South Tahoe Public Utility District

Tahoe Valley South Subbasin (6-5.01) Annual Report

2018 Water Year

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CERTIFICATION

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2012-2016 event: Statewide drought emergency declared under the California Emergency Services Act

ABC Alternative: An Analysis of Basin Conditions that demonstrates that the basin has operated within its sustainable yield for at least a 10-year period

AF: Acre-feet

AFY: Acre-feet per year

BMOs: Basin Management Objectives specified in the GWMP

BHHRA: Baseline Human Health Risk Assessment

Cleanup and Abatement Order: CAO

COC: Constituents of Concern

County Water Agency: El Dorado County Water Agency

District: South Tahoe Public Utility District

DRI: Desert Research Institute

DWR: California Department of Water Resources

Existing Plan Alternative: A GWMP developed pursuant to Part 2.75 of the Water Code

Feasibility Study: Engineering feasibility study of remedial alternatives to mitigate PCE groundwater contamination in the South Y Area

GAC: Granular Activated Carbon

GWMP: Groundwater Management Plan

GSA: Groundwater Sustainability Agency

GSP: Groundwater Sustainability Plan

GSP Alternative: Alternative to a GSP

GSP Regulations: California Code of Regulations Title 23. Waters; Division 2. Department of Water Resources; Chapter 1.5. Groundwater Management; Subchapter 2. Groundwater Sustainability Plans

LBWC: Lukins Brothers Water Company

LRWQCB: Lahontan Regional Water Quality Control Board

MCLs: maximum contaminant levels

MDD: Maximum daily demand

MGD: Million gallons per day

MOU: Memorandum of Understanding

MT3DMS: Modular three-dimensional transport model

NRCS: National Resource Conservation Service

OW: Observation well

Parts per Billion: ppb, equivalent to micrograms per liter (µg/L)

Parts per Million: ppm, equivalent to milligrams per liter (mg/L)

PCA: Potential contaminating activity

PCE: Tetrachloroethylene

PDI: Groundwater investigation performed in support of the Feasibility Study.

PTAS: Packed Tower Air Stripper

PWS: Public water system

SAG: Stakeholders Advisory Group

SCWS: Small community water system is a public water system that serves at least 15 service connections used by yearlong residents or regularly serves at least 25 yearlong residents.

SGMA: Sustainable Groundwater Management Act

SMCLs: Secondary maximum contaminant levels

SNOTEL: NRCS snow telemetry station

South Y: Intersection of Highway 50 and Highway 89, in the City of South Lake Tahoe, CA

SWRCB: California State Water Resources Control Board

SWRCB-DOFA: SWRCB Division of Financial Assistance

TKPOA: Tahoe Keys Property Owners Association

TKWC: Tahoe Keys Water Company

TRPA: Tahoe Regional Planning Agency

TVS Basin: Tahoe Valley South Subbasin of the Tahoe Valley Groundwater Basin, Groundwater Basin 6-5.01

USGS: U.S. Geological Survey

UWMP: South Tahoe Public Utility District 2015 Urban Water Management Plan

WBZs: Water-bearing zones

WY: Water Year

0 Executive Summary

The Tahoe Valley South Subbasin of the Tahoe Valley Groundwater Basin, designated by DWR as Groundwater Basin 6-5.01 (TVS Basin) is a discrete, highly productive sedimentary geologic basin located in the City of South Lake Tahoe and portions of El Dorado County, California. The 2018 Annual Report presents a management level summary of groundwater conditions within the TVS Basin using data collected from the Basin Monitoring Program and results from numerical hydrologic models. District progress on implementation of BMOs defined in Section 8 of its 2014 GWMP (Kennedy-Jenks, 2014) is also reported. In 2016, the 2014 GWMP was submitted to DWR for assessment as an Existing Plan Alternative. BMOs are described in terms of sustainability goals in Section 5 of the Districts ABC Alternative, also submitted that same year for assessment by DWR.

Groundwater Conditions

The 2018 Annual Report provides monitoring data for the for the 2018 Water Year (WY), which is the 12-month period starting October 1, 2017 through September 30, 2018.

Water Year Classification. In terms of precipitation, 2018 WY was a normal water year, which followed a very wet water year (2017 WY), a normal year (2016 WY) and a three year below normal period (2012 WY -2015 WY drought).

Groundwater Recharge. During the 2018 WY, TVS model recharge is calculated at 37,746 acre-feet (AF).

Groundwater Levels. Measured groundwater elevations were above normal, compared to the 10-year base period for groundwater levels (2001 WY -2010 WY). Groundwater levels decreased on average about -1.89 feet compared to 2017 WY groundwater levels.

Groundwater Quality. Tetrachloroethylene (PCE) groundwater contamination continued to have an impact on groundwater supplies in the South "Y" Area. The South Y is a local reference to the intersection of Highway 50 and Highway 89 located in the north central portion of the TVS Basin. The South "Y" Plume covers an area of more than 400 acres, extending north of this intersection to the Tahoe Keys Lagoon. Groundwater contamination within this plume has impaired three public water system (PWS) wells and threatens three other PWS wells. The total source capacity of active PWS wells in the TVS Basin presently exceeds the maximum day demand (MDD) minimum threshold for water quality by about 6 million gallons per day (MGD). Although source capacity has declined due to wells impaired by degraded water quality, these impairments have not risen to a level such that available source capacity cannot meet current potable water demands. To help satisfy LBWC water demands the District provided 7.54 million gallons through its inter-tie connection to the

LBWC water system. During the 2018 WY, the District, entered into an agreement with the SWRCB-DOFA to conduct an engineering feasibility study of remedial alternatives to mitigate PCE contamination in the South Y Area. This same year, a groundwater investigation, update of the South Y PCE Model, and development of management scenarios were completed.

Groundwater Production. Metered groundwater production from PWS wells, which accounts for more than 90% of groundwater extractions in the TVS Basin, totaled 6,910 AF; this is approximately 11% below the median value (7,748 AF) over the groundwater production period of record (2005 WY – 2018 WY).

Groundwater Storage. For the 2018 WY, the annual change in groundwater storage is - 8,621 AF. Since 2005 WY, the cumulative change in groundwater storage is + 49,356 AF.

Basin Management Objectives

Groundwater management activities performed during the 2018 WY included items required for ongoing compliance with the Sustainable Groundwater Management Act (SGMA) and varying efforts to address actions under the 2014 GWMP. Significant achievements during the 2018 WY included:

- Proposition 1 Groundwater Grant Program funding obtained through execution of an Agreement with the SWRCB-DOFA to complete a Feasibility Study.

- Completion of a groundwater investigation involving the collection of hydrologic and water quality data from the middle section of the South Y Plume to inform the development of design strategies for hydraulic control and/or removal of PCE contamination from groundwater.

- Completion of the South Y Fate & Transport Model for evaluation of management scenarios developed for the Feasibility Study.

- Public outreach through press releases and public workshops explaining activities undertaken by local water purveyors and the LRWQCB to address groundwater contamination; and

- Publication of the following technical reports;

    a. Addressing Basin Management Objectives for the Tahoe Valley South (TVS- 6.501) Groundwater Basin (DRI, February, 2018);
    b. Tahoe Valley South Subbasin (6-5.01) Annual Report 2017 Water Year (STPUD, March 2018a); and
    c. TVS Groundwater Basin Survey of Well Owners (Allegro Communications Consulting, December 2018).

1 Introduction

The District has prepared the following report for the TVS Basin. The 2018 Annual Report presents a management level summary to assess groundwater conditions and supplies within the TVS Basin, using data collected from the District's Basin Monitoring Program. Progress on implementation of BMOs defined in the 2014 GWMP is also reported. BMOs are described in Section 8 of the Existing Plan Alternative and as sustainability goals in Section 5 of the Districts ABC Alternative.

This report was prepared in compliance with both the annual reporting requirements of the 2014 GWMP and the requirement to submit an annual report by April 1 of each year following the adoption of a GSP or GSP Alternative pursuant to section 356.2 of the GSP Regulations. On December 28, 2016, the District concurrently submitted (1) its 2014 GWMP as a GSP Alternative (Existing Plan Alternative) pursuant to Water Code section 10733.6(b)(1) and (2) an ABC Alternative as a GSP Alternative pursuant to Water Code section 10733.6(b)(2) to DWR for public comment and DWR review and evaluation.[1]

The 2018 Annual Report is the fourth annual report issued since adoption of the 2014 GWMP and the second annual report issued since submittal of both its Existing Plan Alternative and its ABC Alternative. Table 1-1 lists the components required for inclusion in annual reports submitted by a Groundwater Sustainability Agency (GSA) to DWR following adoption of a GSP or GSP Alternative. Also listed are the corresponding section(s) where this information is found in this report.

§ 356.2	ANNUAL REPORT COMPONENT	SECTION(s)
(a)	General information, including an executive summary and a location map depicting the basin covered by the report	Executive Summary; Section 1.1; Fig. 1-1; Fig. 1-2
(b)	A detailed description and graphical representation of the following conditions of the basin managed in the Plan:	
(1)	Groundwater elevation data from monitoring wells identified in the monitoring network shall be analyzed and displayed as follows:	
(A)	Groundwater elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions.	Section 2.4.2; Fig. 2-6
(B)	Hydrographs of groundwater elevations and water year type using historical data to the greatest extent available, including from January 1, 2015, to current reporting year.	Section 2.4; Fig. 2-4; Appendix A

[1] As part of its submittals, the District indicated its preference to DWR that the review be sequenced in such a manner that its Existing Plan Alternative be reviewed first, and should DWR agree that the Existing Plan Alternative is functionally equivalent to a GSP, review of the ABC Alternative would not be necessary.

(2)	Groundwater extraction for the preceding water year. Data shall be collected using the best available measurement methods and shall be presented in a table that summarizes groundwater extractions by water use sector, and identifies the method of measurement (direct or estimate) and accuracy of measurements, and a map that illustrates the general location and volume of groundwater extractions.	Section 2.6; Table 2-2; Fig. 2-8, Fig. 2-9. All reported water use in Section 2.6 is municipal for residential, commercial and landscaping uses.
(3)	Surface water supply used or available for use, for groundwater recharge or in-lieu use shall be reported based on quantitative data that describes the annual volume and sources for the preceding water year.	Not Applicable; surface water for recharge or in-lieu use is not used as a source of supply, except for Lakeside Park Association, since the SWRCB has not been processing water rights applications until recently. Now that the Truckee River Operating Agreement has been implemented, surface water may be used as a potential future source of supply. The annual volume of surface water used by this system is not provided in this report.
(4)	Total water use shall be collected using the best available measurement methods and shall be reported in a table that summarizes total water use by water use sector, water source type, and identifies the method of measurement (direct or estimate) and accuracy of measurements. Existing water use data from the most recent Urban Water Management Plans or Agricultural Water Management Plans within the basin may be used, as long as the data are reported by water year.	Section 2.6.1; Table 2-3; The water use data provided in Section 2.6 is presented in calendar years, as provided in the District's 2015 Urban Water Management Plan.
(5)	Change in groundwater in storage shall include the following:	
(A)	Change in groundwater in storage maps for each principal aquifer in the basin.	Section 2.7- The annual change in groundwater storage is presented as a single value for the entire basin which is derived from the water budget calculated by the groundwater model for the TVS Basin. As the model calculates groundwater storage for all layers within the principal aquifer (e.g. Basin-fill Aquifer), a storage map is not provided in this report. A graph

		depicting annual and cumulative change in groundwater storage is provided as Figure 2-10.
(B)	A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year.	Section 2.7; Fig. 2-10. All water use, in terms of groundwater production, shown in Figure 2-10 is municipal for residential, commercial and landscaping uses
(c)	A description of progress towards implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report.	Section 3.0[2]

Table 1-1. Component requirements of Annual Reports submitted to DWR by GSAs (§356.2).

1.1 TVS Basin

The TVS Basin is part of the larger Tahoe Valley Groundwater Basin, which is located within the Lake Tahoe Hydrologic Basin and incorporates the sediment-filled basins bordering Lake Tahoe. The Tahoe Valley Groundwater Basin is subdivided into three sub-basins: the TVS Basin, the Tahoe Valley West sub-basin, and the Tahoe Valley North sub-basin (Figure 1-1). Of these three sub-basins, the TVS Basin is the largest and most productive.

Elevations within the TVS Basin range from 6,225 feet at lake level, rising to above 6,500 feet within the groundwater basin. Elevations extend above 10,000 feet within the surrounding watersheds along the Carson Range and Sierra Nevada Range. Portions of seven watersheds overlie the TVS Basin; the largest of these is the Upper Truckee River watershed. The Upper Truckee River flows north across the entire length of the TVS Basin and drains into Lake Tahoe through the Upper Truckee Marsh. The Upper Truckee River is joined by Grass Lake and Big Meadow Creeks along the southern extent of its course, Angora Creek centrally, and Trout Creek near Lake Tahoe.

[2] The discussion in Section 3.0 of this Annual Report only applies to the 2014 GWMP and the Existing Plan Alternative; it is not applicable to the ABC Alternative. The ABC Alternative is a "report" rather than a "plan" and, as such, does not require implementation or set forth any milestones, projects, or management actions.

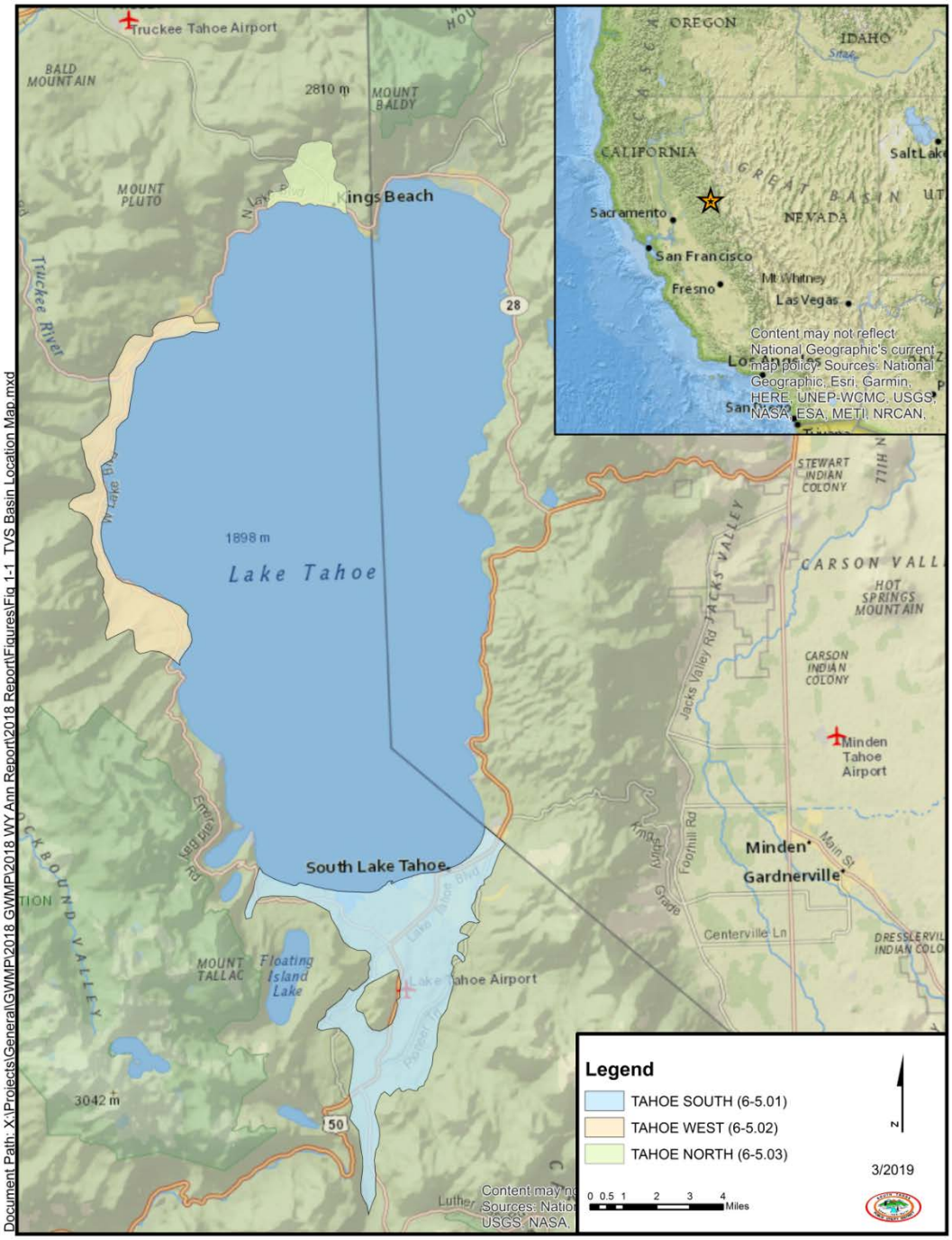

Figure 1-1. Lake Tahoe area regional map with DWR-designated groundwater basins.

The TVS Basin has an area of approximately 23 square miles (14,814 acres) and is located in El Dorado County, California (Figure 1-2). The TVS Basin is roughly triangular-shaped, bounded on the southwest by the Sierra Nevada Range, on the southeast by the Carson Range, and on the north by the southern shore of Lake Tahoe. The TVS Basin generally conforms to the valleys of the Upper Truckee River and Trout Creek. The TVS Basin does not share a boundary with any other DWR basin or sub-basin. The City of South Lake Tahoe overlies the northern portion of the TVS Basin. The southern boundary extends about 3 miles south of the town of Meyers. The northeast boundary of the TVS Basin is defined by the California-Nevada state line. For ease of description, the TVS Basin is subdivided into six geographically based sub-areas, referred to as the Tahoe Keys, South Lake Tahoe, Bijou, Angora, Meyers and Christmas Valley sub-areas. The location and extent of these sub-areas are shown on Figure 1-2.

The TVS Basin includes the City of South Lake Tahoe and portions of eastern El Dorado County, which encompasses the unincorporated communities of Meyers, Angora Highlands and Christmas Valley. Within the greater South Lake Tahoe area, the majority of the land use is classified as Conservation area, followed by Residential, Recreation, Commercial and Public Service, and Tourist areas. The majority of the Conservation areas are federal lands managed by the United States Forest Service - Lake Tahoe Basin Management Unit. Most of the federally managed land is located outside of the TVS Basin, but does include large areas around the Camp Richardson/Fallen Leaf Lake area within the northwest portion of the TVS Basin; and along the basin margin on the east side of the TVS Basin.

Groundwater is the primary source of drinking water for the communities overlying the TVS Basin. Surface water for recharge or in-lieu use is not presently used, except by Lakeside Park Association, since the SWRCB has not been processing water rights applications until recently. Now that the Truckee River Operating Agreement has been implemented, surface water may be used as a potential future source of supply. Most water wells drilled in the TVS Basin are completed in basin-fill deposits that generally consist of unconsolidated glacial, lake and stream sediments. These sedimentary deposits fill the lower reaches of the canyons that drain toward Lake Tahoe and underlie the relatively flat lying valley floors. These deposits can be over 1,000 feet thick in the deeper portions of the TVS Basin, but thin toward the basin margins where they cover shallow bedrock areas. Numerous water-bearing zones (WBZs) have been identified using lithologic and geophysical logs, and interpreted correlations to divide the basin-fill into multiple layers, representing regionally correlated units of high and low permeability. Units of relatively high permeability typically correspond to coarse-grained glacial outwash, fluvial and deltaic deposits forming the basin-fill aquifer. The laterally continuous fine-grained lacustrine (lake-bed) deposits form local confining layers or aquitards that affect groundwater flow between these higher permeability deposits.

Figure 1-3 is a conceptual hydrogeological cross section across the northern portion of the TVS Basin used to illustrate the WBZs. The different WBZ designations are informal and are based on the local geographic area and the stratigraphic order in which the unit occurs. This is indicated as a subscript from deep to shallow depth (1 = lowermost zone; 5 = uppermost zone). The deepest zone (WBZ1) occurs in the deepest portions of the basin, generally at depths below 600 feet, and may act as a confined aquifer

and show artesian conditions in some areas. The middle two zones (WBZ2 and WBZ3) represent the interval at depths between 200 to 600 feet and the shallowest two zones (WBZ4 and WBZ5) represent depths to 200 feet (Bergsohn, 2011).

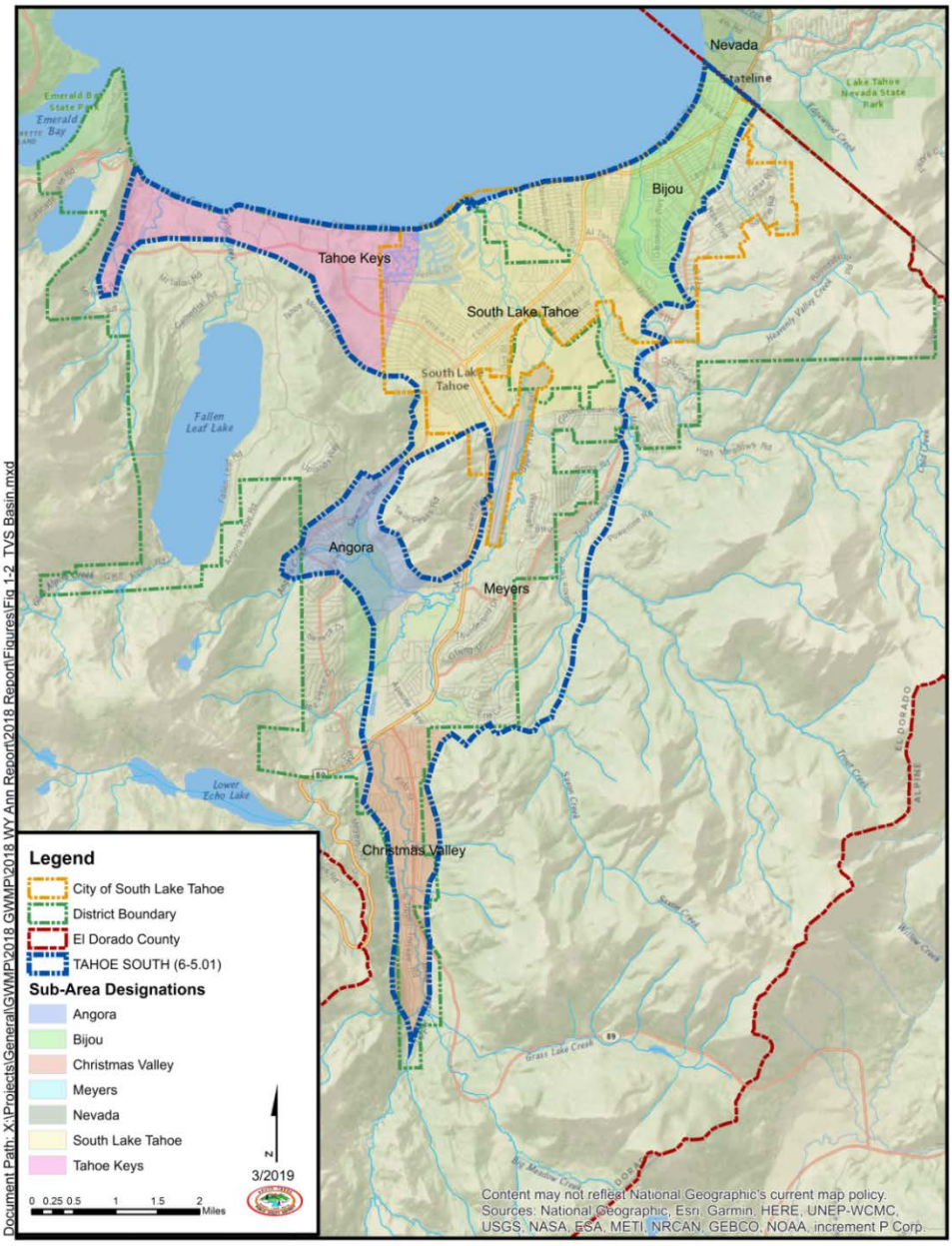

Figure 1-2. TVS Basin showing jurisdictional boundaries and geographically-based sub-area designations used in this report.

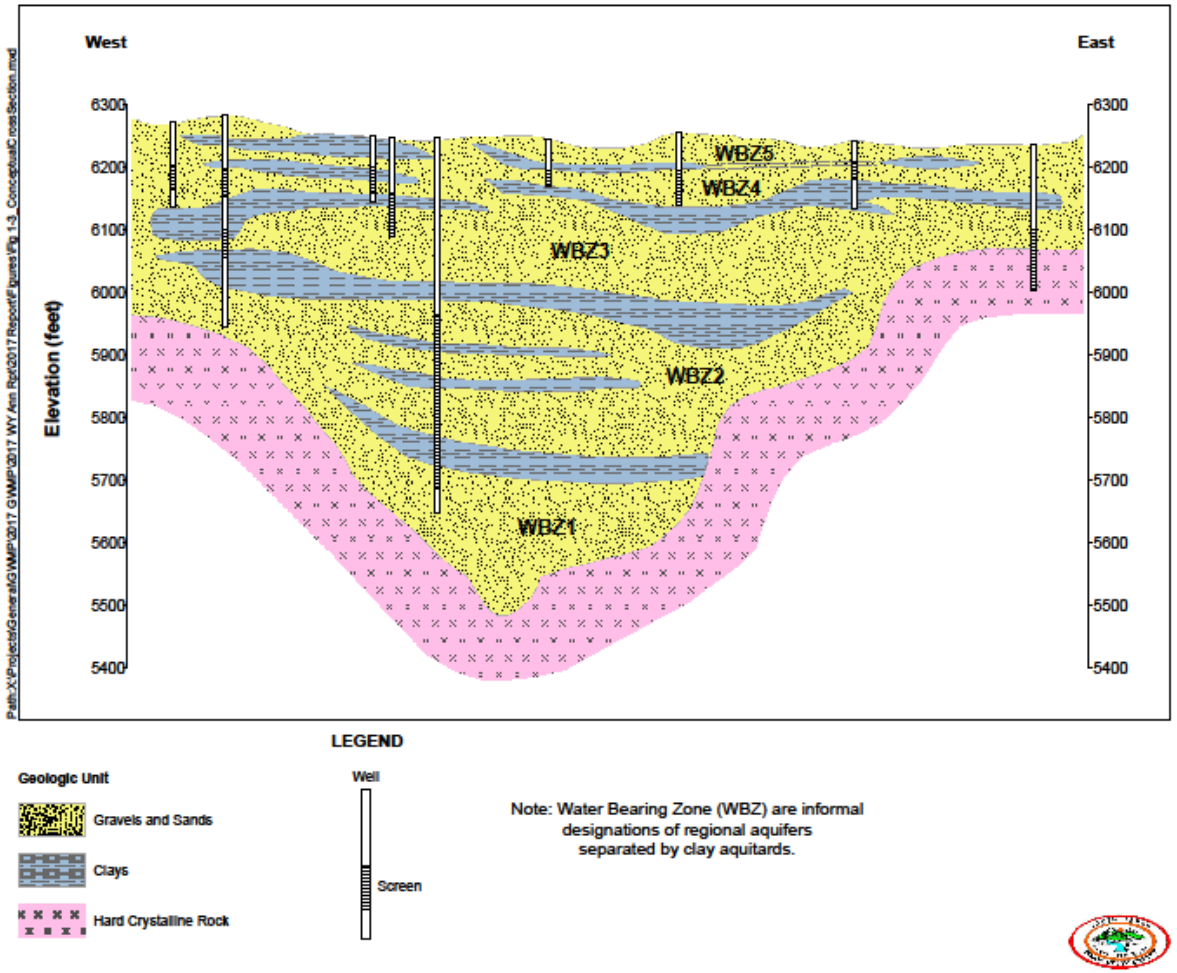

Figure 1-3. Conceptual geologic cross-section oriented east-west showing typical WBZs within the TVS Basin (Adapted from Kennedy-Jenks (2014)).

1.2 Water Year Classification

In terms of precipitation, 2018 WY was a normal water year using the water year classification developed for the TVS Basin. Under the GSP Regulations, annual precipitation in a basin is required to be described in terms of water year type. DWR generally assigns water year type based on river flow indices or precipitation amounts and has developed water year classification systems for several hydrologic basins in California. For example, for the Sacramento Valley hydrologic basin, SWRCB developed five categories based on runoff forecasts and previous water year's index: 1) wet, 2) above normal, 3) below normal, 4) dry, and 5) critical (SWRCB, 1978).

DWR has not developed a water year classification for the Lake Tahoe hydrologic basin. As such, the District requested the Desert Research Institute (DRI) to develop a water year classification for the TVS Basin. The water year classification was created following development of the TVS Basin water budget by DRI. During development of the water budget, a strong linear correlation was identified between simulated precipitation from the regional Groundwater Surface Water Flow Model for the Truckee River Basin and groundwater recharge to the TVS Basin. Linear correlation was also found between groundwater recharge to model calculated change in groundwater storage. Using these relationships from the modeling analysis, total accumulated precipitation measured at four NRCSSNOTEL stations within the model area were further evaluated to find the SNOTEL station with the best correlation to the simulated precipitation from the Groundwater Surface Water Flow Model. SNOTEL 508: Hagan's Meadow, CA was found to have the best correlation with model simulated groundwater recharge and change in groundwater storage. Therefore, NRCS precipitation records for this station were used as a reference station to classify water year type for the TVS Basin (Carroll et al., 2016b). The regression equation between annual total precipitations at SNOTEL 508: Hagan's Meadow, CA to groundwater recharge within the TVS Basin and surrounding watersheds is shown below in Figure 1-4. The regression equation has an R-squared (R^2) of 0.92, which is a statistical measure of how close the data are to the fitted regression line.

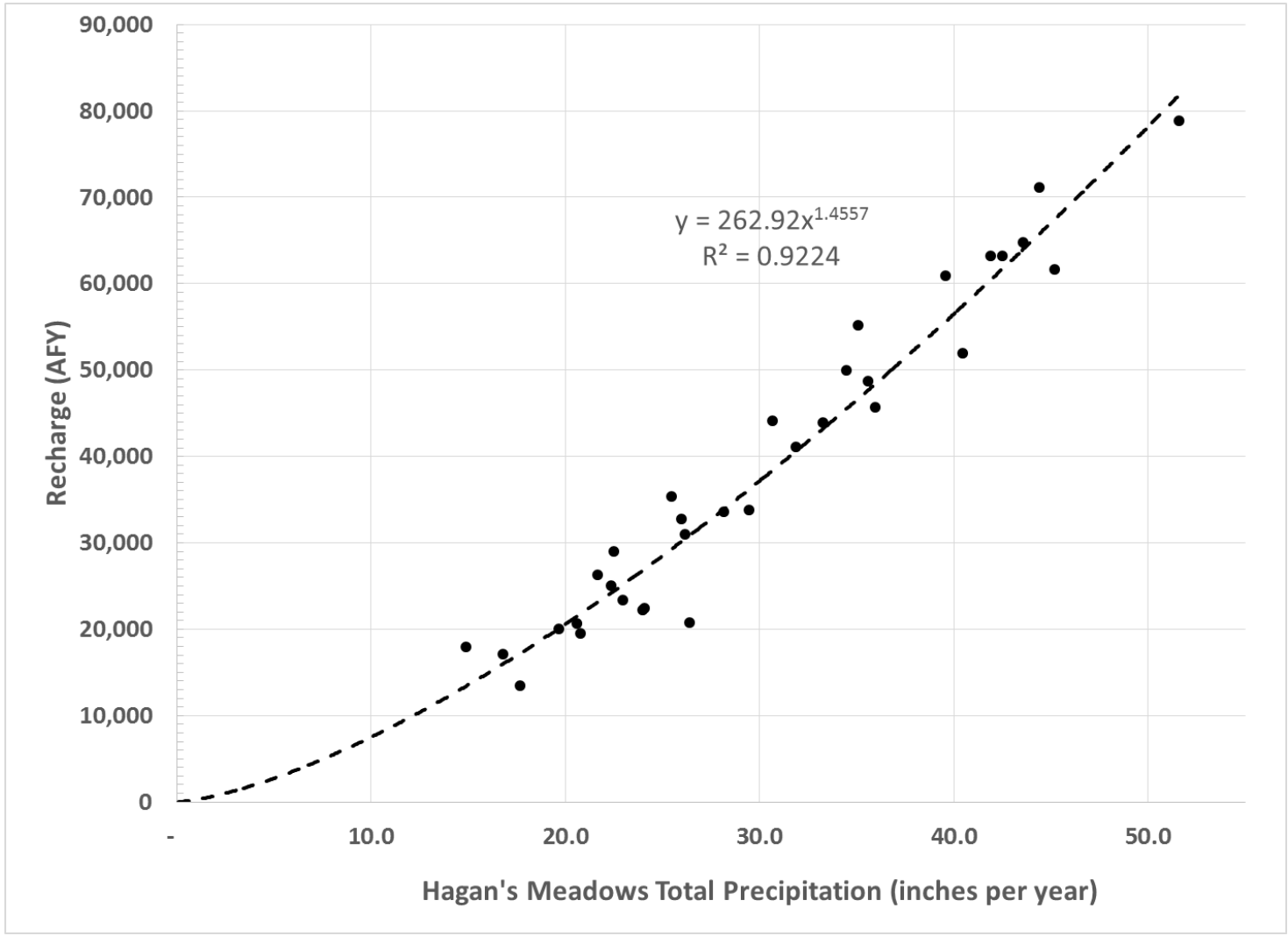

Figure 1-4. SNOTEL 508: Hagan's Meadow, CA annual precipitation versus modeled groundwater recharge within the TVS Basin (G. Pohll et al., 2016)

For the TVS Basin, water years 1979 – 2018 were categorically defined by assuming a normal distribution in precipitation and establishing ranges based on the z-statistics in Table 1-2. To allow more flexibility in water year type, seven categories were established: 1) very wet, 2) wet, 3) above normal, 4), normal, 5) below normal, 6) dry, and 7) critical. The very wet periods are indicated by a z-statistic > 1.5 and occur in 1982 WY, 2011 WY and 2017 WY. The critical water year is indicated by a z-statistic – 1.5 and occurs when total accumulated precipitation is less than 14 inches. During the 2018 WY, total accumulated precipitation measured at SNOTEL 508: Hagan's Meadow, CA was 29.6 inches. Table 1-2 shows the z-statistics, the calculated precipitation range for each water year type, and the number of each water year type (Count) occurring over the period of record (1979 – 2018) for this station. Figure 1-5 shows a graphical representation of this record.

WY Type	z (upper)	Precipitation (in)		Count
		>	≤	
Very Wet	> 1.5	49	-	3
Wet	1.5	43	49	4
Above Normal	1	37	43	4
Normal	0.5	26	37	13
Below Normal	-0.5	20	26	12
Dry	-1.0	14	20	4
Critical	-1.5	0	14	0

Table 1-2. Classification system for Water Year (WY) Type based on observed WY accumulated precipitation at SNOTEL 508: Hagan's Meadows, CA. Upper bound of z-statistic and ranges in precipitation (inches) (Adapted from Carroll *et al.,* 2016b).

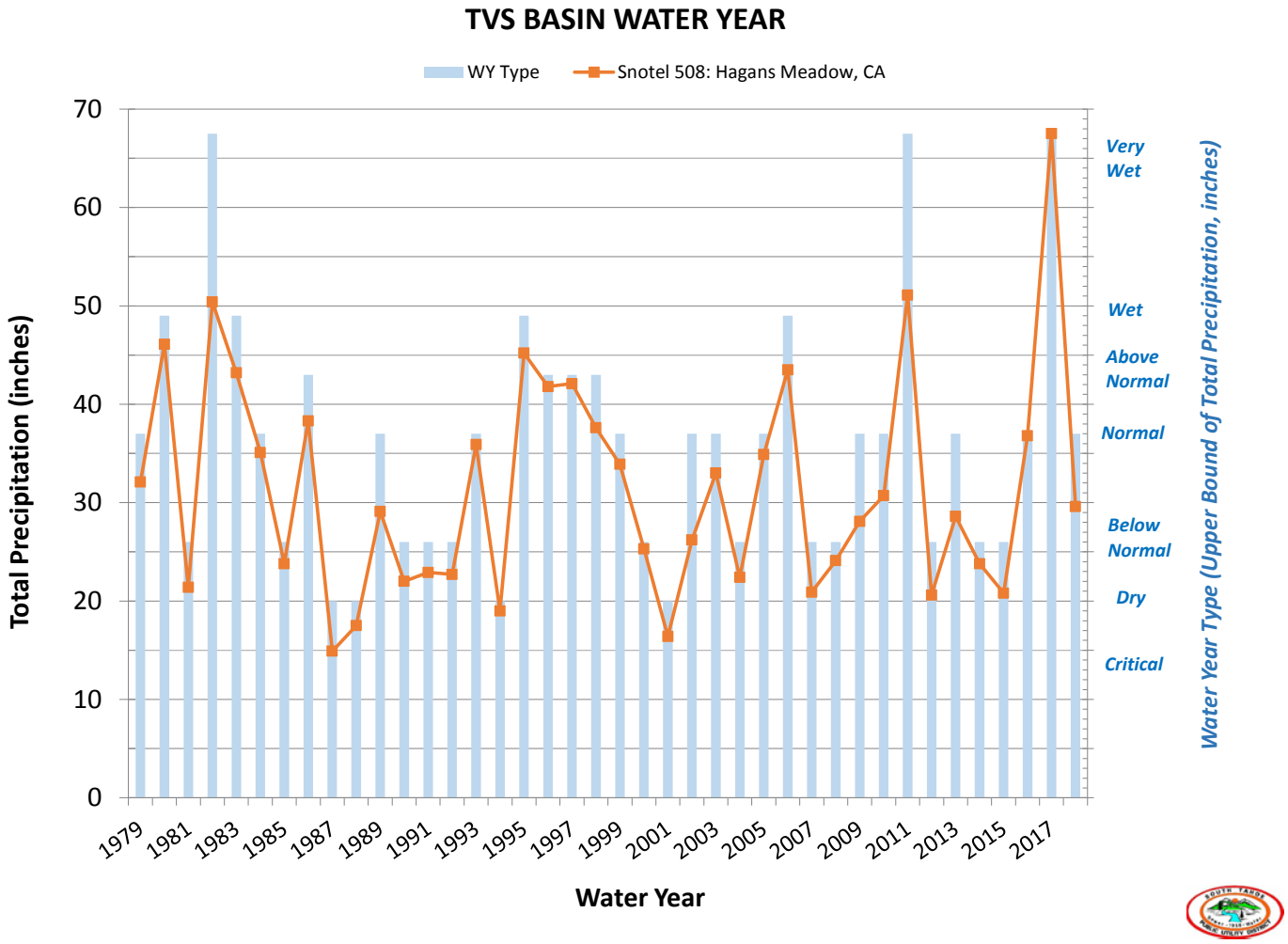

Figure 1-5. The annual accumulated precipitation measured at SNOTEL 508: Hagan's Meadow, CA and water year type indicated on the vertical axis along the right-side of the graph. Precipitation ranges for each water year type are listed in Table 1-2.

2 Groundwater Conditions

The following section presents data collected by the District and derived from numeric groundwater models to show the current state of the TVS Basin. Hydrographs showing groundwater elevation trends across the TVS Basin are provided in Appendix A.

2.1 Groundwater Model

The groundwater model for the TVS Basin was developed by DRI for the TVS Basin and its surrounding watersheds to prepare a water budget, perform complex hydrologic analyses, and inform BMOs specified in the GWMP (Carroll, *et al.*, 2016a). The groundwater model is also described in Section 1.3.4 of the ABC Alternative. The groundwater model for the TVS Basin quantifies basin conditions using the U.S. Geological Survey (USGS) MODFLOW-NWT (Niswonger *et al.,* 2011) software. MODFLOW-NWT is the latest installment of the USGS modular program and relies on the Newton solution method and an unstructured, asymmetric matrix solver to calculate groundwater head. MODFLOW-NWT is specifically designed to work with the upstream weighted package to solve complex, unconfined groundwater flow simulations to maintain numerical stability during the wetting and drying of model cells.

The model grid is oriented north-south and contains 342 rows and 251 columns. Horizontal cell size is 100 meters (328 feet) and is based on the need to capture steep topography, narrow canyons and potentially steep hydrologic gradients, which are present in the TVS Basin (Figure 2-1). The model is subdivided into four subsurface layers to maintain reasonable computation time. Layers are determined based on production well screen intervals. Land surface elevations are based on 30 meter (98 feet) Digital Elevation Model aggregated to a 100 meter (328 feet) resolution. Layer thicknesses are 40 meters (131 ft) for layer 1 and layer 2, and 100 meters (328 feet) for layer 3. The layer 4 bottom elevation is set to a constant 1,600 meters (5,248 feet) to produce variable thickness ranging from approximately 114 meters (274 feet) along the northern boundary with Lake Tahoe to 1,300 meters (4,264 feet) at watershed divides.

The groundwater model simulates two distinct time periods. The first represents steady-state conditions prior to any significant groundwater production in the basin. Hydraulic conductivity was calibrated using the steady-state model configuration. The transient model simulates the period 1983-2018 to calculate changes in groundwater levels and flux due to variations in precipitation and groundwater extractions.

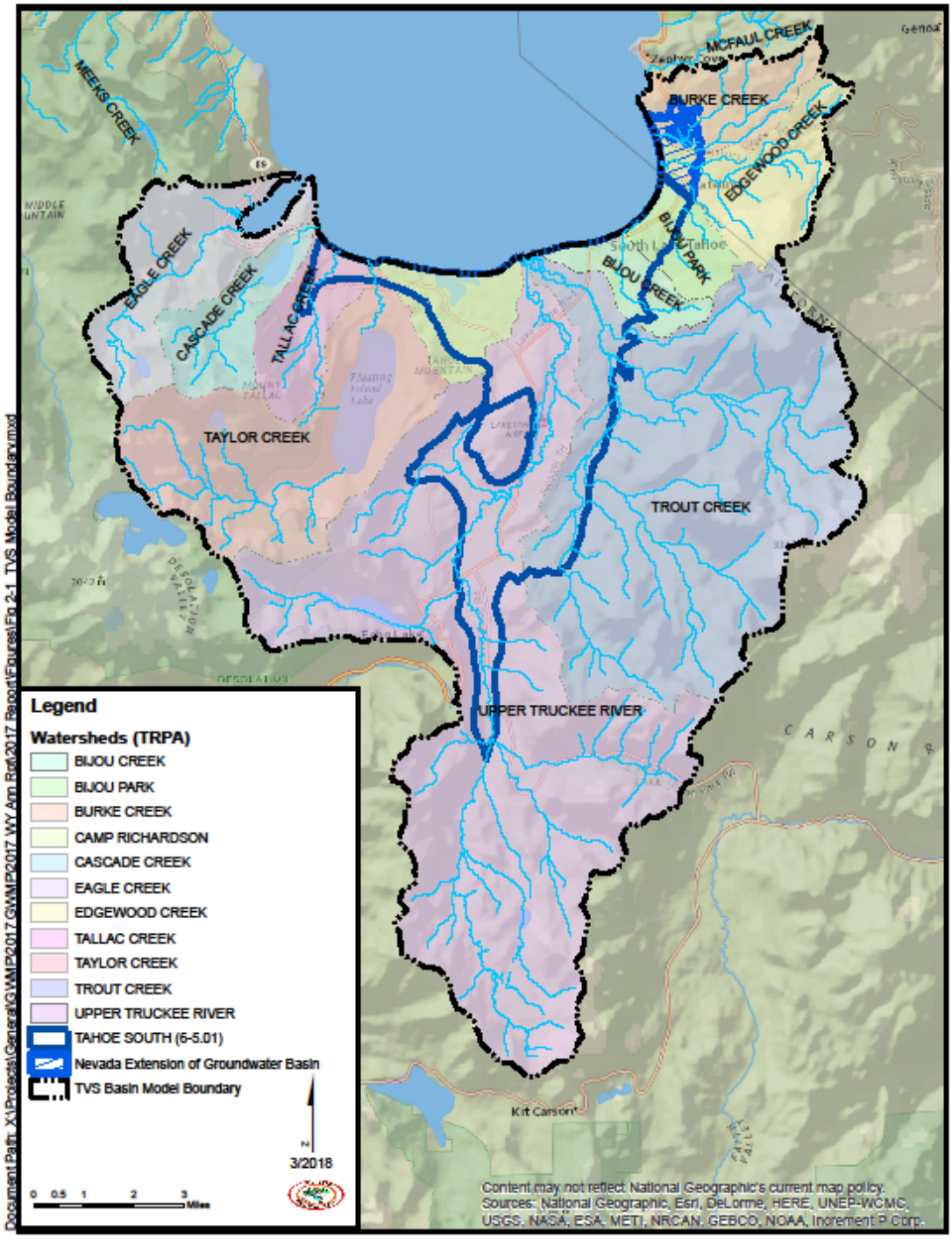

Figure 2-1. The groundwater model for the TVS Basin encompasses the entire TVS Basin as well as the surrounding watersheds contributing recharge to the TVS Basin.

2.2 Groundwater Recharge

Recharge for the TVS Basin was extracted from the transient model developed by DRI for the TVS Basin. Figure 2-2 shows annual groundwater recharge over the simulation period of the transient model (1983 WY- 2018 WY). During the 2018 WY, the model recharge is 37,746 AF. This is about 92% of the average groundwater recharge to the TVS Basin over the 1983 WY through 2018 WY simulation period.

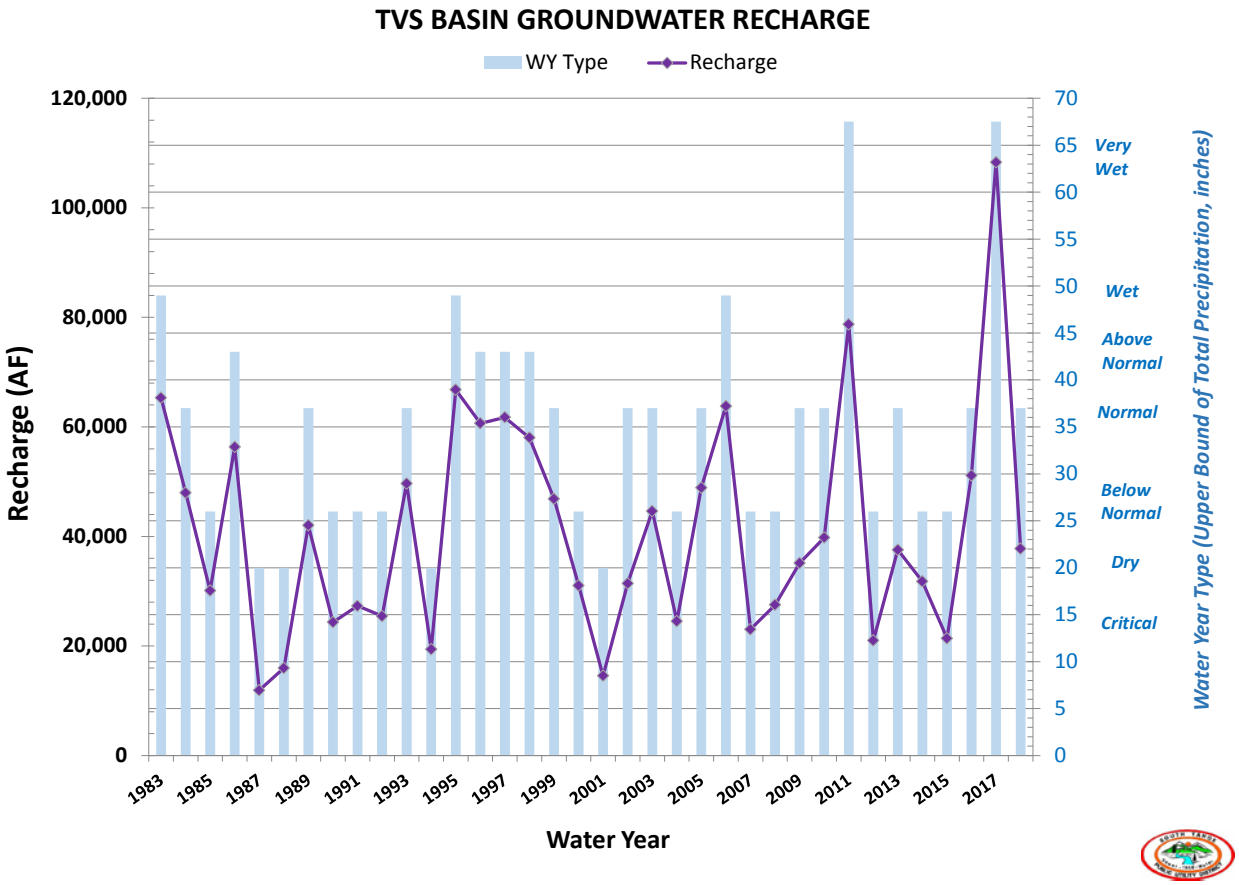

Figure 2-2. TVS Basin model recharge (AFY) from 1983 WY – 2018 WY. Water year type using the TVS Basin classification from total precipitation measured at SNOTEL 508 Hagan's Meadow, CA is indicated on the secondary vertical axis on the far right-side of the graph.

2.3 Groundwater Level Monitoring

The District regularly measures groundwater levels in its forty-seven (47) wells located throughout the TVS Basin. The District well network includes thirty (30) observation wells and seventeen (17) PWS wells (Figure 2-3). The majority of the PWS wells (13 of 17) are actively used for drinking water supply. Two of these wells are on stand-by status, used only for emergency purposes. Two of these wells are off-line and currently used as observation wells. The observation wells include monitoring wells, sentinel wells and test wells, as well as former drinking water supply wells that have been removed from service and are no longer connected to the District's water distribution system. Only the observation wells are used in the California State Groundwater Elevation Monitoring (CASGEM) program.

Construction details for selected wells for which hydrographs are provided (Appendix A) are set forth in Table 2-1. The sub-areas, shown in Table 2-1, are informal designations using the geographically-based designations (Christmas Valley, Meyers, Angora, South Lake Tahoe, Tahoe Keys and Bijou) shown in Figure 1-2. The Christmas Valley sub-area is in the southernmost portion of the TVS Basin, south of Lake Valley and Highway 50. The Meyers sub-area is located in the southern portion of Lake Valley from Highway 50 north to Twin Peaks. The Angora sub-area is located in the northern portion of Lake Valley west of Twin Peaks. The South Lake Tahoe sub-area is located north of Lake Valley. The Tahoe Keys sub-area is located at the north end of the TVS Basin, west of the South Lake Tahoe sub-area; while the Bijou sub-area is located east of the South Lake Tahoe sub-area.

The Basin Monitoring Program is described in Section 9.0 of the Existing Plan Alternative and in Attachment F of the ABC Alternative. The Basin Management Program generally involves the collection, compilation and evaluation of groundwater level, groundwater quality, groundwater production and climate data from numerous sources for the TVS Basin. As part of the groundwater level monitoring effort, the District uses both hand and continuous readings to monitor groundwater elevation trends across the TVS Basin. Hand readings are collected from each of the TVS Basin groundwater elevation monitoring wells in the fall and spring of each water year. Hand readings from active PWS wells are collected a minimum of 12 hours after well pumps are turned-off for static water level measurements. A smaller number of observation wells (13) are fitted with dedicated water-level monitoring equipment. The data loggers are programmed to collect pressure head and temperature readings at 6:00 AM and 6:00 PM on a daily basis to provide a continuous record of groundwater levels in the TVS Basin.

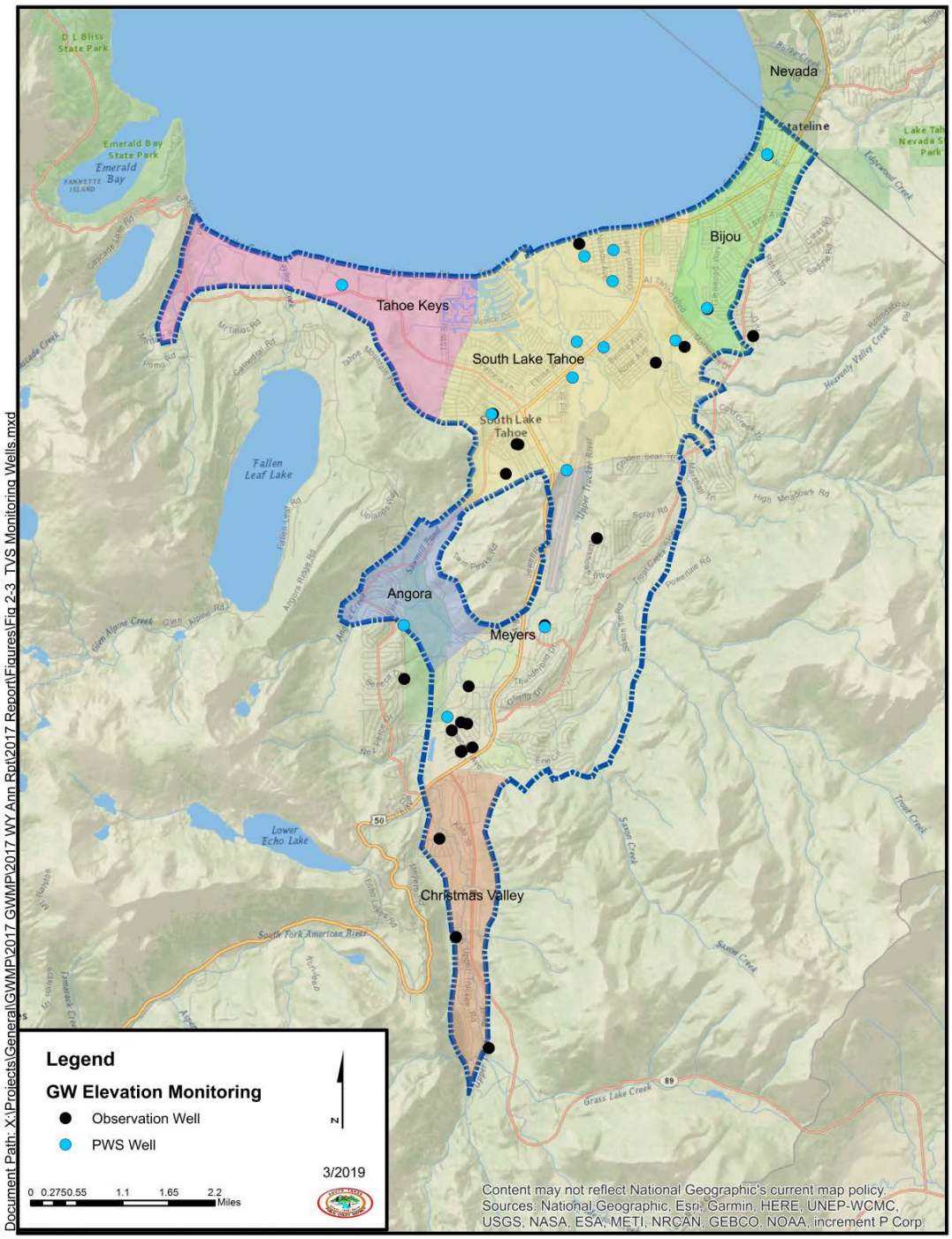

Figure 2-3. Locations of wells used for monitoring changes in groundwater elevation within the TVS Basin.

Well	Sub-Area	Reference Point Elevation (ft msl)	Top of Screen Depth (ft bgs)	Bottom of Screen Depth (ft bgs)
Mountain View	Angora	6313.14	95	164
Blackrock Well #1	Bijou	6242.72	168	180
Glenwood Well #3	Bijou	6261.68	112	192
Henderson OW	Christmas Valley	6369.78	79	100
			142	205
Bakersfield	Meyers	6310.50	130	170
			180	240
Elks Club Well #1	Meyers	6284.63	110	142
Washoan OW	Meyers	6307.84	102	144
			165	186
			207	228
			249	270
CL-1	South Lake Tahoe	6278.37	104	114
CL-3	South Lake Tahoe	6278.49	39	49
Paloma	South Lake Tahoe	6267.10	188	248
			268	408
Sunset	South Lake Tahoe	6249.00	275	430
Martin OW	South Lake Tahoe	6262.42	95	115
			125	145
			160	180
			200	240
USGS TCF-1-1	South Lake Tahoe	6296.48	325	340
USGS TCF-1-2	South Lake Tahoe	6296.47	245	260
USGS TCF-1-3	South Lake Tahoe	6296.65	158	163
USGS TCF-1-4	South Lake Tahoe	6296.63	130	140
USGS TCF-1-5	South Lake Tahoe	6296.63	88	98
Lily OW	South Lake Tahoe	6236.08	35	37.5
Valhalla	Tahoe Keys	6256.50	110	170

NOTES:
feet msl: Elevation in feet above mean sea level (NAVD88).
ft bgs: Depth in feet below ground surface.

Table 2-1. Well screen intervals for selected groundwater elevation wells within the Tahoe Valley South Basin. Hydrographs for selected wells to show groundwater level trends within each sub-area are provided in Appendix A.

2.4 Groundwater Levels

Hydrographs of continuous groundwater elevation readings collected from four observation wells across the TVS Basin are provided below in Figure 2-4. The Henderson Observation Well (OW) is located near the south end of the TVS Basin at the north end of the Christmas Valley sub-area. The Washoan OW is located near the center of the TVS Basin, within the north half of the Meyers sub-area. The Martin OW and Lily OW are both located at the north end of the TVS Basin, within the South Lake Tahoe sub-area. The Martin OW is located near the east margin of the TVS Basin within the south half of the sub-area; and the Lily OW is located near the south shore of Lake Tahoe within the north half of the sub-area.

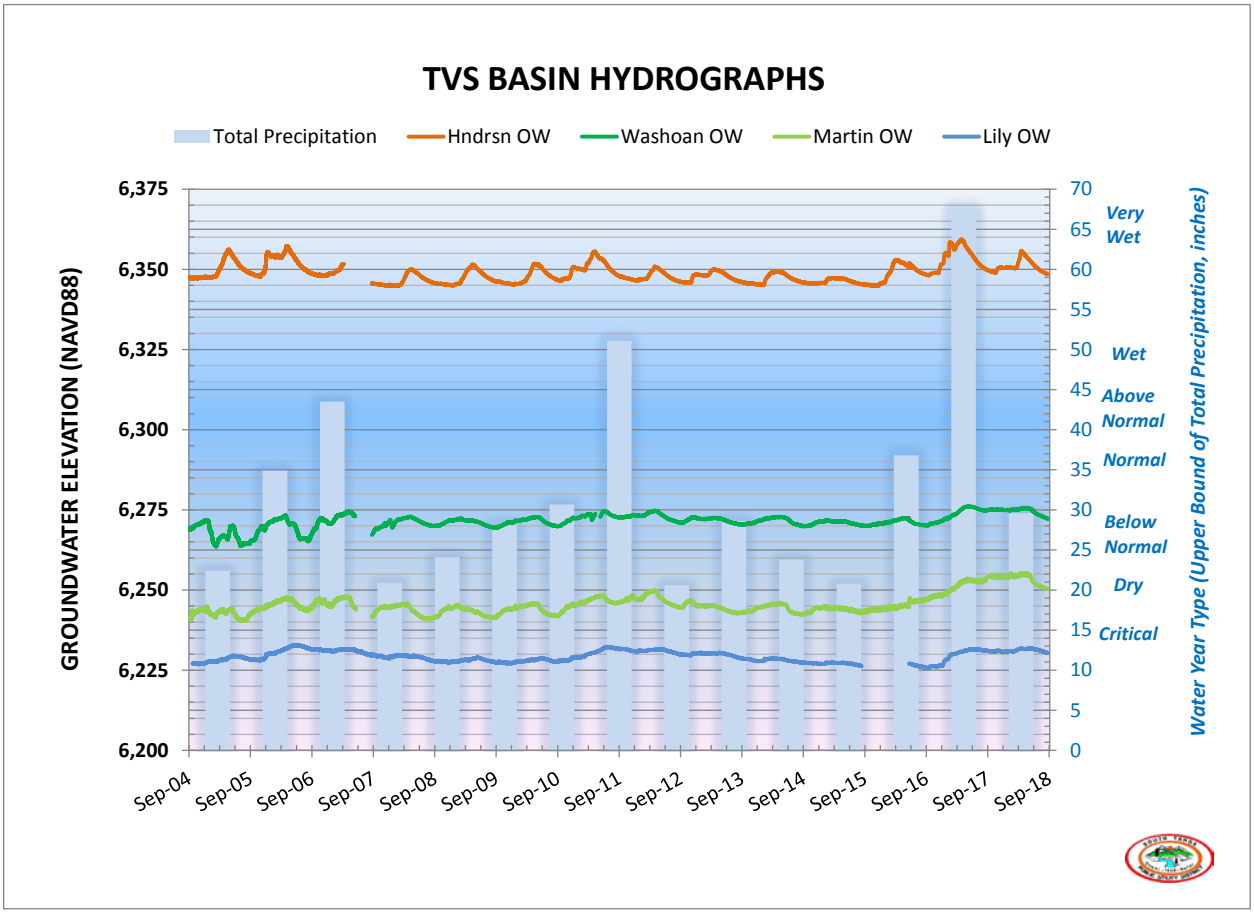

Figure 2-4. Continuous groundwater level readings collected from selected wells distributed across the TVS Basin.

Over the period of record (2005 WY – 2018 WY), the continuous readings show that groundwater elevations have been relatively stable. During this period, there were five below normal water years; six normal water years; one wet water year; and two very wet water years (*see* Figure 1-5). Regular fluctuations representing seasonal changes in groundwater elevations are most pronounced in the

Henderson OW. This may be due to its remote location, away from the pumping influence of neighboring wells and away from the groundwater elevation influence of Lake Tahoe. Groundwater elevations tend to rise during the winter storm season when precipitation exceeds evaporation, plant transpiration (evapotranspiration) is at its lowest and groundwater production is at or near seasonal low water demands. As a result, seasonal high groundwater levels typically occur between early-April through mid-June. Groundwater levels then tend to decline during the summer and into the fall, when evapotranspiration exceeds precipitation and groundwater production is at or near seasonal high water demands. Seasonal low groundwater elevations typically occur at the end of this seasonal cycle from between mid-July through mid-November.

Groundwater elevations within the TVS Basin declined after the 2011 WY (very wet) during the 2012 WY through 2015 WY and then recovered during the 2016 WY (normal) and 2017 WY (very wet). Groundwater elevations marginally declined after the 2017 WY (very wet) during the 2018 WY (normal). The magnitude of these changes is ascertained by comparing interannual changes in seasonal high groundwater levels (May readings) measured from all of the groundwater elevation monitoring wells.

2.4.1 Basin Condition (Groundwater Levels)

Hand readings collected from the groundwater elevation monitoring wells in May of each water year are compared to hand readings collected during a 10-year period (2001 WY- 2010 WY) prior to the 2012 WY through 2015 WY. A statewide drought emergency was declared in California during a 5-year event spanning water years 2012 through 2016, referred to as the 2012-2016 event (https://water.ca.gov/Water-Basics/Drought).

The purpose of this analysis is to gage the current condition of groundwater levels compared to the 2001 WY- 2010 WY base period for groundwater levels selected for the TVS Basin. This base period was selected as groundwater level data for the groundwater elevation monitoring wells are relatively complete and occurred prior to the 2012-2016 event. During the base period accumulated precipitation measured at SNOTEL 508: Hagan's Meadow, CA averaged 29.3 inches, which is within the normal range of precipitation for the TVS Basin. During the base period for groundwater levels there were: one dry water year; three below normal water years; five normal water years; and one wet water year (see Figure 1-5).

Hand readings collected during the May 2018 WY were used to define current basin conditions as being either normal, above normal, or below normal with respect to the record of groundwater levels collected during the base period (2001 WY – 2010 WY). The percentile rank of the groundwater elevation measured during the May 2018 monitoring event at each well was determined for more than thirty (30) of the groundwater elevation monitoring wells using the record of hand readings collected for that well during the base period. The percentile rank of the May 2018 groundwater elevation for each well was then plotted on a cumulative frequency diagram to show the current state of the TVS Basin in terms of groundwater levels (Figure 2-5).

Figure 2-5 shows the distribution of groundwater elevations measured during the May 2015, May 2016, May 2017 and May 2018 monitoring events using their respective percentile ranks within the record of groundwater levels measured for the same wells during the base period. The 2015 WY was a below normal water year near the end of the 2012-2016 event. During 2015 WY, the median for the May 2015 groundwater elevations was in the middle of the normal range (52%) of the base period elevations and seven wells had below normal groundwater elevations. During 2016 WY, the median for the May 2016 groundwater elevations was at the lower end of the above normal range (86%) of the base period elevations and only one well had below normal groundwater elevations. This well (Seneca Observation Well) is located outside the west boundary of the TVS Basin. During 2017 WY, the median for the May 2017 groundwater elevations was at the higher end of the above normal range (97%) of the base period elevations and all wells were in the above normal range, with the exception of the Sunset Well (48%) which was within the normal range. During the 2018 WY, the median for the May 2018 groundwater elevations was near the center of the above normal range (93%) of the base period elevations with six wells in the normal and thirty-one wells in the above normal range. Groundwater elevations in the Sunset Well further declined compared to the base period elevations to near the bottom of the normal range (28%).

Between May 2011 and May 2015, the difference in groundwater elevations decreased an average of 3.98 feet. Between May 2015 and May 2016, the difference in groundwater elevations increased an average of 2.21 feet; and between May 2016 and May 2017, the difference in groundwater elevations increased 4.70 feet. Using these averages, groundwater levels across the TVS Basin appear to have fully recovered from the total decline in groundwater levels that occurred during the2012-2016 event Between May 2017 and May 2018, the difference in groundwater elevations decreased an average of -1.89 feet.

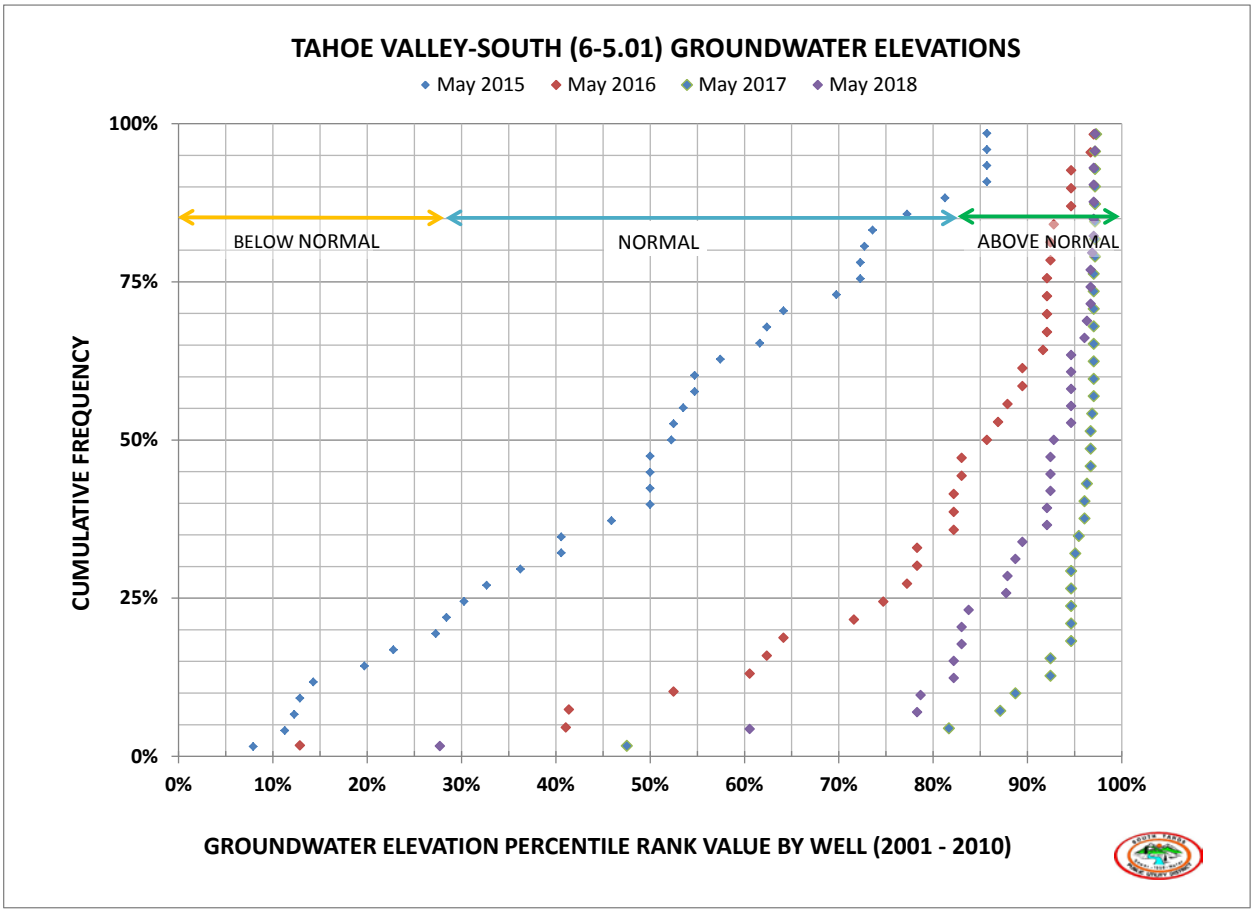

Figure 2-5. Hand readings collected during the May groundwater elevation monitoring event for the 2015 WY through 2018 WY compared to the record of hand readings for the same wells collected during the 2001 WY through 2010 WY base period for groundwater levels.

2.4.2 Groundwater Elevation Contours

Groundwater elevation contour maps for October 2017 and May 2018 are presented in Figure 2-6 and represent seasonal low and seasonal high groundwater elevation conditions. The typical pattern is for seasonal low groundwater conditions to occur in the late summer and early fall due to low recharge following the relatively dry summer months and increased groundwater pumping to meet high water demands. Seasonal high groundwater conditions typically occur in the spring following the spring snowmelt and runoff and lower groundwater pumping needed to meet low water demands.

The groundwater model for the TVS Basin simulates the period 1983-2018 to calculate changes in groundwater levels and flux due to variations in climate and groundwater extractions. Model simulated groundwater levels were used to generate the groundwater contours presented in Figure 2-6. These

contours are considered appropriate to illustrate the general pattern of groundwater flow in the TVS Basin.

Comparison of contours shows that the generalized pattern of groundwater flow remains similar between October 2017 and May 2018. This is consistent with the hydrograph data (Appendix A) that shows the typical variation in groundwater levels is on the order of only a few feet. In most of the TVS Basin, the May 2018 water level contours progress northward indicating a general rise of groundwater levels compared to October 2017 groundwater levels. Inspection of Figure 2-6 shows that rising groundwater levels reduced the extent of a local groundwater depression defined by the 6227 contour along the north margin of the TVS Basin, within the South Lake Tahoe sub-area. Within this contour, the general direction of groundwater flow may locally reverse, with a component of groundwater flow moving south from Lake Tahoe toward the depression. Outside the 6227 contour, groundwater flow through the South Lake Tahoe sub-area is generally directed northward from the TVS Basin toward Lake Tahoe.

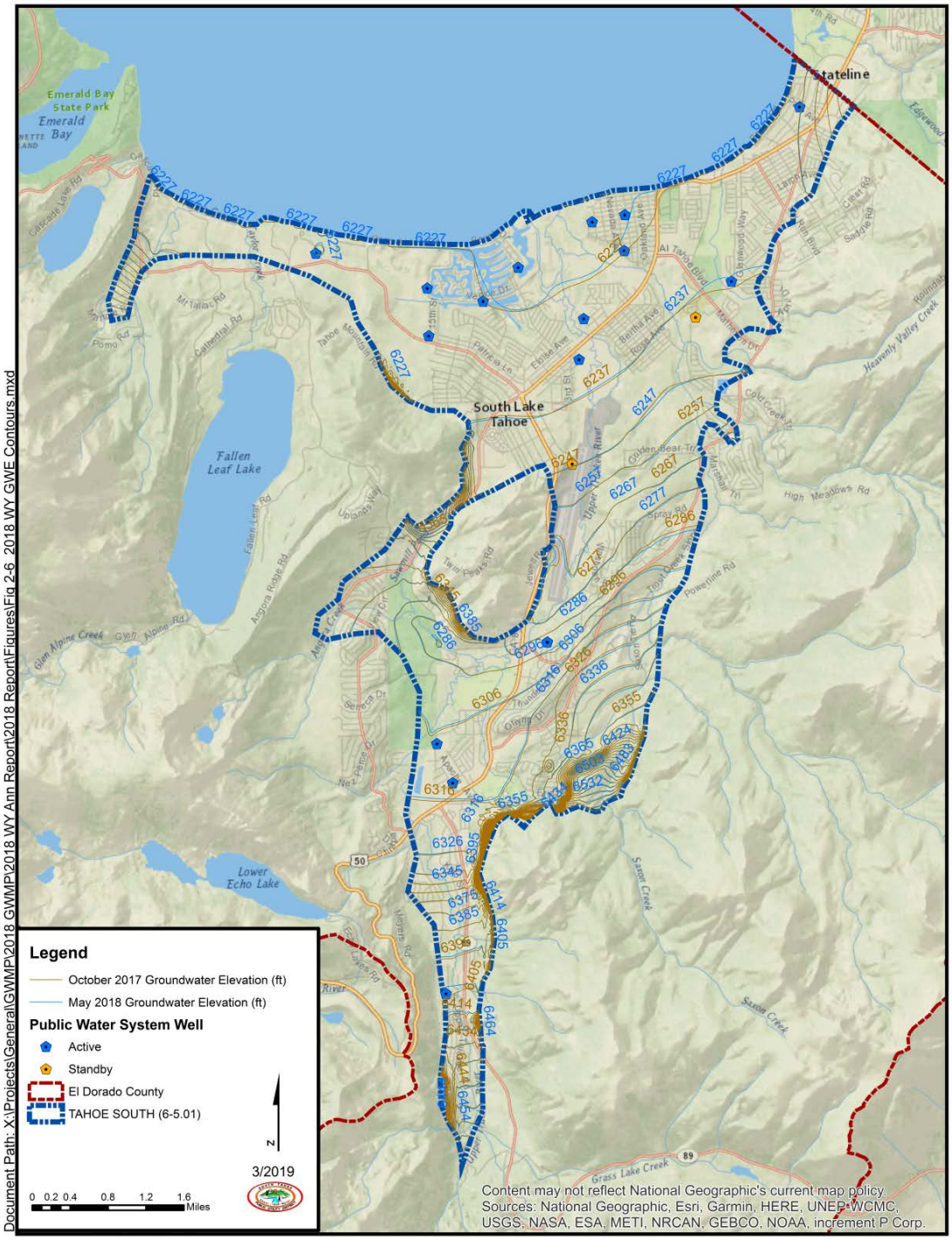

Figure 2-6. TVS Basin model simulated groundwater levels (upper 300 ft) for seasonal low (October 2017) and seasonal high (May 2018) groundwater elevations. Contour interval is 10 ft.

2.5 Groundwater Quality

Groundwater in the TVS Basin is typically of excellent quality; however, there is a history of groundwater contamination from regulated industrial and commercial chemicals impairing drinking water sources within the basin. Over the past ten years, arsenic, iron, and radionuclides (uranium) have been found in both PWS wells and private wells at concentrations exceeding primary or secondary maximum contaminant levels (MCLs) (Pohll *et al.,* 2016). Well head treatment is presently used to remove arsenic from groundwater produced at one active PWS well (Arrowhead Well No. 3). Two other PWS wells are currently on stand-by status due to concentrations of arsenic (Airport Well) and uranium (College Well) in groundwater above MCLs.

Man-made contaminants which have occurred in the TVS Basin include petroleum hydrocarbon and chlorinated hydrocarbon compounds. Of these, the two most prominent constituents of concern (COC) are Methyl-tertiary Butyl Ether (MtBE) and PCE. Well head treatment (Granular Activated Carbon) is presently used to remove PCE from groundwater at one active PWS well (TKWC #2) within the South Lake Tahoe sub-area. A second wellhead treatment system (Packed Tower Air Stripper) is also used for the removal of PCE from groundwater, within this same sub-area at the Clement Well, which is presently inactive. Chlorinated hydrocarbons have been detected in private and municipal supply wells within this area since 1989, when these compounds were first required to be tested in raw water samples collected from regulated drinking water sources.

During the 2018 WY, trace levels of MtBE (0.4 ppb) were detected in a one of twelve samples collected monthly from a single PWS well (Paloma Well) at concentrations below primary (13 ppb) or secondary (5 ppb) MCLs. The quantification of this detection is uncertain as it is below the laboratory reporting limit (0.5 ppb). The Paloma Well is located within the north half of the South Lake Tahoe sub-area, approximately 0.67 miles southeast of the south shore of Lake Tahoe. A relic petroleum hydrocarbon plume (including MtBE) is located at the former Terrible Herbst No. 68 site (Case No. 6T0006A), approximately 2,000 feet south-southeast of the Paloma Well (LRWQCB, 2016). It is unknown whether the trace detection at the Paloma Well is from the relic petroleum hydrocarbon plume remediated at the former Terrible Herbst site.

During the 2018 WY, PCE continued to be detected in ground water samples collected from three PWS wells (LBWC #5, TKWC #2 and TKWC #1) situated within the South Y Plume (Figure 2-7). The South Y is a local reference to the intersection of Highway 50 and Highway 89, located in the north central portion of the TVS Basin. The South Y Plume covers an area of more than 400 acres, extending north of this intersection to the Tahoe Keys Lagoon. The boundaries of this contaminant plume have been generally defined using maximum PCE concentrations detected in groundwater samples collected from between 2011 through early 2016. From these data, the contaminant plume is estimated to cover an area of approximately 465 acres (GEI Consultants, 2016).

During the 2018 WY, PCE was detected above MCLs (5 ppb) in raw water samples collected from the LBWC #5 (60 ppb) and TKWC #2 (24 ppb) wells. PCE was detected below MCLs in raw water samples collected from TKWC # 1 (2.4 ppb). Groundwater samples were also collected from eight (8) monitoring wells situated with the South Y Plume. Samples from these wells were collected during baseline sampling, as part of the PDI conducted for the Feasibility Study. PCE concentrations in these monitoring wells ranged from less than 0.5 ppb (non-detect) to a maximum concentration of 64 ppb (STPUD, 2018b).

The South Y Plume has impaired three PWS wells (LBWC #2, LBWC #5 and TKWC #2) with a combined source capacity of 3.25 MGD. Potential impairment of TKWC #1 would further reduce the total production capacity of area drinking water sources by an additional 1.44 MGD. Two other PWS wells (LBWC #1 and TKWC #3) west of the South Y plume are presently non-detect for PCE. The District has mutual aid and assistance agreements for the emergency provision of drinking water using inter-tie connections from its water distribution system to both the LBWC and TKWC water systems. During the 2018 WY, the District provided 7.54 million gallons through its inter-tie connection to LBWC, which is about 9% of LBWC's total water production for the 2018 WY.

Groundwater management actions taken to mitigate the South Y Plume are described in Sections 3.7 and 3.8 of this report.

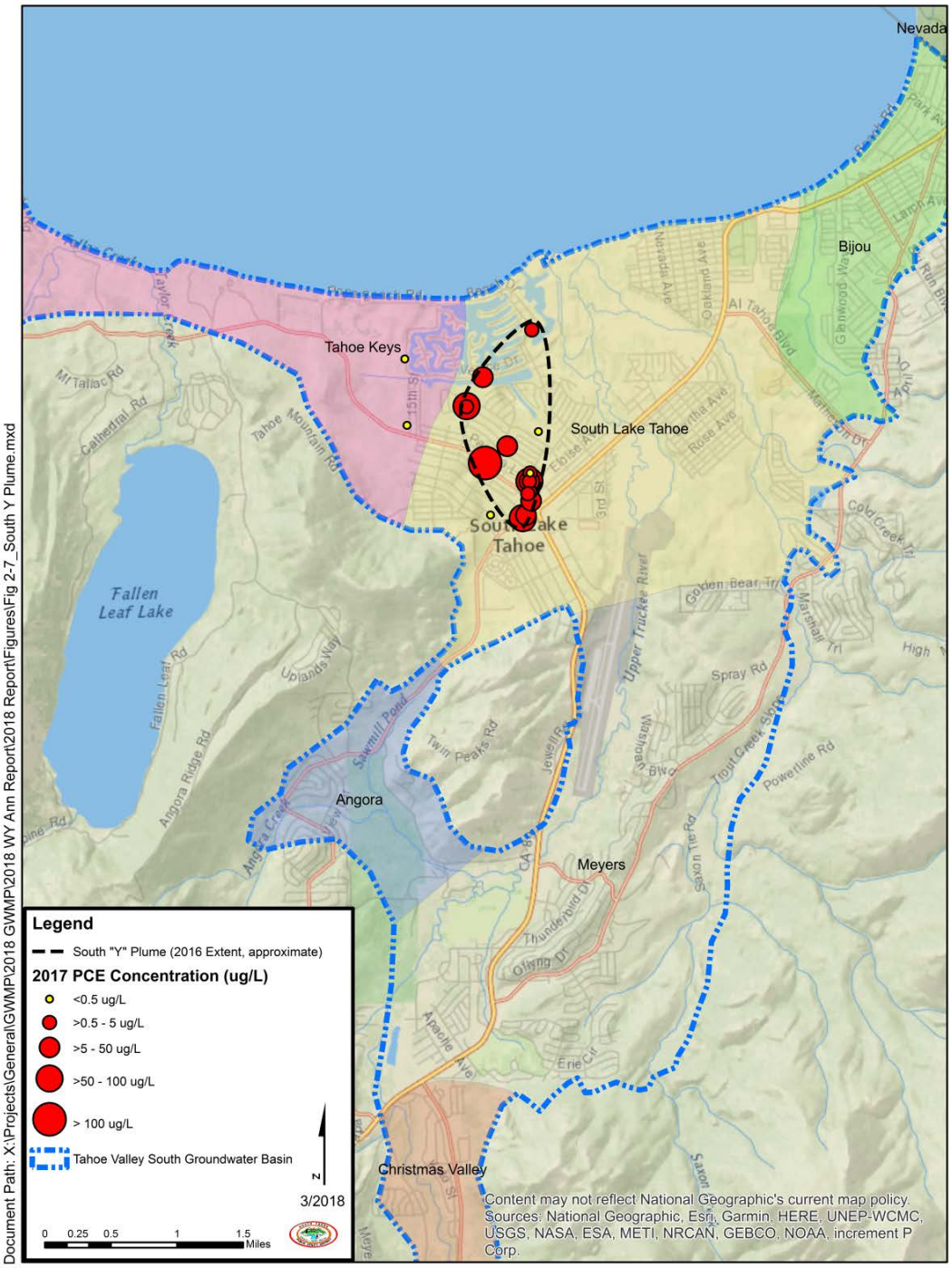

Figure 2-7. Location of the South Y Plume within the TVS Basin, as defined by wells with PCE

concentrations above 5 micrograms per liter during 2011 - 2017 (Adapted from GEI Consultants, 2016a).

High reliance on groundwater requires that PWS wells must have sufficient source capacity to meet water system demands within the TVS Basin. Because of this reliance and susceptibility of groundwater sources to contamination, the total source capacity of active PWS wells is used as an indicator to describe current basin conditions with respect to groundwater quality (Pohll *et al.,* 2016). During the 2018 WY, the total source capacity of PWS wells operating within the TVS Basin is estimated at 28.76 MGD. The minimum threshold for groundwater quality within the TVS Basin is the total MDD requirement for all beneficial users of groundwater within the TVS Basin, estimated at 22.78 MGD (Pohll *et al.,* 2016). As the total source capacity of PWS wells exceeds the MDD requirement for all beneficial users, the impact of the South Y Plume has not reached the level where existing source capacity can no longer satisfy potable water demands. However, the total source capacity of PWS wells has declined by more than 10% compared to 2011 levels (32.4 MGD). The majority of this decline is attributed to degraded water quality impacts from the South Y Plume (see Figure 3-1). At present, the total source capacity of PWS wells exceeds the MDD requirement by 5.98 MGD or about 25% of the MDD.

In 2016, the District in partnership with LBWC and the TKWC undertook renewed investigations to describe the extent of PCE contamination and identify remedial measures that may be used to remove this contamination from groundwater to protect existing groundwater sources used for drinking water supply. This included completion of an engineering assessment of an inactive water supply well (LBWC #4) for use as a potential extraction well (GEI, 2016a); compilation of historical data to show the spatial and temporal distribution of PCE contamination in the South Y Area (GEI, 2016b); and initial development of a modular three-dimensional transport model (MT3DMS) that could be used to evaluate various remedial alternatives designed to mitigate contamination from the South Y Plume.

During the 2017 WY, the water purveyors (District, LBWC and TKWC) completed water quality monitoring to better understand the current extent of PCE contamination in PWS wells; the preliminary MT3DMS model (South Y PCE Model) was completed, and negotiations were initiated with the SWRCB – DOFA to conduct a Feasibility Study under a Proposition 1 Groundwater Planning Grant, addressing this groundwater contaminant problem.

During the 2018 WY, the District entered into an agreement with the SWRCB-DOFA to conduct the Feasibility Study. The Feasibility Study included performance of the PDI in the mid-section of the South Y Plume and was completed during the summer of 2018. Information from the PDI was used to inform the preliminary engineering design of extraction wells for the removal of PCE from groundwater. The South Y PCE Model was updated using 2018 water quality data; and management scenarios were developed for modeling and engineering evaluation. Detailed discussions of these activities are provided in Sections 3.7.2 and 3.8.1 of this report.

In May 2017, the LRWQCB issued a Clean Up and Abatement Order (CAO No. R6T-2017-0022) requiring remediation and additional investigation of PCE groundwater contamination resulting from historic PCE release from the former Lake Tahoe Laundry Works site, located at 1024 Lake Tahoe Boulevard, South

Lake Tahoe, CA (Case No. SL0601754315). During the 2018 WY, consultants for the working parties (Seven Springs Limited Partnership and Fox Capital Management Corporation), prepared work plans, planning reports and conducted initial contaminant investigations required in the CAO. A full list of documents describing the regulatory activities performed at this site can be found online through the SWRCB GeoTracker website at;

(https://geotracker.waterboards.ca.gov/profile_report.asp?global_id=SL0601754315).

2.6 Groundwater Production

Groundwater is the primary source of drinking water throughout the TVS Basin, provided for residential and commercial water use (see Section 2.6.1). About 92 percent of groundwater produced from the TVS Basin is from PWS wells operated by the District, TKWC and LBWC. The remaining 8 percent of groundwater production is pumped from Noncommunity Water System wells (4%); Domestic wells (3%); and Nontransient Noncommunity Water System and State Small Water System wells (about 1%). Groundwater extractions from the PWS wells are metered using propeller or turbine type flowmeters with a register for total flow and a flow rate indicator. Totalizer readings are recorded on a daily basis by the District and on a monthly basis by TKWC and LBWC. Accuracy of measurement for these flow meters is typically on the order of +/- 2%. Groundwater extractions from Noncommunity Water System, Domestic, Nontransient Noncommunity Water System, and State Small Water System wells are typically not metered.

Table 2-2 shows the monthly and total pumping volumes of groundwater produced by PWS wells during the 2018 WY. During the 2018 WY, a total of seventeen (17) PWS wells were active, of which two were on stand-by status (restricted for emergency use only).

PUBLIC WATER SYSTEM (PWS)	UNITS	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JLY	AUG	SEPT	2018 WY
South Tahoe Public Utility District (District)	AF	383	279	375	344	323	325	297	468	690	849	835	694	5,862
Tahoe Keys Water Company (TKWC)	AF	57	14	12	13	10	12	15	87	111	183	163	138	815
Lukins Brothers Water Company (LBWC)	AF	16	8	7	9	7	8	8	21	33	42	40	32	232
TVS BASIN PWS TOTALS		457	302	394	366	340	345	320	576	833	1,074	1,038	864	6,910

Table 2-2. Monthly pumping volumes for PWS wells in the TVS Basin during the 2018 water year, reported in AF.

Annual groundwater production from each of the PWS included in Table 2-2 above is shown below in Figure 2-8. Since the 2005 WY, annual groundwater production from the pumping of PWS wells has ranged from a low of approximately 6,298 AF in 2015 WY to a high of approximately 9,652 AF in 2007 WY, with a median value of 7,748 AF. During the 2018 WY, total groundwater production (6,910 AF)

was about 11% below the median value. Figure 2-9 shows the locations of the active PWS wells and their pumping volumes for the 2018 WY. Inspection of Figure 2-9 shows that more than 75% of the total groundwater used in the TVS Basin is produced from the South Lake Tahoe sub-area.

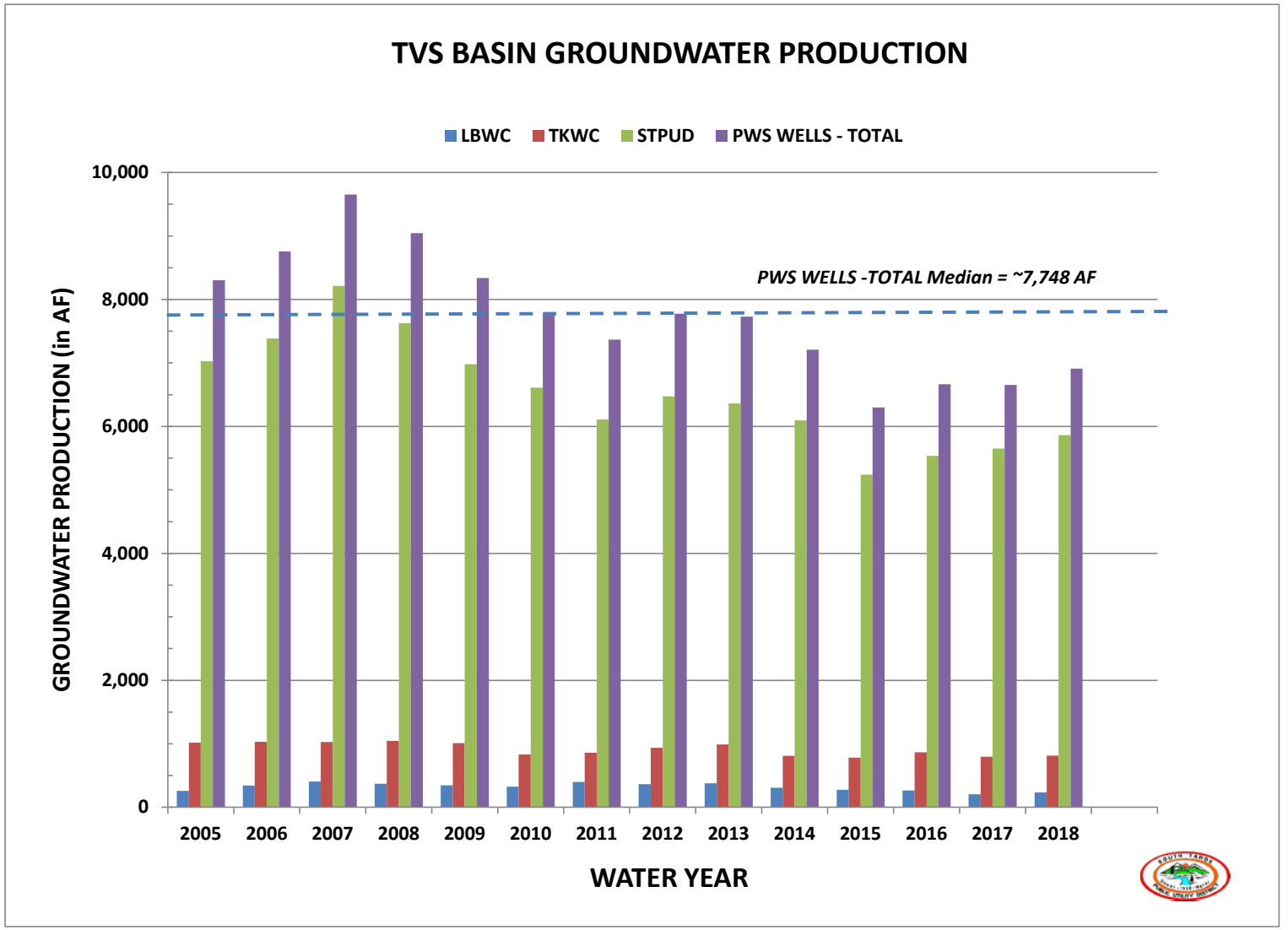

Figure 2-8. Groundwater production trends for public water system wells in the TVS Basin since the 2005 WY, in AF.

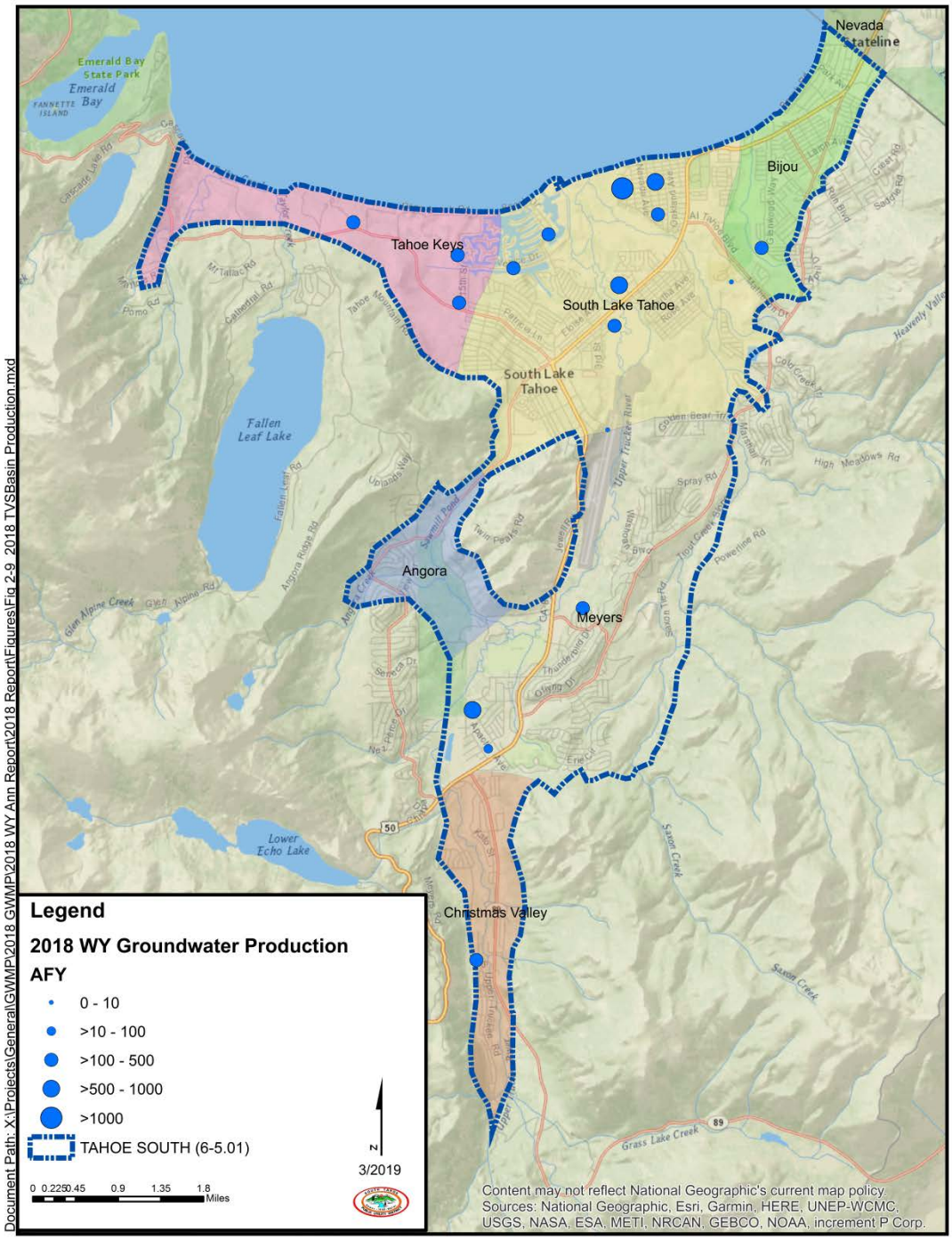

Figure 2-9. Groundwater production from PWS wells during the 2018 WY, in AF. Production from PWS wells accounts for more than 90% of the groundwater extracted from the TVS Basin.

2.6.1 Water Use

Total water use information provided in this section is from the District's 2015 Urban Water Management Plan (UWMP) (J. Crowley Group, 2016). The water use data provided in the UWMP is presented in calendar years and is provided as such in this report. As indicated in Table 2-2 above, the District produces the majority of drinking water used within the TVS Basin (5,652 AF or 85% of TVS Basin PWS totals). Although not complete, information from the UWMP is representative of water demand trends within the TVS Basin, calculated on a calendar year basis.

Actual water demands for the 2018 WY have not been categorized; therefore, 2015 water demands from the UWMP are presented in Table 2-3. All non-residential customers are metered; however, about 13 percent of residential customers are still unmetered. The District is in the process of installing meters on all connections and is projected to be fully metered by 2020. The majority of the District's customers are residential. The District's commercial category includes office and retail, as well as the resorts including hotels, restaurants, and snowmaking. "Losses" account for non-metered water use such as firefighting, flushing, leaks, water theft, or meter inaccuracies.

Use Type *(Add additional rows as needed)*	2015 Actual		
	Additional Description *(as needed)*	Level of Treatment When Delivered	Volume, AFY
Single Family		Drinking Water	1,853
Multi-Family		Drinking Water	915
Commercial	includes institutional	Drinking Water	1,950
Landscape		Drinking Water	6
Losses	non-revenue water	Drinking Water	517
		TOTAL	**5,241**

Table 2-3. District 2015 water system demands for potable water (J. Crowley Group, 2016).

Because use of recycled water within the Lake Tahoe basin is generally prohibited by the Porter-Cologne Act there are no recycled water demands. Water losses during 2015 are calculated per the DWR/AWWA water audit methodology. 2015 water losses as a percent of total water use are used to project future water losses through 2035 (J. Crowley Group, 2016).

2.7 Groundwater Storage

The annual change in groundwater storage is the difference in the volume of water in an aquifer from one year to the next. Figure 2-10 shows the annual trends of groundwater extractions from PWS wells and the changes in groundwater storage, as derived from the annual water budget calculated by the TVS Basin Model from 2005 WY through 2018 WY. The main components of the water budget include groundwater recharge; groundwater discharge to streams (baseflow); groundwater flux to Lake Tahoe; and groundwater pumping. Changes in groundwater storage are calculated from the differences in total inflow (recharge) and total outflows (baseflow, flux to Lake Tahoe and groundwater pumping) to the modeled region over a specified period (Carroll, *et al.*, 2016a).

Groundwater storage changes in response to climate variability and changes in groundwater extraction rates. Figure 2-10 shows that the change in groundwater storage ranged from -19,047 AF during the 2012 WY (below normal) to + 61,998 AF during the 2017 WY (very wet). During the 2018 WY, the annual change in groundwater storage was -8,621 AF.

During water years when the annual change in groundwater storage is negative, groundwater levels decrease slightly. During water years when the annual change in groundwater storage is positive, groundwater levels increase slightly. As the trend in annual groundwater production has generally been stable or slightly declining since 2007, the variation in groundwater storage after 2007 likely reflects annual changes that have occurred in response to changes in total precipitation.

Long-term reductions in groundwater storage within the TVS Basin are not occurring. This is evidenced by stable groundwater levels (*see* Section 2.4) and the cumulative change in groundwater storage. Since the 2005 WY, the cumulative change in groundwater storage is + 49,356 AF.

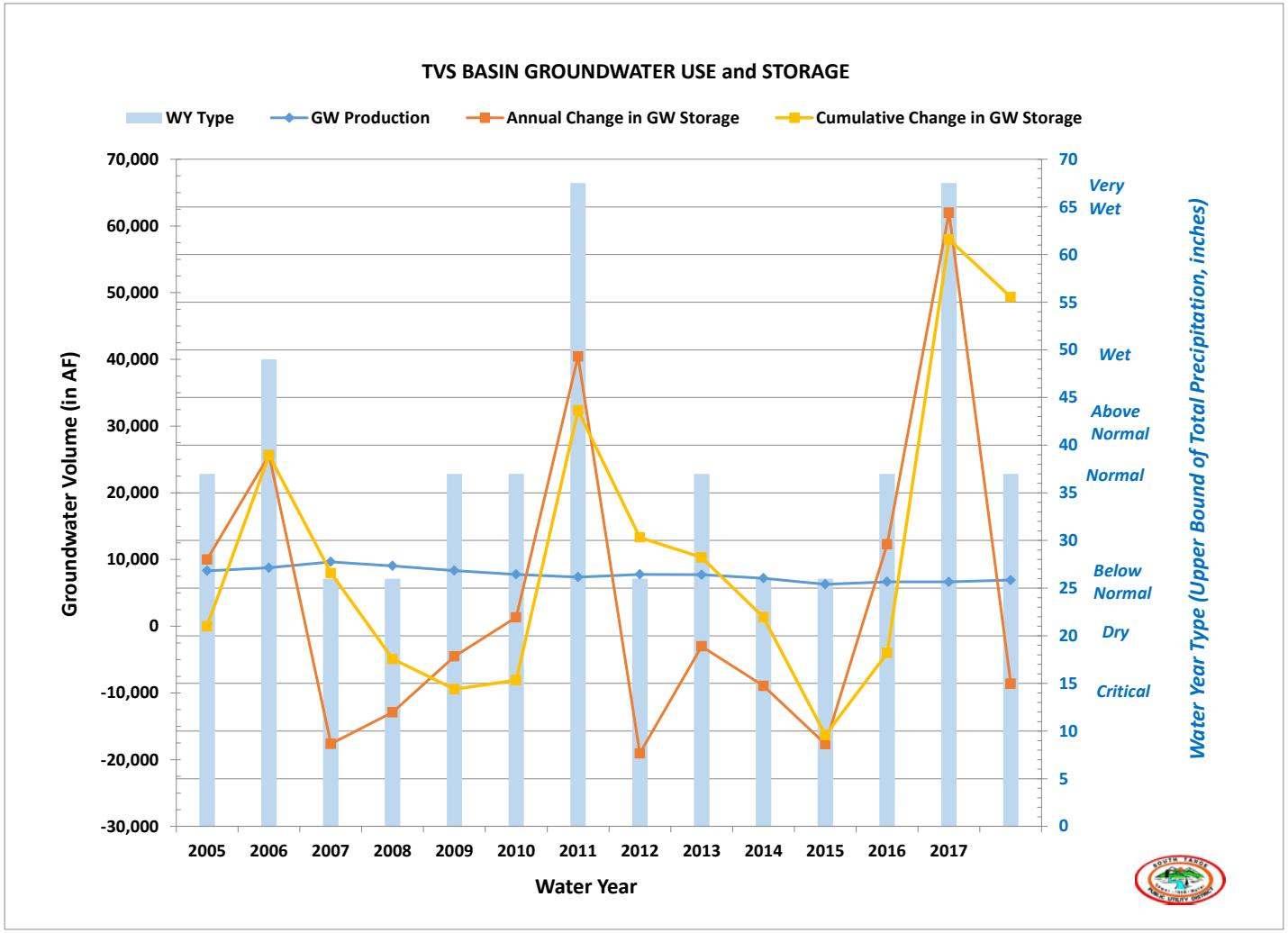

Figure 2-10. Annual groundwater production from public water supply wells and modeled annual and cumulative change in groundwater storage, in AFY, for the TVS Basin from 2005 WY through 2018 WY. Water year type using the TVS Basin classification is indicated on the vertical axis along the right-side of the graph. Positive annual changes in groundwater storage indicate periods of rising groundwater level.

3 Basin Management Objectives

BMOs are flexible guidelines for the management of groundwater resources that describe specific actions to be taken by the District to meet locally developed objectives at the basin or sub-area scale. Under the 2014 GWMP, eight BMOs have been defined for groundwater management of the TVS Basin. BMOs are also described in Section 8 of the Existing Plan Alternative and discussed in terms of sustainability goals in Section 5 of the ABC Alternative.

- BMO #1 – Maintain a sustainable long-term groundwater supply.
- BMO #2 – Maintain and protect groundwater quality.
- BMO #3 – Strengthen collaborative relationships with local water purveyors, governmental agencies, businesses, private property owners and the public.
- BMO #4 – Integrate groundwater quality protection into local land use planning activities.
- BMO #5 – Assess the interaction of water supply activities with environmental conditions.
- BMO #6 – Convene an ongoing Stakeholder's Advisory Group (SAG) as a forum for future groundwater issues.
- BMO #7 – Conduct technical studies to assess future groundwater needs and issues.
- BMO #8 - Identify and obtain funding for groundwater projects.

The following section describes the implementation of projects and management actions taken during the 2018 WY.

3.1 BMO #1- Maintain a Sustainable Supply

The purpose of BMO #1 is to implement measures to manage the groundwater levels for long term sustainability and reliability of the water supply for all users within the TVS Basin. The measurable goal for tracking groundwater levels is to sustain groundwater levels within the normal range of groundwater levels during the base period (2001 WY – 2010 WY) for groundwater levels (Section 2.2.1). If long-term groundwater levels show a consistent declining trend that falls below the normal range, then an assessment of the cause for the decline would be conducted. If excessive groundwater pumping is found to be the cause, then measures would need to be taken to either redistribute the pumping to other portions of the basin, or reduce pumping at the implicated well(s). No action would be required if the condition described above is not observed.

During the 2018 WY, the median for the May 2018 groundwater elevations were near the center of the above normal range (93%) of the base period. Groundwater levels will continue to be monitored in accordance with the District's DWR-approved Groundwater Elevation Monitoring Plan (STPUD, 2011).

3.2 BMO #2 – Maintain and Protect Groundwater Quality

Groundwater in the TVS Basin is typically of excellent quality; however, relic groundwater contamination remains from regulated industrial and commercial chemicals, which continues to impair groundwater sources.

The purpose of BMO #2 is to implement measures to maintain and protect groundwater quality in order to sustain the beneficial use of groundwater resources. These measures would address contamination from man-made contaminants and not natural constituents intrinsic to the aquifer. This would include setting measurable goals and continuing proactive measures to protect groundwater quality. The groundwater quality measurable goals are consistent with existing regulations and policies. These would include:

- All groundwater supply wells will meet drinking water standards as defined by the SWRCB Division of Drinking Water.
- Groundwater quality in the TVS Basin will not be impaired so as to affect its beneficial use of current or potential future use of groundwater for public water supply as defined by the LRWQCB Basin Plan.
- Detection of contaminants from regulated industrial and commercial chemicals in any well within the TVS Basin will be evaluated as to its potential as an emerging groundwater quality threat to the water supply.
- Information on areas of degraded water quality will be collected and maintained in order to consider its effect on available water supply and the development of future groundwater supplies.

The objective of setting quantitative goals for BMO #2 is to provide a means for assessing the relative threat of contamination. The goals are tied to the regulatory requirements, but also make the detection of any man-made contaminant require review and analysis. In this manner, the goals establish a mechanism to be proactive in addressing contamination issues before they reach levels that threaten the beneficial use of groundwater sources within the TVS Basin.

3.2.1 Source Capacity

The measurable goal for BMO #2 is that degraded water quality within the TVS Basin should not rise to a level that threatens the ability of groundwater sources (PWS Wells) to meet water system demands. Demand requirements for public water systems are calculated in accordance with methods described

under Section 64554 of the California Waterworks Standards. Under these standards, a PWS's sources shall have the capacity to meet the system's MDD calculated using water system's daily, monthly or annual water use data, as available. These standards also include a water system's requirements for peak hourly demand; however, these requirements are directed toward the adequacy of the water system's distribution system to provide sufficient flows. As the goal for BMO #2 is to prevent degraded water quality from impairing groundwater sources to a point where water demands can no longer be met and that the PWS wells account for more than 90% of the groundwater use, only the MDD for the PWS wells are used to establish a minimum threshold for degraded water quality in the TVS Basin.

More than 90% of the total water demand is satisfied by the PWS wells operated by the District, TKWC and LBWC. To account for the beneficial users of groundwater not connected to these water systems, a 10 percent safety factor is added to the MDD derived for these water systems to determine the minimum threshold for the TVS Basin. Results of these calculations provide a minimum threshold of 22.775 MGD needed to meet of the MDD for all beneficial users in the TVS Basin.

The current state of the TVS Basin with regard to groundwater quality is indicated below in Figure 3-1. The total production capacity for all active PWS wells operating within the TVS Basin is 28.76 MGD. This exceeds the MDD minimum threshold for water quality by 5.99 MGD. However, total source capacities have declined since 2011 and continue to be of concern if capacity is not replaced. Groundwater management actions taken to mitigate this groundwater concern are described in Sections 3.7 and 3.8.

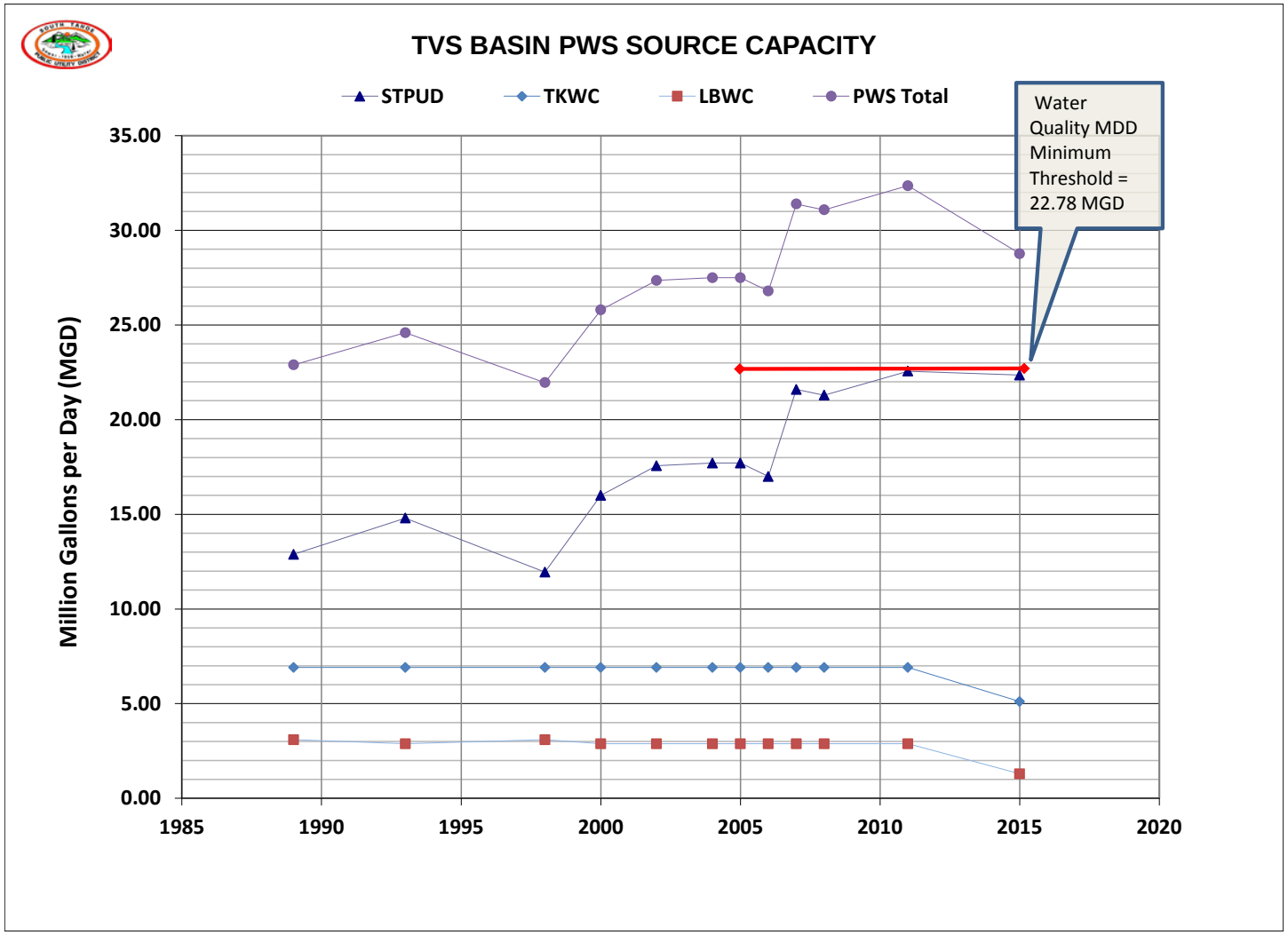

Figure 3-1. Source capacity, in million gallons per day, for active public water system wells operating within the TVS Basin from 1989 through 2015 (adapted from Pohll *et al*., 2016).

3.3 BMO #3 – Building Collaborative Relationships

The TVS Basin includes a wide range of stakeholders in addition to the District, including smaller water companies and domestic well owners. Government agencies, local business interests, environmental groups and private citizens also have interests in local groundwater management. Collaboration and coordination with other local agencies and stakeholders for implementation of the 2014 GWMP is achieved through the SAG. SAG members during the 2018 WY are listed in Table 3-1.

Member	Title	Affiliation
Jason Burke	Storm Water Coordinator	City of South Lake Tahoe
Ken Payne, PE	General Manager	El Dorado County Water Agency
Robert Lauritzen, PG	Geologist	El Dorado County Environmental Management Division
Brian Grey, PG	Engineering Geologist	Lahontan Regional Water Quality Control Board
Joey Keely	Ecosystem Staff Officer	USFS-Lake Tahoe Basin Management Unit
Jennifer Lukins	Assistant Manager	Lukins Brothers Water Company
Rick Robillard, PE	Manager	Tahoe Keys Water Company
Bob Loding	Engineer	Lakeside Mutual Water Company
Scott Carroll	Environmental Planner	California Tahoe Conservancy/Real Property Owner
Rebecca Cremeen	Associate Planner	Tahoe Regional Planning Agency
Harold Singer	Retired	Non-Business Community Rate Payer

Table 3-1. 2018 WY Stakeholder Advisory Group members.

3.3.1 GSA Formation

The TVS Basin lies entirely within El Dorado County, and largely within the jurisdiction of the District. Since November 17, 2015, the District has been recognized as the exclusive GSA for the portion of the TVS Basin within its jurisdiction (South Tahoe Public Utility District -1 GSA). During the summer of 2016, the County Water Agency and the District began discussing options to form a GSA in the portion of the TVS Basin outside of the District's jurisdiction. Pursuant to these discussions—as well as additional conversations with DWR—the County Water Agency and the District determined that it would be appropriate for the District to become the GSA for the portion of the TVS Basin outside of its jurisdiction (i.e., within the County Water Agency's jurisdiction). Concurrent with this decision, the County Water Agency and the District drafted an MOU setting forth the County Water Agency's and the District's agreement to cooperatively manage and coordinate implementation and enforcement of the SGMA in this portion of the Basin. The County Water Agency and the District subsequently entered into this MOU and the District submitted a groundwater sustainability agency formation notice (GSA Formation Notice) to DWR on September 16, 2016 for the portion of the TVS Basin outside of its jurisdiction (2016 GSA Formation Notice).

On December 28, 2016, the District was recognized as the exclusive GSA for the portion of the TVS Basin located outside of its service area jurisdiction (South Tahoe Public Utility District -2 GSA). In March 2017, discussions with the SWRCB raised concerns about an agency forming a GSA outside of its jurisdiction. These concerns raised the risk that the South Tahoe Public Utility District -2 GSA may be considered invalid and that the TVS Basin could potentially be designated as "probationary" by the SWRCB and be put under state management. To ensure that the County Water Agency and the District are able to retain local control of the TVS Basin's groundwater resources, the District agreed to rescind its 2016 GSA Formation Notice and the County Water Agency agreed to elect to act as the GSA for the portion of the TVS Basin covered by the District's 2016 GSA Formation Notice.

On May 4, 2017, the District adopted a resolution rescinding its 2016 GSA Formation Notice. The withdrawal notice had no effect on formation of the South Tahoe Public Utility District -1 GSA or its status as the exclusive GSA for the portion of the TVS Basin within its service area. On June 14, 2017, the County Water Agency held a public hearing and elected to become the GSA for the portion of the TVS Basin outside of the District's service area boundaries; and the District submitted to DWR its notice of intent to withdraw the South Tahoe Public Utility District-2 GSA for the portion of the TVS Basin outside of its service area. On June 15, 2017, the County Water Agency GSA formation notice for the El Dorado County Water Agency GSA was posted on the DWR website through the SGMA Portal.

Concurrent with the County Water Agency GSA formation notice for the El Dorado County Water Agency GSA and the District's notice of intent to withdraw the South Tahoe Public Utility District-2 GSA, the District and County Water Agency entered into an Amended and Restated MOU to work collaboratively to sustainably manage groundwater resources and implement SGMA throughout the entire TVS Basin.

With execution of the MOU (on June 14, 2017), the TVS Basin is in full compliance with GSA formation requirements.

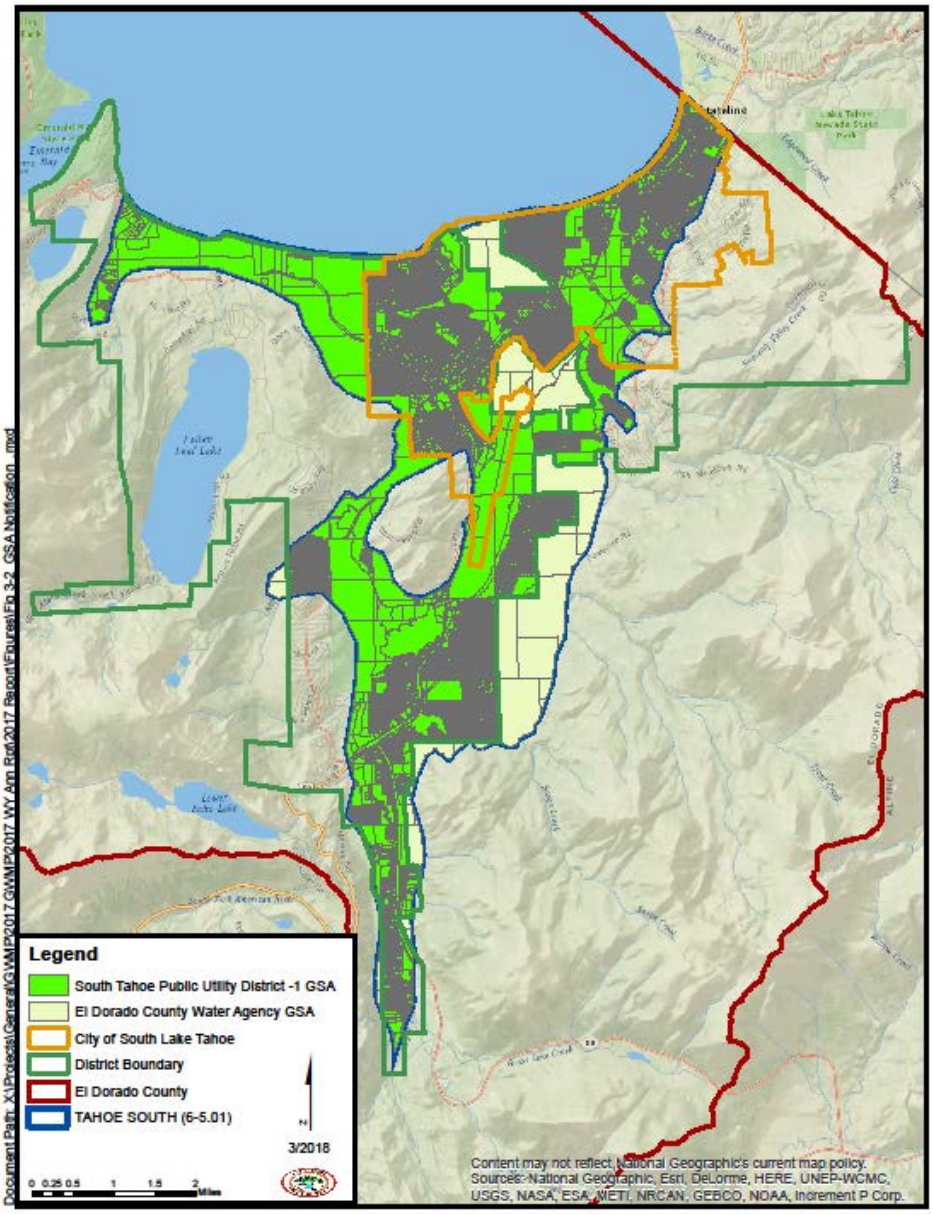

Figure 3-2. GSA boundaries for the TVS Basin. The District is regarded as the exclusive GSA for portions of the basin within its service area. The County Water Agency is regarded as the exclusive GSA for portions of the basin outside the District' service area. Through an MOU, the District and County Water Agency GSAs implement the SGMA across the full extent of the TVS Basin.

In addition to completing GSA formation requirements for the TVS Basin, the District and County Water Agency are required to adopt either a GSP or GSP Alternative by January 31, 2022.

During the 2016 WY, the District conferred with the SAG about submitting a GSP Alternative; compared the 2014 GWMP to the requirements of both SGMA and the GSP Regulations to demonstrate that the 2014 GWMP is functionally equivalent to a GSP; completed an ABC Alternative to demonstrate that the TVS Basin has operated within its sustainable yield for at least a 10-year period; and completed DWR's Alternative Elements Guide to demonstrate that the ABC Alternative is functionally equivalent to a GSP.

In December 2016, the District concurrently submitted both the 2014 GWMP as a GWMP Alternative Plan and an ABC Alternative Plan for public comment and DWR review and evaluation. As part of its submittals, the District indicated its preference to DWR that the review be sequenced in such a manner that its GWMP Alternative Plan be reviewed first and should DWR agree that the GWMP Alternative Plan is functionally equivalent to a GSP, review of the ABC Alternative Plan would not be necessary. Acceptance of the GWMP Alternative would allow the District to continue groundwater management activities under the 2014 GWMP and amend this plan as needed, to be fully compliant with new requirements under SGMA.. Under the GSP Regulations, DWR assessment of the GSP Alternative Plans is required to include determination that the GSP Alternative Plan as submitted is approved, incomplete or inadequate (§ 355.6 (d)). Assessments of the Alternative Plans are anticipated to be completed by DWR by mid-2019.

3.3.2 GWMP Outreach

Over the past year, the District convened the following presentations, public hearings and/or workshops to inform the interested public and agencies of groundwater management activities being performed in the TVS Basin.

1. February 7, 2018: Groundwater at the South Y Public Workshop 1.
2. April 5, 2018: District Board Meeting; Groundwater Management Plan 2017 Water Year Annual Report.
3. August 8, 2018: County Water Agency Board of Directors: TVS Basin Groundwater Management (2017/2018) Cost Share Projects.
4. August 8, 2018: Groundwater at the South Y Public Workshop 2.
5. October 9, 2018: SAG Workshop No. 1.
6. November 7, 2018: Groundwater at the South Y Public Workshop 3.
7. December 20, 2018: SAG Workshop No. 2.

In addition to these public meetings, the District regularly updates its website which includes a Groundwater Page used to post information about current groundwater management issues within the TVS Basin and activities being performed by the GSAs (https://stpud.us/groundwater/). 2014 GWMP

documents, workshop agendas, meeting materials and meeting notes are linked to this web page, which are available for download at http://stpud.us/news/groundwater-management-plan/.

3.3.2.1 Survey of Well Owners

As part of its outreach efforts, the District conducted a survey of SCWS and domestic well owners and users of wells not connected to municipal water services within the TVS Basin. The purposes of this well survey were to;

1. Inform well owners of groundwater management planning and implementation efforts within the TVS Basin;
2. Encourage participation of well owners in the SAG; and
3. Confirm the inferred location and use of SCWS and domestic wells within the TVS Basin.

The well survey spanned a two-month period from August through October 2017. Planning for the survey involved the development of the survey questionnaire, survey team recruitment, preparation of outreach materials and compilation of available well owner lists from the District and SAG members, including El Dorado County and the United States Forest Service –Lake Tahoe Basin Management Unit. From these lists a total of 578 domestic and 56 SCWS potential wells were inferred to be located on parcels located within or surrounding the TVS Basin (Figure 3-3).

The well survey was advertised using local media, public service announcements, direct mail notification letters, door hangers and the District's website. Participation in the well survey was made available through a URL for direct access to the survey online, through paper copy on request from the District, and through direct door-to-door survey performed by a dedicated 3-member survey team. The well survey was successful in collecting information from a total of 370 respondents. Of these respondents, 247 confirmed the presence of a well on their parcel; 77 indicated that there was no well on the parcel; and 2 were uncertain if a well was located on their parcel. Figure 3-3 shows the locations of the inferred wells and the confirmed locations from the well survey. Results from this survey are provided in Appendix B of the 2017 WY Annual Report (STPUD, 2018a).

During the 2018 WY, a final report documenting the well survey was completed (Allegro Communications, December 2018); and made available to the public through the District's website (http://stpud.us/news/groundwater-management-plan/).

Major findings from the *TVS Groundwater Basin Survey of Well Owners* report include;

- Private well geographic distribution reflects travel and settlement patterns of the one hundred year period prior to South Tahoe Public Utility District formation, from 1845 to 1950;

- The majority of respondents to the well survey were property owners (72%). Most of these properties were used as “secondary” residences.
- The majority of respondents (61%) indicated that the well on their property is currently in-use. The majority of this use is either daily or more than 90 days out of the year.
- Private well owners overwhelmingly “like” perceived “purity” of well water. “Taste, color and odor” of well water are perceived favorably. Well owners enjoy features of private well water such as “cold temperature”, “low cost”, “quality” and “absence of chlorine”. They highly value well water while the system consistently delivers high quality water; and
- Well owners indicating concern about well systems mention “pumps”, “wellhead connections”, “water production” and “system maintenance;

Recommendations based on the information gathered during this survey include;

1. Create capacity within the groundwater community to make technical support available to private well owners;
2. Complete the assessment of the status of private wells;
3. Assess risk to groundwater resources from private wells;
4. Cultivate capacity to create and maintain collaborative ties in the groundwater community;
5. Communicate with private well owners;
6. Collaborate with national and state programs that support source water protection; and
7. Share survey findings with Tahoe Basin partner agencies.

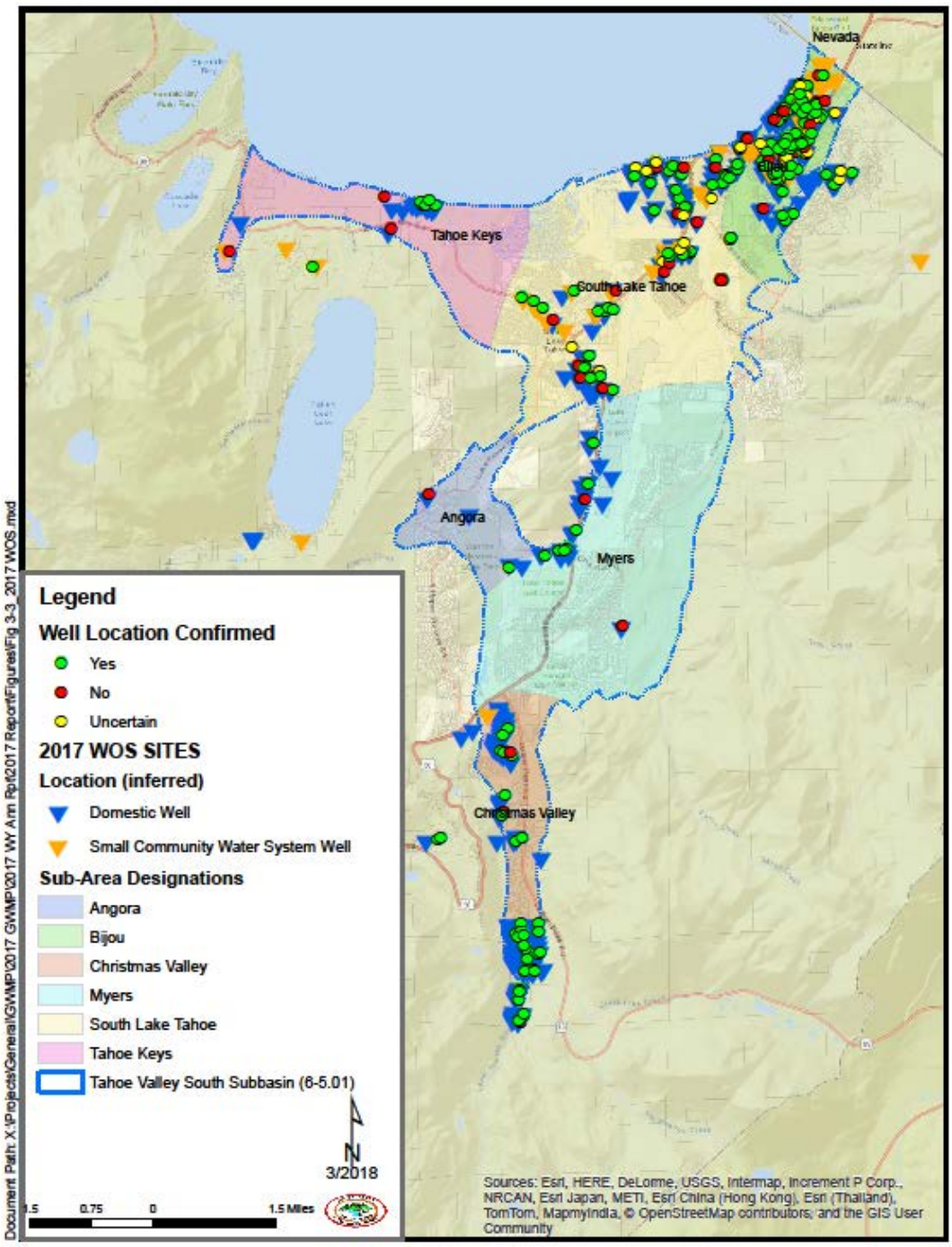

Figure 3-3. Inferred and confirmed locations of SCWS and Domestic wells identified by the 2017 survey of well owners.

3.4 BMO #4 – Integrating Groundwater Quality Protection and Land Use Planning

A key element of the 2014 GWMP is an ongoing program of monitoring groundwater conditions and the potential threat of groundwater contamination within the TVS Basin. In order to better understand this potential threat, the locations of potential contaminating activity (PCA) sites operating within the TVS Basin were regularly updated in 2017 and compared to source water production zones surrounding active PWS wells, defined using the modified calculated fixed radius method (CDHS- DDW, 1999). Descriptions of these zones are as follows:

- **Zone A: Microbial/Direct Chemical Contamination Zone.** Protects the drinking water supply from viral, microbial and direct chemical contamination and is defined by the surface area overlying the portion of the aquifer that contributes water to the well within a two-year time-of-travel.
- **Zone B5: Chemical Contamination Zone.** Prevents chemical contamination of the water supply, and to protect the drinking water source for the long term; encompassing the area between the two- and five-year time-of-travel. This zone provides for more response time for chemical spills.
- **Zone B10: Chemical Contamination Zone.** Prevents chemical contamination of the water supply, and to protect the drinking water source for the long term; encompassing the area between the five- and ten-year time-of-travel. This zone allows for some attenuation or remediation of contaminant sites, or if necessary, time to develop alternate sources of water supply.

The number and types of PCA found within each source water protection zone are summarized in Table 3-2. The 2017 Drinking Water Source Assessment and Protection map for the TVS Basin is presented as Figure 3-4.

Potential Contaminating Activity Sites		
Number of sites (count)	**Type(s)**	**Potential Contaminants (CDPH, 1999)**
Zone A		
2	Sewer Pump Station	Sewage, treatment chemicals
1	Wastewater Treatment Plant	Municipal wastewater; sludge; treatment chemical; nitrates; heavy metals; coliform and non-coliform bacteria; nonhazardous wastes
1	Wells(such as water supply, monitoring well)	Treatment chemicals

Zone B5		
4	Gas Stations	Gasoline, Diesel fuel, Oils; solvents; miscellaneous wastes
2	Cleaners	Soaps; detergents, waxes; miscellaneous chemicals, hydrocarbons
2	Automotive Repair	Waste oils; solvents; acids; paints; automotive wastes; miscellaneous cutting oils.
1	Sewer Pump Station	Sewage, treatment chemicals
Zone B10		
3	Sewer Pump Station	Sewage, treatment chemicals
2	Automotive Repair	Waste oils; solvents; acids; paints; automotive wastes; miscellaneous cutting oils.
2	Gas Stations	Gasoline, Diesel fuel, Oils; solvents; miscellaneous wastes
1	Auto Body	Waste oils; solvents; acids; paints; automotive wastes; miscellaneous cutting oils
1	Boat Building and Repair	Diesel fuels; oil; sewage from boat waste disposal area; wood preservative and treatment chemicals; paints; waxes; varnishes; automotive wastes
1	Car Wash	Soaps; detergents, waxes; miscellaneous chemicals, hydrocarbons
1	Dry Cleaners	Solvents (perchloroethylene, petroleum solvents, Freon); spotting chemicals (trichloroethane, methylchloroform, ammonia, peroxides, hydrochloric acid, rust removers, amyl acetate)
1	Hardware/lumber/parts stores	Hazardous chemical products in inventories; heating oil and fork lift fuel from storage tanks; wood-staining and treating products such as creosote; paints; thinners; lacquers; varnishes
1	Medical/dental offices and clinics	Various chemical substances.

Table 3-2. The numbers and types of potential contaminating activity sites found within source water protection zones delineated within the TVS Basin.

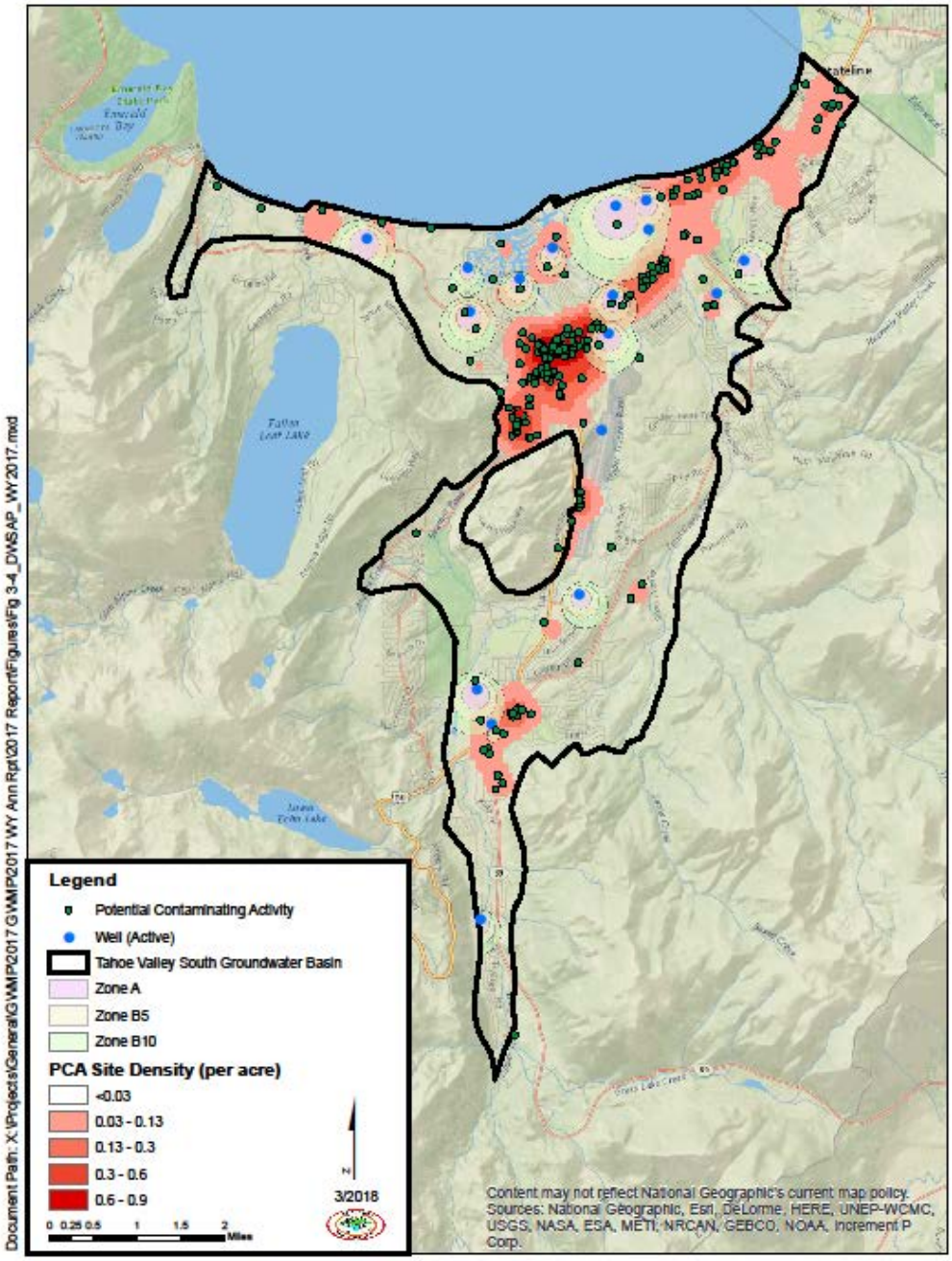

Figure 3-4. Drinking water protection areas for PWS wells in the TVS Basin. Drinking water protection areas surrounding these wells are generated using the modified calculated fixed radius method (CDHS-DDW, 1999) and the average groundwater production rate for each active well (2008 WY -2017 WY).

3.5 BMO #5 – Interaction of Water Supply Extractions on Environmental Conditions

The TVS Basin is located in a unique environmental setting. Water supply operations using groundwater may affect environmental conditions or be affected by changes in the environment. Groundwater – surface water interactions with Lake Tahoe and rivers and streams serve as both groundwater discharge and recharge locations depending on their location and the time of year. Understanding the interactions is a necessary part of providing sound groundwater management for the TVS Basin.

During the 2017 WY, additional analyses of the hydrologic system were completed using recently developed hydrologic modeling tools developed by DRI (Pohll, *et al.,* 2018). Two types of calculations were performed to address pumping effects on surface water (BMO #5, Action 1). The first approach involved evaluating model simulated groundwater levels with and without pumping at individual wells to determine the reduction in groundwater flows to surface water over time. The second approach used the model to produce maps of surface water depletion within the TVS Basin. These maps are referred to as "capture maps" which are useful for illustrating the effects of pumping locations on surface water depletion over a large set of possible pumping locations within an aquifer (Leake *et al,* 2010).

Figure 3-5 presents the results of evaluation from the first approach used to assess the impacts of pumping effects on surface waters. The analysis shows that as pumping rates increased during the 1980s, depletion rates for streams steadily increased from a few hundred AFY in 1983 to an average of 2,500 AFY from 2000 – 2015. Following 2000, the baseflow reduction from streams represents about 2 percent of the average annual runoff (124,000 AFY). This is well below the minimum threshold defined as baseflow depletions in excess of 10 percent of average annual runoff (Pohll *et al.,* 2016).

Capture maps from Lake Tahoe and local streams revealed two areas where the sources of water withdrawal are different. North of the Lake Tahoe Airport, most of water withdrawal is from Lake Tahoe. South of the Lake Tahoe Airport, most of water withdrawal is from streams. To ensure that depletion rates to surface waters at the south end of the TVS Basin do not cause harm to stream ecology, DRI recommended that pumping rates do not exceed 12,400 AFY south of the Lake Tahoe Airport (Pohll, *et al,* 2018). During the 2018 WY, four active wells were operating south of the Lake Tahoe Airport having a combined total pumping rate of about 1,190 AFY, which is less than 10% of the recommended maximum.

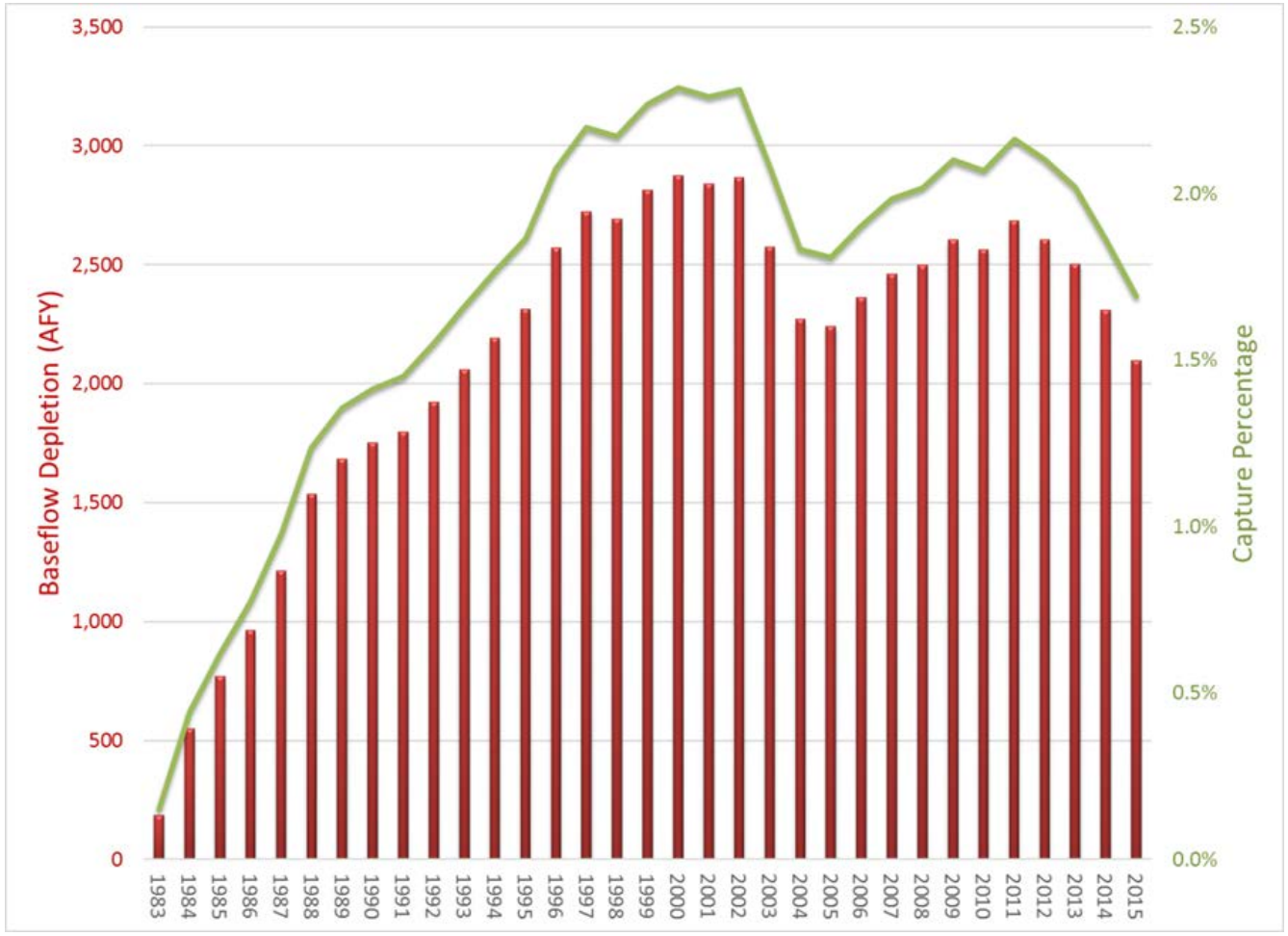

Figure 3-5. The effect of groundwater pumping on baseflow depletion for the TVS Basin as calculated using modeled differences in groundwater levels with and without pumping. The capture percentage is calculated as the ratio of baseflow depletion and average annual runoff (124,000 AFY) (Adapted from Pohll, *et al*. 2018).

3.6 BMO #6 – Stakeholders Advisory Group (SAG)

The purpose of BMO #6 is to provide guidance regarding the role of the SAG in plan implementation. This includes hosting regular SAG workshops in order to provide a forum for discussion of groundwater management issues in the TVS Basin and receive a regional perspective from different members of the community (*see* Table 3-1). Other important functions of the SAG include:

1. Facilitation for interagency collaboration;
2. Assessing groundwater supply issues;
3. Assessing groundwater protection issues;
4. Data sharing; and
5. Developing regional support for groundwater projects.

During the 2018 WY, SAG workshops were convened in October and December. Major topics discussed during these workshops are listed in Table 3-3. Minutes from these workshops are provided in Appendix B.

WORKSHOP 1 (October 9th, 2018)	**TOPICS**
	South "Y" Activity Updates Draft 2018 SGMA Basin Prioritization
WORKSHOP 2 (Dec. 27th, 2018)	**TOPICS**
	South "Y" Activity Updates 2017 Well Owners Survey Report 2018 Closing Items

Table 3-3. Major discussion topics for SAG Workshops convened during the 2018 WY.

3.7 BMO #7 – Technical Studies

Understanding the factors that control groundwater conditions in the TVS Basin is important for long-term management. Several studies have been conducted over the years, but additional work is needed to help address emerging issues. The District and/or other local water purveyors and well owners will need to conduct various studies to support groundwater management decision makers. The projects reported under BMO #7 outline some of the studies being conducted by the District to further the understanding of the groundwater basin to help support groundwater management.

3.7.1 TVS Basin Groundwater Model

During the 2016 WY, DRI completed the initial phase (Phase 1) of development of groundwater models and hydrologic modeling tools for implementation of the GWMP. Phase 1 generally involved: acquiring the data to update the District's existing groundwater flow model and DRI's existing integrated GSFLOW hydrologic model for the South Tahoe watersheds; constructing and calibrating a steady-state groundwater flow model for the TVS Basin; constructing and calibrating a transient integrated hydrologic model for the South Tahoe watersheds; and calculating a water budget for the TVS groundwater system (Carroll *et al*., 2016a).

DRI completed work on Phase 1 in February 2016 and completed work on Phase 2 in February 2018. Phase 2 work completed by DRI extended all boundary stresses through 2015 WY for Phase 2 modeling analysis and provided detailed analysis concerning the spatial and temporal distribution of recharge across the model domain for the TVS Basin Model. During initial work on Phase 2, DRI also defined a threshold between recharge and groundwater storage at approximately 43,200 AFY (Carroll *et al*., 2016b). Recharge below this threshold results in negative changes in groundwater storage and falling groundwater levels, while recharge above this threshold results in positive changes in groundwater storage and rising groundwater levels.

During the 2017 WY, DRI completed the following Phase 2 modeling work:

1. Constructing calibrated transient GSFLOW predictive models (2015 – 2100) to evaluate hydrologic effects resulting from climate change;
2. Constructing calibrated transient MODFLOW predictive models (2015 – 2065) for groundwater sustainability planning;
3. Completing hydrologic modeling tools to address specific BMO Actions identified under the 2014 GWMP;
4. Training District staff to maintain and use the calibrated models; and
5. Completing regular project management status reports and a final technical report documenting model development and model simulation results.

Results of the Phase 2 modeling work are documented in the South Lake Tahoe Groundwater Model Update (Carroll *et al.,* 2016b) and in the report Addressing Basin Management Objectives for the Tahoe Valley South (6-5.01) Groundwater Basin, California, Desert Research Institute (BMO Report) (Pohll et al., 2018). Both the South Lake Tahoe Groundwater Model Update and BMO Report are available for download from the District's website (http://stpud.us/news/groundwater-management-plan/).

During the 2018 WY, DRI completed Phase 2 modeling work. District staff trained by DRI successfully updated the TVS Basin Model through the 2018 WY.

3.7.2 South Y Investigations

As part of the work for the Feasibility Study, the District collected additional groundwater samples from inactive drinking water source wells in the vicinity of the South Y including the LBWC #2 Well (Offline, impaired), the LBWC #4 Well (Offline, abandoned), the LBWC #5 Well (Offline, impaired), the Rockwater Apartment Well (Offline, abandoned) and the Tahoe Valley Elementary School Well (Offline, abandoned). Groundwater samples were also collected from CL-1, a deep monitoring well located at the District's Clement Well Site. Groundwater samples were collected from these wells during four sampling events from between December 2016 through October 2017 to provide up to date information on the extent of PCE concentrations for use during the Feasibility Study. TKWC provided water quality monitoring results through June 2017 for each of their three wells to supplement this data set.

In October 2016, the District entered into an agreement with DRI to add a fate and transport model to the existing groundwater model framework developed for the TVS Basin. It was recognized that a fate and transport groundwater model would be needed to simulate PCE migration of the South Y Plume and evaluate the effectiveness of varying remedial alternatives, in terms of their capacity to remove PCE contaminant mass and inhibit the further movement of the contaminant plume. Results from this alternatives analysis would then be used to refine the Feasibility Study by identifying the likely best alternative(s) for mass removal and cleanup time, thereby reducing the number of remedial alternatives requiring further engineering evaluation for the Feasibility Study.

During the 2017 WY, hydrologic information was compiled and DRI developed the fate and transport model grid by extracting a section of the original model grid covering the area of the South Y Plume and extending northward to Lake Tahoe. The fate and transport model grid was further refined in the area of the existing plume and along the expected plume migration path. South Y Plume Model boundary conditions were established for local areal recharge, streams (Upper Truckee River and Trout Creek), Lake Tahoe, and groundwater pumping from area wells.

Review of the groundwater production data from South "Y" Area wells showed that substantial changes in the location and magnitude of groundwater pumping across the South "Y" Area have occurred since at least 2008. A transient model was subsequently developed to adequately simulate the response of the groundwater system to changing pumping conditions. Flow simulations were run using MODFLOW-NWT. Fate and transport simulations were run using MT3DMS. MT3DMS is a modular three-dimensional transport model for the simulation of advection, dispersion, and chemical reactions of dissolved constituents in groundwater systems (Zheng and Wang, 1999).

In April 2017, the preliminary model was presented to stakeholders, along with a matrix of remedial alternatives proposed for fate and transport modeling evaluation. During the meeting it was determined that simulations of remedial alternatives should be postponed until after additional groundwater sampling planned during the 2017 WY is completed.

During the 2018 WY, the District successfully negotiated and executed an Agreement with the SWRCB-DFA to complete a Feasibility Study of Remedial Alternatives to Mitigate Tetrachloroethylene Contamination (Agreement D1712508). As part of the Feasibility Study, Agreement D1712508 requires the District to perform numerous activities including but not limited to: conducting a PDI; completing a Baseline Human Health Risk Assessment (BHHRA); conducting groundwater modeling for the purposes of evaluating potential implementation projects that will prevent or clean-up groundwater contamination; completing a feasibility study to develop interim remedial alternatives that prevent or clean contamination of groundwater that serves or has served as a source of drinking water; develop an Interim Remedial Action Plan (IRP) that will lead to the implementation of the preferred remedial action alternative; complete environmental analysis checklists and identify mitigation measures required for implementation of the preferred alternative; and perform public outreach to inform the public concerning the progress of these activities.

Following approval of the PDI Workplan, the District and Kennedy Jenks Consultants (KJC) conducted the groundwater investigation at 953 Eloise Avenue, near the intersection of Eloise Avenue and 5th Street, situated within the middle-section of the South Y Plume. The groundwater investigation involved the drilling and logging of a test hole to a total depth of 150 feet; the drilling and construction of two test wells; aquifer testing, soil and groundwater testing and collection of groundwater elevation readings. The data collection was used to characterize the vertical extent of PCE contamination in groundwater and inform the development of design strategies for hydraulic control and/or removal of PCE contamination from groundwater. As extra work for this project the District also updated its Well Owners Survey for the South Y Area. The update was performed in order to gather information on private wells situated within or neighboring the South Y Plume in order to: identify potential wells that may serve as vertical conduits for contaminant migration; and identify property owners with active wells that may be impacted by PCE groundwater contamination. The technical report detailing this investigation is currently in-preparation.

Following performance of the PDI, KJC conducted a screening level Human Health Risk Assessment (HHRA) addressing risks associated with PCE impacted groundwater at PWS wells in the South Y Area. The HHRA was completed and submitted to the SWRCB-DFA in January 2019.

Groundwater modeling for the Feasibility Study resumed in 2018. During 2018, the South Y PCE Model was updated through 2018 and used to evaluate management scenarios developed for the feasibility study. Modeling evaluation used best- and worst-case conditions to forecast the effectiveness of management scenarios to prevent or clean-up groundwater contamination over the next twenty years, through 2038. Scenarios evaluated using the South Y PCE Model included: 1) No Action; 2) Use of new extraction wells to clean-up the PCE plume; 3) Use of new PWS wells to prevent groundwater contamination and provide replacement water supply; and 4) Use of existing PWS wells to clean-up the South Y Plume.

Public outreach completed for the Feasibility Study involved the development of press releases, flyers and public announcements; and the presentation of three public workshops convened at the City Council Chambers, in South Lake Tahoe, CA. These workshops were available by live stream. Video recording from these workshops are also available on the District's website: http://stpud.us/groundwater/.

Under the terms of the Agreement, the Feasibility Study is expected to be completed by June 2019.

3.8 BMO #8 – Funding

Groundwater projects require funding. In addition to funding from local sources, there are state and federal grants and other funding programs available. These types of opportunities require effort to prepare grant funding applications.

3.8.1 Proposition 1 GSP

During the 2016 WY, the District in collaboration with the SAG identified potential projects for funding to address the PCE groundwater contamination in the South "Y" Area. Using the findings of the South Y Investigations (Section 3.7.2), the District in partnership with the LBWC and TKPOA, prepared pre-applications and a full proposal (FAAST # 36772) requesting funding through the Proposition 1 Groundwater Sustainability Program to conduct an engineering feasibility study of remedial alternatives to mitigate PCE groundwater contamination in the South Y Area. The total project budget for this request is $588,540.00 with a 50% funding match of $294,270.00 and a grant request of $294,720.00. Expenditures for supporting studies (e.g., South "Y" Investigations) and technical planning used to develop the feasibility study are used for the funding match.

On March 30, 2017, the District received notice of preliminary grant award of up to $294,270.00, conditioned on the successful negotiation of an agreement with SWRCB-DOFA. On May 18, 2017, the District Board adopted Resolution No. 3059-17 to accept the grant award. Following adoption of the Resolution, the District entered into negotiations with SWRCB-DOFA staff considering changes to the scope of work and budget presented in the proposal. During these negotiations, current groundwater quality data for the South Y Plume was available and a Pre-Design Investigation was developed which was subsequently added to the scope of work. The Pre-Design Investigation involves installing a test well that can be used for data collection to identify the vertical extent of PCE contamination and which could be used as a pumping well during added field tests to define aquifer properties for engineering design. Inclusion of the Pre-Design Investigation increased total project budget to $1,008,590.00 with a 50% funding match of $504,295.00 and a grant request of $504,295.00. Expenditures for supporting studies (e.g., South Y Investigations) and technical planning used to develop the PDI and Feasibility Study are used for the funding match. This will also include County Water Agency funds through the County Water Agency Cost Share Grant Program.

On March 20, 2018, executed Agreement D1712508 funding a feasibility study of remedial alternatives to mitigate PCE contamination. Agreement D1712508 is funded at a level 0f $504, 295, with a work completion date of June 30, 2019. The Proposition 1 Groundwater Planning Grant is for the purpose of conducting the PDI and Feasibility Study to evaluate whether existing and/or new wells can be used to provide hydraulic control and removal of PCE from groundwater in the South Lake Tahoe Basin.

3.8.2 GWMP Costs

Costs for implementation of the 2014 GWMP are accounted from the District's Water Enterprise Fund. Development and implementation costs for groundwater management activities have been supported by the County Water Agency under its Cost Share Grant program. Under this program, the County Water Agency assists projects eligible under Section 96-11 of the El Dorado County Water Agency Act and Board Expenditure Priority Policy (No. B-1003). Grants used for these projects are typically at a 50% matching fund level.

Figure 3-6 shows the 2014 GWMP expenditures during the fiscal year ending June 30, 2018. Costs for groundwater management projects and activities totaled $506,448.25. A cost summary of major items expended during the 2017-18 fiscal year (FY 2017-18) is provided below (Table 3-4). Over the first 4-years of implementation; the total cost of GWMP implementation is $1,552,499.

ITEM	DESCRIPTION	APPROXIMATE COST ($)
Groundwater Sustainability Agency	• SAG Workshops • Basin Monitoring • Reporting	$ 43,500
Technical Studies	• Phase II Modeling • South Y Investigation	$411,500
Public Outreach	• 2017 Well Owners Survey	$51,500
FY 2017-2018 Total		***$506,500***

Table 3-4. Summary of costs for major groundwater management activities expended during the fiscal year ending June 30, 2018.

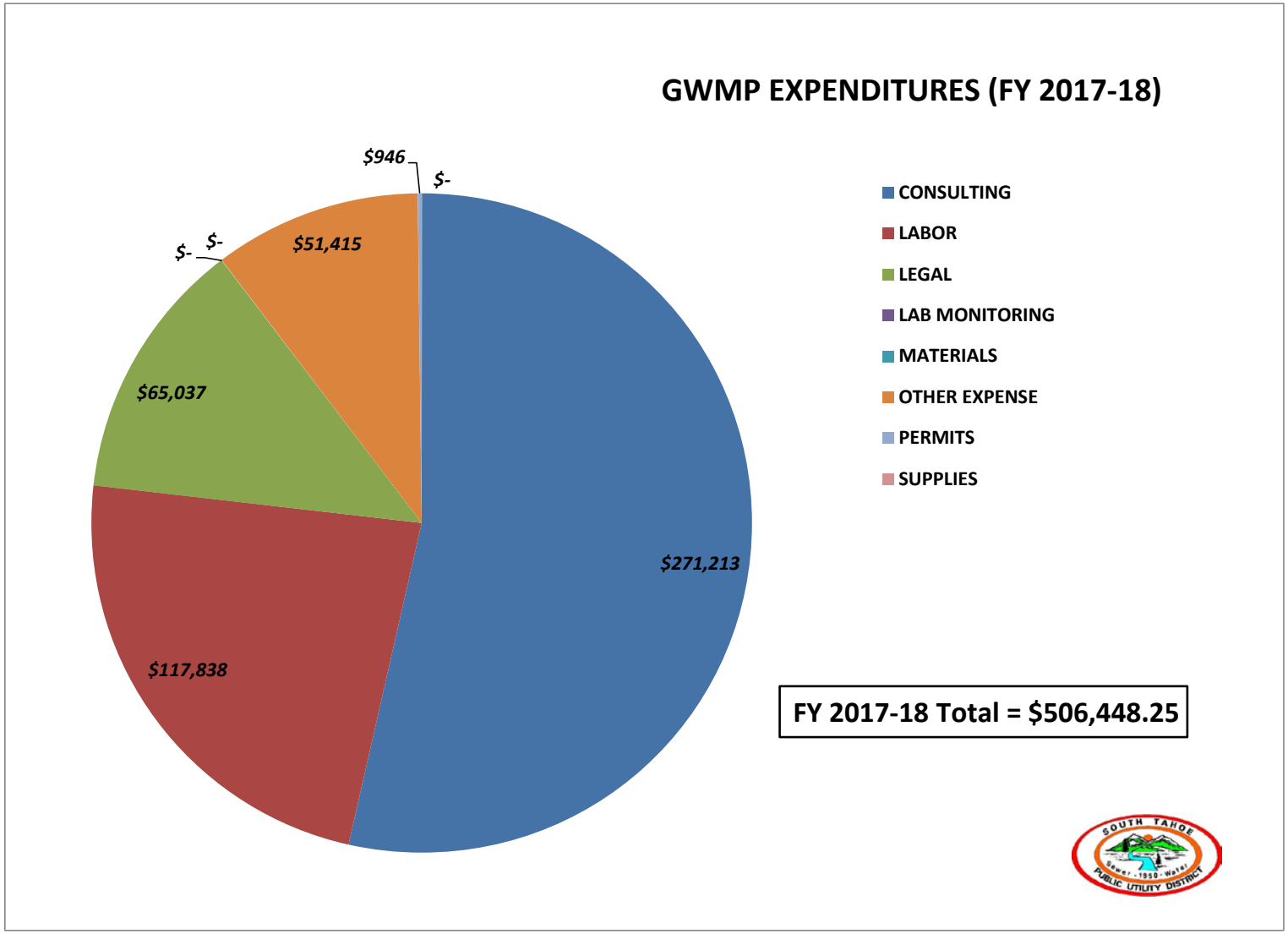

Figure 3-6. GWMP implementation costs for FY 2017-18.

4 Proposed Actions (2019 WY)

Groundwater management activities for the 2019 WY will generally involve continuing the progress of on-going work from the 2018 WY and the proposed actions listed below;

1. Continue to monitor new regulations and Basin Monitoring Program guidance issued by the DWR and SWRCB for implementation of SGMA;
2. Continue to monitor basin conditions and groundwater supplies;
3. Continue to update the SAG on the progress of 2014 GWMP-related activities, seeking active participation of its members;
4. Continue to inform the public of groundwater management activities through public hearings, SAG workshops, notifications through its interested parties list, and the District's web page;
5. Adopt a GSP Alternative or submit a GSP Initial Notification, pending DWR assessment of the District's GSP Alternative submittals (Section 3.3.1);
6. Consider recommendations from the *TVS Groundwater Basin Survey of Well Owners* (Section 3.3.2.1) for implementation;
7. Consider the findings and conclusions of the BMO report for potential changes to the Basin Monitoring Program and 2014 GWMP (Section 3.7.1); and
8. Complete the South Y Feasibility Study (Section 3.7.2).

5 2014 GWMP Changes

The 2014 GWMP was last updated in late 2014 to be fully compliant with DWR requirements (AB3030 Plan; Water Code § 10750 et seq.). Under SGMA, existing groundwater management plans shall remain in effect until a GSP or GSP Alternative is adopted (CWC § 10750.1). As indicated previously in Section 3.0, activities during the 2018 WY focused on items needed to satisfy compliance with new SGMA requirements and conduct projects to address actions identified in the 2014 GWMP.

There were no plan component changes, including addition or modification of BMOs, during the period covered by this report.

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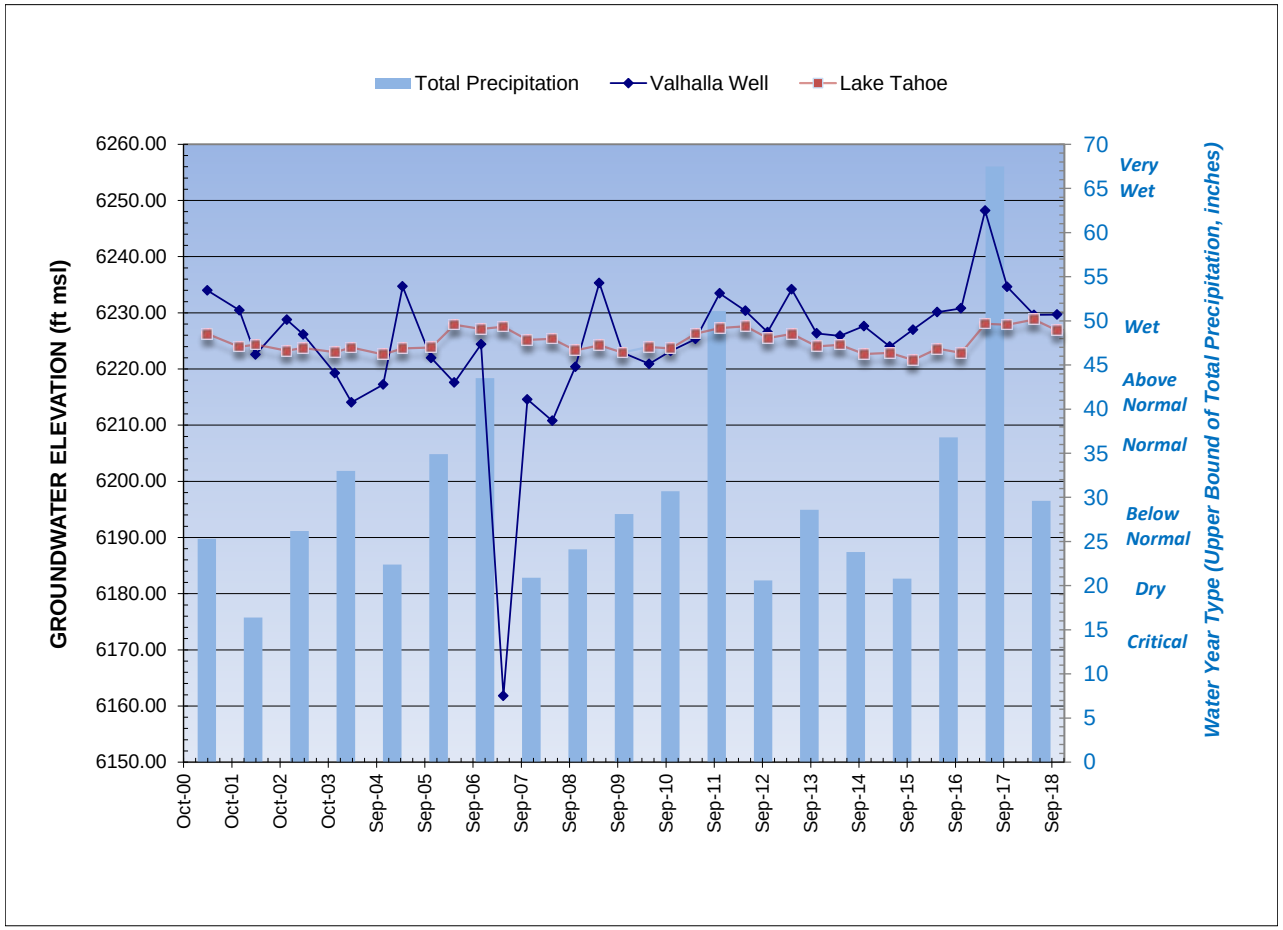
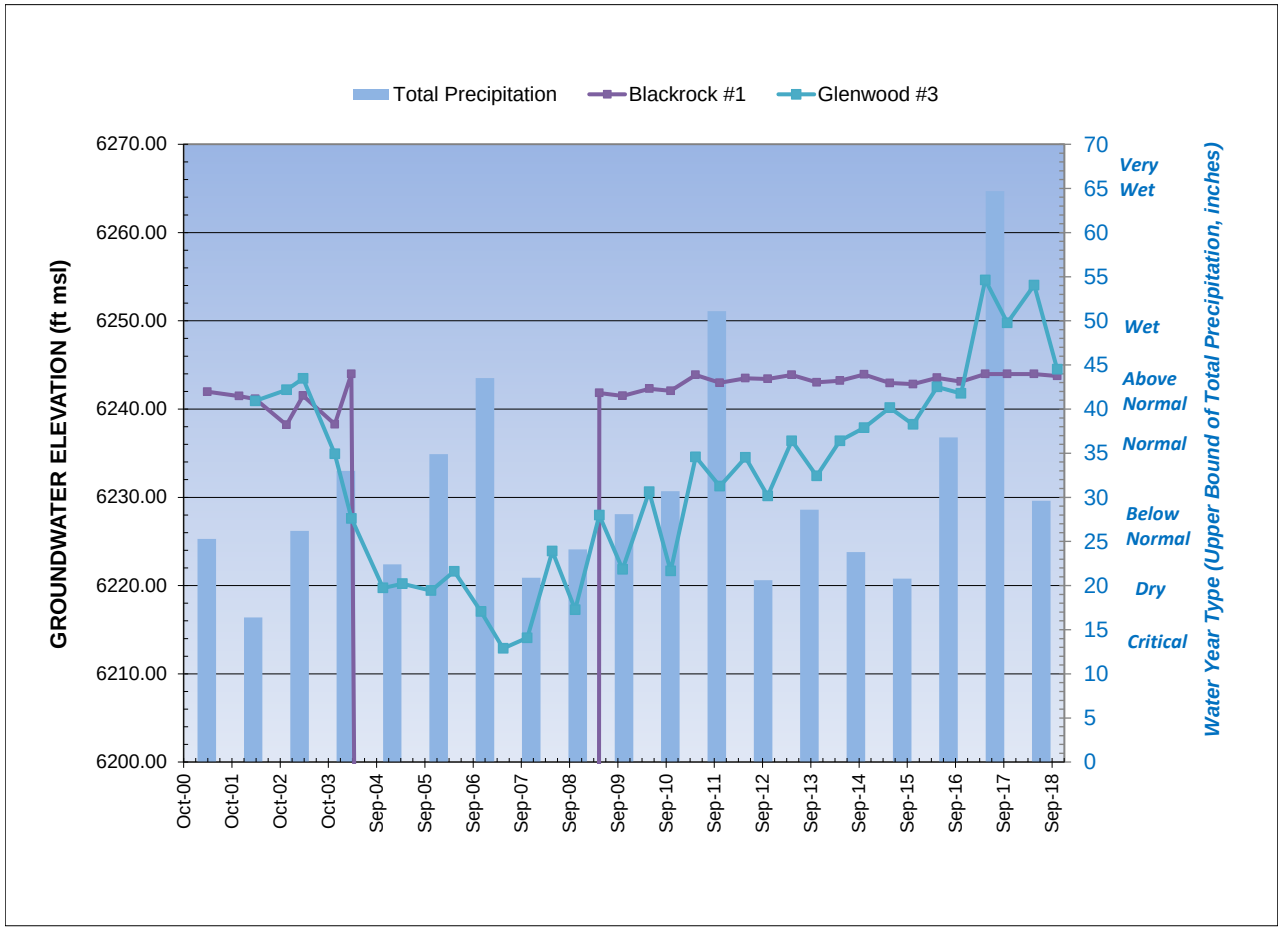
APPENDIX A

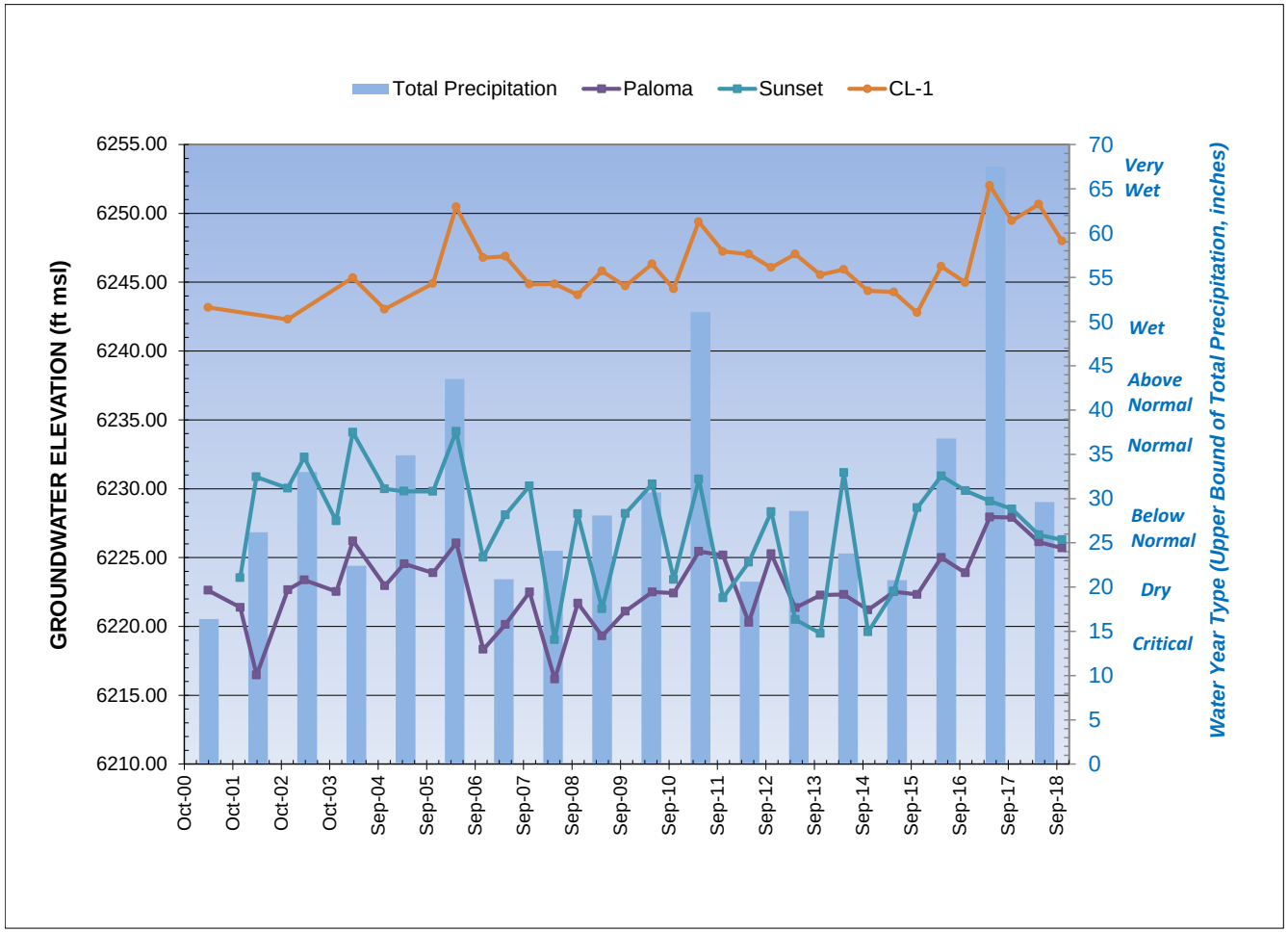
TVS Basin Hydrographs



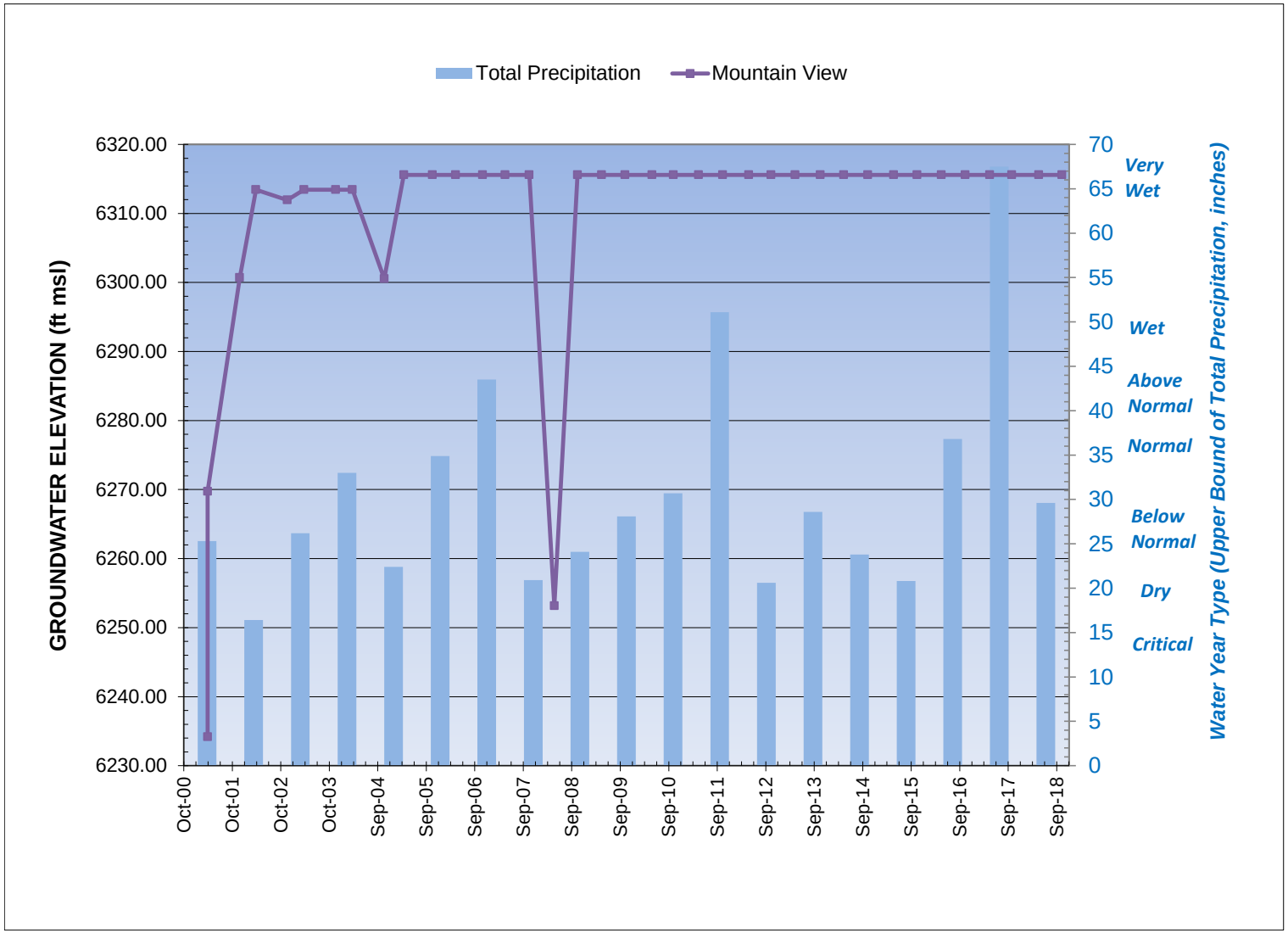
Appendix A – 1. Groundwater hydrograph for the Valhalla Well (6,257 feet msl) within the Tahoe Keys sub-area. Also shown is the water level (stage) of Lake Tahoe measured at USGS 10337000. All readings are static water levels collected following a minimum 12-hour recovery time, with the exception of the May 2007 reading, which is a pumping water level measured at a well pumping rate of 700 gallons per minute(gpm). Water year type using the TVS Basin Water Classification is indicated using the bar chart and upper bound of total precipitation displayed on the secondary-y axis.



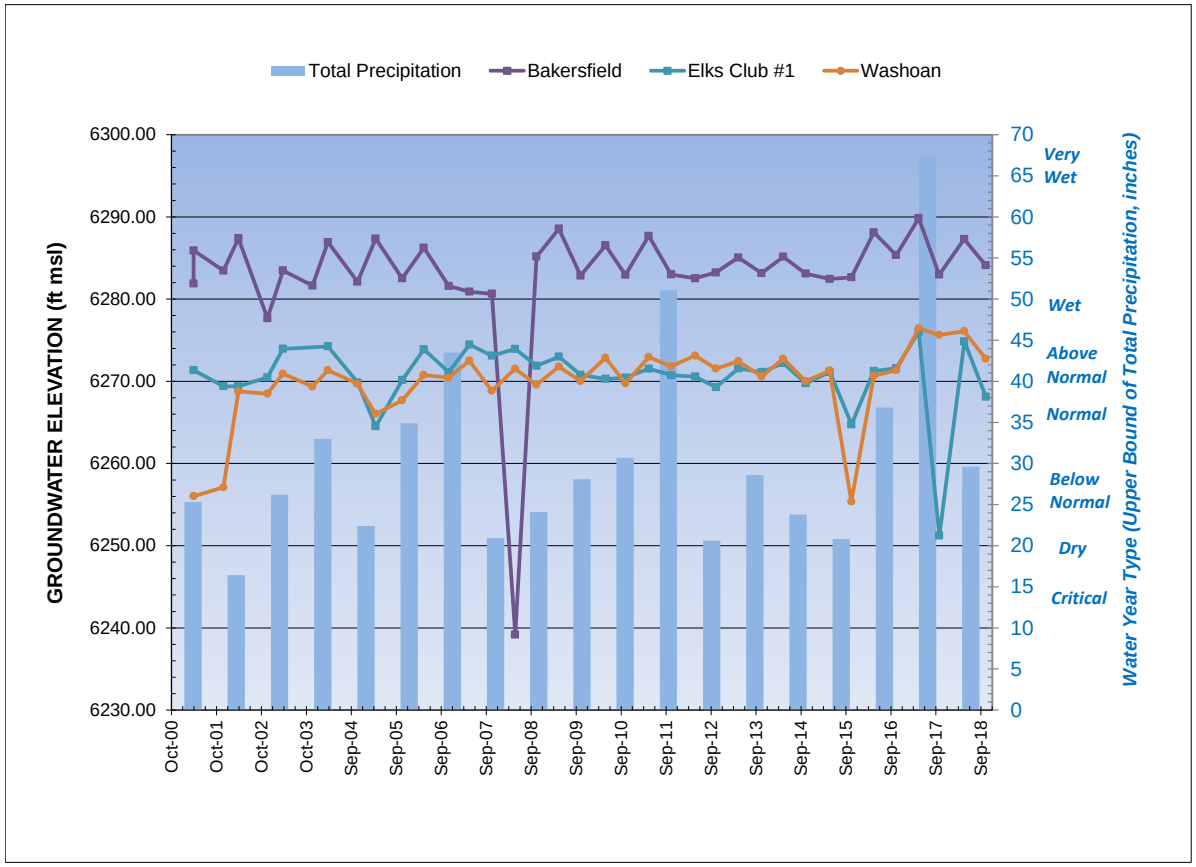
Appendix A – 2. Groundwater hydrograph for the Blackrock #1 (6,241 feet msl) and Glenwood #3 (6,260 feet msl) wells within the Bijou sub-area. Static water levels in the Blackrock #1 well are stable and slightly rise above ground surface (6,240 feet msl). The Glenwood #3 well is used to monitor water levels near an active PWS well (Glenwood #5). In 2007, the District restricted water production from Glenwood #5 in order to sustain groundwater production from this sub-area. The water level response in Glenwood #3 shows that this change in operation has been successful in allowing groundwater levels to recover to sustainable levels.



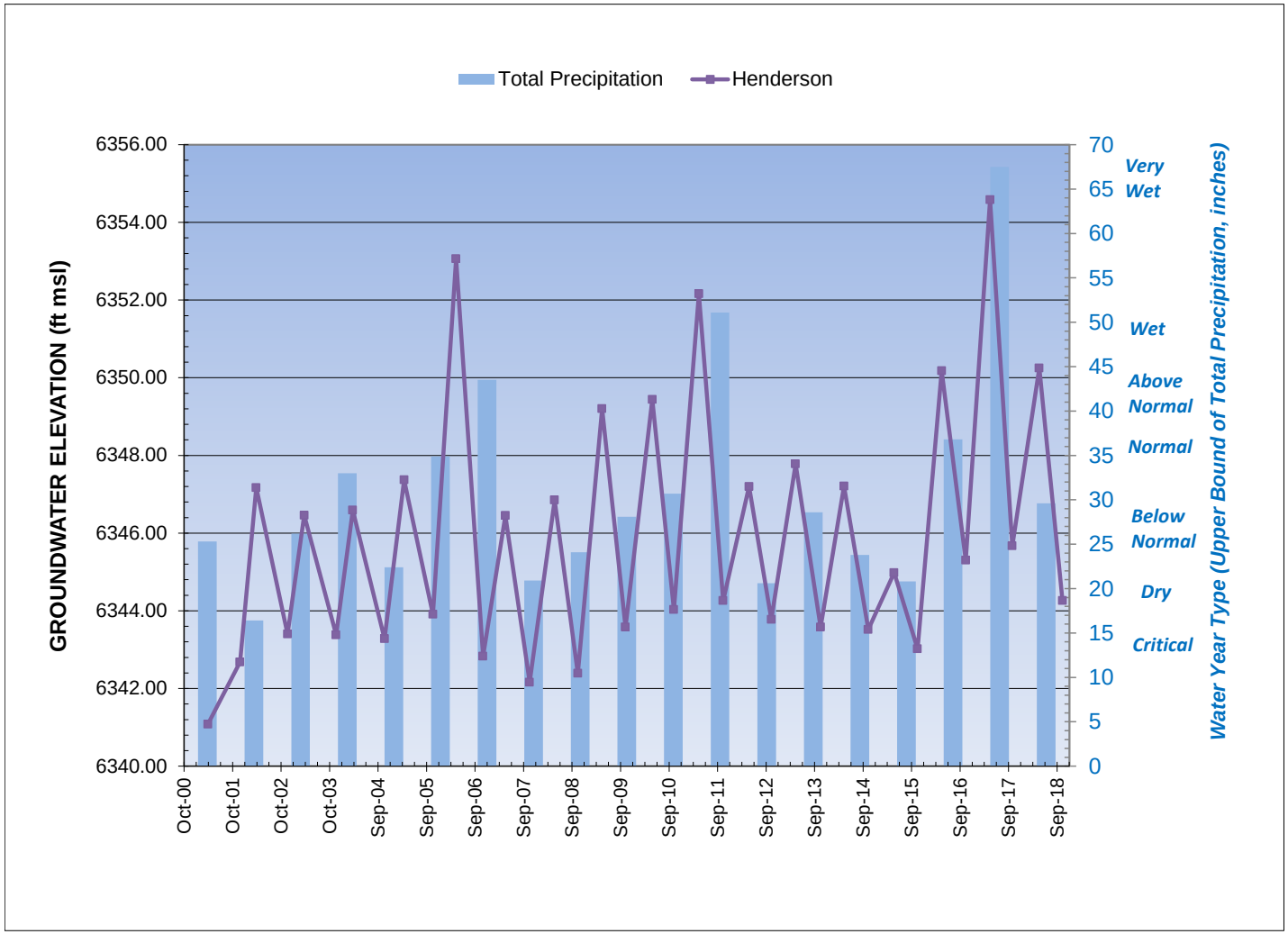
Appendix A – 3. Groundwater hydrograph for the Paloma (6,267 feet msl); Sunset (6,249 feet msl) and CL-1 (6,279 feet msl) wells in the South Lake Tahoe sub-area. Groundwater levels in these wells appear stable. Since 2017, groundwater production from the Sunset and Paloma wells has increased by 162 million gallons.



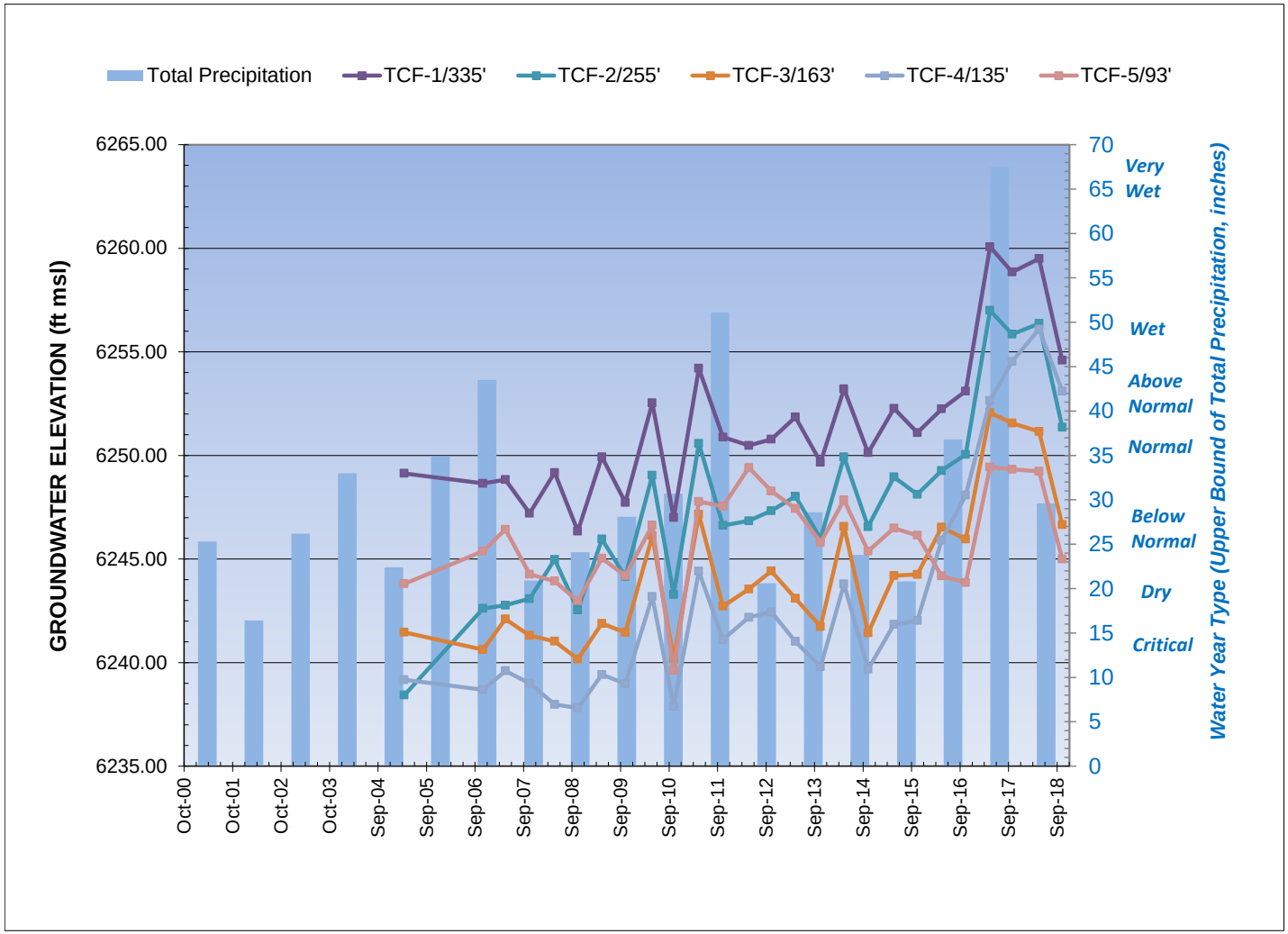
Appendix A – 4. Groundwater hydrograph for the Mountain View (6,313 feet msl) well (artesian flowing well) in the Angora sub-area.



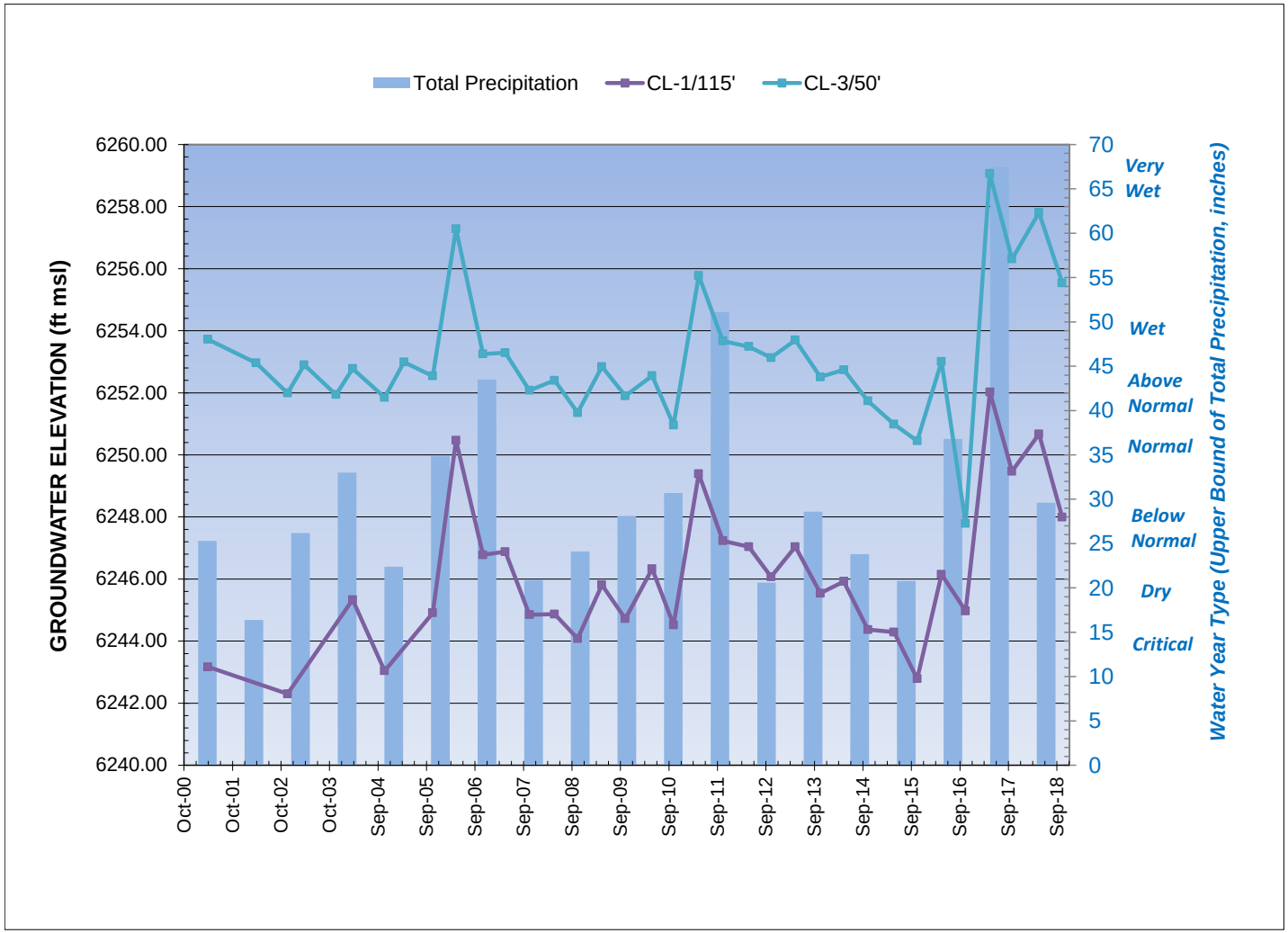
Appendix A - 5. Groundwater hydrograph for the Bakersfield (6,311 feet msl); Elks Club #1 (6,283 feet msl) and Washoan (6,308 feet msl) wells in the Meyers sub-area. Groundwater levels in the Meyers sub-area are relatively stable with short periods of declining water levels in response to increased pumping rates. Static water levels collected from the Bakersfield Well are following a minimum 12-hour recovery time, with the exception of the May 2008 reading which is a pumping water level measured at a well pumping rate of 1,500 gallons per minute(gpm). The Elks Club #1 Well is situated in close proximity to an active pumping well (Elks Club Well #2). Static water levels collected from the Elks Club #1 are typically collected when the Elks Club Well #2 is off. The October 2017 reading is a water level measured when the Elks Club #2 Well was pumping at a rate of 310 gallons per minute (gpm).



Appendix A-6. Groundwater hydrograph for the Henderson Well (6,366 feet msl) within the Christmas Valley sub-area. Groundwater levels in this well are stable and do not exhibit a long-term downward trend.



Appendix A – 7. Groundwater hydrograph for the USGS TCF nested well (6,296 feet msl) within the South Lake Tahoe sub-area. Total well depths for the observation wells completed within the common borehole are as indicated. The complex vertical flow directions indicated by differences in groundwater levels in this well are believed to result from lowered head in BZ 4 induced by pumping of the Glenwood #5 well.



Appendix A - 8. Groundwater hydrograph for the Clement Well cluster (6,279 feet msl) within the South Lake Tahoe sub-area. Total well depths for the observation wells comprising the well cluster are as indicated. Both CL-1 and CL-3 monitor groundwater levels from the uppermost water-bearing zone (TKZ5). Vertical flow is directed downward indicative of recharge adjacent to Tahoe Mountain.

APPENDIX B

SAG Workshop Minutes

Workshop 1 (October 9, 2018)

Workshop 2 (December 27, 2018)

Tahoe Valley South Subbasin (6.5.01) Groundwater Management Plan
MEETING NOTES
Tuesday, October 9, 2018 1:30-4:30 p.m.
Location: 1275 Meadow Crest Drive, South Lake Tahoe CA

ATTENDEES:

Patricia Sussman for Ken Payne, P.E., (El Dorado County Water Agency); Karen Bender (via phone), REHS, RD (El Dorado County -EMD); Jason Burke (City of South Lake Tahoe); Scott Carroll (CA Tahoe Conservancy); Brian Grey, P.G. (Lahontan Regional Water Quality Control Board); Jeff Brooks (Lahontan Regional Water Quality Control Board); Bob Loding (via phone) (Lakeside Park Water Co.); Jennifer Lukins (Lukins Brothers Water Co); Rick Robillard, P.E. (Tahoe Keys Water Co.); Harold Singer (Community Rate Payer); Ivo Bergsohn, P.G., HG (South Tahoe PUD); Shannon Cotulla, (South Tahoe PUD); Richard Solbrig (South Tahoe PUD); Harold Singer (public); Sachi Itagaki (Kennedy Jenks); Gary Kvistad (via phone), Counsel (Brownstein Hyatt Farber Schrek);

BASIN MANAGEMENT OBJECTIVES:

Ivo opened the meeting with a brief explanation of the workshop objectives.

1. Maintain a sustainable long-term groundwater supply.
2. Maintain and protect groundwater quality.
3. Strengthen collaborative relationships with local water purveyors, governmental agencies, businesses, private property owners and the public.
4. Integrate groundwater quality protection into local land use planning activities.
5. Assess the interaction of water supply activities with environmental conditions.
6. Convene an on-going Stakeholders Advisory Group (SAG) as a forum for future groundwater issues.
7. Conduct technical studies to assess future groundwater needs and issues.
8. Identify and obtain funding for groundwater projects.

WORKSHOP OBJECTIVES

1. Discuss the progress of on-going activities in response to the South Y Plume.
2. Discuss the Draft 2018 Basin Prioritization Basin Results for the TVS Basin. Looking for feedback and thoughts. Ranking lowered to a Very Low Priority. We need to review and discuss and address questions Ivo sent out earlier.

DISCUSSION

TVS Basin (6-5.01) - Open Forum

Ivo asked if there were any topics outside the agenda outline that anyone wanted to discuss now or bring up for another meeting. There were none.

South Y Activity Updates

Ivo ran through South Y Feasibility study

We are currently working under Prop 1 groundwater cleanup grant with State Water Board. We are conducting predesign investing to determine the best way to provide hydraulic control and removal of PCE from groundwater.

Ivo briefly described the slides provided in the meeting packet:

- Major Milestones COMPLETED list.
- Predesign Investigation Objectives.
    - Assess vertical extent of contamination;
    - Collect water quality and engineering information useful for design.

Drilling test hole and logging from ground surface to depth (150'). NOTING aquitards that subdivide Section into zones (3 aquitards); the upper zones is where most of contamination is found (Zone B and Upper Zone C). The lower aquitard is believed to be a regional feature (94'-100') which locally separates the contaminated upper zones from the lower most zone (Zone D).Trace amounts of TCE was detected in Zone D (secondary by-

product of PCE degradation). . Two shallow test wells were designed and constructed for use during aquifer testing and possible future use as shallow extraction wells.

Ivo ran through a series of slides providing background and data for findings from our investigative work to date.

Baseline sampling was completed in May to provide contemporaneous PCE water quality data for South Y Area. These were supplemented by water quality monitoring results provided by LBWC and TKWC. Surprising results from this sampling were the high concentrations (60 ppb) detected in samples collected from LBWC #5.

KJC developed initial contour plot showing the highest concentrations of PCE detected in groundwater samples collected from shallow wells (<100' depth) between 2016 – 2018. District and KJC are working to get this water quality data incorporated into the South Y PCE groundwater model.

Another item reflected in the contour map; is detail of plume geometry; this is not reflected in the groundwater model. District and KJC will be looking to see if this level of detail may be present in the updated model for the 2016-2018 periods. The contour map also showed high concentrations of PCE along the west side of the map which decrease in concentration eastward back toward the center of the contaminant plume. This could be an area for further investigation

Contours help us define locations for putting together remedial alternatives to address the mid-plume regions to match what we see in the field rather than relying on the models doing that for us.

Another thing we did as part of the predesign investigation was to update well survey and shared that information with the Regional Board. We are working with El Dorado County to identify different wells near or within the plume. We have identified names, addresses and parcel numbers for these wells to notify well owners of the potential for water quality contamination through this area and need for water quality testing, if well is currently used for drinking water Results of this well testing could then be used to supplement the water quality data used for plume delineation, notify well owners of current well water quality and verify the specific wells which are currently in-use.

Jason B. inquired if there were any regulatory requirements that required private well owners to have their wells tested? That is correct; also that may also be true for small water system wells regulated by the County, as they are not required to test for PCE. . Motel is under lower regulation than an apartment complex. They are only required to test for bacteria quarterly and nitrates (K. Bender, EDCEMD). Jason expressed that this makes it all that much more important that these private well owners get notification

Health and Safety top of list for importance. We have water well driller's reports on some of the private wells and know they may be at a depth penetrating the aquitard and serving as vertical conduits themselves for pathways for this contaminant to travel. Jen identified Jalapeno's restaurant and one private well located on Eloise or James as "active"—LBWC annually tests both of these wells and both have been non-detect for PCE contamination. A lot of the identified private wells are likely not active; LBWC crew have seen inactive wells at one site in a garage covered with plywood.

J. Lukins expressed concern that property owners may hesitate to acknowledge an existing well on their property; costs for possible well abandonment may be a funding issue. Ivo promised to send-out the current private well survey list to the SAG for comment.(Following the workshop, the South Y Area Wells List was sent to J. Lukins, R. Robillard, J. Burke and J. Brooks).

PDI Technical Report – currently working on completing the data analysis and preparing draft Report; hope to have this work completed by the end of October We would then circulate the draft report to for comments from the TAC by end of November.

Modeling Evaluation- currently working on prelim modeling runs and defining remedial alternatives.

LOOK AHEAD: list presented and discussed.

- TAC/SAG meeting set for 10/23, and by SAG meeting 3 some of the preliminary remedial alternatives will have been defined so they can be discussed with the group on the 23rd.
- One thing to do for groundwater analysis—would be helpful to coordinate collecting water levels: Tahoe Keys Wells, Lukins Bros Well 1 and Well 5, monitoring wells used in the predesign investigation, the test wells and groundwater elevations from nearby District wells in order to generate groundwater water level

elevation contours for the South Y Area. This is a large hole in the data, but we can easily address; we just need to schedule a specific day. Discussions ensued regarding scheduling this groundwater level data collection effort.

- SC raised concern about TCE as a breakdown of PCE and smaller molecular size. TCE being deeper, as it is a finer particle is it able to penetrate the deep aquitard more quickly than the PCE, are we doing any modeling to look at the decay rate since it appears to travel more easily, and is it a greater threat to contaminate other wells that have not been impaired. Have we done any evaluation on the TCE front as part of the feasibility study? Good question. Ivo: The model uses literature values for decay rates as default values. Decay could be removed from model in order to show worst-case scenario for contaminant plume extent. Second concern - plume character could change from a PCE to a TCE down gradient plume (SC). As this is not covered under the Feasibility Study, could this be included as a topic of investigation under the SB445 scope? BG indicated that this was a really good point, in terms of remedial alternatives analysis, and what will be done if things start to be reductively de-chlorinated, and what are potential effects. Right now data shows we are fighting a lot of that, we don't have high organics, and we have a highly oxygenated aquifer; but if things change or we do something different it could exacerbate the problem. JB raised issue of TCE vapors as a possible consequence of PCE degradation.

- Look ahead for second half of the project (refer to Slide Look Ahead)
- Public Workshop 3 in November and then roll out remedial alternatives that have been defined, roll out to the public for edification and explain where we are going and give idea how it fits together and will benefit us all.
- Fate transport model complete in January 2019
- Public Workshop 3 – February 2019
- Feasibility Study - March 2019
- Remedial Action Plan – May 2019
- Project Completion – July 2019

Water Suppliers' PCE Action Request - Handout (S. Cotulla)

- 72% of South Lake Tahoe's community water supply is in danger of contamination from this plume. Eye opening awareness! Prompted us to take a look at steps on back of sheet. Immediate and Interim Actions.
- Looking outside Feasibility Study work and work Lahontan is dong. We need to do something to protect our water supply. Lead us to put together a list of things, one being a Multi-Agency Emergency Response Plan (consisting of agencies affected by the plume). We are still working on those issues.
- Also put together a list of other needs such as 1) installation of sentinel wells between the plume and the uncontaminated wells, 2) well destruction program, Lukins and some deep residential wells, 3) zone testing on Tahoe Keys W#2 in order to determine contaminant depth at which PCE is entering the TKWC #2 Well, 4) Test hole at Colorado Court for potential water supply well location. Initially installed as a sentinel well, but constructed in such a way as to be a test well for identifying potential future water production at a public water supply well drilled at this location.
    - Colorado Court well – Scott Carroll indicated that he thought it wasn't feasible because it was in the 100 year flood plan (Scott Carroll). District is not aware of this constraint, but will look more closely at that.
    - District is preparing a detailed list prioritizing these actions down to which sentinel well we need to have happen first for consideration by Lahontan as part of their SB445 Investigation request.

Lahontan (B. Grey, J. Brooks)

- Since last meeting in December, as reminder we originally put in SB445 request for source area evaluation by 7-11 Shopping Center in relation to detections in the Rockwater well, etc. We expanded that scope of

work (upon request from SWRCB) to include more comprehensive investigation, vertical conduit evaluation, soil sampling, perimeter sentry well network, management and communication tools, etc. Written generally to allow us some flexibility so we can adapt, as currently uncertain what actions will be completed by responsible party. May – requested input from water purveyors; June After we got a consultant, solicited additional comments and another meeting to discuss scope of work and developing an accompanying cost estimate for funding. September meeting with SWRCB-DFA to discuss updated work scope and funding. October – received conceptual approval from the SB445 program. Final approval to follow shortly.

- Original consultant who developed cost estimate is not the consultant we will be using for this fiscal year. AECOM out of Sacramento will be taking the lead. They are the consultant associated with the SB445 special program and will be developing a more detailed scope of work and cost estimate based on the updated work scope provided by LRWQCB.
- Shannon indicated that the hope is to take some of these immediate action items and have them incorporated in the SB445 Program.
- There is a timing issue, but we were happy to see that some of these items lined up with the SB445 scope; focus is, in part, to not duplicate efforts, etc.
- Hopefully this will be an opportunity to relieve some of the financial burden that has been placed on the public.

Lukins Brothers Water Company (Jennifer Lukins)

- Good news is that all efforts at state level are helping move forward the applications. Currently they are working on getting the environmental and financial clearances and then will proceed to technical clearances. Then will move on the funding application.
- Optimistic for February or March 2019 funding, allowing for solicitation of Construction Bids.
- Also moving forward James Avenue Waterline project in the James and Patricia Avenues area.

Other Related Items

- Follow up meeting is scheduled with Patty Kouyomdjian next week (?) to further discuss Water Suppliers request (S. Cotulla).
- LTLW Phase 1 workplan was distributed a couple weeks ago (I. Bergsohn). BG indicated there was no formal comment period, but given the interest and number of moving parts they would welcome comments. on the workplan. LRWQCB is expecting weekly planning and progress report meetings and will post summaries of the meetings on line (boring logs, analytical results, etc.) and thereby providing this information before the six-month period. They completed their transect no. 2 and have begun the last 3 monitoring well installations; transect 3 and 4 borings are set for November. Tentatively they are scheduled to provide a draft weekly report by end of day Tuesday and we will meet Thursday. Their 6-month technical report is due by the end of March 2019.
  Transect borings are proposed to go to a depth of 80'. GW-11 refusal limited boring to 76' (B. Grey).

Draft 2018 SGMA Basin Prioritization (I. Bergsohn)

2014 CASGEM Basin Prioritization – Initial prioritization used for SGMA was the 2014 CASGEM Prioritization completed by DWR. The data components, ranking criteria and ranking values for this prioritization were explained. According to this initial prioritization, DWR ranked the TVS Basin as a medium-priority basin.

Under the SGMA, adjustments to basin boundaries completed in 2016 required DWR to conduct a new basin prioritization. Preliminary draft results from this new prioritization were issued by DWR in May 2018. Under the new prioritization the ranking for the TVS Basin was lowered from medium to very low. Components used in the ranking

exercise are in the State regulations (and are similar or the same as were used in 2014). In 2018, a "Statewide Adjustment" criteria was added--applied to basins using between 2000 af and 9500 af with no documented impacts. If the basin met these criteria the basin was reclassified as very low priority. There were several other Basins which were also reclassified through this latest prioritization. Definition of documented impacts (H. Singer)? Documented impacts include land subsidence, declining groundwater level elevations, reductions in groundwater storage, seawater intrusion, water quality (based on number of wells that had exceedances over a given threshold , such as PHG, MCL, etc.) caused by overdraft conditions within a basin. It is Ivo's understanding that application of the Statewide Adjustment zeros out the ranking values based on all previous data components (such as well density and groundwater use/reliance) used in the ranking process.

How will Change in Status affect the current groundwater management process?

- Does District need to continue groundwater management as a GSA? DWR is encouraging GSA's to comply/follow with SGMA. It is unclear if District is still required to prepare and implement a GSP.
- How does the District's Authority under SGMA change if it is no longer a GSA? Would management responsibilities change as a GSA for a low-priority basin? Would scheduling and reporting requirements change?. District is seeking clarification on these questions.

Options

- Comply and adopt GSP under SGMA.
    - GSA is responsible for preparing and implementing a GSP. District has expended significant resources to form a GSA. The District has entered into an MOU to sustainably manage groundwater resources across the full extent of the groundwater basin with the El Dorado County Water Agency (also a GSA).
    - Significant resources have been expended preparing an AB3030-compliant groundwater management plan (2014 GWMP) and completing an Analysis of Basin Conditions (ABC). At end of 2016 the District submitted both the 2014 GWMP and ABC as Alternative Plans to DWR for review and evaluation in lieu of having to develop a GSP. Should the existing plan alternative (2014 GWMP) be approved, the District could continue to manage groundwater resources in accordance with the existing 2014 GWMP. Approval would allow the District to update and amend the 2014 GWMP in a manner that could eventually evolve the 2014 GWMP into a DWR-approved GSP. This is still on the table as the District assumes DWR is still moving forward with considering the District's submitted Alternative Plans.
- Leave or no longer voluntarily comply with GSA – Would allow the District to update our 2014 GWMP and continue groundwater management under AB3030 Plan. Is this statewide adjustment in code, or a whim of someone at the State Board (SC). …. GK: in their implementation regulations, not the statute itself. Not sure where it came from. Developed the adjustment but not sure where it came from. SC; concern if this is a whim, what stops it from going away at the whim in the future and us having to restart this process. GK: No way to predict what the State Board will do in that regard. JL: where are we in the whole SGMA process? Have we met the requirements so far? Yes. Why should we stop doing what we're doing? Why should we cease to follow SGMA? What are the consequences? JL: good point about the change on a whim, and having to start over (at a whim of someone at the State Board). JL: other water basins required to contributed x$/year. Is there a reason to stop? Part of the decision is based on cost, past and future.

How does change in status affect Districts ability to receive Funding?

- If funding is based on basin prioritizations, the first monies released will be based on high priority basins, then medium. We do not believe that will change. Ivo does not believe the Low Priority Basin ranking hurts us. For the Groundwater Cleanup program, the change in status does not have an effect. District's Grant Coordinator added that the only funding based on basin rank is DWR. Only Proposition

1 funding for SGMA is tied to the ranking, and she does not see that changing. DWR will be affected, other funders not so much. Low Priority rating basically means we have less hoops to jump through as far as providing additional studies etc. (LN).

How does this change our authority if we are no longer a GSA within the basin?

- Ivo looked at authority for GSA under the SGMA, and AB3030—Under AB3030, District could become a Groundwater Management District (GMD) . Under AB3030 GMDs have authority to collect fees and assessments to finance and support groundwater management activities within the basin. GSAs have additional authority to require metering water use from wells above a minimum amount, (some private wells excluded). So we could require small community water systems to meter their groundwater production and report it to the GSA, and could impose civil penalties to limit the amount of water they were producing in a basin if the water use was close with respect to recharge, etc. Fortunately we are nowhere near that condition. Recharge is not an issue. Groundwater use represents less than 20% of the total average annual groundwater recharge.
- District has not had to exercise any regulatory fee authority. Ivo believes the greatest costs for complying with SGMA have been met over past 3 years. The difference with staying under SGMA or continuing groundwater management under AB3030 structure doesn't look like we would be losing a lot of authority to implement groundwater management within the TVS basin.
- Gary K. believes that the decision on which route to take depends on whether the District's GWMP Alternatives is accepted as an Alternative by DWR. Because then we can continue under GWMP or opt out and still operate under SGMA. And then you can amend the GWMP, in either instance to conform to whatever you need to do in the Basin. Hopefully a decision on Alternatives will be presented by DWR in November. At that time decision on the best option forward can be made In the meantime we need to get clarification from DWR.

Draft Questions

- Handout at end of meeting materials packet includes 6 draft questions prepared in anticipation of a meeting with DWR. Idea is to contact DWR Project Manager for Basin Prioritization seeking clarification on how the TVS Basin ranking was lowered to VL priority. The new scoring does not seem to be consistent with the 2014 Basin Prioritization although little has changed. The new scoring also does not appear to be consistent with the methods presented in DWR's process document. Ivo is expecting to hear back from the DWR PM shortly after October 10th. DWR is expected to make a decision on submitted Alternative Plans in November 2018.

Draft Questions (slide)

- First question would be regarding the Statewide Adjustment and how it was applied in our case. With respect to the total priority point calculation; question on what they call information determined to be relevant.
- Other information determined to be relevant. First half of Workshop was spent discussing PCE groundwater contamination. Ivo does not believe any of the information provided to DWR about groundwater contamination issues within the TVS Basin was reviewed (e.g., 2014 GWMP, ABC, and Water Year Annual Reports). Although, if they do review it, we may qualify again as a Medium Priority basin. Not sure that's what we want either.
- Question about the status of alternatives and DWR's assessment--is that going to continue as before. Should we expect something back in November?
- Responsibilities for GSA, if we continue as GSA, not required to develop and impellent a GSP etc. if we stay in the program as a Low Priority Basin what are our responsibilities to DWR.

- Ivo asked that meeting participants read through the questions and provide input as soon as possible. He asked that attendees also provide any other questions we might like to have answered by DWR so Ivo can be as productive as possible when he hears from the DWR.

Additional Questions from SAG

- What prompted them to do the statewide adjustments?
- Do they reassess at regular intervals, what prompts? For example (SC) Oroville Dam situation prompted a lot more and greater and stricter regulations….etc.
- Shannon brought up the topic of the consideration for the on-going costs to the District as a GSA or as a GMD.
- Gary suggested that when we get some answers, we should do a cost analysis so we can objectively weigh which is the best route to take moving forward.
- The issue was brought up again with respect to Shannon having asked if they took into consideration the groundwater contamination issues. We need to ask that question sooner than later so we don't go too far down the wrong road. We would not want to find out that they missed that piece of information and "made a mistake" by changing our ranking.

AGENDA

DATE	Tuesday, October 9th, 1:30 PM – 4:30 PM
LOCATION	South Tahoe Public Utility District Board Room, 1275 Meadow Crest Drive, South Lake Tahoe, CA
STAKEHOLDER ADVISORY GROUP LIST	Ken Payne, P.E., (El Dorado County Water Agency); Robert Lauritzen, P.G., Karen Bender, REHS, RD (El Dorado County -EMD); Jason Burke (City of South Lake Tahoe); Scott Carroll (CA Tahoe Conservancy); Brian Grey, P.G. (Lahontan Regional Water Quality Control Board); Rebecca Cremeen (TRPA); Joey Keely, Nicole Bringolf (USFS – LTBMU); Bob Loding (Lakeside Park Water Co.); Jennifer Lukins (Lukins Brothers Water Co); Rick Robillard, P.E. (Tahoe Keys Water Co.); Harold Singer (Community Rate Payer); John Thiel and Ivo Bergsohn, P.G., HG (South Tahoe PUD)
MEETING HOST	Ivo Bergsohn (South Tahoe PUD)
GO TO MEETING	https://global.gotomeeting.com/join/810766261 Call-In: 1(571) 317-3112; Access Code: 810-766-261

BASIN MANAGEMENT OBJECTIVES (BMO)

1. Maintain a sustainable long-term groundwater supply.
2. Maintain and protect groundwater quality.
3. Strengthen collaborative relationships with local water purveyors, governmental agencies, businesses, private property owners and the public.
4. Integrate groundwater quality protection into local land use planning activities.
5. Assess the interaction of water supply activities with environmental conditions.
6. Convene an on-going Stakeholders Advisory Group (SAG) as a forum for future groundwater issues.
7. Conduct technical studies to assess future groundwater needs and issues.
8. Identify and obtain funding for groundwater projects.

WORKSHOP OBJECTIVES

OBJECTIVES

1. Discuss the progress of on-going activities in response to the South Y Plume.
2. Discuss the Draft 2018 Basin Prioritization Basin Results for the TVS Basin.

SEE REVERSE FOR AGENDA

AGENDA

Time	Description	
1:30	**Welcome and Self-Introductions**	**Round Robin**
1:40	**TVS Basin (6-5.01) - Open Forum** **Opportunity for members to briefly raise topics within the subject matter of the SAG and not listed on the Agenda.**	**Round Robin**
1:50	**South Y Activity Updates** • **So. Y Feasibility Study** • **Water Suppliers' PCE Action Request** • **LRWQCB SB445 Investigation** • **LBWC Wellhead Treatment** • **Discussion**	**SAG**
2:50	**Break**	
3:00	**Draft 2018 SGMA Basin Prioritization** • **DWR Process** • **TVS Basin Ranking** • **Discussion**	**(Bergsohn)**
4:15	**Closing Remarks**	**SAG**
4:30	**Adjourn**	

Tahoe Valley South Subbasin (6-5.01)Groundwater Management Plan

2018 Stakeholder Advisory Group Workshop 1

October 9, 2018

South Y Feasibility Study Update

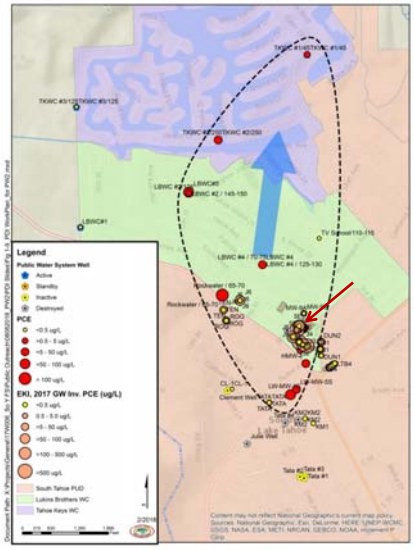
South Y Feasibility Study

- Pre-Design Investigation and Feasibility Study to evaluate whether existing and/or new wells can be used to provide hydraulic control and removal of tetrachloroethylene (PCE) from groundwater.
- Prop. 1 Groundwater Cleanup Grant (Agreement D1712508)

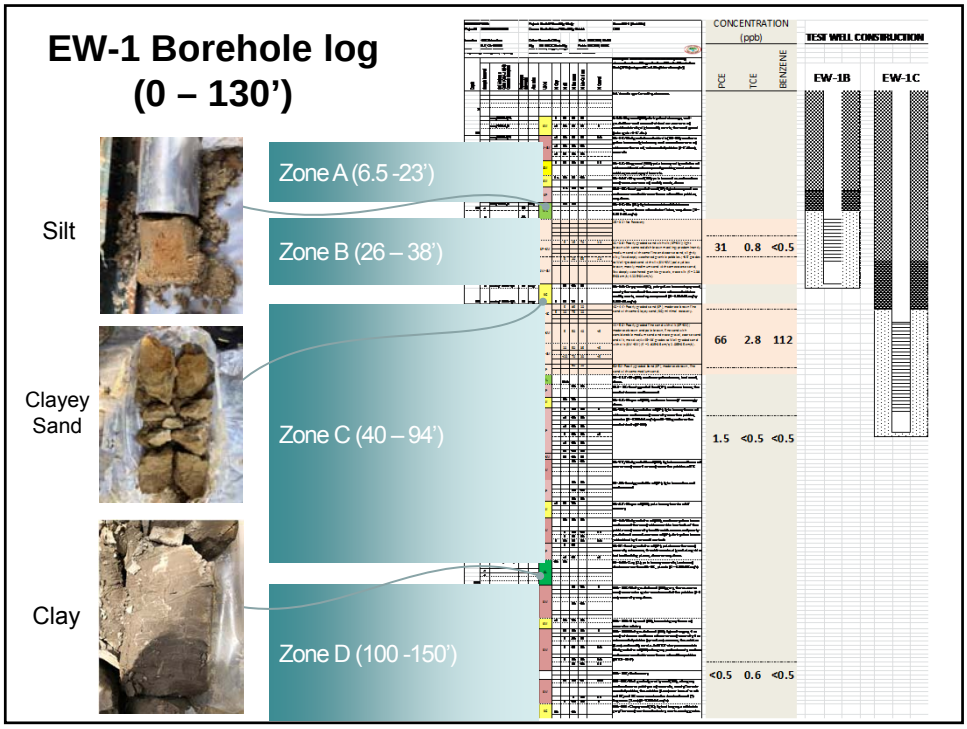
COMPLETED

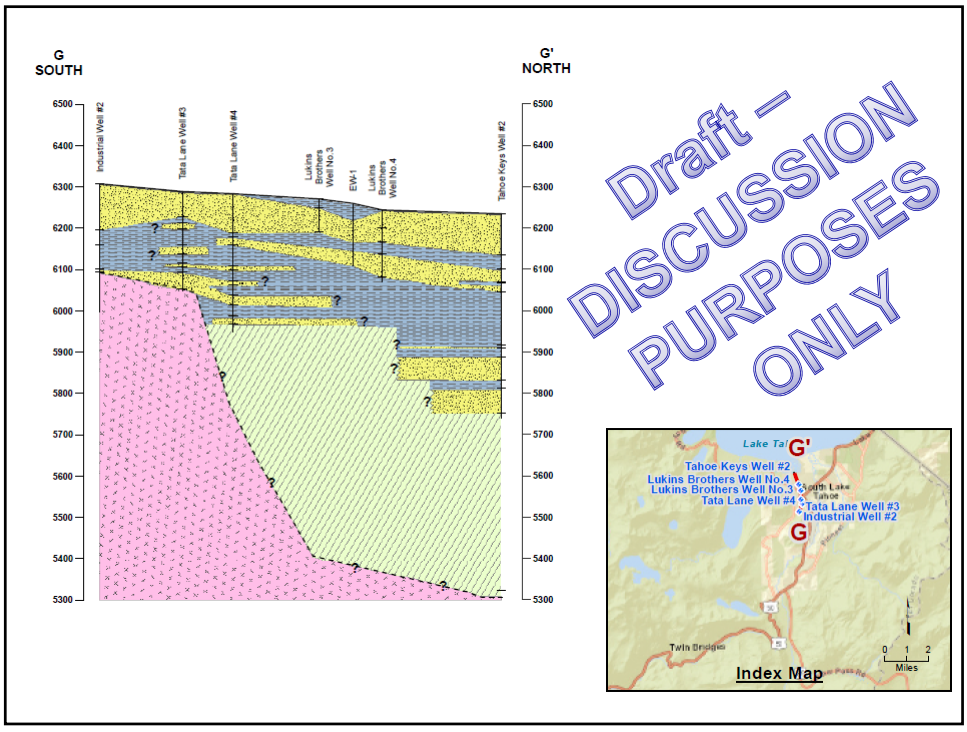
MILESTONE	DATE
• Finalize Grant Agreement	3/29/2018
• Establish TAC/SAG	1/25/2018 - 6/11/2018
• Public Meeting 1	2/7/2018
• Pre-Design Investigation (PDI) Workplan	1/24/2018 – 4/7/2018
• Attain Permits & Site Access Agreements	3/5/2018 – 4/26/2018
• PDI Phase 1- Test Well Drilling Program	4/29/2018 – 7/2/2018
• Baseline Sampling	5/2/2018
• PDI Phase 2 – Aquifer Testing Program	7/9/2018 – 7/14/2018
• Feasibility Study (FS) Kick-Off Meeting	7/18/2018
• Public Meeting 2	8/8/2018

Pre-Design Investigation

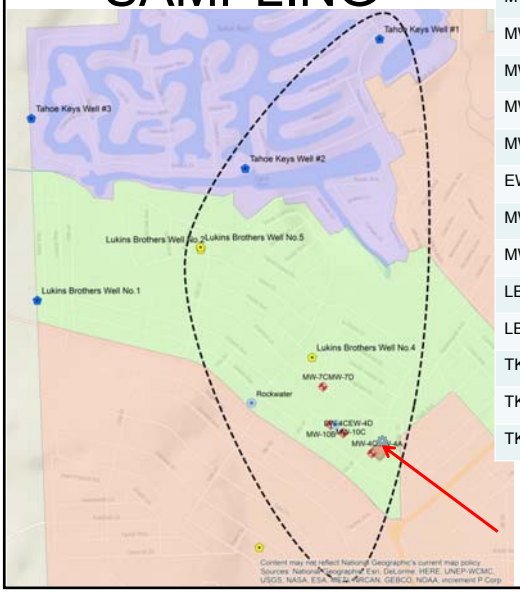


- OBJECTIVES
  - Assess the vertical extent of PCE contamination;
  - Collect water quality and engineering information useful for engineering design


EW-1 Borehole log
(0 – 130')
Silt
Clayey Sand
Clay
Zone A (6.5 -23')
Zone B (26 – 38')
Zone C (40 – 94')
Zone D (100 -150')
CONCENTRATION (ppb)
PCE
TCE
BENZENE
31 0.8 <0.5
66 2.8 112
1.5 <0.5 <0.5
<0.5 0.6 <0.5
TEST WELL CONSTRUCTION
EW-1B
EW-1C


G
SOUTH
G'
NORTH
Industrial Well #2
Tata Lane Well #3
Tata Lane Well #4
Lukins Brothers Well No.3
EW-1
Lukins Brothers Well No.4
Tahoe Keys Well #2
6500
6400
6300
6200
6100
6000
5900
5800
5700
5600
5500
5400
5300
Draft – DISCUSSION PURPOSES ONLY
Tahoe Keys Well #2
Lukins Brothers Well No.4
Lukins Brothers Well No.3
Tata Lane Well #4
Tata Lane Well #3
Industrial Well #2
Twin Bridges
0 1 2
Miles
Index Map

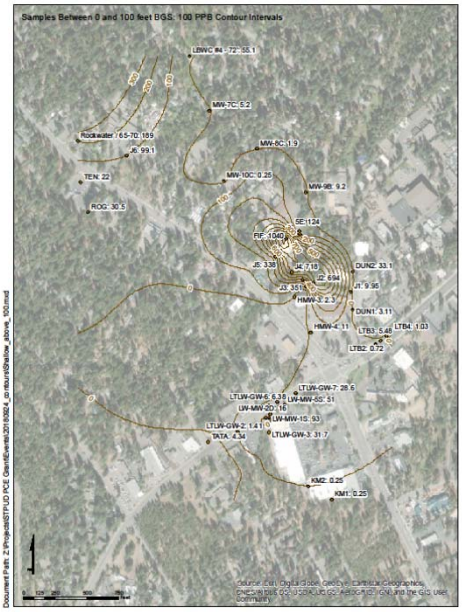
BASELINE SAMPLING



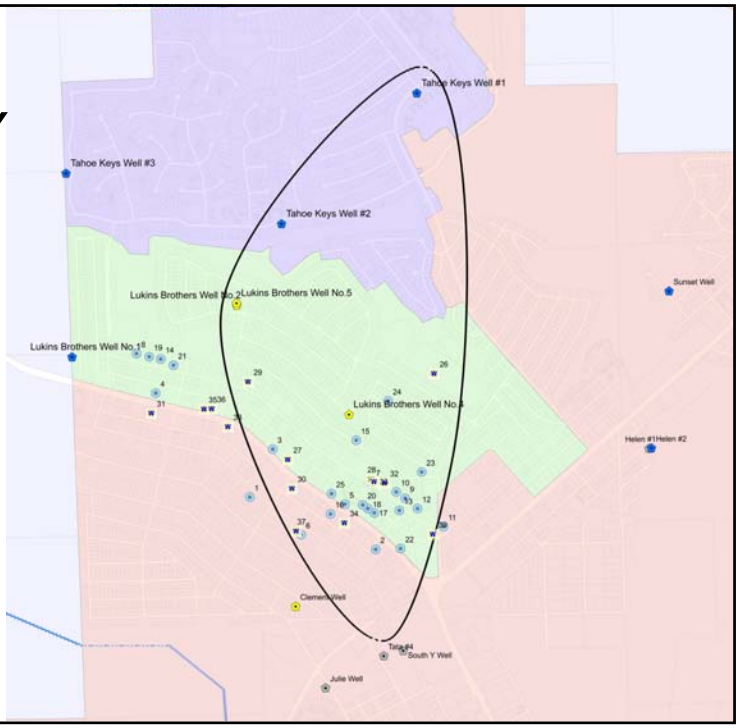
Well ID	Depth (ft)	PCE (ppb)	TCE (ppb)	Sample Date
MW-4A	15 -25	1.5	<0.5	5/2/2018
MW-4B	35 - 50	64	2.3	5/2/2018
MW-4C	59 - 79	2.7	<0.5	5/2/2018
MW-10B	35-50	<0.5	<0.5	5/2/2018
MW-10C	65 - 80	<0.5	<0.5	5/2/2018
EW-4D	120 - 140	<0.5	<0.5	5/2/2018
MW-7C	70 - 80	3.4	<0.5	5/2/2018
MW-7D	120 - 140	14	<0.5	5/2/2018
LBWC#1	132 - 182	<0.5	<0.5	3/13/2018
LBWC #5	141 - 180	60	1.4	6/18/2018
TKWC #1	125 - 312	2.4	<0.5	7/13/2018
TKWC #2	138 - 188	24	NR	7/6/2018
TKWC #3	175 - 300	<0.5	NR	7/13/2018

2016 – 2018 PCE RESULTS (ppb)
Sample Depth < 100 Feet
C. I. = 100 ppb

DRAFT – DISCUSSION PURPOSES ONLY



South Y Area Wells



In-Progress

MILESTONE	DATE
• PDI Data Analysis & Reporting	7/15/2018 – 11/2/2018
• FS Workplan (Draft)	9/13/2018 – 10/3/2018
• Preliminary Modeling Runs	7/19/2018 – 10/15/2018 (?)
• Define Remedial Alternatives	7/19/2018 – 10/15/2018 (?)

LOOK- AHEAD

EVENT	DATE (estimated)
South Y GW Level Monitoring Event	October (tbd)
TAC/SAG Meeting 3	10/23/2018
Public Workshop 3/ CSLT Council Chamber	11/7/2018
Fate and Transport Modeling Analysis	January 2019
Public Workshop 3/ CSLT Council Chamber	February 2019
Feasibility Study - Completed	March 2019
Interim Remedial Action Plan - Completed	May 2019
Project - Completed	July 31, 2019

Tahoe Valley South Subbasin (6-5.01)Groundwater Management Plan

2018 Stakeholder Advisory Group Workshop 1

October 9, 2018

Draft 2018 SGMA Basin Prioritization

2014 CASGEM BASIN PRIORITIZATION

CASGEM BASIN SUMMARY

Hydrologic Region: North Lahontan
North Central Region Office (NCRO)
Basin Area: 14814 acres (23.1 miles)
2010 Population: 25967

Basin: TAHOE VALLEY
Sub_Basin: TAHOE SOUTH
Basin Number: 6-5.01
Date: 5/30/2014

DATA COMPONENT RANKING VALUE TABLE

Data Component		Ranking Range (x)	Units	Ranking Value	Confidence Adjustment	Average of Components	Adjusted Ranking Values
1. Population		1000 ≤ x < 2500	persons/sq-mi	3			3
2. Population Growth		x < 0	percent	0			0
3. Public Supply Wells		x ≥ 1.0	wells/sq-mi	5			5
4. Total Wells		x ≥ 20	wells/sq-mi	5	3.75		3.75
5. Irrigated Acreage		x < 1	acres/sq-mi	0			0
6. GW Reliance	GW Use	0.5 ≤ x < 0.75	acre-foot/acre	4		4.5	4.5
	% of Total Supply	x ≥ 80%	percent	5			
7. Impacts*		--	--	2			2
8. Other Information**		--	--	0			0
Overall Basin Ranking Score		**13.42 ≤ x <**	**--**				**18.3**

Overall Basin Priority: Medium

Very Low Ranking Range	Low Ranking Range	Medium Ranking Range	High Ranking Range
Range < 5.75	5.75 ≥ Range < 13.42	13.43 ≥ Range < 21.08	Range ≥ 21.08

2018 Draft BASIN PRIORITIZATION

Data Component	Ranking Range	Units	DWR Priority Points
1. Population Density	1,000 ≤ x ≤ 2,500	Persons/sq-mi	3
2. Population Growth	6 ≤ x ≤ 15	percent	2
3. Public Supply Wells	x ≥ 1.0	Wells/ sq-mi	5
4. Total Wells	10 ≤ x ≤ 20	Wells/ sq-mi	4
5. Irrigated Acreage	x < 1	Acres/ sq-mi	0
6a. GW Use	0.25 ≤ x ≤ 0.5	Acre-ft/acre	3
6b. GW % Supply	x ≥ 80	GW %	5
7. Documented Impacts	x <3	Total	0
8. Statewide Adjustment	2000 < x ≤ 9,500 af; no documented impacts		V. Low
2018 Draft TOTAL			**0**

How will the change in status affect the current groundwater management process for the Tahoe Valley South Subbasin?

- As a very low-priority basin, District will no longer be required to;
  - Form a GSA;
  - Prepare a Groundwater Sustainability Plan (GSP) or an Alternative
- As a very low-priority basin, District may choose to;
  - Voluntarily comply and adopt a GSP under SGMA, but not required;
  - Voluntarily comply and adopt an Alternative Plan under SGMA, but not required;
    - Existing Plan (2014 GWMP)
    - Analysis of Basin Conditions
  - Update the existing 2014 GWMP under AB3030 [Water Code §§ 10750.1 (b)]

How will the change in status affect the District's ability to receive funding?

- Proposition 1 Sustainable Groundwater Grant funding administered through DWR: Funding for GSP development and technical or facilitation support services. Funding is directed toward GSAs or member agencies of GSAs and prioritized according to Basin Prioritization ranking; most funding will likely be directed towards critically-overdraft High Priority Basins, High Priority Basins and then Medium Priority Basins; Before we had a chance of this type of funding; with the change in status the opportunity for applying for this type of grant funding may no longer be available.
  - Impact (s): Potential loss of grant funding source for costs associated with the installation of additional groundwater observation wells for the Basin Monitoring Network.
- Proposition 1 Groundwater Cleanup Program Grant funding administered through SWRCB-DFA. Funding to prevent and cleanup contamination of groundwater that serves (or has served) as a source of drinking water. Eligible grant applicants are public agencies, non-profit organizations, public utilities, federally recognized Indian tribes, California Native American Tribes, and mutual water companies (Water Code section 79712(a-b)). Funding is **not** restricted to GSAs.
  - Impact (s): Change in status should not affect approved Prop 1 GCP funding being used to defray costs for the South Y Feasibility Study.

How will the change in status affect the District's ability to implement Groundwater Management within the Tahoe Valley South Subbasin?

- Under SGMA GSAs have financial authority to assess regulatory fees, authority to determine groundwater amounts extracted and enforcement powers to impose civil penalties.
  - GSAs may impose fees, including, but not limited to, permit fees and fees on groundwater extraction or other regulated activity, to fund the costs of a groundwater sustainability program, including, but not limited to, preparation, adoption, and amendment of a groundwater sustainability plan, and investigations, inspections, compliance assistance, enforcement, and program administration, including a prudent reserve [§ 10730]
  - GSAs may make determinations fixing the amount of groundwater production from a groundwater extraction facility [§ 10731]
  - GSAs may impose Civil Penalties to persons who extracts groundwater in excess of an authorized amount [§ 10732]
- Under AB3030 local public agencies acting as a Groundwater Management District (GMD) are also allowed to fix and collect fees and assessments for groundwater management [§ 10754 – 10754.3].
- The District has not yet exercised any regulatory fee authority for development and implementation of the 2014 GWMP

DRAFT QUESTIONS (Handout)

- Statewide Adjustment
- Total priority point calculation
- Other information determined to be relevant
- GSP Alternative assessment
- GSA authority for v. low priority basins
- GSA responsibilities for v. low priority basins

Question 1:

According to the DWR 2018 Basin Prioritization Process, the Statewide Adjustment (Sub-component 8.c.2) is only applied to groundwater basins where annual groundwater use is greater than 2,000 acre-feet and less than or equal to 9,500 acre-feet; and have no documented impacts. Documented impacts as described by DWR must **not** include;

4. Groundwater water quality issues that warranted the assignment of water quality degradation points (sub-component 7.d).

Under sub-component 7.d of the Draft 2018 Basin Prioritization, one (1) point was assigned to the Tahoe Valley- Tahoe South Subbasin (6-5.001) for water quality degradation.

If one point was assigned for water quality degradation (sub-component 7.d), why was the Statewide Adjustment applied to this Subbasin?

Question 2:

In order to better understand the DWR 2018 Basin Prioritization Process, the District compared the information used by DWR to information collected by the District for each of the specified components. For the most part, the District is in general agreement with the priority points assigned by DWR for each of the components used in the 2018 Basin Prioritization Process with the exception of Population Growth (Component 2) and application of the Statewide Adjustment. The rate of development within the Lake Tahoe Basin is strictly controlled by the Tahoe Regional Planning Agency (TRPA). Because of these regulatory controls, the majority of growth within El Dorado County occurs outside the Lake Tahoe Basin. Using available demographic data from El Dorado County, the rate of growth within the City of South Lake Tahoe was less than one percent from 1990 to 2006 (EDC 2007 Economic and Demographic Profile). Therefore, the District assigned one priority point for population growth, whereas DWR assigned two. A table comparing the DWR and STPUD assigned priority points is provided below.

COMPONENT	DESCRIPTION	DWR PRIORITY POINTS	PRIORITY POINTS (STPUD)
1	Population Density	3	3
2	Population Growth	2	1
3	Public Supply Wells	5	5
4	Production Wells	4	4
5	Irrigated Acreage	0	0
6	Groundwater Reliance	4	4

7	Documented Impacts	0	1
8	Statewide Adjustment	Yes	No
	2018 Draft Total	0	**18**

Review of the comparison table shows that DWR recognizes the high density and total production well density of groundwater wells within the Tahoe South Subbasin (6-5.001) and the high reliance on those wells for drinking water supply.

Why are priority points for relevant components evaluated through the 2018 Draft Basin Prioritization Process completely negated in the 2018 Draft Total by the Statewide Adjustment?

Question 3:

The process used by DWR for documenting water quality degradation appears to use a statistical measure based on identifying the number of wells with a constituent concentration above a minimum reporting level, PHG or drinking water MCL, occurring within a given groundwater basin. Although the District understands the use of this broad approach for a statewide assessment of the susceptibility of drinking water wells to groundwater contamination, it does not accurately reflect the significance of groundwater quality impacts documented within the Tahoe South Subbasin (6-5.001).

The primary focus of groundwater management within the Tahoe South Subbasin (6-5.001) has always focused on groundwater contamination. The District's first groundwater management plan was developed in 2000 in the form of a groundwater ordinance (Ordinance No. 477-00) for the purpose of regulating and protecting local groundwater resources from man-made contamination. During 2014, the groundwater ordinance was later updated and replaced by a fully compliant AB3030 groundwater management plan (GWMP), establishing Basin Management Objectives (BMOs) along with a plan for implementing the GWMP, based on a prioritization of local groundwater concerns. Under the GWMP Short-Term Implementation Plan priority was given to "renewed investigation and clean-up of groundwater contamination with special emphasis on PCE and MtBE contaminant plumes that currently impair water supplies in the South Lake Tahoe and Bijou Areas." Since adoption of the GWMP, the District and impacted water suppliers have expended significant resources conducting studies to address the impairment of drinking water wells by tetrachloroethylene (PCE) contamination within the Tahoe South Subbasin (6-5.001). This groundwater concern is described in the GWMP, the Analysis of Basin Conditions report submitted to DWR in December 2016 and the 2017 Water Year Annual Report submitted to DWR in 2017. In 2018, the District entered into an agreement with the State Water Resources Control Board to conduct a pre-design investigation and feasibility study to evaluate whether existing and/or new wells can be used to provide hydraulic control and removal of PCE from

groundwater within the groundwater basin, which is being funded, in part, through a Proposition 1 Groundwater Planning Grant (Agreement D1712508).

According to the DWR 2018 Basin Prioritization Process, "other information determined to be relevant by the department" is to be used to determine if there are groundwater-related actual or potential impacts to unique features or actual or potential challenges for groundwater management within the basin. Was relevant information documenting groundwater water quality impacts provided in the existing GWMP, the Analysis of Basin Conditions report and the 2017 WY Annual Report considered when evaluating the Tahoe South Subbasin (6-5.001)?

Question 4:

In December 2016, the District concurrently submitted both the 2014 GWMP as an Existing Plan and an Analysis of Basin Conditions Report as an Alternative Plan for public comment and DWR review and evaluation. It is our understanding that status updates on DWR assessment of the submitted plans are expected to be completed in November 2018.

What effect, if any, will the Draft 2018 Basin Prioritization Process have on DWR completing its assessment of the District's Alternatives submitted in 2016?

Question 5:

The District has expended significant resources in completing SGMA requirements to form a Groundwater Sustainability Agency (GSA) for the Tahoe South Subbasin (6-5.001). The District has also entered into a Memorandum of Understanding with the El Dorado County Water Agency to work collaboratively to sustainably manage groundwater resources and implement SGMA throughout the entire Tahoe South Subbasin (6-5.001).

How would authorities granted under SGMA change for GSAs formed for basins newly ranked as a low- or very low-priority basin?

Question 6:

DWR is encouraging basins that may be newly ranked as a low- or very low-priority to *form GSAs and develop GSPs, update existing groundwater management plans, and coordinate with others to develop a new groundwater management plan in accordance with Water Code Section 10750 et seq.*

If a GSA for a low- or very low-priority basin elected to voluntarily comply with SGMA, would that GSA be subject to the same deadlines and reporting requirements for developing and implementing a GSP, as required under SGMA for medium-priority basins?

Meeting Minutes
Tahoe Valley South Subbasin Groundwater Management Plan
Stakeholders Advisory Group Workshop 2
Meeting Date: Friday, December 15, 2017 (9 a.m. – 12 Noon)

Attendees: See attached Sign-In Sheet

Open Forum

- No discussion

So. Y Remedial Alternatives FS

- Sachi Itagaki with Kennedy/Jenks Consultants (KJC) ran though items having to do with 2018 remedial alternatives investigation. Roles and levels of interest from SAG members regarding the feasibility study.
- Sachi referred to her handout as she provided a rundown of the summary.
- The feasibility study will have a separate Stakeholders Advisory Group (SAG) that will probably include at least some of the same members as the GWMP SAG members.
- Scope of work is large and identifies obligations of the State Water Board and South Tahoe PUD (grantor and grantee). Lots of administrative tasks, GPS coordinates and surveyed elevations to establish common datum between wells used to study groundwater flow, etc. There is a Quality Assurance plan related to how samples are collected; uploading project data to GeoTracker permitting and site access agreements related to the field work. She explained that the Technical Advisory Committee for the So. Y Remedial Alternatives would be independent of the full GWMP SAG.
- She discussed the MOU between the State and STPUD that we currently in the process of being worked out. STPUD's attorney has reviewed it and we are not starting discussions with SWB staff.
- Purpose of the Feasibility Study is to identify remediation methods that do not preclude interference with alternatives being considered by LBWC and TKPOA for their drinking water wells.
- Identifying alternatives (number and location of additional remediation wells), costs (both capital and O&M) of alternatives, looking at long term ramifications, develop Remedial Action Plan, etc.
- STPUD has done ongoing monitoring.
- Outreach is part of the Feasibility study. There will be outreach to this SAG and to disadvantaged communities. Included in the scope of this study is a total of six meetings to be used for outreach (meetings, workshops, webcasts).
- Technical Advisory Committee – part of scope between the State and STPUD. Grant is being administered from the State--Regional Water Board Tricia Carter). Responsibilities: they will provide input on monitoring & reporting program, Pre-Design Investigative (PDI) work plan, Feasibility Study work plan, and interim Remedial Action Plan.
- Stakeholders Advisory Group – will be separate from this SAG (will be referred to as the FS SAG). My include Forest Service, PDI site property owner (e.g. Stanford Alumni Assoc. or CSLT), interested parties (LT Laundry Works (LTLW) parties), and others interested in the very localized area that we will be concerned with. Need to

generate a list. (Scoped to conduct up to six meetings.) Those interested in participating in this SAG will be asked to provide feedback and comment on Feasibility Study. Initial interest show of hands: Jen Lukins, Rick Robillard, Ivo Bergsohn (IB). Will reach out to the Alumni Association, LTLW.

- Schedule-wise: hope to able to do actual field work in the spring. Alumni Association – folks who volunteered their site to be used in this work, asked that we be done by April. In order to meet this request we will need to conduct field work in the winter. Work Plan draft should be pretty quick, feasibility study itself will be about 6-7 months after the work plan.
- Goal for schedule is to complete the FS in a reasonable time frame where the District would be well positioned to request funding for implementation dollars.
- Scott Ferguson asked what is the interaction between the TAC and the FS SAG; may consider combining FS SAG with TAC meetings to advantage direct interaction between these two groups; Why are there two separate groups?; this was a condition of the grant Agreement. if there was a particular reason that the GWMP SAG and So. Y Remediation SAG could not be the same group. Sachi didn't know of any specific reason and thought there could be efficiency in working them together.
- Ivo asked the group for ideas about how to go about when, where, how to pursue the public outreach aspect, i.e. where would be a good first engagement with public to roll out the project. Lisa Dernbach (LD) suggested Tahoe Valley Elementary School – high tide meeting so parents can attend. Especially since the work will be taking place in this neighborhood. Sachi asked if there was awareness already. Jen feels there is a general awareness; they know something is wrong but don't understand the who, what, how, when, where, and whys of it. Scott (CTC) would like to see more press on this (use of media—papers, radio, etc.). Since we are in the study phase it's a good time to get out ahead of this. John Thiel (JT) suggested bringing the media in for a discussion to get them involved to understand. Jen cautioned that this type of discussion with media MUST USE A CAREFULLY CRAFTED MESSAGE with a FACT sheet and map (LD), so they can very specifically see and understand what is going on, and so that there is no misinterpretation by the media. Challenge is to communicate message succinctly (JB)

South Y Activity Updates

TKPOA Phase 1 – (Rick Robillard (RR), TKWC Manager).

- Deals with groundwater and the PCE plume affecting 2 wells. Tahoe Keys Water Company (TKWC) contracted with KJ to develop a Facilities Plan to address the contamination. KJ put together Title 22 Requirements Standards and a plan for how to meet them, including alternatives if TKWC should lose their ability to meet water demands (serve water to its customers) due to PCE contamination. Currently one well is affected but has a filtration system on it, but its source capacity is being limited, but is potable. The Title 22 identifies how TKWC PCE contamination issues affect other stakeholders. KJ put together feasibility alternatives for moving forward.

Future projects, alternatives, etc. to deal with contaminants. Currently in the draft final stage of planning document.. Weighted matrix (short term/long term). Expect to be moving draft facilities plan into the final stage shortly. Once this is achieved they will hold a "town forum" to roll out the plan to the TKPOA who will be paying for it. RR expects this to be completed within about a month.

- Once plan and alternatives are decided, will move to engineering docs, etc.
- RR - all 3 wells are operational. In summer rely on all three wells to meet system demand. Have had PCE detections but not at levels that exceed limits.
- RR - Challenge for TKWC is going to be dealing with very significant costs-$2.5mil to $12mil in costs depending on the selected alternative.
- RR- TKWC has had detections in some wells that have not exceeded MCLs.

JEN –

- Approaching 90% on plans and specs for the work (Wellhead Treatment System at LBWC #5; abandonment at LBWC #2) at their 12th Street Well Site LBWC #2 and #5). Public notice will be going out today for the construction loan application for this treatment plant, subject to a three-month review. This will be a surcharge passed on to customers. We are hopeful that construction will take place this summer. In light of recent test results, staff engineers from the State will meet with SWRCB-DOFA to determine permitting issues at Well 5. Well No. 2 will be destroyed and we will apply to replace it, however we have not located a new site yet. The Feasibility Study will help determine the new site and how we will go about that process, i.e., placement and solution. Feasibility Study will consider all the replacement and relocation issues including location of new well, depth, migration pattern of plum and potential draw of contaminated plume by new well, etc. Jen reported that the State indicated to move forward and continue down the path they have taken, cautioning that a more extensive feasibility study may be needed so as not to draw the plume in a new direction and make matters worse. Harold Singer (HS) raised question about the implementation grant and whether it could be used to fund TKWC and LBWC efforts. Issue is timing of funding and need of water companies to have something in-place sooner rather than later. Use of implementation grant for these efforts could result in delay. FS will consider alternatives being considered by LBWC and TKWC; focus of FS is to select a remedial alternative that compliments LBWC and TKWC efforts (IB). Insurance is currently paying for clean-up at LTLW site (LD) Does LBWC have enough confidence in available data that would allow LBWC to identify a new well location? (JK). That will need to be considered during the FS (JL). J. Keely (JK) offered assistance should LBWC consider a site on USFS lands.

LRWQCB Report – (Brian Grey (BG)).

- Explained that there have been some organizational changes, one being that Laurie Kemper (Assistant EO) is retiring, and Doug Smith is new AEO; Jeff Brooks is now the Supervisor to whom Brian reports. Lisa Dernbach handling 445 project. Brian provided a brief chronology of recent work: CAO issued May 2012; Work Plan submitted July 26. It was considered an incomplete submittal and went into the public comment period. After the comment period closed they received additional

comments from Tahoe Keys (historical storm drain system). Responsible Party (RP) and Seven Springs petitioned, Fox's petition was thrown out, Fox filed separate suit against Regional Board. Phase1 activities were conditionally accepted and went out 10/23/2017 and were completed as one continuous core boring and groundwater sampling. They remobilized on November 15, 2017 to do additional CPT/MIP screening. Only able to do one boring 42' at GW 1 location, November 7 advanced to 82' but experienced mechanical issues and demobilized. Rescheduled drilling for 12/26/2018. Due to holiday congestion the City nixed the 26th date for drilling; schedule has been pushed until after Holidays (January 7, 2018) Gregg Drilling is Drilling Contractor. Work Plan review -LRWQCB staff comment letter in draft and comments on revised groundwater are being reviewed. SB4.5 being investigated by Lisa Dernbach, known as the Westside PCE Investigation – when instigated 280ppb PCE was detected in Rockwater Well/Apartments on Emerald Bay Road and 10th Street. It is believed, because of the limited pumping (Sonny's BBQ), that the estimated PCE source was within a block. Submitted a scope of work to the State for funding to look for a source near the Rockwater. State encouraged us to expand the scope of work, which we did. The expanded SOW includes 10 monitoring wells, a soil vaper survey, possibly a tracer test and CPT/MIP survey near Rockwater Apartments area. Would also like to conduct an indoor air survey to determine risks to inhabitants. LD would like to conduct the Westside Investigation sometime during the spring 2018, to avoid summer season traffic. Challenge of pumping contaminated wells – Sampling costs are very expensive due to added costs for handling, treatment and disposal of contaminated water (JL).

<u>So. Y Pre-Eval</u> – (Ivo)

- IB Presentation - brief summary of results from Pre-Evaluation Sampling. 2016 District started conducting sampling and well assessment L4. In parallel, Tahoe Keys funded a study looking at occurrence of PCE in the South Y Area and compiled all historical data (GEI Study). Found numerous data gaps in sampling data and it was determined that the need to collect new groundwater water quality data was in order. Tried to collect new data from: LRWQCB data from existing monitoring wells, TKPOA Wells #1, #2, #3, LBWC Wells #1,2,4,5; Tahoe Valley School, Rockwater Apts, and from Clement Well site (CL-1); 7 Springs/Fox Capital Off Site Invest. Data compilation was provided to DRI to see if any changes were needed in the Fate and Transport Model. Collected data would provide a check against the contaminant distribution predicted by the model. Ivo ran through a series of slides summarizing and explaining sampling events. Questions asked about sampling methods and conditions of operations before and during sampling. Ivo explained that there were various conditions of operations or lack thereof surrounding samplings. There was discussion regarding geological and vertical gradient information relative to the sampling, as well as if these factors would be part of the FS. Sachi explained how and when these items would be factored in and how they would be used. Ivo said that to the extent that we can, he would like this information incorporated into the data. Another question was posed regarding whether this data has been brought into the model? Ivo explained the Model work is "on hold".

- IB presented slide showing GW flow direction from District Well data from the South Y Area; GW Flow directed to NNE; low gradient of about 0.008 ft/ft.
- Highest levels of PCE contamination found along east side of plume near intersection Eloise Avenue and 5th Street.
- Hi levels of groundwater contamination found in Rockwater Well (PCE > 100 ppb); LBWC#4 (PCE in 20 -50 ppb); and LBWC (PCE > 50 ppb)- extremely impaired source; TKWC #2 (20 ppb/influent treated); TKWC #1 (PCE about 2 ppb).
- PCE was not detected in LBWC # 1 and TKWC #3 wells.
- Vertical Distribution Plots – PCE Concentration versus Sample Depth- bottom screened interval in feet below ground surface. – Highest PCE concentrations in shallow wells found at LTLW site (25' depth); MW4b (50' depth); Rockwater Well (100' depth); lowest concentrations at greatest depths in TKWC #1.
- JK – all all results from pumped wells ?- Results are from three sampling events which included both grab samples using passive samples and grab samples from pumped wells, purging volume = 5 well volumes (IB).
- Offsite Inv. Results (EKI for 7 Springs/Fox Capital)- District requested sampling near Rockwater Well (west side portion of investigation) Vertical distribution plot: James Street samples show vertical extent of contamination on east side of plume (depths > 60 feet)- very high levels (PCE – 100 – 1000 ppb); on west side of plume high concentrations at deeper levels (PCE -100 ppb at 100' depths).
- Upper grouping – South Y eastside; Lower grouping – west side; could be interpreted as multiple plumes; however only a single source has been identified. More groundwater data is needed to better define groundwater flow patterns within contaminant plume; this is one of the objectives of the PDI. HS inquired about impact of geology and vertical hydraulic gradients on PCE distribution. Available data shows the vertical gradients are directed downward; geology will definitely be considered during the PDI, look at potential contaminant pathways from above 100 feet to PCE contamination found at LBWC #5 (IB).
- Jen – believes that a lot of the work will be valuable to LBWC during their engineering study; thanked Ivo for all his dedication and hard work and for all the information being pulled together and collected. Value from production wells without corroboration wells could be very misleading.
- JK – during PDI- consider the pumping time and screen length when comparing PCE concentrations between wells.
- LD- Recent sampling at LTLW site showed higher PCE concentrations; may be more realistic for actual PCE concentrations than samples collected from wells that are pumped continuously which may provide a diluted sample result.

2017l Owners Survey was conducted in order to

- IB Presentation - brief summary of results from 2017 Well Owners Survey (2017 WOS). Purposes 2017 WOS; 1) Inform well owners of Groundwater Management Plan activities occurring within our groundwater basin; 2) Introduce the District as the GSA update well owners on the work being doing with

groundwater management within the basin; 3) Help identify well owner concerns for inclusion in the TVS Basin Groundwater Management Plan; 4)Encourage well owner participation in our SAG (Identify interested domestic and community well owners); and 5) Confirm small community water system and domestic well locations.The survey occurred over a 6-week period from mid-August through September. Last couple weeks of this 6-week period consisted of assessing and organizing the information.

- The 2017 Well Owner Survey included parcels for a potential of 562 domestic well sites; and 58 other small community water system sites (shows number of sites surveyed/visited). He reported that we had 374 respondent sites (61% of inferred locations). Of these, 331 were domestic well sites; 43 were community and non-community well sites. Received responses to well on property from 247 respondents. Most of the respondents were property owners; largest majority were second home owners. Majority of second home owners occupied property between July and September. Likes – aesthetics. Majority concern from respondents is groundwater contamination followed by population growth and groundwater levels.
- The Survey was offered in person, via phone, and on-line.
- Ivo ran through the data collected and compiled from the survey.
- 93% of responders indicated that their private well was being used.
- Gathered quite a bit of information. We have a better and deeper insight in to owners and operators of these wells. This information will allow us to have a more focused outreach.
- There will be a write-up summarizing this survey information/data. We are having some difficulty pulling the information out of the ESRI software we used, but we are working on it.
- A question was asked regarding whether the survey included questions that would assist us in assessing potential demand. Ivo indicated that there was some information collected as to when and how much these wells are used which will feed into the demand information.
- Sachi indicated she would contact Jen so they could discuss possible outreach to any of the survey populous who might be in the South Y area.
- Ivo has additional ideas about possibly conducting a Phase 2 survey/outreach and trying to contact the sites we were not able to reach in the initial survey.
- JL- may want to consider offering water quality testing to well owners as part of expanded outreach.

Groundwater Resources Management

- Joey Keely (JK), Ecosystem Staff Officer & Research Coordinator at USFS, spoke. Provided some personal background and qualifications and introduced Nicole Bringolf, Hydrologist with USFS. They are working on inventorying water rights and uses side of things. Nicole has access to recent developments regarding usable documents, etc. Groundwater and Eco Systems Level 2, and Level 1 goes into

varying levels of assessments. Joe brought and presented a slide presentation that a colleague (Jaime Gough, WRU User Group) in Boise put together.

- Presented a slide show for how to use and access reports via USFS Water Rights & Uses (WRU) Geospatial Interface (GI). More Info – USFS Natural Resource Manager (NRM) at nrm@fs.fed.us
- Joey talked about other ways the system and resources could be used including populating database with well logs and water quality information.
- Also spoke to the idea of using USFS land for wells, or other water facilities needed, and the steps that have to be taken and considerations/checklists gone through prior to permission to use USFS lands.
- USFS has programmatic needs to assess impacts to natural resources from groundwater use; watch not only the USFS water resources, but those within a mile of the forest boundary because of the draw and cone of affect that is caused by any wells or groundwater uses on the peripheral. Impacts on seeps, bogs, fens, ponds, springs, etc. – groundwater bearing zones.
- When considering permits for new wells USFS considers alternative sources of supply outside USFS lands; current demands on natural resources; and changes to baseflow; declines in spring flows. USFS cannot direct applicant to conduct studies, but will provide comments where USFS has concerns where significant and should at a minimum be initially evaluated (e.g. vegetation, stream flows/fish).
- JK discussed current USFS efforts; SNPLA funding (reallocated 2012 returned funds through Tahoe Regional Exec. Committee to secondary projects); USFS-LTBMU submitted request for funding to; 1) second cycle of Angora Burn Area Monitoring; and 2) Water Uses and Protection. Water Uses and Protection would focus on completing inventory and analysis of water uses on lands within USFS-LTBMU; identification and assessment of Groundwater Dependent Ecosystems (GDEs); identification of water needs for watershed health and ecosystem sustainability, identification of surface water source zones and source water protection zones for groundwater and facilitation of conjunctive management of surface/ground water resources. Anticipate having funding available to start this work in 2018. Will also look beyond groundwater-dependent systems to balance of groundwater and surface water, and likely places USFS has allowed water access. They will be reviewing past points of diversion around the lake. They have a lot more work ahead to complete. To this point they have done mostly surface water investigations, and still have a lot of groundwater information to gather.
- USFS concern – development along stream courses has resulted in change from using riparian rights to groundwater (echo creek example). Focus is on impact of shallow wells (< 50 foot depth) on surface waters. Only community water systems are required to be metered. USFS stipulates water use conditions within permit; such as period of use; number of people per cabin and allotted water use.
- JK suggested that Sheryl Schumacher (USFS – Engineering) would be the contact suggested to Ivo to find out what information USFS can share. Ivo would like to have access to information pertaining to the Rainbow Tract which is in our groundwater

basin. NB noted that at Rainbow Tract, residents want to go to move away from using surface water and got to groundwater due to water quality concerns. For new special use permit, a meter may be required. Ivo will contact Nicole to get more information.

- JK- USFS-LTBMU inventory on surface water sources and springs is pretty complete; next focus will be on wells. Meyers Landfill – need to work on off-site investigation for feasibility study to address groundwater impacts from off-site plume. Strong restoration in stream meadows, including removal of conifers to restore groundwater levels.
- Question was asked by Ivo if the USFS is contemplating developing Groundwater Management Program of their own for USFS lands. And if so, how would they anticipate working with the local Groundwater Sustainability Agency? Joe indicated that the USFS has had a Groundwater Management Program since 1998. Have a public based website at national level that describes this program; https://www.fs.fed.us/science-technology/geology/groundwater. The USFS is not a regulator.

GWMP Report Updates

Alternative Submittals

- To close workshop today…
- District 12/2016 submitted Groundwater Management Plan and analysis of basin conditions to Department of Water Resources. Ivo heard that with respect to the SGMA they have two years from the submittal date to complete their evaluation. Last year they wanted to get it done within the first year, now it will not be until mid-2018. We are looking forward to receiving some feedback on our submittals.
- Our submittals will be deemed either “Approved”; “Incomplete” (to be corrected in timely manner (180 days)); or inadequate and thus “Disapproved”.
- Ivo has heard that if we receive an evaluation of “incomplete”, we would consider that a victory. We will work very hard to address the deficiencies.

Phase II Modeling Report

- DRI has been updating the models for our groundwater basin.
- We received a draft groundwater management report. Important sections are: Section 3 which addresses delineating recharge areas and how they change over time and space on a seasonal basis; capture zones within the groundwater basin; Section 4 that looks at pumping surface water – see changes in groundwater flux; Section 5 which focuses on climate change effects (simulations); and Section 6 which uses the model to look at potential changes and recommendations to augment the Basin Monitoring Program.
- Looks forward to sharing when complete.

Annual Report, 2017 WY

- This will be the first annual report that we are officially required to submit to DWR.
- Ivo wanted to thank Jen (LBWC) and Rick (TKWC) for providing their 2017 WY production data.
- We would like to get Lakeside Park Water's production data for 2017. Bob Loding agreed to provide this.
- Ivo reported that the 2017 Water Year was very wet…off the charts. Total precipitation greater than 60" which translates to 120,000 acre feet of groundwater recharge (estimated based on relationship between precipitations at Hagan's Meadow to groundwater recharge).
- Groundwater levels in the basin are up comparing to May 2016 groundwater levels a bit over 4.5' across basin on average.
- We will not do rest of data analysis. Due to DWR by April 1, 2018. Presentation to District Board presenting Annual Report anticipated during first quarter of 2018. Annual Report will be made available on District's website.

Meeting is adjourned.

Tahoe Valley South Subbasin (6.5.01) Groundwater Management Plan
MEETING NOTES
Friday, December 21st, 2018 1:30-4:30 p.m.
Location: 1275 Meadow Crest Drive, South Lake Tahoe CA

ATTENDEES:

Jason Burke (City of South Lake Tahoe); Jeff Brooks (Lahontan Regional Water Quality Control Board); Bob Loding (Lakeside Park Water Co.); Jennifer Lukins (Lukins Brothers Water Co); Rick Robillard, P.E. (Tahoe Keys Water Co.); Paul Nielsen (Tahoe Regional Planning Agency); Michelle Sweeney (Allegro Communications); Christina Boggs-Chavica (California Department of Water Resources-NCRO); Ivo Bergsohn, P.G., HG (South Tahoe PUD); Shannon Cotulla, (South Tahoe PUD); Richard Solbrig (South Tahoe PUD); John Thiel (South Tahoe PUD); Starlet Glaze (South Tahoe PUD) Harold Singer (public); Sachi Itagaki (Kennedy Jenks-Via Teleconference).

BASIN MANAGEMENT OBJECTIVES:

Ivo opened the meeting with a brief explanation of the workshop objectives.

1. Maintain a sustainable long-term groundwater supply.
2. Maintain and protect groundwater quality.
3. Strengthen collaborative relationships with local water purveyors, governmental agencies, businesses, private property owners and the public.
4. Integrate groundwater quality protection into local land use planning activities.
5. Assess the interaction of water supply activities with environmental conditions.
6. Convene an on-going Stakeholders Advisory Group (SAG) as a forum for future groundwater issues.
7. Conduct technical studies to assess future groundwater needs and issues.
8. Identify and obtain funding for groundwater projects.

WORKSHOP OBJECTIVES

OBJECTIVES

1. Learn about the progress of the on-going Off-Site Groundwater Investigation conducted for the former Lake Tahoe Laundry Works site (SL0601754315).

2. Learn about the findings from the 2017 TVS Basin Survey of Well Owners.

DISCUSSION

TVS Basin (6-5.01) - Open Forum

Ivo asked if there were any topics outside of the Agenda outline that anyone wanted to discuss now or bring up for another meeting.

- Shannon Cotulla reported that he had attended a meeting with EDCWA last week on their efforts to put together a water management and development plan for El Dorado County. They are looking at water resources in the Tahoe Basin as well as the West slope. The plan is to look at demand and existing supply to develop the program over the next 6 months. Stantec is the firm doing the work.

South Y Activity Updates

South Y Activity Updates

- former LTLW Off-Site Investigation (J. Brooks, LRWQCB)
- Jeff Brooks gave a slide presentation prepared by Brian Grey on what the responsible parties (RP), Lake Tahoe Laundry Works (LTLW), are doing with regards to their offsite investigation and remediation. (See Attached Presentation).

- All of the relevant documents and reports are available on GeoTracker for review.
- LRWQCB staff assigned to LTLW and the South Y PCE issues are Scott Ferguson, P.E., Division Manager; Jeff Brooks, P.G., Unit Chief of the Cleanup Investigation and Enforcement Unit; Brian Grey, P.G., Case Manager; Abby Cazier, P.E.
- Abby Cazier, P.E. will probably lead the SB445 effort once it gets funded. The Department of Financial Assistance is supposedly transferring funds to the Department of General Services who does the contracting for the State.
- PCE concentrations in shallow groundwater are lower on site and immediately downgradient from the site but that is not entirely surprising since LTLW has been doing remediation since 2010. PCE concentrations are still over the MCL level of 5 micrograms per liter (equivalent to 5 parts per billion (ppb)) that were put in the CAO as a delineation requirement.
- LRWQCB staff has been talking to LTLW about remaining levels of PCE contamination in their middle zone leaving the property. This is despite their on-site soil vapor extraction/air sparge (SVE/AS) system.
- Lahontan is relooking at some of the files for older cases that were closed to see if further contaminant investigation work is warranted at these sites.
- LTLW installed 3 new monitoring wells (MWs)with well pairs for shallow (30') and middle (50') zone testing. Testing behind Big O on Tucker showed high levels of PCE in groundwater back there are pretty hot (1580 ppb).
- On the shopping center property by the former LTLW showed Stage 1 Passive Vapor Soil Sampling Results in mass per sampler (nanograms per sampler units) . The highest PCE concentrations were found in samples collected in the main source area (Sample 9 at 10,095 nanograms per sampler) where the solvent truck unloaded, storm water drain inlets and outside the back door. Common areas for this type of business to dump waste.
- Ivo asked if this was evidence of LTLW dumping waste on the property. Jeff B. said yes.
- Lahontan has continued to tell the working parties to step out and step down when doing the groundwater assessment. They came back and said that they would like to try to understand what was going on historically and look at some of the historical MTBE remediation sites. Their raw conclusion were that they only affected the area where the remediation was going on and the groundwater is controlled by topography.
- Ivo asked if LTLW had generated any groundwater elevation maps as part of their historical assessment. Brian Grey has looked at the report but Jeff B. has not. It is available on GeoTracker.
- LTLW wants to do groundwater modeling but Lahontan as an agency wants to keep moving forward and stepping out. If LTLW wants to parallel that work with the modeling that would probably be fine as long as the project keeps moving on a timely schedule.
- LTLW is planning on doing the proposed locations for Phase III in February 2019. Right now they are focusing on up-gradient and cross-gradient transects.
- There has been some disagreement between LTLW and Lahontan regarding other potential sources, comingling and phasing and what that means. Lahontan's take has been that these are no reasons to stop moving forward. LTLW's has argued that they don't want to keep paying if there are other potential contributors. Lahontan will continue to investigate other parties but does not agree that this is a reason for extensive delays.
- They have access to the Lakeside Napa and a permit from the City for their work on Glorene. They also have access to Tucker Pond but it is full of water and frozen so that won't be done until in the Spring. Big O is currently denying access to their property so Lahontan may have to step in to assist with obtaining access.
- Jason B. advised that the City received a Public Records Request (PRR) from the RP for everything up gradient, including drainage and maintenance logs. In responding to the PRR it was determined that the City doesn't have good historical records of where the storm drains exit

the property. It would be good to find the preferential pathways as part of the process to complete the picture.

- LTLW has been told in writing that Comingling is not a reason to stop the current requirements of the court order. There may need to be an amendment or new order to enforce the order, but that would require upper management approval.
- The first major technical summary report is due by the end of March, 2019. This will be a good opportunity for everyone to comment on what is going on. Each individual comment will be taken under advisement but not necessarily responded to.
- Richard S. advised the group that the RP had sent a PRR to STPUD for a large number of maps and data of their system. While compiling the documentation they asked that STPUD clean the sewer lines and allow them to TV them. STPUD has declined to do this. (Following further discussion between the District and LRWQCB staff, the District later agreed to perform a sewer line survey as part of the RPs preferential pathway evaluation).
- A report (1997-1998) on the investigation of the STPUD sewer lines that was done to determine preferential pathways was found during the PRR response preparation. The work, managed by Ivo prior to him coming to work at STPUD, included coring and sampling. The report has been provided to the RP and copied to Brian G.
- The conclusion of the investigation was that the STPUD sewers are not preferential pathways.
- Jeff B. advised the group that Lahontan will ultimately make the decision on if the preferential pathway investigation is sufficient. He requested a copy of the STPUD report.

South Y Feasibility Study (S. Itagaki, KJC)

- The Feasibility Study Work Plan were finalized and submitted to the State Water Board as part of the grant agreement.
- KJC is Continuing to work on finishing the pre design investigation. They are fairly close to getting a draft done and out in January to the Technical Advisory Committee (TAC).
- A lot of time and effort in the last few months has gone towards advancing the understanding of the model and trying to use it to develop alternatives for modeling evaluation.
- Various modeling scenarios were discussed. The next phase of modeling will include simulations using future pumping rates and potential replacement well locations.
- KJC is also working with Lukins and Tahoe Keys to look at some possible replacement wells outside of the plume. They will continue to work to develop that model alternative but will need to verify that future pumping would not move the plume.
- Updates to follow regarding modeling results.

Discussion

2017 Survey of Well Owners Report

- Ivo advised the group that in 2017, as part of the outreach for the Groundwater Management Plan, STPUD did a well owner's survey.
  - There were a number of objectives for the survey, one of which was to reach out to private and small community well owners to advise them that STPUD was a Groundwater Sustainable Agency (GSA) and explain what that means to them.
  - Another of the objectives was to confirm, through a door to door survey, whether there was actually a well on the property or not and to understand how it was being used.
  - Once the complete technical report is complete it will be posted on the STPUD website.
- Michelle Sweeney from Allegro Communications Consulting gave a power point presentation on the finding of the TVS Groundwater Basin Survey of Well Owners Project (See Attached Presentation).
  - The survey team consisted of a 3 person team with boots on the ground and one person at STPUD fielding calls.
  - A letter was sent out initially explaining the survey to the well owners and requesting that people participate online. For those who did not participate on line a member of the team went door to door to walk-through the survey with the well owner.

- In many ways the survey was a big public relations project to open the doors of communication and let the well owners know that the groundwater is a shared resource.
- The survey was also meant to answer very fundamental questions such as how many private wells were actually out there.
- It is worth noting that when the other stakeholders have access to the report through STPUD's website that they should get the word out that it is a really great resource.
- It is also worth reminding people that groundwater is our primary source of drinking water in the Basin.
- There were 600 well locations identified in Tahoe Valley South. Of that number there were 375 respondents to the survey with 66% of those indicating that there were wells on the property.
- Group discussion was had regarding the potential of testing the private wells.
- There was potential interest from some of the well owners to be included in the SAG group and to receive additional information on groundwater management.

2018 Closing Items

- 2018 Basin Prioritization Update
  - Ivo gave an update on the 2018 preliminary results from the Basin Prioritization and how it affects our groundwater management going forward.
  - A letter sent to DWR after the last SAG meeting in response to the preliminary prioritization findings and a report from DWR are attached for review.
  - The latest from DWR is that we should hear something in early 2019 as far as whether we will continue as a Medium Priority Basin or will be lowered to a very low priority.
- 2014 GWMP Status
  - We should hear from DWR in early 2019 on whether the alternatives that were submitted at the end of 2016 are accepted or not.
- 2019 SAG
  - After we get word from DWR on the prioritization and the decision on the alternatives we will schedule another meeting to discuss how we move forward.
  - The feasibility study is scheduled to be completed by the middle of 2019 so we will have a recommended remedial action plan on the table as for as how to manage the groundwater contamination issue.
  - The next thing will be what our options are on how to actually implement the remedial actions.
  - Representation from private well owners is on the list of something to add to the SAG group next year.

Strategic Advisory Group
Tahoe Valley South Basin Groundwater Management Plan

Lahontan Water Board Update
Status of Lake Tahoe Laundry Works Investigations
December 21, 2018

Scott Ferguson, PE
Division Manager

Jeff Brooks, PG
Senior Engineering Geologist

Brian Grey, PG
Engineering Geologist

Abby Cazier, PE
Water Resource Control Engineer

Lake Tahoe Laundry Works Investigation Update

- Relevant Documents
- Completed Work
- Planned Work
- Tentative Schedule

Relevant Documents

Cleanup and Abatement Order R6T-2017-0022 Submittals

- *July 26, 2017 Groundwater Investigation Work Plan*
  - August 11, 2017 Notice of Incomplete Submittal with Request for Revised Work Plan
- *September 11, 2017 Revised Groundwater Investigation Work Plan*
  - September 15, 2017 Conditional Acceptance of Tasks (accepted Transect 1 activities)
  - February 1, 2018 Notice of Continued Non-Compliance
- March 19, 2018 *Amended Groundwater Investigation Work Plan*
  - August 22, 2018 Conditional Acceptance (required Preliminary Planning Report, Preferential Pathway Evaluation, and Progress and Planning Reports)

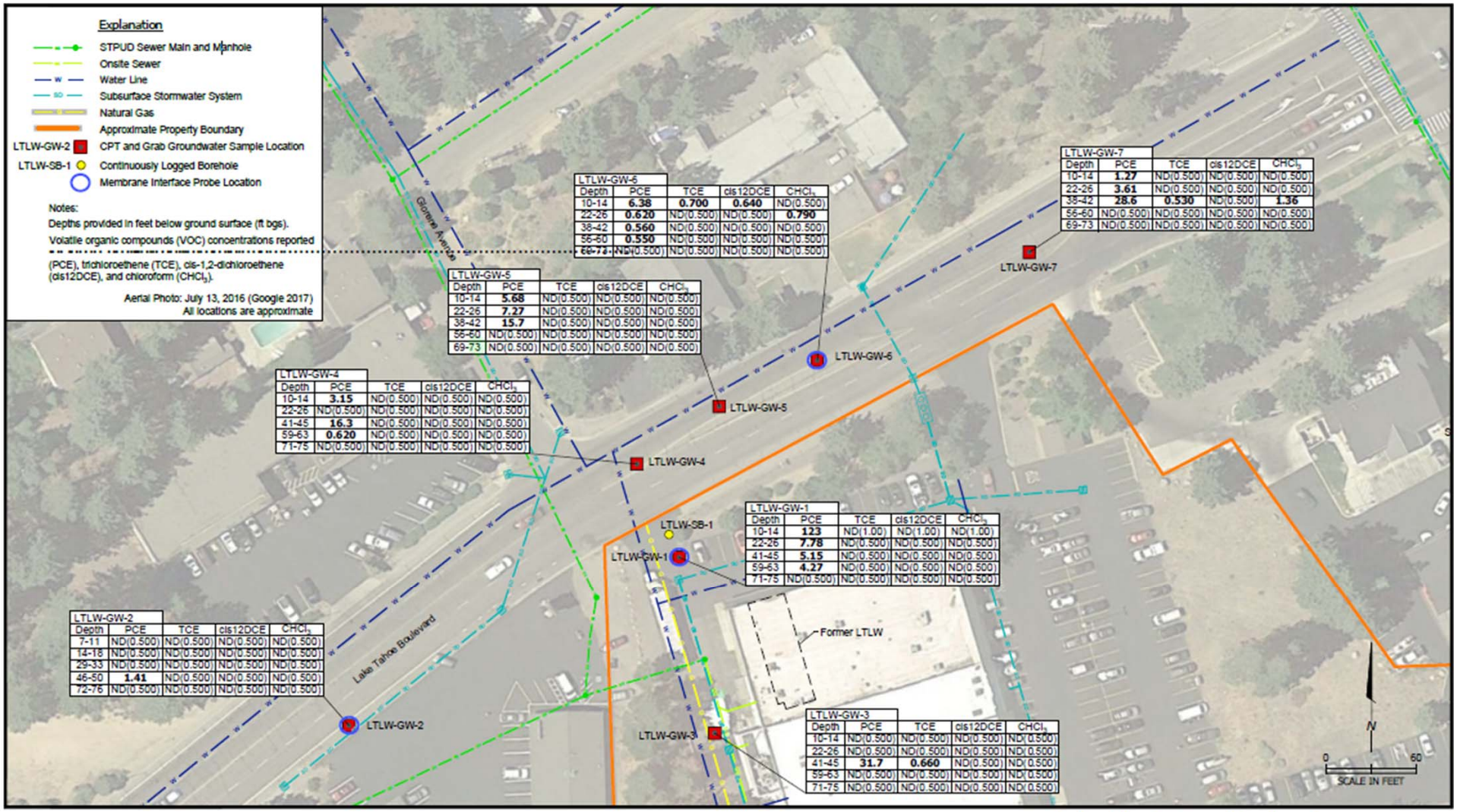
Relevant Documents (cont.)

Water Board's August 22, 2018 *Conditional Acceptance of March 19, 2018 Amended Groundwater Investigation Work Plan* required: (1) Preliminary Planning Report, (2) Preferential Pathway Evaluation, and (3)Progress and Planning Reports

LTLW Submittals:

- September 14, 2018 *Preliminary Planning Report and Progress and Planning Report Schedule* (revised by 10/1 document)
- September 28, 2018 *Preferential Pathway Evaluation Work Plan*
- October 1, 2018 *Revised Preliminary Planning Report and Progress and Planning Report Schedule*
- October through present - *Progress and Planning Reports Nos. 1-11*

Transect 1 Activities



LTLW-GW-6

Depth	PCE	TCE	cis12DCE	$CHCl_3$
10-14	**6.38**	**0.700**	**0.640**	ND(0.500)
22-26	**0.620**	ND(0.500)	ND(0.500)	**0.790**
38-42	**0.560**	ND(0.500)	ND(0.500)	ND(0.500)
56-60	**0.550**	ND(0.500)	ND(0.500)	ND(0.500)
69-73	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)

LTLW-GW-7

Depth	PCE	TCE	cis12DCE	$CHCl_3$
10-14	**1.27**	ND(0.500)	ND(0.500)	ND(0.500)
22-26	**3.61**	ND(0.500)	ND(0.500)	ND(0.500)
38-42	**28.6**	**0.530**	ND(0.500)	**1.36**
56-60	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)
69-73	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)

LTLW-GW-5

Depth	PCE	TCE	cis12DCE	$CHCl_3$
10-14	**5.68**	ND(0.500)	ND(0.500)	ND(0.500)
22-26	**7.27**	ND(0.500)	ND(0.500)	ND(0.500)
38-42	**15.7**	ND(0.500)	ND(0.500)	ND(0.500)
56-60	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)
69-73	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)

LTLW-GW-4

Depth	PCE	TCE	cis12DCE	$CHCl_3$
10-14	**3.15**	ND(0.500)	ND(0.500)	ND(0.500)
22-26	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)
41-45	**16.3**	ND(0.500)	ND(0.500)	ND(0.500)
59-63	**0.620**	ND(0.500)	ND(0.500)	ND(0.500)
71-75	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)

LTLW-GW-1

Depth	PCE	TCE	cis12DCE	$CHCl_3$
10-14	**123**	ND(1.00)	ND(1.00)	ND(1.00)
22-26	**7.78**	ND(0.500)	ND(0.500)	ND(0.500)
41-45	**5.15**	ND(0.500)	ND(0.500)	ND(0.500)
59-63	**4.27**	ND(0.500)	ND(0.500)	ND(0.500)
71-75	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)

LTLW-GW-2

Depth	PCE	TCE	cis12DCE	$CHCl_3$
7-11	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)
14-18	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)
29-33	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)
46-50	**1.41**	ND(0.500)	ND(0.500)	ND(0.500)
72-76	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)

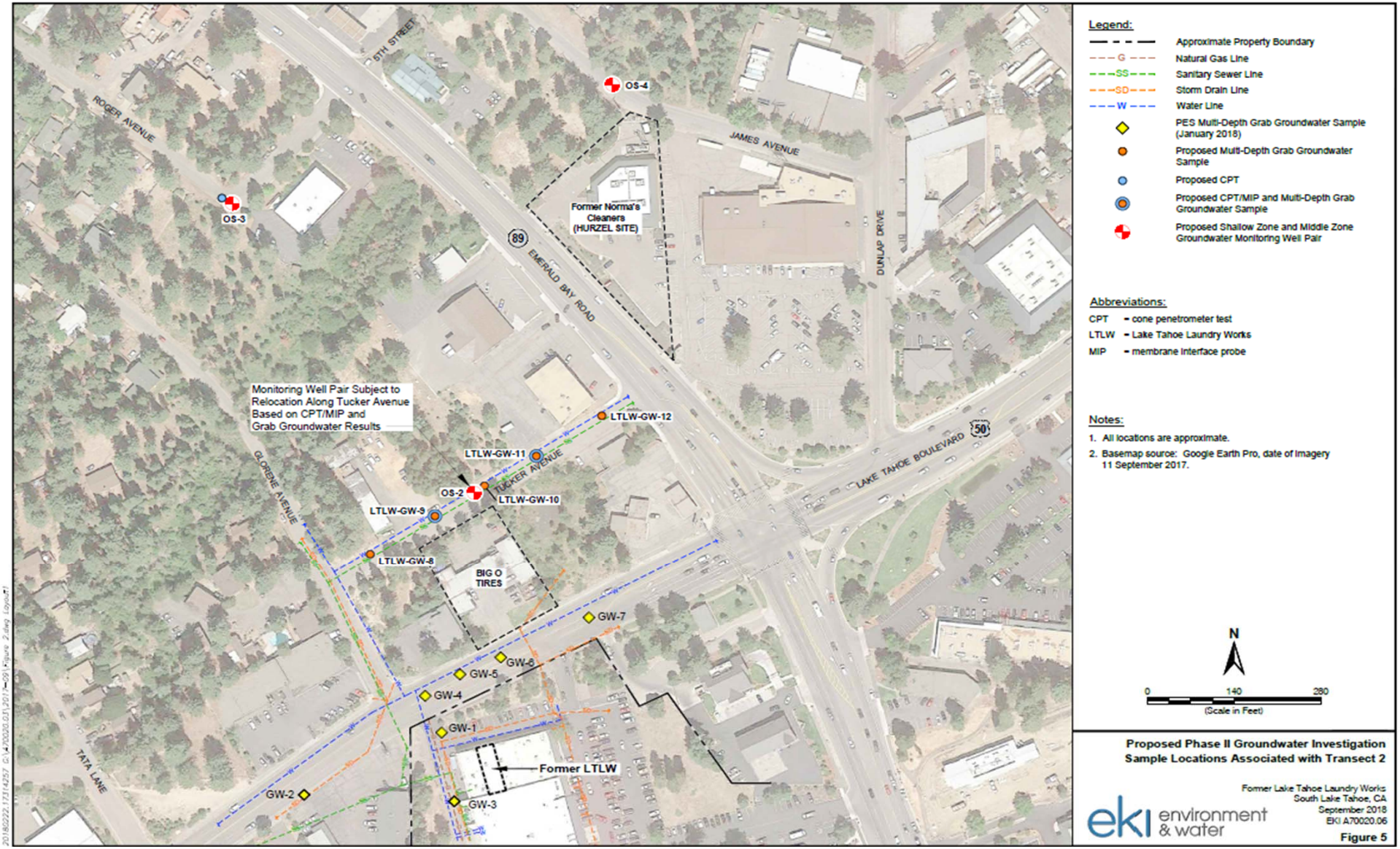
LTLW-GW-3

Depth	PCE	TCE	cis12DCE	$CHCl_3$
10-14	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)
22-26	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)
41-45	**31.7**	**0.660**	ND(0.500)	ND(0.500)
59-63	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)
71-75	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)

Results of Phase I (Transect 1) Groundwater Investigation
Data Transmittal Report
Lake Tahoe Laundry Works
South Lake Tahoe, California

PLATE
1

Transect 2 and OS Well Locations

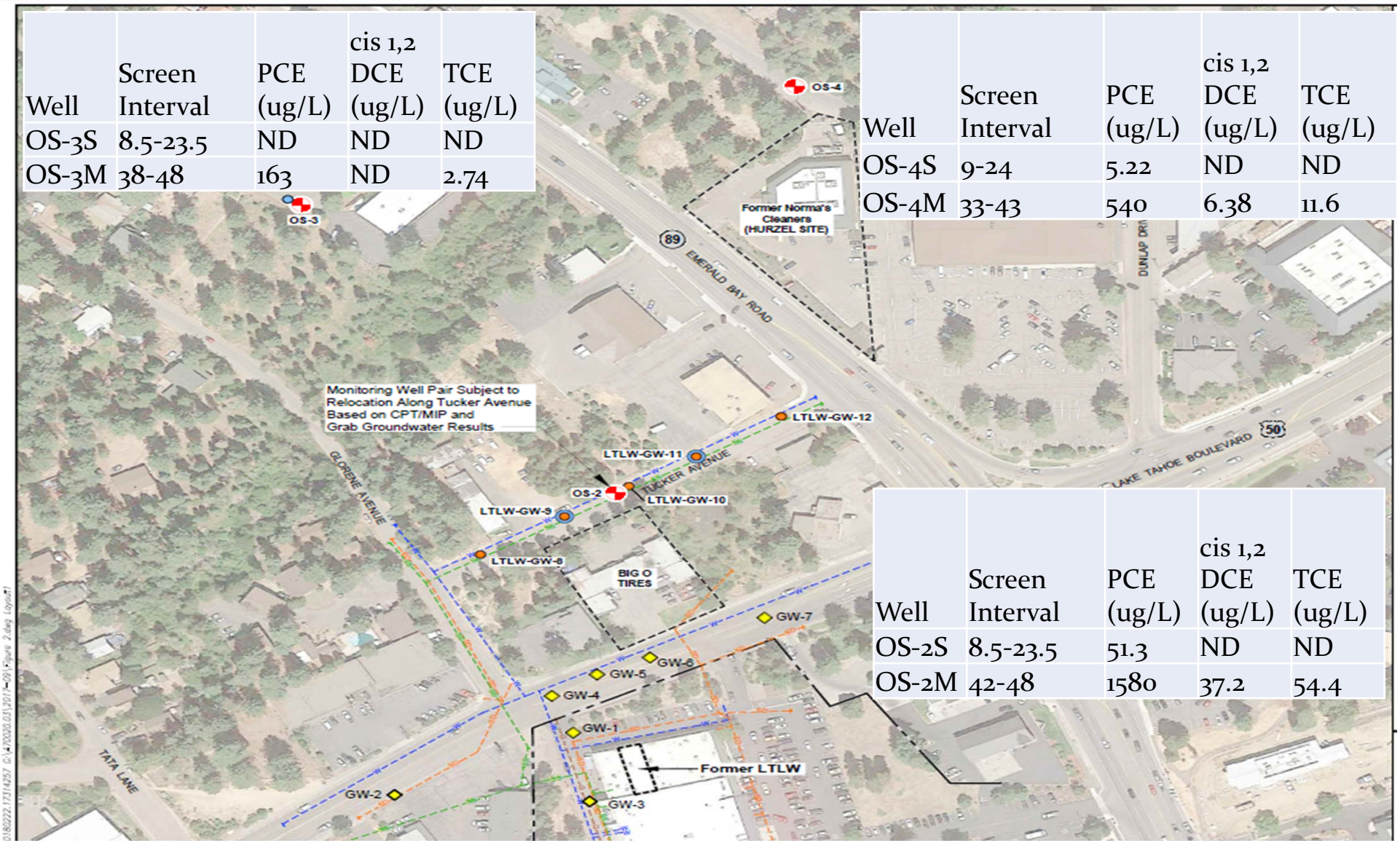


OS Well Sampling Results

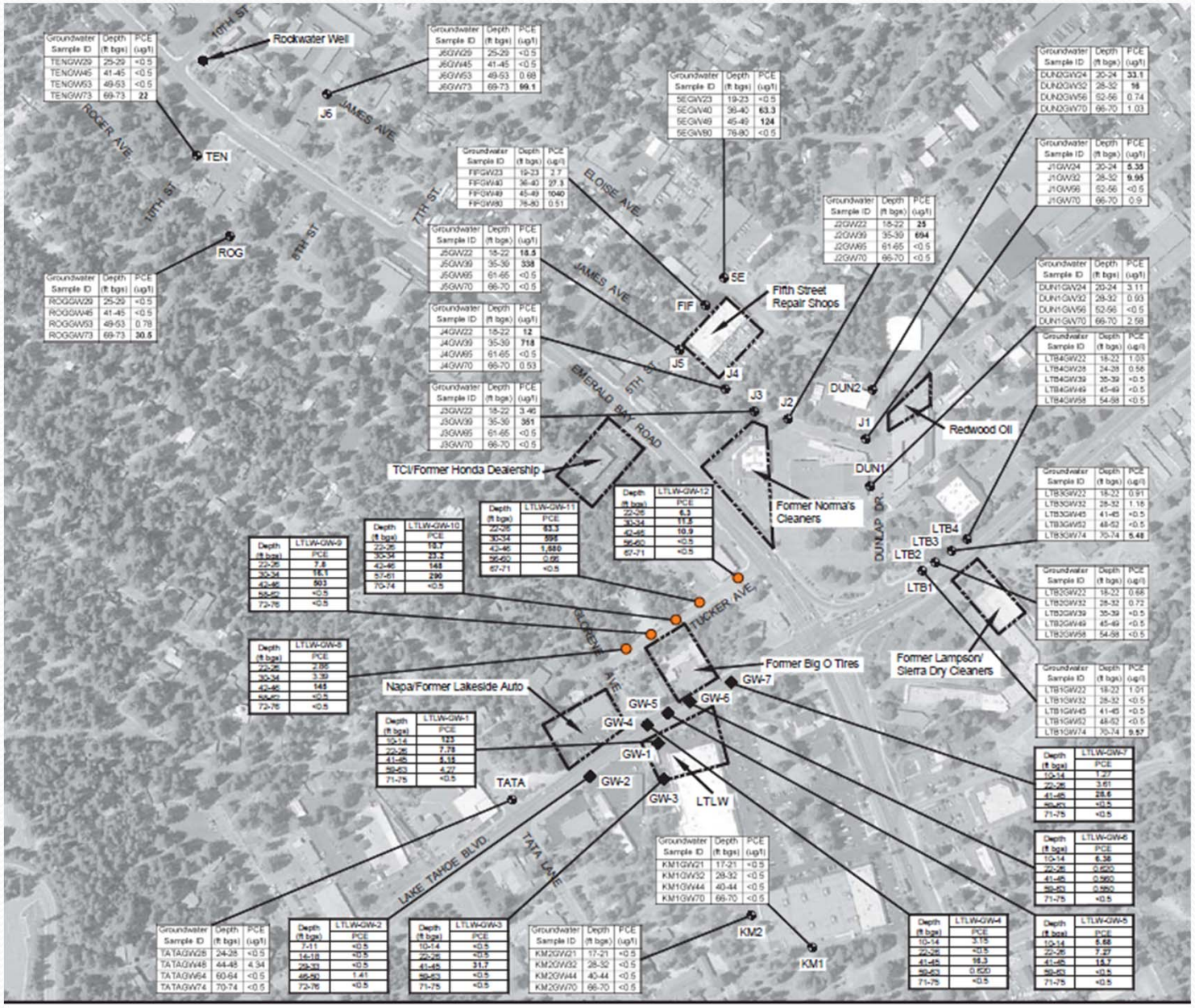
Well	Screen Interval	PCE (ug/L)	cis 1,2 DCE (ug/L)	TCE (ug/L)
OS-3S	8.5-23.5	ND	ND	ND
OS-3M	38-48	163	ND	2.74

Well	Screen Interval	PCE (ug/L)	cis 1,2 DCE (ug/L)	TCE (ug/L)
OS-4S	9-24	5.22	ND	ND
OS-4M	33-43	540	6.38	11.6

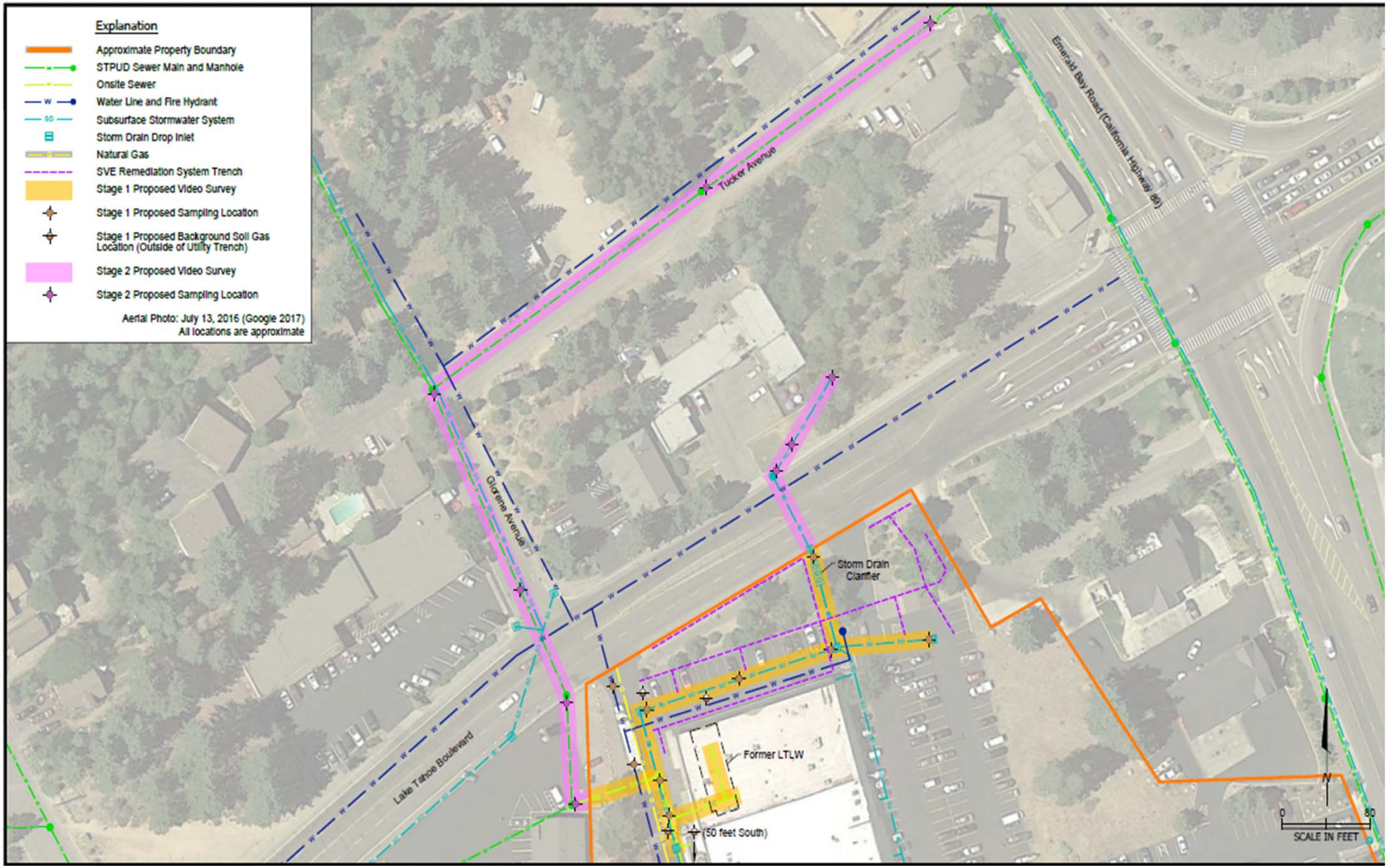
Well	Screen Interval	PCE (ug/L)	cis 1,2 DCE (ug/L)	TCE (ug/L)
OS-2S	8.5-23.5	51.3	ND	ND
OS-2M	42-48	1580	37.2	54.4



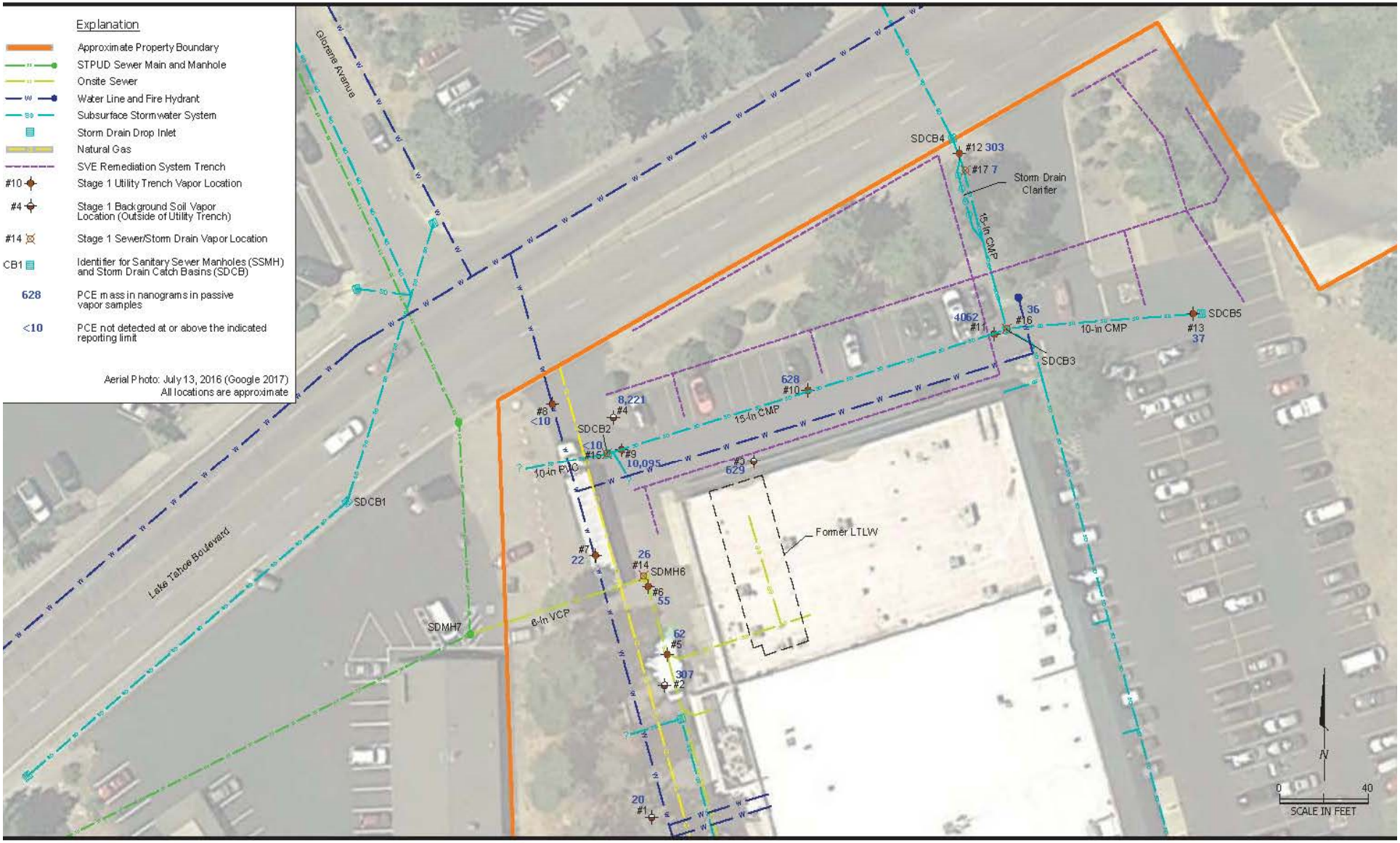
Discrete Depth Sampling Results



Preferential Pathway Evaluation



Stage 1 Passive Vapor Sampling Results

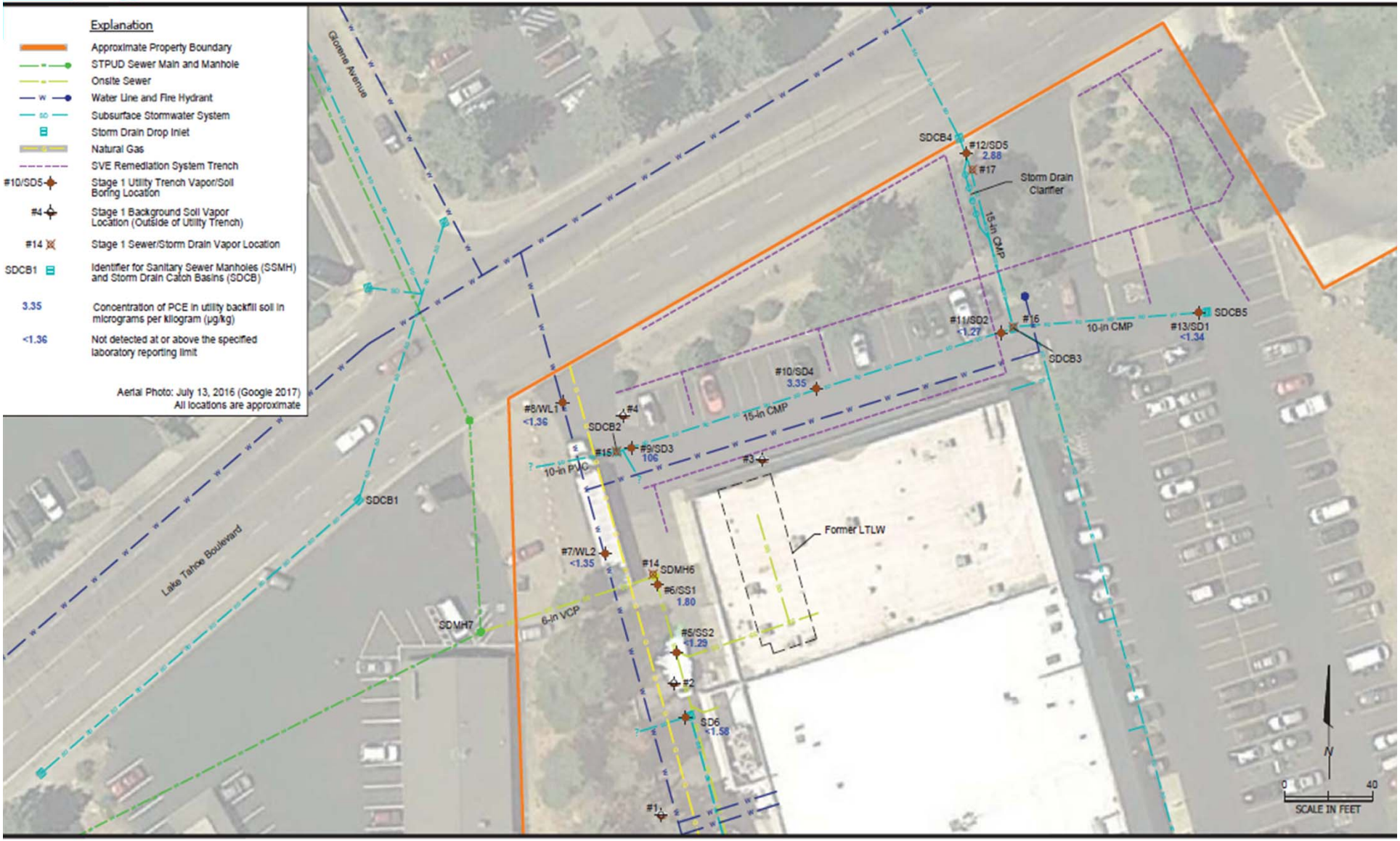


PES Environmental, Inc.
Engineering & Environmental Services

Results of Stage 1 Passive Vapor Survey
Preferential Pathway Evaluation
Lake Tahoe Laundry Works
South Lake Tahoe, California

PLATE 1

Stage 1 Soil Sampling Results



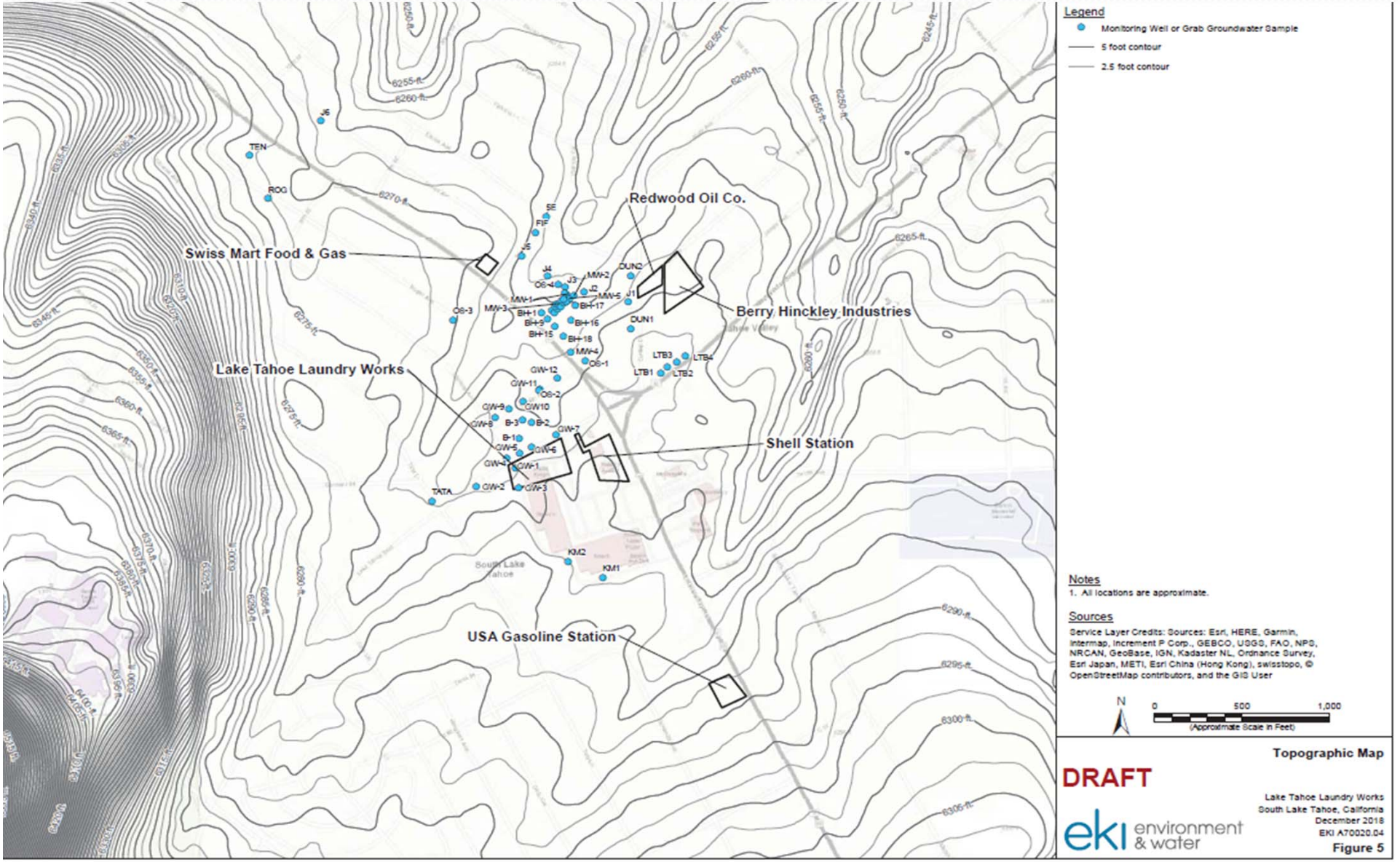
PES Environmental, Inc.
Engineering & Environmental Services

Stage 1 Sample Location Map
Preferential Pathway Evaluation
Lake Tahoe Laundry Works
South Lake Tahoe, California

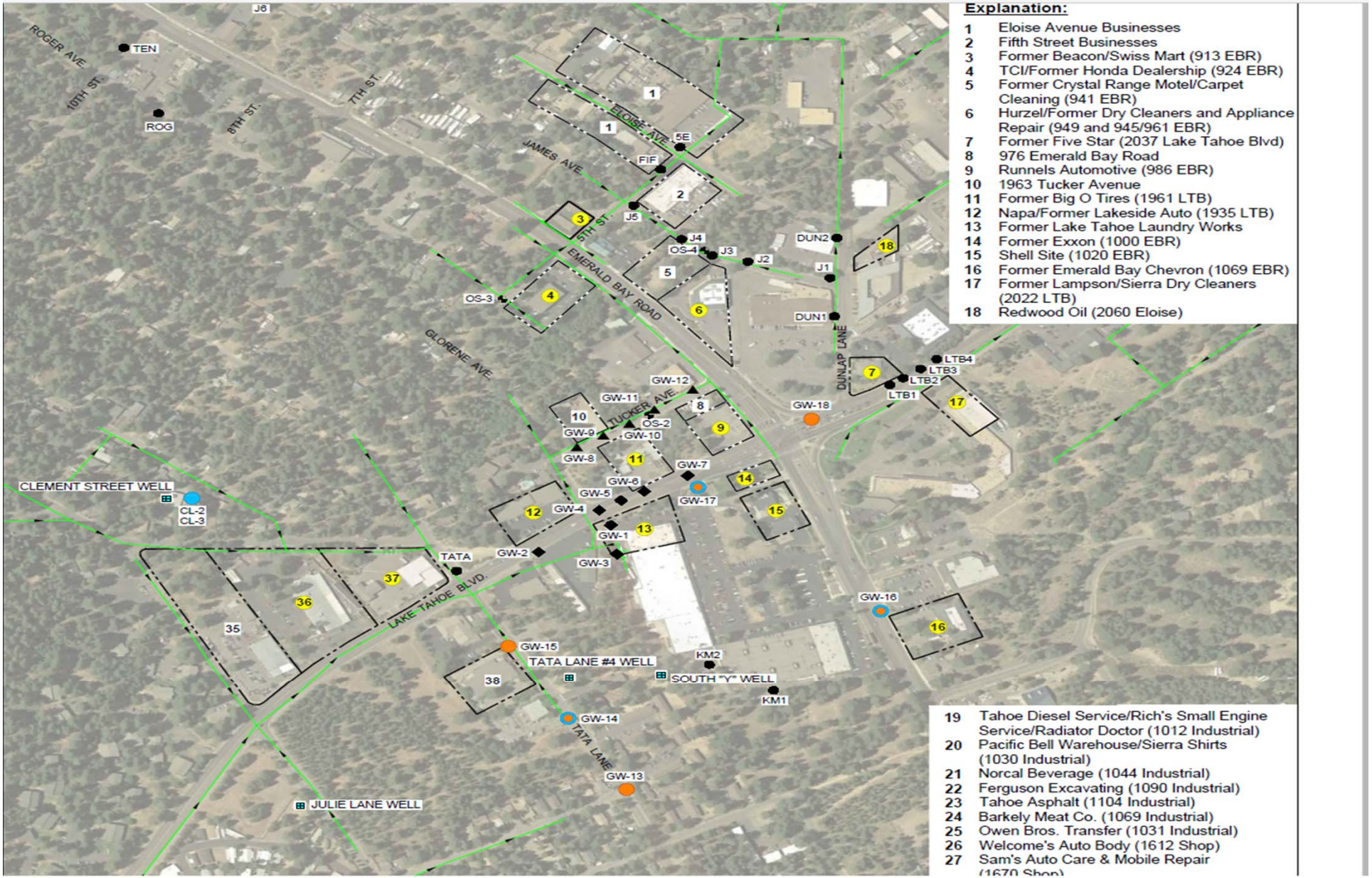
PLATE
1

RDG

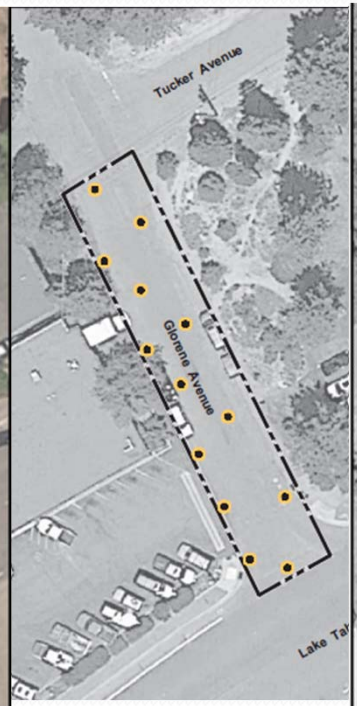
Historical Groundwater Elevation Assessment



Proposed "Phase III" Locations



Source Area Investigation
Passive Soil Gas Locations
Access Granted



Source Area Investigation
Passive Soil Gas Locations
Access Pending

Planned Work

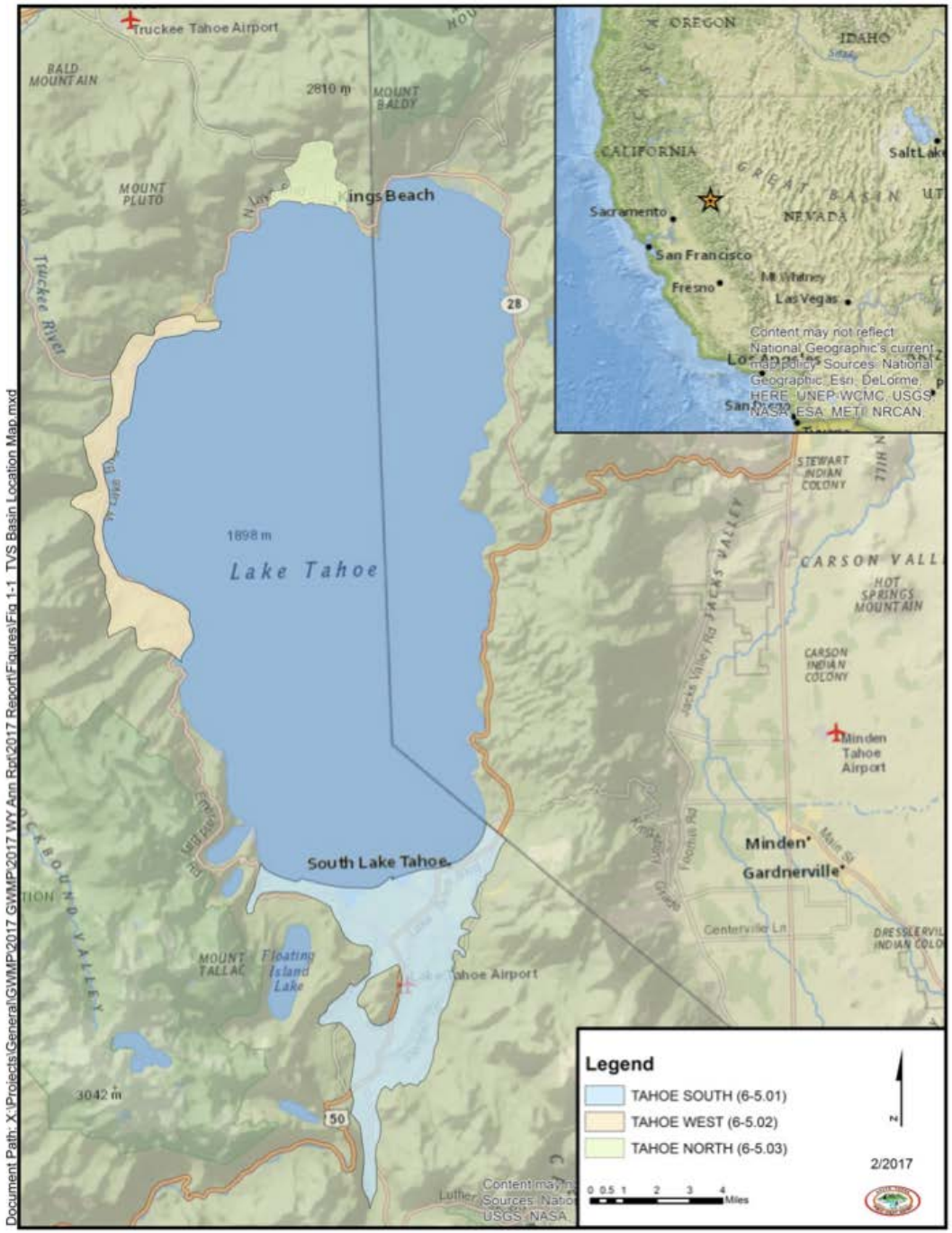
- "Phase III" lateral and up-gradient investigation
  - CPT contractor scheduled for February 4, 2019
- Step down/step out investigation
  - No field work currently scheduled
- Stage 2 passive soil gas, soil and groundwater sampling
  - On hold; pending access
- Source area/data gap passive soil gas evaluations
  - Glorene Avenue- January 2-4, 2018
  - Lakeside Napa- January 2-4, 2018
  - Tucker Basin- pending site conditions
  - Big O- pending site access
- First summary technical report is due at the end of March 2019

Questions?

Tahoe Valley South Groundwater Basin Survey of Well Owners

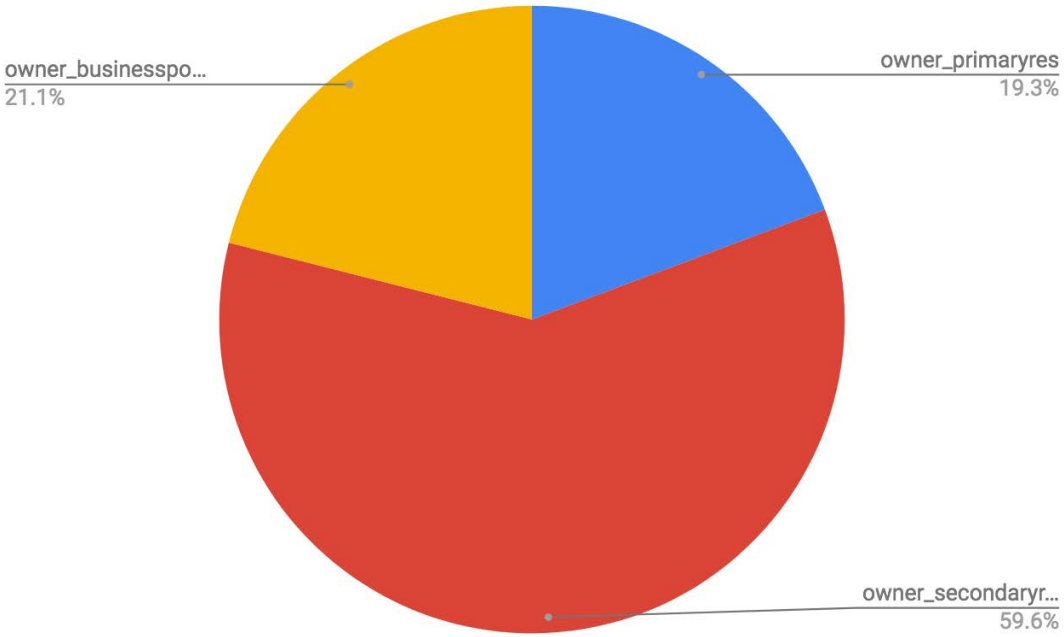
How many private wells?

- Survey of well owners about private wells of Tahoe Valley South
- Groundwater, primary source of drinking water
- Vast majority of drinking water provided by public water systems
- Meanwhile, more than 600 private wells, indicated in government databases, potentially draw from this groundwater basin as well



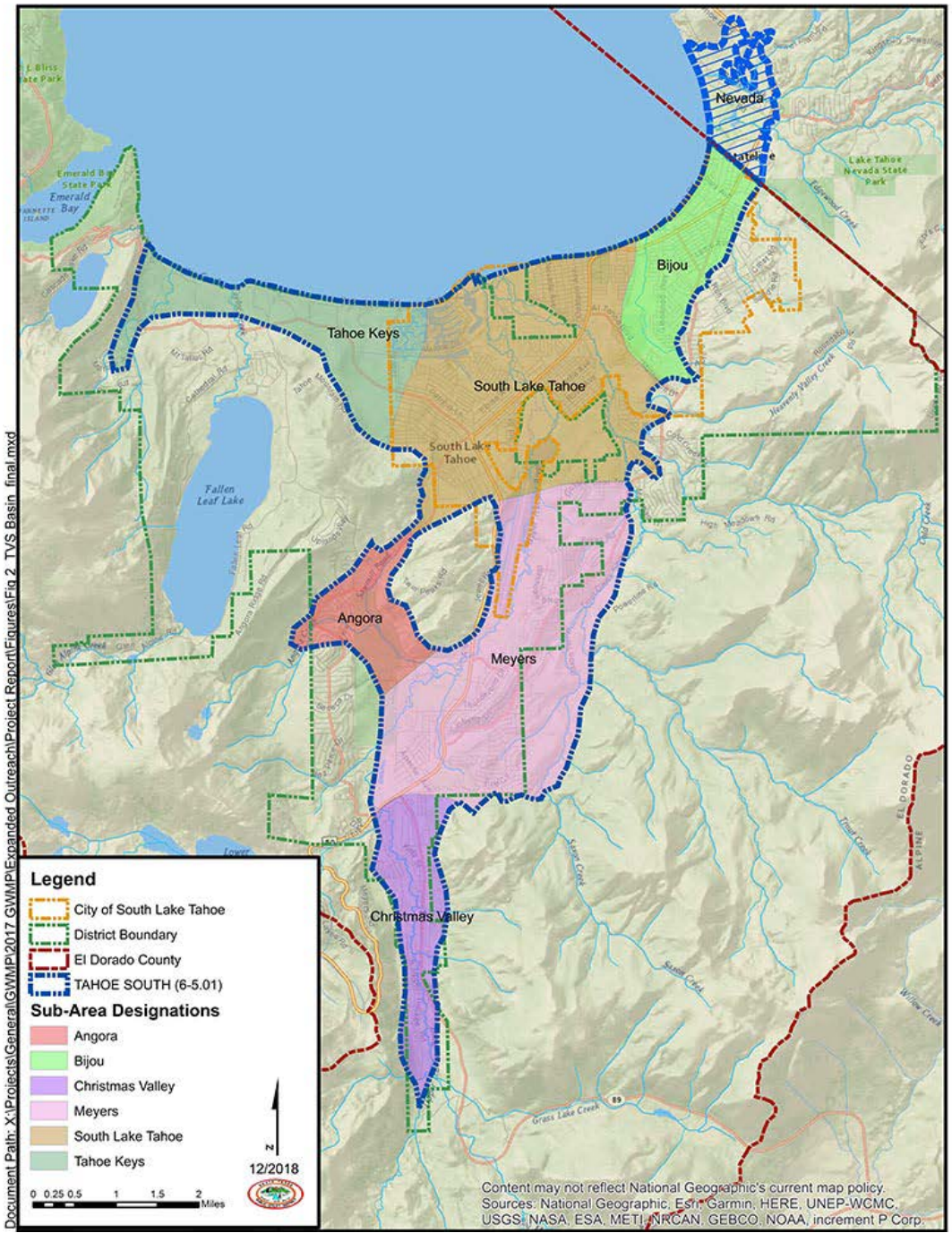
Private well property ownership type

- Example from Bijou Sub-area



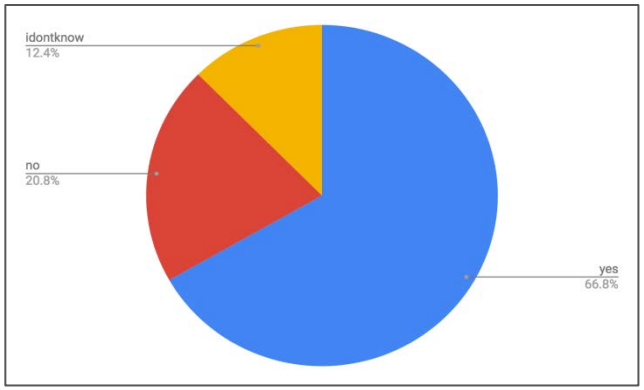
Six geographic sub-areas

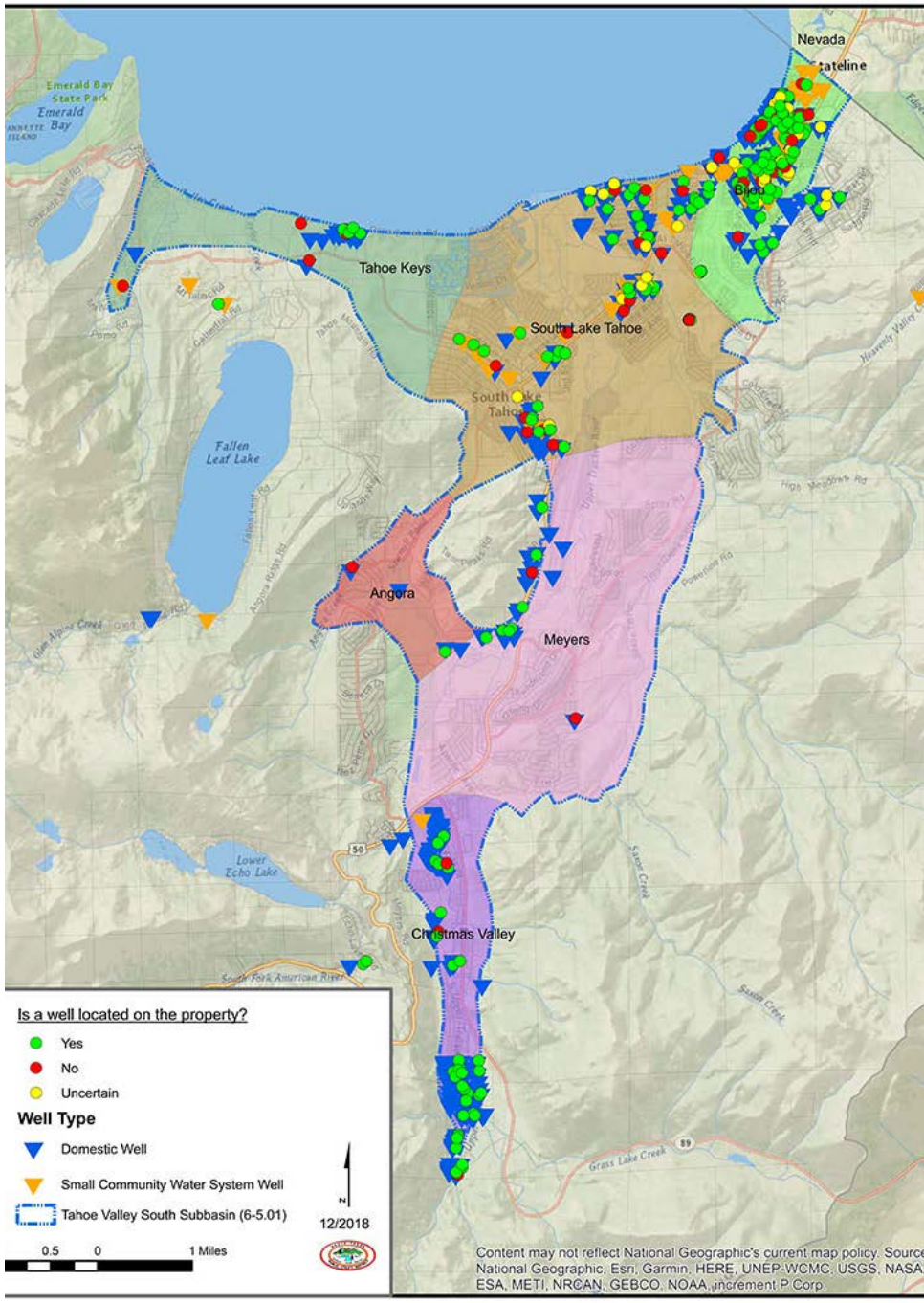
1) Christmas Valley
2) Meyers
3) Angora
4) Tahoe Keys
5) South Lake Tahoe
6) Bijou



Is a well located on the property?

- 66% of 375 (248) respondents indicate there is a well on the property
- 20% (75) indicate there is no well
- 12% (45) indicate they do not know

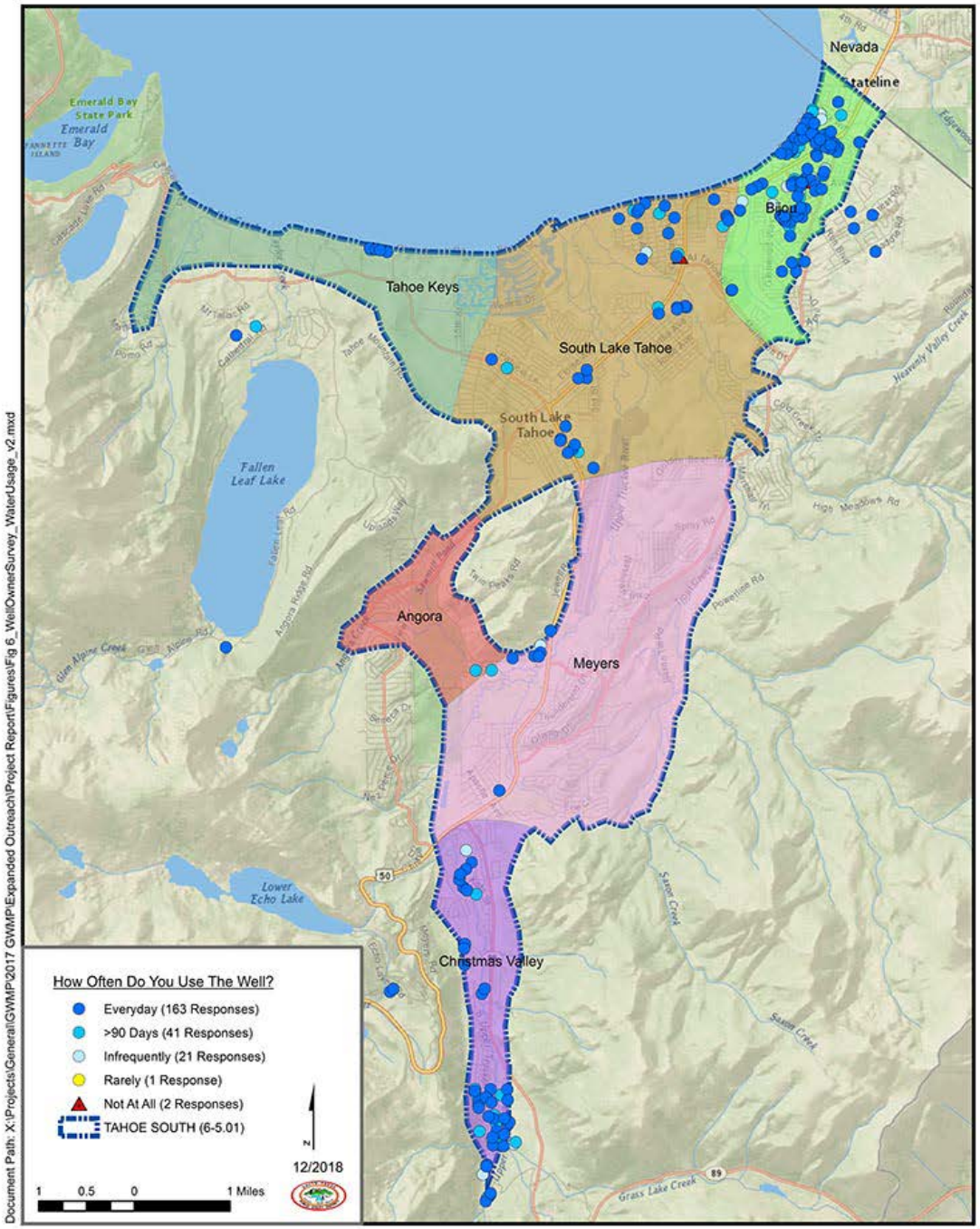




How often do you use the well?

- 163 respondents indicate the well is used in an everyday capacity

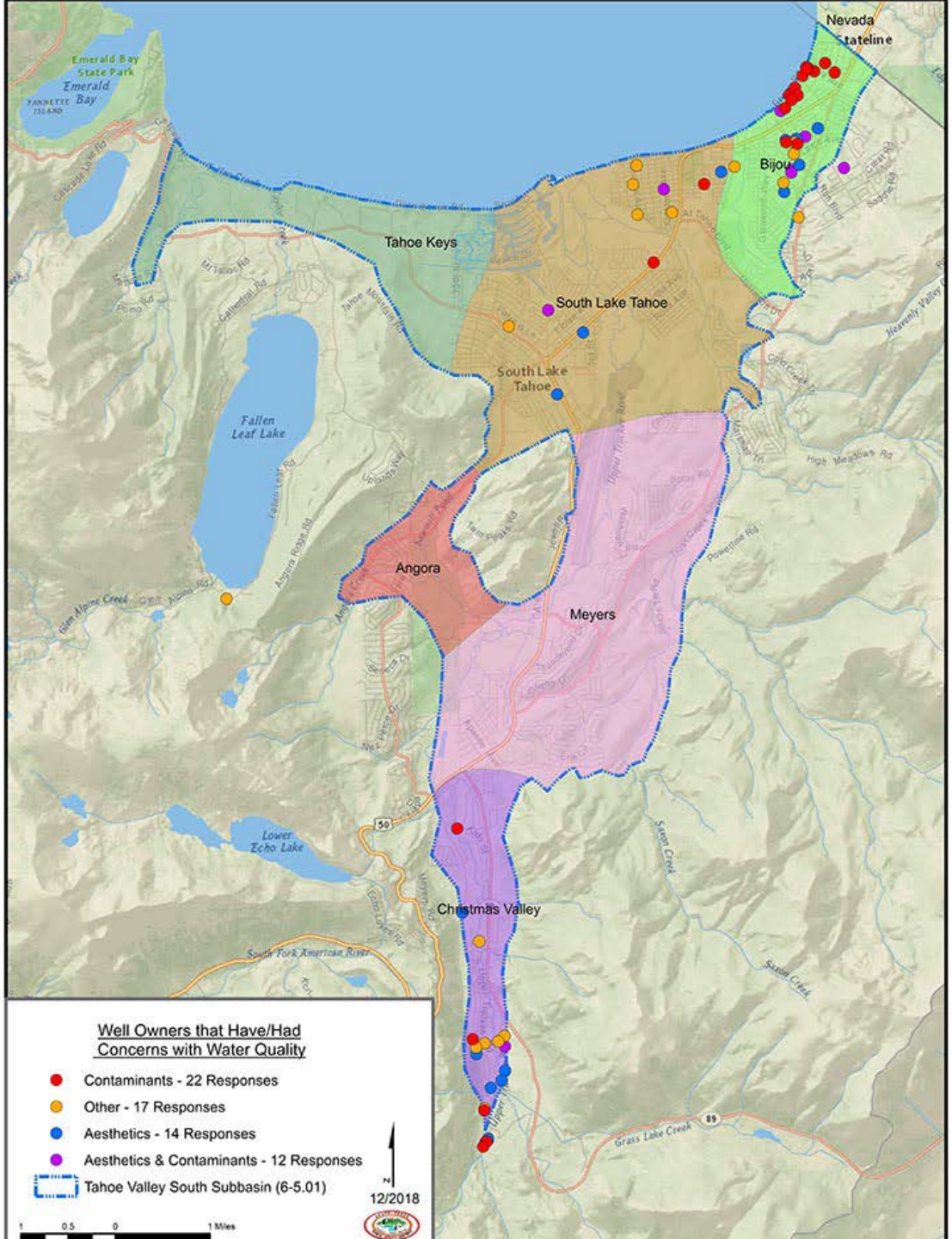
- 41 respondents indicate the well is used “more than 90 days” in a year



Well owner water quality concerns

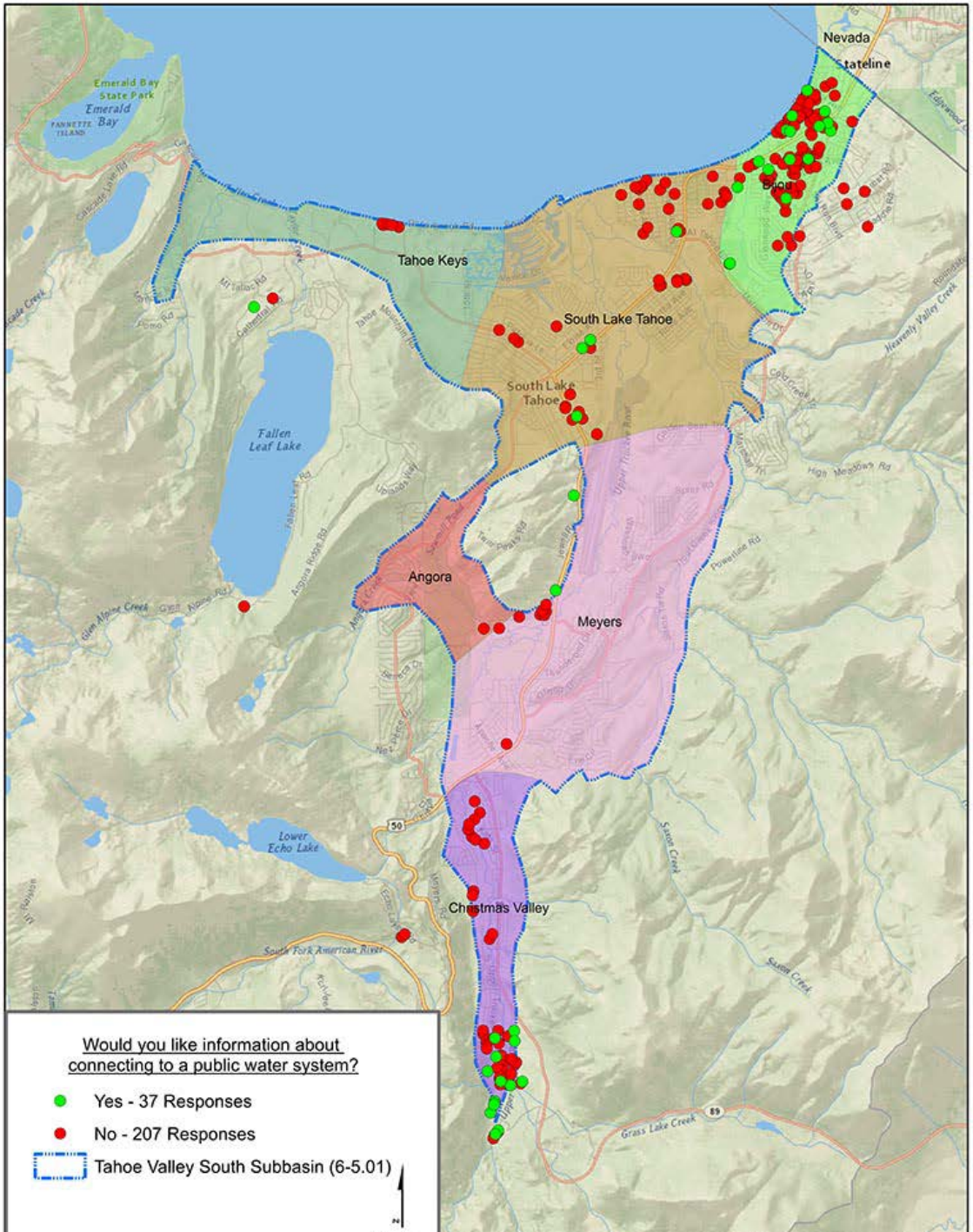
Private wells owners reporting concerns about water quality mention

- contaminants
- color
- Taste
- odor



Information about connection

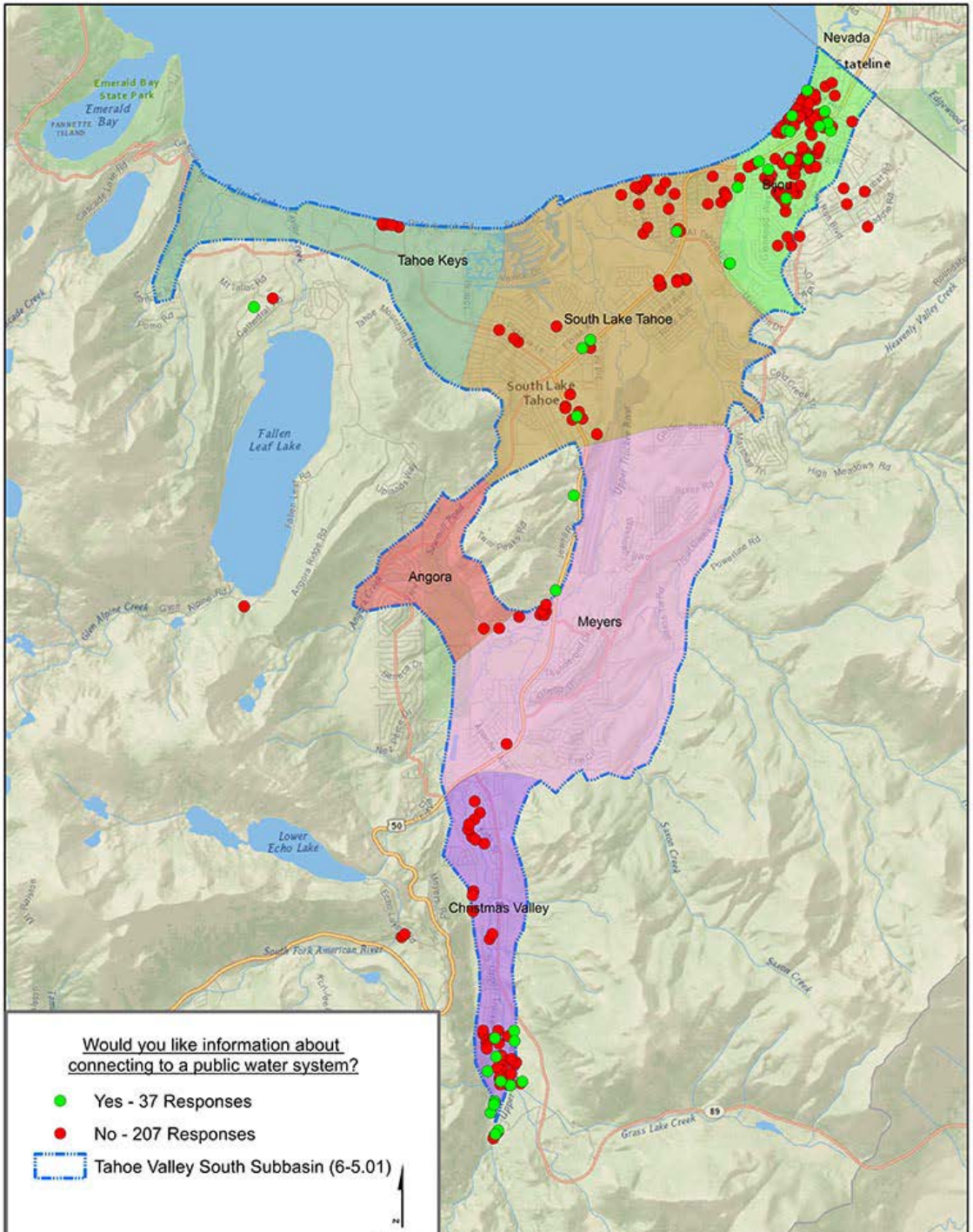
- 37 respondents would like information about connecting to a public water system



Potential Strategic Advisory Group Participation

- What sort of contributions will be looked for from private well owner participation?

- What can SAG participation offer private well owners?



Recommendations

TVS Groundwater Basin has sufficient groundwater but the resource is **not immune to pollutants, spared from drought or exempt from flood**, according to studies that informed the TVS Basin Groundwater Management Plan. Consistent with water resource stewardship South Tahoe Public Utility District espouses and with Sustainable Groundwater Management Act principles, the following recommendations center on **building groundwater stewardship culture and incorporating social, institutional and resource resilience into TVS Basin groundwater management.** As the TVS Basin Management Objectives underscore; a robust, communicative, informed and proactive groundwater community can serve as a foundation for local control and management of groundwater resources. The primary objective is to **"maintain and protect groundwater quality"**. Each of the following recommendations points to specific actions consistent with this primary objective.

Recommendations

1) Create capacity within the groundwater community to make technical support available to private well owners.

2) Complete assessment of private well status.

3) Assess risk and benefit.

4) Cultivate capacity to create and maintain collaborative ties in the groundwater community.

5) Communicate with private well owners.

6) Collaborate with national and state programs that support source water protection.

7) Share survey findings with Tahoe Basin partner agencies.

AGENDA

DATE	Friday, December 21st, 1:30 PM – 4:30 PM
LOCATION	South Tahoe Public Utility District Board Room, 1275 Meadow Crest Drive, South Lake Tahoe, CA
STAKEHOLDER ADVISORY GROUP LIST	Ken Payne, P.E., (El Dorado County Water Agency); Robert Lauritzen, P.G., Karen Bender, REHS, RD (El Dorado County -EMD); Jason Burke (City of South Lake Tahoe); Scott Carroll (CA Tahoe Conservancy); Brian Grey, P.G. (Lahontan Regional Water Quality Control Board); Rebecca Cremeen (TRPA); Joey Keely, Nicole Bringolf (USFS – LTBMU); Bob Loding (Lakeside Park Water Co.); Jennifer Lukins (Lukins Brothers Water Co); Rick Robillard, P.E. (Tahoe Keys Water Co.); Harold Singer (Community Rate Payer); John Thiel and Ivo Bergsohn, P.G., HG (South Tahoe PUD)
MEETING HOST	Ivo Bergsohn (South Tahoe PUD)
GO TO MEETING	https://global.gotomeeting.com/join/509825389 Call-In: 1(669) 224-3412; Access Code: 509-825-389

BASIN MANAGEMENT OBJECTIVES (BMO)

1. Maintain a sustainable long-term groundwater supply.
2. Maintain and protect groundwater quality.
3. Strengthen collaborative relationships with local water purveyors, governmental agencies, businesses, private property owners and the public.
4. Integrate groundwater quality protection into local land use planning activities.
5. Assess the interaction of water supply activities with environmental conditions.
6. Convene an on-going Stakeholders Advisory Group (SAG) as a forum for future groundwater issues.
7. Conduct technical studies to assess future groundwater needs and issues.
8. Identify and obtain funding for groundwater projects.

WORKSHOP OBJECTIVES

OBJECTIVES

1. Learn about the progress of the on-going Off-Site Groundwater Investigation conducted for the former Lake Tahoe Laundry Works site (SL0601754315).
2. Learn about the findings from the 2017 TVS Basin Survey of Well Owners.

SEE REVERSE FOR AGENDA

AGENDA

Time	Description	
1:30	**Welcome and Self-Introductions**	**Round Robin**
1:40	**TVS Basin (6-5.01) - Open Forum** **Opportunity for members to briefly raise topics within the subject matter of the SAG and not listed on the Agenda.**	**Round Robin**
1:50	**South Y Activity Updates** • former LTLW Off-Site Investigation (J. Brooks, LRWQCB) • South Y Feasibility Study (S. Itagaki, KJC) • Discussion	**SAG**
2:30	**Break**	
2:45	**2017 Survey of Well Owners Report** • Findings • Recommendations • Discussion	**M. Sweeney, Allegro Communications**
4:00	**2018 Closing Items** • 2018 Basin Prioritization Update • 2014 GWMP Status • 2019 SAG	**SAG**
4:20	**Adjourn**	

Tahoe Valley South Subbasin (6.5.01) Groundwater Management Plan
MEETING NOTES
Tuesday, October 9, 2018 1:30-4:30 p.m.
Location: 1275 Meadow Crest Drive, South Lake Tahoe CA

ATTENDEES:

Patricia Sussman for Ken Payne, P.E., (El Dorado County Water Agency); Karen Bender (via phone), REHS, RD (El Dorado County -EMD); Jason Burke (City of South Lake Tahoe); Scott Carroll (CA Tahoe Conservancy); Brian Grey, P.G. (Lahontan Regional Water Quality Control Board); Jeff Brooks (Lahontan Regional Water Quality Control Board); Bob Loding (via phone) (Lakeside Park Water Co.); Jennifer Lukins (Lukins Brothers Water Co); Rick Robillard, P.E. (Tahoe Keys Water Co.); Harold Singer (Community Rate Payer); Ivo Bergsohn, P.G., HG (South Tahoe PUD); Shannon Cotulla, (South Tahoe PUD); Richard Solbrig (South Tahoe PUD); Harold Singer (public); Sachi Itagaki (Kennedy Jenks); Gary Kvistad (via phone), Counsel (Brownstein Hyatt Farber Schrek);

BASIN MANAGEMENT OBJECTIVES:

Ivo opened the meeting with a brief explanation of the workshop objectives.

1. Maintain a sustainable long-term groundwater supply.
2. Maintain and protect groundwater quality.
3. Strengthen collaborative relationships with local water purveyors, governmental agencies, businesses, private property owners and the public.
4. Integrate groundwater quality protection into local land use planning activities.
5. Assess the interaction of water supply activities with environmental conditions.
6. Convene an on-going Stakeholders Advisory Group (SAG) as a forum for future groundwater issues.
7. Conduct technical studies to assess future groundwater needs and issues.
8. Identify and obtain funding for groundwater projects.

WORKSHOP OBJECTIVES

1. Discuss the progress of on-going activities in response to the South Y Plume.
2. Discuss the Draft 2018 Basin Prioritization Basin Results for the TVS Basin. Looking for feedback and thoughts. Ranking lowered to a Very Low Priority. We need to review and discuss and address questions Ivo sent out earlier.

DISCUSSION

TVS Basin (6-5.01) - Open Forum

Ivo asked if there were any topics outside the agenda outline that anyone wanted to discuss now or bring up for another meeting. There were none.

South Y Activity Updates

Ivo ran through South Y Feasibility study

We are currently working under Prop 1 groundwater cleanup grant with State Water Board. We are conducting predesign investing to determine the best way to provide hydraulic control and removal of PCE from groundwater.

Ivo briefly described the slides provided in the meeting packet:

- Major Milestones COMPLETED list.
- Predesign Investigation Objectives.
    - Assess vertical extent of contamination;
    - Collect water quality and engineering information useful for design.

Drilling test hole and logging from ground surface to depth (150'). NOTING aquitards that subdivide Section into zones (3 aquitards); the upper zones is where most of contamination is found (Zone B and Upper Zone C). The lower aquitard is believed to be a regional feature (94'-100') which locally separates the contaminated upper zones from the lower most zone (Zone D).Trace amounts of TCE was detected in Zone D (secondary by-

product of PCE degradation). . Two shallow test wells were designed and constructed for use during aquifer testing and possible future use as shallow extraction wells.

Ivo ran through a series of slides providing background and data for findings from our investigative work to date.

Baseline sampling was completed in May to provide contemporaneous PCE water quality data for South Y Area. These were supplemented by water quality monitoring results provided by LBWC and TKWC. Surprising results from this sampling were the high concentrations (60 ppb) detected in samples collected from LBWC #5.

KJC developed initial contour plot showing the highest concentrations of PCE detected in groundwater samples collected from shallow wells (<100' depth) between 2016 – 2018. District and KJC are working to get this water quality data incorporated into the South Y PCE groundwater model.

Another item reflected in the contour map; is detail of plume geometry; this is not reflected in the groundwater model. District and KJC will be looking to see if this level of detail may be present in the updated model for the 2016-2018 periods. The contour map also showed high concentrations of PCE along the west side of the map which decrease in concentration eastward back toward the center of the contaminant plume. This could be an area for further investigation

Contours help us define locations for putting together remedial alternatives to address the mid-plume regions to match what we see in the field rather than relying on the models doing that for us.

Another thing we did as part of the predesign investigation was to update well survey and shared that information with the Regional Board. We are working with El Dorado County to identify different wells near or within the plume. We have identified names, addresses and parcel numbers for these wells to notify well owners of the potential for water quality contamination through this area and need for water quality testing, if well is currently used for drinking water Results of this well testing could then be used to supplement the water quality data used for plume delineation, notify well owners of current well water quality and verify the specific wells which are currently in-use.

Jason B. inquired if there were any regulatory requirements that required private well owners to have their wells tested? That is correct; also that may also be true for small water system wells regulated by the County, as they are not required to test for PCE. . Motel is under lower regulation than an apartment complex. They are only required to test for bacteria quarterly and nitrates (K. Bender, EDCEMD). Jason expressed that this makes it all that much more important that these private well owners get notification

Health and Safety top of list for importance. We have water well driller's reports on some of the private wells and know they may be at a depth penetrating the aquitard and serving as vertical conduits themselves for pathways for this contaminant to travel. Jen identified Jalapeno's restaurant and one private well located on Eloise or James as "active"—LBWC annually tests both of these wells and both have been non-detect for PCE contamination. A lot of the identified private wells are likely not active; LBWC crew have seen inactive wells at one site in a garage covered with plywood.

J. Lukins expressed concern that property owners may hesitate to acknowledge an existing well on their property; costs for possible well abandonment may be a funding issue. Ivo promised to send-out the current private well survey list to the SAG for comment.(Following the workshop, the South Y Area Wells List was sent to J. Lukins, R. Robillard, J. Burke and J. Brooks).

PDI Technical Report – currently working on completing the data analysis and preparing draft Report; hope to have this work completed by the end of October We would then circulate the draft report to for comments from the TAC by end of November.

Modeling Evaluation- currently working on prelim modeling runs and defining remedial alternatives.

LOOK AHEAD: list presented and discussed.

- TAC/SAG meeting set for 10/23, and by SAG meeting 3 some of the preliminary remedial alternatives will have been defined so they can be discussed with the group on the 23rd.
- One thing to do for groundwater analysis—would be helpful to coordinate collecting water levels: Tahoe Keys Wells, Lukins Bros Well 1 and Well 5, monitoring wells used in the predesign investigation, the test wells and groundwater elevations from nearby District wells in order to generate groundwater water level

elevation contours for the South Y Area. This is a large hole in the data, but we can easily address; we just need to schedule a specific day. Discussions ensued regarding scheduling this groundwater level data collection effort.

- SC raised concern about TCE as a breakdown of PCE and smaller molecular size. TCE being deeper, as it is a finer particle is it able to penetrate the deep aquitard more quickly than the PCE, are we doing any modeling to look at the decay rate since it appears to travel more easily, and is it a greater threat to contaminate other wells that have not been impaired. Have we done any evaluation on the TCE front as part of the feasibility study? Good question. Ivo: The model uses literature values for decay rates as default values. Decay could be removed from model in order to show worst-case scenario for contaminant plume extent. Second concern - plume character could change from a PCE to a TCE down gradient plume (SC). As this is not covered under the Feasibility Study, could this be included as a topic of investigation under the SB445 scope? BG indicated that this was a really good point, in terms of remedial alternatives analysis, and what will be done if things start to be reductively de-chlorinated, and what are potential effects. Right now data shows we are fighting a lot of that, we don't have high organics, and we have a highly oxygenated aquifer; but if things change or we do something different it could exacerbate the problem. JB raised issue of TCE vapors as a possible consequence of PCE degradation.

- Look ahead for second half of the project (refer to Slide Look Ahead)
- Public Workshop 3 in November and then roll out remedial alternatives that have been defined, roll out to the public for edification and explain where we are going and give idea how it fits together and will benefit us all.
- Fate transport model complete in January 2019
- Public Workshop 3 – February 2019
- Feasibility Study - March 2019
- Remedial Action Plan – May 2019
- Project Completion – July 2019

Water Suppliers' PCE Action Request - Handout (S. Cotulla)

- 72% of South Lake Tahoe's community water supply is in danger of contamination from this plume. Eye opening awareness! Prompted us to take a look at steps on back of sheet. Immediate and Interim Actions.
- Looking outside Feasibility Study work and work Lahontan is dong. We need to do something to protect our water supply. Lead us to put together a list of things, one being a Multi-Agency Emergency Response Plan (consisting of agencies affected by the plume). We are still working on those issues.
- Also put together a list of other needs such as 1) installation of sentinel wells between the plume and the uncontaminated wells, 2) well destruction program, Lukins and some deep residential wells, 3) zone testing on Tahoe Keys W#2 in order to determine contaminant depth at which PCE is entering the TKWC #2 Well, 4) Test hole at Colorado Court for potential water supply well location. Initially installed as a sentinel well, but constructed in such a way as to be a test well for identifying potential future water production at a public water supply well drilled at this location.
    - Colorado Court well – Scott Carroll indicated that he thought it wasn't feasible because it was in the 100 year flood plan (Scott Carroll). District is not aware of this constraint, but will look more closely at that.
    - District is preparing a detailed list prioritizing these actions down to which sentinel well we need to have happen first for consideration by Lahontan as part of their SB445 Investigation request.

Lahontan (B. Grey, J. Brooks)

- Since last meeting in December, as reminder we originally put in SB445 request for source area evaluation by 7-11 Shopping Center in relation to detections in the Rockwater well, etc. We expanded that scope of

work (upon request from SWRCB) to include more comprehensive investigation, vertical conduit evaluation, soil sampling, perimeter sentry well network, management and communication tools, etc. Written generally to allow us some flexibility so we can adapt, as currently uncertain what actions will be completed by responsible party. May – requested input from water purveyors; June After we got a consultant, solicited additional comments and another meeting to discuss scope of work and developing an accompanying cost estimate for funding. September meeting with SWRCB-DFA to discuss updated work scope and funding. October – received conceptual approval from the SB445 program. Final approval to follow shortly.

- Original consultant who developed cost estimate is not the consultant we will be using for this fiscal year. AECOM out of Sacramento will be taking the lead. They are the consultant associated with the SB445 special program and will be developing a more detailed scope of work and cost estimate based on the updated work scope provided by LRWQCB.
- Shannon indicated that the hope is to take some of these immediate action items and have them incorporated in the SB445 Program.
- There is a timing issue, but we were happy to see that some of these items lined up with the SB445 scope; focus is, in part, to not duplicate efforts, etc.
- Hopefully this will be an opportunity to relieve some of the financial burden that has been placed on the public.

Lukins Brothers Water Company (Jennifer Lukins)

- Good news is that all efforts at state level are helping move forward the applications. Currently they are working on getting the environmental and financial clearances and then will proceed to technical clearances. Then will move on the funding application.
- Optimistic for February or March 2019 funding, allowing for solicitation of Construction Bids.
- Also moving forward James Avenue Waterline project in the James and Patricia Avenues area.

Other Related Items

- Follow up meeting is scheduled with Patty Kouyomdjian next week (?) to further discuss Water Suppliers request (S. Cotulla).
- LTLW Phase 1 workplan was distributed a couple weeks ago (I. Bergsohn). BG indicated there was no formal comment period, but given the interest and number of moving parts they would welcome comments. on the workplan. LRWQCB is expecting weekly planning and progress report meetings and will post summaries of the meetings on line (boring logs, analytical results, etc.) and thereby providing this information before the six-month period. They completed their transect no. 2 and have begun the last 3 monitoring well installations; transect 3 and 4 borings are set for November. Tentatively they are scheduled to provide a draft weekly report by end of day Tuesday and we will meet Thursday. Their 6-month technical report is due by the end of March 2019.
  Transect borings are proposed to go to a depth of 80'. GW-11 refusal limited boring to 76' (B. Grey).

Draft 2018 SGMA Basin Prioritization (I. Bergsohn)

2014 CASGEM Basin Prioritization – Initial prioritization used for SGMA was the 2014 CASGEM Prioritization completed by DWR. The data components, ranking criteria and ranking values for this prioritization were explained. According to this initial prioritization, DWR ranked the TVS Basin as a medium-priority basin.

Under the SGMA, adjustments to basin boundaries completed in 2016 required DWR to conduct a new basin prioritization. Preliminary draft results from this new prioritization were issued by DWR in May 2018. Under the new prioritization the ranking for the TVS Basin was lowered from medium to very low. Components used in the ranking

exercise are in the State regulations (and are similar or the same as were used in 2014). In 2018, a "Statewide Adjustment" criteria was added--applied to basins using between 2000 af and 9500 af with no documented impacts. If the basin met these criteria the basin was reclassified as very low priority. There were several other Basins which were also reclassified through this latest prioritization. Definition of documented impacts (H. Singer)? Documented impacts include land subsidence, declining groundwater level elevations, reductions in groundwater storage, seawater intrusion, water quality (based on number of wells that had exceedances over a given threshold , such as PHG, MCL, etc.) caused by overdraft conditions within a basin. It is Ivo's understanding that application of the Statewide Adjustment zeros out the ranking values based on all previous data components (such as well density and groundwater use/reliance) used in the ranking process.

How will Change in Status affect the current groundwater management process?

- Does District need to continue groundwater management as a GSA? DWR is encouraging GSA's to comply/follow with SGMA. It is unclear if District is still required to prepare and implement a GSP.
- How does the District's Authority under SGMA change if it is no longer a GSA? Would management responsibilities change as a GSA for a low-priority basin? Would scheduling and reporting requirements change?. District is seeking clarification on these questions.

Options

- Comply and adopt GSP under SGMA.
    - GSA is responsible for preparing and implementing a GSP. District has expended significant resources to form a GSA. The District has entered into an MOU to sustainably manage groundwater resources across the full extent of the groundwater basin with the El Dorado County Water Agency (also a GSA).
    - Significant resources have been expended preparing an AB3030-compliant groundwater management plan (2014 GWMP) and completing an Analysis of Basin Conditions (ABC). At end of 2016 the District submitted both the 2014 GWMP and ABC as Alternative Plans to DWR for review and evaluation in lieu of having to develop a GSP. Should the existing plan alternative (2014 GWMP) be approved, the District could continue to manage groundwater resources in accordance with the existing 2014 GWMP. Approval would allow the District to update and amend the 2014 GWMP in a manner that could eventually evolve the 2014 GWMP into a DWR-approved GSP. This is still on the table as the District assumes DWR is still moving forward with considering the District's submitted Alternative Plans.
- Leave or no longer voluntarily comply with GSA – Would allow the District to update our 2014 GWMP and continue groundwater management under AB3030 Plan. Is this statewide adjustment in code, or a whim of someone at the State Board (SC). …. GK: in their implementation regulations, not the statute itself. Not sure where it came from. Developed the adjustment but not sure where it came from. SC; concern if this is a whim, what stops it from going away at the whim in the future and us having to restart this process. GK: No way to predict what the State Board will do in that regard. JL: where are we in the whole SGMA process? Have we met the requirements so far? Yes. Why should we stop doing what we're doing? Why should we cease to follow SGMA? What are the consequences? JL: good point about the change on a whim, and having to start over (at a whim of someone at the State Board). JL: other water basins required to contributed x$/year. Is there a reason to stop? Part of the decision is based on cost, past and future.

How does change in status affect Districts ability to receive Funding?

- If funding is based on basin prioritizations, the first monies released will be based on high priority basins, then medium. We do not believe that will change. Ivo does not believe the Low Priority Basin ranking hurts us. For the Groundwater Cleanup program, the change in status does not have an effect. District's Grant Coordinator added that the only funding based on basin rank is DWR. Only Proposition

1 funding for SGMA is tied to the ranking, and she does not see that changing. DWR will be affected, other funders not so much. Low Priority rating basically means we have less hoops to jump through as far as providing additional studies etc. (LN).

How does this change our authority if we are no longer a GSA within the basin?

- Ivo looked at authority for GSA under the SGMA, and AB3030—Under AB3030, District could become a Groundwater Management District (GMD) . Under AB3030 GMDs have authority to collect fees and assessments to finance and support groundwater management activities within the basin. GSAs have additional authority to require metering water use from wells above a minimum amount, (some private wells excluded). So we could require small community water systems to meter their groundwater production and report it to the GSA, and could impose civil penalties to limit the amount of water they were producing in a basin if the water use was close with respect to recharge, etc. Fortunately we are nowhere near that condition. Recharge is not an issue. Groundwater use represents less than 20% of the total average annual groundwater recharge.
- District has not had to exercise any regulatory fee authority. Ivo believes the greatest costs for complying with SGMA have been met over past 3 years. The difference with staying under SGMA or continuing groundwater management under AB3030 structure doesn't look like we would be losing a lot of authority to implement groundwater management within the TVS basin.
- Gary K. believes that the decision on which route to take depends on whether the District's GWMP Alternatives is accepted as an Alternative by DWR. Because then we can continue under GWMP or opt out and still operate under SGMA. And then you can amend the GWMP, in either instance to conform to whatever you need to do in the Basin. Hopefully a decision on Alternatives will be presented by DWR in November. At that time decision on the best option forward can be made In the meantime we need to get clarification from DWR.

Draft Questions

- Handout at end of meeting materials packet includes 6 draft questions prepared in anticipation of a meeting with DWR. Idea is to contact DWR Project Manager for Basin Prioritization seeking clarification on how the TVS Basin ranking was lowered to VL priority. The new scoring does not seem to be consistent with the 2014 Basin Prioritization although little has changed. The new scoring also does not appear to be consistent with the methods presented in DWR's process document. Ivo is expecting to hear back from the DWR PM shortly after October 10th. DWR is expected to make a decision on submitted Alternative Plans in November 2018.

Draft Questions (slide)

- First question would be regarding the Statewide Adjustment and how it was applied in our case. With respect to the total priority point calculation; question on what they call information determined to be relevant.
- Other information determined to be relevant. First half of Workshop was spent discussing PCE groundwater contamination. Ivo does not believe any of the information provided to DWR about groundwater contamination issues within the TVS Basin was reviewed (e.g., 2014 GWMP, ABC, and Water Year Annual Reports). Although, if they do review it, we may qualify again as a Medium Priority basin. Not sure that's what we want either.
- Question about the status of alternatives and DWR's assessment--is that going to continue as before. Should we expect something back in November?
- Responsibilities for GSA, if we continue as GSA, not required to develop and impellent a GSP etc. if we stay in the program as a Low Priority Basin what are our responsibilities to DWR.

- Ivo asked that meeting participants read through the questions and provide input as soon as possible. He asked that attendees also provide any other questions we might like to have answered by DWR so Ivo can be as productive as possible when he hears from the DWR.

Additional Questions from SAG

- What prompted them to do the statewide adjustments?
- Do they reassess at regular intervals, what prompts? For example (SC) Oroville Dam situation prompted a lot more and greater and stricter regulations….etc.
- Shannon brought up the topic of the consideration for the on-going costs to the District as a GSA or as a GMD.
- Gary suggested that when we get some answers, we should do a cost analysis so we can objectively weigh which is the best route to take moving forward.
- The issue was brought up again with respect to Shannon having asked if they took into consideration the groundwater contamination issues. We need to ask that question sooner than later so we don't go too far down the wrong road. We would not want to find out that they missed that piece of information and "made a mistake" by changing our ranking.

Attachment 2

General Manager
Richard H. Solbrig

Directors
Chris Cefalu
James R. Jones
Randy Vogelgesang
Kelly Sheehan
Duane Wallace

South Tahoe Public Utility District

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October 12, 2018

Roy Hull
Department of Water Resources
2440 Main Street
Red Bluff, CA 96080

Dear Roy:

In response to your recent telephone conversation with our Hydrogeologist, Ivo Bergsohn, the South Tahoe Public Utility District (District) respectfully submits the following questions to the Department of Water Resources (DWR) in order to better understand the draft 2018 Basin Prioritization process and results for the Tahoe Valley - Tahoe South Subbasin (6-5.001) (TVS Basin). The TVS Basin lies entirely within El Dorado County, and largely within the jurisdiction of the District. Since November 17, 2015, the District has been recognized as the exclusive Groundwater Sustainability Agency (GSA) for the portion of the TVS Basin within its jurisdiction (South Tahoe Public Utility District -1 GSA).

The following questions were developed by the District with input from the 2018 GWMP Stakeholder Advisory Group.

Question 1:

According to the DWR 2018 Basin Prioritization Process, additional conditions analyzed prior to priority determination (sub-component 8.c.2) is only applied to groundwater basins where annual groundwater use is greater than 2,000 acre-feet and less than or equal to 9,500 acre-feet; and have no documented impacts. Documented impacts as described by DWR must **not** include;

4. Groundwater water quality issues that warranted the assignment of water quality degradation points (sub-component 7.d).

Under sub-component 7.d of the Draft 2018 Basin Prioritization, one (1) point was assigned to the TVS Basin for water quality degradation.

If one point was assigned for water quality degradation (sub-component 7.d), why was sub-component 8.c.2 applied to this subbasin?

Question 2:

In order to better understand the DWR 2018 Basin Prioritization Process, the District compared the basin prioritization to the 2014 CASGEM Basin Ranking. For the most part, the District is in general agreement with the priority points assigned by DWR for each of the components used in the 2018 Basin Prioritization Process with the exception of Population Growth (Component 2) and the use of the "Other Information" determined to be relevant (Component 8) – see Question 1. The rate of development within the Lake Tahoe Basin is strictly controlled by the Tahoe Regional Planning Agency (TRPA). Because of these regulatory controls, the majority of growth within El Dorado County occurs outside the Lake Tahoe Basin. Using available demographic data from El Dorado County, the rate of growth within the City of South Lake Tahoe was less than one percent from 1990 to 2006 (EDC 2007 Economic and Demographic Profile). Therefore, the District suggests that one priority point should be assigned for population growth.

A table comparing the results from the 2018 Basin Prioritization to the 2014 CASGEM Basin Ranking is provided below.

	2018 Basin Prioritization			**2014 CASGEM Basin Ranking**		
Data Component	**Ranking Range**	**Units**	**Priority Points**	**Ranking Range**	**Units**	**Ranking Value**
1. Population Density	1,000 ≤ x ≤ 2,500	persons/ sq-mi	3	1,000 ≤ x ≤ 2,500	persons/ sq-mi	3
2. Population Growth	6 ≤ x ≤ 15	percent	2	x < 0	percent	0
3. Public Supply Wells	x ≥ 1.0	Wells/ sq-mi	5	x ≥ 1.0	Wells/ sq-mi	5
4. Total Wells	10 ≤ x ≤ 20	Wells/ sq-mi	4	x ≥ 20	Wells/ sq-mi	3.75
5. Irrigated Acreage	x < 1	Acres/ sq-mi	0	x < 1	Acres/ sq-mi	0
6a. GW Use	0.25 ≤ x ≤ 0.5	Acre-ft/ acre	4	0.25 ≤ x ≤ 0.5	Acre-ft/ acre	4.5
6b. GW % Supply	x ≥ 80	GW %		x ≥ 80	GW %	
7. Documented Impacts	x <3	Total	0			2
8. Other Information	2000 < x ≤ 9,500 af; no documented impacts		V. Low			0
Overall Basin Ranking Score			***0***			***18.3***

Review of the comparison table shows little to no change between the 2014 and 2018 basin rankings for data components 1, 3, 4, 5 and 6 recognizing the continued high reliance and dependence on groundwater sources for drinking water supply within the TVS Basin.

Why are ranking points for relevant data components determined in both the 2018 Draft Basin Prioritization and in the 2014 CASGEM Basin Ranking completely negated by the additional conditions criteria (sub-component 8.c.2) applied during the 2018 Basin Prioritization Process?

What prompted DWR to apply this methodology?

Question 3:

The process used by DWR for documenting water quality degradation appears to use a statistical measure based on identifying the number of wells with a constituent concentration above a minimum reporting level, PHG or drinking water MCL, occurring within a given groundwater basin. Although the District understands the use of this broad approach for a statewide assessment of the susceptibility of drinking water wells to groundwater contamination, it does not accurately reflect the significance of groundwater quality impacts documented within the TVS Basin

The primary focus of groundwater management within the TVS Basin has always focused on groundwater contamination. The District's first groundwater management plan was developed in 2000 in the form of a groundwater Ordinance (Ordinance No. 477-00) for the purpose of regulating and protecting local groundwater resources from man-made contamination. During 2014, the groundwater Ordinance was later updated and replaced by a fully compliant AB3030 Groundwater Management Plan (GWMP), establishing Basin Management Objectives (BMOs) along with a plan for implementing the GWMP, based on a prioritization of local groundwater concerns. Under the GWMP Short-Term Implementation Plan priority was given to "renewed investigation and clean-up of groundwater contamination with special emphasis on PCE and MTBE contaminant plumes that currently impair water supplies in the South Lake Tahoe and Bijou Areas." Since adoption of the GWMP, the District and impacted water suppliers have expended significant resources conducting studies to address the impairment of drinking water wells by tetrachloroethylene (PCE) contamination within the TVS Basin. This groundwater concern is described in the GWMP, the Analysis of Basin Conditions report submitted to DWR in December 2016 and the 2017 Water Year Annual Report submitted to DWR in 2017. In 2018, the District entered into an agreement with the State Water Resources Control Board to conduct a pre-design investigation and feasibility study to evaluate whether existing and/or new wells can be used to provide hydraulic control and removal of PCE from groundwater within the groundwater basin, which is being funded, in part, through a Proposition 1 Groundwater Planning Grant (Agreement D1712508).

According to the DWR 2018 Basin Prioritization Process, "other information determined to be relevant by the department" is to be used to determine if there are groundwater-related actual or potential impacts to unique features or actual or potential challenges for groundwater management within the basin. Was relevant information documenting groundwater water quality impacts provided in the

existing GWMP, the Analysis of Basin Conditions report and the 2017 WY Annual Report considered when evaluating the TVS Basin?

Question 4:

In December 2016, the District concurrently submitted both the 2014 GWMP as an Existing Plan and an Analysis of Basin Conditions Report as an Alternative Plan for public comment and DWR review and evaluation. It is our understanding that status updates on DWR assessment of the submitted plans are expected to be completed in November 2018.

What effect, if any, will the Draft 2018 Basin Prioritization Process have on DWR completing its assessment of the District's Alternatives submitted in 2016?

Question 5:

The District has expended significant resources in completing SGMA requirements to form a Groundwater Sustainability Agency (GSA) for the Tahoe South Subbasin (6-5.001). The District has also entered into a Memorandum of Understanding with the El Dorado County Water Agency to work collaboratively to sustainably manage groundwater resources and implement SGMA throughout the entire Tahoe South Subbasin (6-5.001).

How would authorities granted under SGMA change for GSAs formed for basins newly ranked as a low- or very low-priority basin?

Question 6:

DWR is encouraging basins that may be newly ranked as a low- or very low-priority to *form GSAs and develop GSPs, update existing groundwater management plans, and coordinate with others to develop a new groundwater management plan in accordance with Water Code Section 10750 et seq.*

If a GSA for a low- or very low-priority basin elected to voluntarily comply with SGMA, would that GSA be subject to the same deadlines and reporting requirements for developing and implementing a GSP, as required under SGMA for medium-priority basins?

Thank you again for your consideration of our questions concerning the draft 2018 Basin Prioritization process and results for the TVS Basin. As the GSA for the TVS Basin, responses to these questions will help the District better evaluate and determine the best path forward for continued management of groundwater resources within our basin.

Please feel free to contact Ivo Bergsohn (ibergsohn@stpud.dst.ca.us) or myself (rsolbrig@stpud.dst.ca.us), should you require any clarification or wish to further discuss these questions.

Sincerely,

Richard Solbrig, PE
General Manager

cc: T. Joseph, DWR
G. Kvistad, BHFS
K. Payne, EDCWA
I. Bergsohn
S. Cotulla

Attachment 3

From: Emard, Joyia@DWR
To: DWR_SGMP@LISTSERVICE.CNRA.CA.GOV
Subject: SGMO December Newsletter
Date: Wednesday, December 19, 2018 4:33:29 PM
Attachments: image001.emz
image002.png
image006.png
image007.png

CALIFORNIA DEPARTMENT OF WATER RESOURCES
SUSTAINABLE GROUNDWATER MANAGEMENT OFFICE

TODAY'S TOPICS December 19, 2018	
News	Upcoming Events
• New Climate Change Data Tools Available • Draft Basin Boundary Modifications Public Meeting Video Now Online	• California Water Commission Meeting: Jan. 16, 2019, at 9:30 a.m., in Sacramento.

NEW Additional Climate Change Data Tools Now Available

Three, new climate change tools are now available on the California Natural Resources Agency Open Data Platform to assist local agencies with groundwater planning. The tools are:

1. ArcGIS tool designed to work with USGS MODFLOW models.
2. ArcGIS tool designed to work with Department of Water Resources IWFM models.
3. Second Order Correction tool, designed to help correct for shifts in monthly timing and annual volume of streamflow in watersheds where the Variable Infiltration Capacity Model is used.

To view existing climate change resources plus the new desktop tools, click here.
For more information, contact Tyler Hatch at Tyler.Hatch@water.ca.gov

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NEW Draft Basin Boundary Modifications Public Meeting Video Available Online

The video recording of the December 11, 2018, Draft Basin Boundary Modifications Public Meeting is now available on the Department of Water Resources website. To view the video, click here.

REMINDER Public Comment on Draft Basin Boundary Modifications Open through January 4

Draft Basin Boundary Modifications were released in November and public comment is open through January 4, 2019. All public comments received throughout the process will be reviewed and evaluated before Final Basin Boundary Modifications results are announced in February 2019. To submit public comments, click here.

Public comments on Draft Basin Boundary Modifications can also be provided at the following public meeting.

California Water Commission Meeting
Wednesday, January 16, 2019, at 9:30 a.m.
California Natural Resources Agency
First Floor Auditorium
1416 9th St., Sacramento

For questions, email sgmps@water.ca.gov.

REMINDER Final Prioritization for Un-Modified Basins to Be Released

Final Basin Prioritization for basins not affected by Basin Boundary Modifications is expected in early January 2019. Draft Basin Prioritization for modified basins is expected in late February 2019, with final Basin Prioritization in May 2019. The 2018 SGMA Basin Prioritization Timeline has been updated to reflect this.

REMINDER Alternatives Update

SGMO continues to prioritize review of Alternatives to Groundwater Sustainability Plans. DWR expects to release assessments for each of the submitted Alternatives during the first quarter of 2019. If you have any questions or comments, please email Craig Altare at Craig.Altare@water.ca.gov.

REMINDER Submit Your GSP Initial Notification

Groundwater sustainability agencies (GSA) are required to notify DWR, in writing, prior to initiating development of a groundwater sustainability plan (GSP). GSAs must submit all applicable GSP initial notification information to DWR using the SGMA Portal – GSP Initial Notification System. The SGMA Portal – GSP Initial Notification System also allows edits to be made to a previously submitted Initial Notification, including the ability to withdraw a submittal.

Also, remember, *"If the geographic area to be covered by the plan includes a public water system regulated by the Public Utilities Commission, the groundwater sustainability agency shall provide the written statement to the commission."* See Water Code § 10727.8.

For more information, please see Frequently Asked Questions on GSP Initial Notification Requirements or contact the Regional Coordinators in DWR's four Regional Offices.
For assistance with the system, please email monica.reis@water.ca.gov.

Connect with Your Basin Point of Contact

DWR has designated Basin Points of Contact to assist local agencies and GSAs as GSPs are developed and implemented and to assist with applications for Technical Support Services and Facilitation Support Services. To determine your basin point of contact, please see the following links that provide maps and contact information:
Northern Region
North Central Region
South Central Region
Southern Region
For regional inquiries, please contact sgmp_rc@water.ca.gov.
For general inquiries, please contact sgmps@water.ca.gov.
