

DATE: February 13, 2015
TO: WSAC Members
FROM: Rosemary Menard
SUBJECT: Summary of Discussion on MCDS Criteria

These notes, summary and recommendations have been developed by reviewing a variety of available documents and meeting notes. The goal in preparing these notes and recommendations is to provide information needed for the Committee and the technical team to move ahead with refining and evolving these criteria for ultimate use in evaluating portfolios to be developed in scenario planning.

For continuity, the definition, notes and scales provided to the Committee members for use in the MCDS evaluation that took place in early December have been only minimally edited to remove references to earlier rating results. Two additional sections have been added: A summary of key questions and issues, and recommended next steps.

The work below is very much a work in progress. **The goal for today's discussion is to inform the full Committee of the approaches being pursued, and to spend some time discussing some of the larger issues such as whether there are additional criteria that need to be developed for evaluating portfolios (versus alternatives) and whether the Technical Team has additional ideas or suggestions for criteria to be developed for use in further assessments. Examples of these kinds of additional criteria might include robustness, resource diversity, or improves risk profile.**

MCDS Criteria

1. **Technical Feasibility:** Technical feasibility is an estimate of whether this approach would work as envisioned. For complex proposals, rated on the basis of core elements. When rating, City staff used the 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. If you want to change the ratings and look at a longer timeframe, the scale gives you the leeway to do that.
 - 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, Maybe 10-20 years, More than 20, Never
 - c. **Summary of Key Questions and Issues for Technical Feasibility:**
 - Generally this definition and scale of this criterion seemed clear and acceptable.
 - One question that came up was whether it is too speculative to include the longer time frames in the scale for this criterion. For example, would it be reasonable to make a decision now to include an alternative that might not be technically feasible in the next decade in a recommended portfolio.
 - Another issue is whether people would characterize the technical feasibility of various alternatives in the same manner.
 - d. **Recommended Next Steps:**

- Exclude longer time frames from the rating scale so the final scale would be: Widely used, Demonstrated in field, Promising in 3-5 years, Promising in 6-10 years, Never;
 - Clearer information about technical feasibility would help address the varied interpretations by raters of the technical feasibility of options. Have technical team include in the descriptive information of the consolidated alternatives their analysis of the technical feasibility of the alternatives. If a Committee member disagrees with that analysis, he/she can change it and provide comments as to why they have done so.
2. **Legal Feasibility:** Legal Feasibility addresses siting, water rights, environmental and other legal rights relevant to implementing this approach as envisioned.
 - 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, Yes but some ambiguities, Can probably acquire, Difficult to acquire, Very unlikely]
 - c. See discussion notes for Legal, Regulatory and Political Feasibility at the end of the Political Feasibility item.
 3. **Regulatory Feasibility:** This 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. In the scale, the analysis of regulatory feasibility includes the possibility of needing new regs or policies. When rating, City staff used a 10-year horizon on the assumption that it would be very difficult to make predictions about what regulatory innovations would occur more than 10 years out.
 - a. **Question:** Is this approach likely to receive easy, quick regulatory approval?
 - b. **Scale:** Easy and quick, Slow but relatively sure, V slow no regulatory change, Up to 10 year new reg, Not feasible (regulatory)
 - c. See discussion notes for Legal, Regulatory and Political Feasibility at the end of the Political Feasibility item.
 4. **Political Feasibility:** Extent to which an approach will claim and retain the support of formal political entities as well as informal social and political groups.
 - a. **Question:** What level of political support is this approach likely to have?
 - b. **Scale:** Enthusiasm now, Acceptable now, Active resistance now, Acceptable in 5 years, Acceptable in 10 years, Acceptable in 20 years, Likely never
 - c. **Summary of Key Questions and Issues for Legal, Regulatory and Political Feasibility**
 - Legal, Regulatory and Political Feasibility are all elements of overall implementability of an alternative or portfolio of alternatives. Perhaps more so than technical feasibility, these criteria involve judgment calls about how well or

poorly an alternative or portfolio of alternatives would fare as it moved from an idea through the legal, regulatory and public review processes.

- It may be that these individual criteria work better in evaluating individual alternatives than they do in evaluating portfolios because, for example, it might be hard to rate the overall political and/or regulatory feasibility of a portfolio that had both WaterSmart and direct potable reuse in it.
- The addition of an element of a time frame in political acceptability is interesting. It is not clear what more time achieves that would make an alternative more politically acceptable. There are several possible implications: the public accepts new things slowly, but over time things that had limited support become more generally supported; or if a problem doesn't get solved and conditions worsen over time less acceptable options might become more acceptable.

d. Recommended Next Steps:

- Have the Planning Subcommittee work on these three criteria and determine whether it makes sense to combine all three into a single criteria called Ease of Implementation, or
- Whether it makes sense to combine Legal and Regulatory into a single criteria.
- Work with the technical team to get additional information on the types of information that might be available to inform Committee member judgment when rating these criteria – for example, numbers of regulatory or permitting approvals required.
- Look at the Political Feasibility rating scale and determine if there is something more specific that can be added here to make the scale more relevant and less vague.

5. Regional Water Stability: This criterion gets at approaches that would benefit SC water customers and the region.

a. **Question:** Would this approach improve regional water stability?

b. **Scale:** Across County, 4 jurisdictions, 3 jurisdictions, 2 jurisdictions, SC Water only

c. Summary of Key Questions and Issues for Regional Water Stability

- Comments on this criterion had mostly to do with differing interpretations of whether an alternative would provide potential benefits to other regional water providers.
- Beyond the obvious benefits of programs or projects that share infrastructure or administrative costs, the question is really whether the alternative or portfolio has the potential to provide regional benefits in less obvious ways.
- For example, one reviewer noted that he/she didn't see the North Coast Quarry project as something that could provide regional benefits, but might such a project be the source of winter water supply for local jurisdictions dependent on groundwater resources? Would the capacity of such a reservoir be large enough, especially in wet and normal years that it could be the source of water to actively recharge depleted regional aquifers?

d. Recommended Next Steps:

- Work with the Planning Subcommittee to explore the potential for revising this criterion and its scale.

- Focus this criterion on the potential for creating regional benefits rather than the number of jurisdictions involved
- Consider a scale similar to the one being discussed for Addresses Peak Season Demand, i.e., “will, could, won’t” rather than using a scale with the number of jurisdictions that could be involved.
- Ask the technical team to include in its information for consolidated alts any potential for regional benefits.

6. Local Economy: This criterion is measured in terms of numbers of jobs and is meant to synthesize the effect of water supply, water reliability, confidence and local jobs as they might affect local economy.

- Question:** How might this proposal affect Santa Cruz's economy, as reflected in local jobs?
- Scale:** Positive local job, Slight positive, No effect, Slight negative, Negative for local jobs

c. Summary of Key Questions and Issues for Local Economy

- For this criterion, we have both an ill-defined definition and a rating scale that is difficult or impossible to measure.
- One area of possible emphasis is long term, local jobs. In the Committee’s discussions and some follow-up work, one approach would not be on general job growth, but rather on job growth related to whatever is implemented to address water supply reliability. So for example, the water transfer project would receive a low rating on this criteria because no or very few additional long term jobs would be created to operate this system. On the other hand, implementing additional water conservation efforts would rate highly because several additional staff are projected to be needed to implement the Long Term Conservation Master Plan.
- Another possible emphasis is the economic impact on the local/regional community of having a more reliable water supply. Finding a metric that links these two things together is the challenge here.
- The challenge is to figure out if there is any way to differentiate the effect on the local economy from different approaches that could be taken to improving the reliability of Santa Cruz’s water supply.

d. Recommended Next Steps:

- The question of whether or how a criterion on Local Economy would benefit greatly from having the technical team provide the WSAC with input on what kind of measure might be feasible to connect water and the local economy and what rating scale to use in measuring it.

7. Energy: In providing some very broad guesstimates for this criterion, the City staff considered the energy usage of the City's current treatment plant as a 4 and rated the others with respect to that. The City recently compared energy intensity of the treatment

of desal vs traditional sources (surface and groundwater) as 15, 1.5 and 2.1 kWh/1000 gallons respectively. This subcriterion has gone back and forth between carbon emissions and kWh/1000 gallons; later in the process you will want to look at both.

- a. **Question:** How much energy will this approach require per MG of water? (Treating surface water, which the City rated as a 4, is about 1.5 kWh/1000 gallons, see accompanying note.)
- b. **Scale:** 5, 4, 3, 2, 1
- c. **Summary of Key Questions and Issues for Energy:**
 - Key questions are whether this criterion should measure energy use, energy intensity, greenhouse gas emissions, carbon footprint or the energy cost element associated with facility O&M.
 - Also need to have clarity about how much, if any, of existing system energy use parameters are included in the analysis if the portfolio actions include the use of existing facilities or infrastructure.
- d. **Recommended Next Step**
 - Technical evaluation of the alts seem like it would help. Ask the technical team to review the potential energy use parameters and make recommendations for Committee consideration about energy parameters that are readily calculated with planning level information.

8. **Marine Ecosystem Health:** This criterion assesses whether and how a particular approach might affect the health of marine ecosystems.

- a. **Question:** How would this approach affect marine ecosystem health?
- b. **Scale:** Positive effect, does not harm, may harm, cumulative harm, Sig harm to population
- c. See combined analysis for Marine, Freshwater and Terrestrial ecosystem criteria following the Terrestrial criterion.

9. **Freshwater and Riparian Health:** 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:** Plentiful healthier water, About as it is now, Degraded ecosystem health
- c. See combined analysis for Marine, Freshwater and Terrestrial ecosystem criteria following the Terrestrial criterion.

10. **Terrestrial Resources:** 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. **Summary of Key Questions and Issues for Marine, Freshwater, and Terrestrial Ecosystem Health**
 - Relatively little in the various sources of notes on these three indicators of environmental impact.

- There is a philosophical question here about what is being measured in rating these criteria. The scales as now configured pretty much look at a continuum between improving or sustaining the ecosystem attribute to degrading it in some fashion.
- Environmental laws do not require that all environmental impacts be avoided, but they do require that if there are to be impacts they be minimized or mitigated.
- There is a high likelihood that any kind of supplemental water supply project or any project that has land disturbance as part of its implementation, for example construction of a new water treatment plant, will have some environmental impacts. And, it is a certainty that any such project will be required to take steps to minimize and/or mitigate for those impacts. Knowing this to be the case, is a rating scale that includes worsening of ecosystem health a realistic portrayal of the potential impact of any project on one of these environmental indicators?
- If the goal is to relatively compare the impacts of various alternatives or portfolios of alternatives, how should the requirements of environmental protection laws and regulations be taken into account in designing the rating scales for the elements being reviewed?
- Would a rating scale that focuses on the likely success of measures to minimize or mitigate for impacts be more realistic?

b. Recommended Next Steps:

- Discuss philosophical question with the Planning Subcommittee.
- Based on their discussion, convey a summary of input to the technical team and seek their input and suggestions for how to refine the rating scales for these environmental indicators.

11. **Groundwater Resources:** 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, Depletes Resource, Greatly Depletes Resource

c. Summary of Key Questions and Issues for Groundwater Resources

- As with the environmental indicators above, there was no real feedback about this criterion in the materials reviewed.
- This criterion seems to be more about the potential for an alternative or portfolio of alternatives to play a positive role in aquifer restoration at one end of the spectrum and to negatively affect groundwater resources at the other end.
- Again, environmental laws and regulations, including the new law on groundwater sustainability, would seem to limit the ability to implement a project that has truly negative effects on local groundwater.
- Is the goal of this criterion more like the Regional Benefits criterion – the benefit that is being assessed is the potential for a project or portfolio to support/allow regional aquifer restoration even though the amount of groundwater both for the general “good policy” benefits of healthy aquifers as well as the potential benefits

to Santa Cruz of having a more sustainable groundwater supply to draw on in drought years? Can these two goals be measured on the same scale?

d. Recommended Next Steps:

- Discuss philosophical question with the Planning Subcommittee.
- Based on their discussion, convey a summary of input to the technical team and seek their input and suggestions for how to refine the rating scales for groundwater resources.

12. Infrastructure Resilience: Infrastructure resilience relates to the extent to which this approach will help the overall system to withstand natural disasters such as earthquakes, fires, floods, tsunamis and or systemic power outages related to the above--but not drought.

a. **Question:** How well would this approach contribute to the system's ability to withstand natural disasters and other disturbances? (The top of the scale is "meets most challenges well.")

b. **Scale:** Most challenges well, Many moderately well, Some somewhat, Few barely, Doesn't improve resilience, Slightly degrades, Significantly degrades

c. Summary of Key Questions and Issues for Infrastructure Resilience

- No input on this criterion in any of the notes.
- The Committee has noted in various conversations the vulnerability of the Santa Cruz water system to a variety of external natural threats.
- The opportunity for improving the system's resilience through the implementation of actions to improve water supply reliability is what this criterion needs to measure.

d. Recommended Next Steps:

- Consider changing the scale to something like "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.

13. Reliable Supply: 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 much will this approach help the existing system to produce consistently?

b. **Scale:** Makes system sig more rel, Somewhat more reliable, Slightly more reliable, No change, Makes system less reliabl

c. Summary of Key Questions and Issues for Reliable Supply

- Considerable discussion of this topic in the notes. Key topics raised included what does reliability mean? How does it relate or does it relate to peak season demand and yield?

d. Recommended Next Steps:

- Have a discussion with the Planning Subcommittee on the following concept:
 - One way to think about reliability is that it is an agreed upon level of service. A reliable system would be one that has the resources needed to deliver the specified level of service on an ongoing basis. In this case “resources” can mean both supply side and demand management type actions, assets that allow the utility to meet the system’s needs at the agreed upon level 24/7/365.
 - If the Subcommittee accepts this concept, then proceed with the remaining steps, if not continue working the problem until a common understanding is reached.
- Discuss with the Planning Subcommittee the IWP policy on reliability and determine whether the Planning Subcommittee would like to recommend to the full Committee that revisions be considered.
- Evaluate both the results of the Confluence model runs giving information on system reliability and the implications of annual decision-making by staff on recommended levels of curtailment given system conditions in the late winter/early spring each year.

14. Scalability: Scalability measures the extent to which an approach can be scaled up as needs change.

- a. **Question:** How easily can this approach be scaled up within the overall system? (The tilde~ in the scale is shorthand for 'might not meet by itself but sure would help a lot.')
- b. **Scale:** Scales up w no limit, Can scale to ~1BG gap, Can scale to ~650 MG gap, Can scale to ~ 300 MG gap, Not scalable
- c. **Summary of Key Questions and Issues for Reliable Supply**
 - Is the basic goal to assess whether or how well an alternative or portfolio of alternatives would adapt to changing conditions? For example, designing an intake structure to be larger than immediately needed so that the plant could be expanded at some future time without having to upsize the intake.
 - Or is the basic goal to identify those kinds of things that created for one purpose and adaptable for another – for example WaterSmart is typically focused on single family residential, can it be scaled (adapted?) to a different customer group such as multi-family residential or business?
 - With respect to a technology or program, what metrics are important to determining scalability?
 - Does a project or alternative scalability metric transfer to evaluating a portfolio, or would a scalability option for a portfolio relate more to some other criterion, for example, risk management, or keeping future options open?
 - Does scalability inherently have an economic element, as is often referred to when we use the term “economies of scale” or is the economic element separate?
 - Can we or should we have a different scale for rating infrastructure or technological scalability versus the scalability of a program?
 - What information is going to be available about the various types of alternatives that would help us rate them for scalability? As for the rating scale, would a better scale be a simpler one, such as “will, can, won’t” approach or could you build a

scale around the degree of difficulty, for example, easily upscaled, upscalable with some constraints, limited scalability, not scalable.

d. Recommended Next Steps:

- Ask the technical team for input on the scalability metric and whether one metric can work for different types of projects or programs.

15. Preserves Future Choices: In general, this criterion is about the extent to which large capital investments might lock the city in to a certain set of solutions. What is missing in the structure of the model is a way to send a signal about options lost by **IN**action.

- Question:** How well does this approach preserve future choices?
- Scale:** Increases choice, Somewhat inc choice, No effect, Reduces choice, City locked in
- Summary of Key Questions and Issues for Preserves Future Choices – TBD**
- Recommended Next Steps – TBD**

16. Yield: This criterion measures reduction in demand or increase in supply.

- Question:** How much water will this approach save or produce?
- Scale:** Worst - 17.00; Best - 1800.00
- Summary of Key Questions and Issues for Yield – TBD**
- Recommended Next Steps – TBD**

17. Flexibility: The degree to which this approach increases management flexibility that in turn helps the system "get by with less" 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.) In rating 'flexibility,' the City staff looked at an approach's ability to provide diversity, the ability to create a cushion in terms of water availability and other factors. For instance, reuse and desal were seen as "adding another treatment plant" and therefore tended to rate well for flexibility.

- Question:** To what extent does this approach increase flexibility?
- Scale:** Greatly increases, Moderately increases, Somewhat increases, Does not increase, Decreases
- Summary of Key Questions and Issues for Flexibility – TBD**
- Recommended Next Steps – TBD**

18. Addresses Peak Season Demand: This criterion addresses the extent to which a proposal reduces peak season demand or provides water that is not dependent on winter rains.

- Question:** To what extent would this approach help address peak season demand?
- Scale:** Yes, Maybe, No
- Summary of Key Questions and Issues for Addresses Peak Season Demand – TBD**
- Recommended Next Steps – TBD**

Note for Cost Effectiveness Criteria – The Committee received a presentation from Bill Faisst of Brown and Caldwell at the 12/19 WSAC meeting that proposed various approaches to measuring Cost Effectiveness. This information will inform the additional work that will be done on refining and evolving these criteria. In addition, the Committee’s discussion on whether to include the cost to individual customers of various demand management strategies will be reflected.

19. Cost to City: Upfront Costs: This includes siting, permitting, installation or construction and other start-up costs.

a. **Question:** What are the upfront costs of this proposal?

b. **Scale:** Worst - 2.00E+5; Best - 0.00

Cost to City: Operation and Maintenance

Notes:

Scale: Worst - 2.00E+6; Best - 1.00E+5

20. Cost to Customer in Rates: This cost is based on a simplified lifecycle cost (capital cost divided by the life of the project plus annual O&M converted to cost per gallon) and compared to estimates of the cost of a gallon of water to an average single family residential customer in 2018, which is about 1 penny per gallon. An average single family residential customer uses 8 ccg (6,000 gallons) per month. Had to make scale in "per 100 gallons" to stay on the good side of the software.

a. **Question:** How does the cost of this option compare to the cost of an average single family residential customer's cost for a gallon of water in 2018?

b. **Scale:** Worst - 6.00; Best - 0.00

21. Cost to Customer: Individual Purchase: This criterion gets to the cost to an individual of buying, installing and maintaining a system that helps reduce demand or provide storage or supply for that particular household. Example: installing a cistern.

a. **Question:** What is the cost to the individual of buying, installing and maintaining this system?

b. **Scale:** None, Small, Significant