Selecting Alts to Evaluate for the Recon MCDS Exercise

(Agenda Item 7; Documents 5a, 5b, 5c)


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Overview of Discussion

- Review of the “Red Dot” voting exercise
- Alts “selected” for Recon MCDS exercise
- Technical evaluation format for Recon Alts
- Timeline for Recon technical evaluations
- Preliminary evaluations for a subset of Alts.
- Q&A and discussion
- Set up for “What If” exercise

Red Dot Voting

- 13 members provided input on the list of 54 (of the 67 total) alternatives
  - Some of these 54 were bundled into one package for the red dot exercise
- The top 4 include:
  - North Coast Water Storage
  - SCWD 4 Reuse Scenarios
  - SWC Desal alternative
  - WSAC Ranney Collectors

Other Alts Receiving at least 2 dots

- Expanded treatment capacity (membrane/SLR)
- Building code revisions and on-site water systems
- Aquifer restoration with inter-district collaboration
- Water neutral development to address growth
- Storm aquarries
- Regional water authority

Selecting Alts for Recon Exercise

- Objectives:
  - Provide useful cross section of different types of Alts
  - Provide fodder for “exploring the decision space”
  - Reflect (generally) WSAC voting preferences
- **No Alts will be harmed or eliminated for Real Deal consideration**

Various Permutations and Combinations

Sources of Water

- Conservation
- Winter Surface Flows
- Groundwater
- Reuse
- Desal
- Graywater
- Rainwater

Placement and/or Uses

- Loch Lomond
- New surface reservoirs
- Aquifer systems
- Exchanges with neighboring systems
- Irrigation (nonpotable)
- Potable

Additional Infrastructure

- Additional pipelines, Ranney collectors, treatment facilities, etc.

Overview of the 12 Recon MCDS Alts

- Off stream storage (North Coast quarries)
- Water Reuse (2 variations: DPR, NPR/exchange)
- Desal (2 variations: RO, and Trevi/FO)
- Ranney collectors (winter flow capture)
- Expanded treatment capacity (membrane filtration plant to treat/use winter flows)
- Aquifer restoration/inter-district collaboration
- Lochquifer: treat winter flows, recharge aquifers
- Demand Management (4 variations)
  - Code Revisions, Water Neutral Development
  - Conservation Accounts, Landscaping/graywater

Bevirt: North Coast Water

- Convert the Liddell and/or San Vicente Quarries into two reservoirs.
- This would provide up to a combined 11,000 acre feet of storage capacity.
- Some indications that cost may be substantially greater than stated

Santa Cruz Water Department (SCWD): Water Reuse

- Option 1: Potable reuse and groundwater replenishment for Tait Well Field
  - 1a: Potable reuse & North Coast agricultural irrigation
  - 1b: Potable reuse and SLR augmentation

- Option 2: Joint irrigation and groundwater replenishment for Tait Well Field
- Option 3: Santa Cruz regional groundwater replenishment project
- Option 4: Mid-county regional groundwater replenishment project
- Option 5: Large landscape irrigation with grey water

Ripley: Reuse for agriculture

- Reclamation/Coast Groundwater Exchange (RCGE)
  - 4 to 5 MGD tertiary wastewater treatment plant , 8.5 mi pipeline, and associated facilities to deliver water to North Coast farmers for irrigation
  - Wells and associated facilities needed to extract north coast groundwater
- Farmers use reclaimed water to irrigate fields
- City receives N. Coast groundwater supplies (700 MG/yr = 1.9 MGD)

McKinney: Ranney Collectors on SLR

- Install Ranney collector wells along the SLR to enable tapping high turbidity winter flows
- Alternative to extracting from Loch Lomond because Ranney collectors can filter high turbidity river water
- Enables additional SLR water to be pumped to and stored in Loch
- Several potential locations (e.g., Fenton, Tait)
- Geo-physical conditions *may* be suitable

McKinney: Expanded Treatment Capacity

- New Membrane Plant to treat high-turbidity winter water from SLR, or from North Coast streams (Laguna Creek, Majors Creek, and Liddell Creek)
  - Treatment capacity of 9 – 13 MGD located close to the Tait Street Diversion.
  - Or, treatment capacity of 5 MGD located near the Bay Street Reservoir.
- Enables more use of river water, less of Loch
- Additional water can be sent to Loch and/or transferred to neighboring districts

Sustainable Water Coalition: Desalination

- Seawater pumped to Desalination Plant through filtered intakes.
- Freshwater distributed to customers through existing water system.
- Brine waste transferred to the city's existing wastewater treatment facility.
- Brine mixed with treated wastewater and returned to the Pacific Ocean at close to the salinity and temperature of seawater.

Trevi: Forward Osmosis Desalination

- Forward osmosis (FO) process that relies on a source of low-grade heat to supply a large share of the system's energy requirements.
- Waste heat, rather than electricity, is used to desalinate or remove impurities from the water.
- FO process is at least four times more energy efficient than reverse osmosis (RO) in electricity use.

Paul: (13) The Lochquifer Alternatives

- Divert up to 6,000 AFY of SLR/Zayante Creek winter water to LLR and dispense it to aquifer-dependent districts
  - Double Loch pipeline capacity to 28 MGD
  - Build an 8 MGD conventional WTP to treat Loch-bound water all year
  - Use Ranney collectors for water diversions to filter out turbidity
- Resting wells enables regional aquifers to recharge and recover (offering long-term drought protection)

SCDA: Regional Aquifer Restoration

- Sending river water to Scotts Valley and Soquel Creek during winter months, allowing these districts to reduce their well pumping and allow the aquifer to recharge
- May include “banking”/exchange to provide water to City in dry periods (18% return)
- May contribute to higher base flows in local streams, limit saltwater intrusion, ease use of Loch for drought storage

Markowitz: Landscaping, Capture, Reuse

- Grey water for your landscape; minimize irrigation requirements; minimize lawns/design in patios.
- Rainwater to go into the house/building for domestic, non-potable use.

Santa Cruz Desal Alternatives (SCDA): Conservation Building Codes

- Working group to consider building code revisions that include onsite water systems.
- Go beyond the California Building Code, so that new buildings are highly water-efficient and can capture and reuse water onsite.
- The city can pass an ordinance requiring highly efficient fixtures in existing buildings.

SCDA: Water-Neutral Development

- Implementing a water demand offset program
  - Developers fund conservation retrofits to offset the new demand for water created by the development.
  - Also advocates focusing conservation efforts on existing customers

Smallman: Conservation Savings Accounts

- Show a special account with a line on each invoice. This account will accrue money from a percentage of the billing.
- Slowly increase base charge enough to run the agency, and start putting more and more of the high water use fee income toward conservation improvements.
- Part of the money could go toward capital improvement for the water agency and part could go into these conservation accounts.

Approach for Technical Evaluation of Recon Alts

- Bill Faisst will discuss handouts – templates filled in for 2 Alts

“What Ifs” for MCDS Exercise

- Trevi Forward Osmosis
  - Potential emerging technology for reuse, desal, other membrane applications
  - Large energy and carbon footprint savings
  - Will it work reliably at municipal scale?
- Direct Potable Reuse
  - Will it be permitted by state?
  - What will be required?
  - Will public accept it?