

Appendix U

Water Supply Evaluation Criteria and Scoring Index

U.1 Introduction

Working with the advisory committee, a set of criteria and performance measures were developed in parallel with identifying potential supply projects. Requirements for these criteria were that they not be redundant with each other, be measurable with quantitative and/or qualitative indices, be understandable, concise, and reflective of the users values and goals. In addition to cost, four primary criteria were selected, including:

1. Supply Reliability
2. Water Quality
3. Environment
4. Implementation

The evaluation criteria were refined in consultation with the supply advisory committee. This resulted in the creation of the Supply Evaluation Criteria and Scoring Index, which is presented in this appendix (Appendix U). The Supply Evaluation Criteria and Scoring Index presents definitions developed collectively by the Supply Assessment Committee for a 1 to 5 score of the performance measures within each criteria. For this index, a score of 1 represents a low score that translates to a supply project not meeting positive attributes of the performance measures for that particular criterion; a score of 5 is a high score that translates to a project meeting many positive attributes of the performance measures for a particular criterion.

Supply Evaluation Criteria and Scoring Index ^a

1 2 3 4 5
 Low Med. Low Medium Med. High High

Supply Reliability

| Score | Future Availability | Hydrologic and Hydrogeologic Reliability | Resistance to Emergency Disruptions |
|-------|---|--|---|
| 1 | Greatly impacted by long-term climate change. Impacts > 90% of the supply; Access to source has term-limited agreement(s) that will likely not be renewable at current withdrawal conditions. Conservation program, or code change relies heavily on behavioral savings and/or a large amount of uncertainty in success, or not enough incentive for mass appeal; Conservation device, if applicable, has limited life-span and requires high degree of maintenance to maintain effectiveness. | <80% reliable; Impacted by drought and/or storms of short duration; Extremely difficult to obtain approvals to operate as assumed in computing yield. Very careful management of source is needed to operate in a given year to achieve quantity stated. | Highly vulnerable to emergency disruptions such as power outages, Significant distribution of power requirements for source delivery; Source very distant (>10 miles) from large portion of demand area; Access to source is not secured. |
| 2 | Impacted by long-term climate change; Access to source is term-limited through agreement(s) that may need to be renewed through negotiations that will likely modify existing withdrawal. | 80-85% reliable; Impacted by drought and/or storms of moderate duration; | Significant portions of the area served by the project would be disrupted with power outages; Only minor backup supply sources/power; Source is distant from large portion of demand area. |
| 3 | Possibility of climate change impacts in the long-term. Impacts, if existing, influence at least 50% of the source. Access to source is term-limited and/or licensed, but terms have moderate likelihood of being renewed without modification. Conservation program, or code change, is mixed for behavioral savings and uncertainty in desired savings, or incentive for mass appeal; Conservation device, if applicable, has moderate life-span and requires some routine maintenance to maintain effectiveness. | 85-90% reliable; Impacted by extended drought/storm conditions; Some approvals necessary, yet feasible to obtain in order to operate as assumed in computing yield under abnormal conditions. Moderate complexity in managing the source to achieve quantity stated in a given year. | Project impacted by power and/or other emergency disruptions, but has backup supply sources, power generation, and other option to maintain supply at non-peak demand levels; Source is of moderate distance (~ 3 to 5 miles) to large demand area. Moderate security access to source. |
| 4 | Only slight possibility of long-term impacts due to climate change; Climate change impacts can be resolved with management and infrastructure changes. Access to source is term-limited and/or licensed, but terms have high likelihood of being renewed without modification. | 90-95% reliable; Impacted by severe and/or extended droughts/storms; May have some agency and/or agreement to meet under these stressed conditions. | Large portion of area served by project is not affected by power disruption; Source is close to large demand area. May have a redundant transmission system near source to service areas. |
| 5 | Little to no discernable impacts by climate change; <10% of the supply source influenced by climate change. Access to source is not term limited through agreement(s) and/or licenses. Conservation program or code change relies on measures with known technologies and certain long-term savings. Program provides incentive for mass appeal; Little to no reliance on behavioral changes to obtain savings. Conservation device/technology, if applicable, has unlimited life-span and requires no maintenance to maintain effectiveness. | 95-99% reliable; Not greatly impacted by droughts/storms; no additional agency/stakeholder approvals required for operations. Requires minimal source management to achieve quantity stated in any given year. | Centralized supply system that is mostly gravity fed to majority of customers and impacted by power outages and emergency disruptions only under rare and unusual events; Source is next to (<1 mile) large portion of demand area. High security controls regarding access to source. Has redundant transmission system(s) from source to service areas. |

Note:

a) Definitions in project index key are not intended to be inclusive. Some projects may fit one or more of the definitions in the index key, but not all. Professional judgment and knowledge of project are inherent in the selected ranking

Supply Evaluation Criteria and Scoring Index ^a

1 2 3 4 5
 Low Med. Low Medium Med. High High

Water Quality

| Score | Existing Source Water Quality | Protection against Potential Source Contamination | Compatibility with Other Supplies |
|-------|---|---|--|
| 1 | Source water quality very poor, has high variability, and requires a high level of treatment for consumption. | High DOH susceptibility rating; Surface water source: unrestricted access; Groundwater source: Wells <50 feet deep, tap unconfined/water table aquifer; undeveloped wellhead protection; | Not compatible with other supplies; or significant blending with other sources is required to be compatible and acceptable for potable supply; Will require separate piping and cross-connection controls. |
| 2 | Source water quality has, or has the potential for, presence of low concentration drinking water contaminants (e.g. Arsenic =/or >10 ppb; elevated DDBPs) that require higher degrees of filtration/treatment; Moderate to high variability of water quality. | Moderately high DOH susceptibility rating; Surface Water: Source and Storage basin are relatively unprotected; Groundwater wells 50 to 100 feet deep, have thin confining layer, or have a close connection to the surface. | Not desirable through public perception to blend with other higher quality sources. Likely to require separate piping and cross-connection controls. |
| 3 | Source requires filtration/disinfection and some low level treatment to remove elevated constituent for aesthetic reasons only (H2S odor, Fe, Mn, corrosion control); Moderate variability. | Moderate DOH susceptibility rating, Only 50% of the access and restrictions to the source is controlled; Wells are at medium depth 150 to 300 feet. | Source presents moderate to low TOC and DDBP issues with treatment that may require increased monitoring and/or blending. May require separate piping and cross-connection controls. |
| 4 | Source requires filtration and disinfection only; Low variability. | Moderate to Low DOH susceptibility rating, Access and restrictions to 90% or more of the source is controlled: if Groundwater, project is within an actively managed wellhead protection program; moderately deep wells (300 to 500 ft in depth). | Compatible with most systems; May require blending to meet discernible tastes for some customers. Separate piping and cross-connection controls are not critical for implementation and public acceptance. |
| 5 | Source requires no filtration and minimal disinfection; No variability. | Highly protected and/restricted access/prohibition on certain activities within location of source water; If groundwater, wells are >500 feet in depth and have a very thick overlying confining layer. | Very compatible with other supplies. |

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Supply Evaluation Criteria and Scoring Index ^a

1 2 3 4 5
 Low Med. Low Medium Med. High High

Environment

| Score | Net environmental impacts, including energy | Enhancement opportunities over & above mitigation |
|-------|--|---|
| 1 | Direct impacts to existing beneficial uses of surface and/or groundwater; High Energy Requirements; Requires significant transmission construction that negatively alters existing landscape (i.e., tree cutting, land grading). Large storage/use of chemicals/fuel for treatment/backup power. Code Change, or green supply project has long lasting impacts to existing conditions that can not be readily mitigated. Potential examples (Storm water Injection, Irrigation reduction/loss increasing Nutrient Leaching). | Requires significant operational supply trips; Removal of access to existing recreational uses, such as hiking/boating access to lands/waters for securing the source & transmission infrastructure. No enhancement opportunities exist beyond mitigation. |
| 2 | Indirect impacts to existing beneficial uses of surface and groundwater; Moderate to high energy requirements; Some transmission construction that alters landscape and habitat is necessary; Moderate use/storage of chemicals, including fuel storage for backup power. | Frequent resupply trips involving large container truck traffic; Some recreational uses removed to secure source and/or transmission infrastructure; Minimal enhancement opportunities exist beyond mitigation. |
| 3 | Impacts to beneficial uses/environment are neutral; Medium Energy Requirements; Moderate storage of chemicals for treatment and fuel storage for backup power, Code Change, or green supply project has some form of potential contamination to existing conditions, but this impact can be mitigated. | Project impacts to beneficial uses/environment are neutral; Moderate storage of chemicals for treatment and fuel storage for backup power; Moderate/Routine level of resupply trips; Recreational uses if exist will remain and minimal aesthetic changes to landscape/waterscapes. |
| 4 | Project presents some benefits to the environment; Uses recycled/renewable/solar infrastructure to present a net neutral energy use. | Minimal storage of chemicals and resupply trips; Has potential for a recreational, or aesthetic enhancement; Incorporates elements of conservation to reduce demand, or co-generate energy while using the resource. |
| 5 | Uses recycled/renewable/solar/co-generation infrastructure to generate energy for multiple beneficial uses; May utilize gravity flow to generate power to supply project infrastructure and other uses. Code change, or green supply project has no detectable impact to existing conditions. | Project enhances environment and habitat, in particular for locally listed ESA species; Provides aesthetic, and or recreational benefits for the public. Greatly reduces the need for the resource through efficiency measures/conservation. |

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Supply Evaluation Criteria and Scoring Index ^a

1 2 3 4 5
 Low Med. Low Medium Med. High High

Implementation

| Score | Ease of Obtaining Permits (esp. water rights) | Impacts on Tribal Treaty Interests | Public and Political Support | Institutional Barriers | Project Timing and Readiness |
|-------|---|--|---|---|--|
| 1 | Project located in closed basin for further appropriation; Requires a significant, or pending number of federal, state, and local agency permits; Out of basin transfer of water that impacts state, county and local city permits/agreements. | Directly impacts existing tribal agreements; Impacts cannot be mitigated. | Strong opposition to proposed project in both public and political arenas; Will force major lifestyle change for public and/or how they perceive views (real or not) on the definition of a potable water source. | Lengthy and/or complicated contract negotiations are necessary to secure source to water. Requires significant transmission line/intertie work; Significant portion of land for project site and transmission not currently owned by sponsor. | Project mostly unstudied and many unknowns exist; Greatly dependant on pilot phase results; No prior locally existing project example; No existing infrastructure to expand/build on. |
| 2 | Water right permit possible with significant effort and cost in studies/appeals for water right approval; Other permits necessary and these have not been investigated and/or application have not been submitted. Some out of basin transfer use issues exist. | Impacts to existing tribal agreements exist but can be mitigated with severe operational concessions and/or limitations. | Public and local politicians are not clear, or have not had time to review and accept project. | Land for project and transmission obtainable, but very limited and not currently owned by sponsor. | Project research (paper study) phase complete; limited existing infrastructure to build/expand on. |
| 3 | Some effort/cost necessary in finalizing water right approval (if needed); Minimal to no permits needed at the federal level, mostly local permits; Project applications have been submitted. Out of basin transfer issues, if they exist, are negotiated/mitigated through water banking or operational concessions and/or limits. | Impacts existing tribal treaty interests/agreements, but these are mitigated with moderate concessions and/or limits. | Some contract negotiation may be necessary to secure source to water. Public is informed and has mixed 50/50 opinions on project; May involved some lifestyle changes and/or significant public education on potable water. | Land for project and transmission obtainable and feasible locations for infrastructure identified, but not currently owned by sponsor. | Project has been pilot tested to demonstrate and further quantify feasibility/success; Previous example projects to use for guidance; Some existing infrastructure to build/expand project from. |

Supply Evaluation Criteria and Scoring Index ^a

1 2 3 4 5
 Low Med. Low Medium Med. High High

Implementation (cont.)

| Score | Ease of Obtaining Permits (esp. water rights) | Impacts on Tribal Treaty Interests | Public and Political Support | Institutional Barriers | Project Timing and Readiness |
|-------|---|---|--|---|---|
| 4 | Permits, including water rights (if needed) under final review and likely to be approved by government agencies and public; Minimal to no effort necessary in responding to appeals, Minimal out of basin transfer. | Some minor impacts on tribal treaty interests/agreements, but these are negotiated with minimal concessions/limits. | Public and Political arenas are mostly supportive of project; Project satisfies some low level health concern (summer peak fire flow, blending, etc.); Project presents no lifestyle changes, or a one that the public wants to actively participate in. Public Education on perception of potable water standards is not necessary. | Some land options for project site and transmission available, owned, or readily acquired by project sponsor. | Most studies/pilot testing to assess full project feasibility/success nearing, or at completion; Project design stage underway; Significant existing infrastructure in place to expand/build on for proposed project. |
| 5 | Project has all necessary permits, including water rights, No out of basin transfer issues. | Project viewed positively, or supported by existing local holders of senior water rights, claims, and tribal treaty interests/agreements. | Is supported in both public and political arenas; Satisfies an emergency health/safety concern. | Inter-County/City agreements intact; Land available and owned by project sponsor. | Not dependant on pilot phases/results, similar projects have been done locally and successfully; Most existing infrastructure are in place to expand/build on for proposed project . |

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