Tri-Valley Groundwater Management District
PO Box 936
Benton, CA 93512
e-mail tvgmdsec@gmail.com
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MEETING AGENDA

September 26, 2018 -- 6:30 p.m.
Chalfant Community Center

1. Roll Call

2. Public Comment

3. Approval of Minutes

4. Advisory Board

5. District Board Members brief report of activities

6. Correspondence

   a. Letter from Rita Maguire, counsel for owners of Coyote Springs, regarding the groundwater export permit requirement for the groundwater export activities occurring at Coyote Springs. [See Attachments A – C.]

7. Approval of Warrant List of Expenditures made since last board meeting

8. Discussion and possible vote regarding recommendation of Owens Valley Groundwater Authority staff regarding selection of a consultant for preparation of a Groundwater Sustainability Plan; provide any desired direction to staff.

9. Discussion regarding proposed reprioritization of the Owens Valley Groundwater Basin by Department of Water Resources.

10. Staff update and discussion on application submitted by Coyote Springs for permit/approval to export water from the District's boundaries and letter from Rita

Maguire, counsel for the owners of Coyote Springs, regarding the groundwater export permit requirement for the groundwater export activities occurring at Coyote Springs.

11. Discussion regarding resignation of Director Phil West and his continued help with management of the District's website (tabled from previous meeting); provide any desired direction to staff.

12. Discussion and possible appointment of District chairperson, vice-chairperson, and secretary (tabled from previous meeting); provide any desired direction to staff.

13. Staff update and discussion regarding Mono County lawsuit against the City of Los Angeles and the Los Angeles Department of Water and Power regarding water reductions in Southern Mono County.

14. Staff update and discussion of preparation of District bylaws and rules (tabled from previous meeting); provide any desired direction to staff.

15. Schedule next District meeting for October 24, 2018, at 6:30 p.m. at the Benton Community Center.

16. Adjournment.

MAGUIRE PEARCE & STOREY

PLLC

ATTORNEYS AT LAW

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September 12, 2018

Jason Canger, Deputy County Counsel
Mono County Counsel's Office
Mono County, South County Offices
P.O. Box 2415
Mammoth Lakes, CA 93546

Re: Coyote Springs Ranch, Groundwater Exports from Mono County

Dear Jason:

Bob Bowcock and I appreciated the opportunity to meet with you, Wendy Sugimura and Gerry Le Francois last month. Pursuant to our discussion during that meeting, Bob and I have prepared a chronology of groundwater export activities at Coyote Springs Ranch on behalf of the owners, SNB WB, LLC. This "chronology" includes a description of key events, with supporting documentation, evidencing groundwater exports from the Ranch since the late 1980's. In addition, we have contracted with Hayley & Aldrich, Inc. to prepare a technical assessment of the groundwater impacts and general sustainability of the collection of groundwater at Coyote Springs Ranch based upon the previously discussed volume of up to 300 acre-feet per year (afy). This assessment is included as an attachment to the enclosed report.

As you know, Coyote Springs Ranch has been in communication with the staff at Mono County for a number of years in an effort to obtain permission to continue its groundwater exporting activities from the Ranch. We understand that a permit to export groundwater pursuant to Section 128-706(a) of the Mono County Tri-Valley Groundwater Management Act, or a demonstration that the Ranch's exports qualify for an exclusion from the permit requirement pursuant to Section 128-503 is required. The enclosed report and attachments are intended to lay the groundwork to complete the application process with the Mono County Tri-Valley Groundwater Management District (TVGMD).

Upon review of the enclosed materials, you will see that the first Private Water Source Operator License (PWSOL) was issued for bottled spring water from Coyote Springs in the late 1980's under the name "Running Springs." The issuance of this license (which has been issued by the State of California continuously since then) is one of two reasons Coyote Springs now seeks an

exemption from the requirement to obtain a groundwater export permit from the TVGMD. The TVGMD was created by statute in 1989, until then there was no requirement to obtain a groundwater export permit. Accordingly, Coyote Springs export activity predates the regulation of groundwater exports from Mono County. In addition, Section 128-503 authorizes the TVGMD Board to exempt any operator from the export permit requirement found in Section 128-706(a) if they determine that the operator extracts a "minimum amount" of groundwater specified in ordinance and adopted by the Board following a noticed public hearing. Because Coyote Springs Ranch seeks to export no more than 300 afy, any impacts on the groundwater supplies of Benton Valley are anticipated to be minimal.

Please do not hesitate to contact either Bob or myself if you have any questions or would like additional information.

Regards,

Rita P. Maguire
Maguire, Pearce & Storey, PLLC

Enclosures
Cc: Wayne Jacobi, SNB WB, LLC
Sonny Woodall, SNB WB, LLC
Bob Bowcock, Integrated Resource Management, Inc.
Bill Christopher, UrbanConcepts

Chronology of Water Export Activities at Coyote Springs Ranch

Benton Valley, Mono County, California
September 12, 2018

I. Introduction and Jurisdictional Requirements

Wayne Jacobi and Sonny Woodall, on behalf of Coyote Springs Ranch, seek an exemption from the Tri-Valley Groundwater Management District's (TVGMD) Groundwater Transfer Permit for the export of up to 300 acre-feet per year of spring water from the Ranch.

The Coyote Springs Ranch property is located at 1512 Bramlett Ranch Road in an unincorporated area of Mono County, California. The property is within the jurisdiction of Mono County. The exportation of groundwater from the Ranch is governed both by Mono County and the Mono County Tri-Valley Groundwater Management District.

Per Chapter 20.01.030 of the Mono County Code, adopted by Ordinance No. 98-02, groundwater that is extracted from a basin within Mono County's jurisdiction cannot be transferred outside of that basin without a valid Groundwater Transfer Permit (Transfer Permit). However, any groundwater transfer already approved or adjudicated by the State Water Resources Control Board (SWRCB), the Mono County Tri-Valley Groundwater Management District (TVGMD or District), or by a state or federal court of competent jurisdiction, prior to January 1, 1998, or any groundwater transfers that have occurred on a regular, ongoing basis since at least January 1, 1997 is exempt from the County's transfer permit requirement as a legal non-conforming use.

The TVGMD was created by state statute in 1989. (Stats. 1989, c. 844, § 1). The District is charged with regulating the extraction of groundwater from three groundwater basins in Mono County: Benton Valley, Hamill Valley, and Chalfant Valley. Coyote Springs Ranch is located in Benton Valley. Per California Water Code Appendix Section 128-706, no groundwater shall be exported from the District unless an Export Permit is issued by the District Board of Directors establishing the quantity of water which may be exported and the conditions governing the export. Per Section 128-503, the District Board can exempt any operator from this Export Permit requirement if they determine the operator extracts a "minimum amount" of groundwater specified in ordinance and adopted by the Board following a noticed public hearing. In addition, any exports that began prior to January 1989, are not required to obtain an export license because their activities pre-date the District's existence.

II. History of Water Exports at Coyote Springs Ranch

The Coyote Springs Ranch is located in Benton Valley in Mono County, approximately 4.5 miles from the town of Benton, California and less than 5 miles from the Nevada state line. The Ranch has been in operation since the 1800s. It covers approximately 728 acres (*see* APN 24-080-09 and 24-080-10).

The first Private Water Source Operator License (PWSOL) was issued in the late 1980s, licensing spring water from Coyote Springs to be exported to Bishop, California under the name "Running Springs," which was both a spring water bottling company as well as the spring owner.[1] The bottling company was located in Bishop, California. Following an inspection on June 3, 1988, the California Department of Health Services (DHS) determined that Coyote Springs met all regulatory requirements for a spring water source and issued License No. 12-PW to John and Joan Daynes on July 14, 1988, then owners of the property. Since then, DHS and its successor, the California Department of Public Health, have issued successive PWSOLs to the Coyote Springs Ranch under License No. 86013. *See* Attachment A.

According to a Dames & Moore Report published in 2000, the Coyote Springs Ranch property has produced spring water for sale since 1988. (Due to its size, a copy of this Report is being sent separately electronically and via U.S. Mail). A record of spring water exports from Coyote Springs also appears in a legal memorandum written by Marshall Rudolph, Mono County Counsel dated December 5, 2000. *See* Attachment B. In his memorandum to the District, Mr. Marshall refers to a 1992 District legal memorandum discussing TVGMD's jurisdiction over the export of Coyote Spring water from the Ranch. Although the District concluded it lacked jurisdiction at that time because it believed the spring water was surface water rather than groundwater, the memorandum acknowledges spring water export activity from the Ranch as early as 1992.[2]

According to verbal history obtained from Wayne Jacobi, associated with Coyote Springs Ranch, during 1992 and 1993, the Sahara Water Company (owned by Mr. Jacobi) exported approximately three to five truckloads per day of spring water to Redlands, California. In 1993, a major earthquake in the vicinity of the Ranch silted up the spring reducing its flows for several months. From 1994 through 1996, Sahara Water Company reduced its exports of spring water to one to two truckloads per day. Shipments were transported to Bishop, as well as other locations outside of Mono County.

Beginning in 1997, Great Spring Waters of America, Inc. (Arrowhead) began purchasing spring water from Coyote Springs Ranch for its Arrowhead spring water brand. According to Mr. Jacobi, Arrowhead purchased and hauled approximately 20 to 37 truckloads of spring water per day (each truck hauls approximately 6,500 gallons of spring water).[3] These shipments continued through February 2002. During that time, Coyote Springs Ranch sold spring water to several other vendors including Tahoe Spring (shipments to Las Vegas, NV), Lyon Magnus (Fresno, CA) and Barrons Pacific (Redlands, CA). Coyote Springs Ranch continues to export water from the Ranch to Las Vegas, Nevada. *Id.* The attached sign in sheets used at the Ranch to document each truckload shows that in 2017 and 2018, approximately two to four truckloads each month transported spring water from the Ranch. *See* Attachment D.

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[1] Ranch owner John Daynes first applied to the SWRCB for a PWSOL on May 4, 1988. *See* Attachment A.

[2] In a signed application for a Groundwater Export Permit, Sonny Woodall stated that the export of groundwater from Coyote Springs Ranch "has been ongoing since before 1987." *See* Attachment C.

[3] It is our understanding that Ms. Marion Dunn, a current TVGMD Board Member kept a daily log of the truck traffic from Coyote Ranch.

III. Hydrology of Coyote Springs and Water Balance in Benton Valley

Haley & Aldrich, Inc. was commissioned to prepare a technical assessment of the groundwater impacts to the Benton Valley sub-basin from spring water exports of up to 300 acre-feet per year (afy) from Coyote Springs Ranch. The attached technical memorandum describes Hayley & Aldrich's analysis of the sustainability of spring water collection at the Ranch property in the context of the overall Benton Valley water balance and relative effects of spring water collection on other water users in Benton Valley. *See* Attachment E. Hayley & Aldrich has concluded that the Benton Valley water balance shows an influx of water that is greater than the known quantified outflux from the Benton Valley alluvial aquifer. Therefore, the collection of spring water on the Ranch property at the rate of up to 300 afy is in excess of existing groundwater uses in the sub-basin and will not impact other groundwater users in Benton Valley, either up-gradient or down-gradient of the Coyote Springs Ranch property.

IV. Past Reviews by the Tri-Valley Groundwater Management District

Over the years, the owners of Coyote Springs Ranch have approached the District about obtaining an Export Permit to transport spring water out of the Mono County. The most recent attempt occurred in 2015, however, our files indicate that as early as 2003, Coyote Springs approached the District about obtaining an Export Permit. In both 2003 and 2015, an ordinance was prepared by legal counsel for TVGMD. (*See* Attachment F and Attachment G) exempting Coyote Springs from the requirements of a Groundwater Export Permit. This is because the volume of water sought to be exported was "less than or equal to 300 acre-feet per year." (§3.2 draft 2015 Ordinance). We also note that the attached undated copy of a draft agreement titled "Agreement for the Provision of Evaluation, Environmental Review, and Processing Services" indicates that substantial work had been done by the District in the past to authorize the export of spring water from Coyote Springs Ranch. *See* Attachment H.

Sonny Woodall and Wayne Jacobi are seeking an exemption from the District's Export Permit because like their prior efforts, the volume they seek to export will be limited to not more than 300 afy.

HALEY & ALDRICH, INC
One Arizona Center
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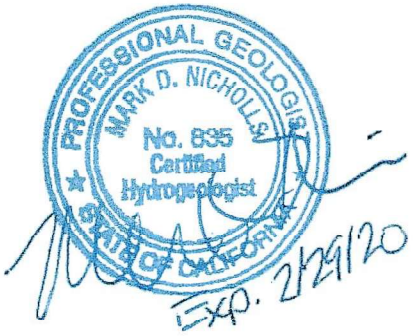
TECHNICAL MEMORANDUM

7 September 2018
File No. 128208-002



TO: Maguire, Pearce, and Storey PLLC
Rita Maguire, Esq., Partner

FROM: Haley & Aldrich, Inc.
Mark Nicholls, PG, CHG

SUBJECT: Assessment of Groundwater Impacts and General Sustainability of Spring Water Collection at the Coyote Springs Ranch, Mono County, California

At your request, Haley & Aldrich, Inc. (Haley & Aldrich) conducted an evaluation of groundwater impacts and general sustainability associated with collection of spring water from Coyote Springs, located at the Coyote Springs Ranch (Ranch) in Mono County, California. This technical memorandum describes our analysis of the sustainability of spring water collection at the Ranch property in the context of the overall Benton Valley water balance and relative effects of spring water collection on other water users in Benton Valley.

Background

The Ranch on which the Coyote Springs site is located is approximately 5 miles north of Benton, California and 3 miles south of the California-Nevada state border. The Ranch is about 2 miles west of State Highway 6, and is located in portions of Sections 6, 7, and 8 of Township 1 South, Range 32 East, Mount Diablo Base and Meridian. The Ranch property is situated on the floor of the north-south trending Benton Valley which is bounded by the White Mountains on the east and the Benton Range on the west. To the northeast, the valley extends approximately 5 miles into Nevada where it transitions into the Queen Valley. A map of the Ranch is included as Figure 1.

The owner of the Ranch property has produced spring water from Coyote Springs for sale since 1988 (Dames & Moore, 2000) using spring water production boreholes that flow by artesian pressure, without the use of pumping equipment. Historical flow rates have been reported to be approximately 180 gallons per minute (gpm) combined from the spring water production boreholes. The boreholes are located adjacent to the naturally occurring Coyote Spring, which continues to flow uninterrupted from the natural spring orifice. The Ranch owner reports that the property has historically produced approximately 300 acre-feet per year (AFY) of Food and Drug Administration (FDA) defined spring water.

Spring water collected from Coyote Springs is obtained from the same geologic underground formation feeding the springs in accordance with Code of Federal Regulations Title 21 (21 CFR Part 165). The Coyote Springs are operated as a Spring Water source for bottling pursuant to Private Water Source Operators License No. 86013 issued by the California Department of Public Health, Food and Drug Branch.

Several studies have been completed that describe the hydrogeologic characteristics of Benton Valley and Coyote Springs; however, none of these studies has addressed the sustainability of, or overall effects of spring water collection at the Ranch in the context of the broader basin scale water balance and relative effects on other water users. The purpose of this evaluation is to characterize the effects of spring water collection on the overall basin water balance and other water users in the basin. The evaluation described in this memorandum was based on existing hydrologic data and information combined with results of pump testing conducted by Haley & Aldrich in July 2018.

Hydrogeologic Setting

The Coyote Springs site is located within the Hutchinson Creek drainage which drains the Benton Valley, an area of approximately 160 square miles. The Coyote Springs are located near the middle of the Benton Valley, and the portion of the watershed which contributes recharge to Coyote Springs is approximately 73 square miles in size. The aquifer area above Coyote Springs is approximately 24 square miles and occupies the northeastern portion of the Benton Valley watershed. The estimated recharge area for Coyote Springs is shown on Figure 1.

GEOLOGY

Benton Valley is bounded to the west and east by faults that separate the uplifted mountain blocks from the down-thrown valley floor. The White Mountains to the east of the valley are composed primarily of uplifted igneous and metamorphic rocks, and the Benton Range and Excelsior Mountains to the west and north are comprised of younger age volcanic flows which have also been uplifted relative to the valley floor. The floor of the Benton Valley is comprised primarily of Quaternary-age alluvial sediments which comprise the alluvial aquifer from which the Coyote Springs flow. The floor of the Benton Valley is comprised of alluvial material including sand and gravel with silt and clay, overlying basalt flows. Based on a review of drilling records, the bulk of the alluvial sediments beneath the Ranch property are materials of granitic origin with lesser amounts of volcanic and metamorphic materials (Dames & Moore, 2000). Based on published reports (Crowder, et al., 1972; Strand, 1967), alluvial accumulations in some portions of the Benton Valley may reach a thickness of up to 2,000 feet near the axis of the valley.

The west-northwest trending Benton Valley fault crosses the valley and forms a southwest-facing fault scarp approximately 20 feet in height through the center of the Ranch property. The Benton Valley fault has been mapped as a normal fault with the northern side upthrown relative to the southern side (Smith, 1984). Alluvial sediments are thinner on the northeast side of the Benton Valley fault beneath the spring site where the underlying basalt has been uplifted by the fault.

ALLUVIAL AQUIFER

The alluvial aquifer beneath the Ranch property extends nearly the full length of the Benton Valley, and is used for domestic and agricultural water supply. Groundwater within the Benton Valley alluvial aquifer originates as precipitation on the surrounding mountains of the Benton and Queen valleys. Precipitation runoff from the White Mountains, Benton Range, and Excelsior Mountains flows toward the valley floor and infiltrates in the alluvial aquifer at the base of the mountains, as mountain front recharge. A portion of the precipitation falling directly on the alluvium of the valley floor also infiltrates into the aquifer as groundwater recharge. The recharge area which supplies water to the alluvial aquifer feeding Coyote Springs extends north and northeast to the mountain front at the edge of the Benton and Queen valleys, an area of approximately 24 square miles.

The sand and gravel layers within the Benton Valley alluvial aquifer readily yield water to local wells. Wells for which records are available (California Department of Water Resources [DWR], 2018) have been constructed in the alluvial aquifer. It is reasonable to assume that there is some water production potential from the basalt flows that underlie the alluvial aquifer. However, sufficient water production capacity has been available from the alluvial aquifer to preclude the need to drill into the deeper formation.

Movement along the Benton Valley fault created a low permeability zone that coincides with the location of the fault and restricts groundwater flow across the fault. The fault acts like a dam, impounding groundwater flow on the up-gradient side of the fault. As the alluvial sediments overlying the volcanic rocks become thinner due to uplift of bedrock along the fault, groundwater flow rises toward ground surface, discharging under natural force as spring flow. On the Ranch property, the springs primarily occur in the area immediately up-gradient (northeast) of the fault; however, several springs occur at the fault scarp itself.

The Benton Valley fault has effectively divided the alluvial aquifer into two distinct sub-basins. This is demonstrated by the fact that the fault has formed a consistent and continuous groundwater flow barrier responsible for the formation of Coyote Springs. This fact is further supported by results of pump testing conducted by Haley & Aldrich in July of 2018 (described below) which showed that wells pumped on the south side of the Benton Valley fault are not in hydraulic communication with the spring water production boreholes. These conditions and observations confirm that the Benton Valley fault impedes the flow of groundwater from the northern end of the Benton Valley, southward toward the Town of Benton.

EXISTING WATER WELLS IN THE BENTON VALLEY

Available online well completion records (DWR, 2018) indicate that there are 30 known domestic wells and 5 known production wells in the Benton Valley. It is possible that there are additional water wells located in Benton Valley that are not reflected in DWR records. The depths of all reported wells in the Benton Valley range from 155 to 485 feet below ground surface (bgs). The deeper wells are located at higher elevation on the alluvial fan at the base of the White Mountains and are located in an area where

the ground surface elevation is approximately 200 feet above the valley floor. The average well depth in the Benton Valley is approximately 230 feet bgs.

Other than the spring water production boreholes and observation wells located on the Ranch property, no wells are known to exist up-gradient of the Benton Valley fault on the California side of the state line. One residence and one county highway yard exist in Queen Valley, on the Nevada side of the state line, and it is assumed that each of these have a domestic well.

COYOTE SPRINGS WATER PRODUCTION BOREHOLES

Spring water is collected from Coyote Springs by means of two vertical spring water production boreholes (BH-2 and BH-4). The boreholes were installed in 1999 to replace earlier existing spring water collection infrastructure. Each borehole consists of a 5-inch stainless steel pipe with stainless steel screen, completed to depths of 129 feet and 180 feet bgs, respectively. No external force is used to collect spring water from the boreholes. Spring water is collected at boreholes BH-2 and BH-4 using natural artesian hydraulic head. The spring water production boreholes collect only a fraction of the total flow from Coyote Springs, and the natural spring orifices continue to flow uninterrupted.

Water Balance

A water balance is an analytical tool used to describe the flow of water through an aquifer system and can be an important tool to gauge the overall stress on the water supply provided by that aquifer system. A water balance uses a sum of quantified inflow and outflow values to determine if the aquifer system is generally in equilibrium or in an overdraft condition and may be used as an indicator of the quantity of water available for production.

Haley & Aldrich prepared a provisional water balance for the Benton Valley that includes flow inputs from the Queen Valley on the Nevada side of the state line. This provisional water balance is based on existing data and information to build on and combine the earlier work of others.

The basic elements of the water balance include inflows such as precipitation, streamflow in, and groundwater underflow; and outflows such as consumptive groundwater use, evapotranspiration, streamflow out, and groundwater flow out. Each of these water balance elements are described below in the context of the Benton Valley.

INFLOWS

Precipitation

The amount of precipitation falling on Benton Valley has been estimated to be approximately 10 inches per year (TEAM Engineering and Management, Inc. [TEAM], 2006). This value reflects data collected from nearby precipitation gauges and has been adjusted to correct for elevation. The United States Geological Survey (USGS, 2014) has constructed a model referred to as the Basin Characterization Model (BCM) for use in estimating hydrologic aspects of California groundwater basins. The BCM (USGS, 2014)

uses an estimated precipitation value of approximately 11 inches for the northern Benton Valley. Haley & Aldrich reviewed precipitation totals from Mammoth Lakes, Mammoth Meadow, and Bishop, California, and found that these elevation-corrected precipitation values are appropriate. Using the conservative precipitation value of 10 inches per year applied over an area of 160 square miles yields an influx of approximately 85,333 AFY.

Because no perennial surface water flows exit the Benton Valley, TEAM (2006) assumed that a significant portion of the creek flows originating in the White Mountains and Benton Range infiltrated into the alluvial fans contributing directly to groundwater recharge. This assumption is consistent with a similar assumption made by Hollett, et. al. (1991) that approximately 75 percent of the surface water flow that reaches the alluvial fans will infiltrate to groundwater in the greater Owens Valley watershed. TEAM (2006) further estimates that approximately 10 percent of the precipitation falling on the study area infiltrates to the aquifer. The total creek flow value from these two mountain ranges cited by TEAM (2006) was 8,969 AFY, which is slightly more than 10 percent of the water introduced to the Benton Valley as precipitation, or 1 inch of recharge. This value is very close to the recharge value estimated by the BCM (USGS, 2014) of 1.2 inches for the upper Benton Valley watershed. Applying the Hollett et. al. (1991) assumption that 75 percent of creek flow reaching the alluvial fans infiltrates to groundwater, the estimated creek flow of 8,969 AFY yields a volume of recharge to groundwater of 6,727 AFY in the Benton Valley.

A calibrated steady-state model prepared by MHA Environmental Consulting, Inc. (MHA, 2001), as cited by Inyo County Water Department in 2016 (ICWD, 2016), estimated a total recharge of 27,653 AFY to the entire Tri-Valley area, which occupies an area of approximately 480 square miles. The approximately 160 square mile Benton Valley constitutes one third of the larger Tri-Valley area. A recharge rate of 6,727 AFY represents slightly more than one quarter of the overall calibrated recharge value for the greater Tri-Valley area. An estimated recharge value for the Benton Valley of 6,727 AFY is conservatively low but serves as a useful value for comparison purposes to evaluate the potential for groundwater surplus in the Benton Valley.

Streamflow In

There is no streamflow that enters the Benton Valley that originates outside of the valley. All surface water flows entering the Benton Valley originate as precipitation falling on the White Mountains, Benton Range, or Excelsior Mountains.

Groundwater Underflow

Some researchers have estimated values for groundwater flow into the Benton Valley from the west through fractures in the rocks of the Benton Range (TEAM, 2006); however, these estimates vary widely. The California DWR (DWR, 2003) has characterized the rocks of the Benton Range to be impermeable and that the amount of water flowing through the rocks of the Benton Range is effectively negligible. No other sources of groundwater underflow are believed to contribute to the groundwater supply in the Benton Valley.

OUTFLOWS

Consumptive Groundwater Use

For the purposes of this estimated water balance, all groundwater pumping is conservatively assumed to be consumptive use. As stated above, there are 5 known production wells and 32 domestic wells located in the Benton and Queen valleys.

Water use from the production wells is assumed to be exclusively for agriculture, with the primary crop being alfalfa. Based on review of aerial photos, there appears to be more cultivated area than can be served by the five known production wells. Consequently, the acreage of cultivated land was used to estimate the quantity of groundwater used to cultivate alfalfa. Review of recent satellite photos available from Google Earth® for June 2016 indicates approximately 642 acres of land under cultivation, or recently cultivated. The volume of water estimated to be consumed by the cultivation of alfalfa in the high desert of California is approximately 5 AFY per acre (Orloff and Gildersleeve, 1991). Applying this quantity of water to the estimated cultivated acreage yields a volume of 3,210 AFY, assuming year-round alfalfa production. This value is conservatively higher than the surveyed 2014 value cited by ICWD (2016) of 2,570 AFY, because 2016 satellite photos show some acreage in fallow that may be brought back into production. The conservative 3,210 AFY value reflects both active and apparent fallow acreage.

The groundwater model prepared by TEAM (2006) used a value of 1.5 AFY of groundwater extraction for each domestic well. Based on this value, the 32 domestic wells located in the Benton and Queen valleys would withdraw 48 AFY of groundwater. Given that the estimated number of domestic wells is based on available DWR records and is uncertain, it is possible that there are additional domestic wells in existence. Assuming that the number of domestic wells is double the value shown in DWR records (64 rather than 32) the potential groundwater extraction associated with domestic wells would be 96 AFY.

The combined total estimated groundwater extraction and consumptive use is 3,306 AFY from the Benton and Queen valleys. This groundwater extraction and consumptive estimate assumes that all groundwater extracted for crop irrigation and domestic use is conservative, because these water uses may return as much as 50 percent of the water extracted back to the groundwater supply through infiltration.

Evapotranspiration

Evapotranspiration is the amount of water lost to evaporation from open pools and the water vapor released to the atmosphere by plant life and is a difficult parameter to estimate. All available published estimates of potential evapotranspiration exceed the amount of precipitation falling on the Benton Valley watershed. The California Irrigation Management Information System (CIMIS) estimates a potential evapotranspiration of 57 inches for the Benton Valley (CIMIS, 1999), and the BCM (USGS, 2014) estimates a potential evapotranspiration value of 68 inches. These values reflect the evaporation that might take place if the water was left in open shallow pools exposed to the sun and wind; they do

not reflect the realities of steep mountain creeks that flow in response to precipitation events and quickly infiltrate once they reach the alluvial fans (Hollett, et. al., 1991). It is only possible for actual evapotranspiration to exceed precipitation in areas of groundwater discharge, like the Owens Valley.

The actual volume of annual evapotranspiration in the areas of the Benton Valley where natural groundwater discharge is not occurring is less than the annual volume of precipitation. As stated above, it is assumed based on TEAM, 2006 that approximately 10 percent of the precipitation falling on the valley will infiltrate to groundwater; the remaining 90 percent will be lost to a combination of evapotranspiration, streamflow out of the valley, or groundwater flow out of the valley. Insufficient data exist to quantify actual evapotranspiration and groundwater flow out of the Benton Valley, and streamflow out occurs infrequently and is not gauged.

TEAM (2006) cites an evapotranspiration estimate for the Benton Valley of 2,344 AFY, and ICWD cites a phreatophyte evapotranspiration value as high as 3,282 AFY for the entire Tri-Valley area. Given that the Benton Valley occupies approximately one-third of the broader Tri-Valley area, it is reasonable to assume that one-third of the broader Tri-Valley evapotranspiration value (1,094 AFY) may be applied to the Benton Valley. Consequently, the 2,344 AFY value cited by TEAM (2006) for the Benton Valley only may be considered to be conservative.

Streamflow Out

There is no perennial stream flow exiting the Benton Valley. Periodic surface water flows do occur from the Benton Valley only in response to precipitation events where the volume of precipitation falling on the valley exceeds the infiltration capacity of the soil. Because of the infrequency of surface water flows out of the Benton Valley, no stream gauge has been installed to measure surface water outflows at the valley margin. Based on available information, for the purposes of this estimated water balance, surface water flows out of the Benton Valley are assumed to be zero.

Groundwater Flow Out

Groundwater flow out of the Benton Valley has not been quantified by any of the researchers cited in this memorandum. This value may be calculated using fairly simple methods provided sufficient data are available from wells or test borings located in specific areas near the down-gradient basin margin. However, the necessary well or borings do not exist, and insufficient data exist to reliably calculate groundwater flux from the Benton Valley to the Hammil Valley. Based on the estimated groundwater recharge value cited above (6,727 AFY) and the estimated total groundwater consumptive use (3,258 AFY), a rough estimate can be made regarding the amount of groundwater available to flow by underflow to the Hammil Valley. Based on these values and supporting assumptions, as much as 3,469 AFY (slightly more than the recharge occurring in the Benton Valley) may be available to flow as underflow to the Hammil Valley.

WATER BALANCE SUMMARY

As described above, estimated agricultural pumping and domestic water supply pumping have been conservatively over-estimated for the purposes of this evaluation, and to demonstrate the potential for surplus groundwater availability in the Benton Valley. A summary of the estimated water balance of the Benton Valley is show in Table 1.

Table 1. Summary of Estimated Water Balance for Benton Valley

Water Balance Element	Value	Notes
Precipitation	85,333 AFY	10 inches over 160 square miles
Phreatophyte Evaporation	2,433 AFY	TEAM (2006) and ICWD (2016)
Recharge to Groundwater	6,727 AFY	TEAM (2006) and Hollet et. al. (1991)
Agricultural Pumping	3,210 AFY	Satellite photo review
Domestic Well Pumping	96 AFY	Review of available DWR records
Surface Water Runoff to Hammil Valley	-	Not quantified
Potential Groundwater Underflow to Hammil Valley	3,421 AFY	Estimated based on above values

The values reflected in this estimated water balance reflect the data sources and assumptions described above and represent a good faith effort to quantify the available groundwater supply of the Benton Valley.

AFY = acre-feet per year

DWR = California Department of Water Resources

ICWD = Inyo County Water Department

TEAM = TEAM Engineering and Management, Inc.

The estimated water balance summarized in Table 1 reflects a large disparity between the total precipitation falling on the Benton Valley watershed and the estimated outflow values. The volume of water represented by this disparity is approximately 73,000 AFY that may be lost to a combination of direct evaporation in non-phreatophyte areas, and surface water flows out of the valley following large storm events. No stream gauges exist at the basin margin or in the Hammil Valley that may be used to estimate the periodic surface water flows out.

However, based on the conservatively estimated groundwater recharge value which is supported by multiple researchers (TEAM, 2006; Hollett et. al., 1991; and ICWD, 2016), the groundwater elements of the water balance may be reasonably bounded by existing data and previous observations. The estimated water balance shown in Table 1 reflects a sub-basin that is in equilibrium, and that has some quantity of excess groundwater flowing out to the Hammil Valley. This observation is supported by the fact that TEAM (2006) found the Benton Valley groundwater system to be in equilibrium, meaning the groundwater levels were neither increasing nor decreasing. Based on review of available satellite imagery, no new agricultural pumping has been started since 2006, and the average groundwater withdrawal from the Benton Valley is assumed to be effectively constant since that time.

Effects of Spring Water Collection on Groundwater Wells

Haley & Aldrich conducted two hydraulic connection tests during July 2018 to evaluate the effect of the Benton Valley fault on groundwater flow. The tests were conducted to determine if pumping influence exerted on the aquifer by a well located on one side of the fault would extend beyond the fault to wells on the other side.

As described above, the two spring water production boreholes (BH-2 and BH-4) were constructed on the northeast side of the fault and flow under artesian pressure with no pumping equipment required. The natural spring orifices continue to flow uninterrupted while spring water is collected from the production boreholes.

The pumping wells used for the tests were two agricultural wells located on the Ranch on the southwest side of the Benton Valley fault. The agricultural wells are both completed in unconfined water bearing units and do not flow under artesian pressure. The static depth to water at each of the pumping wells (Well A and Irrigation Well) was 9.2 and 152 feet bgs, respectively.

Prior to the commencement of the pumping tests, data logging pressure transducers were installed on the wellhead of the two spring water production boreholes (BH-2 and BH-4).

The first pumping well (Well A) is completed to a depth of 83 feet bgs and was constructed using 12-inch polyvinyl chloride well casing. The pumping rate at this well was approximately 12 gpm and the drawdown during pumping was approximately 45 feet. Pumping continued for a period of approximately 3 hours. No pressure response was observed on the other side of the fault at BH-2 or BH-4. The production boreholes are located approximately 2,300 feet from Well A. Because the maximum pumping rate achieved at Well A was lower than expected, arrangements were made to use an irrigation well of known higher capacity located closer to the production boreholes. Water levels at the production boreholes and Well A during testing activities are shown on Figure 2.

Based on available well records, the Irrigation Well is completed to a depth of 260 feet bgs and was constructed using 14-inch steel well casing. The pumping rate at this well was approximately 750 gpm, and the pumping water level was approximately 182 feet bgs. Pumping began at 11:00 on 16 July 2018 and continued for a period of approximately 24 hours until the pump was shut down. The pump remained off for a period of approximately 3 hours to allow time for a water level response at the production boreholes, and then was restarted. Pumping continued for a period of time long enough to allow the cone of depression to stabilize. The Irrigation Well is approximately 1,750 feet from the production boreholes. No water level response was observed at initial startup, during pumping, following shut down, or at the second startup. Water levels observed at the production boreholes during Irrigation Well testing activities are shown on Figure 3.

The spring water production boreholes flow at a near constant combined total rate of 180 gpm, or approximately 330 AFY if annualized. No groundwater pumping exists up-gradient of the Ranch property, up-gradient of the Benton Valley fault within the Benton Valley, on the California side of the state line. There is a possibility that two domestic wells exist in the Queen Valley on the Nevada side of

the state line, and both are located high on the alluvial fan above the valley floor. The nearest of the up-gradient Nevada wells is more than 8 miles from the Ranch property. The second is located at the basin margin, approximately 11 miles from the Ranch property.

Several domestic wells may exist southeast of the Ranch property, along the axis of the Benton Valley fault. Each of these domestic wells is at a higher elevation than the spring water production boreholes and are up-gradient of Coyote Springs due to the geometry of the fault. There is no potential for spring water collection at the Ranch property to affect any well up-gradient of the Ranch property, either in the Queen Valley or to the southeast of the property along the Benton Valley fault.

The nearest down-gradient wells are likely located on the valley floor approximately 2 miles south of the Ranch property. Available DWR records do not reflect any wells at this location, but review of satellite images shows irrigated fields that are likely supported by irrigation wells. Based on the results of the pumping test conducted at the Irrigation Well on the Ranch property, it does not appear that any potential influence on groundwater levels resulting from spring water collection will extend past the Benton Valley fault to affect wells in the lower Benton Valley.

Spring water collection is conducted at a relatively low flow rate and has been ongoing for a long enough period of time to establish equilibrium with existing water uses. No groundwater users in the Benton Valley will experience adverse impacts from the continued collection of spring water from the Ranch property.

Closing

Haley & Aldrich conducted the evaluation described in this Technical Memorandum for the purpose of identifying potential impacts to the Benton Valley water balance and on other groundwater users from collection of spring water at the Ranch property for export. To complete this evaluation, we reviewed publicly available reports, DWR well records, climatic records, and conducted pump testing on the subject property. Based on these materials, and our observations we have concluded the following:

1. The spring water production boreholes flow under artesian pressure with no pumping required and are at equilibrium with current groundwater flux through the Benton Valley alluvial aquifer.
2. The natural spring orifices of Coyote Springs continue to flow uninterrupted during the collection of spring water at the Ranch property.
3. Aggregate water use in the Benton Valley has not materially increased since 2006 when TEAM (2006) found the Benton Valley to be in equilibrium, and spring water collection was ongoing at that time.
4. The Benton Valley water balance shows an influx of water that is greater than the known quantified outflux from the Benton Valley alluvial aquifer.
5. Collection of spring water on the Ranch property at the maximum rate of 300 AFY will not impact other groundwater users in the Benton Valley, either up-gradient or down-gradient of the Ranch property.

6. Conservative evaluation of the Benton Valley water balance indicates that the planned volume of spring water collection (300 AFY) is surplus to the current needs of the Benton Valley groundwater system as defined by the needs of existing and reasonably foreseeable groundwater users.

Haley & Aldrich appreciates the opportunity to assist with this project. Please contact Mark Nicholls at 602-819-0913 with any questions you may have regarding the content of this memorandum.

Attachments:
Figure 1: Coyote Springs Site Map
Figure 2: Coyote Springs Well A Pump Test Hydrograph
Figure 3: Coyote Springs Irrigation Well Pump Test Hydrograph

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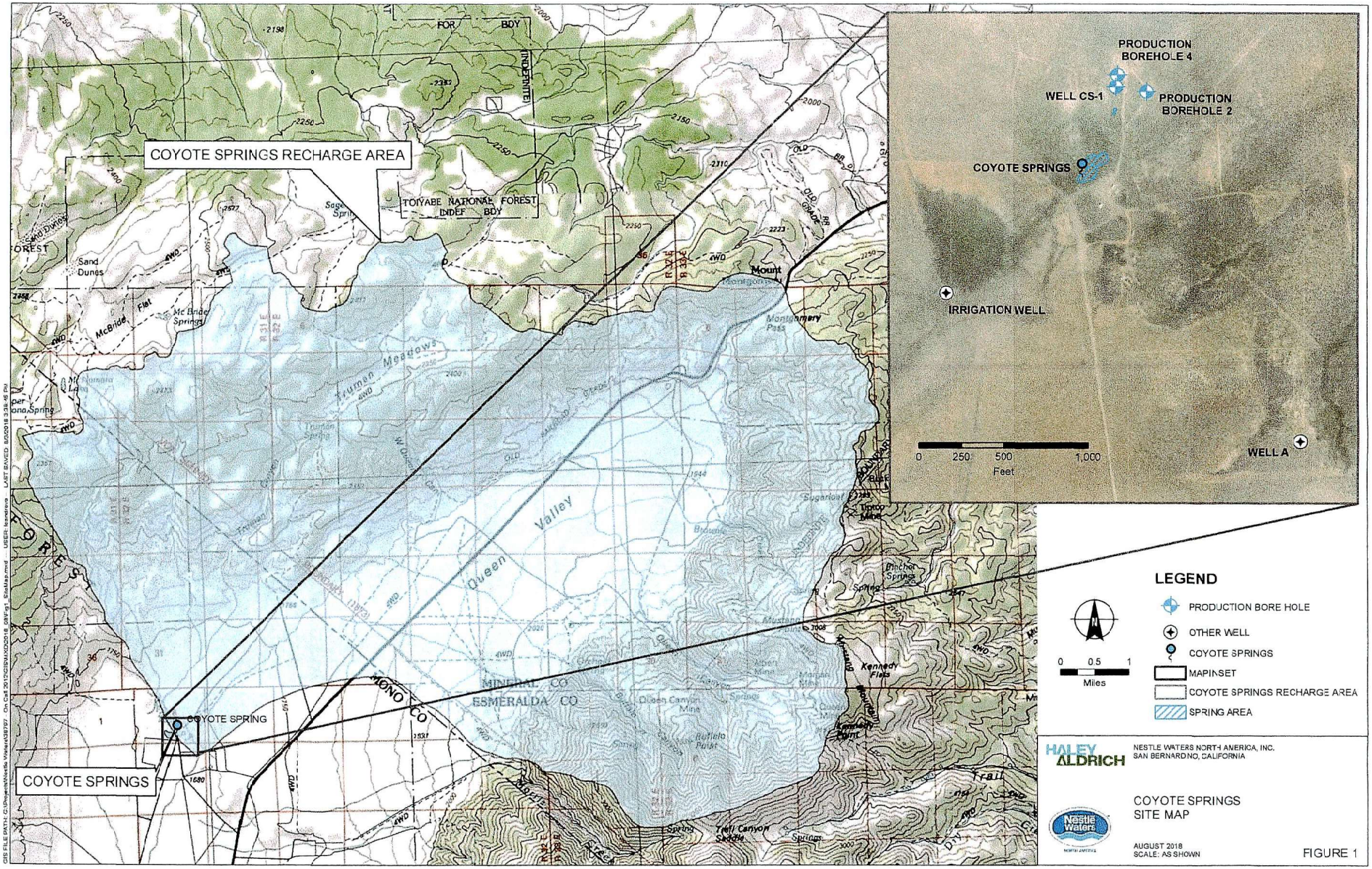
FIGURES


COYOTE SPRINGS RECHARGE AREA
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HALEY ALDRICH
NESTLE WATERS NORTH AMERICA, INC.
SAN BERNARDINO, CALIFORNIA
COYOTE SPRINGS
SITE MAP
AUGUST 2018
SCALE: AS SHOWN
FIGURE 1

FIGURE 2 - COYOTE SPRINGS WELL A PUMP TEST HYDROGRAPH