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Interim Remedial
Action Plan for the South Y
PCE Facilities Feasibility Study
[Agreement D1712508]

9 May 2020

Prepared for
South Tahoe Public Utility District
1275 Meadow Crest Drive
South Lake Tahoe, CA 96150

KJ Project No. 1770027*00

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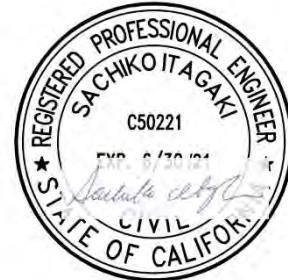
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Section 1: Introduction

The Interim Remedial Action Plan (IRAP) is intended to describe the activities that will lead to the implementation of the preferred remedial alternative recommended in the South Y PCE Facilities Feasibility Study (Feasibility Study). The objective of the Feasibility Study is to evaluate and select a preferred remedial alternative that would remove tetrachloroethylene (PCE) from groundwater and manage use of groundwater sources to maintain adequate drinking water supply and quality in the South Y Area. The Feasibility Study evaluates remedial alternatives that will prevent further migration of contaminants and potential future impacts to downgradient water supply wells. This IRAP considers the outcomes of the South Y Fate and Transport Model and Feasibility Study and presents recommended activities to advance implementation of the preferred remedial alternative, an implementation schedule, potential financing options, and recommended stakeholder outreach activities.

Drinking water service in the South Y is provided by the following water purveyors: South Tahoe Public Utility District (District), Lukins Brothers Water Company (LBWC) and the Tahoe Keys Water Company (TKWC), collectively referred to as water purveyors in this report.

The preferred remedial alternative is an interim measure that meets the water purveyors' objectives of replacing lost water production in the South Y Area while increasing PCE mass removal and reducing cleanup times needed for PCE concentrations to decline below maximum contaminant levels (MCLs) at down-gradient receptor wells. As an interim measure, the water purveyors understand that implementation of this remedial alternative would be most effective in conjunction with remediation by other parties at source area sites contributing groundwater contamination to the South Y Plume.

1.1 Feasibility Study Results

1.1.1 Description of Preferred Remedial Alternative

Based on an evaluation of Alternatives and Model scenario results, Alternative 2 Targeted Pumping was selected as the preferred remedial alternative that will best meet the Feasibility Study goals to control or clean up PCE in groundwater that serves or has served as a source of drinking water. Once GAC treatment is installed at LBWC 5, it will be operated as lead and LBWC 1 will be operated as lag for the LBWC system. A new extraction well 1 (R1) would be used to replace lost water production resulting from the impairment and planned destruction of well LBWC 4 and equipped to deliver potable water to the distribution systems of the District, TKWC, and LBWC. No capital improvements are needed to implement the new operations strategy at LBWC 5 and LBWC 1. R1 would be located at 843 Hazel Drive and equipped with PCE treatment and optionally iron and manganese treatment to meet drinking water quality standards for potable reuse of produced groundwater (collectively referred to as the R1 groundwater treatment facility or GWTF).

LBWC 5 would be operated to meet water system demands in a manner that would result in increased contaminant removal and plume containment compared to the No Action Alternative. R1 would be drilled and screened to remove PCE from groundwater above 150 feet bgs.

Treated water from R1 will be routed to either the District sewer system, City of South Lake Tahoe stormwater collection system, or to a public water distribution system for potable reuse.

To evaluate the effectiveness of the preferred remedial alternative in containing the PCE plume and preventing the spread of PCE mass to downgradient wells, a monitoring network plan will be created. Construction information for existing wells can be used to evaluate their appropriateness to track the PCE plume and monitor water quality upgradient of wells without treatment. If needed, new sentinel wells can be constructed to fill gaps in the monitoring network.

1.1.2 Anticipated Benefits of Preferred Remedial Alternative

Table 1 presents the Model results of the preferred remedial alternative compared to results of the No Action Alternative (Alternative 1).

Table 1: Model Results for Selected Alternative

Alternative		Total PCE Mass Removed ^(a) (lbs)	Peak PCE Concentration ^(a)					Cleanup Time ^(b) (Years)
			LBWC 1	LBWC 5	TKWC 1	TKWC 2	TKWC 3	
1	No Action	280 – 1,800	<1	23 to 96	5 to 50	14 to 108	<1	>20
2, Option 1	LBWC 5 Lead/ R1	770 – 3,300	<1	21 to 89	4 to 38	13 to 103	<1	17 to >20

Notes:

- a. Over 20-year modeling period from 2018 – 2038.
- b. Cleanup time is for all 5 wells from start of 20-year modeling period beginning in 2018.
- c. Fate and Transport Model results assume PCE removal for Alternative 2 begin immediately for all wells, including new R1. To calculate PCE removal through R1 following the implementation period of 3-7 years, it is assumed that mass will be removed from the R1 site at the same fractional rate over a 20 year period, and mass removal for R1 after 3-7 years can be estimated by scaling the total simulated mass removed at R1 in Alternative 2 to the ratio of [Alternative 1 concentration at R1 after 3-7 years] to [Alternative 2 concentration at R1 at start of simulation]. Using this method, mass extraction at R1 beginning in 3-7 years is estimated to be between 77.7% (beginning in 3 years) and 47.6% (beginning in 7 years) of mass extraction beginning immediately, which was estimated to be 446.6 lbs. Therefore, mass extracted at R1 beginning at 3-7 years (for a pumping period of 13 to 17 years out of 20 year total) is estimated to be 213 lbs to 2,559 lbs.

Based on the Model results, it is anticipated that the implementation of Alternative 2 can remove as much as 170% more PCE than the current infrastructure and operations, shortening the cleanup time by three years, and potentially reducing the peak PCE concentrations in down-gradient wells.

In addition to increased PCE Mass Removal and reduced cleanup times at receptor wells, the preferred remedial alternative provides a new source of drinking water that helps replace lost drinking water production due to the impairment of groundwater sources in the South Y Area. Providing sufficient quantities of drinking water to the South Y Area is a significant challenge for the water purveyors. The addition of the R1 GWTF provides a new source of drinking water where the need for additional drinking water supply is the greatest.

1.1.3 Costs of Preferred Remedial Alternative

Section 8.2.1 of the Feasibility Study summarized the preliminary cost estimates for pre-design activities, environmental mitigation, capital, and operations and maintenance of the preferred remedial alternative. Section 5.4 describes the cost factors and assumptions used to develop cost estimates, which utilize Association for the Advancement of Cost Engineering (AACE) Class 4 Estimate for feasibility evaluations (Table 1 – Cost Estimate Classification Matrix for Process Industries, AACEI 2016). Table 2 summarizes the preliminary cost estimate of implementation by well.

Table 2: Preliminary Cost Estimate for Preferred Remedial Alternative (2019\$, Rounded) ^(a)

Activity	LBWC 5	R1
Pre-Design Activities		
R1 Test Well and Treatment Pilot	0	\$130,000 to \$280,000
Policy Memo 97-005 Documentation and Permit Application	0	\$370,000 to \$790,000
Site Survey and Geotechnical Investigation	0	\$50,000 to \$110,000
TRPA/CEQA Environmental Documentation and Approvals	0	\$44,000 to \$94,000
Direct Facility Costs		
R1 Construction and Equipping	0	\$500,000 to \$1,100,000
R1 Groundwater Treatment Facility	0	\$3,200,000 to \$6,800,000
Monitoring Network Plan and New Monitoring Well (1)	0	\$74,000 to \$160,000
O&M for 20 Years	\$670,000 to \$1,400,000 ^(b)	\$3,500,000 to \$7,400,000
Total	\$670,000 to \$1,400,000	\$8,600,000 to \$18,000,000

Note:

- Cost estimates based on 2019 dollars with an accuracy range of -30% to +50%. Cost factors and assumptions are described in Section 5.4 of the Feasibility Study.
- Energy costs only

A more detailed breakdown of the preliminary cost estimate is provided in Appendix D of the Feasibility Study.

Section 2: Implementation Activities

The anticipated implementation activities for the preferred remedial alternative consists of the following Phases:

- Phase 1 – Project Planning
- Phase 2 – R1 Test Well Installation and Treatment Pilot Study
- Phase 3 – Groundwater Treatment Facility (GWTF) Preliminary Design
- Phase 4 – Final GWTF Design
- Phase 5 – GWTF Construction/Startup

2.1 Phase 1: Project Planning

To further develop the preferred remedial alternative, a number of planning activities are recommended, may occur in parallel, and are detailed in the sections that follow:

- Develop Agreements
- Identify and Secure Funding
- Develop Project Workplans and Protocols
- Conduct Stakeholder Outreach

2.1.1 Develop Agreements

It is recommended that additional discussion be held between the three water agencies regarding the preferred remedial alternative, including:

- Property Access/Easements: The preferred remedial alternative includes use of the 843 Hazel Drive property for construction and operation of the new R1 GWTF. This is a 1-acre parcel situated near the middle section of the South Y Plume and owned by LBWC. Agreements will be needed to either lease the property or obtain access from LBWC to construct and operate the R1 GWTF.
- Water Purchase Agreements: The water produced by the R1 GWTF will supplement drinking water produced by the District, TKWC, and LBWC to meet system demands. In order to optimize operation of the R1 GWTF for PCE removal, the treated water from this facility will need to be consumed in the District, TKWC, or LBWC water systems.

District drinking water supply to TKWC and LBWC through the existing mutual aid and assistance agreements is on an as-needed and as-available basis. The water agencies should review the existing mutual aid and assistance agreements as well as possible upgrade of District interties with TKWC and LBWC. These discussions should also consider, but not be limited to:

- Water quality standards and monitoring
- Water quantity
- Purchase pricing, considering existing production costs and R1 production costs

- Agreement term
 - Water delivery points
 - Integration with other existing or future supplies
 - Governance (see below)
- Governance Discussions: Depending on the level of participation of the water agencies in the funding, planning, implementation, and operation of the preferred remedial alternative, the water agencies should develop governance agreements that specifically define issues, including but not limited to, the following:
 - Roles and parties of water producers, water recipients, and other beneficiaries of the facilities and operation of the facilities to implement the preferred remedial alternative
 - Lead agency, ownership, and operational responsibility of the preferred remedial alternative and produced water
 - Levels of commitment
 - Operations and administrative/managerial roles
 - Commencement and termination of agreements
 - Payment mechanisms for debt services, capital costs, administration and development costs, and other expenditures incurred
 - Liability (insurance/indemnity)

If implementation or O&M of the preferred remedial alternative is to include two or more parties, it is recommended that a memorandum of understanding (MOU) or a similar document be developed and reviewed with the parties' legal counsel. A MOU is a type of agreement between two or more parties. It expresses a convergence of will between the parties, indicating an intended common line of action.

- Financing: Discussed further in Section 2.1.2.
- Operations and Maintenance (O&M): Discussed further in Section 2.1.3.4.

2.1.2 Identify and Secure Funding

In parallel to developing agreements, the water agencies should begin to apply for grant/loan funding. This activity should continue through all Phases of implementation of the preferred remedial alternative and can continue after start-up of the preferred remedial alternative to maintain operations and maintenance funding.

The funding strategy used for the preferred remedial alternative should consider the following:

- Grant/loan limitations and schedule of grant solicitations, application deadlines, and funding agreement execution
- Impact of the preferred remedial alternative on the rates and/or reserves of the water agencies and potential partners

- Other financial support either through other agency (i.e., LBWC property access, El Dorado County, City of South Lake Tahoe, or the local Groundwater Sustainability Agency) funding, in-kind services, or waivers of local fees such as District sewer discharge fees.
- Bridge Funding: Local agencies can support the implementation of the preferred remedial alternative by providing a low or zero-interest loan to serve as bridge funding, with repayment from a grant. Typically, state and federal grants are paid to applicants by way of reimbursements for direct costs and work performed. A source of bridge funding would help alleviate the impact to reserves during the implementation of the preferred remedial alternative.

Section 8.3 of the Feasibility Study summarizes the recommended funding strategy:

1. Proposition 1, Round 3 Groundwater Sustainability Funding: As shown in Section 8.2.1 of the Feasibility Study, the total preliminary cost estimate to implement the preferred remedial alternative can be on the order of \$10,000,000, including land coverage or easement acquisition, pre-design and permitting, environmental documentation and mitigation, and design and construction activities. The Proposition 1 Groundwater Grant Program has a grant funding limit of \$50,000,000.

It is anticipated that the solicitation for the Round 3 of Proposition 1 funding will occur in late 2020, and based on the Round 2 funding schedule, it can take approximately 18 months for an applicant to receive an executed grant funding agreement. It is assumed that SWRCB will issue a Preliminary Award Letter prior to the completed funding agreement to allow work to commence. SWRCB will issue this correspondence prior to the executed funding agreement. It should be noted that commencing work prior to an executed agreement is a risk management decision for the Grantee to consider and determine. SWRCB-DFA will accept and approve grant fund reimbursements for costs incurred dating back to the Preliminary Award Letter.

2. Drinking Water SRF Loan Funding: If for some reason the Proposition 1 Groundwater Grant Program does not provide sufficient funding to cover implementation of the R1 portion of the preferred remedial alternative, the water agencies can also apply for additional grant or principal forgiveness funding through the Drinking Water State Revolving Fund (DWSRF). These grant and loan applications are accepted on a continuous basis, with a maximum of \$20,000,000 available for projects with a regional benefit.
3. El Dorado County Bridge Loan Funding: The water agencies should also apply for bridge loan funding through El Dorado County to minimize the drawdown of reserves and for cash flow.
4. Local Project Sponsorship/Cost Share: If the water agencies would like to accelerate implementation activities prior to receipt of an executed grant or loan funding agreement, local agencies can sponsor the preferred remedial alternative through no interest loans, grants, or in-kind services. Project partners may also contribute to the O&M of the preferred remedial alternative by subsidizing or waiving fees (such as the District sewer discharge fees), sharing resources (such as contract services for water quality laboratory

analysis), or providing in-kind services (for example to complete administration duties). These funds can be secured and used as match funding in most State grant programs, in addition to the stated purpose of accelerating implementation activities prior to receipt of an executed funding agreement.

Cost recovery via the Responsible Parties is also another potential source of funding for the water purveyors for the preferred remedial alternative. Cost recovery actions for the construction and operation of and the R1 GWTF requires close coordination with legal counsel and technical support therefore can be both time consuming and expensive.

2.1.3 Develop Project Workplans and Protocols

Prior to conducting field activities and design, it is recommended that project workplans and protocols be developed. These documents should be refined throughout the Phases of Implementation as needed.

2.1.3.1 Project Guide Manual

To guide the activities over the near-term (next three to five years), a Project Guide Manual can be prepared to address administrative and project management aspects related to the implementation activities of water agencies and other project partners. The guidelines and expectations should be developed to provide smooth and efficient execution of all parties' contracted responsibilities. Specific subtopics that will be developed at the appropriate time are likely to include:

- Project Guide Manual Overview, Organization, and Layout
- Project Description and Objectives
- Project Team Organization Chart
- Project Budget and Status
- Project Schedule
- Project Action Plan
- CAD Design Standards
- Quality Assurance and Control Plan
- Forms and Templates

The Project Guide Manual should be a living document to be reviewed and updated periodically over the course of implementation of the preferred remedial alternative. The Project Guide Manual should document practices and procedures to implement the preferred remedial alternative and will be updated to reflect changes as they are identified.

2.1.3.2 Treatment Pilot Study Protocol

Following drilling of the R1 Test well, it is recommended that a treatment pilot study be conducted to identify all contaminants projected to be detected at the R1 GWTF, develop a basis of design for the best available technologies (BATs) use to remove identified contaminants, and inform potential construction and operations maintenance costs. The pilot study plan will describe the objectives of the pilot, including treatment goals, facilities involved, and schedule. The protocol will cover the monitoring and sampling frequency, pump test and

water quality and media analysis requirements and field parameters to be recorded. The protocol will also include the mobilization and demobilization and sewer discharge permit.

2.1.3.3 Policy Memo 97-005 Documentation

Groundwater produced at R1 GWTF is planned to be used for potable consumption, based on the treatment pilot results. If water quality results indicate contaminant concentrations near 10 times the MCL, the following documentation will also be required to satisfy Policy Memo 97-005 permitting¹ for extremely impaired sources, including but not limited to:

- Drinking Water Source Assessment (SA) and Contaminant Assessment (CA): The objective of these tasks is to determine the aquifer's vulnerability to contaminating activities and should include descriptions of the environmental setting, capture zones, and potential sources of contamination.
- Full Characterization of Raw Water Quality: The proposed R1 test well and pilot study described in Phase 2 is anticipated to provide the data needed to meet this documentation requirement.
- Drinking Water Source Protection: Use of an extremely impaired source requires that the origin of the contamination be controlled. To satisfy this requirement the water purveyors will need to stay informed on the progress of on-going contamination assessment and remediation activities at identified source area sites contributing groundwater contamination to the South Y Plume. The water purveyors should review contamination assessment and remedial action plans to ensure that appropriate BMPs for waste handling and reduction are used during the investigation and clean up of source area sites. The water purveyors should also review technical reports to ensure that groundwater monitoring is conducted between identified source areas and the R1 GWTF; and that ground water monitoring for these sites adequately demonstrates contaminant control.
- Treatment and Monitoring Program Proposal: To obtain approval for use of an "impaired water" under Policy Memo 97-005, it is anticipated that prior to full approval and acceptance of the R1 GWTF, there will be 12 months of start-up demonstration operations and 12 months of conditional operations. During start-up demonstration operations, water produced through the R1 GWTF is required to be monitored for PCE at a higher frequency than normal groundwater quality monitoring with all of the produced water disposed of through non-potable uses, if available, or discharged to the sanitary sewer. During conditional operations, it is expected that the monitoring and reporting frequency for PCE remains the same but produced water can be delivered as drinking water. Monitoring frequency for PCE and other drinking water parameters for normal operations can be negotiated with SWRCB-DDW based on the concentration of PCE and revisited as needed.

¹ State Water Resource Control Board, Division of Drinking Water (SWRCB-DDW) Policy Memo 97-005 applies to source waters with more than 10 times the MCL of a regulated contaminant (also known as an "impaired water") and requires additional study, treatment and monitoring prior to delivery as a potable supply.

- Human Health Risks Associated with Failure of Proposed Treatment: An evaluation of the risks of failure of the proposed treatment system must include probability of failure of the treatment technology and description of failure modes. This evaluation will be used to propose monitoring frequency and use of additional levels of treatment, such as redundant treatment units, in order to safeguard protection of public health.

2.1.3.4 Operational Plans

After completion of the R1 Test Well and treatment pilot study (Section 2.2) and in conjunction with development of the engineering design of the R1 GWTF, the operational plans for water quality monitoring, water system operations, and disaster and emergency response should be developed. These documents can be filled-in as design progresses and specific monitoring and reporting requirements become known.

The following topics should be covered:

- Energy costs due to pumping and operating the R1 GWTF
- Purchase of chemicals used for the treatment of groundwater produced by the R1 GWTF
- Annual fees and permits, such as those needed to discharge to the sewer system
- Treatment and Monitoring Program
- Media changeout of the R1 GWTF
- General facility maintenance, including labor, contract work, transportation, and replacement equipment, materials, and parts
- Monitoring and administration of the R1 GWTF as a drinking water source either as a standard domestic water supply or as an extremely impaired source (which requires Policy Memo 97-005 compliance)
- Other topics needed to satisfy SWRCB-DDW water system permit requirements to add the R1 GWTF to a public water distribution system.

2.1.4 Conduct Stakeholder Outreach

As the water purveyors continue to pursue implementation of the preferred remedial alternative, additional outreach to stakeholders should periodically continue to inform not only of the implementation activities, but of other investigations and remedial activities being conducted at identified source areas contributing groundwater contamination to the South Y Plume. Further work to identify contributing source areas is currently being conducted under the direction of the LRWQCB.

Outreach for the Feasibility Study centered around participation of the Stakeholder Advisory Group (SAG) organized through the Tahoe Valley South Subbasin Groundwater Management

Plan. This group includes a broad range of technical staff of the water purveyors, as the LRWQCB, as well as members of the business community and outreach to Disadvantaged Communities represented by the City of South Lake Tahoe (CSLT) and the water utility customers. It is anticipated that outreach for the preferred remedial alternative would continue to utilize this group.

2.2 Phase 2: R1 Test Well and Treatment Pilot Study

This Phase will include the design and construction of a test well and performance of a treatment pilot study. If pump testing of the R1 test well reveals water quality over 10 times the MCL for drinking water, preparation of Policy Memo 97-005 documentation will be initiated. The major tasks under this Phase are:

- **Test Well Design:** The test well design will include a detailed set of technical specifications that can be used to obtain competitive bids for well drilling and construction. The design package will also include a well location figure, site plan figure showing required noise mitigation and erosion control measures, and well profile figure.
- **Test Well Drilling:** A pilot borehole will be drilled to conduct hydrogeological and water quality tests. Based on the pilot borehole test results, the borehole will be reamed, screened, and cased to draw water from the appropriate zones in a test well. Water quality data will be collected in accordance with the pilot study testing protocol and used to further develop the conceptual engineering design presented in the Feasibility Study and a Treatment and Monitoring Program Proposal, if needed.
- **Policy Memo 97-005 Evaluation:** Groundwater produced from R1 is planned to be treated for drinking water use. Once the water quality data from the test well is available, the data will be reviewed to determine whether the evaluation process outlined in the Division of Drinking Water (SWRCB-DDW) Policy Memo 97-005 is applicable. If contaminant levels in the source water is less than 10 times of the MCL for any identified contaminant, the Policy Memo 97-005 evaluation will not be required. Otherwise, the evaluation process for an extremely impaired drinking water source will be initiated. Work related to Policy Memo 97-005 will extend through Phase 5 and would need to be completed before the treated water produced by the R1 GWTF is allowed to be used for drinking water.

This IRAP assumes a Policy Memo 97-005 evaluation will be required based on the levels of PCE in groundwater found at and neighboring the 843 Hazel Drive site; and the levels of PCE contamination predicted in groundwater by the fate and transport modeling of the South Y Plume (DRI, 2019).

- **Identify a treatment vendor:** Contact treatment vendors for quotes, process flow diagrams, and proposals to equip and perform the pilot treatment study. Based on the proposals, select a water treatment vendor that will best meet the objectives laid out in the pilot study plan.
- **Conduct the Pilot Study:** Install the pilot equipment, operate the pilot, and collect data in accordance with the treatment pilot study protocol . It is assumed that water treated

through the pilot treatment facilities will be discharged to the District sewer collection system. The pilot is anticipated to be online for a month, or for a period as determined through discussion with SWRCB-DDW. Field parameters to be collected include, but are not limited to, flow rate, volume of water treated for each filter run, pumping water level, pH, temperature, electroconductivity, pressure at both inlet and outlet from the filter, chlorine dosage, and free and total chlorine residual in the filter effluent. Water quality analysis will include, but not limited to, VOCs, iron and manganese in both raw and treated water and ammonia, sulfide and silica in the raw water. The test well will be capped following completion of the treatment pilot study until construction of the wellhead and installation of the down-hole equipment for the final production well (Phase 5).

- Treatment and Monitoring Program Proposal: Analyze treatment pilot study data and prepare a Treatment and Monitoring Program Proposal in accordance with the requirements of Policy Memo 97-005. The proposal will be submitted to the SWRCB-DDW for review and approval. If California grant funds are used, the proposal will also be submitted to the Grant Manager of the appropriate funding agency (i.e., SWRCB – DFA) with courtesy copy to the LRWQCB.
- Drinking Water Source Assessment Program (DWSAP): A draft DWSAP report will be developed and submitted for review and approval to SWRCB-DDW. If California grant funds are used, the draft DWSAP will also be submitted to the Grant Manager of the appropriate funding agency (i.e., SWRCB – DFA) with courtesy copy to the LRWQCB

2.3 Phase 3: Preliminary Design Report and Draft Design

A preliminary design report (PDR) will be developed in this Phase based on the groundwater quality, treatment pilot study results, survey data, the geotechnical investigation and existing information provided. The PDR will document the criteria to be used as the basis of the R1 GWTF. The PDR will outline the key components of the R1 GWTF. The PDR will develop:

- Preliminary assumptions and criteria list,
- Completed calculations to size the treatment,
- 50% design of treatment facility floor plan and section view, well equipment, flow schematic, and draft process and instrumentation diagrams, and list of technical specifications,
- Opinion of Probable Construction Cost,
- Estimated schedule for construction of the R1 GWTF, and
- List of agreements and required permitting

Survey and geotechnical investigation of the R1 site should also be conducted during this Phase in order to inform limitations in building or infrastructure location or foundation requirements.

Agreements and permitting to be obtained before the construction phase will be initiated during this Phase of the work. The anticipated agreement and permitting would include, but are not limited to:

- Environmental Documents (CEQA and TRPA)
- Technical, Managerial, Financial (TMF) Assessment and Drinking Water Supply Permit Amendment (SWRCB-DDW)
- Sanitary Sewer Connection Agreement (District)
- Storm Sewer Connection Agreement (CSLT)
- Land Coverage Acquisition (CTC)
- Tahoe Regional Planning Agency (TRPA) Permit

2.4 Phase 4: Final Design

Based on the PDR and draft design documents developed during the Preliminary Design Phase (Phase 3) and acknowledged by the Responsible Parties, final design documents for construction including design drawings, specifications and opinion of probable construction cost will be prepared for construction of the R1 GWTF and accompanying drinking water connection to the public water distribution system; and waste discharge connections to the sanitary sewer and storm sewer collection systems. The Final Design Phase will include:

- Mechanical and structural design engineering for R1 GWTF work inside the building,
- Structural design engineering for the building and R1 GWTF,
- Electrical, instrumentation and controls engineering for well, treatment process, building and site,
- Coordination of electrical power service upgrade,
- Calculation of headloss through the treatment process for the selection of well pump, and
- Preparation of the 60%, 90% and final design and construction documents. Because the preferred remedial alternative will be funded using public resources, construction documents must incorporate the public bidding procedures in accordance with Public Contracting Code.

2.5 Phase 5: Construction/Startup

With the completion of Final Design, the final design package will be distributed and go out to bid. A contractor will be identified after the bid analysis and will be brought on board for the construction. Assuming Policy Memo 97-005 requirements, it is assumed that R1 startup will be phased as:

- Year 1 – Start-up Demonstration: treated water will be routed to the sewer discharge with high-frequency sampling requirement
- Year 2 – Conditional Operation: treated water will be connected to the distribution system with high-frequency sampling

- After 2 years – Normal Operation: treated water will be connected to the distribution system with a sampling schedule approved by DDW

Once the R1 GWTF is tested and brought online, the operations strategy will be:

- Operate LBWC 5 with GAC treatment as lead well to meet existing water demands for LBWC system
- Operate LBWC 1 as lag well to meet existing water demands for LBWC system
- Operate the R1 GWTF at 160 gpm for potable reuse by the water purveyors and PCE mass removal

Section 3: Implementation Schedule

Figure 1 shows the proposed project schedule to complete implementation of the preferred remedial alternative. Tasks to complete the preferred remedial alternative are broken into the Phases of the Implementation Activities. Task durations are in months and the schedule is anticipated to start assuming the solicitation period for Round 3 of Proposition 1 Groundwater Sustainability Funding closes in the fourth quarter of 2020.

Phase 2 of the implementation of the preferred remedial alternative is anticipated to begin in the fourth quarter of 2021, assuming that a Letter of Commitment from the SWRCB to fund the preferred remedial alternative is received within one year after submittal of a grant application for Proposition 1 Groundwater Sustainability Funding.

South Y Feasibility Study
Interim Remedial Action Plan
Preferred Remedial Alternative
Project Schedule

