DATE: **April 24, 2015**

TO: **Water Supply Advisory Committee**

FROM: **Rosemary Menard**

SUBJECT: **Working Draft MCDS Evaluation Criteria**

Attached is the most recent working draft of the evaluation criteria to be used with the MCDS model. Item 10 on the WSAC agenda provides an opportunity for a final review prior to having the criteria passed on to Philip Murphy and Carie Fox for use in developing the MCDS model that will be used to evaluate portfolios produced in the April/May meeting.

MCDS Evaluation Criteria Summary Table			
Criterion	**Question**	**Alternative Criteria**	**Portfolio Criteria**
1. Technical Feasibility	How feasible is this approach technically?		
2. Legal Feasibility	Within the required timeframe for this approach are necessary rights currently held in the form needed or feasible to acquire or modify as needed?		
3. Regulatory Feasibility	How easy or difficult would the regulatory approval process for this approach be?		
4. Implementability	How easy or difficult would this portfolio be to implement? What degree of risk or uncertainty is would be involved in implementing the portfolio?		
5. Political Feasibility	What level of political support is this approach likely to have?		
6. Groundwater Resources	How would this approach affect groundwater resources?		
7. Marine Ecosystem Health	How would this approach affect the health of marine ecosystems?		
8. Freshwater and Riparian Ecosystem Health	How would this approach affect the health of freshwater and riparian ecosystems?		
9. Terrestrial Ecosystem Health	How would this approach affect the health of terrestrial ecosystems?		
10. Environmental Profile	How acceptable is the environmental profile of this portfolio?		
11. Operational Flexibility	To what extent does this approach increase operating flexibility?		
12. Addresses Peak Season Demand	To what extent does this approach help address peak season demand?		
13. Yield (Informational Only – Not Rated)	How much water will this approach save or produce?		
14. Energy	How much Energy will this approach/portfolio require per million gallons of water/how much greenhouse gas will the approach/portfolio produce per million gallons of water?		
15. Adaptive Flexibility	How adaptable or flexible is this approach/portfolio to changing conditions?		
16. Regional Benefits	Would or could this portfolio provide benefits to other regional water systems?		
17. Local Economy	How would this portfolio affect local jobs?		
18. Infrastructure Resilience	How would this portfolio affect the system's vulnerability to natural threats?		
19. Supply Reliability	How would this portfolio affect the system's ability to consistently meet an agreed upon level of service?		
20. Supply Diversity	How does this portfolio affect the diversity of supplies?		
21. Sustainability	How sustainable are the actions in this portfolio?		
22. Cost Metrics	What are the upfront and net present value life-cycle costs of alternatives and portfolios?		

1. **Technical Feasibility: Alternative Criterion**
   Technical feasibility is an estimate of whether this approach would work as envisioned. For complex options, technical feasibility would be rated on the basis of core elements. That is, if an option includes many parts, feasibility is rated based on each of the material parts, with the rating tracking the "least feasible." For centralized options, assessment reflects feasibility at utility scale. When rating, City staff used a 10-year horizon on the assumption that it would be very difficult to make predictions about what technical innovations would occur more than 10 years out.
   a. **Question:** How feasible is this approach technically?
   b. **Scale:**
      - Widely used,
      - Demonstrated in field,
      - Promising in 3-5 years,
      - Promising in 6-10 years,
      - More than 10

2. Legal Feasibility: Alternative Criterion
Legal Feasibility addresses siting including acquisition of land, easements or rights or way, water rights, or other legal rights relevant to implementing the alternative as envisioned. This criterion is distinct from Regulatory Feasibility, which relates to specific regulatory approvals that would be required, separate from the legal requirements addressed here.
   a. **Question:** Within the required timeframe for this approach, are the necessary rights currently held in the form needed or feasible to acquire or modify as needed?
   b. Scale:
      - Unambiguous yes; legal issues are routine, non-controversial;
      - Yes, but with some ambiguities; achievable within 6 to 12 months;
      - Can probably acquire; achievable within 12 to 24 months;
      - Difficult to acquire; complex, contentious issues involved, likely requiring more than 2 years to resolve;
      - Very unlikely; significant and contentious legal issues involved, likely requiring more than 5 years, if ever, to resolve.

3. **Regulatory Feasibility: Alternative Criterion**
Regulatory Feasibility addresses environmental and regulatory review. When rating, the City staff looked at the difficulty of getting regulatory approvals under existing regulations as well as the possible necessity of responding to or taking advantage of potential new regulations that might come into place over the next decade. would occur more than 10 years out.
   a. Question: How easy or difficult would the regulatory approval process for this approach be?
   b. Scale
      - Easy and quick; regulatory issues are limited, routine, and/or non-controversial;
      - Slow but relatively sure; regulatory issues include some challenges but approvals and completed processes likely achievable within 6 to 12 months;

- Slow but with some questions due to number or complexity of regulatory issues needing to be resolved; Can probably acquire; achievable within 12 to 36 months;
- Regulatory approvals will be difficult to acquire; new regulations may need to be developed, the scope or number of regulatory process or approvals involves complex, contentious issues, timeframe for completion likely more than 3 years;
- Significant regulatory challenges make approvals or completion of the regulatory review process in a reasonable, predictable time highly uncertain, likely would be expensive and require more than 5 years, if ever, to complete.

4. Implementability – Portfolio Criterion

Implementability is a composite measure for portfolios that is intended to be a judgment call type of rating. Inputs into this rating include the information on technical, regulatory, and legal of the various alternatives included in the portfolio. This composite measure specifically excludes political feasibility because of the degree of individual judgment required in rating political feasibility.

a. **Question:** How implementable would this portfolio be? What is the degree of uncertainty or risk that the one or more measures in the portfolio would not be able to be implemented due to a technical, legal, or regulatory issue or constraint?

b. Scale:

- Readily implemented
- Minor uncertainties and risks related to implementation
- Moderate uncertainties and risks related to implementation
- Significant uncertainties and risks related to implementation
- Unlikely to be implemented

5. **Political Feasibility: Alternative Criterion**

Extent to which an approach will claim and retain the support of the Community, both formal political entities as well as informal social and political groups and the Community at large.

a. **Question:** What level of political support is this approach likely to have?

- **Scale:** Acceptable now;
- Uncertain acceptability, could vary with time;
- Likely never acceptable.

6. **Groundwater Resources: Alternative Criterion**

This criterion looks at the potential for beneficial, neutral or negative effects of a particular approach on groundwater resources. The word "active" in the scale means putting water back not just resting wells.

a. **Question:** How would this approach affect groundwater resources?

b. **Scale:**

- Actively restores,
- Allows restoration,
- Does not affect,

- Degrades Resource,
- Depletes Resource

Note: The scales for Alternative Criteria 7, 8, and 9 are designed to describe the level of the potential impacts of an alternative but do not reflect the legal and policy requirements to avoid, minimize or mitigate for adverse environmental impacts.

7. **Marine Ecosystem Health: Alternative Criterion**
   This criterion assesses whether and how a particular approach might affect the health of marine ecosystems.
   a. **Question:** How would this approach affect the health of marine ecosystems?
   b. **Scale:**
      - Positive effect,
      - does not harm,
      - may harm,
      - cumulative harm,
      - significant harm to populations or species

8. **Freshwater and Riparian Health: Alternative Criterion**
   This criterion assesses whether or how a particular approach would affect the health of freshwater and riparian ecosystems.
   a. **Question:** If this approach were implemented, how would it affect freshwater and riparian ecosystems?
   b. **Scale:**
      - Positive effect,
      - does not harm,
      - may harm,
      - cumulative harm,
      - significant harm to populations or species

9. Terrestrial Resources: Alternative Criterion
   This criterion assesses whether or how a particular approach would affect the health of terrestrial ecosystems. No scale was created for this criterion, so one would need to be created if this criterion is to be used in future analyses.
   a. Question: How would this approach affect the health of terrestrial resources?
   b. Scale:
      - Positive effect,
      - does not harm,
      - may harm,
      - cumulative harm,
      - significant harm to populations or species

10. Environmental Profile: Portfolio Criterion

The environmental profile of a portfolio is made up of a composite of the environmental impacts or benefits of the measures included in the portfolio. Rating the environmental impacts or benefits (i.e., the profile) of a portfolio would involve a judgment call by the rater.

a. **Question:** How acceptable is the environmental profile of this portfolio?
b. **Scale:** A potential scale for the portfolio Environmental Profile criterion would be:
    - The environmental profile of this portfolio is acceptable without mitigation
    - The environmental profile of this portfolio is acceptable with appropriate and effective mitigation
    - The environmental profile of this portfolio is not acceptable and/or cannot be made acceptable even with effective mitigation

11. Operational Flexibility: Alternative Criterion

a. The degree to which this approach increases management flexibility that in turn helps the system do more with existing resources while still meeting resilience, reliability and other goals. (This is particularly designed for approaches that don't actually increase supply or reduce demand, but might nevertheless be useful.) **Question:** To what extent does this approach increase operating flexibility?
b. **Scale:**
    - Increases operating flexibility
    - Has no impact on operating flexibility
    - Decreases operating flexibility

12. Addresses Peak Season Demand: Alternative Criterion

This criterion addresses the extent to which a proposal adds to the water available to meet or peak season demand or reduces peak season demand.

a. **Question:** To what extent would this approach help address peak season demand?
b. **Scale:**
    - All of the water produced is or can be available during the peak season (e.g., aquifer storage and recovery, off stream storage or peak season demand management)
    - The majority of the water produced is or can be available during the peak season (e.g., Ranney collectors that allow the City to stay on the river during river turbidity events and therefore leave water in storage in Loch Lomond)
    - Little or none of the water produced is available during peak season.

13. Yield: Alternative Criterion – Informational Only – Not Ratable

This criterion measures reduction in demand or increase in supply associated with a specific alternative.

a. **Question:** How much water will this approach save or produce?
b. **Scale:** Not Ratable (Information Only)

14. **Energy: Alternative Criterion and Portfolio Criterion**
    This criterion is evaluated for both alternatives and portfolios. After considerable discussion by the Committee, staff and technical team, the metric selected to measure energy use is KWH per million gallons.
    a. **Question:** How much energy does this alternative require for ongoing operations and maintenance?
       How much energy does this portfolio require for ongoing operations and maintenance?
    b. **Scale:** Numeric value

15. **Adaptive Flexibility: Alternative Criterion and Portfolio Criterion**
    Adaptive Flexibility measures the capacity of an alternative or portfolio to respond to changing conditions, for example to higher or lower demands, to more or less impact of climate change. Adaptive flexibility enhances the ability to meet the requirements of changing circumstances in a timely and cost effective manner.
    a. **Question:** How adaptable or flexible is this approach/portfolio to changing conditions?
    b. **Scale:**
        - Provides adaptive flexibility;
        - Has no influence on adaptive flexibility;
        - Reduces adaptive flexibility.

16. **Regional Water Benefits: Portfolio Criterion**
    This criterion allows raters to consider whether an alternative or portfolio of measures would or could provide benefits to both SC water customers and the region.
    a. **Question:** Would this approach or portfolio improve or provide opportunities for improving regional water stability?
    b. **Scale:**
        - Will provide significant regional benefits
        - Will provide some regional benefits
        - Won't provide regional benefits.

17. **Local Economy: Portfolio Criterion**
    This criterion is measured in terms of numbers of living wage jobs specifically produced as a result of ongoing operations and maintenance of programs or projects by measures included in the portfolio. The premise here is that a reasonable number of long-term, living wage jobs is a benefit to the community due to the ripple effect of wage earner spending on goods and services in Santa Cruz.

    a. **Question:** How many long-term, living wage jobs are created by the operations and/or maintenance of programs or projects resulting from the portfolio being evaluated?
    b. Scale:
        - Produces 10 or more permanent living wage jobs
        - Produces 3 to 9 permanent living wage jobs
        - Does not add permanent living wage jobs.

18. Infrastructure Resilience: Portfolio Criterion

Infrastructure resilience is a measure of the system's ability to return to normal operation after an event. As an example, during a power outage caused by any type of circumstance, a system with integrated back up power generation is more resilient than one that does not have back up power generation capacity.

a. **Question:** How would this portfolio affect the system's vulnerability to natural threats?

b. Scale:

- Significantly reduces the system's vulnerability to one or more natural threats;
- Somewhat reduces the system's vulnerability to one or more natural threats;
- Does not impact system vulnerability positively or negatively;
- Somewhat increases the system's vulnerability to one or more natural threat;
- Significantly increases the system's vulnerability to one or more natural threat.

19. Supply Reliability: Portfolio Criterion

Reliability of water supply relates to how much water can be produced under various climate conditions such as drought or extreme precipitation. Remember that in the extreme climate change simplified scenario (the billion gallon shortfall), less rainfall isn't the only issue: turbidity, timing of storm events or other factors may also affect the supply.

a. Question: How would this portfolio affect the system's ability to consistently meet an agreed upon level of service?

b. Scale

- Increases the reliability of supply;
- Does not improve or reduce the existing level of supply reliability;
- Reduces the reliability of supply.

- A couple of additional comments are relevant here:
  - This scale is purposefully qualitative – the quantitative analysis of the portfolios, including analysis of the measures and their effects using Confluence, .
  - When rating this criterion in the MCDS model, it is okay if Committee members use their best estimate of how the portfolio would affect reliability.
  - Also, I think that the use of an "existing" reference point for a reliability criterion allows those working on scenarios to make a decision about whether they want to change the current benchmark in some fashion.

20. Supply Diversity – Portfolio Criterion

This criterion measures the how well prepared or positioned the system is to respond to future uncertainties based on the diversity of its supply portfolio. The premise is that supplies coming from different sources being less likely to as vulnerable to the same kinds of uncertainties.

a. **Question:** How does this portfolio affect the diversity of Santa Cruz water sources?

b. Scale:

- Portfolio significantly increases the diversity of Santa Cruz's supply portfolio.
- Portfolio somewhat increases the diversity of Santa Cruz's supply portfolio.
- Portfolio does not increase the diversity of Santa Cruz's supply portfolio.

21. Sustainability – Portfolio Criterion

EPA's definition of sustainability is "Sustainability creates and maintains the conditions under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic and other requirements of present and future generations."

One concept of sustainability that is very relevant to the WSAC's work is multi-generational equity. The idea behind this concept obviously is reflected in EPA's definition cited above, but a couple of additional perspectives that are relevant include taking actions now to avoid unduly burdening future generations, and protecting current users from paying for all the costs of rehabilitating or replacing current infrastructure when future generations will also benefit from these investments. These two ideas may seem in conflict, but they are really opposite sides of the same coin and both need to be considered in decision-making.

a. **Question:** How does this portfolio rate relative to the environmental, fiscal, and resource management aspects of sustainability?

b. Scale:

- This portfolio is very sustainable
- This portfolio is somewhat sustainable
- This portfolio is not sustainable

22. Cost Metrics:

Information will be provided on the estimated capital costs of Consolidated Alternatives
Net Present Value costs will be provided for the lifecycle costs of operations and maintenance in the form of $/mg.