Memorandum

To: Water Supply Advisory Committee

From: Robert Raucher and Colleen Donovan, Stratus Consulting Inc.; and Bill Faisst, Brown and Caldwell

Date: 3/11/2015

Subject: Consolidating the Alternatives

In this memorandum, the Technical Team presents our process to consolidate the more than 70 water convention alternatives submitted for consideration by the Water Supply Advisory Committee (WSAC). Below, we describe the purpose, process, and results of the consolidation efforts.

Goal and Purpose of Consolidation

The goal of consolidating the more than 70 water convention alternatives (WCAs)[1] is twofold: to capture the range of high-level ideas that people from the community suggested for the water convention; and to balance the desire to include all of the WCAs and the need to have a manageable number of consolidated alternatives (CAs) – in terms of time, clarity, and resources – which the technical team will carry forward in more-detailed analysis. The technical team is working and coordinating with the Planning Subcommittee to define the appropriate set of CAs to present at the March Water Supply Advisory Committee (WSAC) meeting. We imagine this process will be iterative and involve dialogue among the technical team, City staff, the Planning Subcommittee, and other WSAC members.

Our approach to consolidation is outlined below. On March 6, 2015, the Planning Subcommittee meeting reviewed both the purpose of CAs and the approach outlined in this memorandum.

Process and State of the Work

We have begun the process of consolidating the WCAs so that the WSAC has a set of approximately 20 manageable and representative CAs to carry through Solutions Phase and eventually to use in building portfolios for the scenario-analysis process. As work progresses, the

1. Sixty-six alternatives came from submissions to the Alts Fair, eight were submitted after the Alts Convention (Tanaka, Wirkman: Constructed wetlands; McGilvray: Additional pipeline from Felton to Loch Lomond; Spragg: Transport water from NorCal; Bixler: Olympia Quarry surface storage, Quarry storage / groundwater recharge, and deep water desalination, SKYH2O), and three were recently added (Program C Recommended from the Conservation Master Plan; home water recycling; peak season reductions – 10%, 25%, and 50%).

Confluence® model will test the CAs to determine how well they address water shortfalls as part of scenario planning.

We have compiled the full list of WCAs in a spreadsheet, along with the indicator variables below. The purpose of this compilation exercise is threefold:

- First, we want to group similar alternatives to reduce redundancy. For example, several people submitted similar ideas about water reuse for irrigation, and we can group these into one CA.
- Second, we want to ensure that the WSAC captures the full breadth of project types in the final list of CAs so that each major type of alternative is reflected.
- Third, we want to clearly demonstrate that at a high level we have not discarded, omitted, or lost any alternatives from consideration during the consolidation process.

As shown in the accompanying spreadsheet, we took care not to lose any alternatives during the consolidation process and we have carefully documented what has happened to each alternative.

- ***Column A – WCA #:*** we assigned a unique number to each WCA (WCA1 through WCA72)
- ***Column B – WCA name***
- ***Column C – Description****:* a brief overview of the alternative
- ***Column D – Focus area****:* an indicator of whether a particular alternative falls under demand, supply, storage, institutional/administration, or strategy
- ***Column E – Water source(s)****:* an indicator of where water comes; for example, whether it comes from winter flows, recycled water, saltwater, conservation (e.g., mandatory or voluntary), decentralized (gray water and rainwater), groundwater, some combination of sources, or some other source
- ***Column F – Where to store the water****:* an indicator to identify proposed storage options for a given alternative, for example, Loch Lomond, new surface reservoirs, groundwater, or other options
- ***Column G – Intended use(s)****:* an indicator for how an alternative proposes to use water, for example, potable, non-potable, or both; groundwater recharge, stream augmentation, or some other use

- ***Column H – Additional treatment required****:* a yes/no indicator for whether a particular alternative requires additional treatment
- ***Column I – Additional infrastructure****:* a yes/no indicator for whether a particular project requires additional infrastructure
- ***Column J – Outstanding issues****:* for alternatives that the technical team has already examined, we provide a preliminary list of outstanding issues
- ***Column K – Mapping to CAs:*** a mapping of each WCA to the set of CAs listed in Table 1.

Figure 1 provides an illustration of our process during consolidation and how WSAC can use the consolidated groupings in the portfolio development work as part of scenario planning.

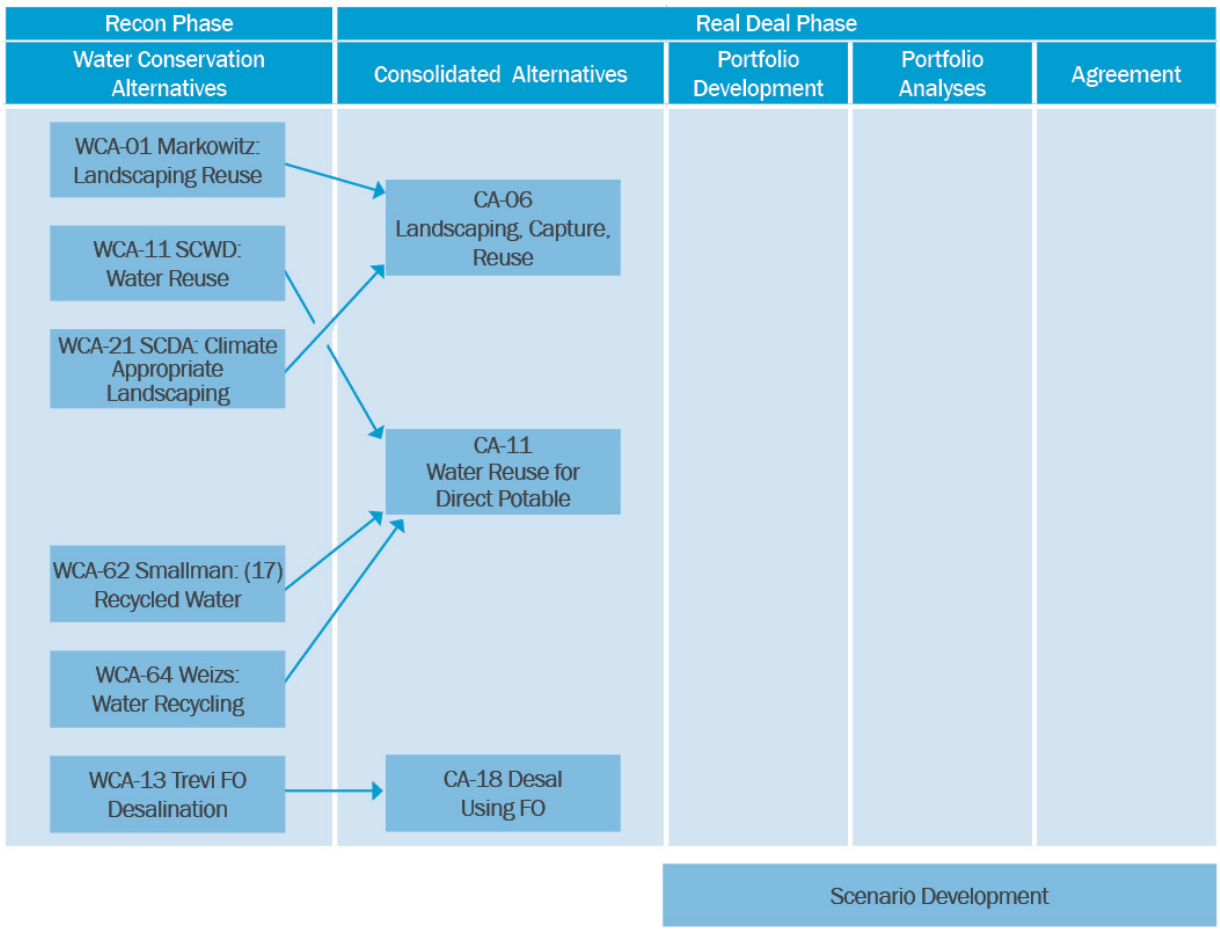

FIGURE 1 FLOW SCHEMATIC FOR PORTFOLIOS DEVELOPMENT

Figure 1. Flow schematic for portfolio development.

Figure 2 presents three simplified schematics that show the typical components required for functional CAs that are not based on water efficiency/water conservation. Water efficiency/water conservation would occur in parallel with alternatives that create supply from new sources (e.g., recycled water, water from new groundwater sources, captured winter flows, or additional diverted surface water).

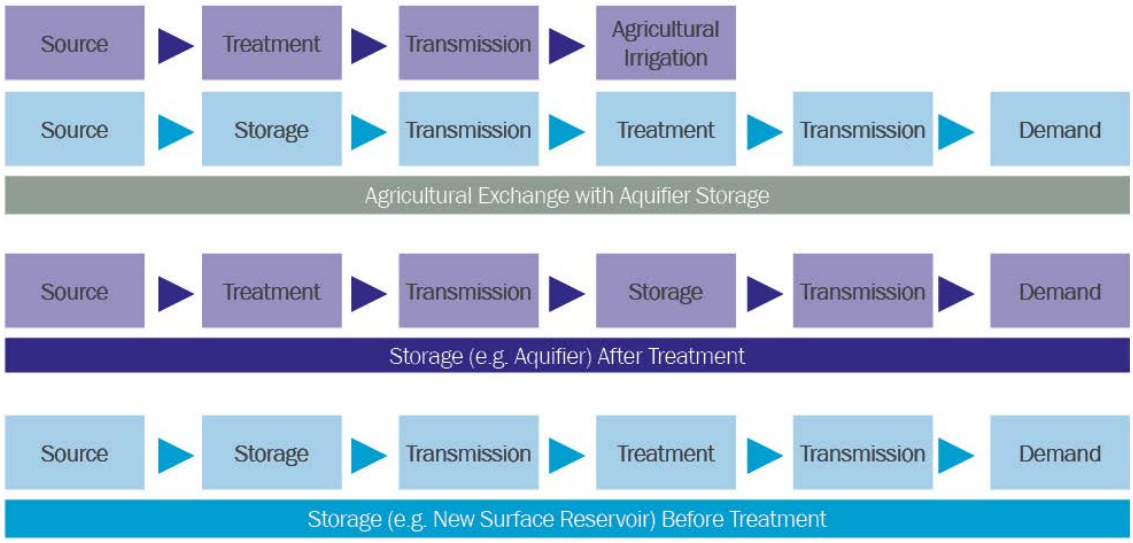

Figure 2. Schematic overview: key components (for example, non-water efficiency CAs).

Proposed CAs

Because many WCAs appear to use similar water sources, means of treatment and/or transmission, and storage – similar high-level ideas – we propose grouping similar WCAs. We have identified 20 CAs for the WSAC to consider. These are listed in Table 1, which provides the following information:

- ***CA #:*** a unique number for each CA (CA1 through CA20)
- ***CA Name:*** a unique name for each CA
- ***CA Description:*** a brief description of what each CA entails
- ***CA Water source:*** where the water would originate
- ***WCA #, name and comments:*** a mapping to indicate which WCAs we grouped into each CA
- ***Assumptions*****:** a more detailed overview of the proposed CA
- ***Reasoning*****:** an explanation for how we tried to capture the essence of each WCA as part of a particular CA, and by doing so, how we did not reject any particular WCA.

This information hopefully will provide a starting point to think about how you could put the alternatives in different bins to create a CA. You will notice that some alternatives, such as Weisz: Water Recycling and Smallman: Recycled Water appear in multiple bins. You also will notice that a handful of WCAs are not included in Table 1. In Table 2 we have included the rationale for not including these "other" WCAs as part of a CA. These "other" WCAs do not necessarily fit into any of the existing CAs (though we welcome any input if you believe there is an appropriate place for them in one of the other categories).

Note that the mapping of WCAs into the CAs is not set in stone. We imagine this process will be iterative and involve dialogue among the technical team, the planning subcommittee, and the other WSAC members.

Transparency

The technical team intends that the approach described here will be transparent to the WSAC members, the public at large, and, more importantly, the proposers who have offered potential solutions for the City's water challenges. The planned iterative process for creating CAs will allow ample opportunity for discussion and alternative adjustment.

Conclusion

The technical team is prepared to apply the approach described above, developing a set of CAs and explaining the rationale for each CA's essential components. We look forward to the WSAC feedback and ideas on how we might polish and implement the consolidation process.

Table 1. Summary of Consolidated Alternatives for the Solutions Phase

Consolidated alternatives (CAs)				Water convention alternatives (WCAs)			
#	**Name**	**Description**	**Water source**	**#**	**Name and comments**	**Assumptions**	**Reasoning**
CA-01	Peak Season Reduction	Develop programs to decrease peak season demands through peak reduction or peak-demand shifting	Conservation (mandated)	WCA-69	SCWD: Peak season reductions – 10%, 25% and 50%	Develop measures to reduce peak season demand by 10%, 25%, and 50%. Measures include, but are not limited to, turf replacement, water restrictions, seasonal water pricing, and permanent water rationing.	Reducing peak season demand would match available supply to actual demands, reducing the need to draw water from aquifers or Loch Lomond. This change would carry over more stored water for dry years.
CA-02	Water-Neutral Development	Implement a demand offset program required for new development to offset new demands	Conservation (mandated)	WCA-03	SCDA: Water-Neutral Development	Water neutral develop focuses on the development "bringing" new water, for example, by fronting costs for water efficiency retrofits and crediting saved water against new demands for a 1:1 offset.	Other water suppliers in NorCal have successfully used development charges to "buy" conservation by other customers.
CA-03	Water conservation measures	Implement Program CREC (Maddaus Water Management, September 30, 2014, Table 4)	Conservation (voluntary)	WCA-20	McGilvray (9): Implement Conservation	The general conservation measures included in this program are: a water loss control program, installation of advance metering infrastructure (AMI), water budget based billing, public information program including various outreach and education approaches, a customer billing report and service, free water surveys and fixture replacement incentives, landscape ordinances and water budget based rates, among other measures.	As implemented in other locations, water conservation measures included in the City's proposed plan have improved efficient water use in other community in Ca, in the US and in other countries.
				WCA-22	SCDA: Conservation Education		
				WCA-65	zNano: Conservation rebate program		
				WCA-68	SCWD: Program C from Long-Term Water Conservation Master Plan		
CA-04	WaterSmart Home Water Reports	Use this software to promote conservation and efficient water use	Conservation (voluntary)	WCA-04	WaterSmart: Home Water Reports	Making water users more aware of their water use through automated notifications would encourage more efficient water use	Newer technologies allow automated tracking and analyses of water use and report directly to user, to increase their awareness.
				WCA-16	Gratz: Maximize Conservation Behavior		

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#	**Name**	**Description**	**Water source**	**#**	**Name and comments**	**Assumptions**	**Reasoning**
CA-05	Home Water Recycling	Package automatic treatment system suitable for single family home or condo or multi-family development; recycles gray water for toilet flushing and landscape irrigation; requires dual plumbing	Decentralized (graywater)	WCA-39	Garges: Residential Gray-Water	This is an infrastructure-based solution that recycles all the gray water in the home. It is automatic and operates without active homeowner management	Several alternatives proposed to use gray water recycling in residential units to reduce potable water demands, especially for flushing toilets and landscape irrigation including CA Plumbing Code compliant facilities and installation
				WCA-66	zNano: Onsite Water re-use		
				WCA-70	Home Water Recycling		
CA-06	Landscaping, Capture, Reuse	Use gray water for irrigation; minimize irrigation for lawns; capture and use rainwater for domestic, non-potable	Decentralized (rainwater, graywater)	WCA-01	Markowitz: Landscaping, Capture, Re-use	This is an infrastructure-based solution that recycles both captured rainwater and gray water in the home. It is automatic and operates without active homeowner management	Several alternatives proposed to capture both rainwater (e.g., roof runoff) and gray water and treat and recycle in residential units to reduce potable water demands, especially for flushing toilets and landscape irrigation including CA Plumbing Code compliant facilities and installation
				WCA-21	SCDA: Climate Appropriate Landscape		
CA-07	Deepwater Desalination	In cooperation with SqCWD, sign up for water delivered from the Deepwater Desalination Project at Moss Landing. Work with SqCWD to create the transfer facilities for potable water conveyance. Upgrade SCWD distribution system to accept water transferred through SqCWD.	Seawater	WCA-19	McGilvray: (11) Seawater Desal	City participation in the Deepwater Desalination Project would allow the City to benefit from economies of scale and permitting efficiency while potentially seeing lower energy for desalting. Establishing a data center cooling system at the Moss Landing site would heat water prior to desalting, reducing required pumping energy. The facility would use a deeper intake to minimize environmental impacts.	Several alternatives propose to use desalting seawater as an opportunity to produce water regardless of rainfall and avoid future water shortages during supply shortfalls.
				WCA-36	Aqueous: Desalination (non-membrane)		
				WCA-37	Brown: Zero-emission Wave energy		
				WCA-67	Tanaka		
				WCA-72	Seawater desalination – Deepwater Desalination		
CA-08	Water from Atmosphere	Extract water from the air to offset other demands	Moist air	WCA-38	DewPoint: Atmospheric Water Generation	The relative humidity in Santa Cruz is often high owing to its sea-side location. Existing technologies can extract purified water from humid air.	These alternatives use the same technology to draw water from the air and hence are combined here. [Note that the sizes for the two systems may differ radically. The technical team is waiting on further manufacturers' information for more detailed evaluation.]
				WCA-77	SKYH2O		

CA-09	Winter flows capture	Capture winter flows for treatment and storage or infiltration	Winter flows	WCA-29	Malone: Winter flows capture	Owing to local rainfall and runoff patterns, peak flows offer potential to capture high flows and divert for treatment and/or groundwater recharge.	Several alternatives advocate that the City use its existing water rights to divert more flow during higher runoff periods and store it either in open reservoirs or as infiltrated groundwater, to cover dry-period demands. This CA encompasses those WCAs.
				WCA-31	McGilvray: (3) Water Capture and Transfers		
				WCA-60	SCDA: Watershed Restoration		
				WCA-63	Smallman: Water Skate Parks		
				WCA-71	Quarry storage/GW recharge at Hanson Quarry		
				WCA-74	Additional Pipeline – Felton Diversion to Loch Lomond (McGilvray)		
				WCA-76	Olympia Quarry		
CA-10	Water Reuse for aquifer recharge	Produce CAT water at City WWTP and pump to SVWD for aquifer recharge (IPR – Indirect Potable Reuse).	Recycled water	WCA-44	McGilvray: (8) Tertiary Treatment, Re-use	The City now discharges millions of gallons of wastewater effluent to the ocean outfall that could potentially be diverted and reused as stored groundwater. California Division of Drinking Water now allows addition of highly purified wastewater effluent to aquifer, for recovery later as potable water.	Several alternatives advocate diverting wastewater effluent after high level tertiary treatment (recycled water) and addition of such recycled water to aquifer, to recharge depleted aquifers and storage it for subsequent reuse. Recycled water would be a highly reliable water source with great drought resiliency.
				WCA-62	Smallman: (17) Recycled Water		
				WCA-64	Weizs: Water Recycling		
CA-11	Water reuse for direct potable	Produce CAT water at City WWTP and pump to GHWTP for treatment and distribution system addition, a Direct Potable Reuse (DPR) alternative.	Recycled water	WCA-11	SCWD: Water Reuse	The City now discharges millions of gallons of wastewater effluent to the ocean outfall that offers potential for reuse. Highly purified wastewater effluent could be combined with raw water, then treated at the City's WTP. California Division of Drinking Water is developing regulations to allow use of a treated combination of highly purified wastewater effluent and other raw water resources for potable water, without routing the CAT effluent through an aquifer system prior to its reuse.	Several alternatives advocate diverting wastewater effluent after high level tertiary treatment (recycled water). This alternative would take advantage of improved, multi-barrier treatment and modified regulations, to recycle effluent directly into GHWTP. Recycled water would be a highly reliable water source with great drought resiliency.
				WCA-46	McKinney: Water Reuse		
				WCA-64	Weizs: Water Recycling		
CA-12	Water Reuse for indirect potable	Produce CAT water at City WWTP and pump to Loch Lomond.	Recycled water	WCA-44	McGilvray: (8) Tertiary Treatment, Re-use	The City now discharges millions of gallons of wastewater effluent to the ocean outfall that offers potential for reuse. Highly purified wastewater effluent could be combined with raw water, then treated at the City's WTP. California Division of Drinking Water is developing regulations to allow use of a treated combination of highly purified wastewater effluent and other raw water resources for potable water.	Several alternatives advocate diverting wastewater effluent after high level tertiary treatment and addition of such recycled water to Loch Lomond Reservoir ultimately for subsequent treatment at the GHWTP and reuse. Recycled water would be a highly reliable water source with great drought resiliency.
				WCA-52	Paul: (17) Detention Tub String		
				WCA-62	Smallman: Recycled Water		
				WCA-64	Weizs: Water Recycling		

CA-13	Water Reuse for non-potable	The City would pump the Title 22 unrestricted effluent north through a new pipeline aligned along the railroad right of way, with turnouts to irrigate up to about 1,300 acres on private land and leased land. The City would use wells on ag land to produce water for treatment at GHWTP.	Recycled water/ groundwater	WCA-09	Ripley: Reuse for Agriculture	Coastal farmers north of the City use significant irrigation water for about 6 months of the year, mainly drawn from groundwater. The City discharges millions of gallons of wastewater effluent to the ocean outfall that offers potential for reuse with additional treatment.	The City would treat water to CA Title 22 unrestricted reuse standards and pump it up the coast through newly installed pipelines, for farmers to use in lieu of groundwater for irrigation. The City would drill new wells and construct new pipelines connecting to the North Coast Pipeline. It would extract groundwater to supplement its other sources during droughts.
				WCA-40	Gratz: Recycled Water for Irrigation		
				WCA-41	McGilvray: (1) Recycled Water for Irrigation		
				WCA-43	McGilvray: (6,7) Pipelines Along RR Line		
				WCA-45	McKinney: Additional Wells and WTPs		
				WCA-64	Weizs: Water recycling		
CA-14	Desal using Forward Osmosis	Use seawater desalting through a Trevi forward osmosis (FO) system. This alternative's other components would match those for seawater desalting. The alternative has several outstanding issues, e.g., Trevi technology and other FO technologies are still in their infancy and being tested at a pilot scale. As described, Trevi would require a lower grade heat source for separately drawing the solution from the potable water but the alternative description did not designate a source for lower grade heat.	Recycled water or seawater	WCA-13	Trevi: Forward Osmosis Desalination (separate FAQs and technical memorandum summarize FO in its various incarnations and its implementation status around the world)	This alternative assumes that the City would implement desalting using FO, an emerging technology. Since FO technology and implementation is in its infancy, this CA will not be developed further.	This alternative captures the intent of WCA-13 Trevi Forward Osmosis. Since the Trevi FO is still at the research/demonstration stage, BC has not developed this alternative further. If future testing and implementation by other entities prove its value, it could replace RO if the City was to select and implement Alternative CA-12.

CA-15	Desalination using Reverse Osmosis	This alternative for initial comparison would use seawater desalting through a new reverse osmosis desalination facility to produce about 2.5 mgd for addition to the City potable water supply. This alternative's components and development would match those for the previously proposed scwd2 desalination facility. The City would own and operate the facility and would use the water produced year round. Excess water would allow the City either to idle the Live Oak wells for conjunctive-use aquifer recovery or to undertake Live Oak well operation in an ASR mode to restore the aquifer more rapidly. In wet years, the City could sell excess desalted to SqCWD and/or SVWD.	Seawater	WCA-12	Sustainable Water Coalition: Desalination	Desalting seawater using RO is a well proven technological approach that requires substantial capital investment and has high O&M costs. Desalting seawater is not impacted by drought conditions.	Several alternatives propose to use desalting seawater as drought relief to avoid future water shortages during supply shortfalls.
				WCA-19	McGilvray: (11) Seawater Desal		
				WCA-36	Aqueous: Desalination (non-membrane)		
				WCA-37	Brown: Zero-emission Wave energy		
				WCA-67	Tanaka		
CA-16	Aquifer restoration/storage	The City would sell treated water to SqCWD during normal and wet years. SqCWD would use the transferred water for either groundwater recharge or demand reduction and conjunctive use. SqCWD would sell pumped groundwater water to City during droughts. The City also should have improved production from its Live Oak wells.	Winter flows	WCA-08	Paul: (13) The Lochquifer Alternatives	The City has diversion rights and treatment capacity that are not utilized during low demand periods of the year. The local aquifers offer storage opportunities given their significantly reduced levels.	The City could treat more water during low demand periods and inject it in its own well field and/or transfer treated water to SqCWD and/or SVWD for aquifer storage.
				WCA-28	Malone: Regional Water Exchanges (also possibly addressed through CA-11)		
				WCA-49	Paul: (14) Upgrade Water Intertie		
				WCA-59	SCDA: Enhance Existing Infrastructure		
				WCA-10	SCDA: Regional Aquifer Restoration		
CA-17	Expand Treatment Capacity	Add a new 14-mgd water treatment plant (WTP) (pretreatment for turbidity control and membrane filtration) near the Tait Street Diversion to produce treated water that would be piped directly into the distribution system. It would increase capacity to divert to Loch Lomond and produce additional water for aquifer recharge.	Winter flows	WCA-06	McKinney: Expanded Treatment Capacity	The City would add a new 14-mgd WTP at the Tait Street Diversion and pipe treated water directly into the distribution system. During periods when treatment exceeds City demands, the City would send the water to the Live Oaks wells, the Soquel Creek Water District, and/or the Scotts Valley Water District for aquifer storage and recovery. During droughts the City would draw more water from its wells and "import" water from adjacent districts.	This alternative captures the intent of both WCA-06 McKinney: Expanded Treatment Capacity, and WCA-27 Malone: Enhanced Storage and Recovery. These alternatives propose capturing additional surface flow from the San Lorenzo River to divert to storage for retrieval later by the City. An added benefit of this CA obviated the need to upgrade the GHWTP since a new, modern, and seismically durable WTP would be constructed.
				WCA-27	Malone: Enhanced Storage and Recharge		

CA-18	Off-stream water storage	Convert Liddell Quarry into 650 MG reservoir, filled with water from City North Coast diversions; use stored water to offset water demand during drought	Winter flows	WCA-05	Bevirt: North Coast Quarries (modified to include diversion of water from City existing sources)	The City would convert Liddell (Bonny Doon) Quarry into a surface-water reservoir to create a new storage facility. Water diverted from the City's existing surface-water rights would fill the reservoir during average-rainfall and wet years. This CA would use portions of the existing North Coast Pipeline in combination new pumping systems, reservoir inlet/outlet pipeline, and re-contoured and lined reservoir.	This CA captures the intent of WCA-05 Bevirt: North Coast Quarries (modified to include diversion of water from City existing sources); WCA 26 Fieberling: Expand Storage (addresses off-stream storage); WCA-30 McGilvray (2): Quarries for Water Storage; WCA-32 SCWD: Zayante Dam and Reservoir; WCA-33 Smallman: Reservoirs; and WCA-34 Smallman: Storm Quarries. These WCAs propose to store diverted surface water in surface reservoirs. Although this CA does not capture all of the specifics for each WCA grouped in this CA, it incorporates the high-level idea of off-stream storage drawing water under the City's existing water rights. The quarry site used in the CA was selected because would likely reduce environmental impacts and political issues associated from construction of a dam in an existing channel and degrading existing undisturbed habitat.
				WCA-26	Fieberling: expand storage (addresses off stream storage)		
				WCA-30	McGilvray (2): Quarries for Water Storage		
				WCA-32	SCWD: Zayante Dam and Reservoir		
				WCA-33	Smallman: Reservoirs		
				WCA-34	Smallman: Storm Aquarries		
CA-19	Ranney Collectors	Use Ranney collectors with a 12.9-mgd capacity (maximum capacity allowed under the current City of Santa Cruz [City] diversion permit), installed near the City's Felton diversion to draw water allocated under the City's existing water rights. Water drawn through the collectors would have greatly reduced turbidity and allow continuous refilling of Loch Lomond while also operating the GHWTP. It would produce additional water for aquifer recharge.	Winter flows	WCA-07	McKinney: Ranney Collectors on SLR (requires a storage component to be a viable alternative)	The City's ability to divert is restricted occasionally when high turbidity is experienced in the existing raw water diversions as a results of treatment restrictions at the GHWTP.	Using Ranney collectors (well screens installed horizontally many feet underground) to capture SLR flows would allow the City to maximize its diversion since diversions would not be impacted during periods of elevated turbidity in the raw water. Note that this alternative also might include a new WTP adjacent to the Tait Street diversion, with low turbidity water from the Ranney collectors contributing to a more cost-effective new WTP.)
				WCA-42	McGilvray: (4,5) Upgrade Water Treatment		
				WCA-48	Paul: (12) Diversion Alternatives		
				WCA-49	Paul: (14) Upgrade Water Intertie		
				WCA-57	Paul: (23) Loch-Down Alternatives		
CA-20	Interagency Cooperation/ County Water Authority	Establish Santa Cruz County Water Authority to manage water resources development and use for public agencies and private diverters and groundwater users	Institutional/ administration	WCA-14	Gratz: Regional Water Authority	This alternative would create a County Water Authority (CWA) to maximize cooperation between local governing authorities.	A CWA could take advantage of system efficiencies and funding opportunities that require multi-agency coordination.
				WCA-15	Smallman: Regional Water Authority		
				WCA-18	McGilvray: (10) Regional Collaboration		

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Table 2. The list of WCAs not included in the CAs

WCA #	WCA name	Why these WCAs are not included in the list of CAs
WCA-17	Holt: Rate-Driven Conservation Behavior	The SCWD has a demand model that takes price and pricing structure into account
WCA-47	Paul: (11) Multi-purpose Settling Ponds	Judged to be infeasible to build in flood plain; enhanced settling/turbidity removal addressed in Ranney collector and new WTP CAs.
WCA-35	Paul: (1-10,22) Foundation Strategies	This WCA provides strategies for dealing with the water supply shortage in Santa Cruz; however, it would not lead to an additional water supply
WCA-50	Paul: (15) Cross-County Pipeline	Concepts captured in several other alternatives that would use water transfers among SVWD, SqCWD, and SCWD
WCA-51	Paul: (16) Water Looping	Alternative does not produce a more reliable and robust water supply for the City; hence, not carried forward
WCA-53	Paul: (18) Weir Systems	Alternative does not produce a more reliable and robust water supply for the City; hence, not carried forward
WCA-54	Paul: (19) Stream Relocation	Judged to be environmentally infeasible; hence dropped from further consideration.
WCA-55	Paul: (20) SLR Alluvial Plain Wells	Aquifer recharge and recover/reuse addressed through other alternatives.
WCA-56	Paul: (21) Groundwater Rights Mgt	Alternative does not produce a more reliable and robust water supply for the City. Groundwater rights not defined; hence, not carried forward
WCA-58	Paul: (24) Cowell Railroad Pipeline	Pipelines and modified diversion and operating strategies addressed through other alternatives; hence, not carried forward.
WCA-02	SCDA: Conservation Building Code	Plumbing and building codes for conservation codes have already been incorporated into the demand forecast. Also, we did not receive any specifics on a suggested “local option” plumbing code.
WCA-23	SCDA: Conservation Pricing	The SCWD has a demand model that takes price and pricing structure into account
WCA-24	SCDA: Demand Management During Droughts	The concept of incorporating demand management during periods of droughts is captured by CAs 1 through 6
WCA-25	Scott: Composting Toilets	Program C Recommended includes two similar conservation measures: Residential Ultra High Efficiency Toilet (UHET) Rebates and Toilet Retrofit at Time of Sale
WCA-61	Smallman: Conservation Savings Accounts	There is insufficient information about whether people would actually change their behavior, and if so, by how much. This idea is not yet mature.
WCA-75	Spragg: Water Bag Transport	Technically unproven and includes major technical, legal, and regulatory challenges; hence, dropped from future consideration.
WCA-73	Wirkman: Constructed Wetlands	Wetlands not required for agricultural and other uses that need CA Title 22 unrestricted water and not approved for indirect and direct potable reuse. Wetlands also require significant land area apparently unavailable around the City. Hence, dropped from further consideration.