewer receivables be available for audit review.

Accrued Payroll - Sewer Utility Fund

Finding 2013-60:

The amount of \$28,737.10, as detailed on Exhibit E-20, for Accrued Payroll, has been on the balance sheet for the past several years. This amount should be reviewed and either applied or cancelled.

It is recommended that the Accrued Payroll in the Sewer Utility Fund be reviewed and either applied or cancelled.

Inventory

Finding 2013-61:

Inventory in the Water Utility Fund has not changed in the past several years and the Sewer Utility Fund has no inventory recorded. Inventory should be counted on an annual basis and properly recorded in the General Ledger.

It is recommended that inventories be performed on an annual basis for both the Water and Sewer Utility Funds.

New Jersey Easement Receivable

Finding 2013-62:

The City's records indicate that a New Jersey Easement Receivable in the amount of \$86,000.00, and a Reserve for Water Easement in the amount of \$236,000.00 as reflected on Exhibits D-15 and D-28, have been on the records for the past five (5) years. It is essential that all receivables be collected on a timely basis. This receivable and reserve should be reviewed and a claim be submitted for reimbursement or be funded by other means or cancelled by resolution.

It is recommended that the New Jersey Easement Receivable and reserve be reviewed and a claim be submitted for reimbursement or be funded by other means or cancelled by resolution.

Payroll Testing

Finding 2013-63:

The Health Benefits Contribution Schedule, required by Section 39 of P.L. 2011, c. 78, was not provided for our examination. We therefore were unable to determine whether employees had the current payroll deduction withheld or if the withholdings are correct.

It is recommended that the Health Benefits Contribution Schedule be available for review during the audit.

Finding 2013-64:

We were unable to verify the correct amount of payroll deductions for pension, both PFRS and PERS because we were not provided with the City's Pension Reports.

It is recommended that the employee deductions for pension be verified to the Quarterly Pension Reports.

Finding 2013-65:

The minimum mandatory health benefits withholding of 1.5% of the employee's salary was not withheld from five (5) employees selected.

It is recommended that Management ensure all eligible employees have health benefits withheld from their pay.

Finding 2013-66:

The pension withholding percentage for both PERS and PFRS did not agree to the required percentage found on the Quarterly Pension Reports.

It is recommended that Management ensure that the correct amount of pension be withheld from employees' pay.

Voucher Testing

Finding 2013-67:

We were not provided with five (5) bid packages.

It is recommended that Management provide all requested bid packages.

Protested Checks

Finding 2013-68:

The City lists protested checks as an asset on the following balance sheets:

Current Fund	\$ 2,628,278.17
Other Funds	427,139.24
Insurance Funds	305.00
Grant Funds	25,238.00
Payroll Agency Fund	7,920.00
Water Operating Fund	83,288.84
	<hr/>
Total	<u>\$ 3,172,169.25</u>

It is recommended that all protested checks be investigated and appropriate action be taken.

Municipal Court

The audit of the Municipal Court is not completed as of the date of this audit. A separate report will be filed with the New Jersey Administrative Office of the Courts and will contain findings and recommendations, if any.

Municipal Revenue Departments

Finding 2013-69:

N.J.S.A. 40A:5-15 requires that all funds be deposited or remitted to the Treasurer within 48 hours of receipt. The following departments did not comply with this statute:

Purchasing
Tax Assessor*
Traffic and Signal Department*
Board of Alcoholic Beverage Control*
Fire Department*
Zoning*
Engineering*
City Clerk

*These were repeated from the previous year.

It is recommended that all departmental receipts be deposited or remitted to the Treasurer within 48 hours per N.J.S.A. 40A:5-15.

Finding 2013-70:

We noted differences between the amount recorded in the following Department's cash books and the FD-3 turnover slips remitted to the Finance Department:

Purchasing
Police Records
Recycling
Taxicabs
Construction Code
Rent Control
Traffic and Signal
Special Tax
General Licenses
Police - Finance
Property Management

It is recommended that the total of the FD-3's agree with the Department's cash books.

Property Management

Finding 2013-71:

Of a sample of sixteen (16) properties occupied, one (1) property was not provided.

It is recommended that Management make available all documentation for review.

Taxicabs

Finding 2013-72:

Out of twenty-four (24) receipts tested, two (2) receipts did not have the specific service listed.

It is recommended that all fees charged should match those listed on the fee schedule.

City Clerk

Finding 2013-73:

We were unable to test the fees for transcription certificate copies because we do not know how many copies were made per day or what rate was charged per customer.

It is recommended that the client maintain a log book for all copies.

Fire Department

Finding 2013-74:

Out of twenty-four (24) receipts tested, nine (9) receipts could not be verified to the fee schedule provided. There was not enough detail provided.

It is recommended that all fees charged should match those listed on the fee schedule.

Recycling

Finding 2013-75:

We were unable to verify fees for all vendors.

It is recommended that all fees to vendors should be made available as to determine the correct price per weight.

Traffic and Signal

Finding 2013-76:

We were unable to test fees in this department because they do not have a fee schedule.

It is recommended that the Municipal Council should memorialize the standard fees in a fee ordinance.

Engineering

Finding 2013-77:

We were not provided with the consultant contracts in order to determine the appropriate fee.

It is recommended that Management make available all documentation for review.

Other Post-Employment Benefits

Finding 2013-78:

Local Finance Notices 2007-15 and 2009-15 require local units that provide non-pension benefits to retired employees, such as health insurance coverage, prescription or other benefits, to disclose the annual payment for currently retired employees and the future cost for those employees in the Notes to the Financial Statements.

Those municipalities that are not members of the State Health Benefits Plan or other cost sharing plans must prepare or have prepared, on a tri-annual basis, an actuarially calculated post-employment benefit report for inclusion in the Notes to the Financial Statements.

The City of Newark maintains private health coverage and provides certain retired employees with post-employment benefits which require appropriate disclosure in the Notes to the Financial Statements in accordance with regulations promulgated by the Local Finance Board.

Finding 2013-78: (Continued)

To date the aforementioned post-employment costs for the City of Newark have not been determined, resulting in our inability to include this information in the Notes to the Financial Statements.

It is recommended that the City prepare the necessary report as it relates to Post-Employment Benefits.

Corrective Action Plan

In accordance with regulations promulgated by the Single Audit Act and the Division of Local Government Services, all municipalities are required to prepare and submit to the Division of Local Government Services, a Corrective Action Plan with regard to audit deficiencies. This plan must be approved by formal resolution of the Governing Body and submitted within 60 days from the date the audit is received. A Corrective Action Plan was prepared for the 2012 Report of Audit.

Status of Prior Year's Audit Recommendations

A review was performed on all prior year's recommendations and all those lacking corrective action have been repeated in this year's recommendations.

Miscellaneous

The examination of the Free Public Library and City Museum are subjects of separate audits performed by other independent accountants. A statutory report summarizing collections of Dog License Fees and remittances of State Registration Fees was prepared by us and copies filed with the appropriate agencies.

Certain Federal and State grants and aid may be subject to independent audits and reporting. Final reviews and determinations would rest with the staffs of sponsoring agencies.

The fixed capital reported on Exhibits "D-20" and "E-13" are as taken from municipal records and does not necessarily reflect the current status of such fixed capital.

The deductions for pensions, withholding tax, social security and other purposes from employees' individual salaries were tested as part of this examination.

Individual payments of the Local School District Tax by the municipality was confirmed as received by the Secretary of the Board of Education for the year 2013.

A summary or synopsis of this report was prepared for publication and filed with the City Clerk.

RECOMMENDATIONS

	<u>Finding Number</u>	<u>Page Number</u>
<u>Report on Surety Bonds</u>		
*That the Surety Bond amount for the Tax/Utility Collector adhere to the minimum amounts prescribed by the New Jersey Administrative Code.	2013-01	305
<u>Finance Office</u>		
*That all reconciling items on the bank reconciliations be reviewed and those items reflecting interfund transfers be properly recorded in the General Ledger.	2013-02	314
*That all deposits-in-transit be current and liquidated in a timely manner.	2013-03	315
That all bank and credit card charges be properly charged as an expense to the current year budget.	2013-04	315
*That the cash balance, as reflected in the General Ledger, be in agreement with the bank reconciliation on a monthly basis.	2013-05	315
*That all bank reconciliations be reviewed by someone other than the preparer.	2013-06	315
*That the City Treasurer stop back dating checks.	2013-07	315
*That a deposit summary (FD #3) should be prepared for all incoming wire transfers and be recorded in the general ledger. A control log should be prepared to identify all outgoing wire transfers. The entry should identify the purpose of the wire transfer and give supporting information in the same manner as any other warrant presented for payment. All wires should then be approved by someone other than the one who initiates the transaction.	2013-08	315
*That separate bank reconciliations for all accounts be proven individually to the General Ledger on a monthly basis.	2013-09	316
*That all postings to the City's records be made in a timely manner.	2013-10	316
*That bank reconciliations for all funds be prepared in a timely manner and that all bank reconciliations be forwarded to the Director of Finance for approval.	2013-11	316
*That the Finance Department reconcile daily the cash receipts deposits (FD #3 Forms) to the actual bank deposit.	2013-12	316
*That all debt service payments be promptly posted into the City's Budget and that all interfunds, if applicable, be settled in a timely manner.	2013-13	316
*That the City comply with certain statutory due dates as it relates to its financial statements.	2013-14	317
*That year end General Ledgers be in agreement with the Annual Unaudited Financial Statement that is filed.	2013-15	317

RECOMMENDATIONS
(Continued)

	<u>Finding Number</u>	<u>Page Number</u>
<u>Finance Office (Continued)</u>		
*That all Budget Activity Reports reflect all activity that occurred throughout the year.	2013-16	317
*That greater care be taken to ensure collection of all anticipated revenues.	2013-17	317
<u>Sales Contracts Receivable - Sales of Property Acquired for Taxes</u>		
*That all sales contracts receivable be reviewed by the Department of Economic and Housing Development for compliance with the approved authorization of sale and either be collected and/or be cancelled by resolution which also includes the sale of property to the New Jersey School's Construction Corporation.	2013-18	318
That a detail list of taxes receivable and tax overpayments be reconciled to the General Ledger.	2013-19	319
That all entries be identified by transaction code when interfaced with the General Ledger.	2013-19	319
<u>Division of Tax Abatement and Special Tax</u>		
*That annual reports showing the status of all tax abated projects, and revenue collection efforts for the parking and payroll taxes, be filed with the Office of the City Clerk.	2013-20	319
<u>Interfunds</u>		
*That all interfunds be in agreement and liquidated by December 31 st .	2013-21	319
<u>General Ledger Accounting System</u>		
*That the City continue to improve the new general ledger accounting system.	2013-22	320
*That changes be made to the General Ledger so that budget appropriations and appropriation reserves can be proved to the General Ledger on a monthly basis.	2013-23	320
<u>Federal and State Grant Fund (Public and Private Programs)</u>		
*That the appropriate City officials review the current status of all Federal and State Grants and also the deficit balances be reviewed and appropriate action be taken on both of them.	2013-24	321
*That the Unappropriated Grants in the Federal and State Grant Fund be reviewed and either appropriated or cancelled, based upon these findings.	2013-25	321
*That all grants be individually posted in the records of the Federal and State Grant Funds as anticipated and not combined into one line item.	2013-26	321

RECOMMENDATIONS
(Continued)

	<u>Finding Number</u>	<u>Page Number</u>
<u>Property Acquired for Taxes</u>		
That adjustments be made to the Foreclosed Property Schedule to reflect any cash collections.	2013-27	321
<u>Overpayments Receivable - Trust Fund</u>		
*That the overpayments receivable in the Trust Fund be researched for collection or cancellation.	2013-28	321
<u>Assessment Trust Fund</u>		
*That the Assessment Overpayments and Prepaid Assessments be reviewed and either cancelled, applied or refunded.	2013-29	322
That the City attempt to collect all outstanding Assessments Receivable and Assessment Liens.	2013-30	322
<u>Accounts Receivable - Trust Fund</u>		
*That the accounts receivable in the Trust Fund be researched for collection or cancellation.	2013-31	322
*That the accounts receivable in the Trust Grant Fund be reviewed and appropriate action be taken based on that review.	2013-32	322
<u>Reserve for Other Funds - Trust Fund</u>		
*That the detailed account balances be reviewed, and written approval be obtained from the Director of the Division of Local Government Services for all funds expended as dedicated revenues and determinations made as to future need and either be refunded, applied to revenue or cancelled by City Council resolution.	2013-33	322
*That a detailed listing by block and lot be maintained to support the Premium of Tax Sale Account in the Trust Fund.	2013-34	323
*That the deficits in the Reserve for Other Funds be reviewed and appropriate action be taken based upon those findings.	2013-35	323
*That funds collected from a Tax Title Lien sale be deposited and recorded in the Current Fund and that amounts received from taxpayers for the redemption of Tax Title Lien Certificates held by third parties be deposited and recorded in the Trust Fund.	2013-36	323
*That the vouchers payable be investigated and either paid or cancelled.	2013-37	323

RECOMMENDATIONS
(Continued)

	<u>Finding Number</u>	<u>Page Number</u>
<u>Payroll Agency Fund</u>		
*That the payroll deductions payable account in the general ledger be proven each month and that a detailed list of unpaid deductions be in agreement with the general ledger and that the Net Payroll Account be reconciled on a monthly basis.	2013-38	323
*That greater care be initiated in the posting of the payroll to the subsidiary ledger to ensure proper accounting of each transaction and that the subsidiary ledger be in agreement with the General Ledger.	2013-39	324
*That disbursements made for statutory and voluntary deductions be reconciled to actual withholdings on a monthly basis.	2013-40	324
<u>Animal Control Fund</u>		
*That amounts owed to the State of New Jersey in the Animal Control Fund be reviewed and any adjustments made based upon the review and amounts collected for dog licenses, which are due to the State of New Jersey, be accurately recorded.	2013-41	324
<u>General Capital Fund, Water Utility Capital Fund and Sewer Utility Capital Fund</u>		
*That all Improvement Authorizations be reviewed and either cancelled or reauthorized for new purposes.	2013-42	324
*That all Deferred Charges - Unfunded be reviewed and action taken to include in the next bond sale or raised in subsequent budgets.	2013-43	325
That all Capital Expenditures be properly charged to an ordinance or budget appropriation.	2013-44	325
That the City stop using premiums at the time of sale to reduce debt without properly budgeting these funds.	2013-45	325
*That the Deferred Charge - Cost of Bond/Note Issue in the General Capital Fund and the Bond Issuance Costs in the Water Utility Fund be either raised in the next Municipal Budget or applied to existing Improvement Authorizations.	2013-46	325
*That the Reserve for Refunds in the General Capital Fund be researched and applied to the appropriate Improvement Authorizations.	2013-47	325
*That the Due from State of New Jersey for Demolition Bond be reviewed and a claim for reimbursement be made.	2013-48	325
*That appropriate adjustments be made between the Fixed Capital and Fixed Capital Authorized and Uncompleted accounts in the Water and Sewer Utility Funds.	2013-49	326

RECOMMENDATIONS
(Continued)

	<u>Finding Number</u>	<u>Page Number</u>
<u>State Receivables</u>		
*That the City cancel this receivable as they have already been denied reimbursement due to insufficient documentation to support the charges and also the City fund Ordinance #8701 by either subsequent operating budgets or by the issuance of notes/bonds.	2013-50	326
That these receivables should be reviewed to determine if funds are still available from the sponsoring agency for their intended uses. Also, if any eligible expenses have been spent, request should be made to obtain the appropriate funds.	2013-51	326
That all State Receivables in the Water and Sewer Utility Funds be reviewed to determine if funds are still existing from the State and that any eligible expenditures be requested for reimbursement.	2013-52	327
That the amount received from the State of New Jersey in the Sewer and Water Capital Funds be properly applied to the project to the extent of collections.	2013-53	327
*That the General Capital Funds be reviewed and programmed to establish one capital fund.	2013-54	327
<u>Water/Sewer Utility Funds</u>		
<u>Delinquent Water and Sewer Rents Receivable</u>		
*That the balances in the Delinquent Water and Sewer Rents be investigated and either collected, cancelled or transferred to liens, depending on the findings of the review.	2013-55	327
That the difference between the outstanding water rents receivable balance in the General Ledger and the detail outstanding water rents receivable balance provided by the Water Utility Collector be investigated.	2013-56	327
That the difference between the outstanding water rent overpayments balance in the General Ledger and the detail outstanding water rent overpayment balance provided by the Water Utility Collector be Investigated.	2013-57	327
That all bank and credit card charges be properly charged as an expense to the current year budget.	2013-58	328
*That detailed lists for all sewer receivables be available for audit review.	2013-59	328
<u>Accrued Payroll - Sewer Utility Fund</u>		
*That the Accrued Payroll in the Sewer Utility Fund be reviewed and either applied or cancelled.	2013-60	328
<u>Inventory</u>		
*That inventories be performed on an annual basis for both the Water and Sewer Utility Funds.	2013-61	328

RECOMMENDATIONS
(Continued)

	<u>Finding Number</u>	<u>Page Number</u>
<u>New Jersey Easement Receivable</u>		
*That the New Jersey Easement Receivable and reserve be reviewed and a claim be submitted for reimbursement or be funded by other means or cancelled by resolution.	2013-62	328
<u>Payroll Testing</u>		
That the Health Benefits Contribution Schedule be available for review during the audit.	2013-63	328
That the employee deductions for pension be verified to the Quarterly Pension Reports.	2013-64	329
That Management ensure all eligible employees have health benefits withheld from their pay.	2013-65	329
That Management ensure that the correct amount of pension be withheld from employees' pay.	2013-66	329
<u>Voucher Testing</u>		
That Management provide all requested bid packages.	2013-67	329
<u>Protested Checks</u>		
That all protested checks be investigated and appropriate action be taken.	2013-68	329
<u>Municipal Revenue Departments</u>		
*That all departmental receipts be deposited or remitted to the Treasurer within 48 hours per N.J.S.A. 40A:5-15.	2013-69	330
That the total of the FD-3's agree with the Department's cash books.	2013-70	330
<u>Property Management</u>		
*That Management make available all documentation to review.	2013-71	330
<u>Taxicabs</u>		
*That all fees charged should match those listed on the fee schedule.	2013-72	330
<u>City Clerk</u>		
*That the client maintain a log book for all copies.	2013-73	331
<u>Fire Department</u>		
*That all fees charged should match those listed on the fee schedule.	2013-74	331

RECOMMENDATIONS
(Continued)

	<u>Finding Number</u>	<u>Page Number</u>
<u>Recycling</u>		
*That all fees to vendors should be made available as to determine the correct price per weight.	2013-75	331
<u>Traffic and Signal</u>		
*That the Municipal Council should memorialize the standard fees in a fee ordinance.	2013-76	331
<u>Engineering</u>		
*That Management make available all documentation for review.	2013-77	331
<u>Other Post-Employment Benefits</u>		
*That the City prepare the necessary report as it relates to Post-Employment Benefits.	2013-78	331

* * *

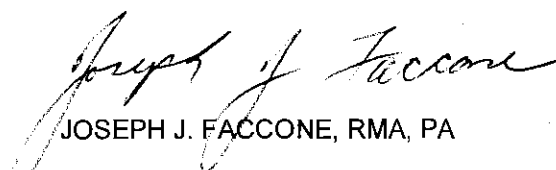
*Repeated from prior year.

The foregoing comments and resulting recommendations are not of sufficient materiality whereby they would affect our ability to express an opinion on the financial statements taken as a whole.

We shall be pleased to confer with the members of the City Council on questions that might arise with respect to any matters in this report and to assist in the implementation of recommendations.

We desire to express our appreciation for the assistance and courtesies rendered by the City officials and employees during the course of our examination.


SAMUEL KLEIN AND COMPANY
CERTIFIED PUBLIC ACCOUNTANTS


JOSEPH J. FACCONI, RMA, PA

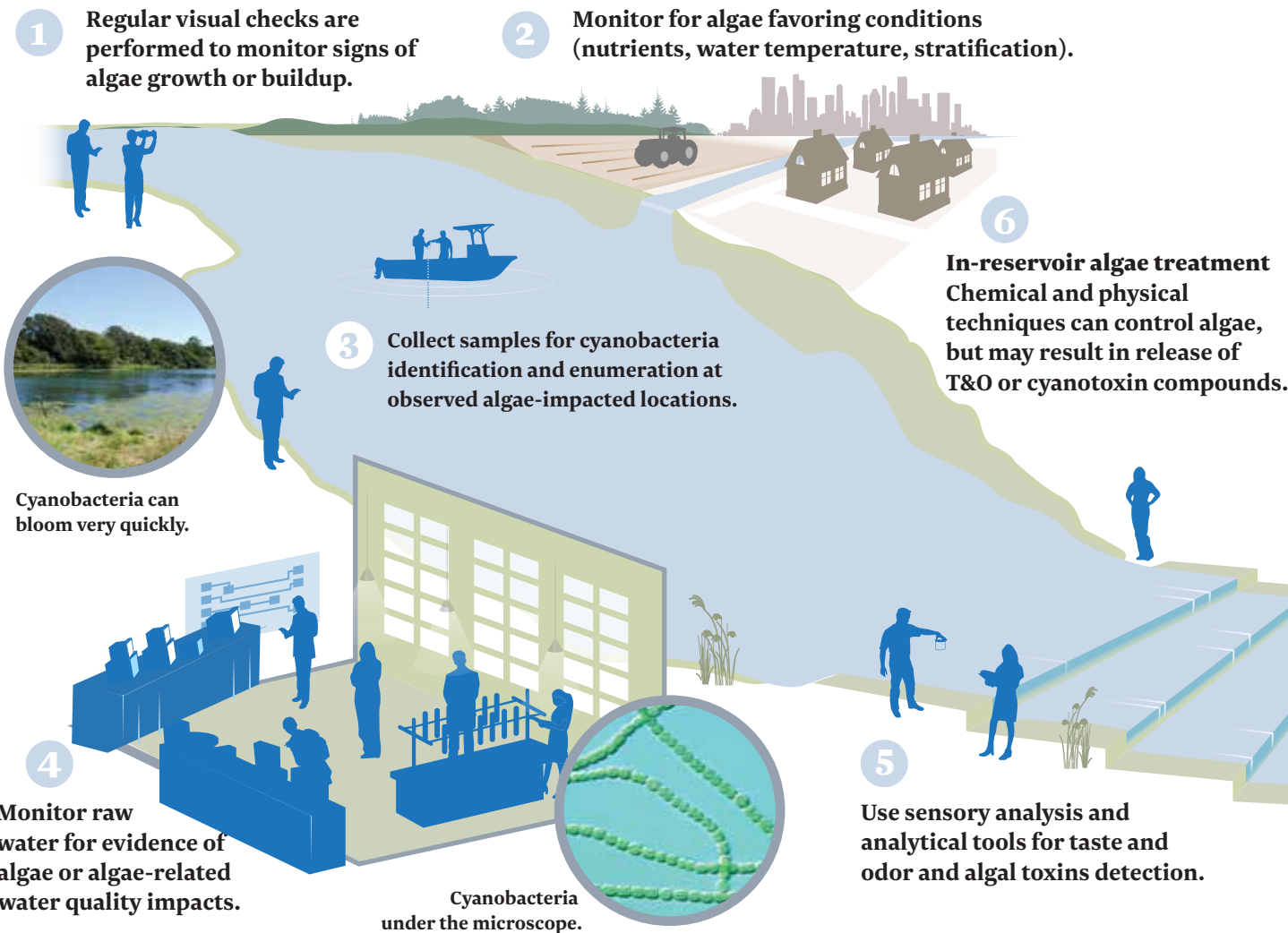
Newark, New Jersey
January 8, 2015

APPENDIX 4A

Algae Alert & Action Plan

Alert & Action Plan Algae

Each summer, municipalities are faced with algae-related issues in their raw water supplies. This wall poster can be used as a guide to develop preventative algae monitoring and treatment for your facility, as well as minimize the impact of an algae event.



Conventional treatment options
Powdered activated carbon (PAC), potassium permanganate, and chlorine have been shown effective under certain conditions to oxidize and remove algal toxins.

Advanced treatment options
Ozone, granular activated carbon (GAC) filtration, and UV advanced oxidation provide effective barriers to algal toxins. These high energy and cost technologies represent significant investments for addressing intermittent water quality issues.

Water Regulations
The EPA has released draft "10-day Health Advisory Levels" for total microcystin and cylindrospermopsin as low as 0.3ppb and 0.7ppb for children younger than school age.

ALERT LEVEL	LOW	MEDIUM	HIGH	VERY HIGH
Conditions	<ul style="list-style-type: none">Non-favorable algae growth conditions	<ul style="list-style-type: none">Favorable growth conditionsPotential presence of cyanobacteriaPotential for algae-related treatment challenges such as pH, DO swings, low level taste and odor (T&O) or toxins in raw	<ul style="list-style-type: none">Confirmed cyanobacteria growthLikely algae-related treatment challengesPotential for algae-related toxins and T&O	<ul style="list-style-type: none">Confirmed cyanobacteria bloomsConfirmed presence of T&O or toxins in raw water
Monitoring Actions	<ul style="list-style-type: none">Regular visual inspection for algaeMonitoring of conditionsWeekly algae Intake sample during growth season	<ul style="list-style-type: none">Bi-weekly to weekly visual inspections with cyanobacteria identification at observed impacted locationsWeekly review of raw water qualityWeekly odor sensory analysis of raw waterDaily algae intake sample	<ul style="list-style-type: none">Vigilant visual inspections and sampling at confirmed bloom location(s)Daily review of raw water qualityDaily odor sensory analysis of raw and treated waterWeekly testing for T&O compounds and/or cyanotoxins in raw and treated water	<ul style="list-style-type: none">Continue daily visual inspection until algae eliminatedDaily review of raw water quality2 daily odor sensory analyses of raw and treated waterDaily testing for T&O compounds and/or cyanotoxins in raw and treated water
Response Actions	<ul style="list-style-type: none">Evidence of algae in reservoir or raw water = move to Medium Alert Level	<ul style="list-style-type: none">Evidence of cyanobacteria observed = move to High Alert LevelPrepare for control of observed algae/cyanobacteria via targeted control methodsPrepare for in-plant treatment of T&O or cyanotoxins	<ul style="list-style-type: none">Evidence of odor or T&O/cyanotoxins in raw or treated water = move to Very High Alert levelTreat confirmed bloom location and consider whole-reservoir treatmentPrepare for in-plant treatment for T&O or cyanotoxins on standby or precautionary implementation	<ul style="list-style-type: none">Alert public as appropriate and advise about treatment strategies in placeIf not already done, treat bloom or whole reservoirImplement in-plant treatment of T&O or cyanotoxins
Step-up Triggers	<ul style="list-style-type: none">Favorable algae growth conditionsEvidence of cyanobacteria in sampling	<ul style="list-style-type: none">Confirmed cyanobacteria growth (2000 - 5000 cells/mL)Evidence of algae raw water quality impactsDetection of algae-related odors in raw water	<ul style="list-style-type: none">Cyanobacteria bloom conditions (>10,000 - >50,000 cells/mL)Detection of algae related T&O and/or toxins in raw and/or treated water	<ul style="list-style-type: none">Chemical algae control in-reservoir often results in T&O or cyanotoxin release into water column, so analysis of compounds should continue even after bloom controlled

10
Proactively prepare a public notification plan in case it is ever needed.

SOURCES:
International Guidance Manual for the Management of Toxic Cyanobacteria, Global Water Research Coalition Water Quality Research Australia, 2009; "EPA Health Advisories for Cyanotoxins" Presented at the May 11, 2015 Cyanotoxins in Drinking Water Stakeholder Meeting

CITY OF NEWARK WATER DEPARTMENT
COMPREHENSIVE TECHNICAL ASSISTANCE
PEQUANNOCK WATER TREATMENT PLANT

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APPENDIX 4B

Hazen & Sawyer HABs and Cyanotoxins Fact Sheet

What You Need to Know About Harmful Algal Blooms and Cyanotoxins

In May, the USEPA hosted a public meeting to solicit input on potential actions to prepare for - and respond to - cyanotoxins in drinking water. A target date of June 15th was identified for public release of final guidance information related to these topics, with the goal of systems implementing monitoring and treatment guidelines by the summer of 2015. The following information is key for utility managers to understand the potential implications of this EPA initiative.



HABs and Algal Toxins

HABs are overgrowths of blue/green algae (a.k.a. cyanobacteria), with some species producing taste and odor compounds MIB and geosmin, and a range of toxic compounds known collectively as algal toxins or cyanotoxins. These toxins have been implicated in fish kills, animal illnesses and deaths, and shut-downs of recreational waters. Recently, several drinking water utilities have detected low levels of cyanotoxins in their finished water, with one incident resulting in a health preventative shut-down of the Toledo (OH) system in the summer of 2014. A holistic approach for reducing risk from HABs and cyanotoxins considers monitoring and managing HABs in source water, and treatment barriers for algal toxins in the plant. Conventional treatment options such as PAC, free chlorine, and permanganate are effective for reducing cyanotoxins under certain conditions, and advanced treatment such as ozone and GAC also provide reductions of the toxic compounds.

The EPA has developed initial health advisory values for microcystin and cylindrospermopsin based upon acute exposure and non-cancer endpoints:

10-day advisory levels

	Bottle-fed infants and pre-school kids	School-age kids and adults
microcystins	0.3 µg/L	1.6 µg/L
cylindrospermopsin	0.7 µg/L	3 µg/L

What Can Utilities Do in Preparation for this Algae Season?

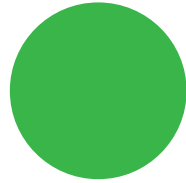
To prepare for the upcoming summer algae season and the potential for algal toxins of concern, the EPA is suggesting a step-wise approach for systems to reduce risks from cyanotoxins in drinking water. The approach is summarized on the back of this sheet, and there are several prudent steps utilities can take in preparation for the upcoming summer.

- Understand vulnerability to HABs in the source water, and develop a HAB and cyanotoxin monitoring program.
- Determine appropriate algal toxin analysis method (Elisa, HPLC/UV, HPLC/MS).
- Develop action plans to control cyanotoxins if they are detected in the raw or finished water
- Evaluate treatment process for robustness of barrier(s) to cyanotoxins.
- Understand the implications and proactively set up communication plans related to detecting cyanotoxins in finished water (see reverse for EPA suggested protocols).

For more information on HABs, see hazenandsawyer.com for regular updates and helpful materials including an Algae Monitoring and Action Plan wall poster and a white paper on the topic.

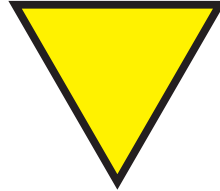
EPA Guidelines to Monitor, Treat, Communicate

In May 2015, the USEPA issued official guidance at its public meeting on cyanotoxins in drinking water. The EPA-suggested approach to minimizing the risks and adverse effects of algal toxins is outlined below.



Low Level

Microcystins $\leq 0.3 \mu\text{g/L}$



Medium Level

Microcystins
 $> 0.3 \mu\text{g/L} \leq 1.6 \mu\text{g/L}$



High Level

Microcystins $> 1.6 \mu\text{g/L}$

Monitor

Continue sampling raw and finished water at least 2-3 times per week until levels are below quantification in at least 2-3 consecutive samples in raw water.

Continue sampling raw and finished water daily until finished water levels are below quantification in at least 2-3 consecutive samples.

Continue sampling raw and finished water at least daily until finished water levels are below quantification in at least 2-3 consecutive samples.

Treat

Modify treatment as necessary to keep algal toxins below HA values.

Adjust existing treatment to reduce the concentration to below $0.3 \mu\text{g/L}$ (MC) as soon as possible. Modify or amend treatment as necessary.

Adjust existing treatment to reduce the concentration to below $0.3 \mu\text{g/L}$ (MC) as soon as possible. Modify or amend treatment as necessary.

Communicate

Continue communication with State primary agency and local health officials on monitoring results.

Notify local public health agency, primary agency, and the public. Recommend use of alternative water sources for children younger than school age.

Notify local public health agency, primary agency, and the public. Recommend "Do Not Drink/Do Not Boil Water" advisory for all consumers.

Adapted from the USEPA Public Meeting and Webinar: Input on Potential Actions to Prepare and Respond to Cyanotoxins in Drinking Water (May 2015).

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APPENDIX 4C

Quick Algae Self-Assessment Checklist

Quick Self-Assessment

Step 1: How prepared is my system for potential cyanotoxin events?

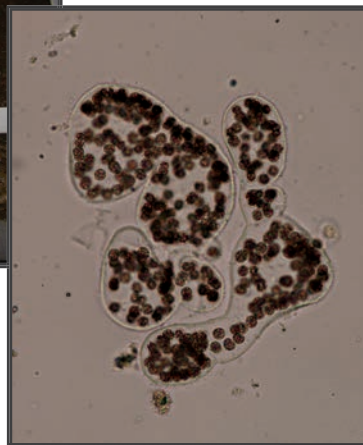
Asking the following questions can give a water utility a better idea of whether the utility should be preparing itself for possible cyanotoxin problems. This brief assessment considers three categories: 1) source water monitoring; 2) source water quality; and 3) cyanobacteria present during the treatment process. This tool is applicable only for water utilities using water from surface water bodies.

	High Concern	Medium Concern	Low Concern	Very Low Concern
Source Water Monitoring				
Does the utility have a source water monitoring program in place?	Doesn't monitor source water before treatment	Conducts some tests on source water (e.g., turbidity, total organic carbon) as it enters treatment plant	Monitors source water monthly (e.g., chlorophyll <i>a</i> , algae counts) at different depths and locations	Has a comprehensive source water monitoring program, sampling at least weekly at different depths, locations
Does the source water quality monitoring program evaluate changes to the water over the year?	No	No	Yes, tracks monthly water quality trends (e.g., to help determine which source(s) to use)	Yes, tracks trends at least weekly of all monitored parameters
Does the utility track changes by comparing water quality data from year to year?	No	No	Yes, seasonal or annual averages are tracked and compared	Yes, charts are created with monthly data for at least the last five years
Source Water Quality and Aesthetics				
Does the source water have algae growth?	Yes, there are blooms and copper sulfate is added regularly	Yes, but treatment adjustments are not necessary in response	Minor algae growth, but no visually obvious blooms	Very minimal, if any, growth
Does the source water stratify thermally in the summer?	Yes, strong thermocline and turnover in late summer/fall with noticeable water quality changes	Yes, stratifies but no noticeable changes in water quality with turnover	Stratifies some during the day but mixes at night	No
Is the surface water source affected by drought?	Yes, water level drops, water is warmer due to drought conditions	Yes, water level drops a small amount, no water temperature increases	No	No
Does the source water have taste and odor producing blooms?	Yes	N/A	N/A	No

	High Concern	Medium Concern	Low Concern	Very Low Concern
<i>Cyanobacteria in the Treatment Process</i>				
Are there restrictions on treating the source water (e.g., in reservoirs)?	Stringent restrictions (source water treatments not allowed)	Some restrictions (source water treatments limited)	Minimal restrictions	No restrictions
Are any treatment processes exposed to sunlight?	Yes, most of the unit processes are outdoors and uncovered	Yes, at least one unit processes is exposed to sunlight	No	No
Is the filter back-wash green?	Yes, frequently	Yes, periodically	No	No
Does the utility have taste and odor problems?	Yes, frequent complaints during the summer	Yes, periodic complaints	Once every few years	No
Are the basins regularly cleaned?	No, never	Maybe once every few years	At least once a year	More than once a year



Algae skimmer removes biomass in a dissolved air flotation plant in Waco, Texas



Microcystis

Quick Self-Assessment

Step 2: What tools are available to respond to cyanotoxins?

The next step is to determine whether the utility has effective measures in place to 1) control cyanobacteria growth and/or treat water for cyanobacteria and cyanotoxins; 2) reliably use an alternative supply or select from different intakes; and 3) communicate effectively with consumers and the public health community. For each topic in the following table, check whether the utility has that measure available. If it is available, check whether or not it has been evaluated specifically for addressing cyanotoxins.

	Yes	No	If yes, has the measure been evaluated for addressing cyanotoxins?
Water Quality Management/Treatment			
Algae reduction tools for source water supply, including: Enhanced aeration/circulation/mixing Chemical addition (e.g., copper sulfate, chlorine) Ultrasound Other			
Ability to select from different intakes, both in terms of depths/locations <i>and</i> time (i.e., the ability to switch intakes without delay or much effort)			
Intake inline oxidant addition: Permanganate Chlorine Chlorine dioxide Other			
Conventional treatment			
Membrane filtration			
Activated carbon (powdered or granular) or other adsorptive media			
Oxidative processes (in use for DBP precursor removal, taste and odor control, or other chemical contaminant removal): Ozone Peroxide Other			
Disinfection processes			
Supplying Water			
For disruptions lasting longer than the system's ability to supply customers using existing finished water storage, have you worked with regulatory agency to develop a plan consistent with <i>Planning for an Emergency Drinking Water Supply</i> ? (EPA 600/R-11/054, June 2011. http://cfpub.epa.gov/si/si_public_file_download.cfm?p_download_id=502174)			
Communicating with the Public			
Reviewed and updated or prepared communication materials for both cyanotoxins and taste and odor events			
Established communication network with the local public health and medical community			

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APPENDIX 10A

City of Newark Division of Water Supply Organizational Chart

TABLE OF ORGANIZATION

Division of Sewers & Water Supply

ANDREA HALL ADEBOWALE, DIRECTOR

Michel Gelin,
Assistant Director

Pequannock Water
Treatment Plant &
Watershed

Page 6

Water Quality Treatment
Montclair
Rechlorination Station

Page 6

Intake & Supply
Distribution Reservoir

Page 6

Contract
Administration &
Engineering

Page 7

Procurement & Budget
Unit

Page 8

Distribution &
Maintenance Operation
(Central Avenue)

Pages 9,
10 & 11

Division of Sewers

Page 12

TABLE OF ORGANIZATION

Division of Water Supply

ANDREA HALL ADEBOWALE, DIRECTOR

**(1) Assistant Director
(Michel Gelin)**

**(1) Director of Public Works
(Andrew Pappachen)**

**Pequannock Water Treatment Plant &
Watershed**

**Water Quality Treatment
Montclair Rechlorination
Station & Cedar Grove**

**Intake and Supply Distribution
Reservoirs**

Pequannock Water Treatment Plant

(1) Water Treatment Plant Supt
(Michael Awertschenko)
(1) Asst. Supt Water Treatment Plant
(Kevin Greer)
(1) Chief Water Treatment Operator
(Robert Lincoln)
(1) Supervising WTP Operator
(Marvin Bailey)
(2) Senior WTP Operators
(JeWayne Jones)
(Prafulgir Goswami)
(4) WTP Operators
(Aniyan Jacob)
(Karriem Beverett)
(Vasant Gosai)
(Christopher Redwood)
(2) Supervising Lab Tech, WA
(Edwin Moran)
(Jaqueline Brown)
(1) Chemist, Instrument Trace Anaylsis
(Robert Murray)
(2) Lab Tech, Water Analysis
(Majeedah Shariah)
(Reina Segura)
(1) Senior WTP Repairer
(Dennis Leonard)
(3) WTP Repairer
(Ronald Jeter)
(Barrington Cohall)
(Lenox Irving) (Karl Culver)
(Abdul-Raheen Yasin)

(1) Chief Chemist
(Selene Samuel)
(1) Chemist 1
(Jennifer Pilgrim)
**(1) Senior Laboratory
Technician (Water Analysis)**
(Jeffrey Baldwin)

(3) Laborer
(Jermaine Land)
(Carl Culver)
(Abdul Raheem Yasin)

(1) Water Leak Detector
(Lenn Gardner)

**(1) Supt. Water Intake and
Supply Mains**
(Divyeshgir R. Gosai)
**(2) Senior Maintenance
Repairer**
(Sajan P. Mathew)
(Lamont Nickerson)

**(2) Water Treatment Plant
Repairer**
(Marco Lopez)
(Kevin Bennett)

Watershed

(1) Forester
(Thomas J. Koeppel)

(2) Sr. Maintenance Repairer
(Warren Congelton)
(John Romachak)

(1) Security Guard
(James Good)

TABLE OF ORGANIZATION

Division of Water Supply

ANDREA HALL ADEBOWALE, DIRECTOR

ASSISTANT DIRECTOR (Michel Gelin)

**CONTRACT ADMINISTRATION & ENGINEERING
(Little Falls)**

**(2) Supervising Engineer
(John George)
(Pierre Lajili)**



**(1) Assistant Director of Public Works
(Talib Aquil)**



**(1) Principal Engineer
(Johnny Lopez)**

**(1) Data Processing Technician
(Margaret Sweeney)**

**(1) Secretary Assistant, Typing
(Adrian Womack-McCoy)**

TABLE OF ORGANIZATION

Division of Water Supply

ANDREA HALL ADEBOWALE, DIRECTOR

**(1) Assistant Director
(Michel Gelin)**

Procurement and Budget

**(1) Chief of Administrative Services
(Celeste Rodriguez)**



**(1) Purchasing Assistant
(Theresa Carson)**



**(1) Data Processing Systems Programmer
(Belinda Davis)**

**(1) Data Processing Technician
(Araion Malone)**

**(1) Supervisor of Accounts
(Albert Velez)**

**(1) Laborer
(Glenn Smith)**

TABLE OF ORGANIZATION

Division of Water Supply

ANDREA HALL ADEBOWALE, DIRECTOR

Distribution & Maintenance Operation

**Michel Gelin,
Assistant Director**

Field Operation

Page 10

Water Operation

Plumbing Crew

Night Crew

Stockroom

Mechanic Shop

Engineering & Administration

Page 11

Technical Unit

Drafting Office

Mark Out Crew

Inspection & Meter Unit

Administration &
Customer Service

TABLE OF ORGANIZATION

Division of Water Supply

ANDREA HALL ADEBOWALE, DIRECTOR

MICHEL GELIN, ASSITANT DIRECTOR

Kareem Adeem, Water Treatment Plant Superintendent

Field Operations

(2) Water Systems Distribution Technician
(James Harvey & Bhoopaul Etwaroo)

Night Crew

- (1) Supervisor, Water**
(Arthur Cleveland)
- (1) Chief Security Guard**
(Ricky Williams)
- (1) Equipment Operator**
(Lamar Black)
- (1) Laborer**
(Michael Holston)

Plumbing Crew

- (3) Plumbers**
(Luis Gonzalez)
(Ivan Rodriquez)
(Jose Garcia)

Mechanic Shop

- (1) Coordinator of Motor Vehicles**
(Alex Koshy)
- (1) Mechanic's Helper**
(Eddie Martinez)

Stock Room

- (1) Security Guard**
(Rory Bynum)
- (1) Laborer**
(Carl Cox)

Water Operation

- (1) Principal Engineering Aide**
(Darryl Harvey)
- (2) Equipment Operators**
(Clifford Hill)
(Dillard Murray)
- (1) Supervising Maintenance Repairer/Landscape**
(Nathaniel Bilal)
- (3) Truck Drivers**
(Anthony Miles)
(Reginald Hamilton)
(Shawn Brown)
- (1) Mason**
(Johnnie Taylor)
- (1) Laborer, Pneumatic Drill**
(Willie Weston)
- (10) Laborers**
(Andres Gonzalez)
(William Newkirk)
(Marquez Robinson)
(Tyran Wilcher)
(Rahman Lee)
(Lewis Bilal)
(Darrius Brown)
(Keith Josey)
(George Barnhill)
(Kirk Sawyer)

TABLE OF ORGANIZATION

Division of Water Supply

ANDREA HALL ADEBOWALE, DIRECTOR

MICHEL GELIN, ASSISTANT DIRECTOR

Engineering

(1) Principal Engineer, Hydraulics
()

&

Administration

(1) WTP Superintendent
(Kareem Adeem)

(1) Environmental Engineer
(Myles Guilford)



Technical Unit

(4) Sr. Maintenance Repairer
(Ronald Johnson)
(Derrick Gully)
(Barry Hudson)
(Johnny Mendez)

Drafting Office

(1) Principal Architectural Draftsman
(Angel Lluminquina)
(2) Engineering Aide
(Lino DaSilva)
(George Smith)

Mark Out Crew

(1) Water Inspector
(Peter Hung)
(1) Dispatcher
(Linda Peten)

Administration & Customer Service

(1) Principal Operator Automated Typewriter
(Sharon Armour)
(1) Timekeeper
(Rita Adams)
(2) Supervising Data Control Clerk
(Maggie Pinckney)
(Maria Colon)
(2) Laborer
(Ricardo Rodriguez)
(Abdul Rasheed-Parker)

Inspection & Meter Unit

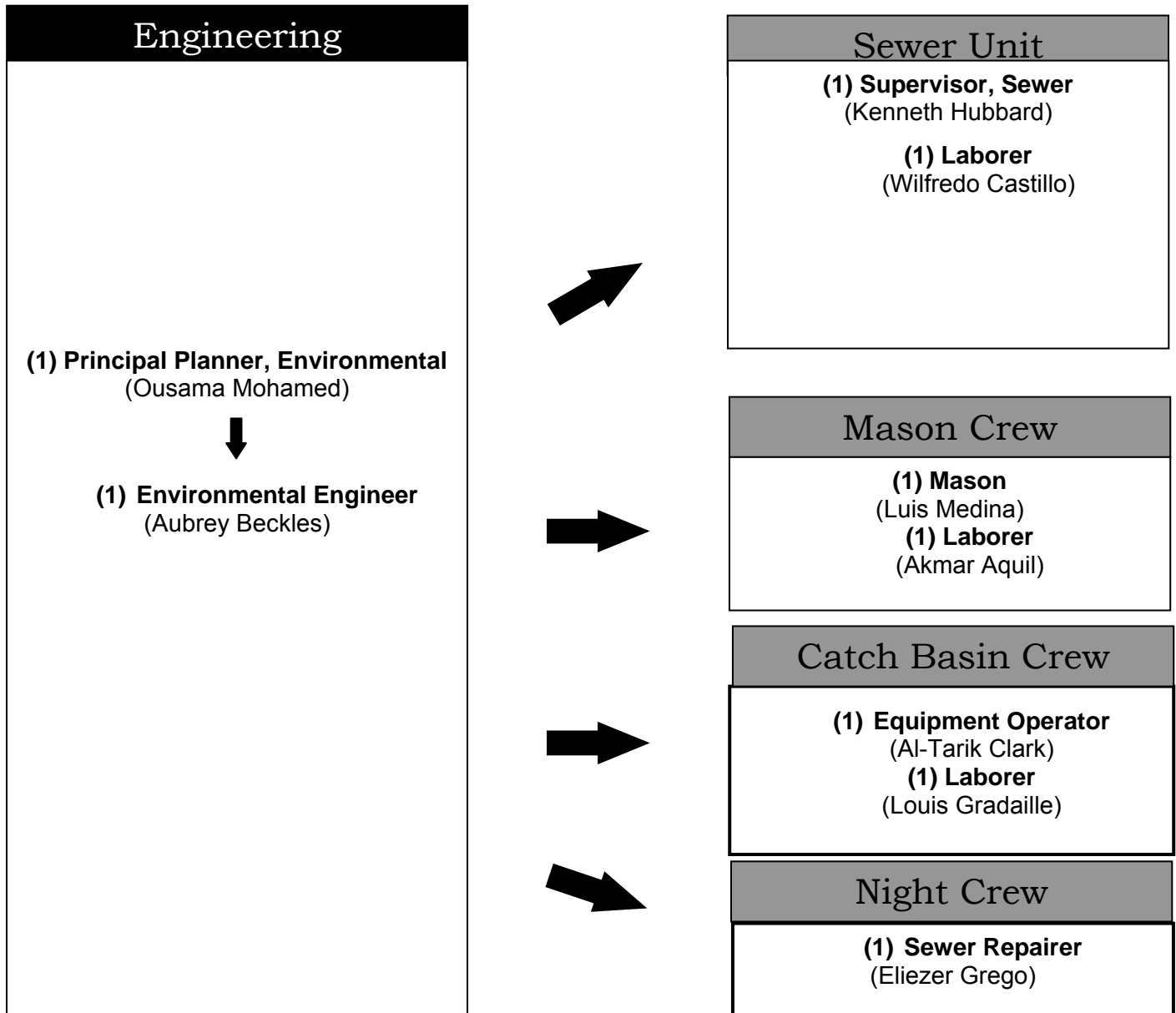
(1) Supervisor of Customer Service
(Brandon Black)
(1) Water Inspector
(Ira Puryear)
(2) Clerk Drivers
(Paul Brown)
(Brian Reid)
(1) Water Meter Reader
(Wyatt Trent)
(2) Water Meter Reader, Bilingual
(Ronnie Figueroa)
(Johnny Rivera-Acosta)
(1) Data Processing Technician
(Stephen Outing)
(1) Data Processing System Programmer
(Stenio Mehu)

TABLE OF ORGANIZATION

Division of Sewers

ANDREA HALL ADEBOWALE, DIRECTOR

Michel Gelin, Assistant Director





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