District Workshop

Bay Delta Conservation Plan

&

Delta Habitat Conservation & Conveyance Program

2013 Nov 20
1a. Introductions

1b. DWR Perspective:
2. **Overview:**

**Purpose:**
- Progress of BDCP and DHCCP
- Provide information for a decision regarding interim finance
3a. Descriptions of Conservation Measures:

![Graph showing CVP Storage vs Ag Service Allocation (1952-2013)]
3a. Descriptions of Conservation Measures:

Long Term Average, CVP S. of Delta Ag Service Contract Allocation

- State Water Resources Control Board Decision 1485 (Implemented 1978)
- Endangered Species Act - Winter Run Salmon Temperature Control
- Central Valley Project Improvement Act - Refuge Supply Increase (Level 2) / Refuge Supply Shortage Provision
- Endangered Species Act - Delta Smelt Biological Opinion
- Water Quality Control Plan (Adopted as D1641 in 2000) / Clean Water Act
- Anadromous Fish Restoration Program - CVPIA B2
- Trinity River Restoration Plan
- Delta Smelt Biological Opinion
- Salmon Biological Opinion

Allocation projections derived from pre-2007 cabin studies and more recent cabin studies associated with the 2008 OCAP BA and Biological Opinion. 2013 Nov 20 Draft Subject to Revision.
3a. Descriptions of Conservation Measures:
### 3a. Descriptions of Conservation Measures:

**Habitat**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Title</th>
<th>Conservation Zone (CZ)</th>
<th>Level</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM2</td>
<td>Yolo Bypass Fisheries Enhancement</td>
<td>CZ 2</td>
<td>Landscape</td>
<td>Seasonal modifications of the Yolo Bypass to improve the timing, frequency, and duration of inundation to improve fish habitat</td>
</tr>
<tr>
<td>CM3</td>
<td>Natural Communities Protection and Restoration</td>
<td>CZs 1-11</td>
<td>Landscape</td>
<td>Protection of a variety of natural communities with specific requirements by 5-year increments.</td>
</tr>
<tr>
<td>CM4</td>
<td>Tidal Natural Communities Restoration</td>
<td>CZs 1, 2, 4-7, 11</td>
<td>Natural Community</td>
<td>Restore 65,000 acres</td>
</tr>
<tr>
<td>CM5</td>
<td>Seasonally Inundated Floodplain Restoration</td>
<td>Plan Area-wide</td>
<td>Natural Community</td>
<td>Restore 10,000 acres</td>
</tr>
<tr>
<td>CM6</td>
<td>Channel Margin Enhancement</td>
<td>CZs 1, 2, 4-6, and/or 7</td>
<td>Natural Community</td>
<td>Restore 20 linear miles</td>
</tr>
<tr>
<td>CM7</td>
<td>Riparian Natural Community Restoration</td>
<td>CZs 4 and 7</td>
<td>Natural Community</td>
<td>Restore 5,000 acres, primarily in association with CMs 4, 5, and 6</td>
</tr>
<tr>
<td>CM8</td>
<td>Grassland Natural Community Restoration</td>
<td>CZs 1, 8, and/or 11, and other zones as needed</td>
<td>Natural Community</td>
<td>Restore 2,000 acres</td>
</tr>
<tr>
<td>CM9</td>
<td>Vernal Pool and Alkali Seasonal Wetland Complex Restoration</td>
<td>CZs 1, 8, or 11</td>
<td>Natural Community</td>
<td>Restore 67 acres of vernal pool complex and 150 acres alkali seasonal wetland complex; restore to achieve no net loss</td>
</tr>
<tr>
<td>CM10</td>
<td>Nontidal Marsh Restoration</td>
<td>CZs 2 and 4 and/or 5</td>
<td>Natural Community</td>
<td>Restore 1,200 acres to support giant garter snake and western pond turtle</td>
</tr>
<tr>
<td>CM11</td>
<td>Natural Communities Enhancement and Management</td>
<td>Plan Area-wide</td>
<td>Natural Community</td>
<td>Applies to all BDCP-protected and -restored habitats</td>
</tr>
</tbody>
</table>
### 3a. Descriptions of Conservation Measures:

- **Other Stressors**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Title</th>
<th>Conservation Zone (CZ)</th>
<th>Level</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM12</td>
<td>Methylmercury Management</td>
<td>CZs 1, 2, 4-7, 11</td>
<td>Species</td>
<td>Minimize the risk for methylation of mercury in restored habitats</td>
</tr>
<tr>
<td>CM13</td>
<td>Invasive Aquatic Vegetation Control</td>
<td>CZs 1, 2, 4-7, 11</td>
<td>Species</td>
<td>Control nonnative aquatic vegetation</td>
</tr>
<tr>
<td>CM14</td>
<td>Stockton Deep Water Ship Channel Dissolved Oxygen Levels</td>
<td>CZ 6</td>
<td>Species</td>
<td>Maintain dissolved oxygen concentrations above levels that impair covered fish species between Turner Cut and Stockton</td>
</tr>
<tr>
<td>CM15</td>
<td>Localized Reduction of Predatory Fishes</td>
<td>CZs 1, 2, 4-7, 11</td>
<td>Species</td>
<td>Reduce the abundance of predatory fish in high predator density locations</td>
</tr>
<tr>
<td>CM16</td>
<td>Nonphysical Fish Barriers</td>
<td>CZs 5-8</td>
<td>Species</td>
<td>Placement of nonphysical fish barriers at strategic locations throughout the Delta</td>
</tr>
<tr>
<td>CM17</td>
<td>Illegal Harvest Reduction</td>
<td>Plan Area-wide</td>
<td>Species</td>
<td>Reduce illegal harvest of Chinook salmon, Central Valley steelhead and sturgeon</td>
</tr>
<tr>
<td>CM18</td>
<td>Conservation Hatcheries</td>
<td>Plan Area-wide</td>
<td>Species</td>
<td>Expand and establish conservation hatcheries for Delta smelt and longfin smelt</td>
</tr>
<tr>
<td>CM19</td>
<td>Urban Stormwater Treatment</td>
<td>Plan Area-wide</td>
<td>Species</td>
<td>Implement stormwater treatment measures to decrease contaminant discharges to the Delta</td>
</tr>
<tr>
<td>CM20</td>
<td>Recreational Users Invasive Species Program</td>
<td>Plan Area-wide</td>
<td>Species</td>
<td>Minimize risk of introducing invasive nonnative species</td>
</tr>
<tr>
<td>CM21</td>
<td>Nonproject Diversions</td>
<td>Plan Area-wide</td>
<td>Species</td>
<td>Remediate agricultural and other diversions not associated with SWP or CVP through voluntary program.</td>
</tr>
<tr>
<td>CM22</td>
<td>Avoidance and Minimization Measures</td>
<td>Plan Area-wide</td>
<td>Species</td>
<td>Avoid and minimize effects of BDCP activities on natural communities and provide habitat for covered species</td>
</tr>
</tbody>
</table>
3a. Descriptions of Conservation Measures:

- 214 Biological Goals and Objectives
- 22 Conservation Measures
- Monitor and adaptive management
3b. Description of CM#1 (Conveyance):

- Multiple Concepts Evaluated
- Multiple Alignments Studied
- Sizes from 3,000 to 15,000 cfs (Proposed = 9,000 cfs)
- ~ 10% level of engineering
- Limited geotechnical data collection

**Map Diagram:**
- Tunnel Option (CM1)
- Separate Corridors Option
- West Canal/Tunnel Option
- East Canal Option
3b. Description of CM#1 (Tunnel Option):

North Delta

3 Intakes & Pumping Plants

Northern Tunnels & Intermediate Forebay

Central Delta

Twin Gravity-flow Tunnels (40 ft. Dia.)

Southern Delta

Partitioned Forebay with Gated Canals to Jones & Banks pumping plants
3b. Description of CM#1 (Intakes & Pumping):

- **Three intakes: 3,000 cfs each**
- Multiple sites evaluated
- Three configurations evaluated (in-river, **on-bank**, and “cylindrical” screens)
- Designed to comply with the more stringent criteria to protect juvenile Salmonids and Delta Smelt
3b. Description of CM#1 (Intakes & Pumping):
3b. Description of CM#1 (Tunnels):

- Twin bores spaced ~ 120 ft. o.c.
- Length: Approx. 35 miles (each)
- 40 ft. diameter
- Concrete segmental liner (approx. 8 segments per ring, bolted with gaskets)
- Method: Tunnel Boring Machine (TBM) (a) Slurry or (b) Earth pressure-balance
- Geology & groundwater chemistry will dictate TBM type selection
3b. Description of CM#1 (Tunnels):

- Requires Deep Shaft Construction
- Explosion-proof equipment (‘gassy’ soil classification)
- Tunnel muck handling system (conveyor or rail)
3b. Description of CM#1 (Tunnels):

Tunnel Muck Operations - Conveyor System
3b. Description of CM#1 (Tunnels):

Tunnel Muck Operations - Conveyor System
3b. Description of CM#1 (Tunnels):

- Emergency response and rescue systems
- Primary & back-up power supply
3b. Description of CM#1 (Clifton Court):

- Southern portion allows south of Delta exports during construction and long-term
- Northern portion stores flows diverted in north Delta
3b. Schedule:

- **Conservation Plan**
  - 2011: Public Draft
  - 2013: Public Draft
  - 2014: Final

- **Environmental Certification**
  - 2011: Public Draft
  - 2013: Final

- **Permit Acquisition**
  - 2011: Final

- **Restoration (includes Mitigation)**
  - 2011: Habitat Restoration Implementation

- **Engineering**
  - 2011: Conceptual
  - 2012: Prelim
  - 2013: Final

- **Construction**
  - 2011: Site Prep
  - 2012: Tunnel, Intakes & Forebays

**Note:** BDCP Chapter 8 (Cost & Funding) assumes construction complete at the end of 2025.
### 3b. Cost (CM#1 Construction & Operations):

<table>
<thead>
<tr>
<th>Construction</th>
<th>Cost $ in Millions (2013 dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Acquisition (with contingency)</td>
<td>$ 161.2</td>
</tr>
<tr>
<td>River Intake #2</td>
<td>$ 348.8</td>
</tr>
<tr>
<td>River Intake #3</td>
<td>$ 270.7</td>
</tr>
<tr>
<td>River Intake #5</td>
<td>$ 303.2</td>
</tr>
<tr>
<td>Intermediate Foreay and Flow Control Structures</td>
<td>$ 70.9</td>
</tr>
<tr>
<td>Byron Tract Forebay and Flow Control Structures</td>
<td>$ 619.4</td>
</tr>
<tr>
<td>North Tunnels and Shafts</td>
<td>$ 1,017.9</td>
</tr>
<tr>
<td>Main Tunnels and Shafts</td>
<td>$ 6,219.6</td>
</tr>
<tr>
<td>Access, Power delivery &amp; Utility Relocations</td>
<td>$ 316.5</td>
</tr>
<tr>
<td>Communications and Control</td>
<td>$ 23.4</td>
</tr>
<tr>
<td>Construction Subtotal</td>
<td>$ 9,190.4</td>
</tr>
<tr>
<td>Tunnel Contingency</td>
<td>$ 2,641.7</td>
</tr>
<tr>
<td>All other Contingency</td>
<td>$ 657.7</td>
</tr>
<tr>
<td>Contingency Subtotal</td>
<td>$ 3,299.4</td>
</tr>
<tr>
<td>Program Management, Construction Management &amp; Final Design</td>
<td>$ 1,919.9</td>
</tr>
<tr>
<td><strong>Total Conveyance Construction</strong></td>
<td><strong>$ 14,570.9</strong></td>
</tr>
</tbody>
</table>

| | Operating Cost (40 years) | $ 1,456.0 |

Subject to Revision
3b. Cost (CM#1 Direct Mitigation):

<table>
<thead>
<tr>
<th>Mitigation for Construction (Years 1 - 10)</th>
<th>Cost $ in Millions (2013 dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM#3: Seasonally Inundated Floodplain</td>
<td>$92.8</td>
</tr>
<tr>
<td>CM#4: Tidal Natural Communities (Marsh)</td>
<td>$4.7</td>
</tr>
<tr>
<td>CM#6: Channel Margin Enhancement (Setback Levees)</td>
<td>$15.6</td>
</tr>
<tr>
<td>CM#7: Riparian Natural Communities</td>
<td>$1.3</td>
</tr>
<tr>
<td>CM#9: Vernal Pool &amp; Alkali Seasonal Wetland</td>
<td>$0.2</td>
</tr>
<tr>
<td>CM#10: Nontidal Marsh</td>
<td>$2.1</td>
</tr>
<tr>
<td>CM#11: Natural Communities Enhancement</td>
<td>$27.9</td>
</tr>
<tr>
<td>CM#15: Localized Reduction of Predatory Fishes</td>
<td>$2.8</td>
</tr>
<tr>
<td>CM#16: Nonphysical Fish Barriers</td>
<td>$36.3</td>
</tr>
<tr>
<td>Replace Count's Lost Property Tax</td>
<td>$97.7</td>
</tr>
<tr>
<td><strong>Construction Mitigation Subtotal</strong></td>
<td>$281.4</td>
</tr>
</tbody>
</table>

For Financing, round to **$14.9 Billion**
### 3b. Cost (Mitigation for Operations):

<table>
<thead>
<tr>
<th>Mitigation for CM#1 Operations:</th>
<th>Cost $ in Millions (2013 dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yrs 1-10</td>
</tr>
<tr>
<td>CM#11: Natural Communities</td>
<td>$9.5</td>
</tr>
<tr>
<td>Enhancement</td>
<td></td>
</tr>
<tr>
<td>CM#15: Localized Reduction of</td>
<td>$8.0</td>
</tr>
<tr>
<td>Predatory Fishes</td>
<td></td>
</tr>
<tr>
<td>CM#16: Nonphysical Fish Barriers</td>
<td>$-</td>
</tr>
<tr>
<td>CM#22: Avoidance &amp; Minimization</td>
<td>$1.8</td>
</tr>
<tr>
<td>Measures</td>
<td></td>
</tr>
<tr>
<td>Program Admin</td>
<td>$6.3</td>
</tr>
<tr>
<td>Monitoring &amp; Research</td>
<td>$15.1</td>
</tr>
<tr>
<td>Changed Circumstances</td>
<td>$-</td>
</tr>
<tr>
<td><strong>Total Mitigation for CM#1 Operations:</strong></td>
<td><strong>$40.7</strong></td>
</tr>
</tbody>
</table>

**Notes:**

(BiOp) Denotes cost that are considered to be a CVP-wide cost. Cost are to implement the applicable RPA in the USFWS Biological Opinion.

(Cap) Denotes work that can be capitalized as opposed to an expense cost.

<table>
<thead>
<tr>
<th>Mitigation for Continued Operations (Years 1 - 10):</th>
<th>Cost $ in Millions (2013 dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM#4: Tidal Natural Communities (8,000 acres)</td>
<td>&gt; $235.9 $-</td>
</tr>
</tbody>
</table>

**Total Operating Costs**

$276.6 $1,801.3
3c. Water Supply Benefits (Historical):
3c. Water Supply Benefits:

BDCP Alt4 - Jones Exports

Dry Probability of Exceedance Wet

TAF

0 500 1000 1500 2000 2500 3000 3500 4000

100% 90% 80% 70% 60% 50% 40% 30% 20% 10% 0%
## 3c. Water Supply Benefits (as Modeled):

### No Action Alternative

<table>
<thead>
<tr>
<th>Water Use Category</th>
<th>No Climate Change</th>
<th>Early Long-term</th>
<th>Late Long-term</th>
</tr>
</thead>
<tbody>
<tr>
<td>WWD</td>
<td>605.2</td>
<td>556.3</td>
<td>477.3</td>
</tr>
</tbody>
</table>

### Low Outflow Scenario

<table>
<thead>
<tr>
<th>Water Use Category</th>
<th>No Climate Change</th>
<th>Early Long-term</th>
<th>Late Long-term</th>
</tr>
</thead>
<tbody>
<tr>
<td>WWD</td>
<td>739.0</td>
<td>681.2</td>
<td>617.0</td>
</tr>
</tbody>
</table>

### High Outflow Scenario

<table>
<thead>
<tr>
<th>Water Use Category</th>
<th>No Climate Change</th>
<th>Early Long-term</th>
<th>Late Long-term</th>
</tr>
</thead>
<tbody>
<tr>
<td>WWD</td>
<td>659.8</td>
<td>597.0</td>
<td>522.6</td>
</tr>
</tbody>
</table>

---

Subject to Revision

2013 Nov 20 Draft
3c. Water Supply Benefits (LOS By Water Year):

Wet

- No Climate Change: 1,117
- ELT: 1,077
- LLT: 1,035

Above Normal

- No Climate Change: 963
- ELT: 910
- LLT: 848

Below Normal

- No Climate Change: 701
- ELT: 622
- LLT: 513

Dry

- No Climate Change: 478
- ELT: 376
- LLT: 290

Critical

- No Climate Change: 152
- ELT: 142
- LLT: 110
3c. Water Supply Benefits (HOS By Water Year):

- **Wet**
  - No Climate Change: 1,011
  - ELT: 984
  - LLT: 939

- **Above Normal**
  - No Climate Change: 860
  - ELT: 854
  - LLT: 768

- **Below Normal**
  - No Climate Change: 586
  - ELT: 478
  - LLT: 361

- **Dry**
  - No Climate Change: 447
  - ELT: 330
  - LLT: 210

- **Critical**
  - No Climate Change: 120
  - ELT: 62
  - LLT: 53
3d. Risks Affecting Assumptions:

**Construction & Operating Costs:**

- Future Scope Changes or ‘refinements’ (currently at ~ 10% design)
- Geotechnical conditions encountered vs. assumed
- Cost of schedule delays. Disruptions occurring both internally & externally as well as near-term vs. during construction
- Cost of risk & its allocation
- Role of Reclamation – How does BDCP benefit CVP contractors (including refuges and exchange contractors)?
- Continued Participation: Impact if a water agency ‘opts out’

*Blue font* denotes risks that affect both cost allocation and water supplies to CVP south of Delta water service contractors.
3d. Risks Affecting Assumptions:

**Construction & Operating Costs:**

- International conditions at time construction contracts awarded
  - a. Construction market (number of bidders)
  - b. Commodity prices & inflation (TBM, cement, steel, copper)
  - c. Financial markets (bonding & insurance)

- Labor conditions at time construction contracts awarded
  - a. Costs (prevailing wage)
  - b. Willingness to allow foreign constructors to bid for work

- Non-Fish Agency Actions (e.g. EPA ~ air quality, USACE ~ CWA)

- Construction contract packaging, Alt. delivery method(s)
  could be less costly, but legislative approval is needed

- Future cost of power for O&M, which will also affect pumping at CVP (and SWP) facilities
3d. Risks Affecting Assumptions:

**Illustration:** Partial levee failure as TBM passed underneath

- **Project:** SFPUC’s Bay-Division Tunnel, Levee at Cargill Salt Pond, Newark CA
- **Date:** 2012 Aug (Dutra)

~ 100 ft. = Depth to Tunnel
3c. Risks Affecting Assumptions:

**Long-term Water Supplies (CVP South of Delta):**

- CalSim modeling process
  - a. Sequence of future water year types
  - b. Estimates of future level of water demand
  - c. Magnitude & timing of climate change (both hydrology & sea-level rise)
  - d. Relationship between surface water and groundwater

- Actual vs. Simulated Operations

- Decision Tree’s High vs. **Low** Outflow Scenarios

- ESA Section 10 Permit Conditions (which includes intra-service Section 7 consultations)

- Durability of regulatory assurances contained in BDCP (to mitigate for future regulatory actions)

- Water quality of diverted north Delta flows with near-zero flows in tunnel
3d. Risks Affecting Assumptions:

**Long-term Water Supplies (CVP South of Delta):**

- Coordinated Operating Agreement (sharing of available water)
  NOTE: 5-year reviews have not occurred since 1986

- Continued Participation: Impact if a water agency ‘opts out’

- Rate & extent of tidal marsh creation (less acres needed)

- Timing and scope of CALFED Storage Projects

- Terms included in future CVP contract extensions

- FERC License renewals in tributaries

- Evolution of the water transfer market

*Blue font* denotes risks that affect both cost allocation and water supplies to CVP south of Delta water service contractors
3d. Short-Term Risks:

**Water Supplies (CVP South of Delta):**
Today through operation of conveyance

- Seismic or flood event(s) affecting Delta Levees (prior to conveyance becoming operable)

- Coordinated Operating Agreement (sharing of available water)  
  First 5-year review since 1986

- Regulatory actions in progress (e.g. SWRCB & unimpaired flows).
4a. Financing (Construction):
Cost Overview and Analytic Assumptions

The BDCP projects that $14.92 billion in capital improvements (2012 dollars) will be required to ensure sustainable water delivery.

- **Purpose**: Build project improvements in the Delta to protect water supplies for municipal and agricultural users and enhance water quality and environmental resources in the Bay/Delta estuary
  - Restore and protect the ecological health of the Delta
  - Restore and protect water supplies

- **Estimated Capital Cost**: Approximately $17.9 billion is needed to implement BDCP conveyance improvements
  - Cost assumed to be Paid for By State and Federal Water Contractors
    - Conveyance Facilities: $14.925 billion
    - Accumulated Inflation Costs (through 2024 at 2.00% annually): $3.017 billion
    - **Total Costs to be Financed**: $17.942 billion

- **Structuring Assumptions**: Project financing, bond amortization and interest cost assumptions
  - Interest cost assumed to be the 10-year average of the Revenue Bond Index (approximately 5.00%)
  - Each bond series is assumed to be issued with a debt service reserve fund ("DSRF")
    - Increases the bonding amount and assumed negative arbitrage (DSRF may be avoided which reduces debt service by $100MM/year)
  - DSRF applied to make the final debt service payment of each series

  - **Scenario 1**: Base Case Scenario
    - The project bonds are scheduled to amortize 30 years past the anticipated in service date (2025-2055)
  - **Scenario 2**: 2-Year Delay and Increased Cost Scenario
    - Construction period is delayed by two years and costs in this period increase by $1.5 billion
    - The project bonds are scheduled to amortize 30 years past the anticipated in service date (2027-2057)
  - **Scenario 3**: 2-Year Delay and Increased Cost Scenario with Capitalized Interest
    - Interest is capitalized through the in-service date
    - The project bonds are scheduled to amortize 30 years past the anticipated in service date (2028-2058)
4a. Financing (Construction):
Expenditure Timeline: Baseline Scenario 1

Bonds are assumed to be issued annually to meet project funding needs.

---

**Projected Expenditure and Bond Issuance Timeline**

<table>
<thead>
<tr>
<th>Scenario 1 ($millions)</th>
<th>Planning / Permitting / Engineering Phase</th>
<th>Construction Phase (In Service December 2025)</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remaining Cost of Delta Improvements</td>
<td>14,925</td>
<td>15,224</td>
<td>15,419</td>
</tr>
<tr>
<td>+ Inflation (2.00% annually)</td>
<td>299</td>
<td>304</td>
<td>308</td>
</tr>
<tr>
<td>- Scheduled Construction expenditure</td>
<td>109</td>
<td>219</td>
<td>219</td>
</tr>
<tr>
<td>= Remaining Construction Costs</td>
<td>15,224</td>
<td>15,419</td>
<td>15,508</td>
</tr>
<tr>
<td>Total Cost Financed (Including Inflation)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4a. Financing (Construction):
Projected Debt Service for Conveyance Facilities

Bonds are assumed to be issued annually 2014 through 2024 and amortize principal 2025 through 2055 (30 years from the assumed in-service date).  

<table>
<thead>
<tr>
<th>Scenario 1 (in millions)</th>
<th>Planning / Permitting / Engineering Phase</th>
<th>Construction Phase (in Service December 2025)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bond Issue Amount</td>
<td>118</td>
<td>237</td>
<td>237</td>
</tr>
<tr>
<td>Annual Debt Service Payment</td>
<td>3</td>
<td>17</td>
<td>29</td>
</tr>
</tbody>
</table>

(1) Estimated capital costs reference those provided in Chapter 8 of the Bay Delta Conservation Plan, released May 2013. (2) Expenditure schedule for illustrative purposes only. (3) Interest is not capitalized and assumed debt service payments begin during construction. Interest cost assumed to be the 10-year average of the Revenue Bond Index (Approximately 5.00%). Each bond series is assumed to be issued with a debt service reserve fund (“DSRF”) which has increased the bonding amount compared to project cost.)
4a. Financing (Construction): Risk Adjusted

Expenditure Timeline: 2-Year Delay and Escalated Costs ($1.5 billion)

Bonds are assumed to be issued annually to meet project funding needs.

---

(1) Estimated capital costs reference those provided in Chapter 8 of the Bay Delta Conservation Plan, released May 2013. Adjusted to accommodate $350MM of initial mitigation expenses as well annual inflation at 2.0%. (2) Expenditure schedule for illustrative purposes only.
4a. Financing (Construction): Risk Adjusted

Projected Debt Service for Conveyance Facilities: Delay and Capitalized Interest Impacts

Scenario 2 assumes a 2-year delay in construction schedule and bonds amortize principal 2027 through 2057 (30 years from the assumed in-service date). Scenario 3 assumes the delay in construction as well as capitalizing interest through the in-service date, with the first full debt service payment made in 2028.

<table>
<thead>
<tr>
<th>Scenario 2: 2-Year Delay Impact</th>
<th>Planning / Permitting / Engineering Phase</th>
<th>Construction Phase (in Service December 2027)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bond Issue Amount</td>
<td>116</td>
<td>237</td>
<td>238</td>
</tr>
<tr>
<td>Annual Debt Service Payment</td>
<td>3</td>
<td>17</td>
<td>29</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scenario 3: 2-Year Delay w/ CAPI Impact</th>
<th>Planning / Permitting / Engineering Phase</th>
<th>Construction Phase (in Service December 2027)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bond Issue Amount</td>
<td>436</td>
<td>785</td>
<td>665</td>
</tr>
<tr>
<td>Annual Debt Service Payment</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Projected Annual Payment Structure

(1) Estimated capital costs reference those provided in Chapter 8 of the Bay Delta Conservation Plan, released May 2013. (2) Expenditure schedule for illustrative purposes only. (3) In Scenario 1, interest is not capitalized and assumed debt service payments begin during construction. In Scenario 2, interest is capitalized until 1 year past the 2027 in service date. Interest cost assumed to be the 10-year average of the Revenue Bond Index (approximately 5.00%). Each bond series is assumed to be issued with a debt service reserve fund (DSRF) which has increased the bonding amount compared to project cost.)
4a. Financing (Construction): Disclaimer

IRS Circular 230 Disclosure: Citigroup Inc. and its affiliates do not provide tax or legal advice. Any discussion of tax matters in these materials (i) is not intended or written to be used, and cannot be used or relied upon, by you for the purpose of avoiding any tax penalties and (ii) may have been written in connection with the "promotion or marketing" of any transaction contemplated hereby ("Transaction"). Accordingly, you should seek advice based on your particular circumstances from an independent tax advisor.

Any terms set forth herein are intended for discussion purposes only and are subject to the final terms as set forth in separate definitive written agreements. This presentation is not a commitment to lend, syndicate a financing, underwrite or purchase securities, or commit capital nor does it obligate us to enter into such a commitment, nor are we acting as a fiduciary to you. By accepting this presentation, subject to applicable law or regulation, you agree to keep confidential the information contained herein and the existence of and proposed terms for any Transaction.

Prior to entering into any Transaction, you should determine, without reliance upon us or our affiliates, the economic risks and merits (and independently determine that you are able to assume these risks) as well as the legal, tax and accounting characterizations and consequences of any such Transaction. In this regard, by accepting this presentation, you acknowledge that (a) we are not in the business of providing (and you are not relying on us for) legal, tax or accounting advice, (b) there may be legal, tax or accounting risks associated with any Transaction, (c) you should receive (and rely on) separate and qualified legal, tax and accounting advice, and (d) you should apprise senior management in your organization as to such legal, tax and accounting advice (and any risks associated with any Transaction) and our disclaimer as to these matters. By acceptance of these materials, you and we hereby agree that from the commencement of discussions with respect to any Transaction, and notwithstanding any other provision in this presentation, we hereby confirm that no participant in any Transaction shall be limited from disclosing the U.S. tax treatment or U.S. tax structure of such Transaction.

We are required to obtain, verify and record certain information that identifies each entity that enters into a formal business relationship with us. We will ask for your complete name, street address, and taxpayer ID number. We may also request corporate formation documents, or other forms of identification, to verify information provided.

Any prices or levels contained herein are preliminary and indicative only and do not represent bids or offers. These indications are provided solely for your information and consideration, are subject to change at any time without notice and are not intended as a solicitation with respect to the purchase or sale of any instrument. The information contained in this presentation may include results of analyses from a quantitative model which represent potential future events that may or may not be realized, and is not a complete analysis of every material fact representing any product. Any estimates included herein constitute our judgment as of the date hereof and are subject to change without notice. We and/or our affiliates may make a market in these instruments for our customers and for our own account. Accordingly, we may have a position in any such instrument at any time.

Although this material may contain publicly available information about Citi corporate bond research, fixed income strategy or economic and market analysis, Citi policy (i) prohibits employees from offering, directly or indirectly, a favorable or negative research opinion or offering to change an opinion as consideration or inducement for the receipt of business or for compensation; and (ii) prohibits analysts from being compensated for specific recommendations or views contained in research reports. So as to reduce the potential for conflicts of interest, as well as to reduce any conflicts of interests, Citi has enacted policies and procedures designed to limit communications between its investment banking and research personnel to specifically prescribed circumstances.

© 2012 Citigroup Global Markets Inc. Member SIPC. All rights reserved. Citic and Citic and Arc Design are trademarks and service marks of Citigroup Inc. or its affiliates and are used and registered throughout the world.

Citi believes that sustainability is good business practice. We work closely with our clients, peer financial institutions, NGOs and other partners to finance solutions to climate change, develop industry standards, reduce our own environmental footprint, and engage with stakeholders to advance shared learning and solutions. Highlights of Citi’s unique role in promoting sustainability include: (a) releasing in 2007 a Climate Change Position Statement, the first US financial institution to do so; (b) targeting $50 billion over 10 years to address global climate change; includes significant increases in investment and financing of renewable energy, clean technology, and other carbon-emission reduction activities; (c) committing to an absolute reduction in GHG emissions of all Citi owned and leased properties around the world by 10% by 2011; (d) purchasing more than 234,000 MWh of carbon neutral power for our operations over the last three years; (e) establishing in 2008 the Carbon Principles; a framework for banks and their U.S. power clients to evaluate and address carbon risks in the financing of electric power projects; (f) producing equity research related to climate issues that helps to inform investors on risks and opportunities associated with the issue, and (g) engaging with a broad range of stakeholders on the issue of climate change to help advance understanding and solutions.

Citi works with its clients in greenhouse gas intensive industries to evaluate emerging risks from climate change and, where appropriate, to mitigate those risks.
4b. Financing (Interim):
BDCP Interim Financing - Overview

Interim financing will have an important role in shaping the future of BDCP financing

- To maintain the implementation schedule, contractors will need to finance $1.2 billion for design and pre-construction activities

- Assumed cost is shared 50/50 between State & Federal Contractors

- Bonds issued through SLDMWA to provide Federal Contractors share:
  - June 1, 2014: $250 Million in proceeds for project fund (capitalized interest for 3 years)
  - June 1, 2017: $350 Million in proceeds for project fund (capitalized interest for 3 years)

- Interim Financing Bonds assumed to be backed by WWD, SCVWD, SLWD, and PWD

- Financing plan contemplates that by 2018 an agreement will be reached with USBR for CVP Participation providing for payments from all beneficiaries
### 4b. Financing (Interim):
BDCP Interim Financing – Annual Financing Cost Structure

Anticipated cost sharing structure assuming Contract Group-only participation

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Westlands WD</td>
<td>1,195,383</td>
<td>76.2%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>10</td>
<td>17</td>
<td>17</td>
<td>26</td>
<td>38</td>
<td>39</td>
<td>39</td>
<td>$1,064</td>
</tr>
<tr>
<td>Santa Clara Valley WD</td>
<td>154,065</td>
<td>9.8%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>137</td>
</tr>
<tr>
<td>San Luis WD</td>
<td>125,080</td>
<td>8.0%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>111</td>
</tr>
<tr>
<td>Panoche WD</td>
<td>94,000</td>
<td>6.0%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>84</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,568,528</strong></td>
<td><strong>100.0%</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td><strong>14</strong></td>
<td><strong>22</strong></td>
<td><strong>22</strong></td>
<td><strong>32</strong></td>
<td><strong>51</strong></td>
<td><strong>51</strong></td>
<td><strong>51</strong></td>
<td><strong>$1,396</strong></td>
</tr>
</tbody>
</table>

#### Projected Annual Payment Structure

(1) For illustrative purposes only. (2) Interest is not capitalized and assumed debt service payments begin during construction. Interest cost assumed to be the 10-year average of the Revenue Bond Index (Approximately 5.00%). (3) Each bond series is assumed to be issued with capitalized interest for 3 years and with a debt service reserve fund ("DSRF") which has increased the bonding amount compared to project cost.)
**4b. Financing (Interim):**
Potential Cost Allocation with CVP Participation, South of Delta Contractors

Outflow will be an important factor in determining the cost for Westland Water District.

<table>
<thead>
<tr>
<th>Cost Sharing Allocation</th>
<th>Annual Debt Service Cost&lt;sup&gt;1,2,3&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>($ Millions)</td>
<td>Outflow</td>
</tr>
<tr>
<td>Exchange Contracts</td>
<td>877,000</td>
</tr>
<tr>
<td>Refuges</td>
<td>300,000</td>
</tr>
<tr>
<td>M&amp;I @75%</td>
<td>134,000</td>
</tr>
<tr>
<td>Westlands WD</td>
<td>902,294</td>
</tr>
<tr>
<td>Other SOD Ag</td>
<td>453,092</td>
</tr>
<tr>
<td>Other SOD M&amp;I</td>
<td>33,614</td>
</tr>
<tr>
<td>Total</td>
<td>2,760,000</td>
</tr>
</tbody>
</table>

**Projected Annual Payment Structure<sup>1,2,3</sup>**

---

<sup>1</sup> For illustrative purposes only.  
<sup>2</sup> Interest is not capitalized and assumed debt service payments begin during construction. Interest cost assumed to be the 10-year average of the Revenue Bond Index (Approximately 5.00%).  
<sup>3</sup> Each bond series is assumed to be issued with capitalized interest for 3 years and with a debt service reserve fund (“DSRF”) which has increased the bonding amount compared to project cost.
4b. Financing (Interim): Agreement

**Assumptions to be confirmed:**

- A mechanism for financing all pre-construction costs (design, permitting, land acquisition and pre-ordering of equipment) after ROD/NOD and prior to commencement of construction (up to [$1.2] billion) will need to be in place on or about the date of the ROD/NOD so that contractors are not charged on a pay as you go basis;

- While not all pre-construction costs (or all categories of pre-construction costs) may be included in initial financing, initial financing proceeds need to be sufficient to sustain the project for the period of potential litigation with respect to ROD/NOD (three years)- (approximately [$500] million);

- Because DWR will not be in a position to issue DWR revenue bonds for these pre-construction costs until sometime significantly later than ROD/NOD approval, bonds will be issued by contractors or contractor JPAs (until, in the case of SWC share of costs, DWR validation action is favorably resolved);

- Federal contractor share of bonds will be net of Bureau contribution, if any;

- New or amended funding agreements required to cover pre-construction costs, to address applicability of existing MOU to current pre-construction activities and to address the interaction between MOU and existing funding agreements.

- Financing proceeds need to be available at time ROD/NOD approved to assure no delay in the payment of post - ROD/NOD preconstruction costs;
4b. Financing (Interim): Agreement

Outstanding Issues:

- Will new management structure be in place by early 2014 or do financing documents (including new or amended funding agreements) need to provide flexibility to implement new management structure at a later date?

- Contractors working with DWR legal on issues related to DWR authority to accept and spend state and federal contractor moneys for pre-construction activities and, in the case of state water contractors, collect revenues and repay debt service on the statement of charges.
## 5. Value Proposition (Economics):

**Economic Analysis** by Brattle Group  
(aka Sunding Report, dated 2013 July)

<table>
<thead>
<tr>
<th>DHCCP (CVP &amp; SWP)</th>
<th>LOS</th>
<th>HOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term Average Deliveries (TAF)</td>
<td>5,591</td>
<td>4,705</td>
</tr>
</tbody>
</table>

#### Expected Present Value Benefits ($ in Millions)

<table>
<thead>
<tr>
<th></th>
<th>LOS</th>
<th>HOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Supply Reliability ($)</td>
<td>$16,642</td>
<td>$15,722</td>
</tr>
<tr>
<td>Water Quality Impacts</td>
<td>$1,789</td>
<td>$1,819</td>
</tr>
<tr>
<td>Seismic Risk Reduction</td>
<td>$364</td>
<td>$470</td>
</tr>
</tbody>
</table>

**Total Benefits:**  
- **LOS:** $18,795  
- **HOS:** $18,011

**Benefit to Cost Ratio:**  
- **LOS:** 1.41  
- **HOS:** 1.35
5. Value Proposition (Cost/acre-ft.):

Key Assumption: Cost follows the delivery of water

<table>
<thead>
<tr>
<th>$/acre-ft. at DHCCP Level:</th>
<th>Early Long-Term</th>
<th>Late Long-Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Long Term</td>
<td>LOS 5,398 TAF/yr</td>
<td>LOS 4,541 TAF/yr</td>
</tr>
<tr>
<td></td>
<td>HOS 5,078 TAF/yr</td>
<td>HOS 4,270 TAF/yr</td>
</tr>
</tbody>
</table>

### Scenario 1: BDCP (Public Draft)

- **Construction Cost with Debt Service**
  - Early Long Term: $1,243 $/yr
  - Late Long Term: $1,243 $/yr
- **Annual Operating Cost**
  - Early Long Term: $45 $/yr
  - Late Long Term: $45 $/yr
- **Total Annualized Cost**
  - Early Long Term: $1,288 $/yr
  - Late Long Term: $1,288 $/yr
- **Average Annual**
  - Early Long Term: 238.6 $/acre-ft.
  - Late Long Term: 283.6 $/acre-ft.

### Scenario 2: BDCP with 2-year Delay + $1.5 B Construction Cost Increase

- **Construction Cost with Debt Service**
  - Early Long Term: $1,397 $/yr
  - Late Long Term: $1,397 $/yr
- **Annual Operating Cost**
  - Early Long Term: $45 $/yr
  - Late Long Term: $45 $/yr
- **Total Annualized Cost**
  - Early Long Term: $1,442 $/yr
  - Late Long Term: $1,442 $/yr
- **Average Annual**
  - Early Long Term: 267.1 $/acre-ft.
  - Late Long Term: 317.6 $/acre-ft.

### Scenario 3: BDCP & Capitalize Construction Interest

- **Construction Cost with Debt Service**
  - Early Long Term: $1,992 $/yr
  - Late Long Term: $1,992 $/yr
- **Annual Operating Cost**
  - Early Long Term: $45 $/yr
  - Late Long Term: $45 $/yr
- **Total Annualized Cost**
  - Early Long Term: $2,037 $/yr
  - Late Long Term: $2,037 $/yr
- **Average Annual**
  - Late Long Term: 448.6 $/acre-ft.

NOTE: Costs in 2012 dollars
6. Questions & Answers:
Q&A How a TBM Works

1. Cutterhead
2. Working Chamber
3. Pressure Wall
4. Screw conveyor
5. Thrust Arm
6. Tail sealant
7. Segments
8. Annulus Grout
Q&A What is Tunnel Muck?

'Native' Material

Conditioner Just Applied

Conditioner at 'full strength'