# PETITION FOR ALTERNATIVE ABATEMENT STANDARDS FORMER PRICE'S VALLEY GOLD NORTH DAIRY BERNALILLO, SANDOVAL COUNTY, NEW MEXICO

Prepared for:
D&GP
Bernalillo, Sandoval County, New Mexico

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April 2016

EA Project No. 1505701.02

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# 1. INTRODUCTION

This document has been prepared on behalf of D&G Price Limited Partnership (D&GP) to petition for Alternative Abatement Standards (AAS) for the former Price's Valley Gold North Dairy (PVGND) in Bernalillo County, New Mexico. PVGND has been in abatement under Title 20, Chapter 6, Part 2 of New Mexico Administrative Code (20.6.2 NMAC) since 1997. Concentrations of nitrate, chloride, and total dissolved solids (TDS) exceed Water Quality Control Commission (WQCC) standards in a few monitoring wells in the Valley Fill Aquifer (VFA).

The VFA is a wedge-shaped perched aquifer of limited extent which has gone through two abatement demonstrations: (1) an extensive field scale in situ denitrification demonstration, and (2) full-scale groundwater pumping with discharge to the Rio Rancho sanitary sewer. Both of these actions were approved by the Ground Water Quality Bureau (GWQB) of the New Mexico Environment Department. PVGND and its successor D&GP agreed to these recommended actions and implemented them under GWQB oversight. The second abatement action (groundwater pumping and discharge) was performed as part of a settlement agreement (Appendix A) between D&GP and NMED to address impacts to the VFA. Despite these interim abatement actions, groundwater concentrations in isolated areas of the VFA still exceed WQCC standards.

The settlement agreement allows for AAS petition in the event the groundwater pumping did not achieve WQCC standards. Since WQCC standards are still exceeded, AAS are sought that are both achievable and protective such that planned development of the property can proceed unencumbered by environmental concerns.

This report discusses the site location and history below. It is important to note that this AAS petition is for VFA groundwater only. Other actions have resulted in partial site closures and are discussed in "*Site History*." However, this discussion is for completeness and this petition does not include (1) Upper Santa Fe Aquifer groundwater impacts or (2) historical soil contamination.

The Upper Santa Fe Aquifer impacts were addressed by a technical infeasibility demonstration (EA 2012), submission of an Abatement Completion Report (EA 2013) with NMED concurrence (NMED 2013a), and partial abatement termination (NMED 2013b) after all Upper Santa Fe Aquifer monitoring wells were plugged and abandoned with the exception of one (MW-11R). Soil impacts were closed through the Voluntary Remediation Program (VRP), with a Certificate of Completion issued on November 28, 2006 (NMED 2006).

## 1.1 SITE LOCATION

The former PVGND is located on the east side of New Mexico Highway 528 in Bernalillo, New Mexico. It is bound on the south by Venada Arroyo. The northern portion of the original dairy has been closed and is occupied by Walmart and other commercial businesses (Figure 1). The portion of the former dairy subject to this petition is depicted on Figure 2, and encompasses Lot 5-B, Lot 5-A6, Parcel 1, and contiguous portions of Venada Plaza Drive.

## 1.2 SITE HISTORY

Originally Ridge Dairy, a 200-cow dairy, was operated on the site from 1960 to 1973 and was owned by Stanley and Ron Ridge. In June 1973, Mr. Dudley Price purchased the Dairy and renamed it Price's Valley Gold Dairy. Mr. Price increased the size of the dairy to 1,000 to 1,200 cows and subsequently purchased 183 acres to the south to accommodate the increased discharge from the enlarged facility.

In February 1986, the New Mexico Environmental Improvement Division notified the PVGND that they were required to have a discharge plan. The dairy submitted an application in May 1986, and it was approved in July 1987. The initial samples collected from groundwater monitoring well MW-1, near the Dairy's east lagoon, had existing nitrate concentrations of 43.8 milligram per liter (mg/l) in November 1986, 93.4 mg/l in February 1987 and 61.8 mg/l in December 1987 (average of 66 mg/l).

In June 1997, the New Mexico Environment Department (NMED) was advised that the Dairy was scheduled to be closed. As part of a site investigation conducted in June and August 1997, the NMED provided guidance on the type of Corrective Action Plan it would require under the discharge permit in connection with the closure of the Dairy. Initial work on the Corrective Action Plan began in August 1997.

The Dairy was closed in June 1998. Beginning in October 1997, Glorieta Geoscience, Inc. and Faith Engineering, Inc. conducted numerous investigations and studies and developed at least three corrective action and abatement plans. In the summer of 2008 a nutrient injection system was operated at the site. The objective of the injection system was to create a treatment wall within the aquifer which would de-nitrify the groundwater as it passed through the wall. In November 2008, METRIC Corporation was retained to conduct an independent evaluation of the historic investigation and remediation efforts at the site.

In October 2010 METRIC submitted an amended Stage 2 Abatement Plan (S2AP) which specified groundwater pumping with irrigated agriculture (alfalfa production) as the end water use and nitrate treatment. The 2010 S2AP modified the original S2AP submitted in 2006 which also relied on groundwater pumping as the principal component of the remedy. The public notice requirement had been satisfied with this initial S2AP submission.

The PVGND has been fully characterized, and the Stage 1 Abatement Plan completed. The site is currently in Stage 2 Abatement according to NMED records, and is in Long Term Monitoring (LTM). The LTM has created a sufficient time-series of groundwater monitoring data to support evaluation of contaminants trends with confidence.

Mr. Price closed the dairy in June 1998. The property was cleared of all structures by 2006 The Property, except for Lot 5-B, has been sold and redeveloped into various lots that contain commercial businesses, including Wal-Mart, Firestone Tires, a gasoline station, a strip mall and several fast food restaurants. There are undeveloped lots within the southeastern portion of the Property. D&G P retains ownership of Lot 5-B and only has limited use of the other surface area that is part of the Site.

In order to facilitate surface redevelopment, PVGND North Area (86.2 acres) entered the NMED VRP (#53061004) for nitrogen compounds in soil. The application was submitted on November 21, 2005, final eligibility granted June 28, 2006, Certificate of Completion issued November 28, 2006 and Covenants Not to Sue (CNS) issued on January 17, 2008 and April 9, 2008. These actions close out soil pathways and complete soil remedies.

Based on the entire record of LTM, relatively high nitrate concentration levels have been observed in VFA monitoring wells. However, the plume has remained relatively constant in size, as it tends to move to the west or east with high or low river flow conditions (METRIC Corp) and shift in hydraulic gradient. A summary of the groundwater contaminant concentrations since March 2011 is provided in Table 1.

With respect to the Upper Santa Fe Aquifer groundwater, on March 27, 2013, D&GP submitted an Abatement Completion Report to NMED that demonstrated abatement was complete for the entire original Abatement Plan Area, with the exception of two areas that remain in abatement because groundwater standards have not yet been achieved.

The two areas still in abatement were Lot 5-A9 (MW-11R) for impacts related to the Upper Santa Fe aquifer groundwater, and Lot 5-B, Lot 5-A6, Parcel 1, and contiguous portions of Venada Plaza Drive for impacts to VFA groundwater. The Abatement Completion Report stated that "D&GP will submit a work plan upon completion of a settlement agreement that addresses the remaining abatement activities." This work plan modified the October 2010 S2AP (METRIC 2010) which had never been implemented. Hence, the S2AP was implemented in accordance with the work plan for implementation of a groundwater extraction system with discharge to the City of Rio Rancho waste water treatment plant rather than field irrigation as specified in the METRIC plan (EA 2013).

Lot 5-B, Lot 5-A6, Parcel 1 and contiguous portions of Venada Plaza Drive overlie the VFA. A series of 3 waste water lagoons operated along Venada Arroyo, and lowest in elevation, or east lagoon, was centered over the VFA in Lot 5-B. This lagoon has a varied history of being initially unlined, then lined during later periods of operation. The volumes of waste water processes through the lagoons, and an estimate of the historic seepage from the lagoons, was not provided in Stage 1 Abatement Plan documents. As result, no means of estimating former discharge from the lagoons is currently available without speculation and assumption; however, since the lagoons ceased receiving waste water circa 1998, it is assumed that drainage out of the vadose zone is complete and sourcing of contaminants to the VFA is complete. According to Hawley (2009), Lot 5-B is underlain by 30 to 40 feet of lithofacies VAY, mapped as younger arroyo-valley alluvium consisting of pale- to light-brown sand, muddy sand, and pebble to cobble gravel associated with tributary streams to the Rio Grande. This soil is expected to drain well.

The east lagoon is the suspected source of groundwater contamination in the VFA as its footprint encompasses perhaps 40 percent of the VFA which directly underlies it. The perched nature of the VFA, along with observed gradient reversals based on river stage (METRIC 2010) has "stranded" the impacts on the confining layer, and dispersion via discharge out of the VFA to the

Rio Grande flood plain alluvium has not occurred. This isolation in concert with gradient reversals has resulted in highly variable contaminant concentrations in some areas. The S2AP intended to collect this isolated groundwater via pumping and discharge it to sanitary sewer. Although much contamination was removed, the variable trends returned once the hydraulic gradient reverted to the natural condition.

The groundwater pumping and discharge system was operated from October 2013 until July 2015 and a total of one pore volume (14,600,000 gallons), which was agreed upon with NMED concurrence, had been pumped from the VFA (EA 2015; Appendix B). In areas where the VFA thickness is sufficient to allow significant pumping rate, the plume in the VFA substantially cleaned up. However, to the north of the VFA where it pinches out and the aquifer is thin, the low pumping rates did not result in cleanup. The positive results from areas where sufficient aquifer thickness exists indicate the technology was appropriate. However, the inability to pump sufficient water in an efficient manner where the aquifer thins indicates a technical infeasibility to achieve WQCC standards with groundwater pumping in areas of insufficient aquifer thickness.

The site is currently being monitored, and the most recent quarterly groundwater monitoring report (EA 2016) is provided in Appendix C. This report includes summary tables of groundwater monitoring data for the VFA going back as far 1998 for MW-1A, a potentiometric surface map for December 2015, plume maps for nitrate chloride, and TDS for December 2015, and hydrographs and trend plots for contaminants of concern.

# 2. AAS PETITION REQUIREMENTS

This petition for AAS at the former PVGND must address the requirements of 20.6.2 NMAC Section 1210 *Variance Petitions* and Section 4103.F *Alternative Abatement Standards*. The responses to these requirements are discussed below.

## 2.1 VARIANCE PETITION REQUIREMENTS

Section 1210.A requires that *"Any person seeking a variance pursuant to Section 74-6-4 (G) NMSA 1978, shall do so by filing a written petition with the commission."*
Petitions shall:

1. *State the petitioner's name and address;*

   D&G Price Limited Partnership
   PO Box 850
   Bernalillo New Mexico 87004

2. *State the date of the petition;*

   February 20, 2016.

3. *Describe the facility or activity for which the variance is sought;*

   Valley Fill Aquifer water quality standards at the former Price's Valley Gold North Dairy, Bernalillo County, New Mexico.

4. *State the address or description of the property upon which the facility is located;*

   The former Price's Valley Gold North Dairy (PVGND) is located on the east side of New Mexico Highway 528 in Bernalillo, New Mexico. The parcel of land where VFA is impacted is legally described as Lot 5-B, Lot 5-A6, Parcel 1, and contiguous portions of Venada Plaza Drive for impacts to VFA groundwater.

5. *Describe the water body or watercourse affected by the discharge;*

   The affected water body is the VFA, a localized wedge-shaped perched aquifer of limited extent. That portion of VFA aquifer subject to this variance petition is bound on the east by the Venada Arroyo, on the north and west it pinches out on the underlying confining clay, and to the south it mingles with the Upper Santa Fe aquifer as the confining clay pinches out. In plan-view, the VFA nitrate impacts are shown on Figure 2. In cross section, the VFA is depicted as the perched water levels along sections G-G' and H-H' at match points with J-J'. To the north, at the match points of G-G' and H-H' with D-D', the VFA is absent and the water levels are in the Upper Santa Fe aquifer.

6. *Identify the regulation of the commission from which the variance is sought;*

Sections A and B of 20.6.2.3103 NMAC as provided in Subsection F of 20.6.2.4103 NMAC.

7. *State in detail the extent to which the petitioner wishes to vary from the regulation;*

   The Alternative Abatement Standards sought under this petition are 220 mg/L for nitrate, 350 mg/L for chloride, and 3,310 mg/L total dissolved solids.

8. *State why the petitioner believes that compliance with the regulation will impose an unreasonable burden upon his activity;*

   Both of the interim abatement actions performed to date—in situ denitrification and groundwater pumping—have failed to achieve standards. The VFA is wedged shaped (Hawley 201, and to the north and west where it pinches out, the ability to hydraulically capture the thin aquifer is technically infeasible.

9. *State the period of time for which the variance is desired.*

   The AAS are requested in perpetuity to facilitate site closure and property development.

## 2.2 ALTERNATIVE ABATEMENT STANDARDS REQUIREMENTS

The demonstration requirements codified in Subpart F of 20.6.2.3103 NMAC include the following:

1. *Compliance with the abatement standard(s) is/are not feasible, by the maximum use of technology within the economic capability of the responsible person; OR there is no reasonable relationship between the economic and social costs and benefits (including attainment of the standard(s) set forth in Section 20.6.2.4103 NMAC) to be obtained;*

   D&GP will demonstrate that compliance with the abatement standards is not technically feasible (Section 7.1) and there is no reasonable relationship between the costs and benefits (Section 7.2).

2. *The proposed alternative abatement standard(s) is/are technically achievable and cost-benefit justifiable; and*

   The AAS proposed will be based on the most recent 8 quarters of groundwater monitoring, thereby ensuring they are achievable.

3. *Compliance with the proposed alternative abatement standard(s) will not create a present or future hazard to public health or undue damage to property.*

   The proposed AAS will be shown to not create a present or future hazard through administrative controls, hydrogeological considerations, and evidence from operation of

the groundwater pumping system. The plume is stable and stagnant in the perched aquifer. After pumping ceased, the plume reverted immediately to its fluctuating east to west, then west to east, groundwater flow pattern which results in very little net migration of contaminants. It will be shown that no undue damage to property will result from the AAS.

# 3. SITE GEOLOGY AND HYDROLOGY

Numerous site-specific data have been collected from boreholes and monitoring wells for the site to develop the hydrogeologic setting. The site specific geology was in turn integrated into the regional geology and hydrogeology. The Stage 2 Abatement Plan completed by METRIC Corporation (2010) developed the geology and hydrogeology for the site as presented below.

## 3.1 TOPOGRAPHY

The property is located from approximately 5,150 to 5,050 feet above mean sea level (amsl) with significant land slope toward the southeast (Figure 1). General storm water flow at the former Dairy is from high ground on the northwest downhill toward the low lying areas to the southeast. The Rio Grande is located approximately 4,000 feet east of the Dairy.

## 3.2 SITE SPECIFIC GEOLOGY

The site specific geology was developed Dr. John W. Hawley, PhD (Hawley Geomatters 2009). METRIC Corporation retained Hawley Geomatters to develop a geologic model of the dairy site. Dr. Hawley was furnished with the available soil boring and monitoring well logs for the site. He was also furnished with historic reports, historic water level data and historic water quality data. The Hawley report is appended the modified S2AP (METRIC 2010; Appendix D).

The Hawley report provides a detailed discussion of all geologic units present, including those units present in the vadose zone. The units and associations germane to the VAF are discussed below.

## 3.3 HYDROGEOLOGY

Evaluation of the site geology and historic water level data indicates that there are two distinct aquifers at the site: the USF aquifer and the VF aquifer. Recharge to the older USF aquifer probably occurs along its subcrop beneath the older valley fill (VAO) and Los Durans Gravel (TAd) to the west and north of the site. Groundwater flow in the USF aquifer is to the southeast as depicted in Figure 2, which represents conditions in June 2010. Hydrographs of the USF aquifer monitoring wells (Figure 3) indicate water levels are stable. Depth to water within the USF aquifer is approximately 60 to 90 feet below ground surface.

> The younger VFA consists of the combined Venada Arroyo Fill (VAY) and the Rio Grande Valley fill (RG). The two units are hydraulically connected on the east, and exhibit an average water level elevation of about 5040. The VFA is hydraulically separated from USF aquifer by “red clay” in the USF. The presence of the “red clay” in the USF aquifer explains the approximate 20 ft. water level difference between the VFA and the USF aquifer. In plan-view, the VFA nitrate impacts are shown on Figure 2. In cross section, the VFA is depicted as the perched water levels along sections G-G’ and H-H’ at match points with J-J’. To the north, at the match points of G-G’ and H-H’ with D-D’, the VFA is absent and the water levels are in the Upper Santa Fe aquifer. The relation of VAY to USF at these locations is shown in G-G’ and H-H’.

Regional perspective suggests groundwater flow direction in the VFA should be toward the southeast, subparallel to the Rio Grande. However, The VFA is perched and limited in extent to the north and west, thinning and pinching out altogether. Moreover, on the east, the VFA is in communication with the river bed aquifer. So when water levels in the river bed aquifer rise, they do so in the VFA, causing groundwater to flow to the west. Conversely, when water levels in the river bed aquifer fall, groundwater flows to the east in the VFA. METRIC (2010) referred to this phenomenon as "estuary-like" with seasonal gradient reversals versus tidally influenced reversals. The net result from contaminant transport perspective that solute moves to and fro, but does not travel significantly to the south or south and out of the VFA.

Recharge to the VFA aquifer is principally from exchange with the river bed aquifer. However, the Venada Arroyo bounds the site on the south, and is unlined and certainly infiltrates water during periods of surface water flow.

## 3.4 DISTRIBUTION OF CONTAMINANTS

The sources of contaminants to the VFA as well their occurrence in the VFA are discussed below.

### 3.4.1 Contaminant Sources

The principal contaminant source for the VFA was a former process lagoon which was situated above the VFA. However, documents obtained in 2011 indicate unauthorized discharges from the City of Rio Ranch's Lift Station 15 to the unlined Venada Arroyo have occurred. These sources are discussed below.

#### *3.4.1.1 Former Dairy Processes*

The former dairy process areas are depicted on Figure 1 of the S2AP (METRIC 2010; Appendix D). The lower (and largest) process water lagoon sat directly over the VFA as shown on Figure 6 of the S2AP. It is former discharges from this lagoon that is suspected of being the principal source of *dairy process related* impacts to the VFA. This lagoon no longer exists and the area has been graded for development.

#### *3.4.1.2 Unauthorized Discharges to Venada Arroyo*

Unauthorized discharges of raw sewage from Rio Rancho Lift Station 15 have occurred in the past and still occur from time to time. Documents requested and received from the City of Rio Rancho in 2011 indicate that at least 25 discharges of raw sewage have occurred since the mid 1990's (Appendix E). The bottom of the Venada Arroyo is only separated from the VFA by 20 to 30 feet of lithofacies VAY, mapped as younger arroyo-valley alluvium consisting of pale- to light-brown sand, muddy sand, and pebble to cobble gravel associated with tributary streams to the Rio Grande (Hawley 2009). The VAY contains very little fine grained sediments that may impede infiltration and discharge of these spills to the VFA. Therefore, interference from these unassessed discharges may be adversely affecting groundwater quality, potentially resulting in

variability in water quality which affects the feasibility of achieving standards through abatement.

### 3.4.2 Nature and Extent of Current Groundwater Impacts

The current extent of groundwater impacts by nitrogen, chloride and TDS are discussed below. MW-21 is located in a downgradient position and was not sampled in December 2015 because it could not be found. However, MW-21 has never exceeded standards, and in 2013 contained <0.1 mg/L nitrate, 94 mg/L chloride, and 768 mg/L TDS. MW-18, which flanks the VFA plume on the west, has been reasonably stable: it has never exceeded standard for chloride or TDS, and twice it elevated to 10 mg/L nitrate, but is generally below standard. On the north, MW-13RR has been below standards since 2011. These perimeter well results indicate plume stability, and it appears that with the gradient reversals that occur (east to west, then west to east) in response to interaction with water levels in the river bed aquifer, the net migration is very little, and the plume stagnant.

#### *3.4.2.1 Nitrate Plume*

The nitrate plume above 10 mg/L is shown in Figure 4 of the most recent monitoring report for results from December 2015 (EA 2016; Appendix B). The nitrate impacts above standard are limited to an area of about one acre in the vicinity of the groundwater extraction well field (wells EX-1 though EX-4). Included are monitoring wells MW-19R, MW-20R and MW-23. Note that MW-11R is completed in the Upper Santa Fe aquifer and is not included in the VFA plume.

#### *3.4.2.2 Chloride Plume*

Chloride is only detected at standard (250 mg/L) in MW-19R (Figure 3, EA 2016); however, elevated chloride is observed in the same general footprint as the nitrate plume and is indicative of the impacted zone of VFA.

#### *3.4.2.3 Total Dissolved Solids Plume*

Total dissolved solids plume above the standard of 1,000 mg/L is defined by MW-19R, MW-23 and MW-1A, and spans a similar footprint as described for the nitrate and chloride plumes. The TDS plume is shown on Figure 5 of the most recent quarterly monitoring report (EA 2016).

# 4. ABATEMENT ACTIVITIES COMPLETED

Abatement activities completed at the site include in situ denitrification conducted by Faith Engineering in summer and fall of 2008.

## 4.1 IN SITU DENITRIFICATION

Details regarding the in situ denitrification abatement are provided in *"Amended Stage II Abatement Plan at the Former Price's Bernalillo Dairy"* (Faith Engineering 2008; Appendix F). Figure 2 of this report shows the alignment of nine total injection wells spanning from just upgradient and west of MW-20R on the south to just east of MW-19R on the north. The line of injection provides a subsurface treatment barrier to denitrify groundwater as is passes to the southeast. Sodium acetate and later sugar were injected, along with tri-sodium phosphate to provide nutrients. The total volume of amendment is was reportedly over 1.5 million gallons (John Price, personal communication 2016).

## 4.2 GROUNDWATER PUMPING AND DISCHARGE

D&GP recently completed pumping one pore volume (14,600,000 gallons) of groundwater (EA 2015) in accordance with the settlement agreement (Appendix A). This resulted in reduced concentrations and a somewhat reduced aerial extent of the solute plume (EA 2016). However, rebound is already appearing in MW-19R and MW-23 (in the northern portion of the plume where the VFA thins and vanishes, and where pumping rates were low. A complete accounting of the groundwater pumping and discharge abatement activity is provided in the final *Quarterly Groundwater Monitoring, and System Operation* Report (EA 2015; Appendix B).

# 5. TECHNICAL INFEASIBILITY EVALUATION

## 5.1 EVALUATION OF CLEANUP TECHNOLOGIES FOR NITRATE

### 5.1.1 In Situ Denitrification

Based on the alignment of injection wells, two downgradient wells that would be useful in evaluating the effectiveness of the test are MW-1A and MW-20R. Concentration trend graphs for these wells are provided in the most recent quarterly monitoring report (EA 2016; Appendix B). Inspection of the trend graphs indicate that after the injection circa 2008, concentrations in these two wells declined. However, between 2010 and 2012 rebound is clearly observed in MW-20R.

The use of in situ denitrification for cleanup of the plume is not feasible, both on economic and technical grounds, for the following reasons:

- The line of injection wells requires that all groundwater pass through the treatment zone in order to be denitrified; however, we know from decades of well gauging that groundwater in the VFA reverses gradient typically from east to west and vice versa based on communication with water levels in river bed alluvium and is therefore somewhat stagnant with respect to ultimate discharge point. This phenomenon was described by METRIC as "in a manner analogous to an estuary." Therefore, downgradient is a transient concept, groundwater flows to and fro, and reliance on groundwater passing through a treatment barrier in a downgradient sense will not result in cleanup in a timely manner;

- This technology does nothing to treat chloride and TDS, so that even if nitrate vanished, AAS for chloride and TDS would be required in order to terminate abatement and close the site;

- The addition of sodium acetate and sucrose will cause the groundwater to become reducing, or anaerobic, in nature. This has the potential to cause dissolution of metals subject to oxidation and reduction reactions: arsenic, iron, and manganese. Robust application of this technology may reduce nitrate only to create an alternate groundwater problem and the site would continue in abatement indefinitely.

### 5.1.2 Groundwater Pump and Discharge

D&GP just completed pumping one pore volume of groundwater (EA 2015) in accordance with the settlement agreement (Appendix A). The pumped groundwater was discharged to the Rio Rancho sanitary sewer as per agreement between Rio Rancho and D&GP to discharge one pore volume (44 acre feet) of groundwater. This resulted in reduced concentrations and a somewhat reduced aerial extent of the solute plume (EA 2016; Appendix C). However, rebound is already appearing in MW-19R and MW-23 (in the northern portion of the plume where the VFA thins and vanishes, and where pumping rates were low.

The results of post-pumping monitoring indicate that since the hydraulic stress of pumping in the line of EW-1 through EW-4 was ceased, the hydraulic gradients reverted to the east to west, and presumably west to east, "estuary" behavior described by METRIC (2010). This aquifer behavior effectively "strands" impacted groundwater from significant movement for hydraulic capture. As soon as the gradient reverted to natural conditions, nitrate advected into MW-19R and MW-23 and elevated to considerably above standard for nitrate, and to levels that are representative of the plume before cleanup attempts.

### 5.1.3 Reverse Osmosis

The ability to directly discharge pumped groundwater to the Rio Rancho sanitary sewer was a temporary arrangement that facilitated pumping the agreed upon pore volume of groundwater. Pumping groundwater over a considerable period would require treatment. Since chloride and TDS would need to be removed, treatment by reverse osmosis (RO) would be required.

RO is a proven desalinization technology that can remove salts from water. It is, however, an expensive technology that requires high pressure pumps to force water across a selective semipermeable membrane. In reverse osmosis, an applied pressure is used to overcome osmotic pressure, which can remove many types of molecules and ions from solutions. The result is that the solute containing undesirable ions is retained on the pressurized side of the membrane, and pure water is allowed to pass to the other side. To be "selective", this membrane should not allow ions to be removed through the pores. The "solute" retained is referred to as "concentrate" or "waste stream" and is very high in TDS.

When sea water is being treated by RO, the concentrate may be returned to the sea. However, Howe (2004) points out the problems with disposal of concentrate in inland areas, since it is toxic to plants and renders fresh water saline, creating great regulatory challenges. For the reasons of high energy expenditure, and no known means of economical disposal of this waste stream, treatment by RO is considered not economically feasible.

### 5.1.4 Monitored Natural Attenuation

The VFA has been in some form of groundwater monitoring for a couple decades now, and the rebound observed MW-19R and MW23 are to levels indicative of the plume prior to the in situ injection test and the groundwater pumping of one pore volume. In other words, neither natural processes nor engineered approaches have significantly reduced nitrate concentrations in the stagnant and stranded VFA groundwater. Nitrate can be recalcitrant in aerobic groundwater, and in the VFA this appears to be the case (see concentration trend graphs in EA 2016; Appendix C). So MNA does not look viable, future concentrations can be reasonable predicted as significantly over standard base on past trend data, and long-term MNA monitoring is likely academic.

## 5.2 EVALUATION OF CLEANUP TECHNOLOGIES FOR INORGANIC CONTAMINANTS

The technology available for significant chloride and TDS reduction is groundwater extraction. Groundwater extraction via pumping and discharge was just completed in accordance with the

settlement agreement, and the effect was not permanent. Contaminant concentrations rebounded as soon as the VFA reverted to natural gradients.

Neither chloride nor TDS will significantly reduce over time via natural attenuation (MNA) processes in the stagnant VFA groundwater. If anything, inducing reducing conditions via acetate and sucrose injection will exacerbate the inorganic constituent concentrations. Ex situ treatment of pumped groundwater via reverse osmosis is cost prohibitive, and technically infeasible due to lack of disposal options for "concentrate."

## 5.3 ENGINEERING AND ADMINISTRATIVE CONTROLS

There are a number of administrative controls that can be used to protect human health and the environment, prevent exposures, eliminate the use of the affected groundwater for any means, and ensure there is no undue harm to property. These include connection to public water supply, deed restriction prohibiting completion of a water well in the affected stratum, and existing well completion rules promulgated by the Office of State Engineer. These controls are discussed in detail below.

### 5.3.1 Requirement to Connect to Public Water Supply

In accordance with Town of Bernalillo Water Use and Water Rate Ordinance, Ordinance 81, Article 4, Section 11, "At such time as public water main becomes available within two hundred (200) feet of a property line served by a private water well, a direct connection shall be made to the public water system in compliance with this Ordinance, within 90 days." Water and sewer lines have been install along existing streets within the (Venada Plaza) Development (Appendix G). Because of this requirement, city water supply will be provided to all buildings. Since the property in question is zoned commercial, residential exposure pathways are not complete. Accordingly, the risk of prolonged exposure by ingestion of water to newborns, toddlers and young children is negligible.

### 5.3.2 Deed Restriction on Well Construction

D&GP will file a deed notice in the real property records of the Bernalillo County where the property is located. The deed notice will provide owners, operators, prospective buyers and others notice and information regarding the groundwater condition in the VFA. The deep regional aquifer, USF aquifer, will still be able to be used for water supply, so there is no unfavorable impact to water availability on the property. A copy of the deed notice is included in Appendix H.

### 5.3.3 Completion of Well in Contaminated Groundwater Prohibition

Title 20, Chapter 27, Part 4 NMAC *Well Driller Licensing; Construction, Repair and Plugging of Wells* provide rules to prevent construction of a water supply in impacted groundwater. Specifically,

> *"All wells shall be constructed to prevent contamination, to prevent inter-aquifer exchange of water, to prevent flood waters from contaminating the aquifer, and to prevent infiltration of surface water."* (19.27.4.29 NMAC)
> ***"****All wells shall be set back a minimum of fifty (50) feet from an existing well of other ownership, unless a variance has been granted by the state engineer. All wells shall be set back from potential sources of contamination in accordance with New Mexico environment department regulations and other applicable ordinances or regulations."* (19.27.4.29.D NMAC)
>
> *"When necessary, annular seals will be required to prevent inter-aquifer exchange of water, to prevent the loss of hydraulic head between geologic zones, and to prevent the flow of contaminated or low quality water."* (19.27.4.30.A NMAC)
>
> *"Wells which encounter non-potable, contaminated, or polluted water at any depth shall have the well annulus sealed and the well properly screened to prevent the commingling of the undesirable water with any potable or uncontaminated water."* (19.27.4.30.A.4 NMAC).

### 5.3.4 State Engineer Order to Prohibit Well

Finally, D&GP will request NMED GWQB petition the OSE to draft a State Engineer Order to prohibit construction of a well in the affected water bearing zone. The order will be established in accordance with 19.27.5.13.A. Rejection of Application, which states:

> *"The state engineer may reject an application for a 72-12-1.1 domestic well permit when the proposed 72-12-1.1 domestic well is to be located in an area where a restriction on the use of water or the drilling of new wells has been imposed by a court. The state engineer may reject an application for a 72-12-1.1 domestic well permit when the proposed 72-12-1.1 domestic well is to be located in an area of water quality concern where a prohibition on or a recommendation against the drilling of new wells has been established by a government entity."*

In this matter, the "area where a restriction on the use of water or the drilling of new wells" shall be the VFA in Lot 5-B and contiguous portions of Venada Plaza Drive. Lot 5-A6 and Parcel 1 are below standards based on MW-13-RR. The government entity establishing the prohibition is NMED. D&GP will provide NMED the necessary documents to support and effect the prohibition and shall not contest its establishment.

In summary, the well construction requirements, deed recordation to document the contaminated groundwater stratum, and Office of State Engineer order will prevent completion of water wells in the VFA, thereby preventing withdrawal of groundwater and potential exposure.

# 6. PROPOSED ALTERNATIVE ABATEMENT STANDARDS

The proposed AAS are intended to capture the last 8 quarters of groundwater monitoring maximum levels in the VFA, and concentrations will therefore not exceed AAS. This will allow immediate termination of abatement, timely closure of the site, and facilitate redevelopment. The Village of Bernalillo has expressed concern regarding development of the parcel in question in its current regulatory state. With this goal in mind, the proposed standards for VFA groundwater are:

- Nitrate 220 mg/L
- Chloride 350 mg/L
- Total Dissolved Solids 3,310 mg/L

Once these AAS are established, D&GP will file an Abatement Completion Report in accordance with 20.6.2 NMAC Section 4112.A.. This will allow the Secretary to notify D&GP that abatement is terminated in accordance with Section 4112.B. The property will then be unencumbered for continued development.

# 7. DEMONSTRATION OF AAS REQUIREMENTS

AAS requirements and the proposed AAS satisfy them are discussed in the follow sections.

## 7.1 ABATEMENT STANDARDS NOT TECHNICALLY ACHIEVABLE

It has been demonstrated herein that the standards at 20.6.2.3103 NMAC, 10 mg/L nitrate, 250 mg/L chloride, and 1,000 mg/L TDS, are not technically achievable. Several decades of natural attenuation and two engineered cleanup actions (in situ denitrification and groundwater pumping and discharge) have not restored groundwater in the VFA to Section 3103 levels. In fact, post groundwater pumping rebound concentrations in select wells in areas where the VFA thins and is difficult to hydraulically stress (due to low transmissivity related to minimal aquifer thickness) have reverted to pre-abatement levels. The VFA is stagnant and perched, and the lack of both (1) groundwater flow-through with attendant dispersion and (2) intrinsic denitrification, renders it very difficult to reduce concentrations despite aggressive efforts.

Compounding the ability to achieve standards is the fact that Lift Station 15 has had and still has unauthorized discharges of raw sewage to the unlined Venada Arroyo. These discharges, which contain the same constituents as the former dairy waste (nitrate, chloride and TDS) are beyond the control and capacity of D&GP to abate. Until these unauthorized discharges cease completely, the VFA will not clean up to Section 3103 standards.

## 7.2 NO REASONABLE RELATIONSHIP BETWEEN ECONOMIC AND SOCIAL COSTS

There is no reasonable relationship between continuing abatement and social costs. In fact, continuing abatement has an adverse social cost as the land sit idle rather than completion of development. The following points can be made regarding social impacts:

- A number of administrative controls will be in place to ensure the VFA is never used as a potable water supply, including:
    - Deed restriction prohibiting construction of a well in the VFA;
    - Public water supply is in place and required by Bernalillo;
    - Well Drillers rules prohibit completing a water well in impacted groundwater. Moreover, it is unfathomable that a water well would be completed in the VFA when the prolific Upper Santa Fe aquifer resides 20 feet below the VFA;
    - State Engineer Order will be placed that prohibits construction of a water well on the property;
- Because of the nature of the VFA, it is apparent that no effort and no cost are likely to achieve to the standards at Section 3103. Therefore, an arrangement whereby the administrative controls are fully in place and fully documented, attached to the title to

the property so that use of and exposure to VFA is prevented, is both protective of human health and beneficial to intended future land use.

- The AAS will allow the NMED to "clear" the property and administratively close out abatement, freeing the property for final development. This is considered a "positive" social impact.

- Conversely, failure to approve the AAS will result in the property remaining in a state of partial development as groundwater monitoring continues *ad infinitum*. The technical infeasibility of an engineered cleanup approach to achieve Section 3103 standards has been demonstrated via two different abatement activities.

## 7.3 PROPOSED AAS ARE TECHNICALLY ACHIEVABLE AND COST-BENEFIT JUSTIFIABLE

The proposed AAS have already been achieved and will result in immediate submission of an Abatement Completion Report and termination of abatement. The cost for this activity is nominal relative to the money spent on the two abatement activities. The ability to complete development of this parcel, which presently lies idle in a partial state of development, is beneficial to the Town of Bernalillo.

The cost-benefit evaluation discussed herein is based on that portion of the VFA in Lot 5-B and contiguous portions of Venada Plaza Drive. Lot 5-A6 and Parcel 1 are below standards based on MW-13-RR and will not require AAS.

Cost of Remediation

To date, $1,400,000 has been expended on abatement activities related to the VFA assessment and cleanup. Because of the technical impracticability of cleanup discussed in Section 5, for the purpose of valuation a continued cleanup period of 20 years is established for cost basis. The recently completed pumping and discharging impacted groundwater cost $50,000 for installation and $55,000 per year consulting, maintenance, sampling and utilities. These costs are captured in the $1,400,000. However, operating and maintaining the system for an additional 20 years at $55,000 per year is $1,100,000. This brings the total cost of abatement for an additional 20 years (assuming standards achieved in 20 years … a goal that may not be attainable) to $1,400,000 already expended plus $1,100,000 … a total of $2,500,000.

Worth of Property

The assessed value of Lot 5-B is $1,276,344. The current cost of remediation exceeds the appraised property value by 15 percent and the projected cost in 2036 exceeds the property valuation by 50 percent.

Although the property is valued at $1,276,344, it has not sold because of the environmental condition. Since the property cannot be sold, its current market worth is arguably zero. Therefore, granting the requested AAS may at least restore the property worth to a fraction of existing abatement costs expended.

Worth of Affected Groundwater

No water right exists for the affected VFA groundwater. The property is zoned commercial, so domestic use is not foreseeable. The city provides water, and requires that new construction connect to the provided water. Therefore, no reasonable worth of groundwater exists even if it were restored to Section 3103 standards. According, granting the proposed AAS will not adversely affect the worth of ground water.

## 7.4 PROPOSED AAS WILL NOT CREATE A HAZARD TO PUBLIC HEALTH OR UNDUE DAMAGE TO PROPERTY

Exposure to nitrate impacted groundwater will be prevented by the administrative controls outlined in Section 5.3.3. The administrative controls will eliminate the potential human exposure pathways and render the solution protective of public health. Chloride and TDS are not human health concerns by rule since they are not Section 3103.A. contaminants. Finally, freeing the property so that development can be completed will enhance the property, cause undue harm thereto.

# 8. SUMMARY AND CONCLUSIONS

The PVGND closed in June 1998. Abatement Plan activities were initiated by Glorieta Geosciences, Inc. and Faith Engineering in October 1997. The abatement activities included soil and groundwater testing to map the nature and extent of sources and impacts to groundwater contamination. Two aquifers were identified at the site: the regional Upper Santa Fe Aquifer, and the perched Valley Fill Aquifer. The Upper Santa Fe Aquifer has been closed with the exception of an isolated area near MW-11R. The VFA remains in abatement, and two attempts at abatement have been undertaken unsuccessfully. The VFA is perched on the Upper Santa Fe Aquifer, and is separated by a confining clay layer.

Development of the property began after this time, and in order to facilitate the development, soil pathways were closed via the Voluntary Remediation Program (VRP #53061004) with a Certificate of Completion issued November 28, 2006.

Following soil pathway closure, abatement of groundwater impacts was initiated. Injection of acetate, sucrose, and nutrients was conducted in 2008, and groundwater pumping and discharge to Rio Rancho sanitary sewer was conducted from October 2013 through July 2015. A total of one pore volume of groundwater was extracted and discharged.

The results of the injection of groundwater amendments showed initial success as measured in select downgradient monitoring wells; however, Section 3103 standards were not achieved, and after two years significant rebound to well above standards was observed. In concept, the injection technology relied on groundwater movement to the southeast, through the line of injection wells. However, the groundwater flow oscillates between east to west, then back to west to east, depending on the water levels in the river bed aquifer. This renders the VFA groundwater mostly stagnant, and not flowing in a direction (southeast and subparallel to the Rio Grande) as predicted by regional consideration. Hence, affected groundwater did not flow through the line of injection wells, and was not treated for nitrate. Moreover, the injection technology provides no means of treatment for chloride and TDS. Another matter apparently not considered at the time the injections were performed is that the injection of acetate and sucrose can lower the dissolved oxygen in the VFA, and dissolve deleterious metals such as arsenic, manganese, and iron. All of these metals are regulated by NMED, and so cleaning up the nitrate may have resulted in a plume with additional regulated constituents above standards. On these grounds, the injection technology is considered technically infeasible.

One pore volume of groundwater was pumped and discharged with the groundwater pumping remedy. Post groundwater pumping sampling has indicated the hydraulic has reverted to its west-east fluctuating pattern, and monitoring wells positively affected by the groundwater pumping have reverted to high nitrate, chloride and TDS concentrations advected from zones not affected by the pumping. The high concentrations returned to areas of the VFA where it is thin and difficult to hydraulically affect via pumping. This renders hydraulic recovery of groundwater via pumping technically infeasible.

Because the abatement activities conducted to date have proven unable to achieve Section 3103 standards, a petition for AAS is appropriate. The VFA is a small, perched aquifer that poses no

threat to regional groundwater supplies. Engineered and administrative controls are available to ensure that no exposure to impacted groundwater can occur. These controls include:

- Potable water is supplied and connection thereto required by Town of Bernalillo; therefore, exposure to VFA water via ingestion is not a complete pathway;

- Administrative rules for well drillers require that water wells be isolated from impacted groundwater via grouting or cementing. Any well installed on the property would be completed at depth in the Upper Santa Fe Aquifer, which yields prolific quantities of groundwater.

- An OSE Order will be completed that prohibits completion of a well on affected property and includes notice in OSE's database.

The proposed AAS are based on the last several years groundwater monitoring data. As a result, the AAS are technically achievable. Acceptance of the AAS will allow D&GP to proceed with submitting an Abatement Completion Report, which in turn allows the Secretary NMED to terminate abatement. Once these actions are completed, the property development can continue to completion, thereby benefitting all involved parties. The administrative controls described above will ensure this action is protective of human health, and causes no undue damage to the property. In fact, approving the AAS will allow the development to proceed as planned and benefit the property.

# 9. REFERENCES

EA Engineering, Science and Technology, Inc., PBC (EA), 2016. Quarterly Groundwater Monitoring Report for the Former Price's Valley Gold Dairy, Sandoval County, New Mexico. January 22.

EA, 2015. Quarterly Groundwater Monitoring, and System Operation Report for the Former Price's Valley Gold Dairy, Sandoval County, New Mexico. August 27.

EA, 2013. Abatement Completion Report, Former Price's Valley Gold Dairy, Bernalillo, NM. March 27.

EA, 2012. Technical Infeasibility Demonstration Former Price's Valley Gold Dairy, Sandoval County, New Mexico. Prepared for VG Farms, Inc., Albuquerque, NM. October 29.

Faith Engineering, Inc., 2008. Amended Stage II Abatement Plan at the Former Price's Bernalillo Dairy prepared for VG Farms, Inc. January 31.

Hawley Geomatters, 2009. Draft Report on the Hydrogeologic Setting of the Price's Valley Gold-North Dairy Site, in and Near Section 36, T13N, R3E, Sandoval County, New Mexico, January 12.

New Mexico Environment Department, 1997. Letter from Marcy Leavitt, Ground Water Quality Bureau Chief to Gary Rose, ECO Resources, documenting Lift Station 15 Spill. November 10.

Meisenheimer, Wyatt, 1998. Letter to Marchell Schulman, NMED regarding Lift Station 15 discharge to Venada Arroyo. September 9.

METRIC Corporation, 2010. Amended Stage 2 Abatement Plan for the Price's Valley Gold North Dairy Site, Sandoval County, New Mexico. Prepared for VG Farms, Inc., Albuquerque, New Mexico. October 10.

New Mexico Environment Department (NMED), 2013a. Abatement Completion Approval, Former Price's Valley Gold North Dairy, Bernalillo, New Mexico. Letter from Jerry Schoeppner, Chief, Ground Water Quality Bureau, to John Price, Price's Valley Gold North Dairy. May 22.

NMED, 2013b. Partial Abatement Plan Termination, Former Price's Valley Gold North Dairy, Bernalillo, New Mexico. Letter from Jerry Schoeppner, Chief, Ground Water Quality Bureau, to John Price, D&GP Price Limited Partnership. December 13.

NMED, 2006. Transmittal of Certificate of Completion the former Price's Valley Gold Dairy, North Dairy - North Area (VRP Site No. 53061004) in Bernalillo, New Mexico. Letter from William C. Olson, Chief, Ground Water Quality Bureau, to John Price, Price's Valley Gold North Dairy. November 28.

# FIGURES


## LEGEND:

ORIGINAL DAIRY BOUNDARY

REPLATTED BOUNDARY VFA

## NOTES:

Replatted lots shown relative to original DP-437 Plat.

1000 500 0 1000

SCALE IN FEET

PRICE'S DAIRY

# FIGURE 1.
# SITE LOCATION

| PROJECT #: | 1463606 | PROJECT PHASE: | 01 | PROJECT MANAGER: | JS |
|---|---|---|---|---|---|

320 Gold Avenue, SW Suite 1210
Albuquerque, NM 87102
Phone: (505) 224-9013
Fax: (505) 224-9016
EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

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## LEGEND:

- SITE BOUNDARY
- REPLATTING BOUNDARY
- VFA $NO_3$ PLUME
- OLD LAGOON
- VALLEY FILL MONITORING WELLS

## NOTES:

Replatted lots shown relative to original DP-437 Plat.

$NO_3$ plume and monitoring well locations shown from Amended Stage 2 Abatement Plan by Metric Corporation dated October, 2010.

N

200 100 0 200

SCALE IN FEET

PRICE'S DAIRY

# FIGURE 2.
# AREA SUBJECT TO VFA ALTERNATIVE ABATEMENT STANDARD

| PROJECT #: | 1463606 | PROJECT PHASE: | 01 | PROJECT MANAGER: | JS |
|---|---|---|---|---|---|

320 Gold Avenue, SW Suite 1210
Albuquerque, NM 87102
Phone: (505) 224-9013
Fax: (505) 224-9016
EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

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# APPENDIX A

# SETTLEMENT AGREEMENT

**NEW MEXICO**
**ENVIRONMENT DEPARTMENT**

***Office of General Counsel***

SUSANA MARTINEZ
Governor
JOHN A. SANCHEZ
Lieutenant Governor

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Ryan Flynn
Cabinet Secretary-Designate
BUTCH TONGATE
Deputy Secretary

Jeffrey M. Kendall, General Counsel

August 26, 2013

Pete Domenici, Jr.
Domenici Law Firm, P.C.
320 Gold Ave. SW, Suite 1000
Albuquerque, NM 87102-3328

Dear Pete,

Enclosed you will find a fully executed copy of the Price's Dairy Settlement Agreement. Please note that the finalized Work Plan is also part of the Settlement Agreement and both documents should be kept together for further reference. If you have any questions, please feel free to contact me at (505) 222-9550.

Sincerely,

Jennifer L. Hower
Deputy General Counsel

Encl.

# SETTLEMENT AGREEMENT

This Settlement Agreement ("Agreement") is made between the New Mexico Environment Department ("Department") and D&G Price Limited Partnership, a NM limited partnership, ("D&G P") to resolve the Notice of Deficiency ("NOD") issued by the Department on March 28, 2011 in response to the Modified Stage 2 Abatement Plan submitted on October 28, 2010.

## I. BACKGROUND

### A. PARTIES

1. The New Mexico Environment Department was created pursuant to NMSA 1978, § 9-7A-6.B(3), and is an executive agency within the government of the State of New Mexico charged with administering and enforcing various laws relating to the environment. NMSA 1978, § 9-7A-4, NMSA 1978, § 74-1-6 and § 74-1-7.

2. D&G P is a New Mexico limited partnership and is the successor in ownership to VG Farms, Inc., fka Price's Valley Gold Dairy, Inc.

3. The Property is the former Price's Valley Gold North Dairy located at 618 NM Highway 528, Bernalillo, New Mexico.

4. The Site subject to the terms of this Settlement Agreement is the Valley Fill (VF) groundwater within its historical impacted domain in Lot 5-B, Lot 5-A6, Parcel 1 and portions of Venada Plaza Drive between and contiguous to these lots (Attachment A, Work Plan for Groundwater Extraction, Figure 1, Abatement Plan Area Valley Fill Aquifer) and well MW-11R, located in lot 5-A9.

### B. INTRODUCTION

5. Pursuant to the New Mexico Water Quality Act ("Act"), NMSA 1978, §§ 74-6-1 to 74-6-17 (1967), and the New Mexico Water Quality Control Commission Regulations, 20.6.2

NMAC - *Ground and Surface Water Protection* ("WQCC Regulations"), the Department may require responsible persons to abate ground water pollution.

6. D&G P, as the successor in ownership to VG Farms, fka Price's Valley Gold Dairy, Inc., is the responsible party for the abatement of ground water pollution resulting from the former dairy operations on the Property.

7. The former dairy operation was established on the Property by Stanley and Ron Ridge in 1960 and operated as Ridge Dairy until 1973. In June, 1973, Mr. Dudley Price purchased the dairy and renamed it Price's Valley Gold North Dairy (the Dairy). Mr. Price increased the size of the Dairy to 1,000 to 1,200 cows and subsequently purchased 183 acres to the south to accommodate the increased discharge from the enlarged facility. All dairy operations ceased in 1998 when the Dairy was closed and all cattle and manure were removed from the Property. The Property was cleared of all structures by 2006.

8. The Property, except for Lot 5-B, has been sold and redeveloped into various lots that contain commercial businesses, including Wal-Mart, Firestone Tires, a gasoline station, a strip mall and several fast food restaurants. There are undeveloped lots within the southeastern portion of the Property.

9. The Property includes two aquifers, the Upper Santa Fe Aquifer and the Valley Fill Aquifer. Ground water monitoring has shown that both aquifers were contaminated in excess of the WQCC ground water quality standards for nitrate, sulfate, chloride, and total dissolved solids ("TDS") in 20.6.2.3103 NMAC.

10. In 1986, the Department required the Dairy to apply for a groundwater discharge permit and DP-437 was approved and issued in July, 1987. DP-437 approval allowed for a maximum discharge of 9,073 gallons per day of wastewater generated in the milking parlor to be discharged to two manure lined lagoons, and then land applied to crops and pasture on the

Property.

11. DP-437 was approved and modified in May, 1994 for a maximum discharge of 70,000 gallons per day of wastewater generated in the milking parlor to be discharged through a manure separator, conveyed to a synthetically lined lagoon ("Lagoon") with 11.17 acre feet of operational capacity and an additional 4.36 acre-feet of freeboard capacity and then land applied to crops and pasture on the Property.

12. In 1997, the Department was notified that the dairy operation on the Property was scheduled to be closed. The Department conducted site inspections in June and August, 1997 and required the submission of a Corrective Action Plan, pursuant to the terms of DP-437, as part of the closure of such dairy operations on the Property.

13. Initial work on the Corrective Action Plan began in August, 1997. The dairy operations on the Property ceased in 1998.

14. DP-437 was renewed and modified on November 16, 2001 to facilitate groundwater monitoring and closure activity on the Property. The permit renewal and modification required a site investigation of the facility because Water Quality Control Commission ground water standards were exceeded and soil was contaminated on portions of the Property at the time of closure.

15. The required site investigation and groundwater monitoring data demonstrated that all closure plan requirements were satisfied in full for a south portion of the Property containing approximately 156 acres ("South Parcel"). The South Parcel was removed from DP-437 on September 27, 2002 and was not subject to any further discharge plan requirements.

16. On April 3, 2003, a Supplemental Site Investigation Report to evaluate the possible withdrawal of a portion of the remainder of the Property ("North Parcel") from DP-437 was submitted to the Department. The request was denied by the Department on May 27, 2003.

17. On July 22, 2005, the Dairy requested that DP-437 be voluntarily terminated and that remediation proceed pursuant to the WQCC abatement regulations, 20.6.2.4100 – 4115 NMAC.

18. On August 10, 2005, the Department responded and requested that a site characterization report be submitted to the Department prior to the termination of DP-437.

19. On January 11, 2006, a Stage 1 Abatement Plan and Site Characterization Report for Termination of DP-437 was submitted to the Department.

20. On March 3, 2006, the Department provided notice that DP-437 was terminated and that further groundwater investigation and remediation would take place pursuant to WQCC Regulations Sections 20.6.2.4000 through 20.6.2.4115 NMAC.

21. The Stage 1 Abatement Plan was approved by the Department on April 3, 2006.

22. On November 21, 2005, a Voluntary Remediation Program (VRP) application for soil remediation on the North Parcel was submitted to the Department. Final eligibility was granted on June 28, 2006 and a Certificate of Completion was issued on November 28, 2006. Covenants Not to Sue were issued to various purchasers on January 17, 2008 and April 9, 2008. These actions closed out the surficial soil pathways and completed surficial soil remediation only.

23. On November 29, 2006, the Department issued approval of the Stage 1 Abatement Plan, Final Site Investigation Report and provided notice that a Stage 2 Abatement Plan was required.

24. The Proposed Stage 2 Abatement Plan was submitted to the Department on December 18, 2006.

25. On March 23, 2007, the Department issued a Notice of Deficiency (NOD) for the Proposed Stage 2 Abatement Plan.

26. In response to the NOD, a Modified Stage 2 Abatement Plan was submitted to the Department on September 18, 2007. The Modified Stage 2 Abatement Plan proposal was to perform ground water monitoring for 5 years with a contingency plan to operate an in-situ denitrification system if ground water contamination persisted following the 5 years of monitoring. The Department determined that the proposal as submitted was not approvable. On May 2, 2008, the Department received a request for temporary permission to discharge and a plan to implement a temporary in-situ denitrification system. On May 30, 2008, the Department issued a Temporary Permission to Discharge. The in-situ system was operated during the summer and fall of 2008 and 1.5 million gallons of media consisting of water, sugar, and sodium acetate was injected into the Valley Fill Aquifer. The system had no long-term impact on the ground water nitrate levels at the Site.

27. In late 2008 and 2009, additional site investigation activities were performed to better understand the hydrogeologic framework and groundwater flow at the Site.

28. Based on the site reevaluation and investigation, a Revised Stage 2 Abatement Plan was submitted to the Department on October 28, 2010. The Revised Stage 2 Abatement Plan proposed 66 milligrams per liter (mg/l) as the clean-up level for nitrate -based on the average nitrogen concentration level in ground water monitoring wells at the Site in 1986 and 1987. The Revised Stage 2 Abatement Plan identified this concentration as the existing condition within the meaning of 20.6.2.2013 NMAC and the allowable limit under a discharge permit. The Revised Stage 2 Abatement Plan proposed to extract contaminated groundwater from the Valley Fill Aquifer and land apply the extracted water to approximately 7 acres of crop land for treatment.

29. On March 28, 2011, the Department issued a Notice of Deficiency pursuant to Subsection A of 2.6.2.4109 NMAC regarding the October 28, 2010 Revised Stage 2 Abatement

Plan.

30. The March 28, 2011 Notice of Deficiency rejected the proposal to use 66 mg/l as the clean-up level for nitrate as nitrogen on the basis that the "existing condition" or "existing concentration" for purposes of setting water quality standards for issuance of discharge permits is the existing concentration at the time the predecessor regulation to 20.6.2.3103 NMAC was promulgated, in 1977, not the existing concentration at the time a discharge permit is applied for or issued, such as in 1986 and 1987 when monitoring data for site was first obtained. The 1986 and 1987 monitoring data are not relevant to the standards under 20.6.2.3103 NMAC. The proposal did not meet the WQCC Regulations, which require submittal of a plan to implement an abatement option that meets the WQCC water quality standards for nitrate, total dissolved solids, chloride, and sulfate for both aquifers at the site, as required by Subsection E of 20.6.2.4104 NMAC.

31. On April 27, 2011, dispute resolution was invoked in accordance with 20.6.2.4113 NMAC, which provides that if there is a technical dispute regarding a Notice of Deficiency, the responsible person may notify the Secretary of the Department that a dispute has arisen, and may invoke the dispute resolution provisions of the Regulations. Upon such notification, all deadlines affected by the technical dispute are extended for a maximum of sixty (60) days. During this negotiation period, the Secretary or his/her designee and the responsible person are required to meet at least once. If the dispute remains unresolved after the negotiation period, the decision of the Secretary is final.

32. On October 18, 2011, an Abatement Completion Report for the Former Price's Valley Gold Dairy was submitted to the Department.

33. On October 29, 2012, the Technical Infeasibility (TI) demonstration for the Upper Santa Fe aquifer was submitted to the Department to establish substitute abatement

standards pursuant to Section 20.6.24103.E NMAC. Addendums to the report were submitted on December 7 and 13, 2012.

34. On January 18, 2013, the Department approved the substitute abatement standards proposed in the TI demonstration report and addendums for the Upper Santa Fe Aquifer, with the exception of the area at or near the groundwater monitoring well identified as MW-11R legally platted as Lot-5-A-9.

35. On March 27, 2013, the Abatement Completion Report was submitted to the Department based on the Department's January 18, 2013 approval of substitute abatement standards for the Upper Santa Fe Aquifer.

36. On May 22, 2013, the Department issued an Abatement Completion Approval letter based upon the March 27, 2013 Abatement Completion Report.

## II. COMPROMISE AND SETTLEMENT

37. The Department and D&G P (collectively, the "Parties") have engaged in settlement discussions to resolve the technical dispute without further administrative or judicial actions.

38. As a result of these discussions, the Parties have entered into this Settlement Agreement.

39. The purpose of this Settlement Agreement is to resolve all matters related to the March 28, 2011 Notice of Deficiency for the Valley Fill Aquifer and the Upper Santa Fe Aquifer near and around MW-11R.

40. This Settlement Agreement is a compromise that sets forth requirements for the management of the Site and is based on the accumulation of data regarding the Valley Fill Aquifer, and other consideration set forth in more detail in the Work Plan attached as Exhibit A.

## III. TERMS OF SETTLEMENT

41. The March 28, 2011 Notice of Deficiency rejected the proposal to use 66 mg/l as the clean-up level for nitrate as nitrogen on the basis that the "existing condition" or "existing concentration" for purposes of setting water quality standards for issuance of discharge permits is the existing concentration at the time the predecessor regulation to 20.6.2.3103 NMAC was promulgated, in 1977, not the existing concentration at the time a discharge permit is applied for or issued, such as in 1986 and 1987 when monitoring data for site was first obtained. The 1986 and 1987 monitoring data are not relevant to the standards under 20.6.2.3103 NMAC. The proposal did not meet the WQCC Regulations, which require submittal of a plan to implement an abatement option that meets the WQCC water quality standards for nitrate, total dissolved solids, chloride, and sulfate for both aquifers at the site, as required by Subsection E of 20.6.2.4104 NMAC.

42. The Valley Fill Aquifer has certain unique characteristics that pose challenges with regard to contaminant removal. The contaminant plume within the Valley Fill Aquifer beneath the site is contained within a wedge shaped formation of low conductivity that is hydraulically separated from the USF aquifer by a red clay unit. Specific details regarding the Valley Fill Aquifer are set forth in the Work Plan attached as Exhibit A.

43. The Parties agree that D&G P may be unable to meet water quality standards at the Site based on the site-specific conditions.

44. Therefore, the Parties agree as follows:

45. Valley Fill Aquifer. D&G P shall perform remedial activities within the Valley Fill Aquifer as follows:

a. D&G P shall extract from the Valley Fill Aquifer, as defined in the Work Plan attached as Exhibit A, and dispose of at the Rio Rancho Waste Water Treatment Plant a

volume of ground water that is the agreed-upon one pore volume of the contaminated plume, in accordance with Exhibit A.

b. D&G P shall implement the storm water prevention plan to prevent ponding at the Site in accordance with Exhibit A.

c. D&G P will adhere to provisions for contingencies related to inability to timely and practicably extract and dispose of one pore volume of the contaminated plume as described in Exhibit A.

d. Upon completion of the extraction and disposal of the one pore volume, or after the extraction system has been in operation for two years, whichever comes first, the Ground Water Quality Bureau of the Department shall support approval of a petition for an alternative abatement standard pursuant to Subsections (D) and (F) of 20.6.2.4103 NMAC if D&G P chooses to bring such a petition before the Water Quality Control Commission.

46. Upper Santa Fe Aquifer. With the exception of monitoring well MW 11-R, ground water monitoring data for the Upper Santa Fe Aquifer for the previous eight consecutive quarters demonstrates that contaminant concentrations in the Upper Santa Fe are not greater than 200 percent of the abatement standard for that contaminant. D&G P shall perform remedial activities within the Upper Santa Fe Aquifer as follows:

a. Pursuant to the Department's January 18, 2013 approval of the Abatement Plan Technical Infeasibility Demonstration, on March 27, 2013, D&G P submitted to the Department an abatement completion report for the Upper Santa Fe Aquifer, except for monitoring well MW-11-R, in accordance with 20.6.2.4112.A NMAC that documented compliance with the standards and requirements in 20.6.2.4103 NMAC. The Abatement Completion Report was approved by the Department on May 22, 2013.

b. D&G P shall continue to monitor MW 11-R for the duration of the implementation of the extraction and treatment plan for the Valley Fill Aquifer, in accordance with the work plan attached as Exhibit A to this Agreement.

c. If upon completion of the extraction and disposal of one pore volume of the contaminated plume in the Valley Fill Aquifer, ground water monitoring data demonstrates that monitoring well MW 11-R is still contaminated in excess of the WQCC ground water quality standards, D&G P and NMED shall resume dispute resolution as described in Paragraph 31.

## IV. OTHER TERMS AND CONDITIONS

### A. RESERVATION OF RIGHTS

47. The Department reserves the right to pursue civil or administrative relief for any violations of state or federal law, past or future, which are not the subject matter of this Settlement Agreement. D&G P reserves the right to assert any and all defenses that they may have to any civil, administrative or judicial action that may be asserted by the Department as described by the terms of this paragraph.

48. In addition to the rights reserved to the Parties, in the event the Petition described in Paragraphs 40.d and 41.c. is filed but not approved by the WQCC or any reviewing body, D&G P and NMED shall resume dispute resolution as described in Paragraph 31.

49. Except as expressly provided herein, the Parties reserve all other legal privileges and rights.

50. The Parties acknowledge that a contract or other agreement providing access to the City of Rio Rancho Wastewater Treatment system is a condition precedent to this Agreement. D&G P expects such agreement will be obtained immediately upon execution of this Agreement. If D&G P cannot obtain such agreement within thirty days of execution of this

Agreement, D&G P will notify NMED and this Agreement shall be terminated without any further action of either Party, unless extended by written agreement of the Parties.

51. Agreement of the Parties to the work plan must be obtained simultaneously with execution of this Agreement.

**B. RELEASE OF LIABILITY**

52. D&G P shall assume all costs and liabilities incurred in performing any of its obligations under the Settlement Agreement. The Department, on its own behalf or on behalf of the State of New Mexico, shall not assume any liability for D&G P's performance of any obligation under this Settlement Agreement.

**C. BINDING EFFECT**

53. This Settlement Agreement shall be binding on the Parties and their officers, directors, employees, agents, subsidiaries, successors, assigns, trustees, or receivers.

**D. DURATION**

54. This Settlement Agreement shall remain in effect until D&G P completes abatement of the Site pursuant to 20.6.2.4112 NMAC, or both the Valley Fill and the Upper Santa Fe Aquifers have received approval of either a petition for alternative abatement standards pursuant to Subsection F of 20.6.2.4103 NMAC or a technical infeasibility demonstration pursuant to Paragraph (1) of Subsection E of 20.6.2.4103 NMAC, or both, or it is terminated by written agreement of the Parties or the Parties resume dispute resolution as set forth in Paragraph 31.

**E. INTEGRATION**

55. This Settlement Agreement merges all prior written and oral communications between the Parties concerning the subject matter of this Agreement, and contains the entire

Agreement between the Parties. This Agreement shall not be modified without the express written consent of the Parties.

## F. COMPLIANCE WITH OTHER STATE AND FEDERAL REQUIREMENTS

56. This Settlement Agreement shall not be construed to prohibit or limit in any way the Department from requiring D&G P to comply with any other applicable state or federal requirements.

## G. DISCLOSURE TO SUCCESSORS-IN-INTEREST

57. D&G P shall disclose this Settlement Agreement to any successor-in-interest and shall advise such successor-in-interest that this Agreement is binding on the successor-in-interest until such time as D&G P complies with the terms and conditions of the Agreement or it is terminated by written agreement of the Parties.

## H. AUTHORITY OF SIGNATORIES

58. The persons executing this Settlement Agreement represent that they have the authority to bind their respective parties to this Agreement, and that their representation shall be legally sufficient evidence of actual or apparent authority to bind their respective parties to this Agreement.

**It is so Agreed**:

**NEW MEXICO ENVIRONMENT DEPARTMENT**

By:_____ Date: 8/23/2013

Ryan Flynn, Secretary-Designate

Ryan Flynn, Secretary-Designate

**D & G Price Limited Partnership,**

By: Dudley Price, G.P. Date: 8-14-13

Dudley Price, General Partner

# APPENDIX B

# FINAL GROUNDWATER MONITORING AND SYSTEM OPERATIONS REPORT

EA Engineering, Science, & Technology, Inc., PBC
320 Gold Avenue SW, Suite 1210
Albuquerque, New Mexico 87102
Phone: (505) 224-9013 Fax (505) 224-9016

August 27, 2015

Justin Ball
New Mexico Environment Department
Ground Water Quality Bureau
Remediation Oversight Section
5500 San Antonio Dr. NE
Albuquerque, New Mexico 87109

Dear Mr. Ball:

On behalf of D&G Price Limited Partnership, EA Engineering, Science, and Technology, Inc., PBC is submitting the Quarterly Groundwater Monitoring, and System Operation Report for the Former Price's Valley Gold Dairy located in Sandoval County, New Mexico. The report discusses the 7th quarterly groundwater sampling event, and groundwater extraction system operation and maintenance conducted to fulfill requirements of the *Work Plan* for groundwater extraction dated May 24, 2013.

As provided in the May 24, 2013 work plan and the August 26, 2013 Settlement Agreement, Paragraph 45.a, the agreed to pore-volume of groundwater has been extracted. The aerial extent and mass of the solute plume has been substantially reduced. Accordingly, operation of the groundwater extraction system has been terminated. D&G Price Limited Partnership will initiate Alternative Abatement Standards for the Valley Fill Aquifer pursuant to Subsections D and F of 20.6.2.4103 NMAC as provided in Paragraph 45.d of the Settlement Agreement.

Please let me know if you have any questions regarding the information provided in this report.

Sincerely,

Jay Snyder
Senior Hydrogeologist

Enclosure

Cc: John Price
Dudley Price
File

# QUARTERLY GROUNDWATER MONITORING, AND GROUNDWATER EXTRACTION SYSTEM OPERATION REPORT FORMER PRICE'S VALLEY GOLD DAIRY BERNALILLO, SANDOVAL COUNTY, NEW MEXICO

Prepared for:

Former Price's Valley Gold Dairy
Bernalillo, Sandoval County, New Mexico

Prepared by:

EA Engineering, Science,
and Technology, Inc., PBC
320 Gold Avenue SW, Suite 1210
Albuquerque, New Mexico 87102

August 2015

EA Project No. 1505701.02

EA Engineering, Science, & Technology, Inc., PBC
320 Gold Avenue SW, Suite 1210
Albuquerque, New Mexico 87102
Phone: (505) 224-9013 Fax (505) 224-9016

# QUARTERLY GROUNDWATER MONITORING, AND GROUNDWATER EXTRACTION SYSTEM OPERATION REPORT FORMER PRICE'S VALLEY GOLD DAIRY BERNALILLO, SANDOVAL COUNTY, NEW MEXICO

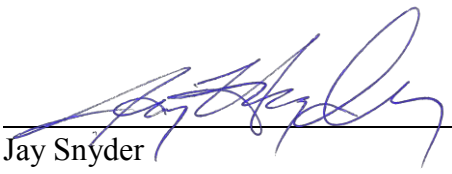
Prepared for:

Former Price's Valley Gold Dairy
Bernalillo, Sandoval County, New Mexico

Prepared by:

EA Engineering, Science,
and Technology, Inc., PBC
320 Gold Avenue SW, Suite 1210
Albuquerque, New Mexico

August 2015



8/27/15

Jay Snyder
Senior Hydrogeologist

Date

EA Project No. 1505701.02

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# 1.0 INTRODUCTION

On behalf of Former Price's Valley Gold Dairy (Price's Dairy), EA Engineering, Science, and Technology, Inc., PBC (EA) has prepared this 5th Quarterly Groundwater Monitoring Report for Price's Dairy located in Sandoval County, New Mexico. This report was completed in accordance with the *Groundwater Extraction Work Plan* dated May 24, 2013. The Work Plan (WP) was prepared to satisfy requirements stated in the New Mexico Administrative Code (NMAC), Title 20, 6.2 §4106 through §4110.

Price's Dairy is located on the east side of New Mexico Highway 528 in Bernalillo, New Mexico. Originally Ridge Dairy, a 200-cow dairy, was operated on the site from 1960 to 1973 and was owned by Stanley and Ron Ridge. In June 1973, Mr. Dudley Price purchased the Dairy and renamed it Price's Valley Gold Dairy. Mr. Price increased the size of the dairy to 1,000 to 1,200 cows and subsequently purchased 183 acres to the south to accommodate the increased discharge from the enlarged facility. Mr. Price closed the dairy in June 1998. The property was cleared of all structures by 2006. The property, except for Lot 5-B, has been sold and redeveloped into various lots that contain commercial businesses, including Wal-Mart, Firestone Tires, a gasoline station, a strip mall and several fast food restaurants. There are undeveloped lots within the southeastern portion of the Property.

The groundwater extraction system is located in Lot 5-B, Figure 1. The system consists of four 5-inch-diameter groundwater extraction wells, EW-1 through EW-4, equipped with Red Jacket Enduro 8S21, 1HP submersible pumps. All wells discharge into the City of Rio Rancho waste water sewer system on the west side of New Mexico Highway 528 via 2-inch SDR-17 HDPE conveyance line. The system layout is provided in Figure 1.

The following scope of work was performed during this monitoring period:

- Gauged 4 extraction wells and 7 monitoring wells;
- Collected groundwater samples from 4 extraction wells and 7 monitoring wells, and analyzed samples for nitrate, chloride, and total dissolved solids (TDS) using EPA Method 300 and SM 2540 C, respectively;
- Collected field nitrate sample using a HACH Model NI-12 0-50 mg/L nitrate test kit;
- Conducted bi-weekly operation and maintenance (O&M) consisting of gauging extraction wells, recording flow meter readings, and collecting field nitrate samples;
- Prepared this Quarterly Groundwater Monitoring, and Groundwater Extraction System Operation Report.

A total of 14.6 million gallons of groundwater have been pumped to date. This equates to 45 acre-feet. The agreed upon pore volume provided in the May 24, 2013 work plan, transmitted to NMED on August 6, 2013, was 44 acre-feet. This objective has been achieved. The plume dimensions, plume mass and average concentrations have been significantly reduced as a result of this abatement action. The groundwater extraction system is not being operated as the agreed

upon pore volume has been removed. A petition for alternative abatement standards is appropriate at this juncture.

# 2.0 GROUNDWATER MONITORING ACTIVITIES

Groundwater monitoring activities included gauging and sampling 4 extraction wells (EW-1, EW-2, EW-3, and EW-4) and 7 monitoring wells (MW-1A, MW-11R, MW-13RR, MW-18, MW-19R, MW-20R, and MW- 23). All wells are completed in Valley Fill Aquifer except MW-11R, which is in the Upper Santa Fe Aquifer.

## 2.1 Well Gauging

On July 23, 2015, 11 wells were gauged with an electronic water level indicator. Groundwater levels in the extraction wells fluctuate daily in response to pump cycling and are therefore not used in the groundwater elevation map. Table 1 provides a summary of the groundwater gauging data collected from the monitoring network including historical data. A potentiometric surface map (Figure 2) was constructed based on the most recent data.

## 2.2 Groundwater Sampling

On July 23, 2015, 4 extraction wells and 7 monitoring wells were sampled. Prior to sampling, the monitoring wells were purged using disposable bailers and new disposable rope or twine. Monitoring wells were purged three well volumes to the extent possible without bailing dry prior to sample collection. During purging, EA measured and recorded on sampling field forms field parameters (specific conductance, pH, dissolved oxygen, and temperature) with an Oakton or YSI water quality meter and a YSI dissolved oxygen meter. The meters were calibrated and/or checked against a standard in accordance with manufacturers' specifications prior to use. Purge water from the wells was ground discharged. Extraction well groundwater parameters, field nitrate samples, and laboratory samples were collected from the extraction well sample ports with the pumps running.

Groundwater samples were collected in the sample containers provided by Hall Environmental Analysis Laboratory (HEAL). Sample containers, preservatives, analytical methods, and holding times are specified in Table 2. All samples were preserved in accordance with method requirements, labeled, then immediately cooled to <6°C with ice and delivered under chain-of-custody to HEAL in Albuquerque, New Mexico. Wells were sampled from clean to dirty to the extent possible to minimize cross-contamination. All equipment was decontaminated between wells with an Alconox™ solution to further ensure sample quality. Copies of field forms are included in Appendix A. The analytical laboratory reports are provided in Appendix B.

# 3.0 GROUNDWATER MONITORING RESULTS

## 3.1 Hydraulic Gradient and Direction of Groundwater Flow

During this quarter groundwater elevations in the wells immediately surrounding the extraction well field have increased. Hydrographs for the Valley Fill Aquifer monitoring wells are included in Appendix C. Figure 2 provides the potentiometric surface map, as indicated by the contours the groundwater flow direction is towards the east. Deflection of the flow lines in response to pumping is observed around EW-1, EW-2, EW-3, and EW-4.

## 3.2 Groundwater Analytical Results and Trend Analysis

During this quarter concentrations of chloride, nitrate and total dissolved solids (TDS) were found above the New Mexico Water Quality Control (NMWQCC) standards. Current and historical contaminant concentrations can be found in Table 3. Concentration trends can be found in Appendix D.

Chloride was below the NMWQCC standard of 250 milligrams per liter (mg/L) in all extraction and monitoring wells except for MW-19R. A map of the chloride distribution can be found in Figure 3.

Nitrate was above the NMWQCC standard of 10 mg/L in wells EW-1 (11 mg/L), MW-11R (22mg/L), MW-19R (220 mg/L), and MW-20R (21 mg/L). Concentrations in wells EW-1and MW-20R decreased by 6 mg/L and 33 mg/L respectively while the concentrations in wells MW-11R and MW-19R increased by 2 and 200 mg/L respectively. Nitrate concentrations in wells EW-2, EW-3, and EW-4 are below the standard of 10 mg/L. A map of the nitrate distribution can be found in Figure 4. Trend plots of nitrate concentrations are provided in Appendix D.

TDS concentrations were above the NMWQCC standard of 1,000 mg/L in wells EW-1(1,300 mg/L), EW-2 (1,040 mg/L), EW-4 (1,070 mg/L), MW-11R (1,250 mg/L), MW-19R (3,310 mg/L), and MW-23 (1,230 mg/L). TDS concentrations in wells EW-1, EW-2, EW-3, MW-1A, and MW-23 have been generally decreased since the 1$^{st}$ quarter sampling event. During this quarter TDS in wells EW-4, MW-11R, MW-19R, and MW-23 increased by 360 mg/L, 180 mg/L, 1,910 mg/L, and 30 mg/L, respectively. All other well TDS concentrations either decreased or remained below the standard. A map of the TDS distribution can be found in Figure 5. TDS concentration trends are provided in Appendix D.

The sample collected from MW-19R on July 23, 2015 showed significant increase in contaminant concentrations. In order to confirm the results, the well was resampled on August 3, 2015 and the nitrate, chloride, and TDS results decreased significantly to 140 mg/L, 210 mg/L, and 2,650 mg/L respectively. Because of the large decrease over the 11 day period the well was resampled again on August 12, 2015. Concentrations for nitrate, chloride, and TDS were 170 mg/L, 240 mg/L, and 2460 mg/L respectively. The large increase for nitrate, chloride, and TDS in well MW-19R is most likely attributed to the 3-foot increase in the site groundwater elevation and shift in groundwater flow direction strongly to the east.

# 4.0 GROUNDWATER EXTRACTION SYSTEM PERFORMANCE ASSESSMENT

## 4.1 Groundwater Extraction System Operation

After system start-up routine operation and maintenance tasks were conducted on a bi-weekly basis, Table 4. The following system parameters were recorded on field data sheets (Appendix A).

- Recorded totalizing flow meter readings;
- Collected field nitrate sample using the HACH Model NI-12 0-50 mg/L nitrate test kit;
- Gauged depth to water;
- Inspected conveyance line along the Venada Arroyo;
- Inspected outfall into City of Rio Rancho waste water sewer.

During this quarter the groundwater extraction system experienced 1 period of downtime lasting approximately 24 hours due to extraction well treatment.

- On February 6, 2015, EW-3 was shut off to optimized the nitrate removal from the site.
- On February 19, 2015, approximately 1 gallon of BioClean and 3 gallons of water was added to wells EW-1, EW-2, and EW-4. The system was left off for approximately 24 hours then restarted.
- On April 24, 2015, the flowmeter in well EW-4 was found to be non-operational. On April 28, 2015, the flowmeter was cleaned and reinstalled.
- On July 10, 2015, the flowmeter in well EW-4 was found to be non-operational. The flowmeter was removed, cleaned and re-installed.
- On July 23, 2015, the flow meter in EW-4 was not working properly due to scale and bio-fouling build up. EW-4 was shut off after sampling and EW-3 was turned on.

## 4.2 Groundwater Extraction System

During this quarter the average system flow rate decreased from 15.23 gpm to 13.03 gpm. This decrease can be mostly attributed to well EW-3 being shut off during this period and the clogged flow meter in EW-4. Approximately 1.69 million gallons (5.19 acre-feet) of contaminated groundwater were extracted during this quarter.

Since start up the average total system extraction rate has averaged 15.74 gallons per minute (gpm). Individual wells varied between 6.03 gpm in EW-3 and 1.86 gpm in EW-1. During this quarter individual wells averaged between 5.80 gpm in EW-2 and 2.71 gpm in EW-1. Calculations of system flow rates can be found in Table 5. As of July 23, 2015, approximately 14.6 million gallons (45 acre-feet) of contaminated groundwater have been extracted from the Valley Fill Aquifer and discharged into the city sewer.

The areal extent of groundwater impacts in Valley Fill Aquifer are now contained in vicinity of extraction wells EW-1 thru EW-4. Nitrate concentrations have generally declined; the system appears to be functioning as designed.

# 5.0 CONCLUSIONS AND RECOMMENDATIONS

This groundwater monitoring event included gauging and sampling 4 extraction wells and 7 monitoring wells. Based on the data collected the following conclusions and recommendations are presented:

- The groundwater extraction system is removing contaminants from the Valley Fill Aquifer.
- Nitrate and TDS concentrations within the Valley Fill Aquifer exceed the NMWQCC standards; however, TDS concentrations are now below 2 times standards in all wells except MW-19R.
- Except for well MW-19R, Chloride concentrations with in the Valley Fill Aquifer do not exceed the NMWQCC standards.
- Approximately 14.6 million gallons (45acre-feet) of contaminated groundwater have been extracted since system startup. This exceeds the 44 acre-foot of groundwater pore volume established in the May 24, 2013 work plan.
- MW-11R, completed in Upper Santa Fe Aquifer, had a concentration of 22 mg/L nitrate this event.
- Nitrate, chloride, and TDS concentrations saw a large increase during this quarter. The increase is most likely attributed to a 3-foot increase in the site groundwater elevation.
- Because the agreed upon pore-volume of groundwater has been extracted, operation of the groundwater extraction system has been terminated.
- Petition for alternative abatement standards for residual contaminants is appropriate at this juncture.

# TABLES

**TABLE 1. VALLEY FILL AQUIFER GROUNDWATER ELEVATION**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date Gauged | Casing Elevation (amsl) | Depth to Water (feet) | Groundwater Elevation (amsl) |
|---|---|---|---|---|
| MW-1A | 7/23/2015 | 5072.26 | 33.77 | 5038.49 |
| | 4/24/2015 | | 36.91 | 5035.35 |
| | 1/23/2015 | | 37.03 | 5035.23 |
| | 10/16/2014 | | 36.71 | 5035.55 |
| | 7/9/2014 | | 36.34 | 5035.92 |
| | 4/10/2014 | | 37.32 | 5034.94 |
| | 1/14/2014 | | 37.45 | 5034.81 |
| | 10/15/2013 | | 36.97 | 5035.29 |
| | 7/29/2013 | | 36.92 | 5035.34 |
| | 3/28/2013 | | 37.66 | 5034.60 |
| | 12/22/2011 | | 36.52 | 5035.74 |
| | 9/8/2011 | | 34.41 | 5037.85 |
| | 6/15/2011 | | 35.20 | 5037.06 |
| | 3/10/2011 | | 35.30 | 5036.96 |
| MW-11R | 7/23/2015 | 5110.54 | 83.95 | 5026.59 |
| | 4/24/2015 | | 84.42 | 5026.12 |
| | 1/23/2015 | | 84.69 | 5025.85 |
| | 10/16/2014 | | 84.33 | 5026.21 |
| | 7/9/2014 | | 84.52 | 5026.02 |
| | 4/10/2014 | | 84.35 | 5026.19 |
| | 1/14/2014 | | 84.72 | 5025.82 |
| | 7/29/2013 | | 85.19 | 5025.35 |
| | 3/28/2013 | | 85.12 | 5025.42 |
| | 12/22/2011 | | 84.22 | 5026.32 |
| | 9/8/2011 | | 84.07 | 5026.47 |
| | 6/15/2011 | | 83.95 | 5026.59 |
| | 3/10/2011 | | 83.89 | 5026.65 |
| MW-13RR | 7/23/2015 | 5090.20 | 53.55 | 5036.65 |
| | 4/24/2015 | | 55.07 | 5035.13 |
| | 1/23/2015 | | 54.70 | 5035.50 |
| | 10/16/2014 | | 54.35 | 5035.85 |
| | 7/9/2014 | | 54.83 | 5035.37 |
| | 4/10/2014 | | 54.70 | 5035.50 |
| | 1/14/2014 | | 54.09 | 5036.11 |
| | 10/15/2013 | | 53.80 | 5036.40 |
| | 7/29/2013 | | 56.05 | 5034.15 |
| | 3/28/2013 | | 56.22 | 5033.98 |
| | 12/22/2011 | | 54.17 | 5036.03 |
| | 9/7/2011 | | 53.76 | 5036.44 |
| | 6/15/2011 | | 54.25 | 5035.95 |
| | 3/10/2011 | | 53.50 | 5036.70 |
| MW-18 | 7/23/2015 | 5080.80 | 39.20 | 5041.60 |
| | 4/24/2015 | | 44.13 | 5036.67 |
| | 1/23/2015 | | 42.21 | 5038.59 |
| | 10/16/2014 | | 40.67 | 5040.13 |
| | 7/9/2014 | | 45.65 | 5035.15 |
| | 4/10/2014 | | 42.61 | 5038.19 |
| | 1/14/2014 | | 38.87 | 5041.93 |
| | 10/15/2013 | | 34.20 | 5046.60 |
| | 7/29/2013 | | Dry | Dry |
| | 3/28/2013 | | 42.54 | 5038.26 |
| | 12/26/2011 | | 40.81 | 5039.99 |
| | 9/7/2011 | | 41.83 | 5038.97 |
| | 6/15/2011 | | 44.33 | 5036.47 |
| | 3/10/2011 | | 40.03 | 5040.77 |

**TABLE 1. VALLEY FILL AQUIFER GROUNDWATER ELEVATION**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date Gauged | Casing Elevation (amsl) | Depth to Water (feet) | Groundwater Elevation (amsl) |
|---|---|---|---|---|
| MW-19R | 7/23/2015 | 5072.69 | 34.57 | 5038.12 |
| | 4/24/2015 | | 37.29 | 5035.40 |
| | 1/23/2015 | | 37.30 | 5035.39 |
| | 10/16/2014 | | 36.70 | 5035.99 |
| | 7/9/2014 | | 36.81 | 5035.88 |
| | 4/10/2014 | | 37.34 | 5035.35 |
| | 1/14/2014 | | 37.34 | 5035.35 |
| | 10/15/2013 | | 37.00 | 5035.69 |
| | 7/29/2013 | | 36.98 | 5035.71 |
| | 3/28/2013 | | 37.51 | 5035.18 |
| | 12/26/2011 | | 36.33 | 5036.36 |
| | 9/7/2011 | | 34.76 | 5037.93 |
| | 6/15/2011 | | 35.10 | 5037.59 |
| | 3/10/2011 | | 35.27 | 5037.42 |
| MW-20R | 7/23/2015 | 5072.57 | 33.73 | 5038.84 |
| | 4/24/2015 | | 37.05 | 5035.52 |
| | 1/23/2015 | | 37.19 | 5035.38 |
| | 10/16/2014 | | 36.85 | 5035.72 |
| | 7/9/2014 | | 36.52 | 5036.05 |
| | 4/10/2014 | | 37.55 | 5035.02 |
| | 1/14/2014 | | 37.71 | 5034.86 |
| | 10/15/2013 | | 36.82 | 5035.75 |
| | 7/29/2013 | | 37.01 | 5035.56 |
| | 3/28/2013 | | 37.98 | 5034.59 |
| | 12/22/2011 | | 36.74 | 5035.83 |
| | 9/7/2011 | | 34.83 | 5037.74 |
| | 6/15/2011 | | 35.41 | 5037.16 |
| | 3/10/2011 | | 35.52 | 5037.05 |
| MW-23 | 7/23/2015 | 5073.13 | 34.98 | 5038.15 |
| | 4/24/2015 | | 37.82 | 5035.31 |
| | 1/23/2015 | | 38.00 | 5035.13 |
| | 10/16/2014 | | 37.61 | 5035.52 |
| | 7/9/2014 | | 37.36 | 5035.77 |
| | 4/10/2014 | | 38.37 | 5034.76 |
| | 1/14/2014 | | 38.45 | 5034.68 |
| | 10/15/2013 | | 37.66 | 5035.47 |
| | 7/29/2013 | | 37.58 | 5035.55 |
| | 3/28/2013 | | 38.25 | 5034.88 |
| | 12/22/2011 | | 37.03 | 5036.10 |
| | 9/7/2011 | | 35.20 | 5037.93 |
| | 6/15/2011 | | 35.72 | 5037.41 |
| | 3/10/2011 | | 35.21 | 5037.92 |

NOTES:
amsl = feet above mean sea level

**TABLE 2. SUMMARY OF SAMPLE ANALYTICAL AND QUALITY CONTROL REQUIREMENTS**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Analyte | Method | Medium | Container and Minimum Volume | Preservation | Holding Time | Storage |
|---|---|---|---|---|---|---|
| Chloride | EPA 300 | Water | 250 ml poly | None | 28 days | Cool < 6 $^{o}$C |
| Nitrate/Nitrite | EPA 300 | Water | 250 ml poly | $H_2SO_4$ pH <2 | 28 days | Cool < 6 $^{o}$C |
| TDS | SM 2540 C | Water | 250 ml poly | None | 7 days | Cool < 6 $^{o}$C |

NOTES:
°C = degrees Celcius
< = less than
EPA = U.S. Environmental Protection Agency
mL = milliliter
VOC = Volatile organic compounds
TDS = total dissolved solids

**TABLE 3. SUMMARY OF ANALYTICAL DATA**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Aquifer | Sample Date | Chloride (mg/L) | TDS (mg/L) | Nitrate (mg/L) |
|---|---|---|---|---|---|
| EW-1 | VF | 7/23/2015 | 190 | 1,300 | 11 |
| | | 4/24/2015 | 170 | 1,420 | 17 |
| | | 1/23/2015 | 220 | 1,460 | 17 |
| | | 10/31/2014 | 230 | 1,610 | 27 |
| | | 7/9/2014 | 240 | 1,520 | 18 |
| | | 4/10/2014 | 290 | 1,750 | 31 |
| | | 1/14/2014 | 390 | 2,140 | 57 |
| | | 10/15/2013 | 350 | 2,320 | 85 |
| EW-2 | VF | 7/23/2015 | 140 | 1,040 | <1.0 |
| | | 4/24/2015 | 160 | 1,100 | <1.0 |
| | | 1/23/2015 | 170 | 1,140 | 1.1 |
| | | 10/16/2014 | 190 | 1,200 | <1.0 |
| | | 7/9/2014 | 200 | 1,270 | 3 |
| | | 4/10/2014 | 200 | 1,380 | 7.6 |
| | | 1/14/2014 | 310 | 1,770 | 23 |
| | | 10/15/2013 | 330 | 1,960 | 21 |
| EW-3 | VF | 7/23/2015 | 120 | 995 | 4.8 |
| | | 4/24/2015 | 120 | 939 | 1.5 |
| | | 1/23/2015 | 130 | 1,010 | 2.5 |
| | | 10/16/2014 | 130 | 1,010 | 3.2 |
| | | 7/9/2014 | 150 | 1,090 | 3.4 |
| | | 4/10/2014 | 170 | 1,210 | 3.2 |
| | | 1/14/2014 | 220 | 1,410 | 6.3 |
| | | 10/15/2013 | 320 | 1,780 | 0.35 |
| EW-4 | VF | 7/23/2015 | 140 | 1,070 | 5.7 |
| | | 4/24/2015 | 83 | 710 | 1.1 |
| | | 1/23/2015 | 77 | 691 | 1.1 |
| | | 10/16/2014 | 89 | 776 | <1.0 |
| | | 7/9/2014 | 110 | 894 | 1.1 |
| | | 4/10/2014 | 110 | 891 | 1.5 |
| | | 1/14/2014 | 130 | 977 | 1.4 |
| | | 10/15/2013 | 210 | 1,300 | <0.10 |
| MW-11R | USF | 7/23/2015 | 230 | 1,250 | 22 |
| | | 4/24/2015 | 200 | 1,070 | 20 |
| | | 1/23/2015 | 210 | 1,070 | 20 |
| | | 10/16/2014 | 190 | 1,120 | 19 |
| | | 7/9/2014 | 230 | 1,110 | 20 |
| | | 4/10/2014 | 210 | 1,060 | 19 |
| | | 1/14/2014 | 220 | 1,020 | 20 |
| | | 7/10/2013 | 220 | 1,030 | 21 |
| | | 3/12/2012 | 190 | 1,060 | 29 |
| | | 12/26/2011 | 190 | 1,030 | 26 |
| | | 9/6/2011 | 220 | 1,180 | 33 |
| | | 6/15/2011 | 240 | 1,260 | 38 |
| | | 3/10/2011 | 240 | 1,180 | 41 |
| | | 9/9/2010 | 210 | 1,180 | 38 |
| | | 3/11/2010 | 260 | 1,190 | 42 |
| | | 9/16/2009 | 270 | 1,210 | 35 |
| | | 3/20/2009 | 270 | 2,000 | 34 |
| | | 3/20/2009 | 230 | 1,270 | 36 |
| | | 3/20/2008 | 200 | 1,000 | 19 |

**TABLE 3. SUMMARY OF ANALYTICAL DATA**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Aquifer | Sample Date | Chloride (mg/L) | TDS (mg/L) | Nitrate (mg/L) |
|---|---|---|---|---|---|
| MW-1A | VF | 7/23/2015 | 82 | 820 | <1.0 |
| | | 4/24/2015 | 92 | 912 | <1.0 |
| | | 1/23/2015 | 120 | 1,040 | 2.1 |
| | | 10/16/2014 | 120 | 1,060 | 1 |
| | | 7/9/2014 | 110 | 990 | 0.14 |
| | | 4/10/2014 | 110 | 1,000 | <0.10 |
| | | 1/14/2014 | 110 | 1,080 | 1.5 |
| | | 10/15/2013 | 200 | 1,530 | 29 |
| | | 7/10/2013 | 140 | 360 | 16 |
| | | 3/13/2012 | 190 | 1,640 | 63 |
| | | 12/22/2011 | 200 | 1,730 | 59 |
| | | 9/8/2011 | 170 | 1,570 | 46 |
| | | 6/15/2011 | 190 | 1,660 | 56 |
| | | 3/10/2011 | 210 | 1,830 | 79 |
| | | 12/9/2010 | 230 | 2,260 | 120 |
| | | 9/9/2010 | 190 | 1,840 | 64 |
| | | 6/18/2010 | 180 | 1,490 | 40 |
| | | 3/11/2010 | 240 | 2,070 | 110 |
| | | 12/17/2009 | 270 | 2,380 | 120 |
| | | 9/16/2009 | 250 | 2,010 | 4.8 |
| | | 6/23/2009 | 250 | 1,700 | 56 |
| | | 3/20/2009 | 340 | 2,300 | 150 |
| | | 3/20/2009 | 275 | 2,780 | 150 |
| | | 6/26/2008 | 190 | 1,400 | 45 |
| | | 3/20/2008 | 110 | 1,000 | 15 |
| | | 8/22/2007 | 140 | 1,200 | 38 |
| | | 7/6/2007 | 140 | 1,300 | 37 |
| | | 5/31/2007 | 270 | 2,500 | 190 |
| | | 2/8/2007 | 140 | 1,300 | 39 |
| | | 10/25/2006 | 220 | 1,700 | 71 |
| | | 5/19/2006 | 97 | 1,100 | 30 |
| | | 1/17/2006 | 83 | 980 | 16 |
| | | 8/22/2005 | 91 | 1,000 | 21 |
| | | 4/27/2005 | 88 | 880 | 4.0 |
| | | 11/16/2004 | 98 | 1,100 | 16 |
| | | 7/15/2004 | 89 | 820 | 11 |
| | | 3/31/2004 | 98 | 800 | 25 |
| | | 7/28/2003 | 100 | 790 | 0.21 |
| | | 2/7/2003 | 120 | 930 | 4.6 |
| | | 11/7/2002 | 150 | 1,000 | 12 |
| | | 8/12/2002 | 150 | 1,100 | 18 |
| | | 5/22/2002 | 180 | 1 300 | 24 |
| | | 2/11/2002 | 210 | 1,100 | 13 |
| | | 12/13/2001 | 150 | 790 | 0.15 |
| | | 9/11/2001 | 200 | 920 | 6 |
| | | 6/25/2001 | 170 | 820 | 21 |
| | | 3/28/2001 | 180 | 850 | 4.9 |
| | | 1/26/2001 | 170 | 730 | 2.0 |
| | | 12/28/2000 | 210 | 1,900 | 130 |
| | | 5/4/2000 | 190 | 1,200 | 31 |
| | | 2/24/2000 | 170 | 920 | 14 |
| | | 10/28/1999 | 200 | 1,300 | 56 |
| | | 7/27/1999 | 190 | 870 | ND |
| | | 4/22/1999 | 140 | 1,100 | 40 |
| | | 1/27/1998 | 152 | 1,324 | 42.5 |

**TABLE 3. SUMMARY OF ANALYTICAL DATA**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Aquifer | Sample Date | Chloride (mg/L) | TDS (mg/L) | Nitrate (mg/L) |
|---|---|---|---|---|---|
| MW-13-RR | VF | 7/23/2015 | 84 | 468 | 4.5 |
| | | 4/24/2015 | 98 | 496 | 5.6 |
| | | 1/23/2015 | 71 | 505 | 4.7 |
| | | 10/16/2014 | 39 | 396 | 4.0 |
| | | 7/9/2014 | 47 | 438 | 5.0 |
| | | 4/10/2014 | 36 | 400 | 4.7 |
| | | 1/14/2014 | 47 | 434 | 7.4 |
| | | 10/15/2013 | 41 | 400 | 5.9 |
| | | 7/10/2013 | 41 | 425 | 5.8 |
| | | 3/13/2012 | 65 | 540 | 8.0 |
| | | 12/22/2011 | 120 | 757 | 14.28 |
| | | 9/7/2011 | 130 | 849 | 11.24 |
| | | 6/15/2011 | 130 | 839 | 11 |
| | | 3/10/2011 | 160 | 931 | 11 |
| | | 12/9/2010 | 130 | 869 | 12 |
| | | 9/9/2010 | 150 | 969 | 12 |
| | | 6/18/2010 | 130 | 920 | 12 |
| | | 3/11/2010 | 140 | 867 | 12 |
| | | 12/17/2009 | 170 | 1,040 | 12 |
| | | 9/16/2009 | 240 | 1,340 | 12 |
| | | 3/20/2009 | 180 | 1,300 | 11 |
| | | 3/20/2009 | 157 | 1,070 | 9.9 |
| | | 6/26/2008 | 94 | 4,600 | 1.5 |
| | | 3/18/2008 | 160 | 680 | 3.4 |
| MW-18 | VF | 7/23/2015 | 31 | 300 | 4.4 |
| | | 4/24/2015 | 72 | 386 | 5.0 |
| | | 1/23/2015 | 69 | 660 | 19 |
| | | 10/16/2014 | 27 | 294 | 3.5 |
| | | 7/9/2014 | 42 | 420 | 8.1 |
| | | 4/10/2014 | 72 | 550 | 19 |
| | | 1/14/2014 | 26 | 340 | 6.4 |
| | | 10/15/2013 | 16 | 269 | 3.1 |
| | | 3/12/2012 | 43 | 368 | 3.7 |
| | | 12/26/2011 | 71 | 416 | 3.5 |
| | | 9/7/2011 | 140 | 648 | 4.0 |
| | | 6/15/2011 | 46 | 403 | 3.3 |
| | | 3/10/2011 | 71 | 378 | 3.4 |
| | | 12/9/2010 | 110 | 567 | 5.8 |
| | | 9/9/2010 | 41 | 316 | 2.5 |
| | | 6/18/2010 | 64 | 445 | 6.1 |
| | | 3/11/2010 | 66 | 428 | 6.9 |
| | | 12/17/2009 | 40 | 339 | 3.8 |
| | | 9/16/2009 | 71 | 438 | 5.0 |
| | | 6/23/2009 | 50 | 440 | 3.3 |
| | | 3/20/2009 | 45 | 650 | 11 |
| | | 3/20/2008 | 34 | 450 | 7.4 |
| | | 8/22/2007 | 50 | 420 | 2.8 |
| | | 6/1/2007 | 69 | 390 | 2.0 |
| | | 2/8/2007 | 8 | 230 | 1.8 |
| | | 10/26/2006 | 6 | 260 | 1.6 |
| | | 5/20/2006 | 24 | 360 | 6.8 |

**TABLE 3. SUMMARY OF ANALYTICAL DATA**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Aquifer | Sample Date | Chloride (mg/L) | TDS (mg/L) | Nitrate (mg/L) |
|---|---|---|---|---|---|
| MW-19R | VF | 8/3/2015 | 210 | 2,650 | 140 |
| | | 7/23/2015 | 280 | 3,310 | 220 |
| | | 4/24/2015 | 180 | 1,400 | 20 |
| | | 1/23/2015 | 220 | 1,560 | 27 |
| | | 10/16/2014 | 270 | 1,940 | 42 |
| | | 7/9/2014 | 350 | 1,970 | 58 |
| | | 4/10/2014 | 350 | 1,930 | 51 |
| | | 1/14/2014 | 330 | 1,960 | 60 |
| | | 10/15/2013 | 330 | 2,160 | 83 |
| | | 7/10/2013 | 370 | 2,260 | 96 |
| | | 3/13/2012 | 330 | 2,360 | 120 |
| | | 12/26/2011 | 310 | 2,380 | 110 |
| | | 9/7/2011 | 400 | 2,880 | 150 |
| | | 6/15/2011 | 380 | 2,700 | 150 |
| | | 3/10/2011 | 290 | 2,540 | 130 |
| | | 12/9/2010 | 360 | 2,910 | 150 |
| | | 9/9/2010 | 510 | 3,520 | 200 |
| | | 6/18/2010 | 520 | 3,760 | 230 |
| | | 3/11/2010 | 320 | 2,850 | 140 |
| | | 12/17/2009 | 420 | 3,190 | 140 |
| | | 9/16/2009 | 500 | 2,920 | 160 |
| | | 6/23/2009 | 470 | 3,000 | 170 |
| | | 3/20/2009 | 410 | 3,500 | 130 |
| | | 3/20/2009 | 334 | 3,120 | 130 |
| | | 6/26/2008 | 120 | 1,100 | 17 |
| | | 3/18/2008 | 470 | 2,200 | 29 |
| MW-20R | VF | 7/23/2015 | 50 | 680 | 21 |
| | | 4/24/2015 | 74 | 975 | 55 |
| | | 1/23/2015 | 74 | 1,020 | 60 |
| | | 10/16/2014 | 54 | 868 | 41 |
| | | 7/9/2014 | 71 | 760 | 17 |
| | | 4/10/2014 | 72 | 905 | 50 |
| | | 1/14/2014 | 59 | 930 | 43 |
| | | 10/15/2013 | 51 | 811 | 37 |
| | | 7/10/2013 | 180 | 1,600 | 40 |
| | | 3/13/2012 | 92 | 1,160 | 76 |
| | | 12/22/2011 | 92 | 963 | 39.39 |
| | | 9/7/2011 | 69 | 1,100 | 51 |
| | | 6/15/2011 | 90 | 1,100 | 25 |
| | | 3/10/2011 | 38 | 632 | 26 |
| | | 12/9/2010 | 28 | 570 | 23 |
| | | 9/9/2010 | 28 | 504 | 14 |
| | | 6/18/2010 | 45 | 687 | 21 |
| | | 3/11/2010 | 48 | 653 | 27 |
| | | 12/17/2009 | 76 | 1,200 | 96 |
| | | 9/16/2009 | 40 | 686 | 29 |
| | | 6/23/2009 | 71 | 1,000 | 59 |
| | | 3/20/2009 | 150 | 1,800 | 160 |
| | | 3/20/2009 | 148 | 2,350 | 170 |
| | | 6/26/2008 | 220 | 2,200 | 110 |
| | | 3/18/2008 | 82 | 1,900 | 190 |

**TABLE 3. SUMMARY OF ANALYTICAL DATA**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Aquifer | Sample Date | Chloride (mg/L) | TDS (mg/L) | Nitrate (mg/L) |
|---|---|---|---|---|---|
| MW-21 | VF | 7/10/2013 | 94 | 768 | <0.10 |
| | | 3/12/2012 | 68 | 724 | ND |
| | | 12/26/2011 | 65 | 686 | ND |
| | | 9/7/2011 | 60 | 678 | ND |
| | | 6/15/2011 | 61 | 673 | ND |
| | | 3/10/2011 | 66 | 683 | ND |
| | | 12/9/2010 | 66 | 667 | ND |
| | | 9/9/2010 | 68 | 662 | ND |
| | | 6/18/2010 | 54 | 565 | ND |
| | | 3/11/2010 | 70 | 0 | ND |
| | | 12/17/2009 | 69 | 663 | ND |
| | | 9/16/2009 | 61 | 612 | ND |
| | | 6/23/2009 | 52 | 490 | ND |
| | | 3/20/2009 | 65 | 390 | ND |
| | | 3/20/2009 | 56 | 632 | ND |
| | | 3/20/2008 | 42 | 480 | 0.29 |
| | | 10/26/2006 | 38 | 490 | ND |
| | | 5/19/2006 | 25 | 450 | ND |
| MW-23 | VF | 7/23/2015 | 130 | 1,230 | 5.7 |
| | | 4/24/2015 | 150 | 1,200 | 9.5 |
| | | 1/23/2015 | 160 | 1,290 | 2.3 |
| | | 10/16/2014 | 170 | 1,640 | 4.8 |
| | | 7/9/2014 | 190 | 1,380 | 5.6 |
| | | 4/10/2014 | 220 | 1,480 | 0.13 |
| | | 1/14/2014 | 250 | 1,580 | 0.22 |
| | | 10/15/2013 | 240 | 1,640 | 9.7 |
| | | 7/10/2013 | 320 | 1,770 | 4.2 |
| | | 3/13/12 | 270 | 1,610 | 17 |
| | | 12/22/11 | 240 | 1,560 | 23 |
| | | 9/7/11 | 250 | 2,100 | 45 |
| | | 6/15/11 | 270 | 1,600 | 15 |
| | | 3/10/11 | 220 | 2,060 | 110 |
| | | 12/9/10 | 270 | 2,180 | 94 |
| | | 9/9/10 | 300 | 2,520 | 94 |
| | | 6/18/10 | 230 | 1,370 | 4.0 |
| | | 3/11/10 | 220 | 2,400 | 190 |
| | | 12/17/09 | 240 | 2,390 | 130 |
| | | 9/16/09 | 260 | 2,140 | 98 |
| | | 6/23/09 | 260 | 1,400 | 1.7 |
| | | 3/20/09 | 220 | 2,200 | 190 |
| | | 3/20/09 | 159 | 2,480 | 171 |
| **NMWQCC Standard** | | | **250** | **1,000** | **10** |

NOTES:
ate data are by EPA Method 300.0
EPA Method SM 2540 C
above NMWQCC standard if shaded
, = milligrams per liter
= Total dissolved solids
ND = Non detect
Mexico Environment Department
ew Mexico Water Quality Control
F = Upper Santa Fe
VF = Valley Fill

**TABLE 4. SUMMARY OF GROUNDWATER FIELD PARAMETERS**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date | Flow Meter Reading (gallons) | Depth to Water (feet) | Field Nitrate (ppm) |
|---|---|---|---|---|
| EW-1 | 7/10/2015 | 1,034,630 | NM | 10 |
| | 6/24/2015 | 957,923 | NM | 10 |
| | 6/12/2015 | 909,752 | NM | 10 |
| | 5/28/2015 | 856,802 | NM | 10 |
| | 4/24/2015 | 744,980 | 37.48 | 5-10 |
| | 3/21/2015 | 638,716 | NM | 10-20 |
| | 3/6/2015 | 592,430 | NM | 10 |
| | 2/19/2015 | 550,503 | NM | 10 |
| | 2/6/2015 | 509,458 | NM | 10 |
| | 1/23/2015 | 462,735 | T.O.P. | 10 |
| | 1/2/2015 | 393,482 | NM | 10 |
| | 12/19/2014 | 345,000 | NM | 10 |
| | 12/5/2014 | 301,755 | NM | 10 |
| | 11/21/2014 | 252,718 | NM | NM |
| | 11/14/2014 | 233,024 | 46.1 | 5-10 |
| | 10/30/2014 | 180,239 | NM | 50 |
| | 10/16/2014 | 180,132 | 36.93 | NM |
| | 10/9/2014 | 175,992 | NM | NM |
| | 10/9/2014 | 9,734,391 | NM | NM |
| | 10/2/2014 | 9,719,793 | T.O.P. | 5 |
| | 9/22/2014 | 9,680,031 | T.O.P. | 10 |
| | 9/8/2014 | 9,627,612 | T.O.P. | 10 |
| | 8/21/2014 | 9,552,453 | 47.75 | 10 |
| | 8/11/2014 | 9,512,921 | T.O.P. | 10 |
| | 7/25/2014 | 9,438,001 | NM | 5 |
| | 7/9/2014 | 9,374,875 | T.O.P. | 10-20 |
| | 6/27/2014 | 9,327,907 | T.O.P. | 10-20 |
| | 6/13/2014 | 9,279,991 | T.O.P. | 10-20 |
| | 5/30/2014 | 9,241,233 | NM | 10-20 |
| | 5/27/2014 | 9,236,547 | NM | NM |
| | 5/11/2014 | 9,216,882 | NM | 10-20 |
| | 4/24/2014 | 9,196,238 | 47.14 | 20 |
| | 4/10/2014 | 9,156,017 | 39.95 | 20 |
| | 3/25/2014 | 9,125,066 | 40.32 | 20 |
| | 3/21/2014 | 9,117,242 | NM | NM |
| | 3/10/2014 | 9,095,016 | NM | NM |
| | 3/10/2014 | 175,992 | T.O.P. | 35 |
| | 2/27/2014 | 159,528 | NM | 20 |
| | 2/26/2014 | 157,970 | NM | NM |
| | 2/12/2014 | 138,240 | NM | 35 |
| | 1/30/2014 | 127,210 | NM | NM |
| | 1/29/2014 | 127,180 | 38.7 | 35 |
| | 1/28/2014 | 127,180 | NM | NM |
| | 1/14/2014 | 127,133 | 39.74 | 20 |
| | 1/10/2014 | 121,034 | NM | NM |
| | 1/8/2014 | 118,810 | 39.75 | 35 |
| | 12/27/2013 | 101,731 | 41.63 | 20 |
| | 12/12/2013 | 73,509 | NM | NM |
| | 11/25/2013 | 52,687 | 41.5 | 35 |
| | 11/11/2013 | 27,220 | T.O.P. | 35 |
| | 11/5/2013 | 18,808 | NM | NM |
| | 10/28/2013 | 7,831 | 37.42 | 35 |
| | 10/18/2013 | 5,740 | | |
| | 10/15/2013 | 155 | | |

**TABLE 4. SUMMARY OF GROUNDWATER FIELD PARAMETERS**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date | Flow Meter Reading (gallons) | Depth to Water (feet) | Field Nitrate (ppm) |
|---|---|---|---|---|
| EW-2 | 7/10/2015 | 6,768,068 | NM | 0 |
| | 6/24/2015 | 6,623,404 | NM | 0 |
| | 6/12/2015 | 6,517,850 | NM | 0-5 |
| | 5/28/2015 | 6,376,551 | NM | 0-5 |
| | 4/24/2015 | 6,060,000 | 38.77 | 0-5 |
| | 3/21/2015 | 5,754,530 | NM | 0 |
| | 3/6/2015 | 5,616,735 | NM | 0-5 |
| | 2/19/2015 | 5,493,835 | NM | 0-5 |
| | 2/6/2015 | 5,393,955 | NM | 0-5 |
| | 1/23/2015 | 5,285,127 | 39.15 | 0-5 |
| | 1/2/2015 | 5,125,385 | NM | 0-5 |
| | 12/19/2014 | 5,015,095 | NM | 0-5 |
| | 12/5/2014 | 4,922,323 | NM | 0-5 |
| | 11/21/2014 | 4,829,370 | NM | NM |
| | 11/14/2014 | 4,784,360 | 38.56 | 0-5 |
| | 10/30/2014 | 4,694,213 | NM | 0-5 |
| | 10/16/2014 | 4,624,453 | 37.30 | 0-5 |
| | 10/2/2014 | 4,623,137 | 40.61 | 0 |
| | 9/22/2014 | 4,551,766 | NM | 0 |
| | 9/8/2014 | 4,463,785 | 41.05 | 0 |
| | 8/21/2014 | 4,342,513 | 40.41 | 0-5 |
| | 8/11/2014 | 4,281,637 | NM | 0-5 |
| | 7/25/2014 | 4,172,899 | NM | 0-5 |
| | 7/9/2014 | 4,085,286 | 42.5 | 0-5 |
| | 6/27/2014 | 4,004,441 | 42.09 | 5 |
| | 6/13/2014 | 3,908,572 | 41.34 | 0-5 |
| | 5/30/2014 | 3,829,979 | NM | 5-10 |
| | 5/27/2014 | 3,813,392 | NM | NM |
| | 5/11/2014 | 3,732,025 | NM | 5 |
| | 4/24/2014 | 3,666,252 | T.O.P. | 5-10 |
| | 4/10/2014 | 3,613,758 | T.O.P. | 10 |
| | 3/25/2014 | 3,539,885 | T.O.P. | 5-10 |
| | 3/21/2014 | 3,528,092 | NM | NM |
| | 3/10/2014 | 3,491,362 | NM | NM |
| | 3/10/2014 | 402,917 | 46.95 | 10 |
| | 2/27/2014 | 371,628 | NM | 10 |
| | 2/26/2014 | 368,940 | NM | NM |
| | 2/12/2014 | 331,010 | 50.15 | <5 |
| | 1/30/2014 | 291,157 | NM | NM |
| | 1/29/2014 | 289,231 | T.O.P. | 20 |
| | 1/28/2014 | 286,464 | NM | NM |
| | 1/14/2014 | 243,439 | 50.55 | 10 |
| | 1/10/2014 | 229,870 | NM | NM |
| | 1/8/2014 | 223,111 | 46 | 15 |
| | 12/27/2013 | 182,942 | 50.4 | 20 |
| | 12/12/2013 | 127,633 | NM | NM |
| | 11/25/2013 | 96,506 | 44.5 | 10-15 |
| | 11/11/2013 | 55,497 | T.O.P. | 20 |
| | 11/5/2013 | 41,237 | NM | NM |
| | 10/28/2013 | 19,430 | 36.05 | 20 |
| | 10/18/2013 | 5,444 | | |
| | 10/15/2013 | 559 | | |

**TABLE 4. SUMMARY OF GROUNDWATER FIELD PARAMETERS**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date | Flow Meter Reading (gallons) | Depth to Water (feet) | Field Nitrate (ppm) |
|---|---|---|---|---|
| EW-3 | 7/10/2015 | OFF | OFF | OFF |
| | 6/24/2015 | OFF | OFF | OFF |
| | 6/12/2015 | OFF | OFF | OFF |
| | 5/28/2015 | OFF | OFF | OFF |
| | 4/24/2015 | 5,183,510 | 37.69 | 0-5 |
| | 3/21/2015 | 5,181,222 | NM | NM |
| | 3/6/2015 | 5,181,222 | NM | NM |
| | 2/19/2015 | 5,181,222 | NM | NM |
| | 2/6/2015 | 5,181,222 | NM | 0-5 |
| | 1/23/2015 | 5,028,453 | 37.25 | 0-5 |
| | 1/2/2015 | 4,811,566 | NM | 0-5 |
| | 12/19/2014 | 4,662,754 | NM | 0-5 |
| | 12/5/2014 | 4,533,018 | NM | 0-5 |
| | 11/21/2014 | 4,304,274 | NM | NM |
| | 11/14/2014 | 4,086,362 | 37.85 | 0-5 |
| | 10/30/2014 | 3,948,289 | NM | 0-5 |
| | 10/16/2014 | 3,820,033 | 36.52 | 0-5 |
| | 10/2/2014 | 3,697,780 | 36.35 | 0 |
| | 9/22/2014 | 3,603,848 | NM | 0-5 |
| | 9/8/2014 | 3,489,198 | 35.85 | 0 |
| | 8/21/2014 | 3,479,893 | NM | NM |
| | 8/11/2014 | 3,466,373 | NM | 0 |
| | 7/25/2014 | 3,268,676 | NM | 0-5 |
| | 7/9/2014 | 3,101,476 | 36.76 | 0-5 |
| | 6/27/2014 | 2,970,535 | 37.02 | 0-5 |
| | 6/13/2014 | 2,813,719 | 37.39 | 0-5 |
| | 5/30/2014 | 2,669,227 | NM | 0-5 |
| | 5/27/2014 | 2,637,622 | NM | NM |
| | 5/11/2014 | 2,478,924 | NM | 0 |
| | 4/24/2014 | 2,334,732 | 48.08 | 0-5 |
| | 4/10/2014 | 2,184,326 | ~48 | 0-5 |
| | 3/25/2014 | 2,037,160 | ~52 | 0-5 |
| | 3/21/2014 | 2,002,039 | NM | NM |
| | 3/10/2014 | 1,917,233 | NM | NM |
| | 3/10/2014 | 889,366 | 42.95 | 5-10 |
| | 2/27/2014 | 889,366 | NM | 0-5 |
| | 2/26/2014 | 883,121 | NM | NM |
| | 2/12/2014 | 794,940 | 42.5 | 5-10 |
| | 1/30/2014 | 713,372 | NM | NM |
| | 1/29/2014 | 713,343 | T.O.P. | 5 |
| | 1/28/2014 | 713,343 | NM | NM |
| | 1/14/2014 | 705,442 | 47.8 | 5-10 |
| | 1/10/2014 | 680,389 | NM | NM |
| | 1/8/2014 | 671,023 | 49.95 | 5 |
| | 12/27/2013 | 587,312 | 45.4 | 5 |
| | 12/12/2013 | 452,351 | NM | NM |
| | 11/25/2013 | 378,479 | 44.78 | 5 |
| | 11/11/2013 | 253,730 | 40.35 | 10 |
| | 11/5/2013 | 199,810 | NM | NM |
| | 10/28/2013 | 126,182 | 37.36 | 5-10 |
| | 10/18/2013 | 27,640 | | |
| | 10/15/2013 | 310 | | |

**TABLE 4. SUMMARY OF GROUNDWATER FIELD PARAMETERS**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date | Flow Meter Reading (gallons) | Depth to Water (feet) | Field Nitrate (ppm) |
|---|---|---|---|---|
| EW-4 | 7/10/2015 | 12,052,981 | NM | 0 |
| | 6/24/2015 | 12,024,187 | NM | 0 |
| | 6/12/2015 | 11,983,510 | NM | 0 |
| | 5/28/2015 | 11,850,263 | NM | 0 |
| | 4/24/2015 | 11,536,200 | 45.72 | 0-5 |
| | 3/21/2015 | 11,437,084 | NM | 0 |
| | 3/6/2015 | 11,239,867 | NM | 0-5 |
| | 2/19/2015 | 11,063,782 | NM | 0-5 |
| | 2/6/2015 | 10,902,545 | NM | 0-5 |
| | 1/23/2015 | 10,751,475 | 45.61 | 0-5 |
| | 1/2/2015 | 10,533,332 | NM | 0-5 |
| | 12/19/2014 | 10,382,760 | NM | 0-5 |
| | 12/5/2014 | 10,250,684 | NM | 0-5 |
| | 11/21/2014 | 10,110,920 | NM | NM |
| | 11/14/2014 | 10,035,777 | 45.95 | 0-5 |
| | 10/30/2014 | 9,938,628 | NM | 0-5 |
| | 10/16/2014 | 9,794,192 | 44.30 | 0-5 |
| | 10/9/2014 | 9,734,391 | NM | NM |
| | 10/9/2014 | 1,787,212 | NM | NM |
| | 10/2/2014 | 1,787,212 | NM | NM |
| | 9/22/2014 | 1,787,212 | NM | NM |
| | 9/8/2014 | 1,726,004 | 36.72 | 0 |
| | 8/21/2014 | 1,554,070 | 36.55 | 0 |
| | 8/11/2014 | 1,467,745 | NM | 0 |
| | 7/25/2014 | 1,339,434 | NM | 0 |
| | 7/9/2014 | 1,232,341 | 40.84 | 0 |
| | 6/27/2014 | 1,125,421 | 42.48 | 0 |
| | 6/13/2014 | 995,618 | 42.27 | 0 |
| | 5/30/2014 | 875,379 | NM | 0 |
| | 5/27/2014 | 844,121 | NM | NM |
| | 5/11/2014 | 684,382 | NM | 0 |
| | 4/24/2014 | 535,613 | 46.97 | 0 |
| | 4/10/2014 | 357,484 | 48.11 | 0 |
| | 3/25/2014 | 192,449 | 47.76 | 0 |
| | 3/21/2014 | 155,133 | NM | NM |
| | 3/10/2014 | 59,837 | NM | NM |
| | 3/10/2014 | 919,953 | 43.7 | 0 |
| | 2/27/2014 | 919,942 | NM | 0-5 |
| | 2/26/2014 | 912,735 | NM | NM |
| | 2/12/2014 | 819,150 | NM | 5 |
| | 1/30/2014 | 736,045 | NM | NM |
| | 1/29/2014 | 731,561 | T.O.P. | 0 |
| | 1/28/2014 | 725,525 | NM | NM |
| | 1/14/2014 | 631,711 | T.O.P. | 0 |
| | 1/10/2014 | 600,440 | NM | NM |
| | 1/8/2014 | 600,412 | T.O.P. | 0 |
| | 12/27/2013 | 522,436 | 18.1 | 0 |
| | 12/12/2013 | 469,465 | NM | NM |
| | 11/25/2013 | 404,730 | 50.1 | 0-5 |
| | 11/11/2013 | 278,248 | 48.3 | 5 |
| | 11/5/2013 | 219,244 | NM | NM |
| | 10/28/2013 | 138,465 | 47.25 | 5 |
| | 10/18/2013 | 31,210 | | |
| | 10/15/2013 | 393 | | |

**TABLE 4. SUMMARY OF GROUNDWATER FIELD PARAMETERS**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date | Flow Meter Reading (gallons) | Depth to Water (feet) | Field Nitrate (ppm) |
|---|---|---|---|---|
| NOTES:<br>ppm = parts per million<br>NM - Not Measured<br>T.O.P. - Top of Pump<br>Changed flow meters on 3/10/14 | | | | |

**TABLE 5. CALCULATION OF SYSTEM FLOW RATES**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date and Time | Elapsed Time (HH:MM:SS) | Elapsed Time (min) | Total elapsed Time (min) | Flow Meter Reading (gallons) | Extracted Volume Between Events (gallons) | Total Extracted Volume (gallons) | Average Flow Rate Between Events (gpm) | Average Flow Rate Since Start-up (gpm) | Quarterly Average Flow Rate (gpm) |
|---|---|---|---|---|---|---|---|---|---|---|
| EW-1 | 7/23/15 14:36 | 310:36:00 | 18636 | 930601 | 1,096,265 | 61,635 | 1,735,640 | 3.31 | 1.86 | |
| | 7/10/15 16:00 | 392:15:00 | 23535 | 911965 | 1,034,630 | 76,707 | 1,674,005 | 3.26 | 1.84 | |
| | 6/24/15 7:45 | 279:05:00 | 16745 | 888430 | 957,923 | 48,171 | 1,597,298 | 2.88 | 1.80 | 2.71 |
| | 6/12/15 16:40 | 364:14:00 | 21854 | 871685 | 909,752 | 52,950 | 1,549,127 | 2.42 | 1.78 | |
| | 5/28/15 12:26 | 290:26:00 | 17426 | 849831 | 856,802 | 40,163 | 1,496,177 | 2.30 | 1.76 | |
| | 5/16/15 10:00 | 527:18:00 | 31638 | 832405 | 816,639 | 71,659 | 1,456,014 | 2.26 | 1.75 | |
| | 4/24/15 10:42 | 811:48:00 | 48708 | 800767 | 744,980 | 106,264 | 1,384,355 | 2.18 | 1.73 | |
| | 3/21/15 14:54 | 358:17:00 | 21497 | 752059 | 638,716 | 46,286 | 1,278,091 | 2.15 | 1.70 | |
| | 3/6/15 16:37 | 362:22:00 | 21742 | 730562 | 592,430 | 41,927 | 1,231,805 | 1.93 | 1.69 | 2.15 |
| | 2/19/15 14:15 | 310:42:00 | 18642 | 708820 | 550,503 | 41,045 | 1,189,878 | 2.20 | 1.68 | |
| | 2/6/15 15:33 | 342:03:00 | 20523 | 690178 | 509,458 | 46,723 | 1,148,833 | 2.28 | 1.66 | |
| | 1/23/15 9:30 | 497:54:00 | 29874 | 669655 | 462,735 | 69,253 | 1,102,110 | 2.32 | 1.65 | |
| | 1/2/15 15:36 | 344:01:00 | 20641 | 639781 | 393,482 | 48,482 | 1,032,857 | 2.35 | 1.61 | |
| | 12/19/14 7:35 | 335:02:00 | 20102 | 619140 | 345,000 | 43,245 | 984,375 | 2.15 | 1.59 | |
| | 12/5/14 8:33 | 328:52:00 | 19732 | 599038 | 301,755 | 49,037 | 941,130 | 2.49 | 1.57 | 1.99 |
| | 11/21/14 15:41 | 176:20:00 | 10580 | 579306 | 252,718 | 19,694 | 892,093 | 1.86 | 1.54 | |
| | 11/14/14 7:21 | 355:48:00 | 21348 | 568726 | 233,024 | 52,785 | 872,399 | 2.47 | 1.53 | |
| | 10/30/14 11:33 | 331:45:00 | 19905 | 547378 | 180,239 | 107 | 819,614 | 0.01 | 1.50 | |
| | 10/16/14 15:48 | 175:48:00 | 10548 | 527473 | 180,132 | 4,140 | 819,507 | 0.39 | 1.55 | |
| | 10/9/14 8:00 | 0:00:00 | 0 | 516925 | 175,992 | 0 | 815,367 | 0.00 | 1.58 | |
| | 10/9/14 8:00 | 160:22:00 | 9622 | 516925 | 9,734,391 | 14,598 | 815,367 | 1.52 | 1.58 | |
| | 10/2/14 15:38 | 239:38:00 | 14378 | 507303 | 9,719,793 | 39,762 | 800,769 | 2.77 | 1.58 | |
| | 9/22/14 16:00 | 335:22:00 | 20122 | 492925 | 9,680,031 | 52,419 | 761,007 | 2.61 | 1.54 | 2.54 |
| | 9/8/14 16:38 | 432:48:00 | 25968 | 472803 | 9,627,612 | 75,159 | 708,588 | 2.89 | 1.50 | |
| | 8/21/14 15:50 | 239:54:00 | 14394 | 446835 | 9,552,453 | 39,532 | 633,429 | 2.75 | 1.42 | |
| | 8/11/14 15:56 | 411:32:00 | 24692 | 432441 | 9,512,921 | 74,920 | 593,897 | 3.03 | 1.37 | |
| | 7/25/14 12:24 | 387:03:00 | 23223 | 407749 | 9,438,001 | 63,126 | 518,977 | 2.72 | 1.27 | |
| | 7/9/14 9:21 | 285:39:00 | 17139 | 384526 | 9,374,875 | 46,968 | 455,851 | 2.74 | 1.19 | |
| | 6/27/14 11:42 | 339:25:00 | 20365 | 367387 | 9,327,907 | 47,916 | 408,883 | 2.35 | 1.11 | |
| | 6/13/14 8:17 | 336:52:00 | 20212 | 347022 | 9,279,991 | 38,758 | 360,967 | 1.92 | 1.04 | |
| | 5/30/14 7:25 | 72:00:00 | 4320 | 326810 | 9,241,233 | 4,686 | 322,209 | 1.08 | 0.99 | 1.69 |
| | 5/27/14 7:25 | 383:55:00 | 23035 | 322490 | 9,236,547 | 19,665 | 317,523 | 0.85 | 0.98 | |
| | 5/11/14 7:30 | 398:45:00 | 23925 | 299455 | 9,216,882 | 20,644 | 297,858 | 0.86 | 0.99 | |
| | 4/24/14 16:45 | 343:05:00 | 20585 | 275530 | 9,196,238 | 40,221 | 277,214 | 1.95 | 1.01 | |

**TABLE 5. CALCULATION OF SYSTEM FLOW RATES**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date and Time | Elapsed Time (HH:MM:SS) | Elapsed Time (min) | Total elapsed Time (min) | Flow Meter Reading (gallons) | Extracted Volume Between Events (gallons) | Total Extracted Volume (gallons) | Average Flow Rate Between Events (gpm) | Average Flow Rate Since Start-up (gpm) | Quarterly Average Flow Rate (gpm) |
|---|---|---|---|---|---|---|---|---|---|---|
| EW-1 (Con't.) | 4/10/14 9:40 | 385:50:00 | 23150 | 254945 | 9,156,017 | 30,951 | 236,993 | 1.34 | 0.93 | |
| | 3/25/14 7:50 | 92:35:00 | 5555 | 231795 | 9,125,066 | 7,824 | 206,042 | 1.41 | 0.89 | |
| | 3/21/14 11:15 | 260:45:00 | 15645 | 226240 | 9,117,242 | 22,226 | 198,218 | 1.42 | 0.88 | |
| | 3/10/14 14:30 | 3:30:00 | 210 | 210595 | 9,095,016 | 0 | 175,992 | 0.00 | 0.83 | |
| | 3/10/14 11:00 | 257:25:00 | 15445 | 210385 | 175,992 | 16,464 | 175,992 | 1.07 | 0.84 | |
| | 2/27/14 17:35 | 24:22:00 | 1462 | 194940 | 159,528 | 1,558 | 159,528 | 1.07 | 0.82 | 0.89 |
| | 2/26/14 17:13 | 338:08:00 | 20288 | 193478 | 157,970 | 19,730 | 157,970 | 0.97 | 0.82 | |
| | 2/12/14 15:05 | 318:45:00 | 19125 | 173190 | 138,240 | 11,030 | 138,240 | 0.58 | 0.80 | |
| | 1/30/14 8:20 | 16:25:00 | 985 | 154065 | 127210 | 30 | 127210 | 0.03 | 0.82 | |
| | 1/29/14 15:55 | 23:05:00 | 1385 | 153080 | 127180 | 0 | 127180 | 0.00 | 0.83 | |
| | 1/28/14 16:50 | 336:20:00 | 20180 | 151695 | 127180 | 47 | 127180 | 0.00 | 0.84 | |
| | 1/14/14 16:30 | 102:45:00 | 6,165 | 131,515 | 127,133 | 6099 | 127,133 | 0.99 | 0.97 | |
| | 1/10/14 9:45 | 40:40:00 | 2,440 | 125,350 | 121,034 | 2224 | 121,034 | 0.91 | 0.96 | |
| | 1/8/14 17:05 | 297:40:00 | 17,860 | 122,910 | 118,810 | 17079 | 118,810 | 0.96 | 0.97 | |
| | 12/27/13 7:25 | 350:25:00 | 21,025 | 105,050 | 101,731 | 28222 | 101,731 | 1.34 | 0.97 | |
| | 12/12/13 17:00 | 407:46:00 | 24,466 | 84,025 | 73,509 | 20822 | 73,509 | 0.85 | 0.87 | |
| | 11/25/13 17:14 | 338:41:00 | 20,321 | 59,559 | 52,687 | 25467 | 52,687 | 1.25 | 0.88 | |
| | 11/11/13 14:33 | 142:28:00 | 8,548 | 39,238 | 27,220 | 8412 | 27,220 | 0.98 | 0.69 | |
| | 11/5/13 16:05 | 190:39:00 | 11,439 | 30,690 | 18,808 | 10977 | 18,808 | 0.96 | 0.61 | 0.97 |
| | 10/28/13 17:26 | 4:26:00 | 266 | 19,251 | 7,831 | 352 | 7,831 | 1.32 | 0.40 | |
| | 10/28/13 13:00 | 245:28:00 | 14,728 | 18,985 | 7,479 | 1739 | 7,479 | 0.12 | 0.39 | |
| | 10/18/13 7:32 | 65:16:00 | 3,916 | 4,257 | 5,740 | 5080 | 5,740 | 1.30 | 1.31 | |
| | 10/15/13 14:16 | 4:55:00 | 295 | 341 | 660 | 434 | 660 | 1.47 | 1.48 | |
| | 10/15/13 9:21 | 0:46:00 | 46 | 46 | 226 | 71 | 226 | 1.54 | 1.54 | |
| | 10/15/13 8:35 | --- | --- | --- | 155 | 155 | 155 | --- | --- | |

**TABLE 5. CALCULATION OF SYSTEM FLOW RATES**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date and Time | Elapsed Time (HH:MM:SS) | Elapsed Time (min) | Total elapsed Time (min) | Flow Meter Reading (gallons) | Extracted Volume Between Events (gallons) | Total Extracted Volume (gallons) | Average Flow Rate Between Events (gpm) | Average Flow Rate Since Start-up (gpm) | Quarterly Average Flow Rate (gpm) |
|---|---|---|---|---|---|---|---|---|---|---|
| EW-2 | 7/23/15 14:16 | 310:16:00 | 18616 | 930582 | 6,813,225 | 45,157 | 3,724,780 | 2.43 | 4.00 | |
| | 7/10/15 16:00 | 392:07:00 | 23527 | 911966 | 6,768,068 | 144,664 | 3,679,623 | 6.15 | 4.03 | |
| | 6/24/15 7:53 | 279:04:00 | 16744 | 888439 | 6,623,404 | 105,554 | 3,534,959 | 6.30 | 3.98 | 5.80 |
| | 6/12/15 16:49 | 364:18:00 | 21858 | 871695 | 6,517,850 | 141,299 | 3,429,405 | 6.46 | 3.93 | |
| | 5/28/15 12:31 | 290:26:00 | 17426 | 849837 | 6,376,551 | 112,335 | 3,288,106 | 6.45 | 3.87 | |
| | 5/16/15 10:05 | 527:28:00 | 31648 | 832411 | 6,264,216 | 204,216 | 3,175,771 | 6.45 | 3.81 | |
| | 4/24/15 10:37 | 811:37:00 | 48697 | 800763 | 6,060,000 | 305,470 | 2,971,555 | 6.27 | 3.71 | |
| | 3/21/15 15:00 | 358:17:00 | 21497 | 752066 | 5,754,530 | 137,795 | 2,666,085 | 6.41 | 3.54 | |
| | 3/6/15 16:43 | 362:22:00 | 21742 | 730569 | 5,616,735 | 122,900 | 2,528,290 | 5.65 | 3.46 | 5.91 |
| | 2/19/15 14:21 | 310:41:00 | 18641 | 708827 | 5,493,835 | 99,880 | 2,405,390 | 5.36 | 3.39 | |
| | 2/6/15 15:40 | 342:28:00 | 20548 | 690186 | 5,393,955 | 108,828 | 2,305,510 | 5.30 | 3.34 | |
| | 1/23/15 9:12 | 497:30:00 | 29850 | 669638 | 5,285,127 | 159,742 | 2,196,682 | 5.35 | 3.28 | |
| | 1/2/15 15:42 | 344:02:00 | 20642 | 639788 | 5,125,385 | 110,290 | 2,036,940 | 5.34 | 3.18 | |
| | 12/19/14 7:40 | 335:15:00 | 20115 | 619146 | 5,015,095 | 92,772 | 1,926,650 | 4.61 | 3.11 | |
| | 12/5/14 8:25 | 328:43:00 | 19723 | 599031 | 4,922,323 | 92,953 | 1,833,878 | 4.71 | 3.06 | 4.65 |
| | 11/21/14 15:42 | 176:07:00 | 10567 | 579308 | 4,829,370 | 45,010 | 1,740,925 | 4.26 | 3.00 | |
| | 11/14/14 7:35 | 359:03:00 | 21543 | 568741 | 4,784,360 | 90,147 | 1,695,915 | 4.18 | 2.98 | |
| | 10/30/14 8:32 | 328:55:00 | 19735 | 547198 | 4,694,213 | 69,760 | 1,605,768 | 3.53 | 2.93 | |
| | 10/16/14 15:37 | 335:51:00 | 20151 | 527463 | 4,624,453 | 1,316 | 1,536,008 | 0.07 | 2.91 | |
| | 10/2/14 15:46 | 239:39:00 | 14379 | 507312 | 4,623,137 | 71,371 | 1,534,692 | 4.96 | 3.02 | |
| | 9/22/14 16:07 | 335:20:00 | 20120 | 492933 | 4,551,766 | 87,981 | 1,463,321 | 4.37 | 2.97 | |
| | 9/8/14 16:47 | 432:50:00 | 25970 | 472813 | 4,463,785 | 121,272 | 1,375,340 | 4.67 | 2.91 | 3.77 |
| | 8/21/14 15:57 | 239:53:00 | 14393 | 446843 | 4,342,513 | 60,876 | 1,254,068 | 4.23 | 2.81 | |
| | 8/11/14 16:04 | 411:34:00 | 24694 | 432450 | 4,281,637 | 108,738 | 1,193,192 | 4.40 | 2.76 | |
| | 7/25/14 12:30 | 387:33:00 | 23253 | 407756 | 4,172,899 | 87,613 | 1,084,454 | 3.77 | 2.66 | |
| | 7/9/14 8:57 | 285:07:00 | 17107 | 384503 | 4,085,286 | 80,845 | 996,841 | 4.73 | 2.59 | |
| | 6/27/14 11:50 | 339:28:00 | 20368 | 367396 | 4,004,441 | 95,869 | 915,996 | 4.71 | 2.49 | |
| | 6/13/14 8:22 | 336:51:00 | 20211 | 347028 | 3,908,572 | 78,593 | 820,127 | 3.89 | 2.36 | |
| | 5/30/14 7:31 | 72:04:00 | 4324 | 326817 | 3,829,979 | 16,587 | 741,534 | 3.84 | 2.27 | 3.64 |
| | 5/27/14 7:27 | 383:52:00 | 23032 | 322493 | 3,813,392 | 81,367 | 724,947 | 3.53 | 2.25 | |
| | 5/11/14 7:35 | 398:40:00 | 23920 | 299461 | 3,732,025 | 65,773 | 643,580 | 2.75 | 2.15 | |
| | 4/24/14 16:55 | 343:35:00 | 20615 | 275541 | 3,666,252 | 52,494 | 577,807 | 2.55 | 2.09 | |

**TABLE 5. CALCULATION OF SYSTEM FLOW RATES**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date and Time | Elapsed Time (HH:MM:SS) | Elapsed Time (min) | Total elapsed Time (min) | Flow Meter Reading (gallons) | Extracted Volume Between Events (gallons) | Total Extracted Volume (gallons) | Average Flow Rate Between Events (gpm) | Average Flow Rate Since Start-up (gpm) | Quarterly Average Flow Rate (gpm) |
|---|---|---|---|---|---|---|---|---|---|---|
| EW-2 (Con't.) | 4/10/14 9:20 | 385:25:00 | 23125 | 254926 | 3,613,758 | 73,873 | 525,313 | 3.19 | 2.06 | |
| | 3/25/14 7:55 | 92:39:00 | 5559 | 231801 | 3,539,885 | 11,793 | 451,440 | 2.12 | 1.95 | |
| | 3/21/14 11:16 | 260:46:00 | 15646 | 226242 | 3,528,092 | 36,730 | 439,647 | 2.35 | 1.94 | |
| | 3/10/14 14:30 | 3:23:00 | 203 | 210596 | 3,491,362 | 0 | 402,917 | 0.00 | 1.91 | |
| | 3/10/14 11:07 | 257:27:00 | 15447 | 210393 | 402,917 | 31,289 | 402,917 | 2.03 | 1.91 | |
| | 2/27/14 17:40 | 24:26:00 | 1466 | 194946 | 371,628 | 2,688 | 371,628 | 1.83 | 1.90 | 2.28 |
| | 2/26/14 17:14 | 338:21:00 | 20301 | 193480 | 368,940 | 37,930 | 368,940 | 1.87 | 1.90 | |
| | 2/12/14 14:53 | 318:10:00 | 19090 | 173179 | 331,010 | 39,853 | 331,010 | 2.09 | 1.91 | |
| | 1/30/14 8:43 | 16:36:00 | 996 | 154,089 | 291,157 | 1,926 | 291,157 | 1.93 | 1.89 | |
| | 1/29/14 16:07 | 23:02:00 | 1,382 | 153,093 | 289,231 | 2,767 | 289,231 | 2.00 | 1.89 | |
| | 1/28/14 17:05 | 336:20:00 | 20,180 | 151,711 | 286,464 | 43,025 | 286,464 | 2.13 | 1.88 | |
| | 1/14/14 16:45 | 103:02:00 | 6,182 | 131,531 | 243,439 | 13,569 | 243,439 | 2.19 | 1.85 | |
| | 1/10/14 9:43 | 40:28:00 | 2,428 | 125,349 | 229,870 | 6,759 | 229,870 | 2.78 | 1.83 | |
| | 1/8/14 17:15 | 297:12:00 | 17,832 | 122,921 | 223,111 | 40,169 | 223,111 | 2.25 | 1.81 | |
| | 12/27/13 8:03 | 350:50:00 | 21,050 | 105,089 | 182,942 | 55,309 | 182,942 | 2.63 | 1.74 | |
| | 12/12/13 17:13 | 408:10:00 | 24,490 | 84,039 | 127,633 | 31,127 | 127,633 | 1.27 | 1.51 | |
| | 11/25/13 17:03 | 338:19:00 | 20,299 | 59,549 | 96,506 | 41,009 | 96,506 | 2.02 | 1.61 | |
| | 11/11/13 14:44 | 142:37:00 | 8,557 | 39,250 | 55,497 | 14,260 | 55,497 | 1.67 | 1.40 | |
| | 11/5/13 16:07 | 190:35:00 | 11,435 | 30,693 | 41,237 | 21,807 | 41,237 | 1.91 | 1.33 | 1.85 |
| | 10/28/13 17:32 | 5:40:00 | 340 | 19,258 | 19,430 | 1,369 | 19,430 | 4.03 | 0.98 | |
| | 10/28/13 11:52 | 244:27:00 | 14,667 | 18,918 | 18,061 | 12,617 | 18,061 | 0.86 | 0.93 | |
| | 10/18/13 7:25 | 65:20:00 | 3,920 | 4,251 | 5,444 | 3,519 | 5,444 | 0.90 | 1.15 | |
| | 10/15/13 14:05 | 4:45:00 | 285 | 331 | 1,925 | 1,020 | 1,925 | 3.58 | 4.13 | |
| | 10/15/13 9:20 | 0:46:00 | 46 | 46 | 905 | 346 | 905 | 7.52 | 7.52 | |
| | 10/15/13 8:34 | --- | --- | --- | 559 | 559 | 559 | --- | --- | |

**TABLE 5. CALCULATION OF SYSTEM FLOW RATES**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date and Time | Elapsed Time (HH:MM:SS) | Elapsed Time (min) | Total elapsed Time (min) | Flow Meter Reading (gallons) | Extracted Volume Between Events (gallons) | Total Extracted Volume (gallons) | Average Flow Rate Between Events (gpm) | Average Flow Rate Since Start-up (gpm) | Quarterly Average Flow Rate (gpm) |
|---|---|---|---|---|---|---|---|---|---|---|
| EW-3 | 7/23/15 13:54 | 309:54:00 | 18594 | 930561 | 5,190,307 | 6,797 | 4,162,440 | 0.37 | 6.03 | |
| | 7/10/15 16:00 | 391:57:00 | 23517 | 911967 | 5,183,510 | 0 | 4,155,643 | 0.00 | 6.02 | |
| | 6/24/15 8:03 | 279:14:00 | 16754 | 888450 | 5,183,510 | 0 | 4,155,643 | 0.00 | 6.02 | 0.05 |
| | 6/12/15 16:49 | 364:15:00 | 21855 | 871696 | 5,183,510 | 0 | 4,155,643 | 0.00 | 6.02 | |
| | 5/28/15 12:34 | 290:24:00 | 17424 | 849841 | 5,183,510 | 0 | 4,155,643 | 0.00 | 6.02 | |
| | 5/16/15 10:10 | 527:43:00 | 31663 | 832417 | 5,183,510 | 0 | 4,155,643 | 0.00 | 6.02 | |
| | 4/24/15 10:27 | 811:25:00 | 48685 | 800754 | 5,183,510 | 2,288 | 4,155,643 | 0.05 | 6.02 | |
| | 3/21/15 15:02 | 358:19:00 | 21499 | 752069 | 5,181,222 | 0 | 4,153,355 | 0.00 | 6.02 | |
| | 3/6/15 16:43 | 362:15:00 | 21735 | 730570 | 5,181,222 | 0 | 4,153,355 | 0.00 | 6.02 | 1.18 |
| | 2/19/15 14:28 | 310:43:00 | 18643 | 708835 | 5,181,222 | 0 | 4,153,355 | 0.00 | 6.02 | |
| | 2/6/15 15:45 | 342:49:00 | 20569 | 690192 | 5,181,222 | 152,769 | 4,153,355 | 7.43 | 6.02 | |
| | 1/23/15 8:56 | 497:09:00 | 29829 | 669623 | 5,028,453 | 216,887 | 4,000,586 | 7.27 | 5.97 | |
| | 1/2/15 15:47 | 344:01:00 | 20641 | 639794 | 4,811,566 | 148,812 | 3,783,699 | 7.21 | 5.91 | |
| | 12/19/14 7:46 | 335:25:00 | 20125 | 619153 | 4,662,754 | 129,736 | 3,634,887 | 6.45 | 5.87 | |
| | 12/5/14 8:21 | 328:38:00 | 19718 | 599028 | 4,533,018 | 228,744 | 3,505,151 | 11.60 | 5.85 | 8.50 |
| | 11/21/14 15:43 | 175:59:00 | 10559 | 579310 | 4,304,274 | 217,912 | 3,276,407 | 20.64 | 5.66 | |
| | 11/14/14 7:44 | 359:18:00 | 21558 | 568751 | 4,086,362 | 138,073 | 3,058,495 | 6.40 | 5.38 | |
| | 10/30/14 8:26 | 329:01:00 | 19741 | 547193 | 3,948,289 | 128,256 | 2,920,422 | 6.50 | 5.34 | |
| | 10/16/14 15:25 | 335:33:00 | 20133 | 527452 | 3,820,033 | 122,253 | 2,792,166 | 6.07 | 5.29 | |
| | 10/2/14 15:52 | 239:38:00 | 14378 | 507319 | 3,697,780 | 93,932 | 2,669,913 | 6.53 | 5.26 | |
| | 9/22/14 16:14 | 335:18:00 | 20118 | 492941 | 3,603,848 | 114,650 | 2,575,981 | 5.70 | 5.23 | |
| | 9/8/14 16:56 | 432:56:00 | 25976 | 472823 | 3,489,198 | 9,305 | 2,461,331 | 0.36 | 5.20 | 5.03 |
| | 8/21/14 16:00 | 239:51:00 | 14391 | 446847 | 3,479,893 | 13,520 | 2,452,026 | 0.94 | 5.49 | |
| | 8/11/14 16:09 | 411:34:00 | 24694 | 432456 | 3,466,373 | 197,697 | 2,438,506 | 8.01 | 5.64 | |
| | 7/25/14 12:35 | 387:50:00 | 23270 | 407762 | 3,268,676 | 167,200 | 2,240,809 | 7.19 | 5.49 | |
| | 7/9/14 8:45 | 284:49:00 | 17089 | 384492 | 3,101,476 | 130,941 | 2,073,609 | 7.66 | 5.39 | |
| | 6/27/14 11:56 | 339:28:00 | 20368 | 367403 | 2,970,535 | 156,816 | 1,942,668 | 7.70 | 5.29 | |
| | 6/13/14 8:28 | 336:53:00 | 20213 | 347035 | 2,813,719 | 144,492 | 1,785,852 | 7.15 | 5.15 | |
| | 5/30/14 7:35 | 72:06:00 | 4326 | 326822 | 2,669,227 | 31,605 | 1,641,360 | 7.31 | 5.02 | 7.08 |
| | 5/27/14 7:29 | 383:48:00 | 23028 | 322496 | 2,637,622 | 158,698 | 1,609,755 | 6.89 | 4.99 | |
| | 5/11/14 7:41 | 398:41:00 | 23921 | 299468 | 2,478,924 | 144,192 | 1,451,057 | 6.03 | 4.84 | |
| | 4/24/14 17:00 | 344:00:00 | 20640 | 275547 | 2,334,732 | 150,406 | 1,306,865 | 7.29 | 4.74 | |

**TABLE 5. CALCULATION OF SYSTEM FLOW RATES**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date and Time | Elapsed Time (HH:MM:SS) | Elapsed Time (min) | Total elapsed Time (min) | Flow Meter Reading (gallons) | Extracted Volume Between Events (gallons) | Total Extracted Volume (gallons) | Average Flow Rate Between Events (gpm) | Average Flow Rate Since Start-up (gpm) | Quarterly Average Flow Rate (gpm) |
|---|---|---|---|---|---|---|---|---|---|---|
| EW-3 (Con't.) | 4/10/14 9:00 | 384:58:00 | 23098 | 254907 | 2,184,326 | 147,166 | 1,156,459 | 6.37 | 4.54 | |
| | 3/25/14 8:02 | 92:44:00 | 5564 | 231809 | 2,037,160 | 35,121 | 1,009,293 | 6.31 | 4.35 | |
| | 3/21/14 11:18 | 260:53:00 | 15653 | 226245 | 2,002,039 | 84,806 | 974,172 | 5.42 | 4.30 | |
| | 3/10/14 14:25 | 14:25:00 | 865 | 210592 | 1,917,233 | 0 | 889,366 | 0.00 | 4.22 | |
| | 3/10/14 0:00 | 246:13:00 | 14773 | 209727 | 889,366 | 0 | 889,366 | 0.00 | 4.24 | |
| | 2/27/14 17:47 | 24:31:00 | 1471 | 194954 | 889,366 | 6,245 | 889,366 | 4.25 | 4.56 | 3.66 |
| | 2/26/14 17:16 | 338:31:00 | 20311 | 193483 | 883,121 | 88,181 | 883,121 | 4.34 | 4.56 | |
| | 2/12/14 14:45 | 316:20:00 | 18980 | 173172 | 794,940 | 81,568 | 794,940 | 4.30 | 4.59 | |
| | 1/30/14 10:25 | 18:05:00 | 1,085 | 154,192 | 713,372 | 29 | 713,372 | 0.03 | 4.62 | |
| | 1/29/14 16:20 | 23:14:00 | 1,394 | 153,107 | 713,343 | 0 | 713,343 | 0.00 | 4.66 | |
| | 1/28/14 17:06 | 335:56:00 | 20,156 | 151,713 | 713,343 | 7,901 | 713,343 | 0.39 | 4.70 | |
| | 1/14/14 17:10 | 103:28:00 | 6,208 | 131,557 | 705,442 | 25,053 | 705,442 | 4.04 | 5.36 | |
| | 1/10/14 9:42 | 40:20:00 | 2,420 | 125,349 | 680,389 | 9,366 | 680,389 | 3.87 | 5.43 | |
| | 1/8/14 17:22 | 297:49:00 | 17,869 | 122,929 | 671,023 | 83,711 | 671,023 | 4.68 | 5.46 | |
| | 12/27/13 7:33 | 350:30:00 | 21,030 | 105,060 | 587,312 | 134,961 | 587,312 | 6.42 | 5.59 | |
| | 12/12/13 17:03 | 408:07:00 | 24,487 | 84,030 | 452,351 | 73,872 | 452,351 | 3.02 | 5.38 | |
| | 11/25/13 16:56 | 337:58:00 | 20,278 | 59,543 | 378,479 | 124,749 | 378,479 | 6.15 | 6.35 | |
| | 11/11/13 14:58 | 142:50:00 | 8,570 | 39,265 | 253,730 | 53,920 | 253,730 | 6.29 | 6.45 | |
| | 11/5/13 16:08 | 190:26:00 | 11,426 | 30,695 | 199,810 | 73,628 | 199,810 | 6.44 | 6.50 | 5.36 |
| | 10/28/13 17:42 | 6:11:00 | 371 | 19,269 | 126,182 | 2,168 | 126,182 | 5.84 | 6.53 | |
| | 10/28/13 11:31 | 244:12:00 | 14,652 | 18,898 | 124,014 | 96,374 | 124,014 | 6.58 | 6.55 | |
| | 10/18/13 7:19 | 65:35:00 | 3,935 | 4,246 | 27,640 | 26,004 | 27,640 | 6.61 | 6.44 | |
| | 10/15/13 13:44 | 4:25:00 | 265 | 311 | 1,636 | 731 | 1,636 | 2.76 | 4.26 | |
| | 10/15/13 9:19 | 0:46:00 | 46 | 46 | 905 | 595 | 905 | 12.93 | 12.93 | |
| | 10/15/13 8:33 | --- | --- | --- | 310 | 310 | 310 | --- | --- | |

**TABLE 5. CALCULATION OF SYSTEM FLOW RATES**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date and Time | Elapsed Time (HH:MM:SS) | Elapsed Time (min) | Total elapsed Time (min) | Flow Meter Reading (gallons) | Extracted Volume Between Events (gallons) | Total Extracted Volume (gallons) | Average Flow Rate Between Events (gpm) | Average Flow Rate Since Start-up (gpm) | Quarterly Average Flow Rate (gpm) |
|---|---|---|---|---|---|---|---|---|---|---|
| EW-4 | 7/23/15 14:46 | 310:46:00 | 18646 | 930614 | 12,117,304 | 64,323 | 5,030,240 | 3.45 | 5.40 | |
| | 7/10/15 16:00 | 391:57:00 | 23517 | 911968 | 12,052,981 | 28,794 | 4,965,917 | 1.22 | 5.44 | |
| | 6/24/15 8:03 | 279:09:00 | 16749 | 888451 | 12,024,187 | 40,677 | 4,937,123 | 2.43 | 5.56 | 4.47 |
| | 6/12/15 16:54 | 364:14:00 | 21854 | 871702 | 11,983,510 | 133,247 | 4,896,446 | 6.10 | 5.62 | |
| | 5/28/15 12:40 | 290:25:00 | 17425 | 849848 | 11,850,263 | 112,626 | 4,763,199 | 6.46 | 5.60 | |
| | 5/16/15 10:15 | 528:02:00 | 31682 | 832423 | 11,737,637 | 201,437 | 4,650,573 | 6.36 | 5.59 | |
| | 4/24/15 10:13 | 811:06:00 | 48666 | 800741 | 11,536,200 | 99,116 | 4,449,136 | 2.04 | 5.56 | |
| | 3/21/15 15:07 | 358:19:00 | 21499 | 752075 | 11,437,084 | 197,217 | 4,350,020 | 9.17 | 5.78 | |
| | 3/6/15 16:48 | 362:20:00 | 21740 | 730576 | 11,239,867 | 176,085 | 4,152,803 | 8.10 | 5.68 | 5.98 |
| | 2/19/15 14:28 | 310:37:00 | 18637 | 708836 | 11,063,782 | 161,237 | 3,976,718 | 8.65 | 5.61 | |
| | 2/6/15 15:51 | 343:10:00 | 20590 | 690199 | 10,902,545 | 151,070 | 3,815,481 | 7.34 | 5.53 | |
| | 1/23/15 8:41 | 496:49:00 | 29809 | 669609 | 10,751,475 | 218,143 | 3,664,411 | 7.32 | 5.47 | |
| | 1/2/15 15:52 | 344:01:00 | 20641 | 639800 | 10,533,332 | 150,572 | 3,446,268 | 7.29 | 5.39 | |
| | 12/19/14 7:51 | 335:36:00 | 20136 | 619159 | 10,382,760 | 132,076 | 3,295,696 | 6.56 | 5.32 | |
| | 12/5/14 8:15 | 328:30:00 | 19710 | 599023 | 10,250,684 | 139,764 | 3,163,620 | 7.09 | 5.28 | 6.73 |
| | 11/21/14 15:45 | 175:54:00 | 10554 | 579313 | 10,110,920 | 75,143 | 3,023,856 | 7.12 | 5.22 | |
| | 11/14/14 7:51 | 359:34:00 | 21574 | 568759 | 10,035,777 | 97,149 | 2,948,713 | 4.50 | 5.18 | |
| | 10/30/14 8:17 | 329:05:00 | 19745 | 547185 | 9,938,628 | 144,436 | 2,851,564 | 7.32 | 5.21 | |
| | 10/16/14 15:12 | 175:12:00 | 10512 | 527440 | 9,794,192 | 59,801 | 2,707,128 | 5.69 | 5.13 | |
| | 10/9/14 8:00 | 0:00:00 | 0 | 516928 | 9,734,391 | 0 | 2,647,327 | 0.00 | 5.12 | |
| | 10/9/14 8:00 | 160:00:00 | 9600 | 516928 | 1,787,211 | 0 | 2,647,327 | 0.00 | 5.12 | |
| | 10/2/14 16:00 | 239:20:00 | 14360 | 507328 | 1,787,211 | 0 | 2,647,327 | 0.00 | 5.22 | |
| | 9/22/14 16:40 | 335:37:00 | 20137 | 492968 | 1,787,211 | 61,207 | 2,647,327 | 3.04 | 5.37 | 4.30 |
| | 9/8/14 17:03 | 432:49:00 | 25969 | 472831 | 1,726,004 | 171,934 | 2,586,120 | 6.62 | 5.47 | |
| | 8/21/14 16:14 | 239:59:00 | 14399 | 446862 | 1,554,070 | 86,325 | 2,414,186 | 6.00 | 5.40 | |
| | 8/11/14 16:15 | 411:34:00 | 24694 | 432463 | 1,467,745 | 128,311 | 2,327,861 | 5.20 | 5.38 | |
| | 7/25/14 12:41 | 388:21:00 | 23301 | 407769 | 1,339,434 | 107,093 | 2,199,550 | 4.60 | 5.39 | |

**TABLE 5. CALCULATION OF SYSTEM FLOW RATES**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date and Time | Elapsed Time (HH:MM:SS) | Elapsed Time (min) | Total elapsed Time (min) | Flow Meter Reading (gallons) | Extracted Volume Between Events (gallons) | Total Extracted Volume (gallons) | Average Flow Rate Between Events (gpm) | Average Flow Rate Since Start-up (gpm) | Quarterly Average Flow Rate (gpm) |
|---|---|---|---|---|---|---|---|---|---|---|
| EW-4 (Con't.) | 7/9/14 8:20 | 284:18:00 | 17058 | 384468 | 1,232,341 | 106,920 | 2,092,457 | 6.27 | 5.44 | |
| | 6/27/14 12:02 | 339:29:00 | 20369 | 367410 | 1,125,421 | 129,803 | 1,985,537 | 6.37 | 5.40 | |
| | 6/13/14 8:33 | 336:53:00 | 20213 | 347041 | 995,618 | 120,239 | 1,855,734 | 5.95 | 5.35 | |
| | 5/30/14 7:40 | 72:09:00 | 4329 | 326828 | 875,379 | 31,258 | 1,735,495 | 7.22 | 5.31 | 15.23 |
| | 5/27/14 7:31 | 383:43:00 | 23023 | 322499 | 844,121 | 159,739 | 1,704,237 | 6.94 | 5.28 | |
| | 5/11/14 7:48 | 398:41:00 | 23921 | 299476 | 684,382 | 148,769 | 1,544,498 | 6.22 | 5.16 | |
| | 4/24/14 17:07 | 344:35:00 | 20675 | 275555 | 535,613 | 178,129 | 1,395,729 | 8.62 | 5.06 | |
| | 4/10/14 8:32 | 384:20:00 | 23060 | 254880 | 357,484 | 165,035 | 1,217,600 | 7.16 | 4.78 | |
| | 3/25/14 8:12 | 92:53:00 | 5573 | 231820 | 192,449 | 37,316 | 1,052,565 | 6.70 | 4.54 | |
| | 3/21/14 11:19 | 261:39:00 | 15699 | 226247 | 155,133 | 95,296 | 1,015,249 | 6.07 | 4.49 | |
| | 3/10/14 13:40 | 2:25:00 | 145 | 210548 | 59,837 | 0 | 919,953 | 0.00 | 4.37 | |
| | 3/10/14 11:15 | 257:20:00 | 15440 | 210403 | 919,953 | 11 | 919,953 | 0.00 | 4.37 | |
| | 2/27/14 17:55 | 24:37:00 | 1477 | 194963 | 919,942 | 7,207 | 919,942 | 4.88 | 4.72 | 4.75 |
| | 2/26/14 17:18 | 338:48:00 | 20328 | 193486 | 912,735 | 93,585 | 912,735 | 4.60 | 4.72 | |
| | 2/12/14 14:30 | 315:10:00 | 18910 | 173158 | 819,150 | 83,105 | 819,150 | 4.39 | 4.73 | |
| | 1/30/14 11:20 | 18:49:00 | 1129 | 154248 | 736,045 | 4,484 | 736,045 | 3.97 | 4.77 | |
| | 1/29/14 16:31 | 23:23:00 | 1403 | 153119 | 731,561 | 6,036 | 731,561 | 4.30 | 4.78 | |
| | 1/28/14 17:08 | 336:09:00 | 20169 | 151716 | 725,525 | 93,814 | 725,525 | 4.65 | 4.78 | |
| | 1/14/14 16:59 | 103:22:00 | 6202 | 131547 | 631,711 | 31,271 | 631,711 | 5.04 | 4.80 | |
| | 1/10/14 9:37 | 40:09:00 | 2409 | 125345 | 600,440 | 28 | 600,440 | 0.01 | 4.79 | |
| | 1/8/14 17:28 | 297:38:00 | 17858 | 122936 | 600,412 | 77,976 | 600,412 | 4.37 | 4.88 | |
| | 12/27/13 7:50 | 350:44:00 | 21044 | 105078 | 522,436 | 52,971 | 522,436 | 2.52 | 4.97 | |
| | 12/12/13 17:06 | 408:19:00 | 24499 | 84034 | 469,465 | 64,735 | 469,465 | 2.64 | 5.58 | |
| | 11/25/13 16:47 | 337:48:00 | 20268 | 59535 | 404,730 | 126,482 | 404,730 | 6.24 | 6.79 | |
| | 11/11/13 14:59 | 142:50:00 | 8570 | 39267 | 278,248 | 59,004 | 278,248 | 6.88 | 7.08 | 4.80 |
| | 11/5/13 16:09 | 190:24:00 | 11424 | 30697 | 219,244 | 80,779 | 219,244 | 7.07 | 7.13 | |
| | 10/28/13 17:45 | 6:29:00 | 389 | 19273 | 138,465 | 2,504 | 138,465 | 6.44 | 7.16 | |
| | 10/28/13 11:16 | 244:03:00 | 14643 | 18884 | 135,961 | 104,751 | 135,961 | 7.15 | 7.18 | |
| | 10/18/13 7:13 | 65:39:00 | 3939 | 4241 | 31,210 | 28,570 | 31,210 | 7.25 | 7.27 | |
| | 10/15/13 13:34 | 4:17:00 | 257 | 302 | 2,640 | 1,735 | 2,640 | 6.75 | 7.44 | |
| | 10/15/13 9:17 | 0:45:00 | 45 | 45 | 905 | 512 | 905 | 11.38 | 11.38 | |
| | 10/15/13 8:32 | --- | --- | --- | 393 | 393 | 393 | --- | --- | |

**TABLE 5. CALCULATION OF SYSTEM FLOW RATES**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date and Time | Elapsed Time (HH:MM:SS) | Elapsed Time (min) | Total elapsed Time (min) | Flow Meter Reading (gallons) | Extracted Volume Between Events (gallons) | Total Extracted Volume (gallons) | Average Flow Rate Between Events (gpm) | Average Flow Rate Since Start-up (gpm) | Quarterly Average Flow Rate (gpm) |
|---|---|---|---|---|---|---|---|---|---|---|
| Totalized | 7/23/15 14:46 | 310:46:00 | 18646 | 930614 | 25,217,101 | 177,912 | 14,653,100 | 9.54 | 15.74 | |
| | 7/10/15 16:00 | 391:57:00 | 23517 | 911968 | 25,039,189 | 250,165 | 14,475,188 | 10.64 | 15.87 | |
| | 6/24/15 8:03 | 279:09:00 | 16749 | 888451 | 24,789,024 | 194,402 | 14,225,023 | 11.61 | 16.01 | 13.03 |
| | 6/12/15 16:54 | 364:14:00 | 21854 | 871702 | 24,594,622 | 327,496 | 14,030,621 | 14.99 | 16.09 | |
| | 5/28/15 12:40 | 290:25:00 | 17425 | 849848 | 24,267,126 | 265,124 | 13,703,125 | 15.22 | 16.12 | |
| | 5/16/15 10:15 | 528:02:00 | 31682 | 832423 | 24,002,002 | 477,312 | 13,438,001 | 15.07 | 16.14 | |
| | 4/24/15 10:13 | 811:06:00 | 48666 | 800741 | 23,524,690 | 513,138 | 12,960,689 | 10.54 | 16.18 | |
| | 3/21/15 15:07 | 358:19:00 | 21499 | 752075 | 23,011,552 | 381,298 | 12,447,551 | 17.74 | 16.55 | |
| | 3/6/15 16:48 | 362:20:00 | 21740 | 730576 | 22,630,254 | 340,912 | 12,066,253 | 15.68 | 16.51 | 15.23 |
| | 2/19/15 14:28 | 310:37:00 | 18637 | 708836 | 22,289,342 | 302,162 | 11,725,341 | 16.21 | 16.54 | |
| | 2/6/15 15:51 | 343:10:00 | 20590 | 690199 | 21,987,180 | 459,390 | 11,423,179 | 22.31 | 16.55 | |
| | 1/23/15 8:41 | 496:49:00 | 29809 | 669609 | 21,527,790 | 664,025 | 10,963,789 | 22.28 | 16.37 | |
| | 1/2/15 15:52 | 344:01:00 | 20641 | 639800 | 20,863,765 | 458,156 | 10,299,764 | 22.20 | 16.10 | |
| | 12/19/14 7:51 | 335:36:00 | 20136 | 619159 | 20,405,609 | 397,829 | 9,841,608 | 19.76 | 15.89 | |
| | 12/5/14 8:15 | 328:30:00 | 19710 | 599023 | 20,007,780 | 510,498 | 9,443,779 | 25.90 | 15.76 | 21.87 |
| | 11/21/14 15:45 | 175:54:00 | 10554 | 579313 | 19,497,282 | 357,759 | 8,933,281 | 33.90 | 15.42 | |
| | 11/14/14 7:51 | 359:34:00 | 21574 | 568759 | 19,139,523 | 378,154 | 8,575,522 | 17.53 | 15.08 | |
| | 10/30/14 8:17 | 329:05:00 | 19745 | 547185 | 18,761,369 | 342,559 | 8,197,368 | 17.35 | 14.98 | |
| | 10/16/14 15:12 | 335:12:00 | 20112 | 527440 | 18,418,810 | 202,108 | 7,854,809 | 10.05 | 14.89 | |
| | 10/2/14 16:00 | 239:20:00 | 14360 | 507328 | 19,827,921 | 205,065 | 7,652,701 | 14.28 | 15.08 | |
| | 9/22/14 16:40 | 335:37:00 | 20137 | 492968 | 19,622,856 | 316,257 | 7,447,636 | 15.71 | 15.10 | |
| | 9/8/14 17:03 | 432:49:00 | 25969 | 472831 | 19,306,599 | 377,670 | 7,131,379 | 14.54 | 15.08 | 15.64 |
| | 8/21/14 16:14 | 239:59:00 | 14399 | 446862 | 18,928,929 | 200,253 | 6,753,709 | 13.91 | 15.11 | |
| | 8/11/14 16:15 | 411:34:00 | 24694 | 432463 | 18,728,676 | 509,666 | 6,553,456 | 20.64 | 15.15 | |
| | 7/25/14 12:41 | 388:21:00 | 23301 | 407769 | 18,219,010 | 425,032 | 6,043,790 | 18.24 | 14.82 | |
| | 7/9/14 8:20 | 284:18:00 | 17058 | 384468 | 17,793,978 | 365,674 | 5,618,758 | 21.44 | 14.61 | |
| | 6/27/14 12:02 | 339:29:00 | 20369 | 367410 | 17,428,304 | 430,404 | 5,253,084 | 21.13 | 14.29 | |
| | 6/13/14 8:33 | 336:53:00 | 20213 | 347041 | 16,997,900 | 382,082 | 4,822,680 | 18.90 | 13.89 | |
| | 5/30/14 7:40 | 72:09:00 | 4329 | 326828 | 16,615,818 | 84,136 | 4,440,598 | 19.44 | 13.58 | 19.16 |
| | 5/27/14 7:31 | 383:43:00 | 23023 | 322499 | 16,531,682 | 419,469 | 4,356,462 | 18.22 | 13.50 | |
| | 5/11/14 7:48 | 398:41:00 | 23921 | 299476 | 16,112,213 | 379,378 | 3,936,993 | 15.86 | 13.14 | |
| | 4/24/14 17:07 | 344:35:00 | 20675 | 275555 | 15,732,835 | 421,250 | 3,557,615 | 20.37 | 12.91 | |

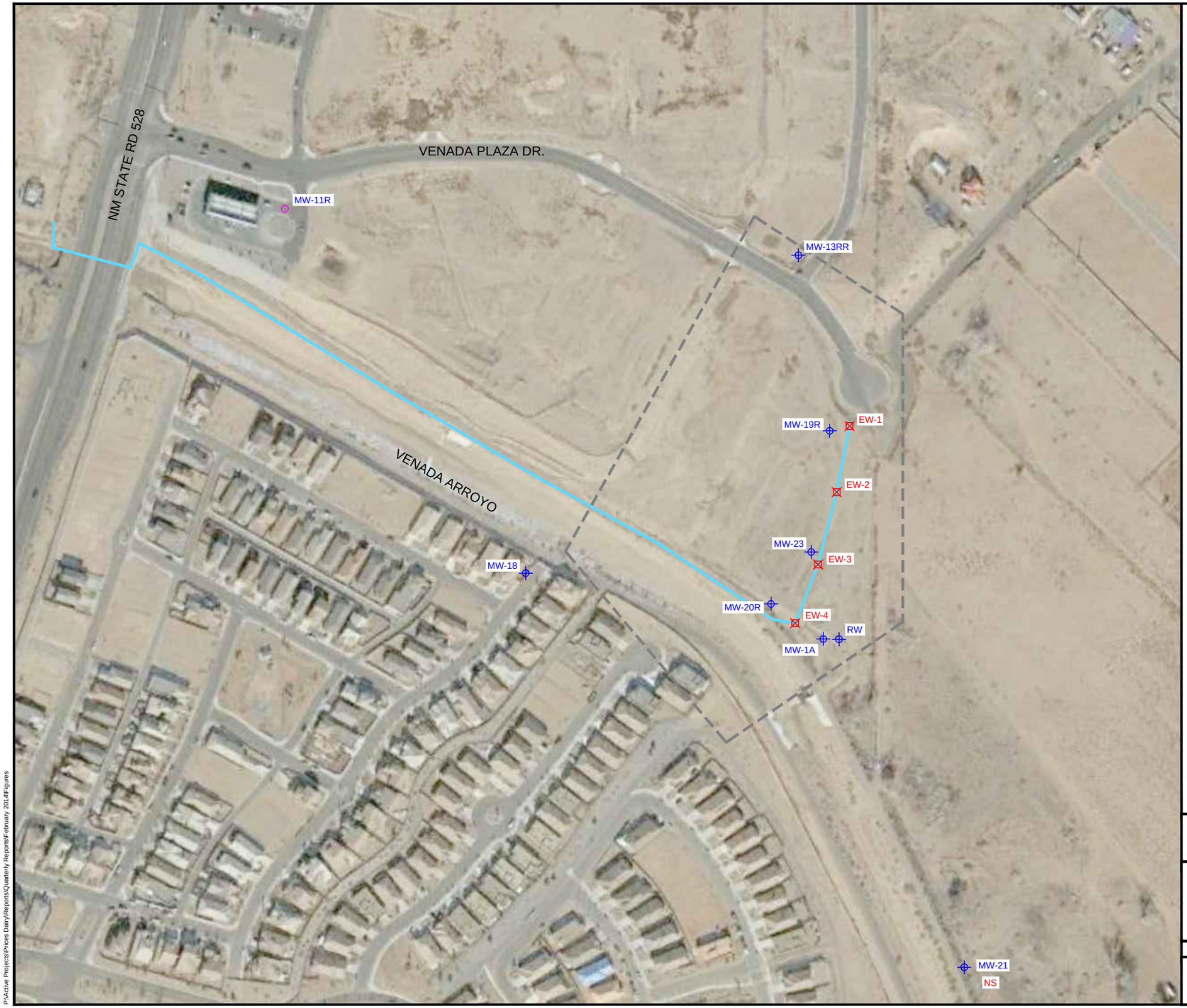
**TABLE 5. CALCULATION OF SYSTEM FLOW RATES**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date and Time | Elapsed Time (HH:MM:SS) | Elapsed Time (min) | Total elapsed Time (min) | Flow Meter Reading (gallons) | Extracted Volume Between Events (gallons) | Total Extracted Volume (gallons) | Average Flow Rate Between Events (gpm) | Average Flow Rate Since Start-up (gpm) | Quarterly Average Flow Rate (gpm) |
|---|---|---|---|---|---|---|---|---|---|---|
| Totalized (Con't.) | 4/10/14 8:32 | 384:20:00 | 23060 | 254880 | 15,311,585 | 417,025 | 3,136,365 | 18.08 | 12.30 | |
| | 3/25/14 8:12 | 92:53:00 | 5573 | 231820 | 14,894,560 | 92,054 | 2,719,340 | 16.52 | 11.72 | |
| | 3/21/14 11:19 | 261:39:00 | 15699 | 226247 | 14,802,506 | 239,058 | 2,627,286 | 15.23 | 11.61 | |
| | 3/10/14 13:40 | 13:40:00 | 820 | 210548 | 14,563,448 | 0 | 2,388,228 | 0.00 | 11.34 | |
| | 3/10/14 0:00 | 246:05:00 | 14765 | 209728 | 2,388,228 | 47,764 | 2,388,228 | 3.23 | 11.38 | |
| | 2/27/14 17:55 | 24:37:00 | 1477 | 194963 | 2,340,464 | 17,698 | 2,340,464 | 11.98 | 12.00 | 11.58 |
| | 2/26/14 17:18 | 338:48:00 | 20328 | 193486 | 2,322,766 | 239,426 | 2,322,766 | 11.78 | 12.00 | |
| | 2/12/14 14:30 | 315:10:00 | 18910 | 173158 | 2,083,340 | 215,556 | 2,083,340 | 11.40 | 12.02 | |
| | 1/30/14 11:20 | 18:49:00 | 1129 | 154248 | 1,867,784 | 6,469 | 1,867,784 | 5.73 | 12.10 | |
| | 1/29/14 16:31 | 23:23:00 | 1403 | 153119 | 1,861,315 | 8,803 | 1,861,315 | 6.27 | 12.15 | |
| | 1/28/14 17:08 | 336:09:00 | 20169 | 151716 | 1,852,512 | 144,787 | 1,852,512 | 7.18 | 12.20 | |
| | 1/14/14 16:59 | 103:22:00 | 6202 | 131547 | 1,707,725 | 75,992 | 1,707,725 | 12.25 | 12.97 | |
| | 1/10/14 9:37 | 40:09:00 | 2409 | 125345 | 1,631,733 | 18,377 | 1,631,733 | 7.63 | 13.01 | |
| | 1/8/14 17:28 | 297:38:00 | 17858 | 122936 | 1,613,356 | 218,935 | 1,613,356 | 12.26 | 13.11 | |
| | 12/27/13 7:50 | 350:44:00 | 21044 | 105078 | 1,394,421 | 271,463 | 1,394,421 | 12.90 | 13.26 | |
| | 12/12/13 17:06 | 408:19:00 | 24499 | 84034 | 1,122,958 | 190,556 | 1,122,958 | 7.78 | 13.35 | |
| | 11/25/13 16:47 | 337:48:00 | 20268 | 59535 | 932,402 | 317,707 | 932,402 | 15.68 | 15.64 | |
| | 11/11/13 14:59 | 142:50:00 | 8570 | 39267 | 614,695 | 135,596 | 614,695 | 15.82 | 15.62 | |
| | 11/5/13 16:09 | 190:24:00 | 11424 | 30697 | 479,099 | 187,191 | 479,099 | 16.39 | 15.56 | 12.97 |
| | 10/28/13 17:45 | 6:29:00 | 389 | 19273 | 291,908 | 6,393 | 291,908 | 16.43 | 15.07 | |
| | 10/28/13 11:16 | 244:03:00 | 14643 | 18884 | 285,515 | 215,481 | 285,515 | 14.72 | 15.04 | |
| | 10/18/13 7:13 | 65:39:00 | 3939 | 4241 | 70,034 | 63,173 | 70,034 | 16.04 | 16.18 | |
| | 10/15/13 13:34 | 4:17:00 | 257 | 302 | 6,861 | 3,920 | 6,861 | 15.25 | 18.03 | |
| | 10/15/13 9:17 | 0:45:00 | 45 | 45 | 2,941 | 1,524 | 2,941 | 33.87 | 33.87 | |
| | 10/15/13 8:32 | --- | --- | --- | 1,417 | 1,417 | 1,417 | --- | --- | |

**TABLE 5. CALCULATION OF SYSTEM FLOW RATES**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date and Time | Elapsed Time (HH:MM:SS) | Elapsed Time (min) | Total elapsed Time (min) | Flow Meter Reading (gallons) | Extracted Volume Between Events (gallons) | Total Extracted Volume (gallons) | Average Flow Rate Between Events (gpm) | Average Flow Rate Since Start-up (gpm) | Quarterly Average Flow Rate (gpm) |
|---|---|---|---|---|---|---|---|---|---|---|
| NOTES:<br>gpm = Gallons per minute<br>HH:MM:SS = Hours: Minutes: Seconds<br>min = minutes<br>Changed flow meter on 3/10/14 | | | | | | | | | | |

# FIGURES




## LEGEND:

- EW-1 — EXTRACTION WELLS
- MW-23 — VALLEY FILL AQUIFER MONITORING WELL
- MW-11R — UPPER SANTA FE AQUIFER MONITORING WELL
- BOUNDARY OF AFFECTED GROUNDWATER
- DISCHARGE LINE

N

200 100 0 200

SCALE IN FEET

IMAGE SOURCE: GOOGLE 01/17/2013

FORMER PRICE'S VALLEY GOLD DAIRY
BERNALILLO, SANDOVAL COUNTY

# FIGURE 1
# SITE LAYOUT

| PROJECT #: | 1506901 | PROJECT PHASE: | 04 | PROJECT MANAGER: | JS |
|---|---|---|---|---|---|

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Albuquerque, NM 87102
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## LEGEND:

- EW-1 — EXTRACTION WELLS
- MW-23 — VALLEY FILL AQUIFER MONITORING WELL
- MW-11R — UPPER SANTA FE AQUIFER MONITORING WELL
- BOUNDARY OF AFFECTED GROUNDWATER
- DISCHARGE LINE
- GROUNDWATER FLOW DIRECTION

**NOTE:**

GROUNDWATER LEVELS IN THE EXTRACTION WELLS EXPERIENCES FREQUENT CHANGES DUE TO THE CYCLING OF THE PUMPS. THEREFORE, THESE ELEVATIONS WERE NOT USED TO FOR CONTOURING.

N

200 100 0 200

SCALE IN FEET

IMAGE SOURCE: GOOGLE 01/17/2013

FORMER PRICE'S VALLEY GOLD DAIRY
BERNALILLO, SANDOVAL COUNTY

# FIGURE 2
# GROUNDWATER ELEVATIONS
# JULY 2015

| PROJECT #: | 1506901 | PROJECT PHASE: | 04 | PROJECT MANAGER: | JS |
|---|---|---|---|---|---|

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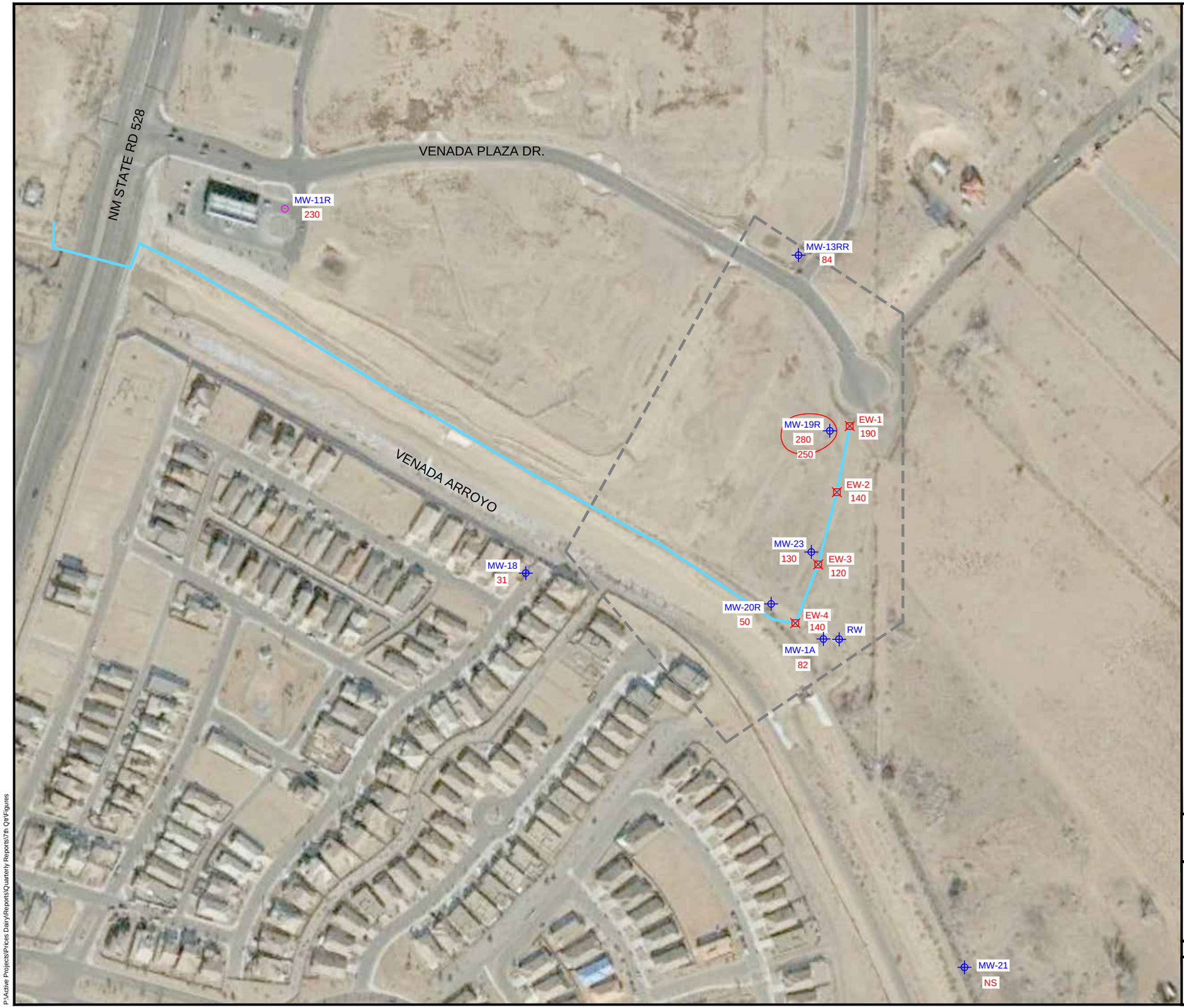


## LEGEND:

| | |
|---|---|
| EW-1 | EXTRACTION WELLS |
| MW-23 | VALLEY FILL AQUIFER MONITORING WELL |
| MW-11R | UPPER SANTA FE AQUIFER MONITORING WELL |
| | BOUNDARY OF AFFECTED GROUNDWATER |
| | DISCHARGE LINE |
| 250 | CHLORIDE CONCENTRATION CONTOUR |
| NS | NOT SAMPLED |

**NOTE:**

VALUES NEXT TO WELLS INDICATE CHLORIDE CONCENTRATIONS IN GROUNDWATER SAMPLES (mg/L).

N

200 100 0 200

SCALE IN FEET

IMAGE SOURCE: GOOGLE 01/17/2013

FORMER PRICE'S VALLEY GOLD DAIRY
BERNALILLO, SANDOVAL COUNTY

# FIGURE 3
# CHLORIDE CONCENTRATIONS IN GROUNDWATER, JULY 2015

| PROJECT #: | 1506901 | PROJECT PHASE: | 04 | PROJECT MANAGER: | JS |
|---|---|---|---|---|---|

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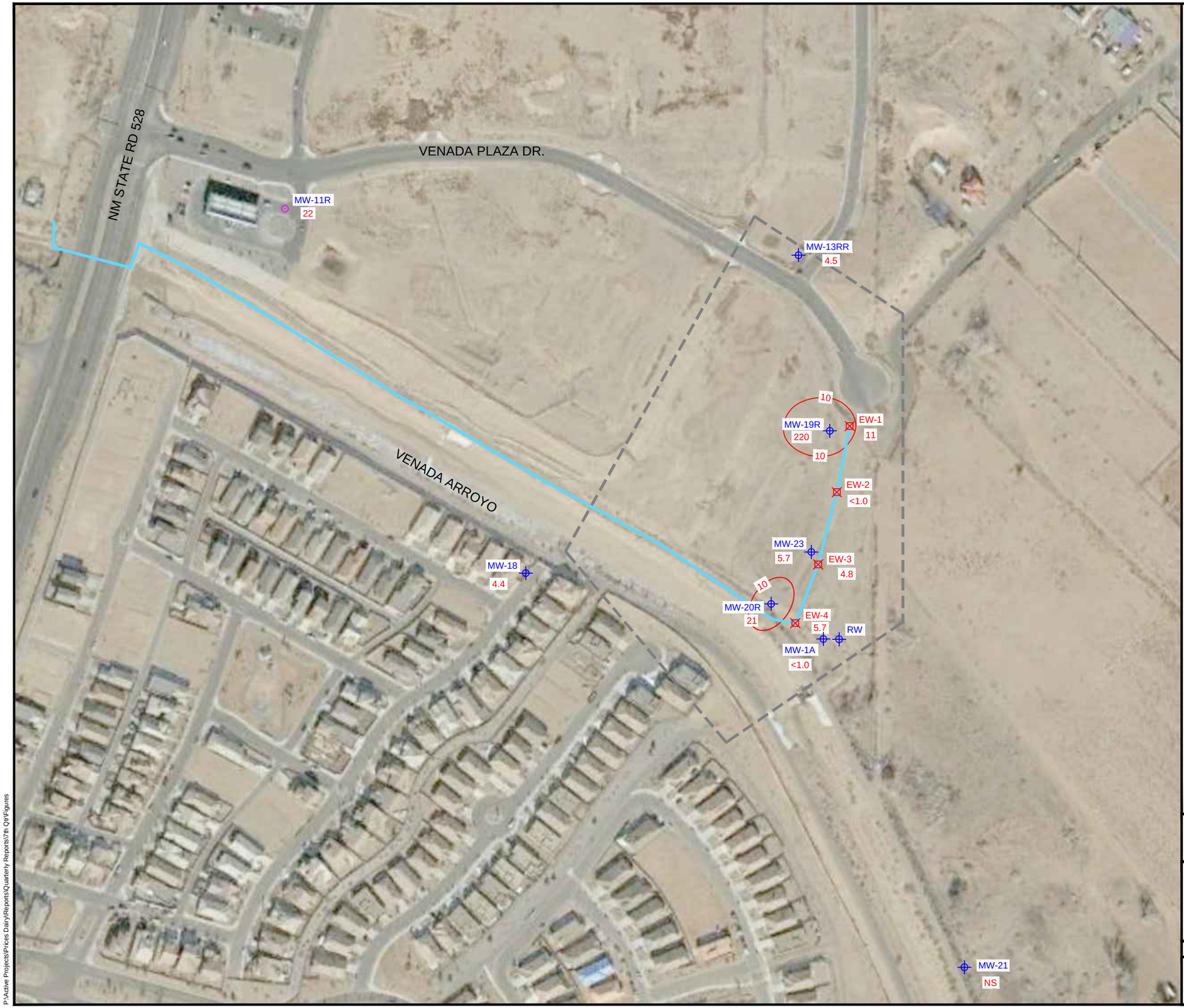


## LEGEND:

| | |
|---|---|
| EW-1 | EXTRACTION WELLS |
| MW-23 | VALLEY FILL AQUIFER MONITORING WELL |
| MW-11R | UPPER SANTA FE AQUIFER MONITORING WELL |
| | BOUNDARY OF AFFECTED GROUNDWATER |
| | DISCHARGE LINE |
| 10 | NITRATE CONCENTRATION CONTOUR MILLIGRAMS PER LITER (mg/L) |
| NS | NOT SAMPLED |

**NOTE:**

VALUES NEXT TO WELLS INDICATE NITRATE CONCENTRATIONS IN GROUNDWATER SAMPLES (mg/L).

N

200 100 0 200

SCALE IN FEET

IMAGE SOURCE: GOOGLE 01/17/2013

FORMER PRICE'S VALLEY GOLD DAIRY
BERNALILLO, SANDOVAL COUNTY

# FIGURE 4
# NITRATE CONCENTRATIONS IN GROUNDWATER, JULY 2015

| PROJECT #: | 1506901 | PROJECT PHASE: | 04 | PROJECT MANAGER: | JS |
|---|---|---|---|---|---|

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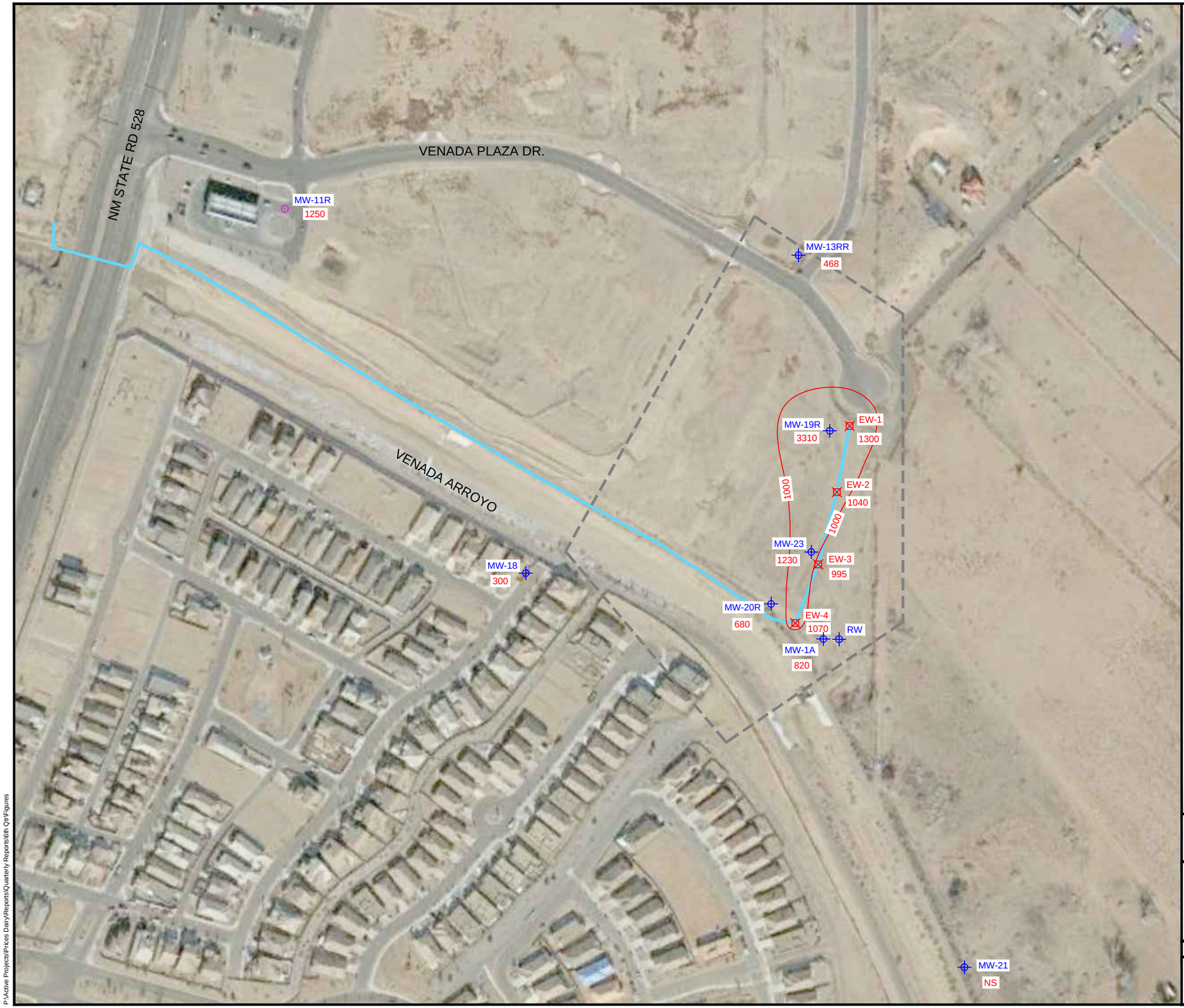


## LEGEND:

| | |
|---|---|
| EW-1 | EXTRACTION WELLS |
| MW-23 | VALLEY FILL AQUIFER MONITORING WELL |
| MW-11R | UPPER SANTA FE AQUIFER MONITORING WELL |
| | BOUNDARY OF AFFECTED GROUNDWATER |
| | DISCHARGE LINE |
| 1000 | TOTAL DISSOLVED SOLIDS CONCENTRATION CONTOUR IN MILLIGRAMS PER LITER (mg/L) |
| NS | NOT SAMPLED |

**NOTE:**

VALUES NEXT TO WELLS INDICATE TOTAL DISSOLVED SOLIDS (TDS) CONCENTRATIONS IN GROUNDWATER SAMPLES (mg/L).

N

200 100 0 200

SCALE IN FEET

IMAGE SOURCE: GOOGLE 01/17/2013

FORMER PRICE'S VALLEY GOLD DAIRY
BERNALILLO, SANDOVAL COUNTY

# FIGURE 5
# TDS IN GROUNDWATER
# JULY 2015

| PROJECT #: | 1506901 | PROJECT PHASE: | 04 | PROJECT MANAGER: | JS |
|---|---|---|---|---|---|

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# APPENDIX A
# FIELD FORMS

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# MONITOR WELL SAMPLING FIELD FORM

## FLUID LEVEL DATA

Well ID: MW-1A
Site: Price's Dairy
Depth to PSH: — Feet
Depth to water: 33.77 Feet
Total depth: 51.70 Feet
NAPL thickness: — Feet

Date gauged: 7/23/15
Time gauged: 0824
Well diameter: 2 Inches
Height of fluid column: 17.93 Feet
Volume in well: 3.0 Gallons

(3 well volumes = 90 gallons)

After Bailing NAPL
Depth to PSH: _____ Feet
Depth to water: _____ Feet
NAPL thickness: _____ Feet
NAPL Recovered: _____ Gallons

## GROUNDWATER SAMPLING DATA

Time/date purged: _____
Purge Method: Hand Bailed

| Time | Purge Volume (gal) | Temp (°C) | SpC (µs/cm) | pH | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|
| 0829 | 0.25 | 19.3 | 1234 | 6.83 | | 0.83 |
| 0838 | 4.5 | 18.7 | 1019 | 7.16 | | |
| 0846 | 8.25 | 18.5 | 1213 | 7.18 | | |
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Actual purge volume: 9.0 gal.
Field measurements stabilized within ± 10%? Yes

Time/date sampled: 0848
Purged/sampled by: T. Cutler

Sample method: Clean bailer
Requested analyses: Nitrate chloride TDS

Comments/observations: _____

**Well Casing Volumes**
2" diameter = 0.17 gal/ft 4" diameter = 0.66 gal/ft 6" diameter = 1.50 gal/ft

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# MONITOR WELL SAMPLING FIELD FORM

## FLUID LEVEL DATA

Well ID: MW-13RR
Site: Price's Dairy
Depth to PSH: — Feet
Depth to water: 53.55 Feet
Total depth: 66.80 Feet
NAPL thickness: — Feet

Date gauged: (7/23/15)
Time gauged: 0904
Well diameter: 2 Inches
Height of fluid column: 13.25 Feet
Volume in well: 2.25 Gallons

(3 well volumes = 6.75 gallons)

After Bailing NAPL
Depth to PSH _____ Feet
Depth to water _____ Feet
NAPL thickness _____ Feet
NAPL Recovered _____ Gallons

## GROUNDWATER SAMPLING DATA

Time/date purged: _____
Purge Method: Hand bailed

| Time | Purge Volume (gal) | Temp (°C) | SpC (µs/cm) | pH | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|
| 0908 | 0.25 | 20.2 | 801 | 7.93 | | 1.04 |
| 0919 | 3.5 | 19.2 | 791 | 7.76 | | |
| 0930 | 6.75 | 19.1 | 792 | 7.77 | | |
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Actual purge volume: 7.0 gal.
Field measurements stabilized within ± 10%? Yes

Time/date sampled: 0932
Purged/sampled by: T. Curley

Sample method: Clean bailer
Requested analyses: Nitrate Chloride TDS
Comments/observations:

**Well Casing Volumes**
2" diameter = 0.17 gal/ft 4" diameter = 0.66 gal/ft 6" diameter = 1.50 gal/ft

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# MONITOR WELL SAMPLING FIELD FORM

## FLUID LEVEL DATA

Well ID: MW-18
Site: Price's Dairy
Date gauged: 7/23/15
Time gauged: 1000

Depth to PSH: — Feet
Depth to water: 39.70 Feet
Total depth: 52.10 Feet
NAPL thickness: — Feet

Well diameter: 2 Inches
Height of fluid column: 12.9 Feet
Volume in well: 2.2 Gallons

(3 well volumes = 6.6 gallons)

After Bailing NAPL
Depth to PSH: _____ Feet
Depth to water: _____ Feet
NAPL thickness: _____ Feet
NAPL Recovered: _____ Gallons

## GROUNDWATER SAMPLING DATA

Time/date purged: _____
Purge Method: Hand bailed

| Time | Purge Volume (gal) | Temp (°C) | SpC (µs/cm) | pH | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|
| 1004 | 0.75 | 19.7 | 433 | 7.84 | | 7.65 |
| 1012 | 3.5 | 18.4 | 464 | 7.80 | | |
| 1020 | 6.5 | 18.3 | 464 | 7.77 | | |
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Actual purge volume: 6.75 gal.
Field measurements stabilized within ± 10%? Yes

Time/date sampled: 1022
Purged/sampled by: T. Curley

Sample method: Clean bailer
Requested analyses: Nitrate Chloride TDS

Comments/observations:

**Well Casing Volumes**
2" diameter = 0.17 gal/ft 4" diameter = 0.66 gal/ft 6" diameter = 1.50 gal/ft

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# MONITOR WELL SAMPLING FIELD FORM

## FLUID LEVEL DATA

Well ID: MW-23
Site: Price's Dairy
Depth to PSH: — Feet
Depth to water: 34.98 Feet
Total depth: 42.55 Feet
NAPL thickness: — Feet

Date gauged: 7/23/15
Time gauged: 1045
Well diameter: 2 Inches
Height of fluid column: 7.57 Feet
Volume in well: 1.28 Gallons

(3 well volumes = 3.84 gallons)

After Bailing NAPL
Depth to PSH: _____ Feet
Depth to water: _____ Feet
NAPL thickness: _____ Feet
NAPL Recovered: _____ Gallons

## GROUNDWATER SAMPLING DATA

Time/date purged: _____
Purge Method: Hand bailed

| Time | Purge Volume (gal) | Temp (°C) | SpC (µs/cm) | pH | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|
| 1051 | 0.25 | ~~7.17~~ 20.7 | 1700 | 7.17 | | 1.07 |
| 1055 | 2.0 | 15.8 | 1722 | 7.16 | | |
| 1100 | 3.75 | 18.5 | 17341 | 7.17 | | |
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Actual purge volume: 4.0 gal.
Field measurements stabilized within ± 10%? No

Time/date sampled: 1102
Purged/sampled by: T. Curley

Sample method: clean bailer
Requested analyses: Nitrate Chloride TDS
Comments/observations:

**Well Casing Volumes**
2" diameter = 0.17 gal/ft 4" diameter = 0.66 gal/ft 6" diameter = 1.50 gal/ft

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# MONITOR WELL SAMPLING FIELD FORM

## FLUID LEVEL DATA

Well ID: MW-11R
Site: Price's Dairy
Date gauged: 7/23/15
Time gauged:
Depth to PSH: — Feet
Well diameter: 2 Inches
Depth to water: 83.95 Feet
Height of fluid column: 7.45 Feet
Total depth: ~~87.50~~ 91.40 Feet
Volume in well: 1.76 Gallons
NAPL thickness: — Feet
(3 well volumes = 3.78 gallons)

After Bailing NAPL
Depth to PSH: _____ Feet
Depth to water: _____ Feet
NAPL thickness: _____ Feet
NAPL Recovered: _____ Gallons

## GROUNDWATER SAMPLING DATA

Time/date purged: _____
Purge Method: Hand bailed

| Time | Purge Volume (gal) | Temp (°C) | SpC (µs/cm) | pH | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|
| 1122 | 0.75 | 20.7 | 1513 | 7.41 | | 6.38 |
| 1135 | 2.0 | 19.5 | 1531 | 7.35 | | |
| 1140 | 3.75 | 18.9 | 1541 | 7.33 | | |
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Actual purge volume: 4.0 gal.
Field measurements stabilized within ± 10%? Yes
Time/date sampled: 1140
Purged/sampled by: T. Curley
Sample method: Clean bailer
Requested analyses: Nitrate chloride TDS
Comments/observations:

**Well Casing Volumes**
2" diameter = 0.17 gal/ft 4" diameter = 0.66 gal/ft 6" diameter = 1.50 gal/ft

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# MONITOR WELL SAMPLING FIELD FORM

## FLUID LEVEL DATA

Well ID: MW-19R
Site: Price's Dairy
Depth to PSH: — Feet
Depth to water: 34.57 Feet
Total depth: 40.40 Feet
NAPL thickness: — Feet

Date gauged: 7/23/15
Time gauged: 1250
Well diameter: 2 Inches
Height of fluid column: 5.83 Feet
Volume in well: 0.99 Gallons

(3 well volumes = 2.97 gallons)

After Bailing NAPL
Depth to PSH: _____ Feet
Depth to water: _____ Feet
NAPL thickness: _____ Feet
NAPL Recovered: _____ Gallons

## GROUNDWATER SAMPLING DATA

Time/date purged: _____
Purge Method: Hand bailed

| Time | Purge Volume (gal) | Temp (°C) | SpC (µs/cm) | pH | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|
| 1255 | 0.25 | 21.0 | 3680 | 6.88 | | 1.31 |
| 1300 | 1.5 | 19.5 | 3810 | 6.90 | | |
| 1303 | 2.75 | 18.7 | 3870 | 6.90 | | |
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Actual purge volume: 3.0 gal.
Field measurements stabilized within ± 10%? No

Time/date sampled: 1305
Purged/sampled by: T. Curley

Sample method: Clean Bailer
Requested analyses: Nitrate Chloride TDS

Comments/observations: _____

**Well Casing Volumes**
2" diameter = 0.17 gal/ft 4" diameter = 0.66 gal/ft 6" diameter = 1.50 gal/ft

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# MONITOR WELL SAMPLING FIELD FORM

## FLUID LEVEL DATA

Well ID: MW-20R
Site: Price's Dairy
Date gauged: 7/23/15
Time gauged: 1326
Depth to PSH: — Feet
Well diameter: 2 Inches
Depth to water: 33.73 Feet
Height of fluid column: 6.92 Feet
Total depth: 40.65 Feet
Volume in well: 1.17 Gallons
NAPL thickness: — Feet
(3 well volumes = 3.51 gallons)

After Bailing NAPL
Depth to PSH: _____ Feet
Depth to water: _____ Feet
NAPL thickness: _____ Feet
NAPL Recovered: _____ Gallons

## GROUNDWATER SAMPLING DATA

Time/date purged: _____
Purge Method: Hand Bailed

| Time | Purge Volume (gal) | Temp (°C) | SpC (µs/cm) | pH | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|
| 1330 | 0.25 | 20.9 | 1753 | 7.34 | | 0.94 |
| 1335 | ~~0.75~~ 2.0 | 20.0 | 1076 | 7.28 | | |
| 1339 | 3.50 | 19.0 | 1079 | 7.28 | | |
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Actual purge volume: 3.75 gal.
Field measurements stabilized within ± 10%? ~~Yes~~ No
Time/date sampled: ~~Test~~ 1341
Purged/sampled by: T. Curley
Sample method: Clean bailer
Requested analyses: Nitrate Chloride TDS
Comments/observations:

**Well Casing Volumes**
2" diameter = 0.17 gal/ft 4" diameter = 0.66 gal/ft 6" diameter = 1.50 gal/ft

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# MONITOR WELL SAMPLING FIELD FORM

## FLUID LEVEL DATA

Well ID: EW-1
Site: Arces Dairy
Depth to PSH: — Feet
Depth to water: 38.50 Feet
Total depth: _____ Feet
NAPL thickness: — Feet

Date gauged: 7/23/15
Time gauged: 1436
Well diameter: ⊘ Inches
Height of fluid column: _____ Feet
Volume in well: _____ Gallons

(3 well volumes = _____ gallons)

After Bailing NAPL
Depth to PSH: _____ Feet
Depth to water: _____ Feet
NAPL thickness: _____ Feet
NAPL Recovered: _____ Gallons

## GROUNDWATER SAMPLING DATA

Time/date purged: _____
Purge Method: Pump

| Time | Purge Volume (gal) | Temp (°C) | SpC (µs/cm) | pH | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|
| 1436 | | 21.9 | 826 | 7.34 | | 2.02 |
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Actual purge volume _____ gal.
Field measurements stabilized within ± 10%? _____

Time/date sampled: 1438
Purged/sampled by: T. Curley

Sample method: Sample tap
Requested analyses: Nitrate Chloride TDS

Comments/observations: _____

**Well Casing Volumes**
2" diameter = 0.17 gal/ft 4" diameter = 0.66 gal/ft 6" diameter = 1.50 gal/ft

**EA Engineering, Science, and Technology**
320 Gold Avenue SW, Suite 1210
Albuquerque, NM 87102
Phone: (505) 224-9013

# MONITOR WELL SAMPLING FIELD FORM

## FLUID LEVEL DATA

Well ID: EW-2
Site: Price's Dairy
Date gauged: 7/23/15
Time gauged: 1416

Depth to PSH: _____ Feet
Depth to water: 37.85 Feet
Total depth: _____ Feet
NAPL thickness: _____ Feet

Well diameter: _____ Inches
Height of fluid column: _____ Feet
Volume in well: _____ Gallons

(3 well volumes = _____ gallons)

After Bailing NAPL
Depth to PSH: _____ Feet
Depth to water: _____ Feet
NAPL thickness: _____ Feet
NAPL Recovered: _____ Gallons

## GROUNDWATER SAMPLING DATA

Time/date purged: _____
Purge Method: Pump

| Time | Purge Volume (gal) | Temp (°C) | SpC (µs/cm) | pH | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|
| 1417 | | 21.5 | 1457 | 7.51 | | |
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Actual purge volume _____ gal.
Field measurements stabilized within ± 10%? _____

Time/date sampled: 1419
Purged/sampled by: T. Curley

Sample method: Tap
Requested analyses: Nitrate Chloride TDS

Comments/observations: _____

**Well Casing Volumes**
2" diameter = 0.17 gal/ft 4" diameter = 0.66 gal/ft 6" diameter = 1.50 gal/ft

EA Engineering, Science, and Technology
320 Gold Avenue SW, Suite 1210
Albuquerque, NM 87102
Phone: (505) 224-9013

# MONITOR WELL SAMPLING FIELD FORM

## FLUID LEVEL DATA

Well ID: EW-3
Site: Price's Dairy
Date gauged: 7/23/15
Time gauged: 1354

Depth to PSH: _____ Feet
Depth to water: _____ Feet
Total depth: _____ Feet
NAPL thickness: _____ Feet

Well diameter: _____ Inches
Height of fluid column: _____ Feet
Volume in well: _____ Gallons

(3 well volumes = _____ gallons)

After Bailing NAPL
Depth to PSH: _____ Feet
Depth to water: _____ Feet
NAPL thickness: _____ Feet
NAPL Recovered: _____ Gallons

## GROUNDWATER SAMPLING DATA

Time/date purged: _____
Purge Method: Pump

| Time | Purge Volume (gal) | Temp (°C) | SpC (µs/cm) | pH | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|
| 0745 | 5,183510 | Turn on pump | | | | |
| 1357 | 5,190307 | | | | | |
| 1358 | | 20.9 | 1466 | 7.38 | | 1.50 |
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Actual purge volume _____ gal.
Field measurements stabilized within ± 10%? _____

Time/date sampled: 1402
Purged/sampled by: T. Curley

Sample method: Sample tap
Requested analyses: Nitrate Chloride TDS

Comments/observations: _____

**Well Casing Volumes**
2" diameter = 0.17 gal/ft 4" diameter = 0.66 gal/ft 6" diameter = 1.50 gal/ft

EA Engineering, Science, and Technology
320 Gold Avenue SW, Suite 1210
Albuquerque, NM 87102
Phone: (505) 224-9013

# MONITOR WELL SAMPLING FIELD FORM

## FLUID LEVEL DATA

Well ID: EW-4
Site: Price's Dairy
Date gauged: 7/23/15
Time gauged: 1446

Depth to PSH: — Feet
Depth to water: 32.70 Feet
Total depth: _____ Feet
NAPL thickness: — Feet

Well diameter: _____ Inches
Height of fluid column: _____ Feet
Volume in well: _____ Gallons

(3 well volumes = _____ gallons)

After Bailing NAPL
Depth to PSH: _____ Feet
Depth to water: _____ Feet
NAPL thickness: _____ Feet
NAPL Recovered: _____ Gallons

## GROUNDWATER SAMPLING DATA

Time/date purged: _____
Purge Method: Pump

| Time | Purge Volume (gal) | Temp (°C) | SpC (µs/cm) | pH | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|
| 1450 | | 22.5 | 1594 | 7.51 | | |
| | | | | | | |
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Actual purge volume _____ gal.
Field measurements stabilized within ± 10%? _____

Time/date sampled: 1452
Purged/sampled by: T. Cosley

Sample method: Sample Tap
Requested analyses: Nitrate chloride TDS
Comments/observations: Pump was not on. Turned pump on for ~ 50 min then sampled.

**Well Casing Volumes**
2" diameter = 0.17 gal/ft 4" diameter = 0.66 gal/ft 6" diameter = 1.50 gal/ft

| FORMER PRICE'S VALLEY GOLD DAIRY | | | | |
|---|---|---|---|---|
| Date & Time: 7/23/15 | | Personnel: T. Curley | | |
| Electric Meter Reading: 7391 | | | | |
| Well ID: | Meter Reading (gal) | DTW (ft.) | Nitrate (ppm) | Notes: |
| EW-1: | 1,096,265 | 38.50 | 10 | |
| EW-2 | 6,883,225 | 37.85 | 0-5 | |
| EW-3 | 5190307 | 36.90 | 0-5 | |
| EW-4 | 2,117,304 | 32.70 | 0-5 | |
| Visual Inspection of Outfall: | | | | |

EW-4 was not operating properly. Turned well flowmeter off after sampling & turned on EW-3.

# Chain-of-Custody Record

Client: EA Engineering

Mailing Address: 320 Gold Ave Ste 1010
ABQ NM 87102

Phone #: 505-344-9013

email or Fax#: tcurley@eaest.com

QA/QC Package:
☑ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☑ Standard ☐ **Rush** _____

Project Name: Acres Dairy

Project #: 1505701

Project Manager: Jay Snyder

Sampler: Tyler Curley

On Ice: ☑ Yes ☐ No

Sample Temperature: 3.1


**HALL ENVIRONMENTAL ANALYSIS LABORATORY**

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107


**Analysis Request**

| Date | Time | Matrix | Sample Request ID | Container Type and # | Preservative Type | HEAL No. | BTEX + MTBE + TMB's (8021) | BTEX + MTBE + TPH (Gas only) | TPH 8015B (GRO / DRO / MRO) | TPH (Method 418.1) | EDB (Method 504.1) | PAH's (8310 or 8270 SIMS) | RCRA 8 Metals | Anions ($F,Cl,NO_3,NO_2,PO_4,SO_4$) | 8081 Pesticides / 8082 PCB's | 8260B (VOA) | 8270 (Semi-VOA) | Methane/Ethane/TDS | | | | Air Bubbles (Y or N) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7/25/15 | 0815 | Aq | MW-1A | 3x Poly | $NaOH/H_2SO_4$ | | | | | | | | | | | | | X | | | | |
| | 1112 | | MW-11R | | | | | | | | | | | | | | | X | | | | |
| | 0932 | | MW-13RR | | | | | | | | | | | | | | | X | | | | |
| | 1022 | | MW-18 | | | | | | | | | | | | | | | X | | | | |
| | 1305 | | MW-19R | | | | | | | | | | | | | | | X | | | | |
| | 1341 | | MW-20R | | | | | | | | | | | | | | | X | | | | |
| | 1102 | | MW-23 | | | | | | | | | | | | | | | X | | | | |
| | 1438 | | EW-1 | | | | | | | | | | | | | | | X | | | | |
| | 1419 | | EW-2 | | | | | | | | | | | | | | | X | | | | |
| | 1402 | | EW-3 | | | | | | | | | | | | | | | X | | | | |
| | 1452 | | EW-4 | ↓ | ↓ | | | | | | | | | | | | | X | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |

| Date: | Time: | Relinquished by: | Received by: | Date | Time |
|---|---|---|---|---|---|
| 7/25/15 | 1951 | | | | |
| Date: | Time: | Relinquished by: | Received by: | Date | Time |
| | | | | | |

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

| FORMER PRICE'S VALLEY GOLD DAIRY | | | | |
|---|---|---|---|---|
| Date & Time: 5/28/15 | | Personnel: T. Curley | | |
| Electric Meter Reading: 68509 | | | | |
| Well ID: | Meter Reading (gal) | DTW (ft.) | Nitrate (ppm) | Notes: |
| EW-1: | 856,802 | — | 10 | @12:26 |
| EW-2 | 6,376,551 | — | 0-5 | @ 12:31 |
| EW-3 | off | | | |
| EW-4 | 1,850,263 | — | 0 | @12:40 |
| Visual Inspection of Outfall: | | | | |

| FORMER PRICE'S VALLEY GOLD DAIRY | | | | |
|---|---|---|---|---|
| Date & Time: 6/12/15 | | Personnel: T. Curtis | | |
| Electric Meter Reading: 697779 | | | | |
| Well ID: | Meter Reading (gal) | DTW (ft.) | Nitrate (ppm) | Notes: |
| EW-1: | 909,752 | — | 10 | @1640 |
| EW-2 | 6,517,850 | — | 0-5 | @1649 |
| EW-3 | off | — | NA | |
| EW-4 | 1,983,510 | — | 0 | @1654 |
| Visual Inspection of Outfall: | No visible leaks | | | |

| FORMER PRICE'S VALLEY GOLD DAIRY | | | | |
|---|---|---|---|---|
| Date & Time: 6/24/15 | | Personnel: T. Curtay | | |
| Electric Meter Reading: | | | | |
| Well ID: | Meter Reading (gal) | DTW (ft.) | Nitrate (ppm) | Notes: |
| EW-1: | 957923 | — | 10 | 7:45 |
| EW-2 | 6,623,402 | | 0 | 7:53 |
| EW-3 | off | | | |
| EW-4 | 2,024,187 | | 0 | 8:03 |
| Visual Inspection of Outfall: | | | | |

| FORMER PRICE'S VALLEY GOLD DAIRY | | | | |
|---|---|---|---|---|
| Date & Time: 7/10/15 | | Personnel: T. Curley | | |
| Electric Meter Reading: | | | | |
| Well ID: | Meter Reading (gal) | DTW (ft.) | Nitrate (ppm) | Notes: |
| EW-1: | 1034630 | — | 10 | |
| EW-2 | 6,769,068 | — | 0 | |
| EW-3 | off | | | |
| EW-4 | 2,052,981 | — | 0 | |
| Visual Inspection of Outfall: | No visible leaks | | | |

EW-4 flowmeter was clogged, disassembled & cleaned flowmeter.

# APPENDIX B
# ANALYTICAL LABORATORY RESULTS

HALL ENVIRONMENTAL ANALYSIS LABORATORY

*Hall Environmental Analysis Laboratory*
*4901 Hawkins NE*
*Albuquerque, NM 87109*
*TEL: 505-345-3975 FAX: 505-345-4107*
*Website: www.hallenvironmental.com*

July 29, 2015

Jay Snyder
EA Engineering
320 Gold Ave SW Suite 1210
Albuquerque, NM 87102
TEL:
FAX

RE: Prices Dairy OrderNo.: 1507B19

Dear Jay Snyder:

Hall Environmental Analysis Laboratory received 11 sample(s) on 7/23/2015 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

**Analytical Report**
Lab Order **1507B19**
Date Reported: **7/29/2015**

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** EA Engineering
**Client Sample ID:** MW-1A
**Project:** Prices Dairy
**Collection Date:** 7/23/2015 8:48:00 AM
**Lab ID:** 1507B19-001
**Matrix:** AQUEOUS
**Received Date:** 7/23/2015 3:51:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 82 | 5.0 | | mg/L | 10 | 7/23/2015 7:05:26 PM | R27725 |
| Nitrogen, Nitrate (As N) | ND | 1.0 | | mg/L | 10 | 7/23/2015 7:05:26 PM | R27725 |
| **SM2540C MOD: TOTAL DISSOLVED SOLIDS** | | | | | | Analyst: **KS** | |
| Total Dissolved Solids | 820 | 40.0 | * | mg/L | 1 | 7/27/2015 11:49:00 AM | 20433 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** EA Engineering
**Client Sample ID:** MW-11R
**Project:** Prices Dairy
**Collection Date:** 7/23/2015 11:42:00 AM
**Lab ID:** 1507B19-002
**Matrix:** AQUEOUS
**Received Date:** 7/23/2015 3:51:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 230 | 50 | | mg/L | 100 | 7/23/2015 8:07:29 PM | R27725 |
| Nitrogen, Nitrate (As N) | 22 | 1.0 | * | mg/L | 10 | 7/23/2015 7:55:04 PM | R27725 |
| **SM2540C MOD: TOTAL DISSOLVED SOLIDS** | | | | | | Analyst: **KS** | |
| Total Dissolved Solids | 1250 | 200 | * | mg/L | 1 | 7/27/2015 11:49:00 AM | 20433 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** EA Engineering
**Client Sample ID:** MW-13RR
**Project:** Prices Dairy
**Collection Date:** 7/23/2015 9:32:00 AM
**Lab ID:** 1507B19-003
**Matrix:** AQUEOUS
**Received Date:** 7/23/2015 3:51:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 84 | 5.0 | | mg/L | 10 | 7/23/2015 8:19:53 PM | R27725 |
| Nitrogen, Nitrate (As N) | 4.5 | 1.0 | | mg/L | 10 | 7/23/2015 8:19:53 PM | R27725 |
| **SM2540C MOD: TOTAL DISSOLVED SOLIDS** | | | | | | Analyst: **KS** | |
| Total Dissolved Solids | 468 | 40.0 | | mg/L | 1 | 7/27/2015 11:49:00 AM | 20433 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** EA Engineering
**Client Sample ID:** MW-18
**Project:** Prices Dairy
**Collection Date:** 7/23/2015 10:22:00 AM
**Lab ID:** 1507B19-004
**Matrix:** AQUEOUS
**Received Date:** 7/23/2015 3:51:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 31 | 5.0 | | mg/L | 10 | 7/23/2015 8:44:43 PM | R27725 |
| Nitrogen, Nitrate (As N) | 4.4 | 1.0 | | mg/L | 10 | 7/23/2015 8:44:43 PM | R27725 |
| **SM2540C MOD: TOTAL DISSOLVED SOLIDS** | | | | | | Analyst: **KS** | |
| Total Dissolved Solids | 300 | 40.0 | | mg/L | 1 | 7/27/2015 11:49:00 AM | 20433 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** EA Engineering
**Client Sample ID:** MW-19R
**Project:** Prices Dairy
**Collection Date:** 7/23/2015 1:05:00 PM
**Lab ID:** 1507B19-005
**Matrix:** AQUEOUS
**Received Date:** 7/23/2015 3:51:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 280 | 50 | * | mg/L | 100 | 7/23/2015 9:46:45 PM | R27725 |
| Nitrogen, Nitrate (As N) | 220 | 10 | * | mg/L | 100 | 7/23/2015 9:46:45 PM | R27725 |
| **SM2540C MOD: TOTAL DISSOLVED SOLIDS** | | | | | | Analyst: **KS** | |
| Total Dissolved Solids | 3310 | 200 | * | mg/L | 1 | 7/27/2015 11:49:00 AM | 20433 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** EA Engineering
**Client Sample ID:** MW-20R
**Project:** Prices Dairy
**Collection Date:** 7/23/2015 1:41:00 PM
**Lab ID:** 1507B19-006
**Matrix:** AQUEOUS
**Received Date:** 7/23/2015 3:51:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 50 | 5.0 | | mg/L | 10 | 7/23/2015 9:59:10 PM | R27725 |
| Nitrogen, Nitrate (As N) | 21 | 1.0 | * | mg/L | 10 | 7/23/2015 9:59:10 PM | R27725 |
| **SM2540C MOD: TOTAL DISSOLVED SOLIDS** | | | | | | Analyst: **KS** | |
| Total Dissolved Solids | 680 | 200 | * | mg/L | 1 | 7/27/2015 11:49:00 AM | 20433 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** EA Engineering
**Client Sample ID:** MW-23
**Project:** Prices Dairy
**Collection Date:** 7/23/2015 11:02:00 AM
**Lab ID:** 1507B19-007
**Matrix:** AQUEOUS
**Received Date:** 7/23/2015 3:51:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 130 | 5.0 | | mg/L | 10 | 7/23/2015 10:23:59 PM | R27725 |
| Nitrogen, Nitrate (As N) | 5.7 | 1.0 | | mg/L | 10 | 7/23/2015 10:23:59 PM | R27725 |
| **SM2540C MOD: TOTAL DISSOLVED SOLIDS** | | | | | | Analyst: **KS** | |
| Total Dissolved Solids | 1230 | 200 | * | mg/L | 1 | 7/27/2015 11:49:00 AM | 20433 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** EA Engineering
**Client Sample ID:** EW-1
**Project:** Prices Dairy
**Collection Date:** 7/23/2015 2:38:00 PM
**Lab ID:** 1507B19-008
**Matrix:** AQUEOUS
**Received Date:** 7/23/2015 3:51:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 190 | 5.0 | | mg/L | 10 | 7/23/2015 10:48:48 PM | R27725 |
| Nitrogen, Nitrate (As N) | 11 | 1.0 | * | mg/L | 10 | 7/23/2015 10:48:48 PM | R27725 |
| **SM2540C MOD: TOTAL DISSOLVED SOLIDS** | | | | | | Analyst: **KS** | |
| Total Dissolved Solids | 1300 | 20.0 | * | mg/L | 1 | 7/27/2015 11:49:00 AM | 20433 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** EA Engineering
**Client Sample ID:** EW-2
**Project:** Prices Dairy
**Collection Date:** 7/23/2015 2:19:00 PM
**Lab ID:** 1507B19-009
**Matrix:** AQUEOUS
**Received Date:** 7/23/2015 3:51:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 140 | 5.0 | | mg/L | 10 | 7/23/2015 11:13:37 PM | R27725 |
| Nitrogen, Nitrate (As N) | ND | 1.0 | | mg/L | 10 | 7/23/2015 11:13:37 PM | R27725 |
| **SM2540C MOD: TOTAL DISSOLVED SOLIDS** | | | | | | Analyst: **KS** | |
| Total Dissolved Solids | 1040 | 20.0 | * | mg/L | 1 | 7/27/2015 11:49:00 AM | 20433 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** EA Engineering
**Client Sample ID:** EW-3
**Project:** Prices Dairy
**Collection Date:** 7/23/2015 2:02:00 PM
**Lab ID:** 1507B19-010
**Matrix:** AQUEOUS
**Received Date:** 7/23/2015 3:51:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 120 | 5.0 | | mg/L | 10 | 7/24/2015 12:03:15 AM | R27725 |
| Nitrogen, Nitrate (As N) | 4.8 | 1.0 | | mg/L | 10 | 7/24/2015 12:03:15 AM | R27725 |
| **SM2540C MOD: TOTAL DISSOLVED SOLIDS** | | | | | | Analyst: **KS** | |
| Total Dissolved Solids | 995 | 20.0 | * | mg/L | 1 | 7/27/2015 11:49:00 AM | 20433 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** EA Engineering
**Client Sample ID:** EW-4
**Project:** Prices Dairy
**Collection Date:** 7/23/2015 2:52:00 PM
**Lab ID:** 1507B19-011
**Matrix:** AQUEOUS
**Received Date:** 7/23/2015 3:51:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 140 | 5.0 | | mg/L | 10 | 7/24/2015 12:28:04 AM | R27725 |
| Nitrogen, Nitrate (As N) | 5.7 | 1.0 | | mg/L | 10 | 7/24/2015 12:28:04 AM | R27725 |
| **SM2540C MOD: TOTAL DISSOLVED SOLIDS** | | | | | | Analyst: **KS** | |
| Total Dissolved Solids | 1070 | 20.0 | * | mg/L | 1 | 7/27/2015 11:49:00 AM | 20433 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1507B19**

***29-Jul-15***

**Client:** EA Engineering

**Project:** Prices Dairy

| Sample ID **MB** | SampType: **MBLK** | TestCode: **EPA Method 300.0: Anions** |
|---|---|---|
| Client ID: **PBW** | Batch ID: **R27725** | RunNo: **27725** |
| Prep Date: | Analysis Date: **7/23/2015** | SeqNo: **833510** Units: **mg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | ND | 0.50 | | | | | | | | |
| Nitrogen, Nitrate (As N) | ND | 0.10 | | | | | | | | |

| Sample ID **LCS** | SampType: **LCS** | TestCode: **EPA Method 300.0: Anions** |
|---|---|---|
| Client ID: **LCSW** | Batch ID: **R27725** | RunNo: **27725** |
| Prep Date: | Analysis Date: **7/23/2015** | SeqNo: **833511** Units: **mg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.6 | 0.50 | 5.000 | 0 | 91.3 | 90 | 110 | | | |
| Nitrogen, Nitrate (As N) | 2.3 | 0.10 | 2.500 | 0 | 93.0 | 90 | 110 | | | |

| Sample ID **1507B19-001AMS** | SampType: **MS** | TestCode: **EPA Method 300.0: Anions** |
|---|---|---|
| Client ID: **MW-1A** | Batch ID: **R27725** | RunNo: **27725** |
| Prep Date: | Analysis Date: **7/23/2015** | SeqNo: **833523** Units: **mg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 130 | 5.0 | 50.00 | 82.45 | 97.8 | 81.2 | 116 | | | |
| Nitrogen, Nitrate (As N) | 23 | 1.0 | 25.00 | 0 | 91.3 | 87.3 | 111 | | | |

| Sample ID **1507B19-001AMSD** | SampType: **MSD** | TestCode: **EPA Method 300.0: Anions** |
|---|---|---|
| Client ID: **MW-1A** | Batch ID: **R27725** | RunNo: **27725** |
| Prep Date: | Analysis Date: **7/23/2015** | SeqNo: **833524** Units: **mg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 130 | 5.0 | 50.00 | 82.45 | 99.7 | 81.2 | 116 | 0.697 | 20 | |
| Nitrogen, Nitrate (As N) | 23 | 1.0 | 25.00 | 0 | 92.6 | 87.3 | 111 | 1.34 | 20 | |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1507B19**

***29-Jul-15***

**Client:** EA Engineering

**Project:** Prices Dairy

| Sample ID | **MB-20433** | SampType: | **MBLK** | | TestCode: | **SM2540C MOD: Total Dissolved Solids** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: | **PBW** | Batch ID: | **20433** | | RunNo: | **27770** | | | | |
| Prep Date: | **7/24/2015** | Analysis Date: | **7/27/2015** | | SeqNo: | **834805** | Units: | **mg/L** | | |
| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
| Total Dissolved Solids | ND | 20.0 | | | | | | | | |

| Sample ID | **LCS-20433** | SampType: | **LCS** | | TestCode: | **SM2540C MOD: Total Dissolved Solids** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: | **LCSW** | Batch ID: | **20433** | | RunNo: | **27770** | | | | |
| Prep Date: | **7/24/2015** | Analysis Date: | **7/27/2015** | | SeqNo: | **834806** | Units: | **mg/L** | | |
| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
| Total Dissolved Solids | 1040 | 20.0 | 1000 | 0 | 104 | 80 | 120 | | | |

| Sample ID | **1507B19-004AMS** | SampType: | **MS** | | TestCode: | **SM2540C MOD: Total Dissolved Solids** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: | **MW-18** | Batch ID: | **20433** | | RunNo: | **27770** | | | | |
| Prep Date: | **7/24/2015** | Analysis Date: | **7/27/2015** | | SeqNo: | **834816** | Units: | **mg/L** | | |
| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
| Total Dissolved Solids | 2380 | 40.0 | 2000 | 300.0 | 104 | 80 | 120 | | | |

| Sample ID | **1507B19-004AMSD** | SampType: | **MSD** | | TestCode: | **SM2540C MOD: Total Dissolved Solids** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: | **MW-18** | Batch ID: | **20433** | | RunNo: | **27770** | | | | |
| Prep Date: | **7/24/2015** | Analysis Date: | **7/27/2015** | | SeqNo: | **834817** | Units: | **mg/L** | | |
| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
| Total Dissolved Solids | 2390 | 40.0 | 2000 | 300.0 | 105 | 80 | 120 | 0.419 | 5 | |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

HALL ENVIRONMENTAL ANALYSIS LABORATORY

*Hall Environmental Analysis Laboratory*
*4901 Hawkins NE*
*Albuquerque, NM 87109*
*TEL: 505-345-3975 FAX: 505-345-4107*
*Website: www.hallenvironmental.com*

# Sample Log-In Check List

Client Name: **EA Engineering Alb** Work Order Number: **1507B19** RcptNo: 1

Received by/date: 07/23/15

Logged By: **Ashley Gallegos** **7/23/2015 3:51:00 PM**

Completed By: **Ashley Gallegos** **7/23/2015 4:04:30 PM**

Reviewed By: 07/23/15

## Chain of Custody

| | | | |
|---|---|---|---|
| 1. Custody seals intact on sample bottles? | Yes ☐ | No ☐ | Not Present ☑ |
| 2. Is Chain of Custody complete? | Yes ☑ | No ☐ | Not Present ☐ |
| 3. How was the sample delivered? | Client | | |

## Log In

| | | | |
|---|---|---|---|
| 4. Was an attempt made to cool the samples? | Yes ☑ | No ☐ | NA ☐ |
| 5. Were all samples received at a temperature of >0° C to 6.0°C | Yes ☑ | No ☐ | NA ☐ |
| 6. Sample(s) in proper container(s)? | Yes ☑ | No ☐ | |
| 7. Sufficient sample volume for indicated test(s)? | Yes ☑ | No ☐ | |
| 8. Are samples (except VOA and ONG) properly preserved? | Yes ☑ | No ☐ | |
| 9. Was preservative added to bottles? | Yes ☐ | No ☑ | NA ☐ |
| 10. VOA vials have zero headspace? | Yes ☐ | No ☐ | No VOA Vials ☑ |
| 11. Were any sample containers received broken? | Yes ☐ | No ☑ | |
| 12. Does paperwork match bottle labels? (Note discrepancies on chain of custody) | Yes ☑ | No ☐ | # of preserved bottles checked for pH: 11 (<2 or >12 unless noted) |
| 13. Are matrices correctly identified on Chain of Custody? | Yes ☑ | No ☐ | Adjusted? NO |
| 14. Is it clear what analyses were requested? | Yes ☑ | No ☐ | |
| 15. Were all holding times able to be met? (If no, notify customer for authorization.) | Yes ☑ | No ☐ | Checked by: CS |

## Special Handling (if applicable)

| | | | |
|---|---|---|---|
| 16. Was client notified of all discrepancies with this order? | Yes ☐ | No ☐ | NA ☑ |

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. **Cooler Information**

| Cooler No | Temp °C | Condition | Seal Intact | Seal No | Seal Date | Signed By |
|---|---|---|---|---|---|---|
| 1 | 3.6 | Good | Not Present | | | |

# Chain-of-Custody Record

Client: EA Engineering

Mailing Address: 320 Gold Ave Ste 410
ABQ NM 87102

Phone #: 505-224-9013

email or Fax#: tcurley@eaest.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☒ Standard ☐ Rush _____

Project Name: Price's Dairy

Project #: 1505701

Project Manager: Jay Snyder

Sampler: Tyler Curley

On Ice: ☒ Yes ☐ No

Sample Temperature: 3.6

**HALL ENVIRONMENTAL ANALYSIS LABORATORY**

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

**Analysis Request**

| Date | Time | Matrix | Sample Request ID | Container Type and # | Preservative Type | HEAL No. 1507B19 | BTEX + MTBE + TMB's (8021) | BTEX + MTBE + TPH (Gas only) | TPH 8015B (GRO / DRO / MRO) | TPH (Method 418.1) | EDB (Method 504.1) | PAH's (8310 or 8270 SIMS) | RCRA 8 Metals | Anions ($F,Cl,NO_3,NO_2,PO_4,SO_4$) | 8081 Pesticides / 8082 PCB's | 8260B (VOA) | 8270 (Semi-VOA) | Nitrate/Chloride/TDS | | | | Air Bubbles (Y or N) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7/23/15 | 0848 | Aq | MW-1A | 2xPoly | None/$H_2SO_4$ | -001 | | | | | | | | | | | | X | | | | |
| | 1142 | | MW-11R | | | -002 | | | | | | | | | | | | X | | | | |
| | 0932 | | MW-13RR | | | -003 | | | | | | | | | | | | X | | | | |
| | 1022 | | MW-18 | | | -004 | | | | | | | | | | | | X | | | | |
| | 1305 | | MW-19R | | | -005 | | | | | | | | | | | | X | | | | |
| | 1341 | | MW-20R | | | -006 | | | | | | | | | | | | X | | | | |
| | 1102 | | MW-23 | | | -007 | | | | | | | | | | | | X | | | | |
| | 1438 | | EW-1 | | | -008 | | | | | | | | | | | | X | | | | |
| | 1419 | | EW-2 | | | -009 | | | | | | | | | | | | X | | | | |
| | 1402 | | EW-3 | | | -010 | | | | | | | | | | | | X | | | | |
| | 1452 | | EW-4 | ↓ | ↓ | -011 | | | | | | | | | | | | X | | | | |

| Date: | Time: | Relinquished by: | Received by: | Date | Time |
|---|---|---|---|---|---|
| 7/23/15 | 1951 | | | 07/23/15 | 1551 |
| Date: | Time: | Relinquished by: | Received by: | Date | Time |

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

*Hall Environmental Analysis Laboratory*
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*Albuquerque, NM 87109*
*TEL: 505-345-3975 FAX: 505-345-4107*
*Website: www.hallenvironmental.com*

August 06, 2015

Jay Snyder
EA Engineering
320 Gold Ave SW Suite 1210
Albuquerque, NM 87102
TEL: (505) 224-9013
FAX

RE: Prices Dairy OrderNo.: 1508044

Dear Jay Snyder:

Hall Environmental Analysis Laboratory received 1 sample(s) on 8/3/2015 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

**Analytical Report**
Lab Order **1508044**
Date Reported: **8/6/2015**

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** EA Engineering
**Client Sample ID:** MW-19R
**Project:** Prices Dairy
**Collection Date:** 8/3/2015 11:53:00 AM
**Lab ID:** 1508044-001
**Matrix:** AQUEOUS
**Received Date:** 8/3/2015 1:15:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 210 | 50 | | mg/L | 100 | 8/3/2015 4:55:01 PM | R27933 |
| Nitrogen, Nitrate (As N) | 140 | 10 | * | mg/L | 100 | 8/3/2015 4:55:01 PM | R27933 |
| **SM2540C MOD: TOTAL DISSOLVED SOLIDS** | | | | | | Analyst: **KS** | |
| Total Dissolved Solids | 2650 | 100 | * | mg/L | 1 | 8/5/2015 7:28:00 PM | 20581 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1508044**

***06-Aug-15***

**Client:** EA Engineering

**Project:** Prices Dairy

| Sample ID **MB** | SampType: **MBLK** | TestCode: **EPA Method 300.0: Anions** |
|---|---|---|
| Client ID: **PBW** | Batch ID: **R27933** | RunNo: **27933** |
| Prep Date: | Analysis Date: **8/3/2015** | SeqNo: **840123** Units: **mg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | ND | 0.50 | | | | | | | | |
| Nitrogen, Nitrate (As N) | ND | 0.10 | | | | | | | | |

| Sample ID **LCS** | SampType: **LCS** | TestCode: **EPA Method 300.0: Anions** |
|---|---|---|
| Client ID: **LCSW** | Batch ID: **R27933** | RunNo: **27933** |
| Prep Date: | Analysis Date: **8/3/2015** | SeqNo: **840124** Units: **mg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.7 | 0.50 | 5.000 | 0 | 94.7 | 90 | 110 | | | |
| Nitrogen, Nitrate (As N) | 2.5 | 0.10 | 2.500 | 0 | 98.7 | 90 | 110 | | | |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1508044**

***06-Aug-15***

**Client:** EA Engineering

**Project:** Prices Dairy

| Sample ID | **MB-20581** | SampType: | **MBLK** | TestCode: | **SM2540C MOD: Total Dissolved Solids** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: | **PBW** | Batch ID: | **20581** | RunNo: | **27984** | | | | | |
| Prep Date: | **8/4/2015** | Analysis Date: | **8/5/2015** | SeqNo: | **842184** | Units: | **mg/L** | | | |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | ND | 20.0 | | | | | | | | |

| Sample ID | **LCS-20581** | SampType: | **LCS** | TestCode: | **SM2540C MOD: Total Dissolved Solids** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: | **LCSW** | Batch ID: | **20581** | RunNo: | **27984** | | | | | |
| Prep Date: | **8/4/2015** | Analysis Date: | **8/5/2015** | SeqNo: | **842185** | Units: | **mg/L** | | | |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 1010 | 20.0 | 1000 | 0 | 101 | 80 | 120 | | | |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

HALL ENVIRONMENTAL ANALYSIS LABORATORY

*Hall Environmental Analysis Laboratory*
*4901 Hawkins NE*
*Albuquerque, NM 87109*
*TEL: 505-345-3975 FAX: 505-345-4107*
*Website: www.hallenvironmental.com*

# Sample Log-In Check List

Client Name: EA Engineering Alb | Work Order Number: 1508044 | RcptNo: 1

Received by/date: KM 08/03/15

Logged By: Ashley Gallegos 8/3/2015 1:15:00 PM

Completed By: Ashley Gallegos 8/3/2015 2:29:42 PM

Reviewed By: 08/05/15

## Chain of Custody

| | | | |
|---|---|---|---|
| 1. Custody seals intact on sample bottles? | Yes ☐ | No ☐ | Not Present ☑ |
| 2. Is Chain of Custody complete? | Yes ☑ | No ☐ | Not Present ☐ |
| 3. How was the sample delivered? | Client | | |

## Log In

| | | | |
|---|---|---|---|
| 4. Was an attempt made to cool the samples? | Yes ☑ | No ☐ | NA ☐ |
| 5. Were all samples received at a temperature of >0° C to 6.0°C | Yes ☐ | No ☑ | NA ☐ |
| 6. Sample(s) in proper container(s)? | Yes ☑ | No ☐ | |
| 7. Sufficient sample volume for indicated test(s)? | Yes ☑ | No ☐ | |
| 8. Are samples (except VOA and CNG) properly preserved? | Yes ☑ | No ☐ | |
| 9. Was preservative added to bottles? | Yes ☐ | No ☑ | NA ☐ |
| 10. VOA vials have zero headspace? | Yes ☐ | No ☐ | No VOA Vials ☑ |
| 11. Were any sample containers received broken? | Yes ☐ | No ☑ | |
| 12. Does paperwork match bottle labels? (Note discrepancies on chain of custody) | Yes ☑ | No ☐ | # of preserved bottles checked for pH: 1 (<2 or >12 unless noted) |
| 13. Are matrices correctly identified on Chain of Custody? | Yes ☑ | No ☐ | Adjusted? — |
| 14. Is it clear what analyses were requested? | Yes ☑ | No ☐ | |
| 15. Were all holding times able to be met? (If no, notify customer for authorization.) | Yes ☑ | No ☐ | Checked by |

Samples were collected the same day and chilled.

## Special Handling (if applicable)

| | | | |
|---|---|---|---|
| 16. Was client notified of all discrepancies with this order? | Yes ☐ | No ☐ | NA ☑ |

Person Notified: ____ Date: ____

By Whom: ____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: ____

Client Instructions: ____

17. Additional remarks:

18. **Cooler Information**

| Cooler No | Temp °C | Condition | Seal Intact | Seal No | Seal Date | Signed By |
|---|---|---|---|---|---|---|
| 1 | 7.8 | Good | Not Present | | | |

# Chain-of-Custody Record

Client: EA Engineering

Mailing Address: 320 Gold Ave Ste 1210
ABQ NM 87102

Phone #: 505-224-9013

email or Fax#: tarley@eaest

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
~~☐ Standard~~ ☒ Rush 2 day

Project Name: Price's Dairy

Project #: 150570 1

Project Manager: Jay Snyder

Sampler: T. Carley

On Ice: ☒ Yes ☐ No

Sample Temperature: 7.1

| Date | Time | Matrix | Sample Request ID | Container Type and # | Preservative Type | HEAL No. |
|---|---|---|---|---|---|---|
| 8/3/15 | 1153 | Aq | MW-19R | 2 poly | None/$H_2SO_4$ | 1508044 -001 |

**HALL ENVIRONMENTAL ANALYSIS LABORATORY**

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

**Analysis Request**

| BTEX + MTBE + TMB's (8021) | BTEX + MTBE + TPH (Gas only) | TPH 8015B (GRO / DRO / MRO) | TPH (Method 418.1) | EDB (Method 504.1) | PAH's (8310 or 8270 SIMS) | RCRA 8 Metals | Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$) | 8081 Pesticides / 8082 PCB's | 8260B (VOA) | 8270 (Semi-VOA) | Nitrate/Chloride/TDS | | | | Air Bubbles (Y or N) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | X | | | | |

| Date: | Time: | Relinquished by: | Received by: | Date | Time |
|---|---|---|---|---|---|
| 8/3/15 | 1315 | | | 08/03/15 | 1315 |
| Date: | Time: | Relinquished by: | Received by: | Date | Time |

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

*Hall Environmental Analysis Laboratory*
*4901 Hawkins NE*
*Albuquerque, NM 87109*
*TEL: 505-345-3975 FAX: 505-345-4107*
*Website: www.hallenvironmental.com*

August 14, 2015

Jay Snyder

EA Engineering
320 Gold Ave SW Suite 1210
Albuquerque, NM 87102
TEL:
FAX

RE: Prices Dairy OrderNo.: 1508569

Dear Jay Snyder:

Hall Environmental Analysis Laboratory received 1 sample(s) on 8/12/2015 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

**Analytical Report**
Lab Order **1508569**
Date Reported: **8/14/2015**

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** EA Engineering
**Client Sample ID:** MW-1aR
**Project:** Prices Dairy
**Collection Date:** 8/12/2015 2:25:00 PM
**Lab ID:** 1508569-001
**Matrix:** AQUEOUS
**Received Date:** 8/12/2015 2:55:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 260 | 10 | * | mg/L | 20 | 8/13/2015 3:00:56 AM | R28163 |
| Nitrogen, Nitrate (As N) | 170 | 2.0 | * | mg/L | 20 | 8/13/2015 3:00:56 AM | R28163 |
| **SM2540C MOD: TOTAL DISSOLVED SOLIDS** | | | | | | Analyst: **KS** | |
| Total Dissolved Solids | 2460 | 100 | *D | mg/L | 1 | 8/14/2015 3:16:00 PM | 20772 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1508569**

***14-Aug-15***

**Client:** EA Engineering

**Project:** Prices Dairy

| Sample ID **MB** | SampType: **MBLK** | TestCode: **EPA Method 300.0: Anions** |
|---|---|---|
| Client ID: **PBW** | Batch ID: **R28163** | RunNo: **28163** |
| Prep Date: | Analysis Date: **8/12/2015** | SeqNo: **848618** Units: **mg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | ND | 0.50 | | | | | | | | |
| Nitrogen, Nitrate (As N) | ND | 0.10 | | | | | | | | |

| Sample ID **LCS** | SampType: **LCS** | TestCode: **EPA Method 300.0: Anions** |
|---|---|---|
| Client ID: **LCSW** | Batch ID: **R28163** | RunNo: **28163** |
| Prep Date: | Analysis Date: **8/12/2015** | SeqNo: **848619** Units: **mg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 5.0 | 0.50 | 5.000 | 0 | 99.8 | 90 | 110 | | | |
| Nitrogen, Nitrate (As N) | 2.6 | 0.10 | 2.500 | 0 | 104 | 90 | 110 | | | |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1508569**

***14-Aug-15***

**Client:** EA Engineering

**Project:** Prices Dairy

| Sample ID | **MB-20772** | SampType: | **MBLK** | TestCode: | **SM2540C MOD: Total Dissolved Solids** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: | **PBW** | Batch ID: | **20772** | RunNo: | **28209** | | | | | |
| Prep Date: | **8/13/2015** | Analysis Date: | **8/14/2015** | SeqNo: | **850204** | Units: | **mg/L** | | | |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | ND | 20.0 | | | | | | | | |

| Sample ID | **LCS-20772** | SampType: | **LCS** | TestCode: | **SM2540C MOD: Total Dissolved Solids** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: | **LCSW** | Batch ID: | **20772** | RunNo: | **28209** | | | | | |
| Prep Date: | **8/13/2015** | Analysis Date: | **8/14/2015** | SeqNo: | **850205** | Units: | **mg/L** | | | |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 1010 | 20.0 | 1000 | 0 | 101 | 80 | 120 | | | |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

HALL ENVIRONMENTAL ANALYSIS LABORATORY

*Hall Environmental Analysis Laboratory*
*4901 Hawkins NE*
*Albuquerque, NM 87109*
*TEL: 505-345-3975 FAX: 505-345-4107*
*Website: www.hallenvironmental.com*

# Sample Log-In Check List

Client Name: EA Engineering Alb | Work Order Number: 1508569 | RcptNo: 1

Received by/date: MG 08/12/15

Logged By: Ashley Gallegos 8/12/2015 2:55:00 PM

Completed By: Ashley Gallegos 8/12/2015 3:36:35 PM

Reviewed By: CS 08/12/15 @ 1546

## Chain of Custody

| | | | |
|---|---|---|---|
| 1. Custody seals intact on sample bottles? | Yes ☐ | No ☐ | Not Present ☑ |
| 2. Is Chain of Custody complete? | Yes ☑ | No ☐ | Not Present ☐ |
| 3. How was the sample delivered? | Client | | |

## Log In

| | | | |
|---|---|---|---|
| 4. Was an attempt made to cool the samples? | Yes ☑ | No ☐ | NA ☐ |
| 5. Were all samples received at a temperature of >0° C to 6.0°C | Yes ☐ | No ☑ | NA ☐ |
| Samples were collected the same day and chilled. | | | |
| 6. Sample(s) in proper container(s)? | Yes ☑ | No ☐ | |
| 7. Sufficient sample volume for indicated test(s)? | Yes ☑ | No ☐ | |
| 8. Are samples (except VOA and ONG) properly preserved? | Yes ☑ | No ☐ | |
| 9. Was preservative added to bottles? | Yes ☐ | No ☑ | NA ☐ |
| 10. VOA vials have zero headspace? | Yes ☐ | No ☐ | No VOA Vials ☑ |
| 11. Were any sample containers received broken? | Yes ☐ | No ☑ | |
| 12. Does paperwork match bottle labels? (Note discrepancies on chain of custody) | Yes ☑ | No ☐ | # of preserved bottles checked for pH: 1 (<2 or >12 unless noted) |
| 13. Are matrices correctly identified on Chain of Custody? | Yes ☑ | No ☐ | Adjusted? — |
| 14. Is it clear what analyses were requested? | Yes ☑ | No ☐ | |
| 15. Were all holding times able to be met? (If no, notify customer for authorization.) | Yes ☑ | No ☐ | Checked by: |

## Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: ____ Date: ____

By Whom: ____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: ____

Client Instructions: ____

17. Additional remarks:

18. Cooler Information

| Cooler No | Temp °C | Condition | Seal Intact | Seal No | Seal Date | Signed By |
|---|---|---|---|---|---|---|
| 1 | 15.8 | Good | Not Present | | | |

# Chain-of-Custody Record

Client: EA Engineering

Mailing Address: 300 Gold Ave Stenw

Phone #: 505-244-9013

email or Fax#: tcurley

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☐ Standard ☒ Rush 2day

Project Name: Price's Dairy

Project #: 150501

Project Manager: Jay Snyder

Sampler: Tyler Curley

On Ice: ☒ Yes ☐ No

Sample Temperature: 15.8°C


HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107


| Date | Time | Matrix | Sample Request ID | Container Type and # | Preservative Type | HEAL No. 1508569 | BTEX + MTBE + TMB's (8021) | BTEX + MTBE + TPH (Gas only) | TPH 8015B (GRO / DRO / MRO) | TPH (Method 418.1) | EDB (Method 504.1) | PAH's (8310 or 8270 SIMS) | RCRA 8 Metals | Anions (F,Cl,$NO_3$,$NO_2$,$PO_4$,$SO_4$) | 8081 Pesticides / 8082 PCB's | 8260B (VOA) | 8270 (Semi-VOA) | Nitrate/Chloride/TDS | | | | Air Bubbles (Y or N) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8/12/15 | 1445 | Aq | MW-1aR | 2x1day | HgSO4/none | -001 | | | | | | | | | | | | X | | | | |

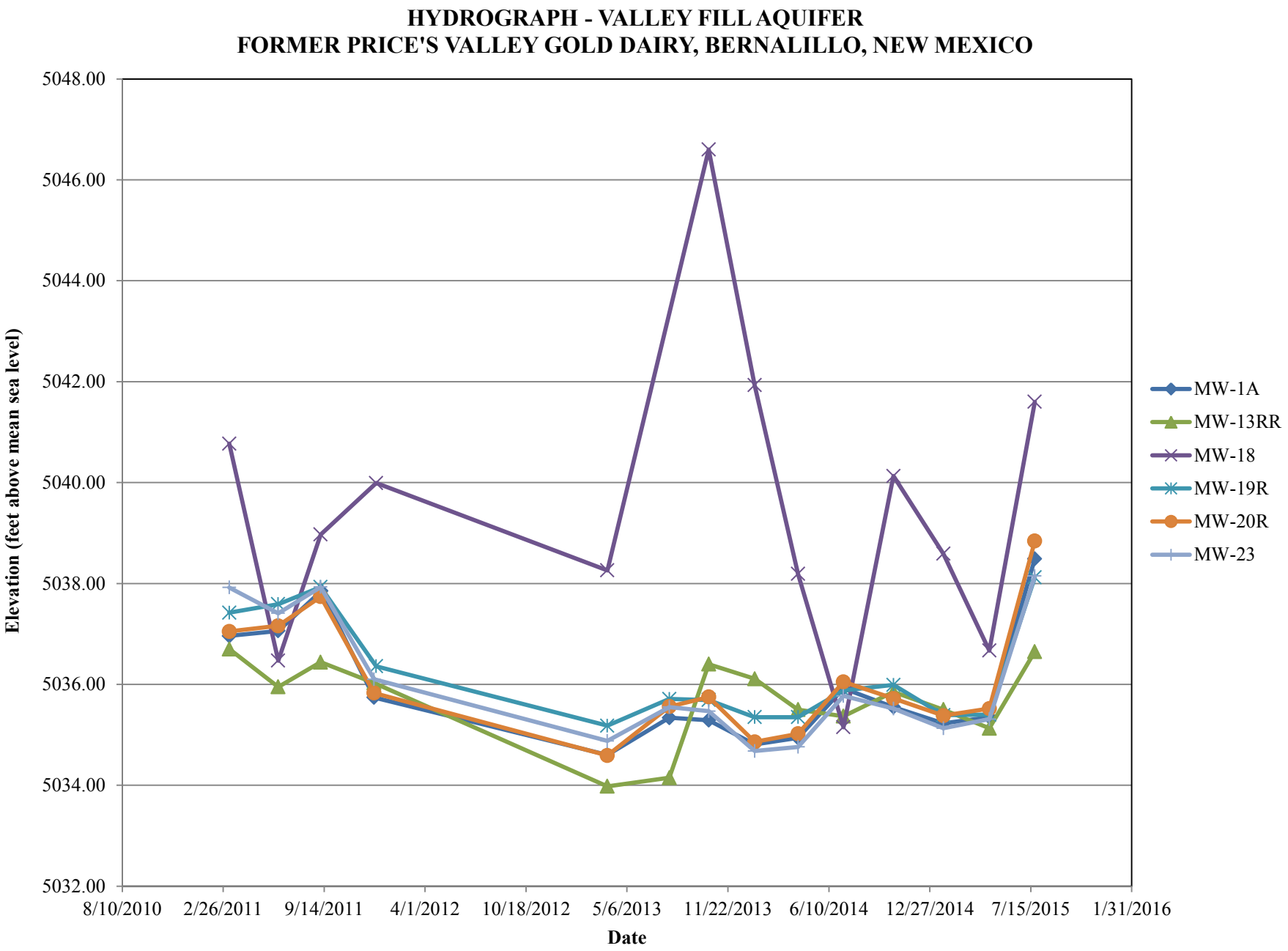
Analysis Request

| Date: | Time: | Relinquished by: | Received by: | Date | Time |
|---|---|---|---|---|---|
| 8/12/15 | 1455 | | | 08/12/15 | 1455 |
| Date: | Time: | Relinquished by: | Received by: | Date | Time |

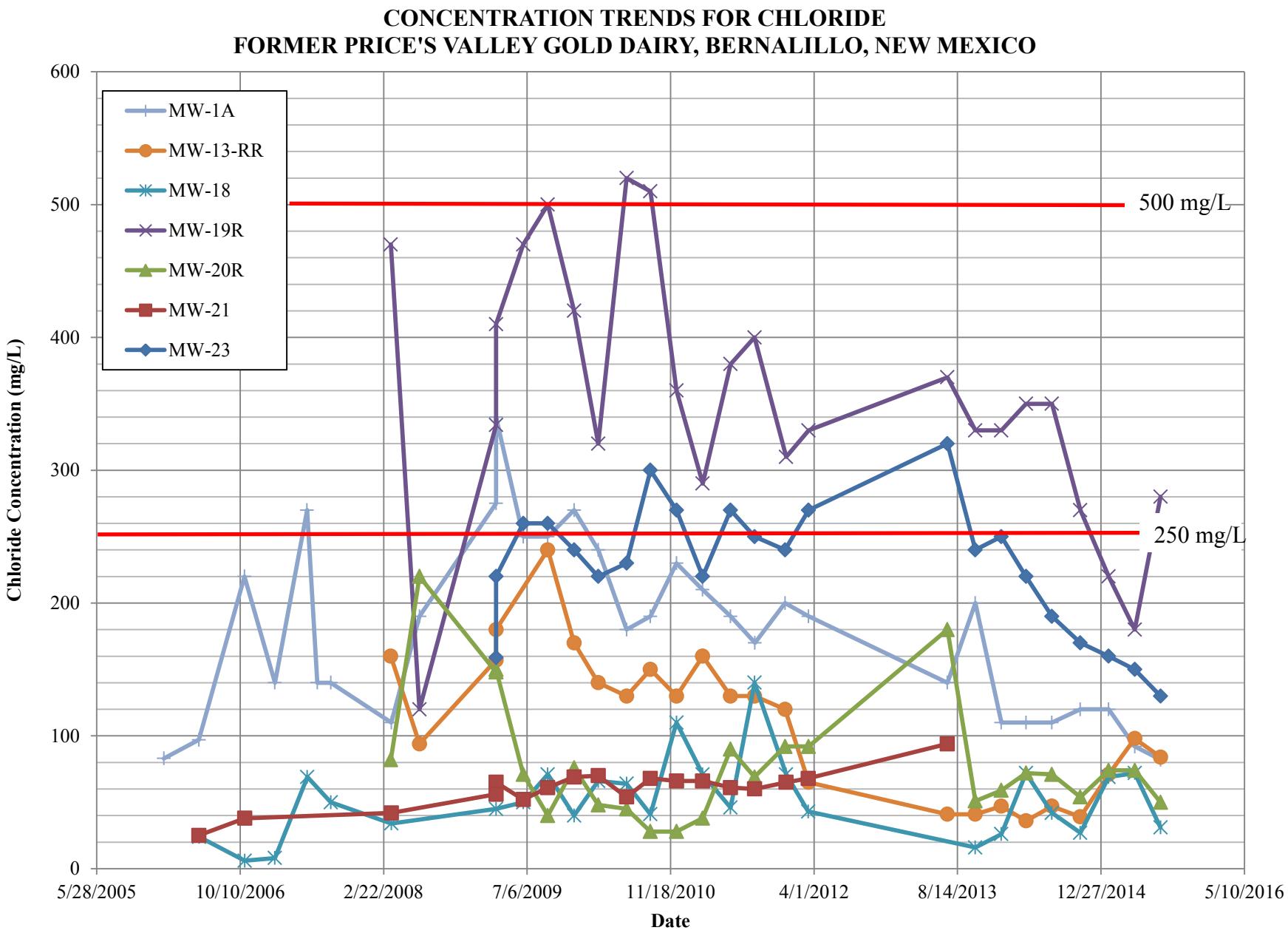
Remarks:

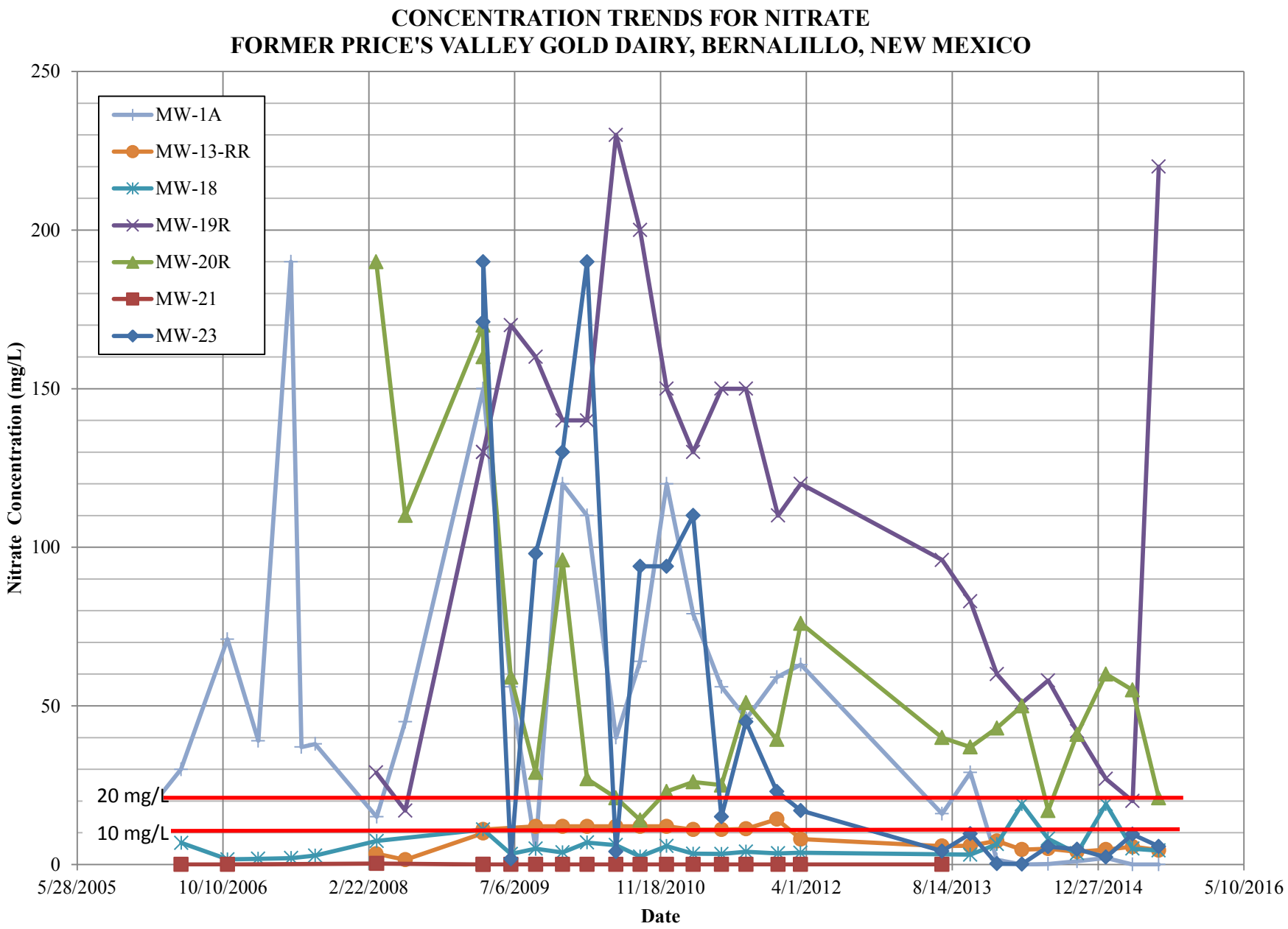
If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

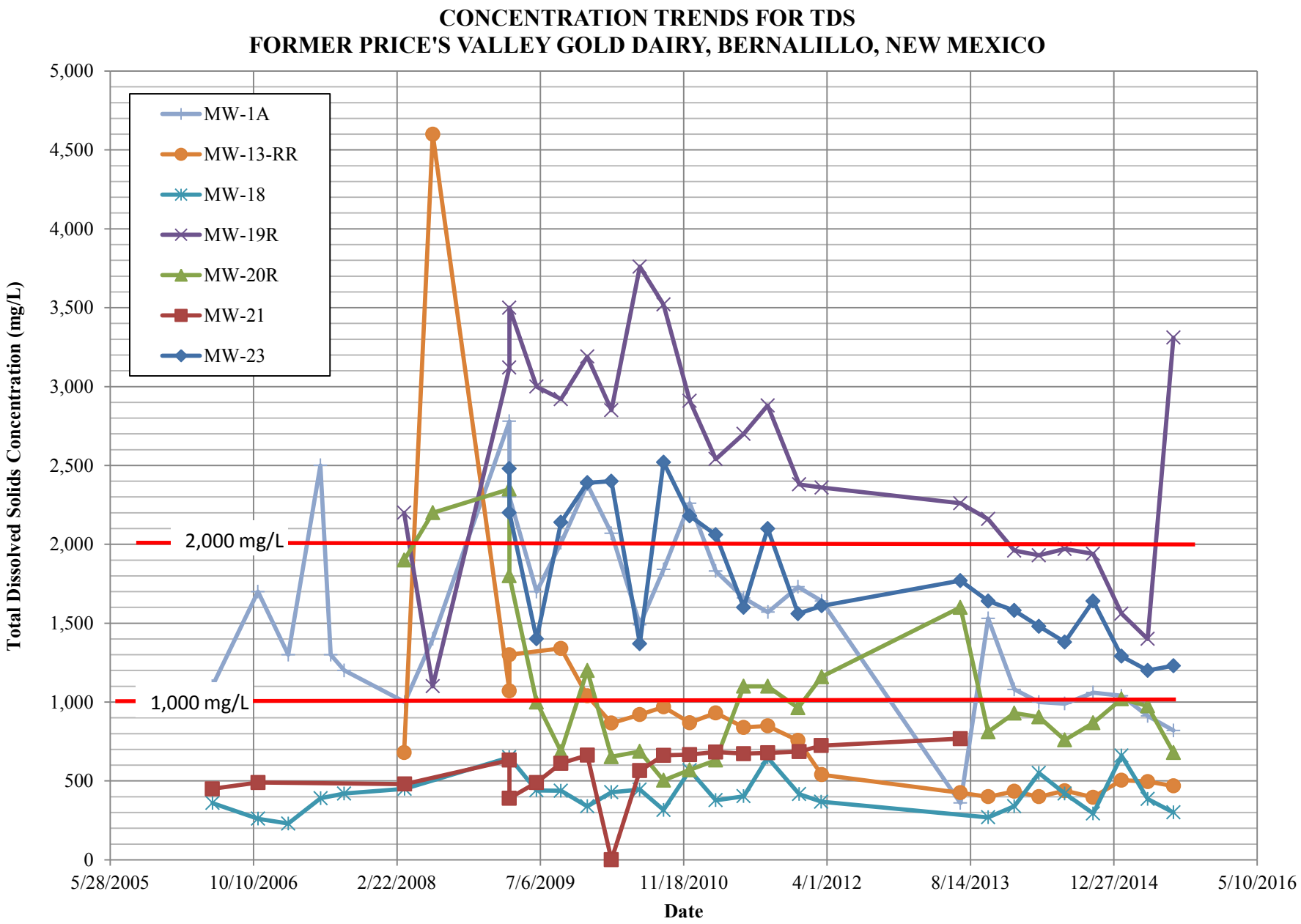
# APPENDIX C
# HYDROGRAPHS VALLEY FILL AQUIFER


HYDROGRAPH - VALLEY FILL AQUIFER
FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO
Elevation (feet above mean sea level)
5048.00
5046.00
5044.00
5042.00
5040.00
5038.00
5036.00
5034.00
5032.00
8/10/2010
2/26/2011
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
Date
MW-1A
MW-13RR
MW-18
MW-19R
MW-20R
MW-23

# APPENDIX D
# CONCENTRATION TRENDS


CONCENTRATION TRENDS FOR CHLORIDE
FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO
Chloride Concentration (mg/L)
600
500
400
300
200
100
0
MW-1A
MW-13-RR
MW-18
MW-19R
MW-20R
MW-21
MW-23
500 mg/L
250 mg/L
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
Date


CONCENTRATION TRENDS FOR NITRATE
FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO
Nitrate Concentration (mg/L)
250
200
150
100
50
0
MW-1A
MW-13-RR
MW-18
MW-19R
MW-20R
MW-21
MW-23
20 mg/L
10 mg/L
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
Date


CONCENTRATION TRENDS FOR TDS
FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO
Total Dissolved Solids Concentration (mg/L)
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
MW-1A
MW-13-RR
MW-18
MW-19R
MW-20R
MW-21
MW-23
2,000 mg/L
1,000 mg/L
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
Date

# APPENDIX C

# DECEMBER 2015
# QUARTERLY GROUNDWATER MONITORING REPORT

EA Engineering, Science, & Technology, Inc., PBC
320 Gold Avenue SW, Suite 1300
Albuquerque, New Mexico 87102
Phone: (505) 224-9013

January 22, 2016

Justin Ball
New Mexico Environment Department
Ground Water Quality Bureau
Remediation Oversight Section
121 Tijeras Ave. NE, Suite 1000
Albuquerque, New Mexico 87102

Dear Mr. Ball:

On behalf of D&G Price Limited Partnership, EA Engineering, Science, and Technology, Inc., PBC is submitting the Quarterly Groundwater Monitoring Report for the Former Price's Valley Gold Dairy located in Sandoval County, New Mexico. The report discusses the 9th quarterly groundwater sampling event since approval of the *Work Plan for Groundwater Extraction* dated May 24, 2013.

Please let me know if you have any questions regarding the information provided in this report.

Sincerely,

Jay Snyder
Senior Hydrogeologist

Enclosure

Cc: John Price
Dudley Price
File

# QUARTERLY GROUNDWATER MONITORING REPORT
# FORMER PRICE'S VALLEY GOLD DAIRY
# BERNALILLO, SANDOVAL COUNTY, NEW MEXICO

Prepared for:

Former Price's Valley Gold Dairy
Bernalillo, Sandoval County, New Mexico

Prepared by:

EA Engineering, Science,
and Technology, Inc., PBC
320 Gold Avenue SW, Suite 1210
Albuquerque, New Mexico 87102

January 2016

EA Project No. 1505701.02

EA Engineering, Science, & Technology, Inc., PBC
320 Gold Avenue SW, Suite 1300
Albuquerque, New Mexico 87102
Phone: (505) 224-9013

# QUARTERLY GROUNDWATER MONITORING REPORT
# FORMER PRICE'S VALLEY GOLD DAIRY
# BERNALILLO, SANDOVAL COUNTY, NEW MEXICO

Prepared for:

Former Price's Valley Gold Dairy
Bernalillo, Sandoval County, New Mexico

Prepared by:

EA Engineering, Science,
and Technology, Inc., PBC
320 Gold Avenue SW, Suite 1210
Albuquerque, New Mexico

January 2016

1/22/16

Jay Snyder
Senior Hydrogeologist

Date

EA Project No. 1505701.02

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## LIST OF TABLES



## LIST OF FIGURES



## LIST OF APPENDICES

# 1.0 INTRODUCTION

On behalf of Former Price's Valley Gold Dairy (Price's Dairy), EA Engineering, Science, and Technology, Inc., PBC (EA) has prepared this 9th Quarterly Groundwater Monitoring Report for Price's Dairy located in Sandoval County, New Mexico. This report was completed in accordance with the *Groundwater Extraction Work Plan* dated May 24, 2013. The Work Plan (WP) was prepared to satisfy requirements stated in the New Mexico Administrative Code (NMAC), Title 20, 6.2 §4106 through §4110.

Price's Dairy is located on the east side of New Mexico Highway 528 in Bernalillo, New Mexico. Originally Ridge Dairy, a 200-cow dairy, was operated on the site from 1960 to 1973 and was owned by Stanley and Ron Ridge. In June 1973, Mr. Dudley Price purchased the Dairy and renamed it Price's Valley Gold Dairy. Mr. Price increased the size of the dairy to 1,000 to 1,200 cows and subsequently purchased 183 acres to the south to accommodate the increased discharge from the enlarged facility. Mr. Price closed the dairy in June 1998. The property was cleared of all structures by 2006. The property, except for Lot 5-B, has been sold and redeveloped into various lots that contain commercial businesses, including Wal-Mart, Firestone Tires, a gasoline station, a strip mall and several fast food restaurants. There are undeveloped lots within the southeastern portion of the Property.

The following scope of work was performed during this monitoring period:

- Gauged 7 monitoring wells;
- Collected groundwater samples from 7 monitoring wells, and analyzed samples for nitrate, chloride, and total dissolved solids (TDS) using EPA Method 300 and SM 2540 C, respectively;
- Prepared this Quarterly Groundwater Monitoring Report.

# 2.0 GROUNDWATER MONITORING ACTIVITIES

Groundwater monitoring activities included gauging and sampling 7 monitoring wells (MW-1A, MW-11R, MW-13RR, MW-18, MW-19R, MW-20R, and MW- 23). All wells are completed in Valley Fill Aquifer except MW-11R, which is in the Upper Santa Fe Aquifer.

## 2.1 Well Gauging

On December 4, 2015, 7 wells were gauged with an electronic water level indicator. Table 1 provides a summary of the groundwater gauging data collected from the monitoring network including historical data. A potentiometric surface map (Figure 2) was constructed based on the most recent data.

## 2.2 Groundwater Sampling

On December 4, 2015, 7 monitoring wells were sampled. Prior to sampling, the monitoring wells were purged using disposable bailers and new disposable rope or twine. Monitoring wells were purged three well volumes to the extent possible without bailing dry prior to sample collection. During purging, EA measured and recorded on sampling field forms field parameters (specific conductance, pH, dissolved oxygen, and temperature) with an Oakton or YSI water quality meter and an YSI dissolved oxygen meter. The meters were calibrated and/or checked against a standard in accordance with manufacturers' specifications prior to use. Purge water from the wells was ground discharged.

Groundwater samples were collected in the sample containers provided by Hall Environmental Analysis Laboratory (HEAL). Sample containers, preservatives, analytical methods, and holding times are specified in Table 2. All samples were preserved in accordance with method requirements, labeled, then immediately cooled to <6°C with ice and delivered under chain-of-custody to HEAL in Albuquerque, New Mexico. Wells were sampled from clean to dirty to the extent possible to minimize cross-contamination. All equipment was decontaminated between wells with an Alconox™ solution to further ensure sample quality. Copies of field forms are included in Appendix A. The analytical laboratory reports are provided in Appendix B.

# 3.0 GROUNDWATER MONITORING RESULTS

## 3.1 Hydraulic Gradient and Direction of Groundwater Flow

During this quarter groundwater elevations have increased in three wells (MW-1A, MW-11R, MW-20R) ranging between 0.11 ft. and 0.02 ft. Groundwater elevations have decreased in 4 wells (MW-13RR, MW-18, MW-19R, and MW-23) ranging between 1.39 ft. and 0.21 ft. Hydrographs for the Valley Fill Aquifer monitoring wells are included in Appendix C. Figure 2 provides the potentiometric surface map, as indicated by the contours the groundwater flow direction is towards the northeast. This reflects a reversion to the natural variable gradients that reverse from east to west, then west to east, based on water levels and hydraulic interaction with the river bed aquifer to the south east.

## 3.2 Groundwater Analytical Results and Trend Analysis

During this quarter concentrations of chloride, nitrate and total dissolved solids (TDS) were found above the New Mexico Water Quality Control Commission (NMWQCC) standards. Current and historical contaminant concentrations can be found in Table 3. Concentration trends can be found in Appendix D.

Chloride was below the NMWQCC standard of 250 milligrams per liter (mg/L) in all monitoring wells except for MW-19R. A map of the chloride distribution can be found in Figure 3.

Nitrate was above the NMWQCC standard of 10 mg/L in wells MW-11R (27 mg/L), MW-19R (50 mg/L), and MW-20R (27 mg/L). Concentrations in wells MW-19R decreased by 120 mg/L, while the concentrations in wells MW-11R and MW-20R increased by 5 and 6 mg/L respectively. Nitrate concentrations in wells MW-1A, MW-13RR, and MW-18 are below the standard of 10 mg/L. A map of the nitrate distribution can be found in Figure 4. Trend plots of nitrate concentrations are provided in Appendix D.

TDS concentrations were above the NMWQCC standard of 1,000 mg/L in wells MW-11R (1,080 mg/L), MW-1A (1,030 mg/L), MW-19R (1,880 mg/L), and MW-23 (2,760 mg/L). TDS concentrations in wells MW-1A, and MW-23 have been generally decreased since the 1$^{st}$ quarter sampling event. During this quarter TDS in wells, MW-1A and MW-23 increased by 210 mg/L, and 1530 mg/L, respectively. All other well TDS concentrations either decreased or remained below the standard. A map of the TDS distribution can be found in Figure 5. TDS concentration trends are provided in Appendix D.

# 4.0 CONCLUSIONS AND RECOMMENDATIONS

This groundwater monitoring event included gauging and sampling 7 monitoring wells. Based on the data collected the following conclusions and recommendations are presented:

- The hydraulic gradient appears to have reverted to its variable pattern of east to west and west to east depending of water levels in the river bed aquifer, and is currently to the northeast;

- Nitrate and TDS concentrations within the Valley Fill Aquifer exceed the NMWQCC standards; however, TDS concentrations are below the standard in all wells except MW-13RR, MW-18, and MW-20R;

- Except for well MW-19R, Chloride concentrations with in the Valley Fill Aquifer do not exceed the NMWQCC standards;

- MW-11R, completed in Upper Santa Fe Aquifer, had a concentration of 27 mg/L nitrate this event.

# TABLES

**TABLE 1. VALLEY FILL AQUIFER GROUNDWATER ELEVATION**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date Gauged | Casing Elevation (amsl) | Depth to Water (feet) | Groundwater Elevation (amsl) |
|---|---|---|---|---|
| MW-1A | 12/4/2015 | 5072.26 | 33.88 | 5038.38 |
| | 7/23/2015 | | 33.77 | 5038.49 |
| | 4/24/2015 | | 36.91 | 5035.35 |
| | 1/23/2015 | | 37.03 | 5035.23 |
| | 10/16/2014 | | 36.71 | 5035.55 |
| | 7/9/2014 | | 36.34 | 5035.92 |
| | 4/10/2014 | | 37.32 | 5034.94 |
| | 1/14/2014 | | 37.45 | 5034.81 |
| | 10/15/2013 | | 36.97 | 5035.29 |
| | 7/29/2013 | | 36.92 | 5035.34 |
| | 3/28/2013 | | 37.66 | 5034.60 |
| | 12/22/2011 | | 36.52 | 5035.74 |
| | 9/8/2011 | | 34.41 | 5037.85 |
| | 6/15/2011 | | 35.20 | 5037.06 |
| | 3/10/2011 | | 35.30 | 5036.96 |
| MW-11R | 12/4/2015 | 5110.54 | 83.97 | 5026.57 |
| | 7/23/2015 | | 83.95 | 5026.59 |
| | 4/24/2015 | | 84.42 | 5026.12 |
| | 1/23/2015 | | 84.69 | 5025.85 |
| | 10/16/2014 | | 84.33 | 5026.21 |
| | 7/9/2014 | | 84.52 | 5026.02 |
| | 4/10/2014 | | 84.35 | 5026.19 |
| | 1/14/2014 | | 84.72 | 5025.82 |
| | 7/29/2013 | | 85.19 | 5025.35 |
| | 3/28/2013 | | 85.12 | 5025.42 |
| | 12/22/2011 | | 84.22 | 5026.32 |
| | 9/8/2011 | | 84.07 | 5026.47 |
| | 6/15/2011 | | 83.95 | 5026.59 |
| | 3/10/2011 | | 83.89 | 5026.65 |

**TABLE 1. VALLEY FILL AQUIFER GROUNDWATER ELEVATION**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date Gauged | Casing Elevation (amsl) | Depth to Water (feet) | Groundwater Elevation (amsl) |
|---|---|---|---|---|
| MW-13RR | 12/4/2015 | 5090.20 | 53.34 | 5036.86 |
| | 7/23/2015 | | 53.55 | 5036.65 |
| | 4/24/2015 | | 55.07 | 5035.13 |
| | 1/23/2015 | | 54.70 | 5035.50 |
| | 10/16/2014 | | 54.35 | 5035.85 |
| | 7/9/2014 | | 54.83 | 5035.37 |
| | 4/10/2014 | | 54.70 | 5035.50 |
| | 1/14/2014 | | 54.09 | 5036.11 |
| | 10/15/2013 | | 53.80 | 5036.40 |
| | 7/29/2013 | | 56.05 | 5034.15 |
| | 3/28/2013 | | 56.22 | 5033.98 |
| | 12/22/2011 | | 54.17 | 5036.03 |
| | 9/7/2011 | | 53.76 | 5036.44 |
| | 6/15/2011 | | 54.25 | 5035.95 |
| | 3/10/2011 | | 53.50 | 5036.70 |
| MW-18 | 12/4/2015 | 5080.80 | 37.81 | 5042.99 |
| | 7/23/2015 | | 39.20 | 5041.60 |
| | 4/24/2015 | | 44.13 | 5036.67 |
| | 1/23/2015 | | 42.21 | 5038.59 |
| | 10/16/2014 | | 40.67 | 5040.13 |
| | 7/9/2014 | | 45.65 | 5035.15 |
| | 4/10/2014 | | 42.61 | 5038.19 |
| | 1/14/2014 | | 38.87 | 5041.93 |
| | 10/15/2013 | | 34.20 | 5046.60 |
| | 7/29/2013 | | Dry | Dry |
| | 3/28/2013 | | 42.54 | 5038.26 |
| | 12/26/2011 | | 40.81 | 5039.99 |
| | 9/7/2011 | | 41.83 | 5038.97 |
| | 6/15/2011 | | 44.33 | 5036.47 |
| | 3/10/2011 | | 40.03 | 5040.77 |

**TABLE 1. VALLEY FILL AQUIFER GROUNDWATER ELEVATION**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date Gauged | Casing Elevation (amsl) | Depth to Water (feet) | Groundwater Elevation (amsl) |
|---|---|---|---|---|
| MW-19R | 12/4/2015 | 5072.69 | 33.90 | 5038.79 |
| | 7/23/2015 | | 34.57 | 5038.12 |
| | 4/24/2015 | | 37.29 | 5035.40 |
| | 1/23/2015 | | 37.30 | 5035.39 |
| | 10/16/2014 | | 36.70 | 5035.99 |
| | 7/9/2014 | | 36.81 | 5035.88 |
| | 4/10/2014 | | 37.34 | 5035.35 |
| | 1/14/2014 | | 37.34 | 5035.35 |
| | 10/15/2013 | | 37.00 | 5035.69 |
| | 7/29/2013 | | 36.98 | 5035.71 |
| | 3/28/2013 | | 37.51 | 5035.18 |
| | 12/26/2011 | | 36.33 | 5036.36 |
| | 9/7/2011 | | 34.76 | 5037.93 |
| | 6/15/2011 | | 35.10 | 5037.59 |
| | 3/10/2011 | | 35.27 | 5037.42 |
| MW-20R | 12/4/2015 | 5072.57 | 33.77 | 5038.80 |
| | 7/23/2015 | | 33.73 | 5038.84 |
| | 4/24/2015 | | 37.05 | 5035.52 |
| | 1/23/2015 | | 37.19 | 5035.38 |
| | 10/16/2014 | | 36.85 | 5035.72 |
| | 7/9/2014 | | 36.52 | 5036.05 |
| | 4/10/2014 | | 37.55 | 5035.02 |
| | 1/14/2014 | | 37.71 | 5034.86 |
| | 10/15/2013 | | 36.82 | 5035.75 |
| | 7/29/2013 | | 37.01 | 5035.56 |
| | 3/28/2013 | | 37.98 | 5034.59 |
| | 12/22/2011 | | 36.74 | 5035.83 |
| | 9/7/2011 | | 34.83 | 5037.74 |
| | 6/15/2011 | | 35.41 | 5037.16 |
| | 3/10/2011 | | 35.52 | 5037.05 |

**TABLE 1. VALLEY FILL AQUIFER GROUNDWATER ELEVATION**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Date Gauged | Casing Elevation (amsl) | Depth to Water (feet) | Groundwater Elevation (amsl) |
|---|---|---|---|---|
| MW-23 | 12/4/2015 | 5073.13 | 34.53 | 5038.60 |
| | 7/23/2015 | | 34.98 | 5038.15 |
| | 4/24/2015 | | 37.82 | 5035.31 |
| | 1/23/2015 | | 38.00 | 5035.13 |
| | 10/16/2014 | | 37.61 | 5035.52 |
| | 7/9/2014 | | 37.36 | 5035.77 |
| | 4/10/2014 | | 38.37 | 5034.76 |
| | 1/14/2014 | | 38.45 | 5034.68 |
| | 10/15/2013 | | 37.66 | 5035.47 |
| | 7/29/2013 | | 37.58 | 5035.55 |
| | 3/28/2013 | | 38.25 | 5034.88 |
| | 12/22/2011 | | 37.03 | 5036.10 |
| | 9/7/2011 | | 35.20 | 5037.93 |
| | 6/15/2011 | | 35.72 | 5037.41 |
| | 3/10/2011 | | 35.21 | 5037.92 |

NOTES:
amsl = feet above mean sea level

**TABLE 2. SUMMARY OF SAMPLE ANALYTICAL AND QUALITY CONTROL REQUIREMENTS**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Analyte | Method | Medium | Container and Minimum Volume | Preservation | Holding Time | Storage |
|---|---|---|---|---|---|---|
| Chloride | EPA 300 | Water | 250 ml poly | None | 28 days | Cool < 6 °C |
| Nitrate/Nitrite | EPA 300 | Water | 250 ml poly | $H_2SO_4$ pH <2 | 28 days | Cool < 6 °C |
| TDS | SM 2540 C | Water | 250 ml poly | None | 7 days | Cool < 6 °C |

NOTES:
°C = degrees Celcius
< = less than
EPA = U.S. Environmental Protection Agency
mL = milliliter
VOC = Volatile organic compounds
TDS = total dissolved solids

**TABLE 3. SUMMARY OF ANALYTICAL DATA**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Aquifer | Sample Date | Chloride (mg/L) | TDS (mg/L) | Nitrate (mg/L) |
|---|---|---|---|---|---|
| EW-1 | VF | 7/23/2015 | 190 | 1,300 | 11 |
| | | 4/24/2015 | 170 | 1,420 | 17 |
| | | 1/23/2015 | 220 | 1,460 | 17 |
| | | 10/31/2014 | 230 | 1,610 | 27 |
| | | 7/9/2014 | 240 | 1,520 | 18 |
| | | 4/10/2014 | 290 | 1,750 | 31 |
| | | 1/14/2014 | 390 | 2,140 | 57 |
| | | 10/15/2013 | 350 | 2,320 | 85 |
| EW-2 | VF | 7/23/2015 | 140 | 1,040 | <1.0 |
| | | 4/24/2015 | 160 | 1,100 | <1.0 |
| | | 1/23/2015 | 170 | 1,140 | 1.1 |
| | | 10/16/2014 | 190 | 1,200 | <1.0 |
| | | 7/9/2014 | 200 | 1,270 | 3 |
| | | 4/10/2014 | 200 | 1,380 | 7.6 |
| | | 1/14/2014 | 310 | 1,770 | 23 |
| | | 10/15/2013 | 330 | 1,960 | 21 |
| EW-3 | VF | 7/23/2015 | 120 | 995 | 4.8 |
| | | 4/24/2015 | 120 | 939 | 1.5 |
| | | 1/23/2015 | 130 | 1,010 | 2.5 |
| | | 10/16/2014 | 130 | 1,010 | 3.2 |
| | | 7/9/2014 | 150 | 1,090 | 3.4 |
| | | 4/10/2014 | 170 | 1,210 | 3.2 |
| | | 1/14/2014 | 220 | 1,410 | 6.3 |
| | | 10/15/2013 | 320 | 1,780 | 0.35 |
| EW-4 | VF | 7/23/2015 | 140 | 1,070 | 5.7 |
| | | 4/24/2015 | 83 | 710 | 1.1 |
| | | 1/23/2015 | 77 | 691 | 1.1 |
| | | 10/16/2014 | 89 | 776 | <1.0 |
| | | 7/9/2014 | 110 | 894 | 1.1 |
| | | 4/10/2014 | 110 | 891 | 1.5 |
| | | 1/14/2014 | 130 | 977 | 1.4 |
| | | 10/15/2013 | 210 | 1,300 | <0.10 |

**TABLE 3. SUMMARY OF ANALYTICAL DATA**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Aquifer | Sample Date | Chloride (mg/L) | TDS (mg/L) | Nitrate (mg/L) |
|---|---|---|---|---|---|
| MW-11R | USF | 12/4/2015 | 250 | 1,080 | 27 |
| | | 7/23/2015 | 230 | 1,250 | 22 |
| | | 4/24/2015 | 200 | 1,070 | 20 |
| | | 1/23/2015 | 210 | 1,070 | 20 |
| | | 10/16/2014 | 190 | 1,120 | 19 |
| | | 7/9/2014 | 230 | 1,110 | 20 |
| | | 4/10/2014 | 210 | 1,060 | 19 |
| | | 1/14/2014 | 220 | 1,020 | 20 |
| | | 7/10/2013 | 220 | 1,030 | 21 |
| | | 3/12/2012 | 190 | 1,060 | 29 |
| | | 12/26/2011 | 190 | 1,030 | 26 |
| | | 9/6/2011 | 220 | 1,180 | 33 |
| | | 6/15/2011 | 240 | 1,260 | 38 |
| | | 3/10/2011 | 240 | 1,180 | 41 |
| | | 9/9/2010 | 210 | 1,180 | 38 |
| | | 3/11/2010 | 260 | 1,190 | 42 |
| | | 9/16/2009 | 270 | 1,210 | 35 |
| | | 3/20/2009 | 270 | 2,000 | 34 |
| | | 3/20/2009 | 230 | 1,270 | 36 |
| | | 3/20/2008 | 200 | 1,000 | 19 |
| MW-1A | VF | 12/4/2015 | 110 | 1,030 | 7.9 |
| | | 7/23/2015 | 82 | 820 | <1.0 |
| | | 4/24/2015 | 92 | 912 | <1.0 |
| | | 1/23/2015 | 120 | 1,040 | 2.1 |
| | | 10/16/2014 | 120 | 1,060 | 1 |
| | | 7/9/2014 | 110 | 990 | 0.14 |
| | | 4/10/2014 | 110 | 1,000 | <0.10 |
| | | 1/14/2014 | 110 | 1,080 | 1.5 |
| | | 10/15/2013 | 200 | 1,530 | 29 |
| | | 7/10/2013 | 140 | 360 | 16 |
| | | 3/13/2012 | 190 | 1,640 | 63 |
| | | 12/22/2011 | 200 | 1,730 | 59 |
| | | 9/8/2011 | 170 | 1,570 | 46 |
| | | 6/15/2011 | 190 | 1,660 | 56 |
| | | 3/10/2011 | 210 | 1,830 | 79 |
| | | 12/9/2010 | 230 | 2,260 | 120 |
| | | 9/9/2010 | 190 | 1,840 | 64 |
| | | 6/18/2010 | 180 | 1,490 | 40 |
| | | 3/11/2010 | 240 | 2,070 | 110 |
| | | 12/17/2009 | 270 | 2,380 | 120 |
| | | 9/16/2009 | 250 | 2,010 | 4.8 |

**TABLE 3. SUMMARY OF ANALYTICAL DATA**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Aquifer | Sample Date | Chloride (mg/L) | TDS (mg/L) | Nitrate (mg/L) |
|---|---|---|---|---|---|
| MW-1A (continued) | | 6/23/2009 | 250 | 1,700 | 56 |
| | | 3/20/2009 | 340 | 2,300 | 150 |
| | | 3/20/2009 | 275 | 2,780 | 150 |
| | | 6/26/2008 | 190 | 1,400 | 45 |
| | | 3/20/2008 | 110 | 1,000 | 15 |
| | | 8/22/2007 | 140 | 1,200 | 38 |
| | | 7/6/2007 | 140 | 1,300 | 37 |
| | | 5/31/2007 | 270 | 2,500 | 190 |
| | | 2/8/2007 | 140 | 1,300 | 39 |
| | | 10/25/2006 | 220 | 1,700 | 71 |
| | | 5/19/2006 | 97 | 1,100 | 30 |
| | | 1/17/2006 | 83 | 980 | 16 |
| | | 8/22/2005 | 91 | 1,000 | 21 |
| | | 4/27/2005 | 88 | 880 | 4.0 |
| | | 11/16/2004 | 98 | 1,100 | 16 |
| | | 7/15/2004 | 89 | 820 | 11 |
| | | 3/31/2004 | 98 | 800 | 25 |
| | | 7/28/2003 | 100 | 790 | 0.21 |
| | | 2/7/2003 | 120 | 930 | 4.6 |
| | | 11/7/2002 | 150 | 1,000 | 12 |
| | | 8/12/2002 | 150 | 1,100 | 18 |
| | | 5/22/2002 | 180 | 1 300 | 24 |
| | | 2/11/2002 | 210 | 1,100 | 13 |
| | | 12/13/2001 | 150 | 790 | 0.15 |
| | | 9/11/2001 | 200 | 920 | 6 |
| | | 6/25/2001 | 170 | 820 | 21 |
| | | 3/28/2001 | 180 | 850 | 4.9 |
| | | 1/26/2001 | 170 | 730 | 2.0 |
| | | 12/28/2000 | 210 | 1,900 | 130 |
| | | 5/4/2000 | 190 | 1,200 | 31 |
| | | 2/24/2000 | 170 | 920 | 14 |
| | | 10/28/1999 | 200 | 1,300 | 56 |
| | | 7/27/1999 | 190 | 870 | ND |
| | | 4/22/1999 | 140 | 1,100 | 40 |
| | | 1/27/1998 | 152 | 1,324 | 42.5 |

**TABLE 3. SUMMARY OF ANALYTICAL DATA**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Aquifer | Sample Date | Chloride (mg/L) | TDS (mg/L) | Nitrate (mg/L) |
|---|---|---|---|---|---|
| MW-13-RR | VF | 12/4/2015 | 120 | 526 | 7.0 |
| | | 7/23/2015 | 84 | 468 | 4.5 |
| | | 4/24/2015 | 98 | 496 | 5.6 |
| | | 1/23/2015 | 71 | 505 | 4.7 |
| | | 10/16/2014 | 39 | 396 | 4.0 |
| | | 7/9/2014 | 47 | 438 | 5.0 |
| | | 4/10/2014 | 36 | 400 | 4.7 |
| | | 1/14/2014 | 47 | 434 | 7.4 |
| | | 10/15/2013 | 41 | 400 | 5.9 |
| | | 7/10/2013 | 41 | 425 | 5.8 |
| | | 3/13/2012 | 65 | 540 | 8.0 |
| | | 12/22/2011 | 120 | 757 | 14.28 |
| | | 9/7/2011 | 130 | 849 | 11.24 |
| | | 6/15/2011 | 130 | 839 | 11 |
| | | 3/10/2011 | 160 | 931 | 11 |
| | | 12/9/2010 | 130 | 869 | 12 |
| | | 9/9/2010 | 150 | 969 | 12 |
| | | 6/18/2010 | 130 | 920 | 12 |
| | | 3/11/2010 | 140 | 867 | 12 |
| | | 12/17/2009 | 170 | 1,040 | 12 |
| | | 9/16/2009 | 240 | 1,340 | 12 |
| | | 3/20/2009 | 180 | 1,300 | 11 |
| | | 3/20/2009 | 157 | 1,070 | 9.9 |
| | | 6/26/2008 | 94 | 4,600 | 1.5 |
| | | 3/18/2008 | 160 | 680 | 3.4 |

**TABLE 3. SUMMARY OF ANALYTICAL DATA**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Aquifer | Sample Date | Chloride (mg/L) | TDS (mg/L) | Nitrate (mg/L) |
|---|---|---|---|---|---|
| MW-18 | VF | 12/4/2015 | 23 | 289 | 6.4 |
| | | 7/23/2015 | 31 | 300 | 4.4 |
| | | 4/24/2015 | 72 | 386 | 5.0 |
| | | 1/23/2015 | 69 | 660 | 19 |
| | | 10/16/2014 | 27 | 294 | 3.5 |
| | | 7/9/2014 | 42 | 420 | 8.1 |
| | | 4/10/2014 | 72 | 550 | 19 |
| | | 1/14/2014 | 26 | 340 | 6.4 |
| | | 10/15/2013 | 16 | 269 | 3.1 |
| | | 3/12/2012 | 43 | 368 | 3.7 |
| | | 12/26/2011 | 71 | 416 | 3.5 |
| | | 9/7/2011 | 140 | 648 | 4.0 |
| | | 6/15/2011 | 46 | 403 | 3.3 |
| | | 3/10/2011 | 71 | 378 | 3.4 |
| | | 12/9/2010 | 110 | 567 | 5.8 |
| | | 9/9/2010 | 41 | 316 | 2.5 |
| | | 6/18/2010 | 64 | 445 | 6.1 |
| | | 3/11/2010 | 66 | 428 | 6.9 |
| | | 12/17/2009 | 40 | 339 | 3.8 |
| | | 9/16/2009 | 71 | 438 | 5.0 |
| | | 6/23/2009 | 50 | 440 | 3.3 |
| | | 3/20/2009 | 45 | 650 | 11 |
| | | 3/20/2008 | 34 | 450 | 7.4 |
| | | 8/22/2007 | 50 | 420 | 2.8 |
| | | 6/1/2007 | 69 | 390 | 2.0 |
| | | 2/8/2007 | 8 | 230 | 1.8 |
| | | 10/26/2006 | 6 | 260 | 1.6 |
| | | 5/20/2006 | 24 | 360 | 6.8 |

**TABLE 3. SUMMARY OF ANALYTICAL DATA**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Aquifer | Sample Date | Chloride (mg/L) | TDS (mg/L) | Nitrate (mg/L) |
|---|---|---|---|---|---|
| MW-19R | VF | 12/4/2015 | 230 | 1,880 | 50 |
| | | 8/12/2015 | 260 | 2,460 | 170 |
| | | 8/3/2015 | 210 | 2,650 | 140 |
| | | 7/23/2015 | 280 | 3,310 | 220 |
| | | 4/24/2015 | 180 | 1,400 | 20 |
| | | 1/23/2015 | 220 | 1,560 | 27 |
| | | 10/16/2014 | 270 | 1,940 | 42 |
| | | 7/9/2014 | 350 | 1,970 | 58 |
| | | 4/10/2014 | 350 | 1,930 | 51 |
| | | 1/14/2014 | 330 | 1,960 | 60 |
| | | 10/15/2013 | 330 | 2,160 | 83 |
| | | 7/10/2013 | 370 | 2,260 | 96 |
| | | 3/13/2012 | 330 | 2,360 | 120 |
| | | 12/26/2011 | 310 | 2,380 | 110 |
| | | 9/7/2011 | 400 | 2,880 | 150 |
| | | 6/15/2011 | 380 | 2,700 | 150 |
| | | 3/10/2011 | 290 | 2,540 | 130 |
| | | 12/9/2010 | 360 | 2,910 | 150 |
| | | 9/9/2010 | 510 | 3,520 | 200 |
| | | 6/18/2010 | 520 | 3,760 | 230 |
| | | 3/11/2010 | 320 | 2,850 | 140 |
| | | 12/17/2009 | 420 | 3,190 | 140 |
| | | 9/16/2009 | 500 | 2,920 | 160 |
| | | 6/23/2009 | 470 | 3,000 | 170 |
| | | 3/20/2009 | 410 | 3,500 | 130 |
| | | 3/20/2009 | 334 | 3,120 | 130 |
| | | 6/26/2008 | 120 | 1,100 | 17 |
| | | 3/18/2008 | 470 | 2,200 | 29 |

**TABLE 3. SUMMARY OF ANALYTICAL DATA**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Aquifer | Sample Date | Chloride (mg/L) | TDS (mg/L) | Nitrate (mg/L) |
|---|---|---|---|---|---|
| MW-20R | VF | 12/4/2015 | 24 | 554 | 27 |
| | | 7/23/2015 | 50 | 680 | 21 |
| | | 4/24/2015 | 74 | 975 | 55 |
| | | 1/23/2015 | 74 | 1,020 | 60 |
| | | 10/16/2014 | 54 | 868 | 41 |
| | | 7/9/2014 | 71 | 760 | 17 |
| | | 4/10/2014 | 72 | 905 | 50 |
| | | 1/14/2014 | 59 | 930 | 43 |
| | | 10/15/2013 | 51 | 811 | 37 |
| | | 7/10/2013 | 180 | 1,600 | 40 |
| | | 3/13/2012 | 92 | 1,160 | 76 |
| | | 12/22/2011 | 92 | 963 | 39.39 |
| | | 9/7/2011 | 69 | 1,100 | 51 |
| | | 6/15/2011 | 90 | 1,100 | 25 |
| | | 3/10/2011 | 38 | 632 | 26 |
| | | 12/9/2010 | 28 | 570 | 23 |
| | | 9/9/2010 | 28 | 504 | 14 |
| | | 6/18/2010 | 45 | 687 | 21 |
| | | 3/11/2010 | 48 | 653 | 27 |
| | | 12/17/2009 | 76 | 1,200 | 96 |
| | | 9/16/2009 | 40 | 686 | 29 |
| | | 6/23/2009 | 71 | 1,000 | 59 |
| | | 3/20/2009 | 150 | 1,800 | 160 |
| | | 3/20/2009 | 148 | 2,350 | 170 |
| | | 6/26/2008 | 220 | 2,200 | 110 |
| | | 3/18/2008 | 82 | 1,900 | 190 |

**TABLE 3. SUMMARY OF ANALYTICAL DATA**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

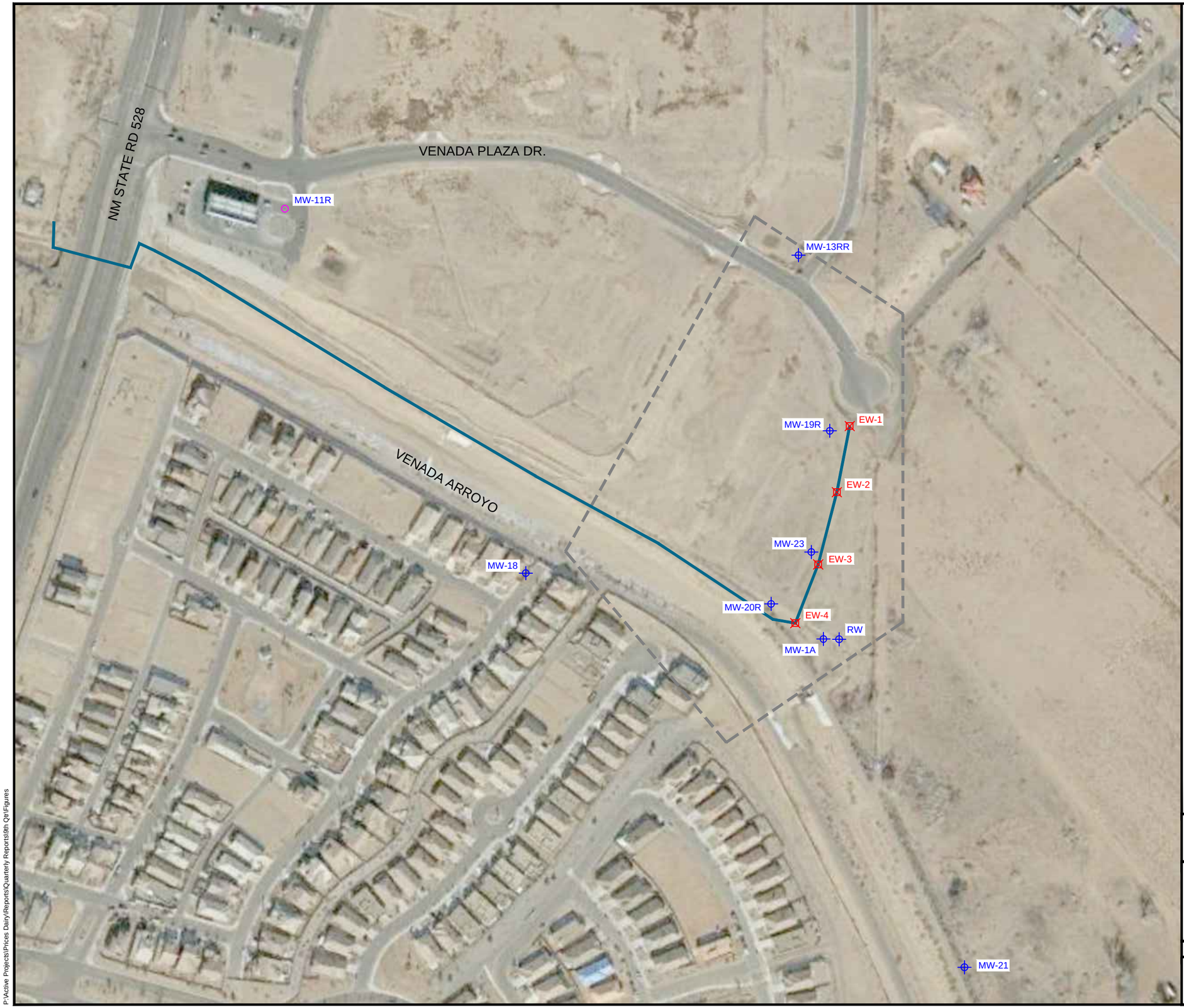
| Well Identification | Aquifer | Sample Date | Chloride (mg/L) | TDS (mg/L) | Nitrate (mg/L) |
|---|---|---|---|---|---|
| MW-21 | VF | 7/10/2013 | 94 | 768 | <0.10 |
| | | 3/12/2012 | 68 | 724 | ND |
| | | 12/26/2011 | 65 | 686 | ND |
| | | 9/7/2011 | 60 | 678 | ND |
| | | 6/15/2011 | 61 | 673 | ND |
| | | 3/10/2011 | 66 | 683 | ND |
| | | 12/9/2010 | 66 | 667 | ND |
| | | 9/9/2010 | 68 | 662 | ND |
| | | 6/18/2010 | 54 | 565 | ND |
| | | 3/11/2010 | 70 | 0 | ND |
| | | 12/17/2009 | 69 | 663 | ND |
| | | 9/16/2009 | 61 | 612 | ND |
| | | 6/23/2009 | 52 | 490 | ND |
| | | 3/20/2009 | 65 | 390 | ND |
| | | 3/20/2009 | 56 | 632 | ND |
| | | 3/20/2008 | 42 | 480 | 0.29 |
| | | 10/26/2006 | 38 | 490 | ND |
| | | 5/19/2006 | 25 | 450 | ND |

**TABLE 3. SUMMARY OF ANALYTICAL DATA**
**FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO**

| Well Identification | Aquifer | Sample Date | Chloride (mg/L) | TDS (mg/L) | Nitrate (mg/L) |
|---|---|---|---|---|---|
| MW-23 | VF | 12/4/2015 | 250 | 2,760 | 160 |
| | | 7/23/2015 | 130 | 1,230 | 5.7 |
| | | 4/24/2015 | 150 | 1,200 | 9.5 |
| | | 1/23/2015 | 160 | 1,290 | 2.3 |
| | | 10/16/2014 | 170 | 1,640 | 4.8 |
| | | 7/9/2014 | 190 | 1,380 | 5.6 |
| | | 4/10/2014 | 220 | 1,480 | 0.13 |
| | | 1/14/2014 | 250 | 1,580 | 0.22 |
| | | 10/15/2013 | 240 | 1,640 | 9.7 |
| | | 7/10/2013 | 320 | 1,770 | 4.2 |
| | | 3/13/12 | 270 | 1,610 | 17 |
| | | 12/22/11 | 240 | 1,560 | 23 |
| | | 9/7/11 | 250 | 2,100 | 45 |
| | | 6/15/11 | 270 | 1,600 | 15 |
| | | 3/10/11 | 220 | 2,060 | 110 |
| | | 12/9/10 | 270 | 2,180 | 94 |
| | | 9/9/10 | 300 | 2,520 | 94 |
| | | 6/18/10 | 230 | 1,370 | 4.0 |
| | | 3/11/10 | 220 | 2,400 | 190 |
| | | 12/17/09 | 240 | 2,390 | 130 |
| | | 9/16/09 | 260 | 2,140 | 98 |
| | | 6/23/09 | 260 | 1,400 | 1.7 |
| | | 3/20/09 | 220 | 2,200 | 190 |
| | | 3/20/09 | 159 | 2,480 | 171 |
| **NMWQCC Standard** | | | **250** | **1,000** | **10** |

NOTES:
ate data are by EPA Method 300.0
EPA Method SM 2540 C
above NMWQCC standard if shaded
= milligrams per liter
= Total dissolved solids
ND = Non detect
Mexico Environment Department
w Mexico Water Quality Control
F = Upper Santa Fe
VF = Valley Fill

# FIGURES




## LEGEND:

- EXTRACTION WELLS
- MW-23 — VALLEY FILL AQUIFER MONITORING WELL
- MW-11R — UPPER SANTA FE AQUIFER MONITORING WELL
- BOUNDARY OF AFFECTED GROUNDWATER
- DISCHARGE LINE

200 100 0 200

SCALE IN FEET

IMAGE SOURCE: GOOGLE 01/17/2013

FORMER PRICE'S VALLEY GOLD DAIRY
BERNALILLO, SANDOVAL COUNTY

# FIGURE 1
# SITE LAYOUT

| PROJECT #: | 1505701 | PROJECT PHASE: | 02 | PROJECT MANAGER: | TC |
|---|---|---|---|---|---|

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Albuquerque, NM 87102
Phone: (505) 224-9013
Fax: (505) 224-9016
EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

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## LEGEND:

- EXTRACTION WELLS
- MW-23 — VALLEY FILL AQUIFER MONITORING WELL
- MW-11R — UPPER SANTA FE AQUIFER MONITORING WELL
- BOUNDARY OF AFFECTED GROUNDWATER
- DISCHARGE LINE
- GROUNDWATER FLOW DIRECTION

**NOTE:**

GROUNDWATER LEVELS IN THE EXTRACTION WELLS EXPERIENCES FREQUENT CHANGES DUE TO THE CYCLING OF THE PUMPS. THEREFORE, THESE ELEVATIONS WERE NOT USED TO FOR CONTOURING.

N

200 100 0 200

SCALE IN FEET

IMAGE SOURCE: GOOGLE 01/17/2013

FORMER PRICE'S VALLEY GOLD DAIRY
BERNALILLO, SANDOVAL COUNTY

# FIGURE 2
# GROUNDWATER ELEVATIONS
# DECEMBER 2015

| PROJECT #: | 1505701 | PROJECT PHASE: | 02 | PROJECT MANAGER: | TC |
|---|---|---|---|---|---|

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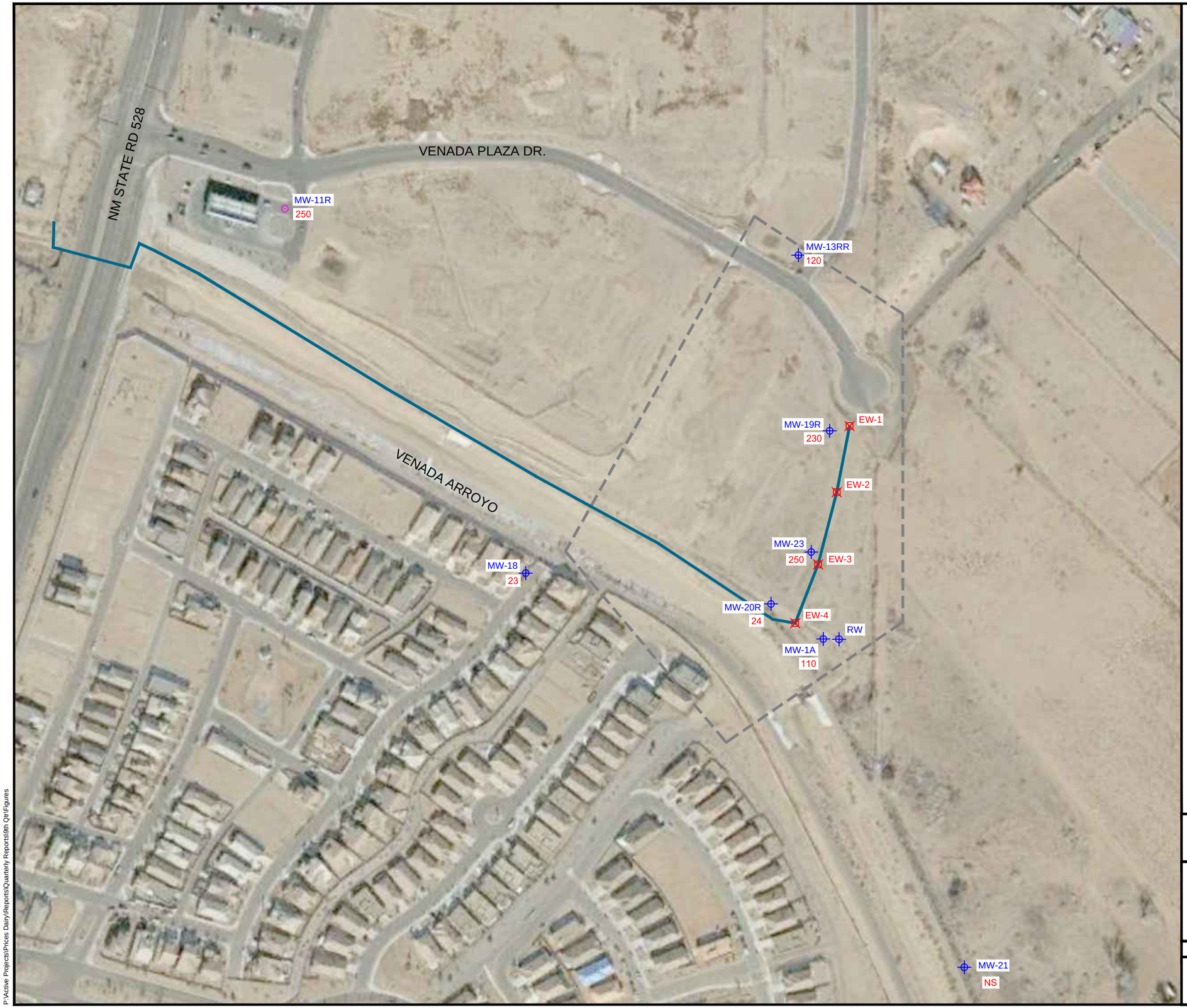


## LEGEND:

- EXTRACTION WELLS
- MW-23 — VALLEY FILL AQUIFER MONITORING WELL
- MW-11R — UPPER SANTA FE AQUIFER MONITORING WELL
- BOUNDARY OF AFFECTED GROUNDWATER
- DISCHARGE LINE
- 250 — CHLORIDE CONCENTRATION CONTOUR
- NS — NOT SAMPLED

**NOTE:**

VALUES NEXT TO WELLS INDICATE CHLORIDE CONCENTRATIONS IN GROUNDWATER SAMPLES (mg/L).

N

200 100 0 200

SCALE IN FEET

IMAGE SOURCE: GOOGLE 01/17/2013

FORMER PRICE'S VALLEY GOLD DAIRY
BERNALILLO, SANDOVAL COUNTY

# FIGURE 3
# CHLORIDE CONCENTRATIONS IN GROUNDWATER, DECEMBER 2015

| PROJECT #: | 1505701 | PROJECT PHASE: | 02 | PROJECT MANAGER: | TC |
|---|---|---|---|---|---|

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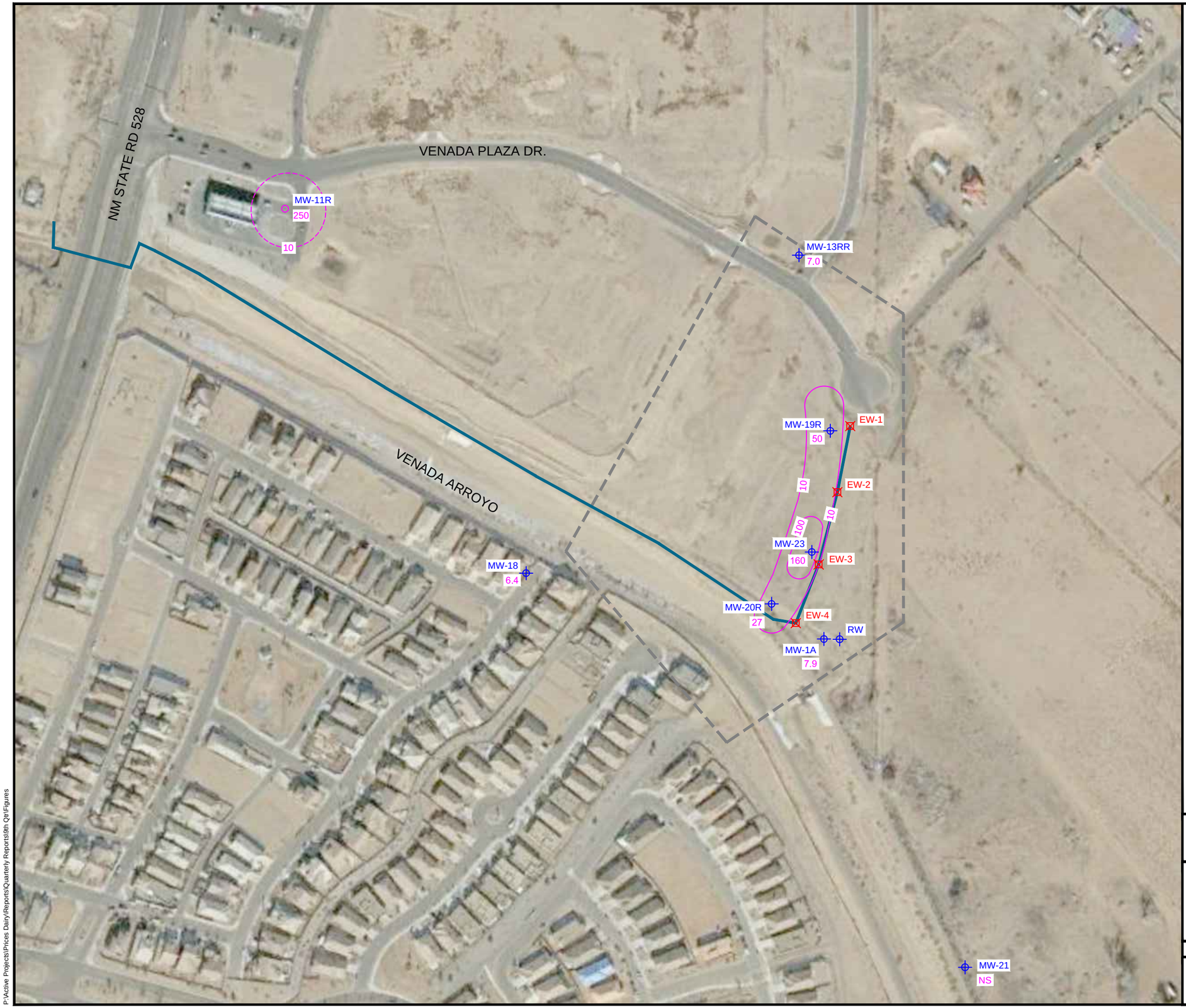


## LEGEND:

- EXTRACTION WELLS
- MW-23 — VALLEY FILL AQUIFER MONITORING WELL
- MW-11R — UPPER SANTA FE AQUIFER MONITORING WELL
- BOUNDARY OF AFFECTED GROUNDWATER
- DISCHARGE LINE
- 10 — NITRATE CONCENTRATION CONTOUR MILLIGRAMS PER LITER (mg/L)
- NS — NOT SAMPLED

**NOTE:**

VALUES NEXT TO WELLS INDICATE NITRATE CONCENTRATIONS IN GROUNDWATER SAMPLES (mg/L).

200 100 0 200

SCALE IN FEET

IMAGE SOURCE: GOOGLE 01/17/2013

FORMER PRICE'S VALLEY GOLD DAIRY
BERNALILLO, SANDOVAL COUNTY

# FIGURE 4
# NITRATE CONCENTRATIONS IN GROUNDWATER, DECEMBER 2015

| PROJECT #: | 1505701 | PROJECT PHASE: | 02 | PROJECT MANAGER: | TC |
|---|---|---|---|---|---|

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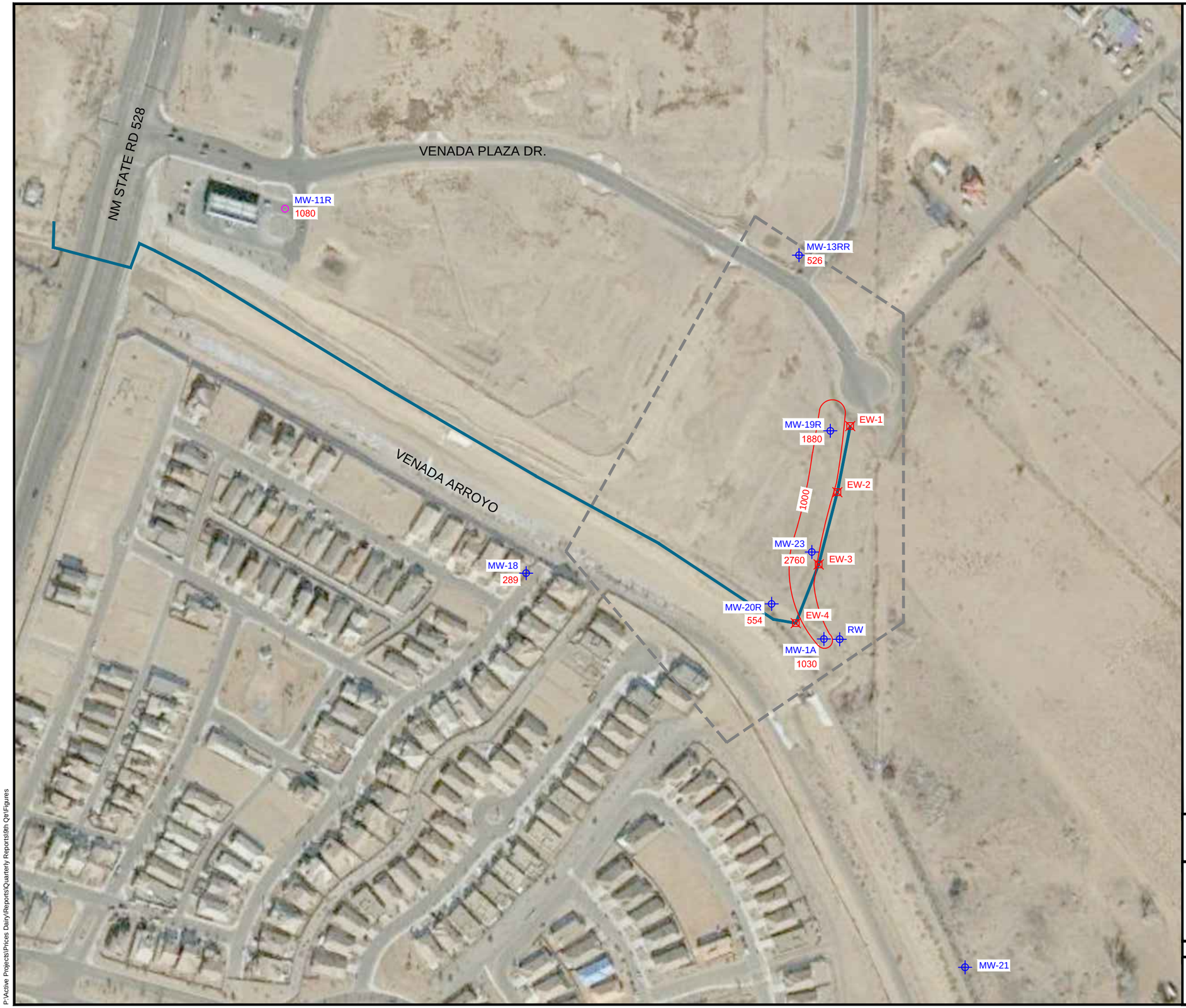


## LEGEND:

- EXTRACTION WELLS
- MW-23 — VALLEY FILL AQUIFER MONITORING WELL
- MW-11R — UPPER SANTA FE AQUIFER MONITORING WELL
- BOUNDARY OF AFFECTED GROUNDWATER
- DISCHARGE LINE
- 1,000 — TOTAL DISSOLVED SOLIDS CONCENTRATION CONTOUR IN MILLIGRAMS PER LITER (mg/L)
- NS — NOT SAMPLED

**NOTE:**

VALUES NEXT TO WELLS INDICATE TOTAL DISSOLVED SOLIDS (TDS) CONCENTRATIONS IN GROUNDWATER SAMPLES (mg/L).

N

200 100 0 200

SCALE IN FEET

IMAGE SOURCE: GOOGLE 01/17/2013

FORMER PRICE'S VALLEY GOLD DAIRY
BERNALILLO, SANDOVAL COUNTY

# FIGURE 5
# TDS IN GROUNDWATER
# DECEMBER 2015

| PROJECT #: | 1505701 | PROJECT PHASE: | 02 | PROJECT MANAGER: | TC |
|---|---|---|---|---|---|

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# APPENDIX A
# FIELD FORMS

# Chain-of-Custody Record

Client: EA Engineering

Mailing Address: 320 Gold Ave SW #1300 Abq

Phone #: 505 224 7013

email or Fax#: tcurley@envest.com

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☐ Standard ☐ **Rush** _____

Project Name: Price's Dairy

Project #: 150701

Project Manager: Tyler Curley

Sampler: Colton Tuke

On Ice: ☒ Yes ☐ No

Sample Temperature: 89°C

**HALL ENVIRONMENTAL ANALYSIS LABORATORY**

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

**Analysis Request**

| Date | Time | Matrix | Sample Request ID | Container Type and # | Preservative Type | HEAL No. | BTEX + MTBE + TMB's (8021) | BTEX + MTBE + TPH (Gas only) | TPH 8015B (GRO / DRO / MRO) | TPH (Method 418.1) | EDB (Method 504.1) | PAH's (8310 or 8270 SIMS) | RCRA 8 Metals | Anions ($F,Cl,NO_3,NO_2,PO_4,SO_4$) | 8081 Pesticides / 8082 PCB's | 8260B (VOA) | 8270 (Semi-VOA) | Nitrate | Chloride | TDS | | Air Bubbles (Y or N) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12-4 | 1015 | Aq | MW-1A | 250 mL 100mL HNO3 | None $H_2SO_4$ | | | | | | | | | | | | | X | X | X | | |
| | 1050 | | MW-13RR | | | | | | | | | | | | | | | | | | | |
| | 1235 | | MW-18 | | | | | | | | | | | | | | | | | | | |
| | 1305 | | MW-23 | | | | | | | | | | | | | | | | | | | |
| | 1336 | | MW-11R | | | | | | | | | | | | | | | | | | | |
| | 1420 | | MW-19R | | | | | | | | | | | | | | | | | | | |
| | 1436 | | MW-20R | | | | | | | | | | | | | | | | | | | |
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| Date: | Time: | Relinquished by: | Received by: | Date | Time |
|---|---|---|---|---|---|
| 12-4-15 | 1530 | | Celina Sanchez | 12/4/15 | 1530 |
| Date: | Time: | Relinquished by: | Received by: | Date | Time |

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

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320 Gold Avenue SW, Suite 1210
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Phone: (505) 224-9013

# MONITOR WELL SAMPLING FIELD FORM

## FLUID LEVEL DATA

Well ID: MW-1A
Site: Rios Dairy
Depth to PSH: — Feet
Depth to water: 33.88 Feet
Total depth: 51.70 Feet
NAPL thickness: — Feet

Date gauged: 12/4/15
Time gauged: 0955
Well diameter: 2 Inches
Height of fluid column: 17.82 Feet
Volume in well: 3.0 Gallons

(3 well volumes = 9.0 gallons)

After Bailing NAPL
Depth to PSH _____ Feet
Depth to water _____ Feet
NAPL thickness _____ Feet
NAPL Recovered _____ Gallons

## GROUNDWATER SAMPLING DATA

Time/date purged: 1000
Purge Method: Hand Bail

| Time | Purge Volume (gal) | Temp (°C) | SpC (µs/cm) | pH | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|
| 1000 | 0.25 | 16.4 | 1280 | 7.48 | | 2.96 |
| 1006 | 4.0 | 17.2 | 1274 | 7.07 | | " |
| 1012 | 8.75 | 17.3 | 1260 | 7.11 | | " |
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Actual purge volume: 9.0 gal.
Field measurements stabilized within ± 10%? Y
Time/date sampled: 1015 12-4-15
Purged/sampled by:
Sample method: Disposable Bailer
Requested analyses: Nitrate Chloride TDS
Comments/observations:

**Well Casing Volumes**
2" diameter = 0.17 gal/ft 4" diameter = 0.66 gal/ft 6" diameter = 1.50 gal/ft

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# MONITOR WELL SAMPLING FIELD FORM

## FLUID LEVEL DATA

Well ID: MW-13 RR
Site: Price Dairy
Depth to PSH: — Feet
Depth to water: 53.34 Feet
Total depth: 66.80 Feet
NAPL thickness: — Feet

Date gauged: 12/4/15
Time gauged: 1033
Well diameter: 2 Inches
Height of fluid column: 13.46 Feet
Volume in well: 2.2 Gallons

(3 well volumes = 6.6 gallons)

After Bailing NAPL
Depth to PSH: _____ Feet
Depth to water: _____ Feet
NAPL thickness: _____ Feet
NAPL Recovered: _____ Gallons

## GROUNDWATER SAMPLING DATA

Time/date purged: 1035
Purge Method: Hand Bail

| Time | Purge Volume (gal) | Temp (°C) | SpC (µs/cm) | pH | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|
| 1035 | 0.25 | 17.8 | 856 | 8.04 | | 3.60 |
| 1042 | 3.25 | 17.6 | 840 | 7.79 | | " |
| 1048 | 6.5 | 17.5 | 832 | 7.77 | | " |
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Actual purge volume: 6.75 gal.
Field measurements stabilized within ± 10%? Y
Time/date sampled: 1050 12-4-15
Purged/sampled by:
Sample method: Disposable Bailer
Requested analyses: Nitrate chloride TDS
Comments/observations:

**Well Casing Volumes**
2" diameter = 0.17 gal/ft 4" diameter = 0.66 gal/ft 6" diameter = 1.50 gal/ft

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# MONITOR WELL SAMPLING FIELD FORM

## FLUID LEVEL DATA

Well ID: MW-18
Site: Pitts Dairy
Depth to PSH: — Feet
Depth to water: 37.81 Feet
Total depth: 52.10 Feet
NAPL thickness: — Feet

Date gauged: 12/4/15
Time gauged: 1215
Well diameter: 2 Inches
Height of fluid column: 14.29 Feet
Volume in well: 2.4 Gallons

(3 well volumes = 7.2 gallons)

After Bailing NAPL
Depth to PSH _____ Feet
Depth to water _____ Feet
NAPL thickness _____ Feet
NAPL Recovered _____ Gallons

## GROUNDWATER SAMPLING DATA

Time/date purged: _____
Purge Method: Hand Bail

| Time | Purge Volume (gal) | Temp (°C) | SpC (µs/cm) | pH | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|
| 1218 | 0.25 | 16.3 | 520 | 8.09 | | 7.92 |
| 1225 | 3.25 | 16.4 | 506 | 7.90 | | " |
| 1232 | 7.0 | 16.4 | 500 | 7.83 | | " |
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Actual purge volume 7.25 gal.
Field measurements stabilized within ± 10%? Y

Time/date sampled: 1235 12-4-15
Purged/sampled by: [signature]

Sample method: Disposable Bailer
Requested analyses: Nitrate Chloride TDS

Comments/observations: _____

**Well Casing Volumes**
2" diameter = 0.17 gal/ft 4" diameter = 0.66 gal/ft 6" diameter = 1.50 gal/ft

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# MONITOR WELL SAMPLING FIELD FORM

## FLUID LEVEL DATA

Well ID: MW-23
Site: Pecos Dairy
Depth to PSH: — Feet
Depth to water: 34.53 Feet
Total depth: 42.55 Feet
NAPL thickness: — Feet

Date gauged: 12/4/15
Time gauged: 1250
Well diameter: 2 Inches
Height of fluid column: 8.02 Feet
Volume in well: 1.3 Gallons

(3 well volumes = 3.9 gallons)

After Bailing NAPL
Depth to PSH _____ Feet
Depth to water _____ Feet
NAPL thickness _____ Feet
NAPL Recovered _____ Gallons

## GROUNDWATER SAMPLING DATA

Time/date purged: 1255
Purge Method: Hand Bail

| Time | Purge Volume (gal) | Temp (°C) | SpC (µs/cm) | pH | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|
| 1255 | 0.25 | 17.4 | 1840 | 7.11 | | 5.18 |
| 1300 | 2.0 | 17.6 | 1817 | 7.10 | | 1 |
| 1304 | 3.75 | 17.6 | 1812 | 7.09 | | |
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Actual purge volume: 4.0 gal.
Field measurements stabilized within ± 10%? Y
Time/date sampled: 1305 12-4-15
Purged/sampled by:
Sample method: Disposable Bailer
Requested analyses: Nitrate Chloride TDS
Comments/observations: NO well cap

**Well Casing Volumes**
2" diameter = 0.17 gal/ft 4" diameter = 0.66 gal/ft 6" diameter = 1.50 gal/ft

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# MONITOR WELL SAMPLING FIELD FORM

## FLUID LEVEL DATA

Well ID: MW-11R
Site: Prices Dairy
Depth to PSH: — Feet
Depth to water: 83.97 Feet
Total depth: 91.40 Feet
NAPL thickness: — Feet

Date gauged: 12/4/15
Time gauged: 1315
Well diameter: 2 Inches
Height of fluid column: 7.43 Feet
Volume in well: 1.2 Gallons

(3 well volumes = 3.6 gallons)

After Bailing NAPL
Depth to PSH _____ Feet
Depth to water _____ Feet
NAPL thickness _____ Feet
NAPL Recovered _____ Gallons

## GROUNDWATER SAMPLING DATA

Time/date purged: 1318 Purge Method: Hand Bail

| Time | Purge Volume (gal) | Temp (°C) | SpC (µs/cm) | pH | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|
| 1318 | 0.25 | 17.2 | 1632 | 7.35 | | 6.92 |
| 1324 | 2.0 | 17.2 | 1611 | 7.37 | | |
| 1332 | 3.5 | 17.1 | 1607 | 7.41 | | |
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Actual purge volume ~3.75 gal.
Field measurements stabilized within ± 10%? Y
Time/date sampled: 1336 12-4-15 Purged/sampled by: [signature]
Sample method: Disposable Bailer
Requested analyses: Nitrate Chloride TDS
Comments/observations:

**Well Casing Volumes**
2" diameter = 0.17 gal/ft 4" diameter = 0.66 gal/ft 6" diameter = 1.50 gal/ft

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# MONITOR WELL SAMPLING FIELD FORM

## FLUID LEVEL DATA

Well ID: MW-19R
Site: Prices Dairy
Depth to PSH: — Feet
Depth to water: 33.90 Feet
Total depth: 40.40 Feet
NAPL thickness: — Feet

Date gauged: 12/4/15
Time gauged: 1410
Well diameter: 2 Inches
Height of fluid column: 6.5 Feet
Volume in well: 1.1 Gallons

(3 well volumes = 3.3 gallons)

After Bailing NAPL
Depth to PSH _____ Feet
Depth to water _____ Feet
NAPL thickness _____ Feet
NAPL Recovered _____ Gallons

## GROUNDWATER SAMPLING DATA

Time/date purged: 1412
Purge Method: Hand Bail

| Time | Purge Volume (gal) | Temp (°C) | SpC (µs/cm) | pH | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|
| 1412 | 0.25 | 17.3 | 3780 | 7.15 | / | 2.24 |
| 1415 | 2.0 | 17.8 | 3750 | 7.09 | / | / |
| 1417 | 3.25 | 17.9 | 3750 | 7.08 | / | / |
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Actual purge volume: 3.5 gal.
Field measurements stabilized within ± 10%? Y
Time/date sampled: 1420 12-4-15
Purged/sampled by:
Sample method: Disposable Bailer
Requested analyses: Nitrate Chloride TDS
Comments/observations:

**Well Casing Volumes**
2" diameter = 0.17 gal/ft 4" diameter = 0.66 gal/ft 6" diameter = 1.50 gal/ft

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Phone: (505) 224-9013

# MONITOR WELL SAMPLING FIELD FORM

## FLUID LEVEL DATA

Well ID: MW-20R
Site: Prices Dairy
Depth to PSH: — Feet
Depth to water: 33.77 Feet
Total depth: 40.65 Feet
NAPL thickness: — Feet

Date gauged: 12/4/15
Time gauged: 1425
Well diameter: 2 Inches
Height of fluid column: 6.88 Feet
Volume in well: 1.1 Gallons

(3 well volumes = 3.3 gallons)

After Bailing NAPL
Depth to PSH: _____ Feet
Depth to water: _____ Feet
NAPL thickness: _____ Feet
NAPL Recovered: _____ Gallons

## GROUNDWATER SAMPLING DATA

Time/date purged: 1428
Purge Method: Hand Bail

| Time | Purge Volume (gal) | Temp (°C) | SpC (µs/cm) | pH | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|
| 1428 | 0.25 | 17.6 | 1230 | 7.52 | | 2.30 |
| 1431 | 2.0 | 17.7 | 1156 | 7.36 | | |
| 1434 | 3.25 | 17.7 | 1142 | 7.33 | | |
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| | | | | | | |

Actual purge volume: 3.5 gal.
Field measurements stabilized within ± 10%? Y
Time/date sampled: 1436 12-4-15
Purged/sampled by:
Sample method: Disposable Bailer
Requested analyses: Nitrate Chloride TDS
Comments/observations:

**Well Casing Volumes**
2" diameter = 0.17 gal/ft 4" diameter = 0.66 gal/ft 6" diameter = 1.50 gal/ft

EA Engineering, Science, and Technology
320 Gold Avenue SW, Suite 1210
Albuquerque, NM 87102
Phone: (505) 224-9013

# MONITOR WELL SAMPLING FIELD FORM

## FLUID LEVEL DATA

Well ID: MW-21 | Date gauged: 12/4/15

Site: Price Dairy | Time gauged: _____

Depth to PSH: _____ Feet | Well diameter: _____ Inches

Depth to water: _____ Feet | Height of fluid column: _____ Feet

Total depth: _____ Feet | Volume in well: _____ Gallons

NAPL thickness: _____ Feet

(3 well volumes = _____ gallons)

After Bailing NAPL

Depth to PSH: _____ Feet

Depth to water: _____ Feet

NAPL thickness: _____ Feet

NAPL Recovered: _____ Gallons

## GROUNDWATER SAMPLING DATA

Time/date purged: _____ | Purge Method: _____

| Time | Purge Volume (gal) | Temp (°C) | SpC (µs/cm) | pH | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|
| | | | | | | |
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| | | | | | | |

Actual purge volume _____ gal. | Field measurements stabilized within ± 10%? _____

Time/date sampled: _____ | Purged/sampled by: _____

Sample method: _____

Requested analyses: _____

Comments/observations: Could not locate. Large piles of tumble-weed where it might be located

**Well Casing Volumes**

2" diameter = 0.17 gal/ft 4" diameter = 0.66 gal/ft 6" diameter = 1.50 gal/ft

# APPENDIX B
# ANALYTICAL LABORATORY RESULTS

HALL ENVIRONMENTAL ANALYSIS LABORATORY

*Hall Environmental Analysis Laboratory*
*4901 Hawkins NE*
*Albuquerque, NM 87109*
*TEL: 505-345-3975 FAX: 505-345-4107*
*Website: www.hallenvironmental.com*

December 15, 2015

Tyler Curlie
EA Engineering
320 Gold Ave SW Suite 1210
Albuquerque, NM 87102
TEL:
FAX

RE: Prices Dairy OrderNo.: 1512240

Dear Tyler Curlie:

Hall Environmental Analysis Laboratory received 7 sample(s) on 12/4/2015 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

**Analytical Report**
Lab Order **1512240**
Date Reported: **12/15/2015**

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** EA Engineering
**Client Sample ID:** MW-1A
**Project:** Prices Dairy
**Collection Date:** 12/4/2015 10:15:00 AM
**Lab ID:** 1512240-001
**Matrix:** AQUEOUS
**Received Date:** 12/4/2015 3:30:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 110 | 5.0 | | mg/L | 10 | 12/4/2015 7:06:41 PM | B30627 |
| Nitrogen, Nitrate (As N) | 7.9 | 1.0 | | mg/L | 10 | 12/4/2015 7:06:41 PM | B30627 |
| **SM2540C MOD: TOTAL DISSOLVED SOLIDS** | | | | | | Analyst: **SRM** | |
| Total Dissolved Solids | 1030 | 40.0 | *D | mg/L | 1 | 12/13/2015 1:47:00 PM | 22696 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** EA Engineering
**Client Sample ID:** MW-13RR
**Project:** Prices Dairy
**Collection Date:** 12/4/2015 10:50:00 AM
**Lab ID:** 1512240-002
**Matrix:** AQUEOUS
**Received Date:** 12/4/2015 3:30:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 120 | 5.0 | | mg/L | 10 | 12/4/2015 7:31:30 PM | B30627 |
| Nitrogen, Nitrate (As N) | 7.0 | 1.0 | | mg/L | 10 | 12/4/2015 7:31:30 PM | B30627 |
| **SM2540C MOD: TOTAL DISSOLVED SOLIDS** | | | | | | Analyst: **SRM** | |
| Total Dissolved Solids | 526 | 40.0 | *D | mg/L | 1 | 12/13/2015 1:47:00 PM | 22696 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** EA Engineering
**Client Sample ID:** MW-18
**Project:** Prices Dairy
**Collection Date:** 12/4/2015 12:35:00 PM
**Lab ID:** 1512240-003
**Matrix:** AQUEOUS
**Received Date:** 12/4/2015 3:30:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 23 | 5.0 | | mg/L | 10 | 12/4/2015 7:56:18 PM | B30627 |
| Nitrogen, Nitrate (As N) | 6.4 | 1.0 | | mg/L | 10 | 12/4/2015 7:56:18 PM | B30627 |
| **SM2540C MOD: TOTAL DISSOLVED SOLIDS** | | | | | | Analyst: **SRM** | |
| Total Dissolved Solids | 289 | 20.0 | | mg/L | 1 | 12/13/2015 1:47:00 PM | 22696 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** EA Engineering
**Client Sample ID:** MW-23
**Project:** Prices Dairy
**Collection Date:** 12/4/2015 1:05:00 PM
**Lab ID:** 1512240-004
**Matrix:** AQUEOUS
**Received Date:** 12/4/2015 3:30:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 250 | 50 | | mg/L | 100 | 12/4/2015 8:58:21 PM | B30627 |
| Nitrogen, Nitrate (As N) | 160 | 10 | * | mg/L | 100 | 12/4/2015 8:58:21 PM | B30627 |
| **SM2540C MOD: TOTAL DISSOLVED SOLIDS** | | | | | | Analyst: **SRM** | |
| Total Dissolved Solids | 2760 | 100 | *D | mg/L | 1 | 12/13/2015 1:47:00 PM | 22696 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** EA Engineering
**Client Sample ID:** MW-11R
**Project:** Prices Dairy
**Collection Date:** 12/4/2015 1:36:00 PM
**Lab ID:** 1512240-005
**Matrix:** AQUEOUS
**Received Date:** 12/4/2015 3:30:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 250 | 50 | * | mg/L | 100 | 12/10/2015 5:22:20 AM | R30757 |
| Nitrogen, Nitrate (As N) | 27 | 10 | * | mg/L | 100 | 12/5/2015 5:19:56 AM | A30652 |
| **SM2540C MOD: TOTAL DISSOLVED SOLIDS** | | | | | | Analyst: **SRM** | |
| Total Dissolved Solids | 1080 | 100 | *D | mg/L | 1 | 12/13/2015 1:47:00 PM | 22696 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** EA Engineering
**Client Sample ID:** MW-19R
**Project:** Prices Dairy
**Collection Date:** 12/4/2015 2:20:00 PM
**Lab ID:** 1512240-006
**Matrix:** AQUEOUS
**Received Date:** 12/4/2015 3:30:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 230 | 50 | | mg/L | 100 | 12/10/2015 5:34:45 AM | R30757 |
| Nitrogen, Nitrate (As N) | 50 | 10 | * | mg/L | 100 | 12/5/2015 5:44:45 AM | A30652 |
| **SM2540C MOD: TOTAL DISSOLVED SOLIDS** | | | | | | Analyst: **SRM** | |
| Total Dissolved Solids | 1880 | 40.0 | *D | mg/L | 1 | 12/13/2015 1:47:00 PM | 22696 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** EA Engineering
**Client Sample ID:** MW-20R
**Project:** Prices Dairy
**Collection Date:** 12/4/2015 2:36:00 PM
**Lab ID:** 1512240-007
**Matrix:** AQUEOUS
**Received Date:** 12/4/2015 3:30:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 24 | 5.0 | | mg/L | 10 | 12/10/2015 5:47:10 AM | R30757 |
| Nitrogen, Nitrate (As N) | 27 | 10 | * | mg/L | 100 | 12/5/2015 6:09:35 AM | A30652 |
| **SM2540C MOD: TOTAL DISSOLVED SOLIDS** | | | | | | Analyst: **SRM** | |
| Total Dissolved Solids | 554 | 40.0 | *D | mg/L | 1 | 12/13/2015 1:47:00 PM | 22696 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1512240**

***15-Dec-15***

**Client:** EA Engineering

**Project:** Prices Dairy

| Sample ID **MB** | SampType: **MBLK** | TestCode: **EPA Method 300.0: Anions** |
|---|---|---|
| Client ID: **PBW** | Batch ID: **B30627** | RunNo: **30627** |
| Prep Date: | Analysis Date: **12/4/2015** | SeqNo: **935553** Units: **mg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | ND | 0.50 | | | | | | | | |
| Nitrogen, Nitrate (As N) | ND | 0.10 | | | | | | | | |

| Sample ID **LCS** | SampType: **LCS** | TestCode: **EPA Method 300.0: Anions** |
|---|---|---|
| Client ID: **LCSW** | Batch ID: **B30627** | RunNo: **30627** |
| Prep Date: | Analysis Date: **12/4/2015** | SeqNo: **935554** Units: **mg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.8 | 0.50 | 5.000 | 0 | 96.9 | 90 | 110 | | | |
| Nitrogen, Nitrate (As N) | 2.5 | 0.10 | 2.500 | 0 | 101 | 90 | 110 | | | |

| Sample ID **MB** | SampType: **MBLK** | TestCode: **EPA Method 300.0: Anions** |
|---|---|---|
| Client ID: **PBW** | Batch ID: **R30757** | RunNo: **30757** |
| Prep Date: | Analysis Date: **12/10/2015** | SeqNo: **939434** Units: **mg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | ND | 0.50 | | | | | | | | |

| Sample ID **LCS** | SampType: **LCS** | TestCode: **EPA Method 300.0: Anions** |
|---|---|---|
| Client ID: **LCSW** | Batch ID: **R30757** | RunNo: **30757** |
| Prep Date: | Analysis Date: **12/10/2015** | SeqNo: **939435** Units: **mg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.8 | 0.50 | 5.000 | 0 | 96.9 | 90 | 110 | | | |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1512240**

***15-Dec-15***

**Client:** EA Engineering

**Project:** Prices Dairy

| Sample ID | **MB-22696** | SampType: | **MBLK** | TestCode: | **SM2540C MOD: Total Dissolved Solids** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: | **PBW** | Batch ID: | **22696** | RunNo: | **30818** | | | | | |
| Prep Date: | **12/9/2015** | Analysis Date: | **12/13/2015** | SeqNo: | **941671** | Units: | **mg/L** | | | |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | ND | 20.0 | | | | | | | | |

| Sample ID | **LCS-22696** | SampType: | **LCS** | TestCode: | **SM2540C MOD: Total Dissolved Solids** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: | **LCSW** | Batch ID: | **22696** | RunNo: | **30818** | | | | | |
| Prep Date: | **12/9/2015** | Analysis Date: | **12/13/2015** | SeqNo: | **941672** | Units: | **mg/L** | | | |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 1000 | 20.0 | 1000 | 0 | 101 | 80 | 120 | | | |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

HALL ENVIRONMENTAL ANALYSIS LABORATORY

*Hall Environmental Analysis Laboratory*
*4901 Hawkins NE*
*Albuquerque, NM 87109*
*TEL: 505-345-3975 FAX: 505-345-4107*
*Website: www.hallenvironmental.com*

# Sample Log-In Check List

Client Name: EA Engineering Alb  Work Order Number: 1512240  RcptNo: 1

Received by/date: CS 12/04/15

Logged By: Celina Sessa 12/4/2015 3:30:00 PM Celina Sessa

Completed By: Celina Sessa 12/4/2015 3:33:04 PM Celina Sessa

Reviewed By: 12/04/15

## Chain of Custody

1. Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☑
2. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
3. How was the sample delivered? Client

## Log In

4. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C Yes ☐ No ☑ NA ☐
   **Samples were collected the same day and chilled.**
6. Sample(s) in proper container(s)? Yes ☑ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
9. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
10. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☑
11. Were any sample containers received broken? Yes ☐ No ☑
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes ☑ No ☐
13. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
14. Is it clear what analyses were requested? Yes ☑ No ☐
15. Were all holding times able to be met? (If no, notify customer for authorization.) Yes ☑ No ☐

# of preserved bottles checked for pH: 7 (<2 or >12 unless noted)
Adjusted? No
Checked by:

## Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: ____ Date: ____
By Whom: ____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: ____
Client Instructions: ____

17. Additional remarks:

18. Cooler Information

| Cooler No | Temp °C | Condition | Seal Intact | Seal No | Seal Date | Signed By |
|---|---|---|---|---|---|---|
| 1 | 8.9 | Good | Not Present | | | |

# Chain-of-Custody Record

Client: EA Engineering

Mailing Address: 320 Gold Ave SW #1300
Abq

Phone #: 505 224 9013

Email or Fax#: tcurley@eaest.com

QA/QC Package:
Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

EDD (Type) _____

Turn-Around Time:
☒ Standard ☐ Rush _____

Project Name:
Prices Dairy

Project #:
505701

Project Manager:
Tyler Curley

Sampler: Colton Luke

On Ice: ☒ Yes ☐ No

Sample Temperature: 8.9°C


**HALL ENVIRONMENTAL ANALYSIS LABORATORY**

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107


| Date | Time | Matrix | Sample Request ID | Container Type and # | Preservative Type | HEAL No. 1512240 |
|---|---|---|---|---|---|---|
| 12-4 | 1015 | Aq | MW-1A | 500 mL 100 mL poly | None $H_2SO_4$ | -001 |
| | 1050 | | MW-13RR | | | -002 |
| | 1235 | | MW-18 | | | -003 |
| | 1305 | | MW-23 | | | -004 |
| | 1336 | | MW-11R | | | -005 |
| | 1420 | | MW-19R | | | -006 |
| | 1436 | | MW-20R | | | -007 |

Analysis Request

| BTEX + MTBE + TMB's (8021) | BTEX + MTBE + TPH (Gas only) | TPH 8015B (GRO / DRO / MRO) | TPH (Method 418.1) | EDB (Method 504.1) | PAH's (8310 or 8270 SIMS) | RCRA 8 Metals | Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$) | 8081 Pesticides / 8082 PCB's | 8260B (VOA) | 8270 (Semi-VOA) | Nitrate | Chloride | TDS | | Air Bubbles (Y or N) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | X | X | X | | |
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| | | | | | | | | | | | | | | | |

Date: 12-4-15 Time: 1530 Relinquished by: [signature]

Received by: Celina Sanchez Date: 12/04/15 Time: 1530

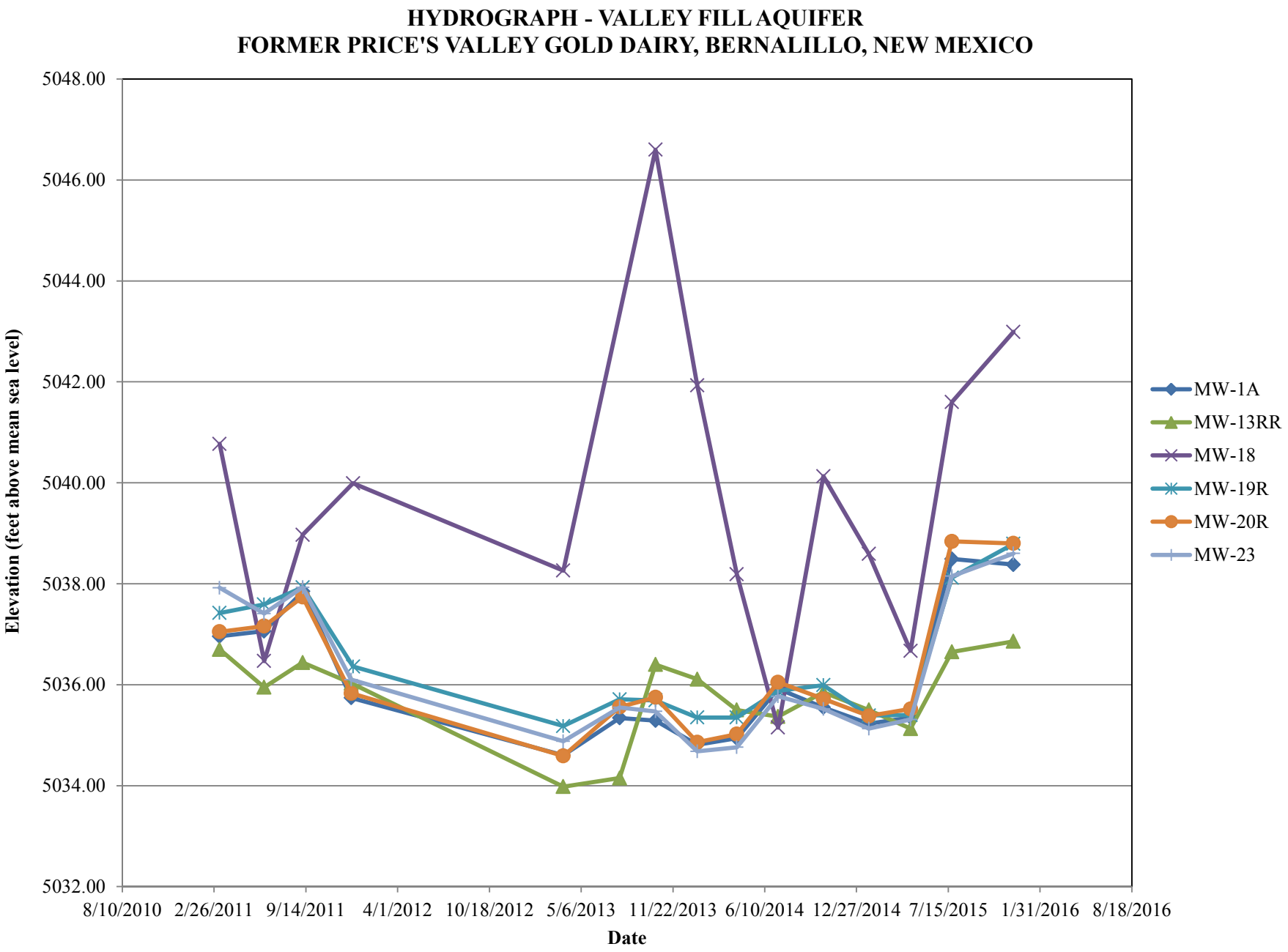
Date: _____ Time: _____ Relinquished by: _____

Received by: _____ Date: _____ Time: _____

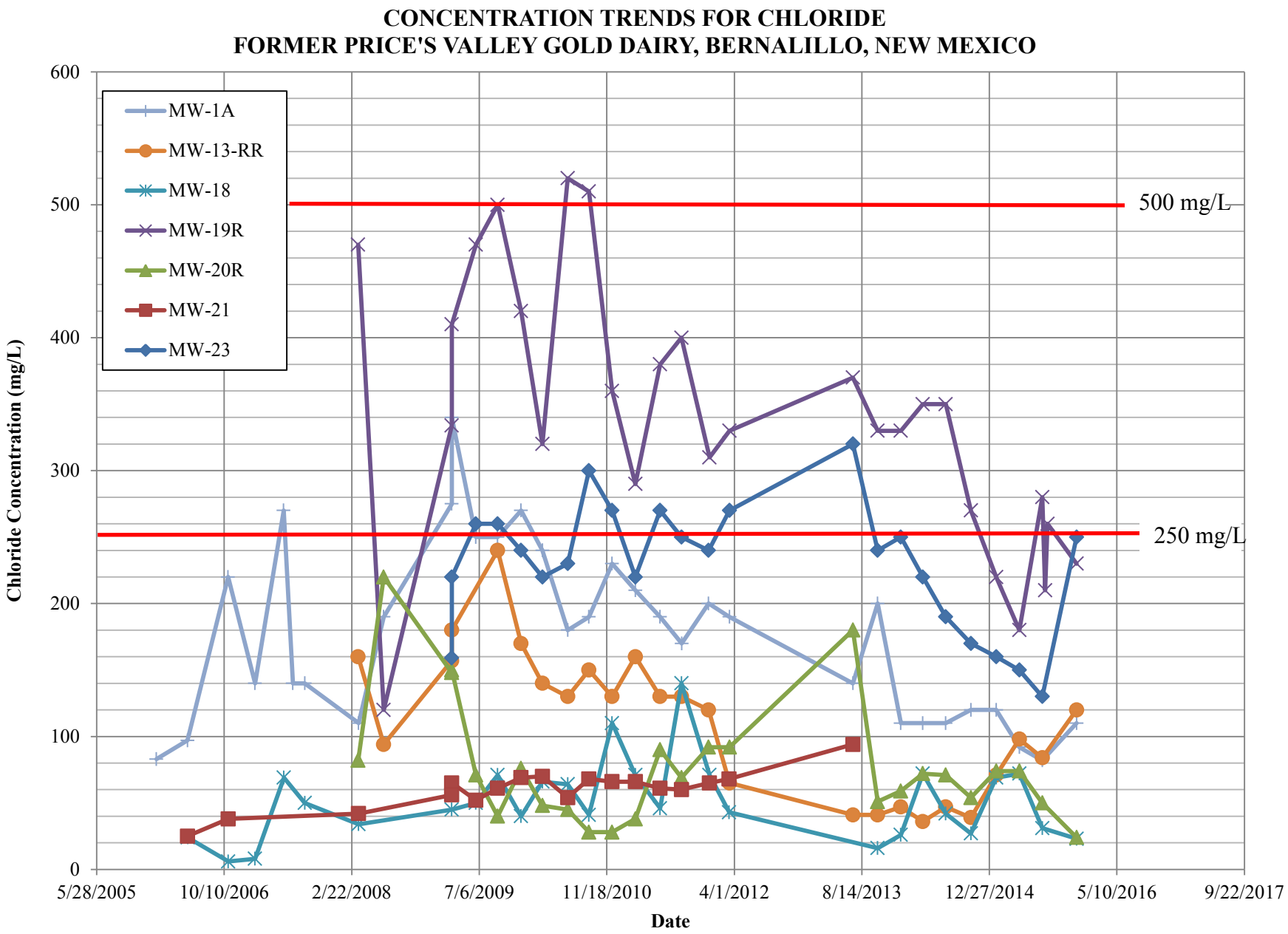
Remarks:

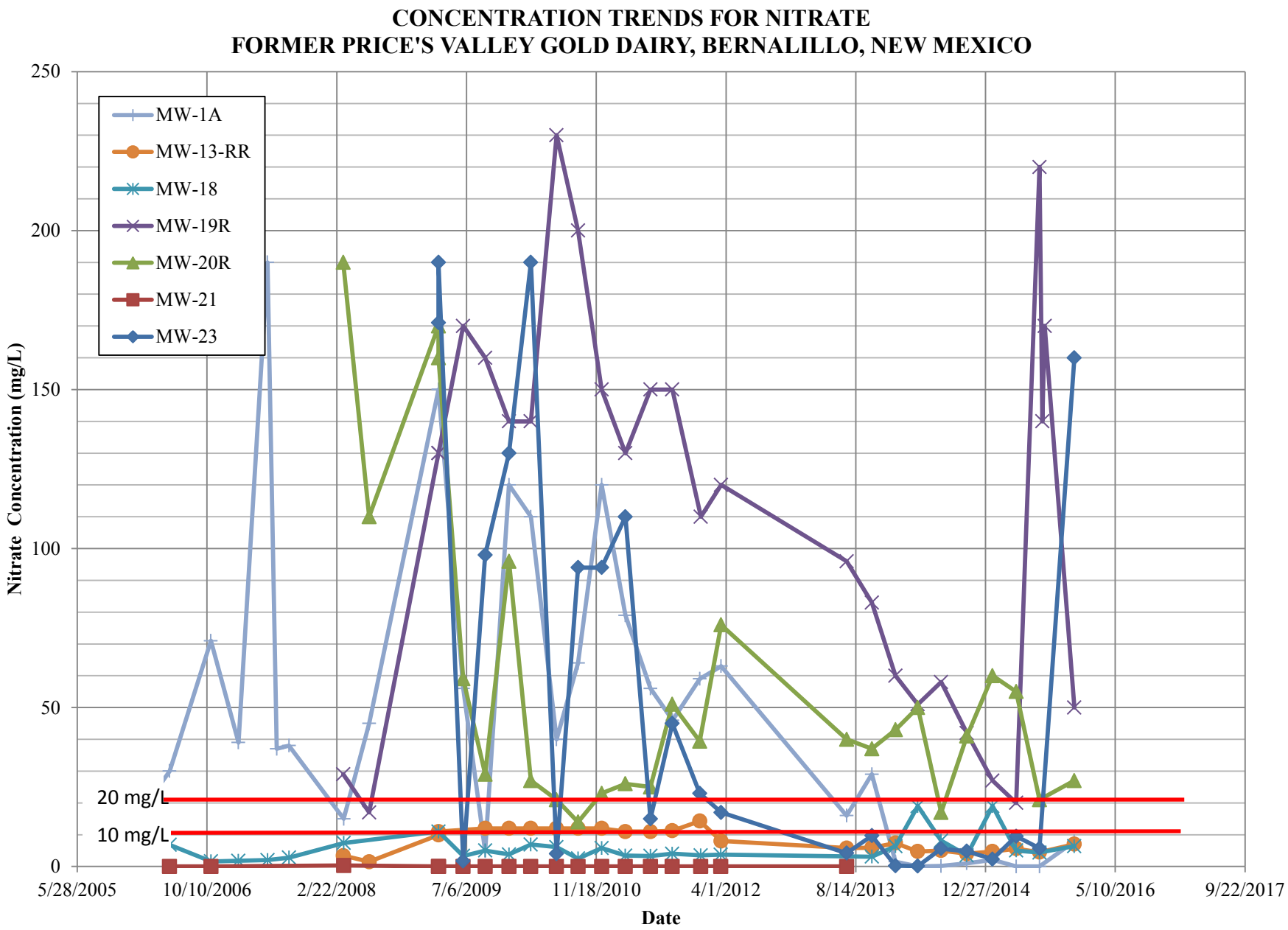
If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

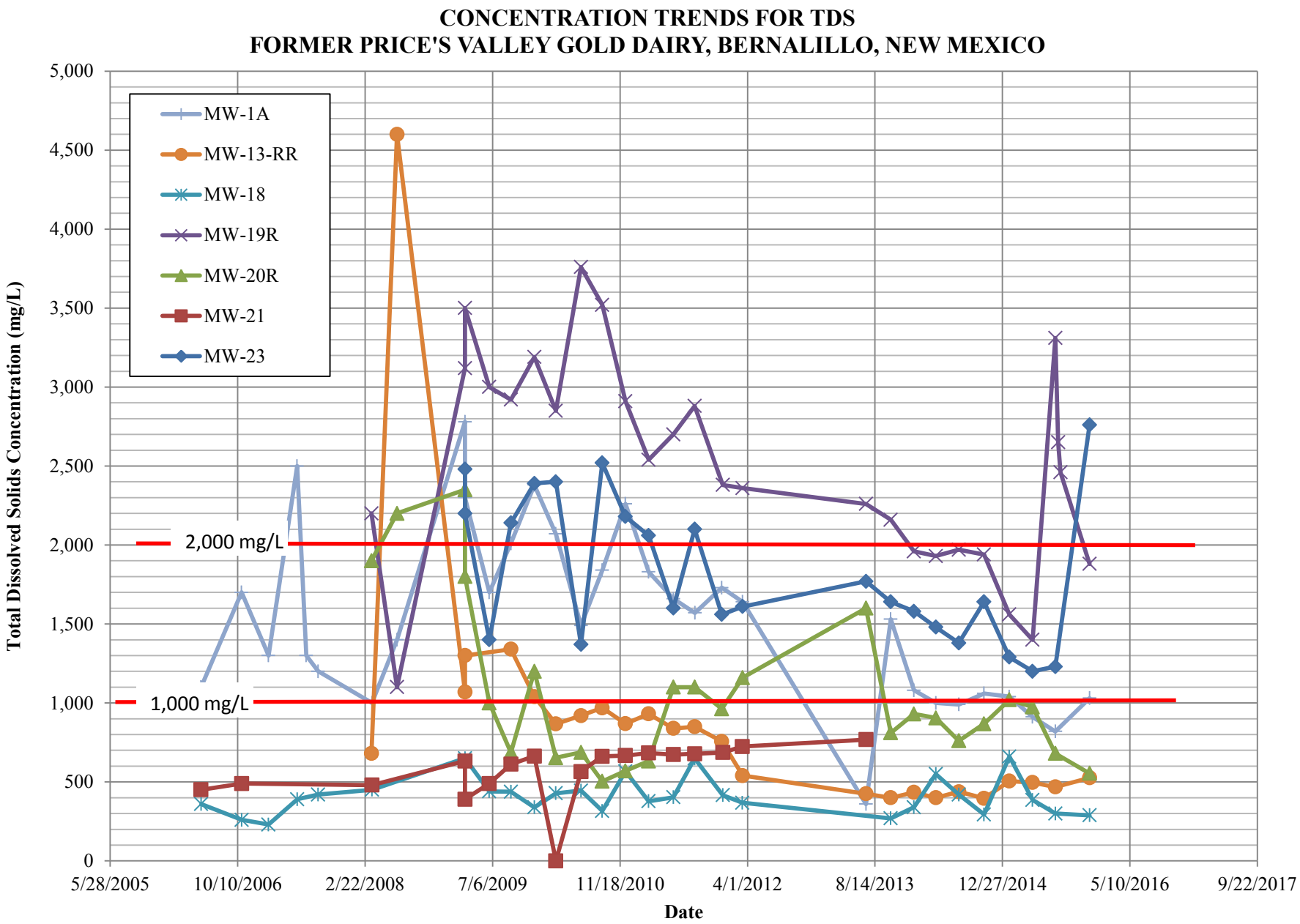
# APPENDIX C
# HYDROGRAPHS VALLEY FILL AQUIFER


HYDROGRAPH - VALLEY FILL AQUIFER
FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO
Elevation (feet above mean sea level)
5048.00
5046.00
5044.00
5042.00
5040.00
5038.00
5036.00
5034.00
5032.00
8/10/2010
2/26/2011
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
Date
MW-1A
MW-13RR
MW-18
MW-19R
MW-20R
MW-23

# APPENDIX D
# CONCENTRATION TRENDS


CONCENTRATION TRENDS FOR CHLORIDE
FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO
Chloride Concentration (mg/L)
600
500
400
300
200
100
0
MW-1A
MW-13-RR
MW-18
MW-19R
MW-20R
MW-21
MW-23
500 mg/L
250 mg/L
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
9/22/2017
Date


CONCENTRATION TRENDS FOR NITRATE
FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO
Nitrate Concentration (mg/L)
250
200
150
100
50
0
MW-1A
MW-13-RR
MW-18
MW-19R
MW-20R
MW-21
MW-23
20 mg/L
10 mg/L
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
9/22/2017
Date


CONCENTRATION TRENDS FOR TDS
FORMER PRICE'S VALLEY GOLD DAIRY, BERNALILLO, NEW MEXICO
Total Dissolved Solids Concentration (mg/L)
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
MW-1A
MW-13-RR
MW-18
MW-19R
MW-20R
MW-21
MW-23
2,000 mg/L
1,000 mg/L
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
9/22/2017
Date

# APPENDIX D

# MODIFIED STAGE 2 ABATEMENT PLAN

# AMENDED STAGE 2 ABATEMENT PLAN
# FOR THE
# PRICE'S VALLEY GOLD NORTH DAIRY SITE
# SANDOVAL COUNTY, NEW MEXICO

**Prepared For**
**VG Farms, Inc.**
**Albuquerque, New Mexico**

**Prepared By**
**METRIC Corporation**
**Los Lunas, New Mexico**

**October 2010**

## INTRODUCTION

The Price's Valley Gold North Dairy site is located on the east side of NM Hwy 528 in Bernalillo, New Mexico (FIGURE 1). A dairy was operated on the site from the late 1960's until 1998.

In February 1986 the New Mexico Environmental Improvement Division notified the Price's Valley Gold North Dairy that they were required to have a discharge plan. The dairy submitted an application in May 1986, and it was approved in July 1987. The initial samples collected from MW-1, near the dairy's East lagoon, had existing Nitrate concentrations of 43.8 mg/l in November 1986, 93.4 mg/l in February 1987 and 61.8 mg/l in December 1987 (average = 66 mg/l).

In June 1997, the New Mexico Environment Department was advised that the dairy was scheduled to be closed. As part of a site investigation conducted in June and August 1997, the New Mexico Environment Department provided guidance on the type of Corrective Action Plan it would require under the discharge permit in connection with the closure of the dairy. Initial work on the Corrective Activation Plan began in August 1997. The dairy was closed in June 1998. Beginning in October 1997, Glorieta Geoscience, Inc., Faith Engineering, Inc. and MJ Darr Consultant conducted numerous investigations and studies and developed at least three corrective action and abatement plans. The most recent corrective action, conducted during the summer of 2008, involved operating a nutrient injection system at the site. The objective of the injection system was to create a treatment wall within the aquifer which would de-nitrify the groundwater as it passed through the wall. In November 2008, METRIC Corporation was retained to conduct an independent evaluation of the historic investigation and remediation efforts at the site.

Successful remediation of any contaminated groundwater depends on five key factors. These factors are as follows:

- An accurate description of the geology and hydrology of the area.
- An accurate description of the sources of the contaminants.
- An accurate description of the horizontal and vertical extent of the contaminants in the aquifers.
- An accurate description of the movement of the contaminates in the aquifers.
- An accurate description of the fate of the contaminates in the aquifers. That is, are the contaminants subject to attenuation by processes occurring in the aquifer, or are they recalcitrant.

Any proposed remediation scheme can be judged by these factors.

## Geology

John W. Hawley, PhD, CPG #2309 with Hawley Geomatters, Albuquerque, NM was retained by METRIC Corporation to develop a geologic model of the dairy site. Dr. Hawley was furnished the available soil boring and monitoring well logs for the site. He was also furnished with historic reports, historic water level data and historic water quality data.

Dr. Hawley's geologic model of the site is presented in APPENDIX A. The model is presented in the form of ten cross sections. Referring to Sections I-I' and J-J', which are oriented along the geologic dip in the upper Santa Fe beds (USF) and are located along the north bank of Venada Arroyo, five relevant geologic formations are identified. Starting with the oldest, the upper Santa Fe (USF) consists of alternating clay and sand beds and is dipping to the southeast at about 2° to 5°.

Overlying the USF in the western part of the cross section is older axial valley fill (VAO).

Overlying the upper Santa Fe (USF) on the terrace previously occupied by the dairy, is the Los Durans Gravel (TAd). The Los Durans Gravel consists of a clean gravel to cobble layer with its base at about elevation 5057.

The younger Venada Arroyo Fill (VAy) is inset into the VAO, TAd and USF. The Venada Arroyo Fill consists of sand and gravel derived from the Venada Arroyo watershed and from the Los Durans Gravel.

The Rio Grande Valley fill (RG) overlies the Upper Santa Fe (USF) in the eastern part of the cross section. The Rio Grande Valley Fill consists of gravel, sand, and clay and has a base elevation of about 4990.

## Hydrology

Evaluation of the site geology and historic water level data indicates that there are two distinct aquifers at the site. Referring to FIGURES 1, 2 and 3, the two aquifers are identified as follows.

The older upper Santa Fe aquifer is designated the USF-aquifer, Monitoring Wells 6, 8, 9, 11, 12, 14, 15 and 19 were completed in USF aquifer. Recharge to the USF aquifer probably occurs along it's subcrop beneath the older valley fill (VAO) and Los Durans Gravel (TAd) to the west and north of the site.

The younger valley fill aquifer (designated VF aquifer) consists of the combined Venada Arroyo Fill (VAy) and the Rio Grande Valley fill (RG). The two units are hydraulically connected and exhibited an average water level elevation of about 5040. Monitoring Wells 1, 18, and 20 were completed in this aquifer. The VF aquifer is hydraulically separated from USF aquifer by a "red clay" in the upper Santa Fe as shown in FIGURE 2 and FIGURE 3. The "red clay" was identified in the logs for MW-8, 12, 15, 18, and 19.

The presence of the “red clay” in the Upper Santa Fe (USF) explains the approximate 20ft. water level difference between the VF aquifer and the USF aquifer.

Groundwater flow in the USF aquifer is to the Southeast as depicted in FIGURE 4, which represents conditions in June 2010. Hydrographs of the USF monitoring wells (FIGURE 5) indicate water levels are stable.

Regional data indicates the groundwater flow direction in the Rio Grande Valley Fill aquifer (RG) is to the south-southwest (generally parallel to the Rio Grande). Water levels presented in Glorieta Geoscience, Inc. April 1998, which included Monitoring Wells MW-1a, 2, 2a and 3 (FIGURE 1) support that point. A comparison of water levels in MW-18 and MW-1A indicates the Venada Arroyo Fill portion of the VF-aquifer is acting in a manner analogous to an estuary.

When the water levels in the Rio Grande Valley Fill aquifer rise, groundwater flows to the west in the Arroyo Fill, and when water levels in the Rio Grande Valley Fill fall, ground water flows to the east in the Arroyo Fill. Recharge to the Rio Grande Valley fill aquifer in this area comes primarily from leakage out of the Rio Grande. Recharge to the Venada Arroyo Fill portion of the aquifer (VAy) comes primarily from the Rio Grande Valley Fill and to a lesser extent from direct infiltration of stormwater into the bottom of Venada Arroyo. FIGURE 6 depicts the eastward groundwater flow direction in the VF aquifer in March 2010. FIGURE 7 depicts the westward groundwater flow direction in the VF aquifer in June 2010. Hydrographs of the VF monitoring wells (FIGURE8) show two reversals in groundwater flow direction which occurred in May and July 2010.

***Potential Sources of Nitrate in the Groundwater***

Since 1997, several potential sources of Nitrate to the groundwater have been suggested. Potential sources include the following:

- The three dairy lagoons located along the north bank of Venada Arroyo (FIGURE 1).
- The dairy corral area located on the terrace north of Venada Arroyo (FIGURE 1).
- Sewage lift stations and associated sewer pipes located southwest and northeast of the dairy corral area (FIGURE 1).
- Individual septic systems associated with housing areas located west of NM Hwy. 528 and east of the dairy corral area.
- The Town of Bernalillo wastewater treatment plant located about 1 mile southeast of the dairy corral area.

- The irrigated fields located on the Rio Grande Flood Plain south of Venada Arroyo where water from the dairy lagoons was used as irrigation water (FIGURE 1).

Based on review of the available data, it is believed that the most likely source of Nitrate to the VF aquifer near the mouth of Venada Arroyo is the dairy lagoons. Leakage from the dairy lagoons would infiltrate directly in to the VF aquifer, and Nitrate and TKN concentrations observed in the groundwater are consistent with leakage from dairy lagoons.

The most likely sources of the Nitrate observed in the USF aquifer are infiltration from the corral area and leakage from the municipal sewer pipe and lift station located on the west side of Hwy 528. Both sources are hydraulically positioned to infiltrate into the USF aquifer (FIGURE-3). In March 2009, samples from all of the existing monitoring wells were analyzed for byproducts of chlorination (tri halo methans and halo acetic acids). No such compounds were detected in significant quantities, suggesting that the municipal sewer and lift station on the west side of Hwy 528 are not significant contributors to the Nitrate observed in the USF aquifer.

Both the sewage lift station located near the northeast corner of the site and the individual septic systems located to the east of the corral area might have contributed to the Nitrate concentrations observed in the VF aquifer near the mouth of Venada Arroyo. Both sources are upgradient from the observed contamination. The lift station, however, may not have been in place long enough to have contributed.

The individual septic systems located west of NM Hwy 528 might possibly have contributed to the Nitrate in the USF aquifer. However, if they did, most of the contamination would be deeper in the USF aquifer than the depth at which the site monitoring wells are completed, due to the southeastward dip of the USF beds.

It is extremely unlikely that the discharge from the Bernalillo wastewater treatment plant has contributed to the observed Nitrate contamination, because infiltration from the Rio Grande acts as a hydraulic barrier between the wastewater treatment plant and the site.

Previous investigators (Glorieta Geoscience, Inc., April, 1998) have concluded that irrigation of the fields south of Venada Arroyo with water from the dairy lagoons did not cause significant Nitrate contamination of the groundwater.

**Extent of Elevated Nitrate in the Groundwater**

The existing concentration of Nitrate in the Upper Santa Fe (USF) aquifer prior to approval of D.P.-437 in July 1987 is not known because no monitoring wells had been installed in that aquifer by that date. The most recent groundwater monitoring, in March 2010 (TABLE 1), indicates that the WQCC numeric standard (allowable limit) for Nitrate (10 mg/l) is exceeded at three wells in the USF aquifer. These exceedences are 42 mg/l (MW-11R), 14 mg/l (MW-14R) and 18 mg/l (MW-15R).

A review of the Nitrate concentrations in MW-1 and subsequently MW-1A (its' replacement) indicates substantial temporal fluctuations in Nitrate concentrations in the VF aquifer in response to the flow in the Rio Grande, which is located to the east of the site. TABLE 2 and FIGURE 9 indicate a good correlation exists between the maximum annual monthly flow in the Rio Grande at San Felipe, NM (USGS gage 08319000) and the subsequent minimum annual Nitrate concentration in monitoring well MW-1 (FIGURE 1). The gage at San Felipe, NM is about 12 miles upstream from the project site.

Simply, when the flow in the Rio Grande is high, the groundwater in the VF aquifer in the vicinity of MW-1 (and the old dairy lagoon) flows to the west (FIGURE 7) moving the Nitrate plume with it. When the flow in the river is low, the ground water flow in VF aquifer is to the east (FIGURE 6) which moves the Nitrate plume back around MW-1. This phenomenon explains the widely fluctuating Nitrate, TDS and Chloride concentrations that have been observed at MW-1, MW-1A, MW-20, MW-20R and MW-23 during the past 23 years.

In recent years high Nitrate concentrations have been observed in MW-1A (150 mg/l), MW-19R (230 mg/l), MW-20R (190 mg/l), and MW-23 (190 mg/l). Based on the previously described hydrologic conditions the size of the Nitrate plume in the VF aquifer remains relatively constant, however the location changes with time. In years of high river flow, the plume is pushed to the west, and in years of low river flow, it moves back to the east. Current data suggests the locus of the Nitrate plume locations covers an area about 1000 feet long in the northeast/southwest direction and about 800 feet long in the northwest/southeast direction.

Based on a comparison of Nitrate concentrations at MW-2 and 2A and MW-20 and 20R, the high Nitrate concentrations in VF aquifer appear to be confined to the upper part of the aquifer.

**Movement of Nitrate in the Groundwater**

In the concentrations observed at the site, Nitrate moves as a dissolved ion with the groundwater. Thus, Nitrate in the USF aquifer will move to the southeast with the groundwater flow (FIGURE 4).

Nitrate in the VF aquifer will likewise move with the groundwater. Nitrate in the VF aquifer near the mouth of Venada Arroyo may move either eastward or westward depending on the direction of groundwater flow at the time.

**Fate of Nitrate in the Groundwater**

The primary natural process that will tend to diminish Nitrate concentrations at the site are dispersion and the associated dilution. Nitrate is not subject to significant

adsorption on soil particles, nor is it subject to chemical or biological reduction due to relatively high dissolved oxygen concentrations in the shallow groundwater.

### Effectiveness of the Injection System

A nutrient injection system was installed and operated at the site during the summer and fall of 2008. It appears the objective of the injection system was to develop an insitu treatment wall across the VF aquifer. The effectiveness of such a remediation scheme depends on two elements. First, the Nitrate contaminated groundwater must pass through the treatment wall, and second chemical or biological processes must denitrify the groundwater.

Development of a biomass within the aquifer shouild reduce the permeability of the aquifer. If the treatment wall does not extend to the base and lateral limits of the aquifer, and if there are holes in it, the groundwater will tend to flow under, around or through the wall, those being paths of lesser resistance.

Theoretically, if the contaminated groundwater passes through the treatment wall, denitrafication will occur. Too many unknowns exist to allow determination of whether or not the treatment wall has had a beneficial affect on the Nitrate in the VF aquifer, although some reduction in Nitrate mass may yet occur.

## AMENDED STAGE 2 ABATEMENT PLAN

Since the nutrient injection system operated at the site in the summer and fall of 2008 does not appear to have achieved significant reductions in groundwater Nitrate concentrations, VG Farms, Inc. has re-evaluated the available options.

### Abatement Options

The USF aquifer and the VF aquifer have been shown to be hydraulically separate. As a result, different abatement options are appropriate for each aquifer. The following options have been reconsidered:

- Continue nutrient injection
- Investigate potential off-site sources
- Pump, treat and onsite re-injection
- Substitute abatement standards
- Alternate abatement standards
- Natural attenuation
- Pump and discharge to municipal wastewater plant
- Pump and irrigate an agricultural crop

### Preferred Abatement Options

VG Farms proposes monitored natural attenuation for the USF aquifer. The Nitrate concentrations in this aquifer are generally declining, and are less than 200% of the WQCC Numeric Standards in all but one of the wells (MW-11R). If the concentration in that well drops below the 200% threshold, substitute abatement standards may be proposed in the future.

Since January 2009, V G Farms has been working with the Town of Bernalillo to develop an agreement to discharge pumped groundwater to the Town's waste water treatment plant as a means of remediating the VF aquifer. Those efforts have been unsuccessful. As a result, V G Farms proposes to remediate the VF aquifer by pumping up to four containment/remediation wells to irrigate between three and four acres of alfalfa on their remaining 7.7 acres of land known as lot 5-B (FIGURE 10).

Based on V G Farms' recent experience raising alfalfa at their South Valley farm, they expect to produce between 12 and 14 tons/acre/yr of alfalfa. According to NRCS, NM, February, 2002, alfalfa will remove 47.75 pounds of Nitrogen per ton of hay harvested. If the production is 12 tons/ac/yr and 4 ac-ft/ac/yr of irrigation water is applied, the alfalfa will fully utilize all the Nitrogen in irrigation water having up to 53 mg/l of Nitrate as Nitrogen.

An analysis of the groundwater monitoring data since March 2008 suggests the 66 mg/l Nitrate plume has an aerial extent of about 2.5 ac (APPENDIX B) and an average thickness of about 20 ft. A porosity of 40% yields a plume pore volume of about 20 ac-ft. It is estimated that the 66 mg/l Nitrate plume has an average concentration of about 135 mg/l. In order to maintain the Nitrate concentration in the pumped irrigation water at or below 53 mg/l, it will be necessary to pump about 2.5 times as much or about 50 ac-ft of water from the aquifer.

The site will accommodate two rectangular fields totaling about 3.5 ac. If 3.5 ac of alfalfa is irrigated with 4.0 ac-ft/ac/yr of water, the total pumpage would be 13.6 ac-ft/yr. Ideally, this would require about 4 yr to remove the 66 mg/l Nitrate plume.

Up to four containment/irrigation wells are proposed. Existing well RW will be utilized plus up to three additional wells. Blending of water from the wells will be used to control the Nitrate concentration of the irrigation water applied to the fields. The area to be irrigated consists of two level benches shown on Figure 10. Each bench will be surrounded by a berm to prevent surface runoff, and the irrigation water will be applied with a sprinkler system to assure uniform distribution of the water and to minimize deep percolation.

V G Farms plans to begin raising alfalfa on the approximate 3.5 ac area shown on FIGURE 10 in the spring of 2011. V G Farms does not plan to apply for or obtain a discharge permit under NMAC 20.6.2.3104 and 3106 because NMAC 20.6.2.3105 exempts irrigated agriculture from those requirements. Additionally, any deep percolation of Nitrate containing irrigation water would not contaminate any previously uncontaminated groundwater.

Nitrate concentrations in the applied irrigation water and alfalfa production will be monitored during the growing season to assure that no more than 47.75 lb of Nitrogen per ton of alfalfa harvested will be applied to the fields. As long as deep percolation is minimized, elevated TDS and Chloride in the VF aquifer will coincidently be remediated.

**Modified Monitoring Program**

The following table summarizes the proposed modified groundwater monitoring program. Monitoring frequency in the in the USF aquifer is less frequent because that aquifer exhibits very small fluctuations in water levels and water quality.

| Well | Aquifer | Water Level Frequency | Sampling Frequency |
|---|---|---|---|
| | | | |
| MW-1A | VF | Quarterly | Quarterly |
| MW-6R | USF | Annually | Annually |
| MW-8R | USF | Annually | Annually |
| MW-11R | USF | Annually | Annually |
| MW-13RR | VF[1] | Quarterly | Quarterly |
| MW-14R | USF | Annually | Annually |
| MW-15R | USF | Annually | Annually |
| MW-16R | USF | Annually | Annually |
| MW-18 | VF | Quarterly | Quarterly |
| MW-19R | VF | Quarterly | Quarterly |
| MW-20R | VF | Quarterly | Quarterly |
| MW-21 | VF | Quarterly | Quarterly |
| MW-23 | VF | Quarterly | Quarterly |
| MW-24 | VF | Quarterly | Quarterly |
| MW-25 | VF | Quarterly | Quarterly |
| MW-26 | VF | Quarterly | Quarterly |
| MW-27 | VF | Quarterly | Quarterly |
| Irrig/Cont | VF | NA | Monthly[2] |

[1]MW-13RR is completed geologically in the USF aquifer above the red clay, thus it is hydraulically connected to the VF aquifer.

[2]During the growing season only.

Shaded portions represent modifications to the presently approved monitoring program.

All samples will be analyzed for $NO_2$+$NO_3$, TKN, TDS and Cl.

**Performance Standards**

All the monitoring wells are designated compliance wells. When all monitoring wells in the USF aquifer are below the numeric standards or substitute standards as may be

approved by the NMED for Nitrate, TDS and Chloride for two consecutive years, an abatement completion report will be submitted to the NMED for that aquifer.

When all monitoring wells and containment/irrigation wells in the VF aquifer are below the allowable limit for Nitrate (66 mg/l), TDS (1000 mg/l) and Chloride (250 mg/l) for two consecutive years, an abatement completion report will be submitted to the NMED for that aquifer.

When the Secretary of the NMED notifies VG Farms, Inc. that an abatement completion report is approved, all monitoring wells in that aquifer will be plugged and abandoned in accordance with NMED and NMOSE requirements. In the case of the VF aquifer, the containment/irrigation wells will also be plugged and abandoned.

**Schedule**

V G Farms plans to begin raising irrigated alfalfa on the site in the spring of 2011, contingent upon NMOSE approval of a water rights permit and provision of temporary power by Public Service Company of New Mexico.

Annual progress reports will be submitted to the NMED for the duration of the abatement activities in each aquifer.

**Public Notice**

V G Farms believes that public notice required by NMAC 20.6.2.4108.B. has been satisfied by the previous public notice related to the December 18, 2006 Stage 2 Abatement Plan, because both plans rely on pumpage of shallow groundwater for remediation . Therefore this amended Stage 2 Abatement plan does not constitute a significant modification to the December 18, 2006 plan. The previous public notice is presented in Appendix C.

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**Appendix A**

**Hawley, J.W., January 12, 2009**

# APPENDIX A

Hawley, J. W., January 12, 2009

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# DRAFT REPORT ON THE HYDROGEOLOGIC SETTING OF THE PRICE'S VALLEY GOLD-NORTH DAIRY SITE IN AND NEAR SECTION 36, T13N, R3E, SANDOVAL COUNTY, NEW MEXICO[1]

**JANUARY 12, 2009**

[1] Prepared in cooperation with Gary A Richardson, P.E., Metric Corporation

## Introduction

This report is an independent characterization of the Price's Valley Gold-North Dairy (**PVGND**) site's hydrogeologic setting in and near Section 36, T13N, R3E, Sandoval County, NM (USGS Bernalillo 7.5 minute quadrangle). The primary study area is located at the southwestern edge of the Town of Bernalillo and along the western border of the inner Rio Grande Valley east of NM-528 and south of NM-505. The general area of interest is in the northern part of the Albuquerque Basin of the Rio Grande rift tectonic province, and includes the zone of structural transition between the Santo Domingo and Calabacillas subbasins (Hawley 1978, Keller and Cather 1994, Hansen and Gorbach 1998; Bartolino and Cole 2002; Connell et al. 2005, 2007; Connell 2008). Upper Cenozoic Santa Fe Group basin fill (Ceja Fm) and late Pleistocene to Holocene river-valley fill (Los Padillas Fm) comprise the major aquifer systems of this "alluvial-basin" (Hawley et al. 1995, Kernodle et al. 1995, Hawley and Kernodle 2000, McAda and Barrow 2002). Emphasis here is on hydrogeologic characterization of aquifers and overlying deposits in the unsaturated (vadose) zone in order to develop better geohydrologic-hydrochemical treatment strategies for remediation of any groundwater contamination that may be associated with previous operations at or near the **PVGND** site.

Key references* on the local geologic and hydrogeologic setting and related publications of a more general nature are cited at the end of the report, and include unpublished reports by consultants and State agencies on monitoring-well installation and soil-borings. More-detailed geologic interpretations are provided by the 1:24,000-scale geologic map of the Bernalillo and Placitas quadrangles (Connell et al., 1995-1998), and a new 1:50,000-scale compilation of geologic and hydrogeologic mapping in the entire Albuquerque-Rio Rancho metropolitan area (Connell, 2008).

Report Plate 1 is an index map showing locations of 1) ten schematic cross sections (Plates 2 to 4) that illustrate shallow-subsurface hydrogeologic conditions at the **PVGND** site, and 2) forty-five well- and borehole-control points used in construction of the cross sections. This map is a 1:6,000-scale enlargement of the USGS Bernalillo 7.5 minute topographic quadrangle (10 ft contour interval). Plate 1 also shows the

approximate location of the north-south trending "Venada" fault that borders the study area on the west. Section vertical exaggeration is 5x, and primary base elevation is 4,900 ft asl (about 150 ft blw the river floodplain). *Note that southward to eastward dips of Upper Santa Fe Group beds of 2° to 5.5° (Plates 2 to 4) are in the dip range inferred from geologic mapping in the general area of interest (Connell et al. 1995-1998); however, basin-fill dips at the actual **PVGND** site have never been specifically measured (due to unit burial) and may range from nearly flat to gently westward dipping.*

Additional supporting materials include general explanations (Fig. 1, Tables 1 to 3) of the basic hydrogeologic components (hydrostratigraphic units and lithofacies assemblages) of the basin-fill aquifer system illustrated on the attached schematic cross-sections (Plates 2 to 4). For example: Lithofacies-assemblage (***LFA***) units are the basic building blocks of the Santa Fe Group hydrogeologic framework. Their general attributes are illustrated and defined in Figure 1 and Table1; and their geohydrologic properties are summarized in Table 2. The major hydrostratigraphic units (**HSU**s) are subdivisions of the Upper Santa Fe Group basin fill and Rio Grande Valley fill (Fig. 2, Table 3: **HSU-USF, and HSUs-RG, VA, VAY, VAO,** and **TAd**). *See Hawley and Kernodle (2000) for more detailed discussion of hydrogeologic mapping concepts basin-fill aquifer systems throughout the Rio Grande rift province of New Mexico and Colorado. Figure 2, modified from Figure 6 in the latter report, summarizes Cenozoic chronology and correlates major lithostratigraphic and hydrostratigraphic units of the Rio Grande rift region.*

## Overview of Local Hydrogeologic Framework

The ten schematic hydrogeologic cross-sections (Plates 2 to 4) illustrate the general subsurface conditions at the **PVGND** site inferred from our hydrostratigraphic interpretations of 1) previous geologic field studies in the general area of interest, and 2) forty-five lithologic logs of monitoring wells and soil borings in the specific site area (in and adjacent to Sec. 36, T13N, R3E). Of special local interest is the location of a north-south-trending intra-rift-basin fault, here designated the "Venada" fault, located near the western edge of the study area (unnamed fault mapped by Connell (2008) that located approximately at sharp N-S to E-W bends in lower Arroyo Venada-NE¼, NW¼, Sec. 36). Inferred down-to-the-east displacement of this fault ranges from hundreds of feet offset of Pliocene **USF** beds to less than 20 feet offset of middle to upper Pleistocene **HSUs-VAO/TAd** (Connell et. al. 1995-1998; Connell, 2008, 01/2009 personal communication). As also noted in the **Introduction**, the less than 6° southward to eastward dips of **HSU-USF** beds ( schematically shown on Plates 2 to 4) are in the general dip range inferred from geologic mapping by Connell and others (1995-1998). Because unit **USF** is buried by valley-fill deposits (**HSUs-VAY. VAO, and TAd**) at all but one small outcrop at the **PVGND** site, basin-fill deformation has not been measured and may range from nearly flat to gently dipping in any direction. This inference is supported by published dip and strike measurements at Upper Santa Fe-Ceja Formation outcrops within two miles of the study area (Connell et. al. 1995-1998).

The primary aquifer systems at the site comprise 1) basin-fill hydrostratigraphic unit (**HSU**) **USF**, which is dominated by lithofacies assemblage (***LFA*** *3*; and 2) valley-fill **HSU-RG**, which is mainly ***LFA a1-2*** (Fig. 1, Tables 1 to 3, Plates 2 to 4). The basin-fill (**USF-*LFA 3***) hydrogeologic component of the regional aquifer system exhibits a

wide range in permeability. However, estimated horizontal-hydraulic conductivities ($K_h$) in the Albuquerque groundwater basin are commonly in the "moderate" range (3-30 ft/d, Table 2; Hawley and Kernodle 2000), while model-$K_h$ estimates in the **PVGND** site area are about 4 ft/d (Kernodle et al. 2005, McAda and Barrow 2002). Silty clay to sandy mudstone interbeds in ***LFA 3*** are as much as 20 ft thick, and appear to act as effective confining beds (aquitards and aquicludes) beneath much of the site area. The potentiometric surface (pressure head) in monitoring wells screened in unit **USF** is usually significantly less than local unconfined water-table elevations in **HSU-RG** of the river-valley-floor area (about 5,040 ft asl, Plates 2 to 4).

Geohydrologic/hydraulic properties of Rio Grande valley-fill hydrostratigraphic unit (**HSU-RG**) and the saturated basal part of contiguous tributary alluvium of Arroyo Venada (**HSU-VAY**) contrast markedly with those of **HSU-USF**. Estimated horizontal-hydraulic conductivities ($K_h$) are commonly in the "high to moderate" range in these valley-fill units (***LFAs a1-2*** and ***b***) throughout the northern Rio Grande Valley region (Hawley and Kernodle 2000-Table 3), with model-$K_h$ estimates of about 40 ft/d in the Bernalillo-**PVGND** site area (Kernodle et al. 1995). As noted above, the potentiometric surface in the upper unconfined aquifer system of the inner Rio Grande Valley (**HSUs RG** and basal **VAY**) is within 10 to 15 feet of the local river-floodplain surface (about 5,050 ft asl), except near major pumping centers. Valley-fill groundwater heads (about 5, 040 ft) are therefore significantly higher than those in the adjacent/subjacent confined basin-fill (**UFS**) aquifer system in most parts of the study area.

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**Table 1.** Summary of depositional settings and dominant textures of major lithofacies assemblages (***LFAs***) in basin and valley fills of the Rio Grande rift region: Santa Fe Group basin fill (***1-10***), and post-Santa Fe river-valley and basin fill (***a-c***). Modified from Hawley and Kernodle (2000)

| Lithofacies Assemblages | Dominant depositional settings and process | Dominant textural classes |
|---|---|---|
| 1 | Basin-floor fluvial plain | Sand and pebble gravel, lenses of silty clay |
| 2 | Basin-floor fluvial, locally eolian | Sand; lenses of pebble sand, and silty clay |
| 3 | Basin-floor, fluvial-overbank, fluvial-deltaic and playa-lake; eolian | Interbedded sand and silty clay; lenses of pebbly sand |
| 4 | Eolian, basin-floor alluvial | Sand and sandstone; lenses of silty sand to clay |
| 5 | Distal to medial piedmont-slope; alluvial fan | Gravel, sand, silt, and clay; common loamy (sand-silt-clay) |
| 5a | Distal to medial piedmont-slope, alluvial fan; associated with large watersheds; alluvial-fan distributary-channel primary; sheet-flood and debris-flow secondary | Sand and gravel; lenses of gravelly, loamy sand to sandy loam |
| 5b | Distal to medial piedmont-slope, alluvial fan; associated with small steep watersheds, debris-flow sheet-flood, and distributary-channel | Gravelly, loamy sand to sandy loam; lenses of sand, gravel, and silty clay |
| 6 | Proximal to medial piedmont-slope, alluvial-fan | Coarse gravelly, loamy sand and sandy loam; lenses of sand and cobble to boulder gravel |
| 6a | Like 5a | Sand and gravel; lenses of gravelly to non-gravelly, loamy sand to sandy loam |
| 6b | Like 5b | Gravelly, loamy sand to sandy loam; lenses of sand, gravel, and silty clay |
| 7 | Like 5 | Partly indurated 5 |
| 8 | Like 6 | Partly indurated 6 |
| 9 | Basin-floor-alluvial flat, playa, lake, and fluvial-lacustrine; distal-piedmont alluvial | Silty clay interbedded with sand, silty sand and clay |
| 10 | Like 9, with evaporite processes (paleophreatic) | Partly indurated 9, with gypsiferous and alkali- impregnated zones |
| a | River-valley, fluvial | Sand, gravel, silt and clay |
| a1 | Basal channel | Pebble to cobble gravel and sand (like 1) |
| a2 | Braided plain, channel | Sand and pebbly sand (like 2) |
| a3 | Overbank, meander- belt oxbow | Silty clay, clay, and sand (like 3) |
| b | Arroyo channel, and valley-border alluvial-fan | Sand, gravel, silt, and clay (like 5) |
| c | Basin floor, alluvial flat, cienega, playa, and fluvial-fan to lacustrine plain | Silty clay, clay and sand (like 3,5, and 9) |

**Table 2.** Summary of major sedimentary properties that influence groundwater-production potential of Santa Fe Group river-valley and basin fill (***LFAs 1-10***). Modified from Haase and Lozinsky (1992)

| Lithofacies | Ratio of sand plus gravel to silt plus clay[1] | Bedding thickness (meters) | Bedding configuration[2] | Bedding continuity (feet)[3] | Bedding connectivity[4] | Hydraulic conductivity (K)[5] | Groundwater production potential |
|---|---|---|---|---|---|---|---|
| 1 | High | >1.5 | Elongate to planar | >1000 | High | High | High |
| 2 | High to moderate | >1.5 | Elongate to planar | >1000 | High to moderate | High to moderate | High to moderate |
| 3 | Moderate | >1.5 | Planar | 500 to 1000 | Moderate to high | Moderate | Moderate |
| 4 | Moderate to low* | >1.5 | Planar to elongate | 100 to 500 | Moderate to high | Moderate | Moderate |
| 5 | Moderate to high | 0.3 to 1.5 | Elongate to lobate | 100 to 500 | Moderate | Moderate(l-h) | Moderate(l-h) |
| 5a | High to moderate | 0.3 to 1.5 | Elongate to lobate | 100 to 500 | Moderate | Moderate to high | Moderate to high |
| 5b | Moderate | 0.3 to 1.5 | Lobate | 100 to 500 | Moderate to low | Moderate to low | Moderate to low |
| 6 | Moderate to low | 0.3 to 1.5 | Lobate to elongate | 100 to 500 | Moderate to low | Moderate to low | Low to moderate |
| 6a | Moderate | 0.3 to 1.5 | Lobate to elongate | 100 to 500 | Moderate | Moderate to low | Moderate to low |
| 6b | Moderate to low | 0.3 to 1.5 | Lobate | <100 | Low to moderate | Low to moderate | Low |
| 7 | Moderate* | 0.3 to 1.5 | Elongate to lobate | 100 to 500 | Moderate | Low | Low |
| 8 | Moderate to low* | >1.5 | Lobate | <100 | Low to moderate | Low | Low |
| 9 | Low | >5 | Planar | >500 | Low | Very low | Very low |
| 10 | Low* | >5 | Planar | >500 | Low | Very low | Very low |

[1]High >2; moderate 0.5-2; low <0.5

[2]Elongate (length to width ratios >5); planar (length to width ratios 1-5); lobate (asymmetrical or incomplete planar beds).

[3]Measure of the lateral extent of an individual bed of given thickness and configuration.

[4]Estimate of the ease with which groundwater can flow between individual beds within a particular lithofacies. Generally, high sand + gravel/silt + clay ratios, thick beds, and high bedding continuity favor high bedding connectivity. All other parameters being held equal, the greater the bedding connectivity, the greater the groundwater production potential of a sedimentary unit (Hawley and Haase 1992, VI).

[5]10 to 30 m/day; moderate, 1 to 10 m/day; low, <1 m/day; very low, <0.1 m/day.

*Significant amounts of cementation of coarse-grained beds (as much as 30%)

**TABLE 3. Major Hydrostratigraphic Units of the Valley Gold Dairy Site Area, Sandoval County, New Mexico (See Figures 1 and 2, Tables 1 and 2, and Plates 1 to 3)**

**Post-Santa Fe Group Hydrostratigraphic Units (HSUs), and Major Lithofacies-Assemblage Components (*LFAs*)**

**RG—Los Padillas Formation** (historic to uppermost Pleistocene, Connell et al. 2007)—Pinkish-gray to grayish-brown sand, sandy pebble to cobble gravel, and silty to sandy clay; contains paleochannel, point-bar, and overbank floodplain deposits that underlie the floor of the inner Rio Grande Valley; gravel dominated by rounded quartzite and volcanic clasts; very weak to no soil development; commonly 60 to 80 ft thick in the study area, and mostly in the zone of saturation. Lithofacies Assemblages (***LFAs***) ***a1-3*** (Fig. 1, Tables 1 and 2). Correlative with **Qrp** of Connell (2008).

**VA**—Alluvium of arroyo systems tributary to the Rio Grande Valley-undivided **VAY** and **VAO** (Middle Pleistocene to Holocene). Valley-border deposits with local veneers of eolian silty sand; primarily pebbly sand to silty sand and sandy silt; usually less than 20 ft thick in the study area, and entirely in vadose (unsaturated) zone. Lithofacies Assemblage (***LFA***) ***b*** (Fig. 1, Tables 1 and 2).

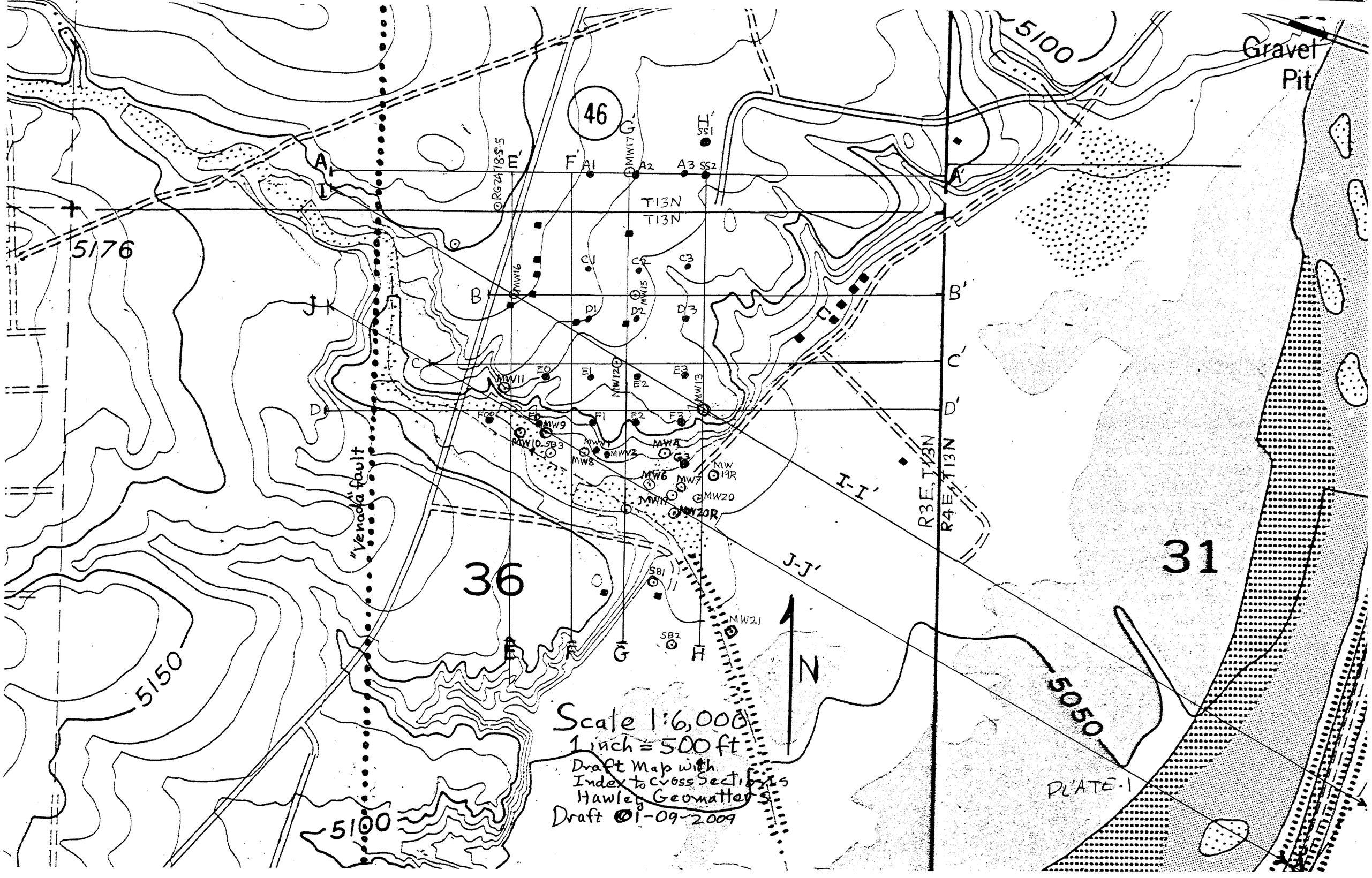
**VAY—Younger arroyo-valley alluvium** (Holocene to upper Pleistocene)—Pale- to light-brown sand, muddy sand, and pebble to cobble gravel associated with tributary streams graded to the Rio Grande (**HSU-RG**); variable quartzose-feldspathic lithology with gravel dominated by chert, volcanic, and reddish granitic clasts; weakly developed soils with stage I and II carbonate morphology (Gile et al., 1966); depositional surface as much as 10 ft above local-arroyo base level, and less than 70 ft thick in lower reaches of major tributary valleys; mostly in vadose zone, with basal beds partly saturated in valley of Arroyo Venada. Lithofacies Assemblage (***LFA***) ***b*** (Fig. 1, Tables 1 and 2). Correlative with **Qay** of Connell (2008).

**VAO— Intermediate valley-border alluvium** (upper to middle Pleistocene)—Alluvial deposits associated with geomorphic surfaces (e.g. fans and terraces) bordering the inner Rio Grande Valley and graded to ancestral- river (**HSU-TAd**) base levels. Yellowish-brown to reddish-yellow sand, muddy sand, silty clay, and pebble to cobble gravel; variable quartzose-feldspathic lithology with gravel dominated by chert, volcanic, and reddish granitic clasts; surface commonly veneered with eolian silty sand; moderately developed soils with stage II to weak stage III carbonate morphology (Gile et al., 1966); 25-100 ft above local-arroyo base level, and as much as 100 ft thick, and entirely in the vadose zone. Lithofacies Assemblage (***LFA***) ***b*** (Fig. 1, Tables 1 and 2). Correlative with **Qam** of Connell (2008).

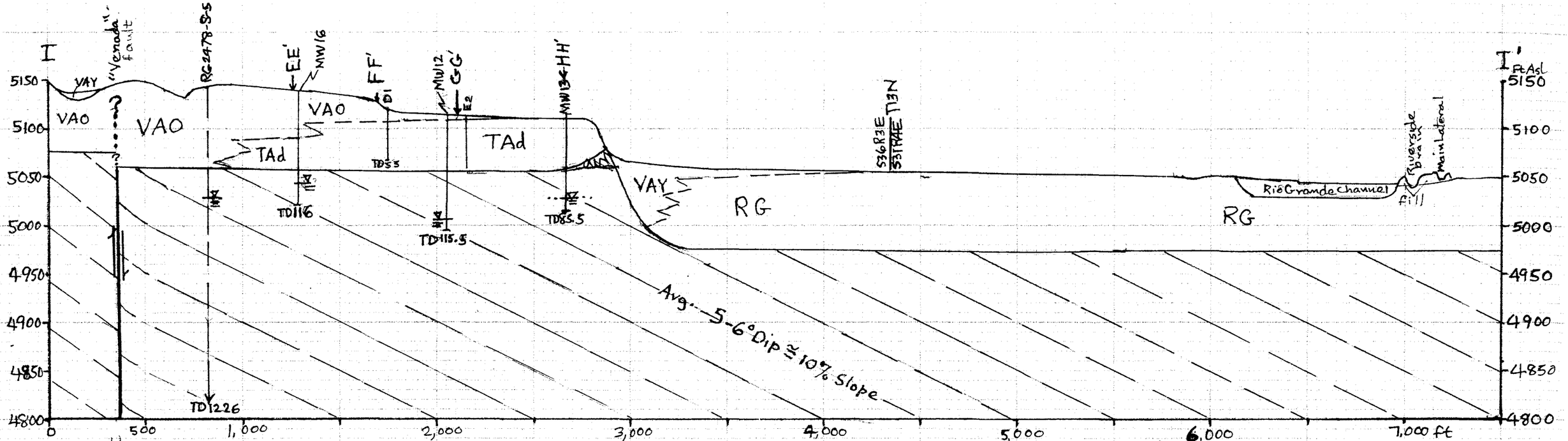
**TAd—Los Duranes Formation** (middle Pleistocene, Connell et al. 2007)—Pale-brown to light-reddish-brown sand, sandy pebble to cobble gravel, and silty to sandy clay; fluvial-terrace (channel and floodplain) deposits of the ancestral Rio Grande; gravel dominated by rounded quartzite and volcanic clasts; surface commonly veneered with eolian silty sand; moderately developed soils with stage II to weak stage III carbonate morphology (Gile et al., 1966). Terrace surface is 50-70 ft above historic floodplain base level in the study area; deposits are as much as 70 ft thick, with a minimum elevation in the 5,050 to 5,060-ft range thick and entirely in the vadose zone. Lithofacies Assemblages (***LFAs***) ***a1-3*** (Fig. 1, Tables 1 and 2). Unit intertongues with **HSU-VAO** along valley margins, and is correlative with **Qrd** of Connell (2008).

**Santa Fe Group Hydrostratigraphic Units (HSUs), and Major Lithofacies-Assemblage Components (*LFAs*)**

**USF**—Upper Santa Fe Gp **HSUs**-undivided intermontane-basin fill (Pliocene): Unit includes intertonguing distal piedmont-slope (**USF3**) and basin-floor (**USF2**) alluvium deposited prior to incision of the present valley systems of the Rio Grande and its major tributaries (e.g. Arroyo Venada). Primarily Lithofacies Assemblage (***LFA***) ***3*** (Fig. 1, Tables 1 and 2) in the study area: Interbedded reddish-brown to yellowish-red silty clay, mudstone, and weakly cemented sandstone and pebbly sandstone derived from pre-Valles caldera Jemez-Nacimiento Mountain area; variable quartzose-feldspathic lithology with gravel dominated by chert, volcanic, and reddish granitic clasts. Correlative with the Santa Ana Mesa Member of the Ceja Formation (**Tcs**) as mapped by Connell (2008) and Connell and others (1995-1998). *Major Santa Fe Group aquifer, with saturated thickness locally exceeding 1000 ft.*


46
36
31
T13N
T13N
R3E, T13N
R4E, T13N
A
A'
B
B'
C
C'
D
D'
E
E'
F
F'
G
G'
H
H'
I
I'
J
J'
A1
A2
A3
SS1
SS2
RG24
MW16
MW17
MW15
MW12
MW13
MW11
MW9
MW10
SB3
MW8
MW1
MW2
MW4
MW5
MW6
MW7
MW19R
MW18
MW20
MW20R
SB1
SB2
MW21
C1
C2
C3
D1
D2
D3
E0
E1
E2
E3
F0
F1
F2
F3
G3
5176
5150
5100
5050
"Venada" fault
Gravel Pit
N
Scale 1:6,000
1 inch = 500 ft
Draft Map with
Index to Cross Sections
Hawley Geomatters
Draft 01-09-2009
PLATE-1

# Hawley Geomatters: ~NW-SE Sections (01-09-2009 Draft)



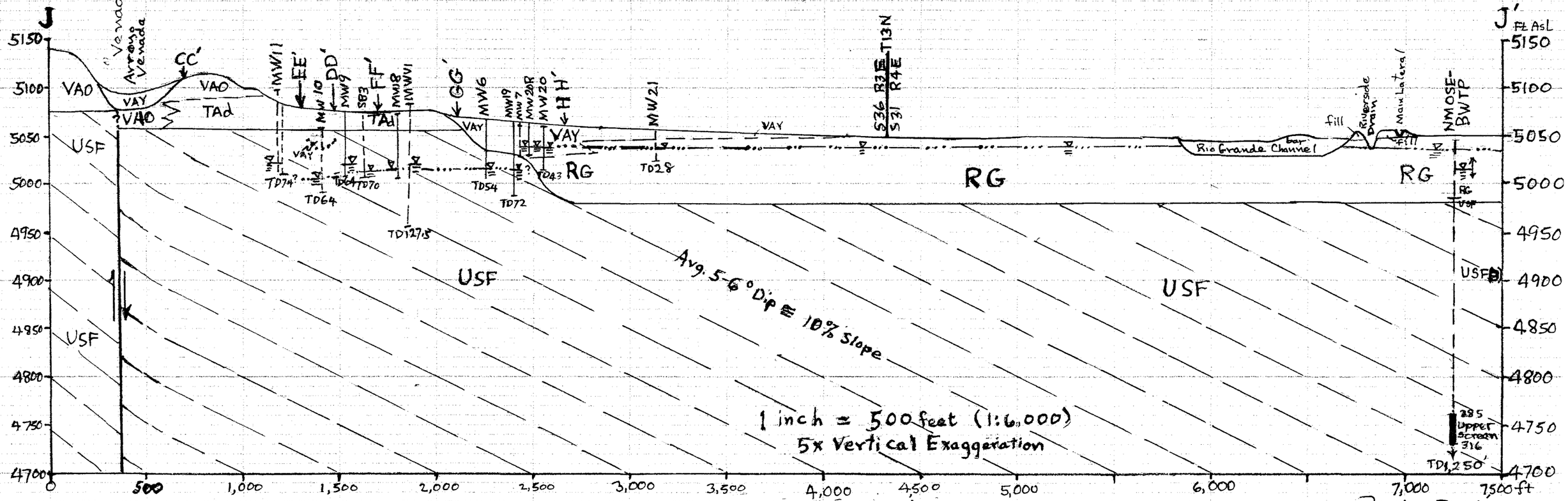
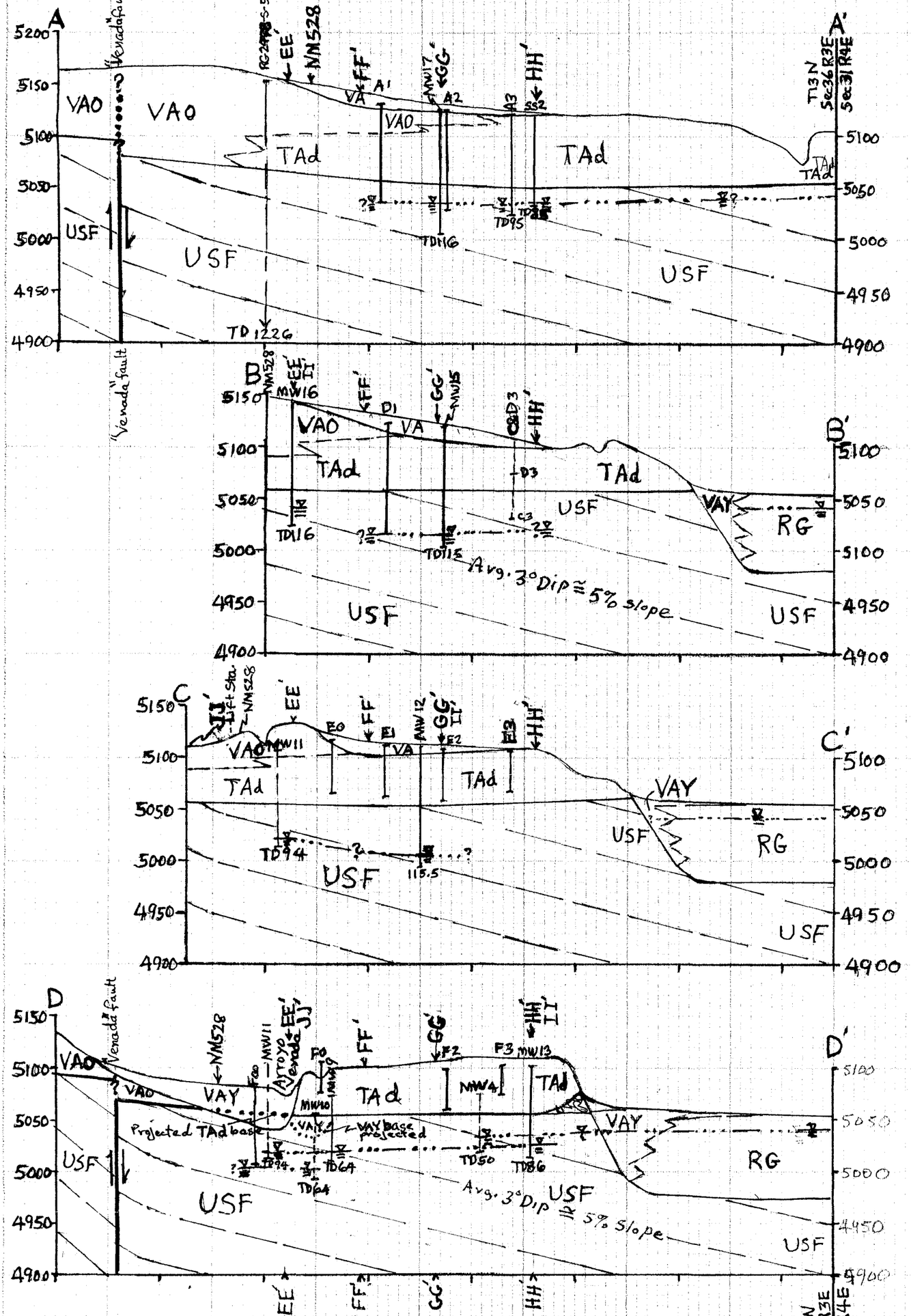




PLATE-4




1 inch = 500 feet (1:6,000)
5x Vertical Exaggeration
East-West Sections
Hawley Geomatters
01-09-2009
Draft

PLATE-2

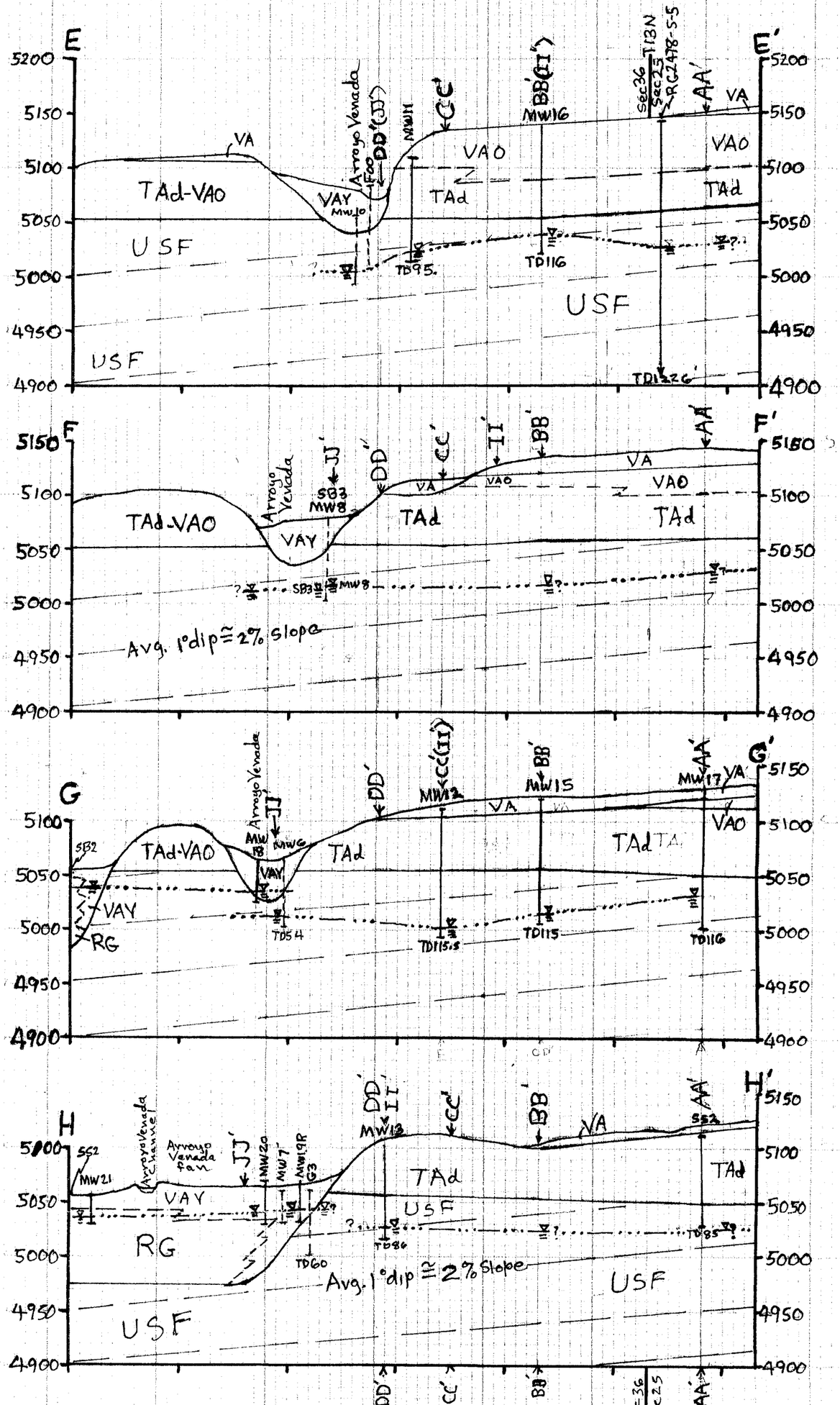

E
E'
F
F'
G
G'
H
H'
VA
VAO
VAY
TAd-VAO
TAd
USF
RG
Arroyo Venada
Arroyo Venada channel
Arroyo Venada fan
MW10
MW11
MW16
MW12
MW15
MW17
MW8
MW7
MW19R
MW20
MW21
SB3
SB2
TD95
TD116
TD126
TD54
TD115.5
TD115
TD116
TD86
TD85
TD60
Sec36 T13N
Sec25 RG24W-S-5
Avg. 1°dip ≅ 2% slope
1 inch = 500 feet (1:6,000)
3x Vertical Exaggeration
North-South Sections
Hawley Geomatters
01-09-2009
Draft

PLATE-3

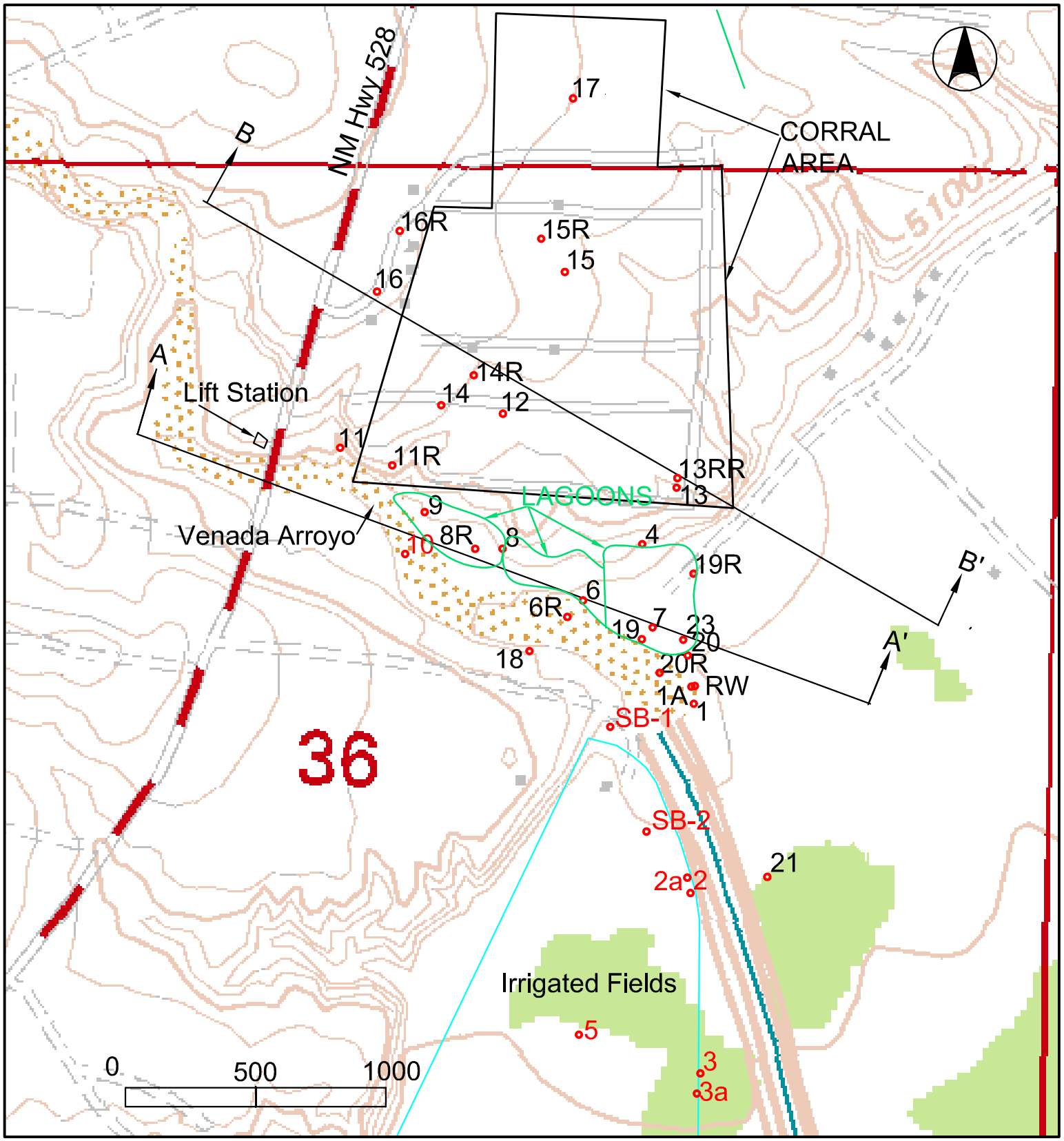



FIGURE 1

Monitor Well and Cross Section Locations

9 March 2010

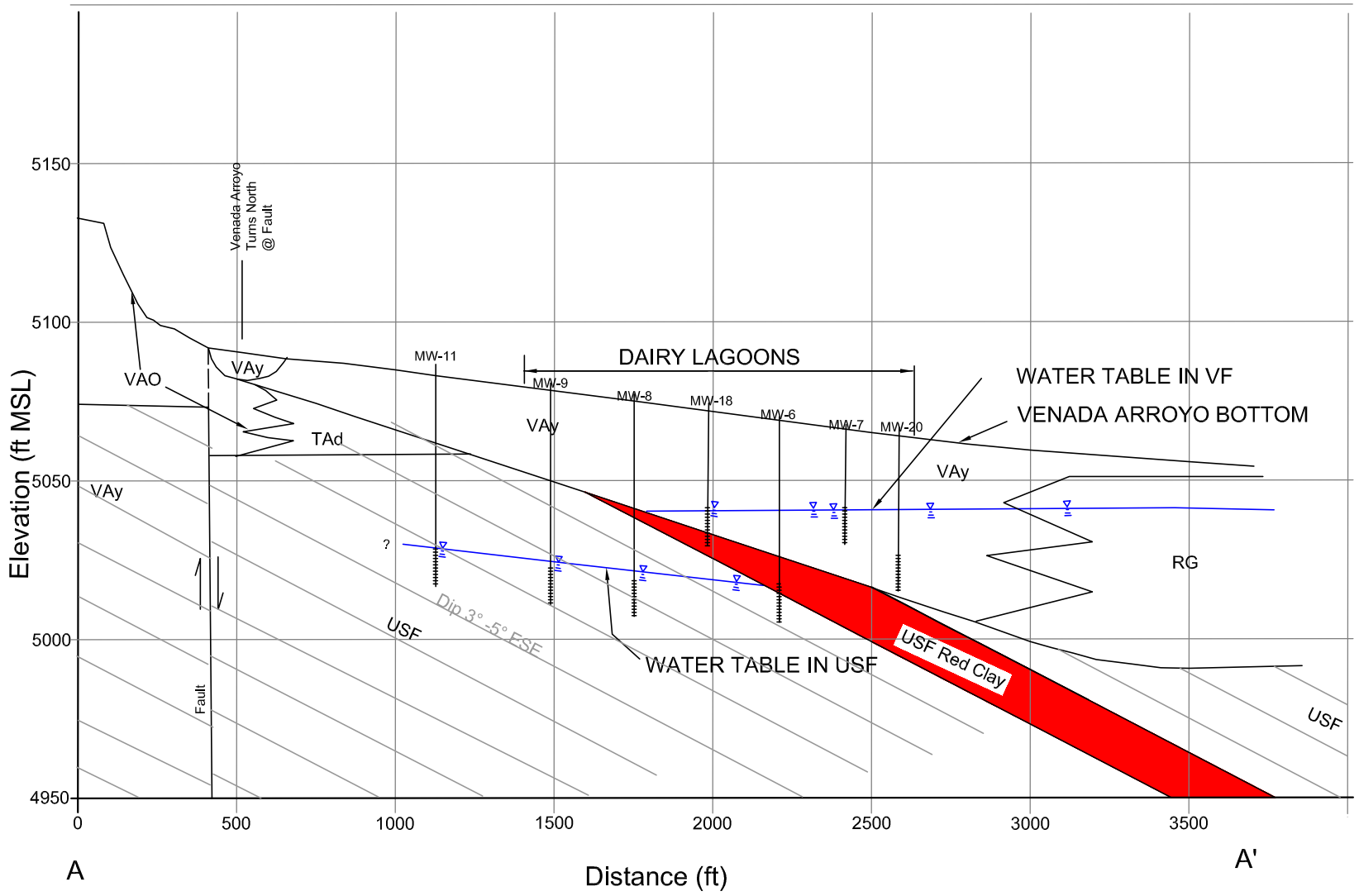



FIGURE 2
Geo-Hydrologic Section Along
Venada Arroyo

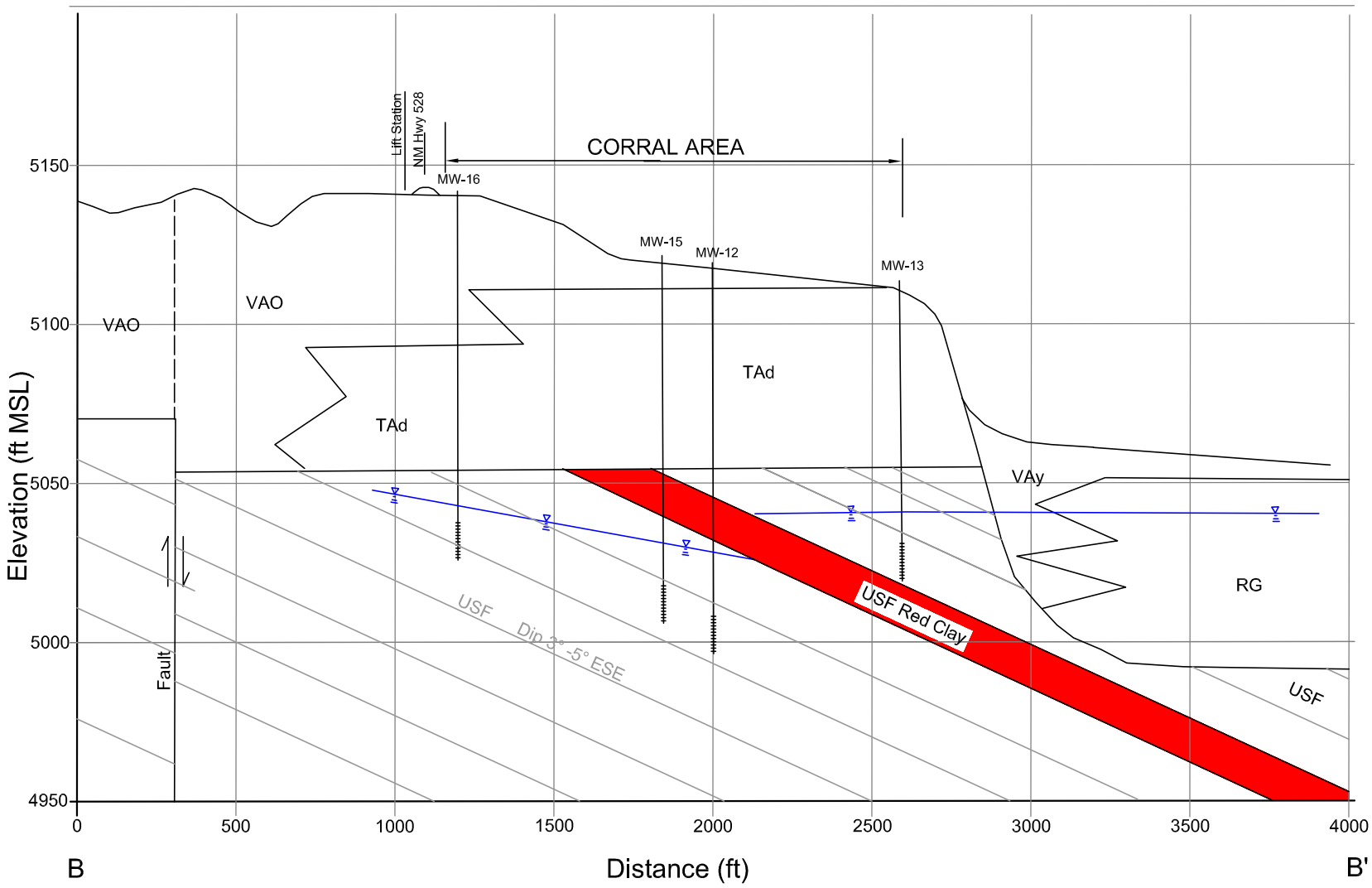



FIGURE 3
Geo-Hydrologic Section
Across The Terrace

PVGND
Hydrographs (Upper Santa Fe Aquifer)
2010

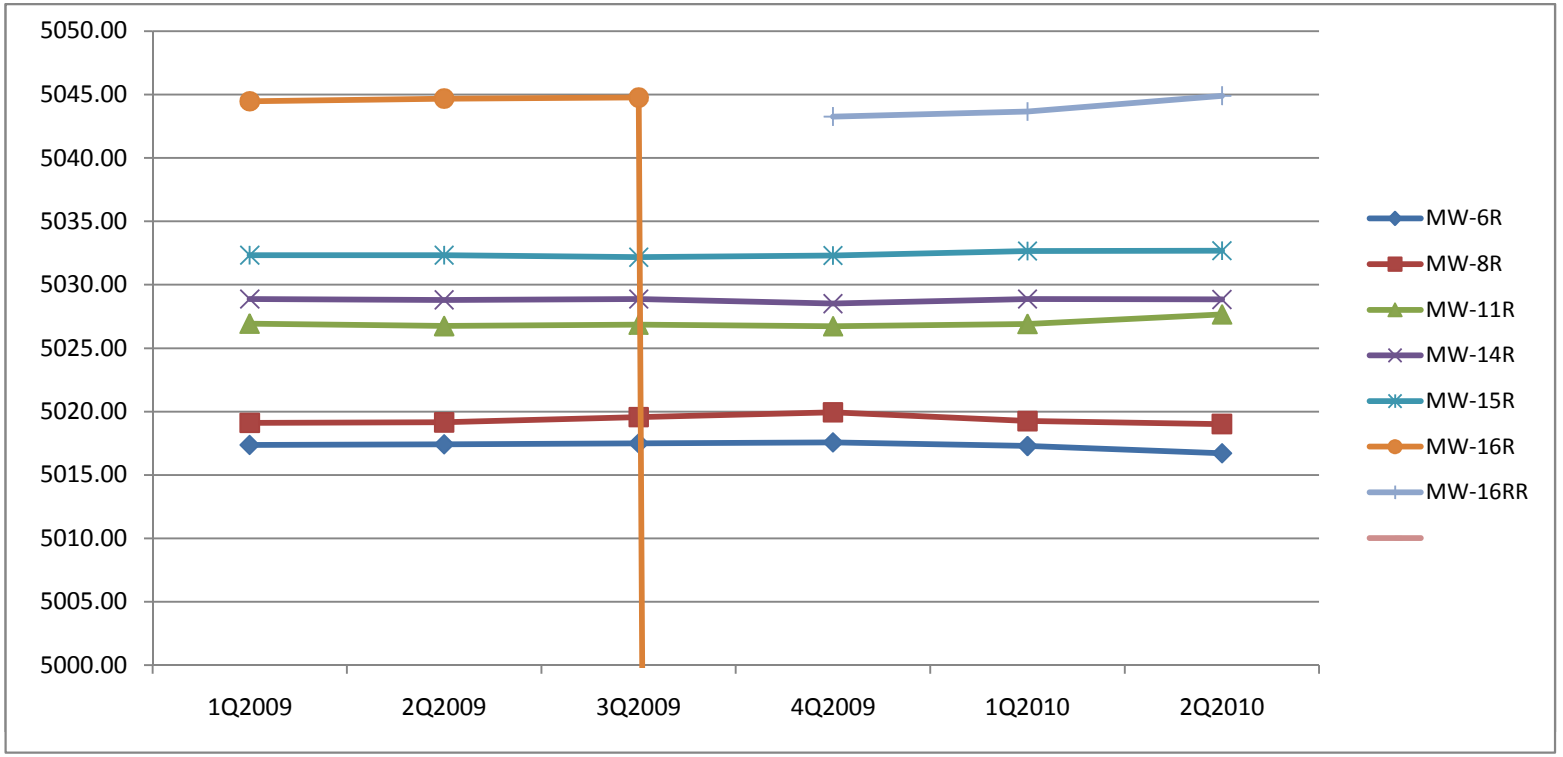



Figure 4

PVGND
Hydrograph (Valley Fill Aquifer)
August 2010

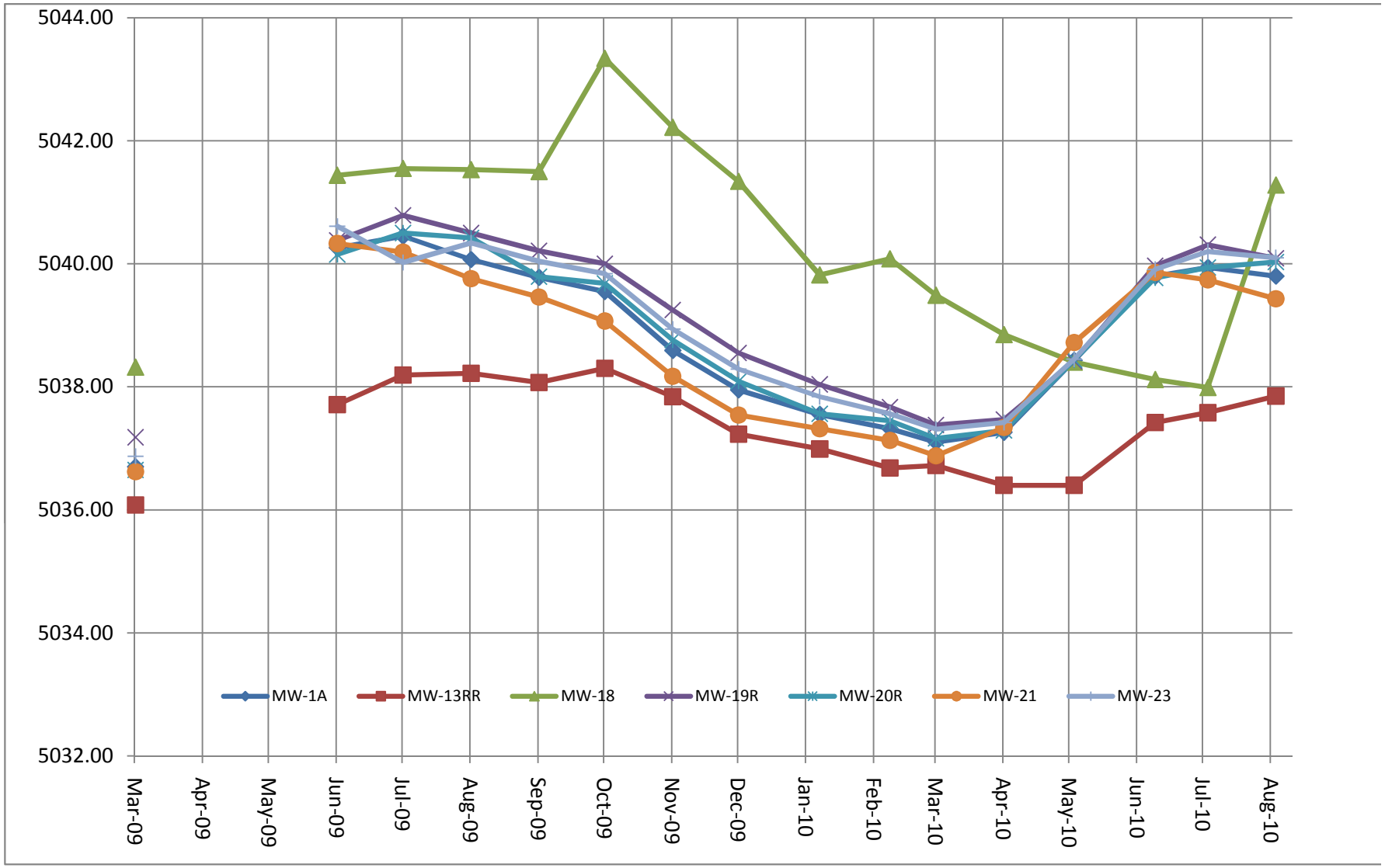
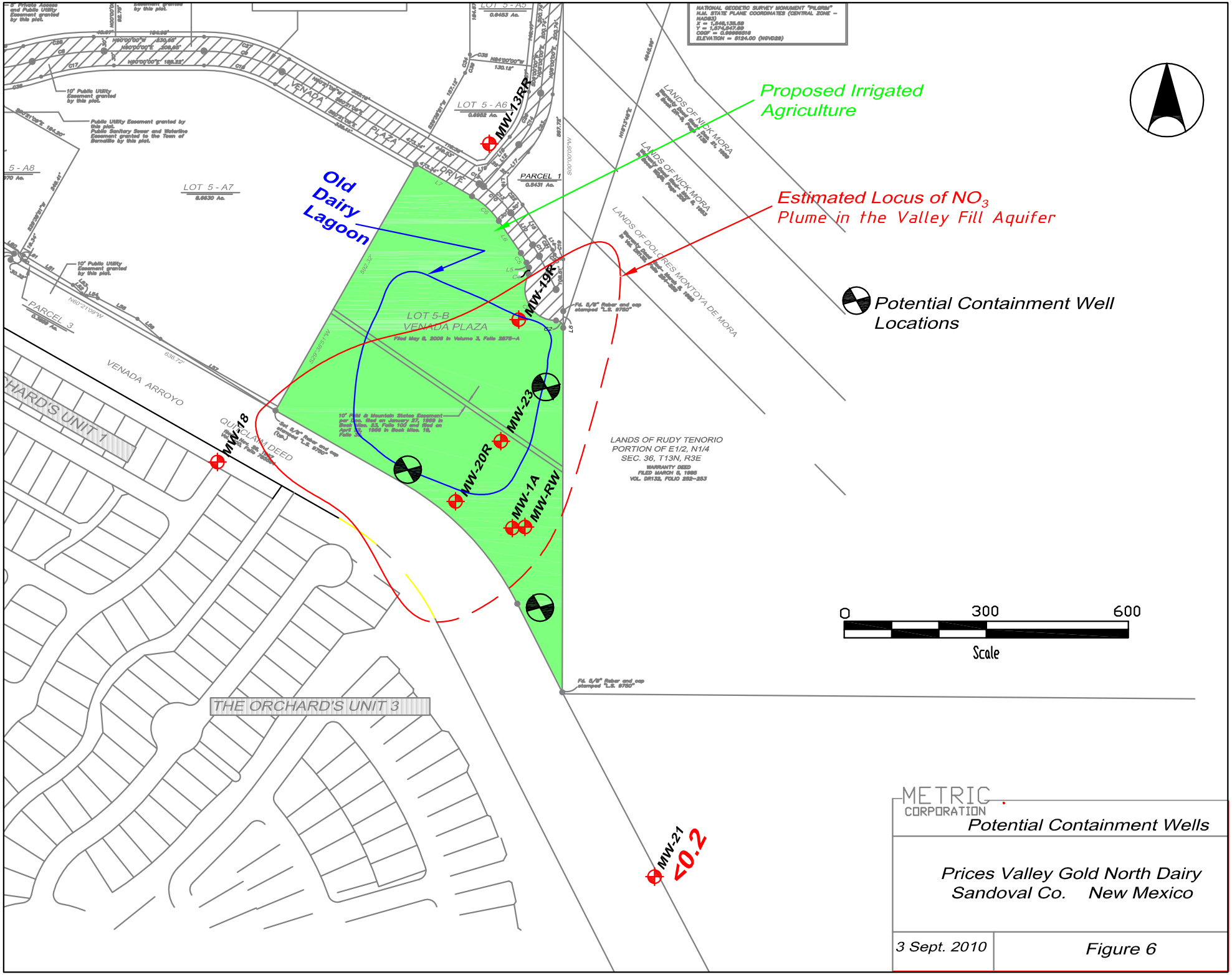



Figure 5


Proposed Irrigated Agriculture
Estimated Locus of $NO_3$ Plume in the Valley Fill Aquifer
Potential Containment Well Locations
Old Dairy Lagoon
MW-13RR
MW-19R
MW-23
MW-20R
MW-1A
MW-RW
MW-18
MW-21 <0.2
LOT 5-B VENADA PLAZA
LOT 5 - A7
LOT 5 - A6
LOT 5 - A5
PARCEL 1
PARCEL 3
VENADA PLAZA DRIVE
VENADA ARROYO
LANDS OF NICK MORA
LANDS OF DOLORES MONTOYA DE MORA
LANDS OF RUDY TENORIO
PORTION OF E1/2, N1/4
SEC. 36, T13N, R3E
THE ORCHARD'S UNIT 3
THE ORCHARD'S UNIT 1
0
300
600
Scale
METRIC CORPORATION
Potential Containment Wells
Prices Valley Gold North Dairy
Sandoval Co. New Mexico
3 Sept. 2010
Figure 6

# APPENDIX E

# UNAUTHORIZED LIFT STATION 15
# DISCHARGE RECORDS

# Lift Station #15 Spill Log

| | Date of Spill | Reported Gallons Spilled | Ref | Estimated Spill Volume | Estimates for Plotting | Accumulate Volume | Comments |
|---|---|---|---|---|---|---|---|
| 1 | 7/23/1996 | 3,000 | | | 3,000 | 3,000 | Each spill was treated with granular chlorine (HTH) |
| 2 | 3/1/1997 | 200 | 1 | | 200 | 3,200 | |
| 3 | 4/15/1997 | 100,000 | 1 | | 100,000 | 103,200 | |
| 4 | 4/20/1997 | 200 | 2 | | 200 | 103,400 | |
| 5 | 7/27/1997 | 300 | 2 | | 300 | 103,700 | |
| 6 | 8/13/1997 | 4,000 | | 45,000 - 100,000 | 45,000 | 148,700 | Venada Arroyo wet for 1500 ft - 1" of water = 46,500 gal |
| 7 | 8/14/1997 | ? | | 30,000-60,000 | 30,000 | 178,700 | Venada Arroyo wet for 900 ft |
| 8 | 8/24/1997 | 40,000-50,000 | 2 | | 40,000 | 218,700 | |
| 9 | 9/5/1998 | 35,640 | 5 | 100,000-500,000 | 100000 | 318,700 | Venada Arroyo wet 0.6 miles below LS #15 - 1" of water =98,000 gal, 6" = 550,000 gal |
| 10 | 5/7/2003 | 600-700 | 7 | | 600 | 319,300 | |
| 11 | 11/11/2003 | <5,000 | 9 | 10,000-60,000 | 10000 | 329,300 | Venada Arroyo wet 300' - 1" of water = 9,300 gal, 6"= 56,000 gal |
| 12 | 7/28/2004 | ? | 11 | | 500 | 329,800 | |
| 13 | 3/3/2005 | 2000 | 15 | | 2,000 | 331,800 | |
| 14 | 3/4/2005 | 10,000 | 20 | 10,000-30,000 | 10000 | 341,800 | Lift station out of operation for 30 minutes @ 1000 gpm = 30,000 gal |
| 15 | 5/24/2005 | 1600 | 17 | | 1,600 | 343,400 | |
| 16 | 6/1/2005 | 1000 | 21 | | 1,000 | 344,400 | |
| 17 | 8/9/2005 | 2000 | 19 | | 2,000 | 346,400 | |
| 18 | 1/28/2006 | 2000 | 24 | | 2,000 | 348,400 | |
| 19 | 1/30/2006 | 3000 | 23 | | 3,000 | 351,400 | |
| 20 | 3/24/2006 | <100 | 25 | | 100 | 351,500 | |
| 21 | 4/15/2006 | 2500 | 30 | | 2,500 | 354,000 | |
| 22 | 4/29/2006 | 500 | 31 | | 500 | 354,500 | |
| 23 | 6/14/2007 | 200 | 33 | | 200 | 354,700 | |
| 24 | 9/13/2010 | 30,000 | 39 | 150,000-1,000,000 | 150000 | 504,700 | Venada Arroyo wet all the way to the river - 1" of water =150,000 gal, 13 hrs at 2000 gpm = 1,500,000 gal |
| 25 | 9/24/2010 | 300 | 40 | | 300 | 505,000 | |

**Note: the containment area west of the lift station appears to be an unlined shallow pit. There have been over 20 spills into this area with subsequent HTH treatments.**

Pete V. Domenici, Jr.
pdomenici@domenicilaw.com

Jeanne Cameron Washburn
jwashburn@domenicilaw.com

Lorraine Hollingsworth
lhollingsworth@domenicilaw.com

Reed Easterwood[1]
reasterwood@domenicilaw.com
Law Clerk, Licensed to practice law in [1]OR

**DOMENICI LAW FIRM, P.C.**
ATTORNEYS AT LAW
320 Gold Avenue SW, Suite 1000
Albuquerque, New Mexico 87102-3228
-
(505) 883-6250 Telephone
(505) 884-3424 Facsimile

June 30, 2011
**VIA FAX AND US MAIL**

City of Rio Rancho,
Public Works Department,
**ATTN**: Lisa Vornholt, or
current Director
3200 Civic Center Circle NE
Rio Rancho, NM 87124
Tel 505-891-5016
Fax 505-891-5203

**Public Records Request**

Dear Director:

Pursuant to the *Inspection of Public Records Act*, NMSA 1978 § 14-2-1 et seq., the Domenici Law Firm requests any and all records of spills regarding the City of Rio Rancho sewer lift station # 15 located west of New Mexico state road 528 adjacent to the Venada Arroyo. Any records responsive to this request include any spills associated with past, existing, or future locations of the City of Rio Rancho sewer lift station # 15.

We understand reasonable fees for copying may be assessed and we also are willing to accept responsive documents in electronic format if available. Please **stop** work on this request and advise me if copy or other fees to execute this request exceed $150.00.

Thank you for your attention.

Sincerely,
**Domenici Law Firm, P.C.**

Reed Easterwood, legal assistant

cc: file 2036//client

RioRancho
City of Vision

July 15, 2011

Reed Easterwood
Domenici Law Firm
320 Gold Ave SW.
Suite 1000
Albuquerque, NM 87102

Re: Inspection of Public Record Request

Mr. Easterwood on June 30, 2011 you submitted an inspection of public records request regarding sewer lift station #15. The requested documents are available for inspection. Please contact our office at (505) 891-5004 to set up a time to view.

Thank you,

Yolanda Lucero
Records Technician
City Clerks Office
3200 Civic Center Cir NE
Rio Rancho, NM 87144
(505) 891-5004

# Appendix C

NMED Corrective Action Reports Approval
November 10, 1997 Correspondence

*State of New Mexico*
*ENVIRONMENT DEPARTMENT*
*Harold Runnels Building*
*1190 St. Francis Drive, P.O. Drawer 26110*
*Santa Fe, New Mexico 87502-0110*
*(505) 827-2855*
*Fax: (505) 827-2836*

*GARY E. JOHNSON*
*GOVERNOR*

*MARK E. WEIDLER*
*SECRETARY*

Reviewed
12-16-97

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

November 10, 1997



Gary Rose, General Manager
ECO Resources, Inc.
P. O. Box 15940
Rio Rancho, NM 87174

RE: Corrective Action Reports Approval, City of Rio Rancho

Dear Mr. Rose:

The Ground Water Pollution Prevention Section of the New Mexico Environment Department (NMED) has received the Corrective Action Reports for the five sewage spills that occurred on March 1, April 15, April 20, July 27, and August 24 of 1997. The Corrective Action Reports are hereby approved pursuant to the New Mexico Water Quality Control Commission (WQCC) Regulations, Section 1203.A.7.

The spill incidents along with the response actions taken by the City of Rio Rancho are briefly described as follows:

1. A sewage spill of approximately 200 gallons occurred on March 1, 1997, due to an over flowing manhole located on Villa Verde Drive. The spillage was caused due to a blockage in the collection line caused by accumulation of roots and grease. Response actions for the spill included using a VACTOR truck to vacuum the collection line and spreading granular chlorine on the spillage.

2. A 10 inch sewer line which conveys raw sewage between lift station #2 and lift station #10 developed an 18 inch split on the side causing approximately 100,000 gallons to spill into the Black Arroyo on April 15, 1997. The break occurred at the intersection of Southern Boulevard and Nicklaus Drive. Response actions for the spill included replacement of the four foot section of the damaged pipe with a new section and spreading granular chlorine along the spill (350 yards) . Three soil samples were collected from three different depths from two locations on the spillage area. One of the sampling locations was the site

immediately next to the force main break and one downstream from the break in the arroyo. The soil samples were analyzed for total kjeldahl nitrogen, ammonia, nitrate as nitrogen and nitrite as nitrogen. The analytical results indicate that surface soils at the two sites were impacted by the spill to a depth of 10.3 feet. The concentration of total nitrogen at the depth of 10.3 feet in the sample collected immediately next to the force main break was 76 milligrams per kilogram. The concentration of total nitrogen at the depth of 10.3 feet in the sample collected downstream from the break in the arroyo was 29 milligrams per kilogram. However, no additional correction actions are being required at this time as NMED does not believe that the spill will be a considerable threat to ground water.

3. A sewage spill of approximately 200 gallons occurred at 2345 Southern Boulevard on April 20, 1997, due to a blockage in the manhole. The blockage was cleared using a VACTOR truck and the spill was disinfected. Immediately after cleaning the first spill, another backup of sewage was reported at 2006 Southern Blvd-Garden Plaza in which 300 to 400 gallons of sewage was spilled onto the ground. The sewer blockage was caused due to chunks of concrete and asphalt that fell in when Hale Construction Company crew broke out the manhole cover and ring to lower the grade of pavement. Response actions for the spill included disinfection with granular chlorine and cleaning the blockage using the VACTOR truck.

4. A sewage spill of approximately 300 gallons occurred at lift station #12 due to tripping of all the pumps on July 27, 1997. Response actions for the spill included resetting all pumps, using a VACTOR truck to pump the ponded sewage and disinfection with granular chlorine.

5. A sewage spill of approximately 40,000 to 50,000 gallons occurred at lift station #15 on August 24, 1997, due to lack of power which may have been caused by shorting of the phase-monitor or inadequate wiring. Sewage spilled onto the ground and into the Berrendo Arroyo. Response actions for the spill included restoring power to the lift station and disinfection with granular chlorine down the entire length of spillage (1500 yards east of Highway 528 within the arroyo) and discing of contaminated soil. The lift station was constructed by AMREP Corporation and there has not been a transfer of ownership to the City of Rio Rancho. Until the discrepancies over ownership can be resolved, a Radio Transmitter unit (RTU) will be installed to sound an alarm if failure occurs at the lift station.

Additional corrective actions may be required if ground water contamination occurs as a result of the described spills, or if additional information becomes available indicating that the proposed corrective actions are inadequate.

NMED is concerned about the volume and frequency of spills from the Rio Rancho sewer system. Please provide NMED with an update of your February 21, 1997 letter and the actions taken to date to prevent future spills. If you require any further information or wish to discuss this further, please

feel free to contact Kavitha Casula of my staff at (505)-827-0629.

Sincerely,

Marcy Leavitt, Chief
Ground Water Quality Bureau

ML:KC/kc

xc: Lloyd W. Bartels, NMED District I, Manager
Nora Romero, Environmentalist, District I, Rio Rancho
Michael S. Castillo, AMREP SOUTHWEST INC., 333 Rio Rancho Dr. NE, Rio Rancho, NM 87124

ST. 04143

copy:
DT
NA
HO
12-16-97

# Appendix D

Lift Station #15 Overflow
September 9, 1998 Notification

Marchell Schulman, Permit Specialist
UIC Program, Ground Water Specialist
State of New Mexico Environment Department
1190 St. Francis Dr. - Harold Runnels Building
Sante Fe, New Mexico 87502

September 9, 1998

**Re : Sanitary Sewer Spillage**

**Location : Lift Station # 15 Hwy 528**

Dear Marchell,

As required by discharge plan 215, Systems Maintenance shall provide notification of all wastewater seeps, spills, and / or leaks located within the City of Rio Rancho operating area. This letter provides notice that on September 5, 1998 at approximately 2 pm, the manhole containing the pumps located at Lift Station # 15 overflowed, 35,640 gallons of raw sewage to run into the arroyo adjacent to Price's Dairy Inc. The following description provides details regarding the spill for your information:

**Date :** 9-05-98 **Time :** 2 pm **Duration :** 10 hours

**Estimated Volume :** 35,640 gallons raw sewage (no solids observed)

**Cause:** The SCADA System at WWTP # 2 showed a data failure at lift station # 15, which caused a no power condition. The pumps didn't come on. The data failure was not responded to by the operator. There was no common alarm page. The manhole containing the wet well did not overflow. The cause of the leak appears to be a faulty seam at approximately 8 feet down in the wet well. The crack in the seam filtered all solids, which allowed the solids to be contained within the wet well. The lift station battery back-up failed.

**Environmental Impact :** The sewage spilled into the arroyo, from the northwest side of lift station, down through the 3 section box culvert (concrete bottom), east down the SCAFCA channel for approximately .6 miles. There were some small areas of water ponding noted near the spill sight in the arroyo.

**Mitigation :** HTH was spread along the effected area of the sewage spill for disinfection.

**Corrective Actions :** The construction of this lift station should be re-evaluated to resolve any future problems with this lift station that may arise. It has been the center of controversy for some time. The ownership of this lift station has not yet been established with either the City of Rio Rancho Utilities Department or Amrep Southwest Development Corp.

If you need any additional information, please contact myself or Chris Valdez, Assistant Manager at 505 891-1225.

Sincerely,

WYATT MISENHEIMER
SENIOR OPERATOR

cc: file
M. Lail, Manager, STE
L. Webb, Director of Water Resources, City of Rio Rancho
N. Romero, District 1 Field Office
USEPA

# Appendix E

Lift Station #15 Overflow
May 12, 2003 Notification

# City of Rio Rancho

3900 Southern Blvd. SE • PO Box 15550
Rio Rancho, New Mexico 87174-0550
(505) 891-5019 • Fax (505) 891-5201

DEPARTMENT OF
UTILITIES

Jim Owen
Mayor

Acting City Administrator
Ed Chismar

Director of Utilities
Larry W. Webb


May 12, 2003

Kurt Frischkorn, Geo-Scientist
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Dr./ P.O. Box 26110
Santa Fe, NM 87502

**RE: Lift Station #15 force main – Air Vacuum valve leak**

Dear Kurt,

On Wednesday May 7, 2003 at approximately 1:30 p.m. we received a call from the Systems Maintenance department with a report of a leak from the force main discharge line of Lift Station #15. The collections crew was immediately dispatched to the site to further investigate and begin remediation.

Upon arrival, it was found that the leak was coming out of a manhole-covered vault approximately 2500 feet north of the lift station along the force main. When the manhole cover was removed, the leak was observed to be coming out of an air-vacuum (air-vac) relief valve. To facilitate repair of the leak, the lift station was turned off at the control panel with an on-site operator to monitor wetwell levels and control discharge from lift station. The VACTOR truck was then staged to remove the standing water from the air-vac vault and then inlet gate valve to the air vac was closed to stop the leak. The air-vac unit was noted to be defective internally and is scheduled for repair/replacement as soon as possible. The gate valve will remain closed until the air-vac repair is made to prevent any further spillage from the site.

Based on the extent of the spillage site, it is believed that no more than 600-700 gallons of sewage was discharged from the faulty air-vac unit. The area was disinfected with granular chorine as required and any standing liquid was picked up with the VACTOR for discharge back into the collection system. After cleanup of site, all controls of lift station and collection system were put back into normal operation with no further problems to report.

Please contact me at 896-8810 with any further questions in this regard.

Sincerely,

Rock Raiford, Project Manager
OMI, Inc.

C: Larry Webb, Director of Utilities, City of Rio Rancho
Chuck Morgan, Environmentalist, NMED District I
Nick Apodaca Jr., Operations Manager-Wastewater
Jeff Burkett, Operations Supervisor – Wastewater

# Appendix F

Lift Station #15 Overflow
November 18, 2003 Notification

# City of Rio Rancho

3900 Southern Blvd. SE • PO Box 15550
Rio Rancho, New Mexico 87174-0550
(505) 891-5019 • Fax (505) 891-5201

DEPARTMENT OF UTILITIES

Jim Owen
Mayor

City Administrator
James M. Palenick

Director of Utilities
Larry W. Webb


November 18, 2003

Kurt Vollbrecht, Geologist
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Dr./ P.O. Box 26110
Santa Fe, NM 87502

**RE: Sanitary Sewer Overflow – Lift Station #15**

Dear Kurt,

On Tuesday November 11th, at approximately 5:00 p.m. we received alarms for Lift Station (LS) #15. The Maintenance and Collection crews were immediately dispatched to the site to further investigate and begin remediation as necessary.

Upon arrival, it was noted that the lift station was close to overflow. A six thousand gallon tanker truck and a four thousand gallon tanker truck were used to help keep the LS wet well from overflowing excessively. However, since the incident occurred during a high inflow period, some of the sewage began to overflow its wetwell containment. During this same time, maintenance personnel were able to identify that the Lift Station was receiving no incoming power from PNM Electric Company. PNM was immediately contacted to provide a crew to check their power transformers and supply power. PNM indicated that their emergency crew would be dispatched to the site.

In order to establish emergency power with the portable generator, the tanker trucks were removed from the immediate area to allow generator tie-in. Once the generator was tied in, emergency power was initiated for the pumps to operate and pump the wetwell level down. Once the LS was under control with emergency power, the extent of the spillage area was determined and disinfected with granular chlorine.

The emergency crew from PNM arrived on site at approximately 8:00 p. m. The crew determined that two fuses on a transformer poll, which feeds the LS, were burnt out. The fuses were replaced and power was restored to the LS at approximately 8:30 p.m. The LS was found to be in good operational order before leaving the site.

Based on the extent of the spillage site, it is believed that <5000 gallons of sewage was lost from the overflowing LS. The overflowing sewage flowed into the Berrendo Arroyo, which is adjacent to the LS, and with its reach extending no more than approximately 100 yards East of Highway 528.

Please contact me at 896—8810 with any further questions in this regard.

Sincerely,

Paul Romero

Paul Romero, Acting Project Manager
OMI, Inc.

C: Larry Webb, Director of Utilities, City of Rio Rancho
Alex Puglisi, Environmental Office, Pueblo of Sandia
Chuck Morgan, Environmentalist, NMED District I
Nick Apodaca Jr., Operations Manager, OMI
Jeff Burkett, Operations Supervisor, OMI
Nora Romero, Compliance Officer, OMI

FILE COPY



Official Correspondence

# Appendix G

Lift Station #15 Overflow
July 28, 2004 Notification

# City of Rio Rancho

3900 Southern Blvd. SE • PO Box 15550
Rio Rancho, New Mexico 87174-0550
(505) 896-8715 • Fax (505) 891-5201

DEPARTMENT OF UTILITIES

Jim Owen
Mayor

City Administrator
James M. Palenick

Director of Utilities
Larry W. Webb


July 28, 2004

Certified No. 7002 2030 0003 3224 8653

Kurt Vollbrecht, Geologist
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Dr./ P.O. Box 26110
Santa Fe, NM 87502

**RE: Sanitary Sewer Overflow – Lift Station #15**

Dear Kurt,

On Friday July 23, at approximately 1800 hours, there was a power outage due to severe rain and thunderstorms that affected nearly the entire City of Rio Rancho. On call personnel were immediately dispatched to check all lift stations and the three major wastewater facilities. We managed to avoid spills at all lift stations except Lift Station #15 which is located on Highway 528, two miles south of Enchanted Hills. Tanker trucks were used to pump the lift station down, it is estimated that no more then 500 gallons of sewage was lost.

If you have any questions I can be reached at 896-8810.

Sincerely,

David Sohns, Project Manager
OMI, Inc.

C: Chuck Morgan, Environmentalist, NMED District I
Alex Puglisi, Pueblo Sandia
Jim Owen, Mayor, City of Rio Rancho
James Palenick, City of Rio Rancho Administrator
Larry Webb, Director of Utilities, City of Rio Rancho
Jeff Burkett, Operations Manager-Wastewater, OMI
Nora Romero, Compliance Officer, OMI

FILE COPY

Offical Correspondence
2004

# City of Rio Rancho

3900 Southern Blvd. SE • PO Box 15550
Rio Rancho, New Mexico 87174-0550
(505) 891-5019 • Fax (505) 891-5201

DEPARTMENT OF UTILITIES

Jim Owen
Mayor

City Administrator
James M. Palenick

Director of Utilities
Larry W. Webb


November 18, 2003

Kurt Vollbrecht, Geologist
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Dr./ P.O. Box 26110
Santa Fe, NM 87502

**RE: Sanitary Sewer Overflow – Lift Station #15**

Dear Kurt,

On Tuesday November 11th, at approximately 5:00 p.m. we received alarms for Lift Station (LS) #15. The Maintenance and Collection crews were immediately dispatched to the site to further investigate and begin remediation as necessary.

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Based on the extent of the spillage site, it is believed that <5000 gallons of sewage was lost from the overflowing LS. The overflowing sewage flowed into the Berrendo Arroyo, which is adjacent to the LS, and with its reach extending no more than approximately 100 yards East of Highway 528.

Please contact me at 896—8810 with any further questions in this regard.

Sincerely,

Paul Romero

Paul Romero, Acting Project Manager
OMI, Inc.

C: Larry Webb, Director of Utilities, City of Rio Rancho
Alex Puglisi, Environmental Office, Pueblo of Sandia
Chuck Morgan, Environmentalist, NMED District I
Nick Apodaca Jr., Operations Manager, OMI
Jeff Burkett, Operations Supervisor, OMI
Nora Romero, Compliance Officer, OMI

# City of Rio Rancho

3900 Southern Blvd. SE • PO Box 15550
Rio Rancho, New Mexico 87174-0550
(505) 891-5019 • Fax (505) 891-5201

Jim Owen
Mayor

Acting City Administrator
Ed Chismar

Director of Utilities
Larry W. Webb

DEPARTMENT OF
UTILITIES


May 12, 2003

Kurt Frischkorn, Geo-Scientist
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Dr./ P.O. Box 26110
Santa Fe, NM 87502

**RE: Lift Station #15 force main – Air Vacuum valve leak**

Dear Kurt,

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Based on the extent of the spillage site, it is believed that no more than 600-700 gallons of sewage was discharged from the faulty air-vac unit. The area was disinfected with granular chorine as required and any standing liquid was picked up with the VACTOR for discharge back into the collection system. After cleanup of site, all controls of lift station and collection system were put back into normal operation with no further problems to report.

Please contact me at 896-8810 with any further questions in this regard.

Sincerely,

Rock Raiford, Project Manager
OMI, Inc.

C: Larry Webb, Director of Utilities, City of Rio Rancho
Chuck Morgan, Environmentalist, NMED District I
Nick Apodaca Jr., Operations Manager-Wastewater
Jeff Burkett, Operations Supervisor – Wastewater

OC SSO 2003

FILE COPY

# City of Rio Rancho

3900 Southern Blvd. SE • PO Box 15550
Rio Rancho, New Mexico 87174-0550
(505) 896-8715 • Fax (505) 891-5201

DEPARTMENT OF UTILITIES

Jim Owen
Mayor

City Administrator
James M. Palenick

Director of Utilities
Larry W. Webb


July 28, 2004

Certified No. 7002 2030 0003 3224 8653

Kurt Vollbrecht, Geologist
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Dr./ P.O. Box 26110
Santa Fe, NM 87502

**RE: Sanitary Sewer Overflow – Lift Station #15**

Dear Kurt,

On Friday July 23, at approximately 1800 hours, there was a power outage due to severe rain and thunderstorms that affected nearly the entire City of Rio Rancho. On call personnel were immediately dispatched to check all lift stations and the three major wastewater facilities. We managed to avoid spills at all lift stations except Lift Station #15 which is located on Highway 528, two miles south of Enchanted Hills. Tanker trucks were used to pump the lift station down, it is estimated that no more then 500 gallons of sewage was lost.

If you have any questions I can be reached at 896-8810.

Sincerely,

David Sohns, Project Manager
OMI, Inc.

C: Chuck Morgan, Environmentalist, NMED District I
Alex Puglisi, Pueblo Sandia
Jim Owen, Mayor, City of Rio Rancho
James Palenick, City of Rio Rancho Administrator
Larry Webb, Director of Utilities, City of Rio Rancho
Jeff Burkett, Operations Manager-Wastewater, OMI
Nora Romero, Compliance Officer, OMI

FILE COPY

Official Correspondence
2004

# City of Rio Rancho

3900 Southern Blvd. SE • PO Box 15550
Rio Rancho, New Mexico 87174-0550
(505) 896-8715 • Fax (505) 891-5201

DEPARTMENT OF UTILITIES

Mayor
Jim Owen

City Administrator
James M. Palenick

Director of Public Infrastructure
John Kolessar

Director of Utilities
Larry W. Webb


March 8, 2005

Certified No. 7002 2030 0003 3226 4639

Kurt Vollbrecht, Geologist
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Dr./ P.O. Box 26110
Santa Fe, NM 87502

**RE: Sanitary Sewer Overflow – Lift Station # 15, Calle Bona Tierra & NM 528.**

Dear Kurt,

On Thursday March 3rd, at approximately 6:10 p.m., we received an alarm condition page from our SCADA system. The on call personnel responded and upon arrival found the Lift Station operating properly. Upon further investigation it was found that the lift station had already overflowed out of the wet well.

Based on the extent of the spillage site, approximately 2,000 gallons was discharged from the lift station into the arroyo just north of the area as indicated by our Sanitary Sewer Overflow Worksheet.

At 7:10 p.m. a crew from Public Service Company of New Mexico arrived at the lift station to inform us that all power was lost in the area due to a lighting strike to a transformer up the street from the lift station. After discussing the incident with PNM, it was determined that the cause of the overflow was due to the power outage.

The area around the lift station and the arroyo was disinfected with granular HTH. No further problems were noted at the site.

Please contact me at 896-8810 with any further questions in this regard.

Sincerely,

David Sohns, Project Manager
OMI, Inc.

C: John Kolessar, P.E., Director of Public Infrastructure
Larry Webb, Director of Utilities, City of Rio Rancho
Chuck Morgan, Environmentalist, NMED District I
Alex Puglisi, Pueblo of Sandia
Joel Lusk, Fish and Wildlife
File

**From:** JEFF BURKETT
**To:** LARRY webb
**Date:** 3/13/2005 1:21:57 PM
**Subject:** Lift Station #15

Larry,

We again have problems at lift station #15. We had high levels yesterday morning. Upon inspection of the lift station the crew found that it was having a difficult time keeping up with the flow at around 9:30 a.m. Saturday morning.

The crew (Eddie DeLara, Kyle Medders, Mark Baker, Lawrence Romero, Dennis Esquibel) began hauling tanker loads out of the station to lower the level in the wetwell. After pulling the pumps for inspection, and pumping the lift station down low enough to see what was going on with the pumps it was determined that one of the pumps stand was loose and no longer mounted to the floor.

An emergency bypass like we've done in the past was one alternative. However, with the completion of the new lift station hopefully being very close now, we wanted to avoid spending thousands of dollars to get AUI out here again to assist in a confined space entry for repairs.

I won't go into all the details, but the crew came up with an outstanding plan. They were able to retrofit an existing submersible pump. With assistance from Southwest repairs, JCH and Action Hose we are now have two pumps again operable at LS #15 and no confined space entry was done. (see pics)

I will submit all required paperwork first thing Monday a.m. for the emergency parts and assistance charges incurred for this job.

I want to thank the team for their outstanding response and innovative thinking to complete this job at our favorite lift station, once again avoiding a spill and without having to enlist AUI to assist. This was about a 15 hour job ending at 12:30 a.m. Sunday morning.

Mr. Ketchum, any idea of a completion date for the new lift station? This lift station is literally hanging on by a thread. Anything you can do to get the contractor to complete the job will be greatly by.

Thanks

Jeff

**CC:** ANTHONY MARTINEZ; DAVID SOHNS; EDDIE DELARA; JOHN KETCHUM; KYLE MEDDERS; LYNN KRONOWIT; MARK S BAKER; NITA GONZALES; PETE ENGLISH; RUBEN GONZALES; SCOTT SENSANBAUGHER; SUSAN DEMPSEY

# City of Rio Rancho

3900 Southern Blvd. SE • PO Box 15550
Rio Rancho, New Mexico 87174-0550
(505) 896-8715 • Fax (505) 891-5201

DEPARTMENT OF UTILITIES

Mayor
Jim Owen

City Administrator
James M. Palenick

Director of Public Infrastructure
John Kolessar

Director of Utilities
Larry W. Webb


May 24, 2005

Certified No. 7002 2030 0003 3219 1966

Kurt Vollbrecht, Geologist
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Dr./ P.O. Box 26110
Santa Fe, NM 87502

**RE: Sanitary Sewer Overflow – Lift Station # 15, Calle Bona Tierra & NM 528.**

Dear Kurt,

On Tuesday May 24th, at approximately 5:25 p.m., we received an alarm condition page from Lift Station #15. The on call personnel responded and upon arrival found the lift station power to be off and the wetwell close to overflowing. An emergency generator was hooked up and power to the pumps restored, unfortunately not before some sewage spilled.

Based on the extent of the spillage site, we estimate that not more than 1600 gallons was discharged from the lift station into the arroyo just north of the area as indicated by our Sanitary Sewer Overflow Worksheet.

At 6:30 p.m. a crew from Public Service Company of New Mexico arrived on the scene. After discussing the incident with PNM, we determined the cause of the power outage was most likely attributed to a blown fuse located between PNM's power line and the lift station. The fuse was replaced and the lift station was put back in normal operational service.

Start up of the new lift station #15 should take place within the next two weeks. Fortunately the new station is equipped with an on-site emergency generator, which will automatically engage when PNM power is lost, greatly reducing the chances of spills occurring due to power loss.

The area around the lift station and the arroyo was cleaned and disinfected with granular HTH. No further problems were noted at the site.

Please feel free to contact me at 896-8810 if you have any questions.

Sincerely,

David Sohns, Project Manager
OMI, Inc.

C: John Kolessar, P.E., Director of Public Infrastructure
Larry Webb, Director of Utilities, City of Rio Rancho

FILE COPY

# City of Rio Rancho

3900 Southern Blvd. SE • PO Box 15550
Rio Rancho, New Mexico 87174-0550
(505) 896-8715 • Fax (505) 891-5201

DEPARTMENT OF
UTILITIES




June 8, 2005

Certified No. 7002 2030 0003 3219 1980

Kurt Vollbrecht, Geologist
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Dr./ P.O. Box 26110
Santa Fe, NM 87502

**RE: Lift Station # 15 Line Break, Calle Bona Tierra & NM 528.**

Dear Kurt,

On Wednesday June 1st, at approximately 2:35 p.m., we received a call from Triad Construction Company. They are in charge of construction of the new Lift Station #15 and all related sewer line tie-ins. The Triad foreman informed us that after excavation of the force main at the manhole next to the original Lift Station #15 they began chipping away concrete around the force main to ready the line for final tie-in. During this procedure, they unintentionally punched a hole in the force main with a jack hammer causing sewage to flow into the 10' x 15' hole that had been dug out around the line. It was estimated that no more than 1000 gallons of sewage flowed into this contained holding area. It was then pumped back into the system by a tanker truck.

At that point Triad decided to go ahead and complete the tie-in, which was scheduled for the following night. The Lift Station was shut down and a fleet of 10 tanker trucks continued to pump out the wet well. They were able to maintain a low level of sewage in the wet well while transporting and releasing it into the sewer system on Willow Creek Road. The line tie-in went smoothly and the new Lift Station 15 is now on line and fully operational. The area was disinfected with HTH and backfilled with clean soil.

Please contact me at 896-8810 if you have any questions

Sincerely,

Paul A. Romero

Paul A. Romero, Acting Project Manager
OMI, Inc.

C: John Kolessar, P.E. Director of Public Infrastructure
Larry Webb, Director of Utilities, City of Rio Rancho

FILE COPY

# City of Rio Rancho

3900 Southern Blvd. SE • PO Box 15550
Rio Rancho, New Mexico 87174-0550
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DEPARTMENT OF UTILITIES

Mayor
Jim Owen

City Administrator
James M. Palenick

Director of Public Infrastructure
John Kolessar, P.E.

Utilities Division Manager
Larry W. Webb


August 12, 2005

Certified No. 7003 2260 0007 2282 1013

Kurt Vollbrecht, Geologist
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Dr. / P.O. Box 26110
Santa Fe, NM 87502

**RE: Sanitary Sewer Overflow – Lift Station # 15, Calle Bona Tierra and NM 528.**

Dear Kurt,

On Tuesday August 9th, at approximately 1100 hours, Our office was notified by the contractor ( TRIAD ) who is in charge of construction and final line tie ins of the new lift station, when the final tie was taking place there crew had set a 4" hose from the east manhole into the lift station wet well to divert the flow the hose managed to break loose and spill sewage within the lift station containment area. After the pump was shut down the contractor proceeded to open vent areas in the containment wall and released sewage within the fenced area and into the arroyo just south of the lift station. The vactor crew responded immediately, cleaned up the lift station containment area and the wet well.

Based on the extent of the spillage site, we estimate that no more than 2,000 gallons was discharged from the lift station into a contained area around the lift station and no more than 100 gallons of the total estimate was discharged into the arroyo just south of the lift station. All standing sewage, which had overflowed, was removed with our VACTOR and discharged back into the lift station wet well.

The area around the lift station and the arroyo was disinfected with granular HTH. No further problems were noted at the site.

All proper agencies where notified in a timely manner.

Please contact me at 891-5025 with any further questions in this regard.

Sincerely,

David Sohns, Project Director OMI, Inc.

Cc: John Kolessar, P. E., Director of Public Utilities, City of Rio Rancho
Larry Webb, Utilities Division Manager, City of Rio Rancho



FILE COPY

**From:** DAVID SOHNS
**To:** webb, LARRY
**Date:** Fri, Mar 4, 2005 2:44 PM
**Subject:** Re: SSO - Lift Station 15 Overflow

Larry,

Right now (Franco is still on it) it looks like a relay switch. And yes the pumps had restarted and the wet well was half way down when we arrived.

Also, after calculations, the actual spill was more like 2,000 gallons.

David

>>> LARRY webb 03/04/05 02:35PM >>>
Thanks for the information. Let me know when you find out why the SCADA system didn't alarm for loss of power. Did the pumps restart themselves or does it take a person on location to start the pumps at this site?

>>> <David.Sohns@omiinc.com> 03/04/05 09:00AM >>>
Larry,

Last night, due to a lightning strike in Enchanted Hills, lift station 15 was without power for 30 minutes. We did not receive an alarm until the power came back on (high level). We are investigating why we were not notified when the power failed.

The initial estimated discharge is 10,000 gallons. The required phone contacts have been made and we will submit a written report when all the facts are in.

The good news is that new lift station 15 should be on line within the next few weeks. At that point, we will have backup power and new SCADA equipment.

David Sohns

OMI, Inc.
Project Director
Rio Rancho, NM
Office - 505 896-8810
Fax - 505 891-1244
Cell - 505 975-1601

**CC:** BURKETT, JEFF; FRANCO, MIKE

# City of Rio Rancho

3900 Southern Blvd. SE • PO Box 15550
Rio Rancho, New Mexico 87174-0550
(505) 896-8715 • Fax (505) 891-5201

DEPARTMENT OF
UTILITIES




June 8, 2005

Certified No. 7002 2030 0003 3219 1980

Kurt Vollbrecht, Geologist
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Dr./ P.O. Box 26110
Santa Fe, NM 87502

**RE: Lift Station # 15 Line Break, Calle Bona Tierra & NM 528.**

Dear Kurt,

On Wednesday June 1st, at approximately 2:35 p.m., we received a call from Triad Construction Company. They are in charge of construction of the new Lift Station #15 and all related sewer line tie-ins. The Triad foreman informed us that after excavation of the force main at the manhole next to the original Lift Station #15 they began chipping away concrete around the force main to ready the line for final tie-in. During this procedure, they unintentionally punched a hole in the force main with a jack hammer causing sewage to flow into the 10' x 15' hole that had been dug out around the line. It was estimated that no more than 1000 gallons of sewage flowed into this contained holding area. It was then pumped back into the system by a tanker truck.

At that point Triad decided to go ahead and complete the tie-in, which was scheduled for the following night. The Lift Station was shut down and a fleet of 10 tanker trucks continued to pump out the wet well. They were able to maintain a low level of sewage in the wet well while transporting and releasing it into the sewer system on Willow Creek Road. The line tie-in went smoothly and the new Lift Station 15 is now on line and fully operational. The area was disinfected with HTH and backfilled with clean soil.

Please contact me at 896-8810 if you have any questions

Sincerely,

Paul A. Romero

Paul A. Romero, Acting Project Manager
OMI, Inc.

C: John Kolessar, P.E. Director of Public Infrastructure
Larry Webb, Director of Utilities, City of Rio Rancho

FILE COPY

# City of Rio Rancho

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DEPARTMENT OF UTILITIES

Mayor
Jim Owen

City Administrator
James M. Palenick

Director of Public Infrastructure
John Kolessar, P.E.

Utilities Division Manager
Larry W. Webb


August 12, 2005

Certified No. 7003 2260 0007 2282 1013

Kurt Vollbrecht, Geologist
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Dr. / P.O. Box 26110
Santa Fe, NM 87502

**RE: Sanitary Sewer Overflow – Lift Station # 15, Calle Bona Tierra and NM 528.**

Dear Kurt,

On Tuesday August 9th, at approximately 1100 hours, Our office was notified by the contractor ( TRIAD ) who is in charge of construction and final line tie ins of the new lift station, when the final tie was taking place there crew had set a 4" hose from the east manhole into the lift station wet well to divert the flow the hose managed to break loose and spill sewage within the lift station containment area. After the pump was shut down the contractor proceeded to open vent areas in the containment wall and released sewage within the fenced area and into the arroyo just south of the lift station. The vactor crew responded immediately, cleaned up the lift station containment area and the wet well.

Based on the extent of the spillage site, we estimate that no more than 2,000 gallons was discharged from the lift station into a contained area around the lift station and no more than 100 gallons of the total estimate was discharged into the arroyo just south of the lift station. All standing sewage, which had overflowed, was removed with our VACTOR and discharged back into the lift station wet well.

The area around the lift station and the arroyo was disinfected with granular HTH. No further problems were noted at the site.

All proper agencies where notified in a timely manner.

Please contact me at 891-5025 with any further questions in this regard.

Sincerely,

David Sohns, Project Director OMI, Inc.

Cc: John Kolessar, P. E., Director of Public Utilities, City of Rio Rancho
Larry Webb, Utilities Division Manager, City of Rio Rancho

**From:** EDDIE DELARA
**To:** DAVID SOHNS; LARRY webb
**Date:** Mon, Jan 30, 2006 11:19 AM
**Subject:** Re: Lift Station #15 Spill

Larry,

Triad did respond in a timely manner, the problem was the cover to the check ball had come off when two of the bolts came loose and fell off, it was stated by Dwayne of Triad that the bolts were to short for the cover. We had to provide a cover for Triad to replace the old one since it was damaged. A total of about 3,000 gallons was spilled into the arroyo and excessive erosion was caused in and around the lift station. Triad is scheduled to be back out at the lift station on Monday morning to clean up and make repairs.

>>> LARRY webb 01/30/06 10:48AM >>>
Have you had time to ascertain what the problem was and fix is for the sewer overflow at L.S. #15 Saturday ? Did the contractor, Triad, respond in a timely manner?

# City of Rio Rancho

3900 Southern Blvd. SE • PO Box 15550
Rio Rancho, New Mexico 87174-0550
(505) 896-8715 • Fax (505) 891-5201

DEPARTMENT OF
UTILITIES

Mayor
Jim Owen

City Administrator
James M. Palenick

Director of Public
Infrastructure
John Kolessar, P.E.

Utilities Division Manager
Larry W. Webb


January 31, 2006

Certified No. 7005 0390 0001 6089 7483

Mr. Robert George
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Dr. / P.O. Box 26110
Santa Fe, NM 87502

**RE: Sanitary Sewer Overflow – Lift Station # 15, Calle Bona Tierra and NM 528.**

Dear Robert,

On Saturday January 28th, at approximately 1530 hours, the Operations Manager was in route to Rio Rancho when he observed Lift Station #15 overflowing from the south wall area and into the arroyo. He made a call and dispatched all on call staff to the site immediately. Upon inspection it was found the main wet well was empty and both pumps were fully operational which explained why no alarms were sent out through the SCADA system alerting the on call staff. The dry well was completely full and overflowing. Once the flow into the wet well was diverted and it was pumped down, it was observed that the cover for check ball # 1 had broken off. The valve was then closed to isolate the line for repair of the cover, and once completed the Lift Station was put back into operation. The VACTOR crew cleaned up the lift station containment area and the dry well.

Based on the extent of the spillage site, we estimate that no more than 2,000 gallons was discharged from the lift station into a contained area west of the lift station and no more than 1000 gallons of the total estimate was discharged into the arroyo just south of the lift station. All standing sewage, which had overflowed into the contained area was removed with out VACTOR and discharged back into the lift station wet well. The area around the lift station, contained area and the arroyo was disinfected with granular HTH. No further problems were noted at the site.

All proper agencies where notified in a timely manner. Please contact me at 896-8811 if you have any questions.

Sincerely,

David Sohns, Project Director,
OMI, Inc.

Cc: John Kolessar, P. E., Director of Public Utilities, City of Rio Rancho
Larry Webb, Utilities Division Manager, City of Rio Rancho

# City of Rio Rancho

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DEPARTMENT OF
UTILITIES

Mayor
Jim Owen

City Manager
James M. Palenick

Director of Public
Infrastructure
John Kolessar, P.E.

Utilities Division Manager
Larry W. Webb


March 27, 2006 Certified No. 7005 1820 0002 4758 3769

Mr. Robert J. George
Domestic Waste Team Leader
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Dr. / P.O. Box 26110
Santa Fe, NM 87502

**RE: Sanitary Sewer Overflow – Lift Station # 15 Force Main, Santiago Way and NM 528**

Dear Mr. George,

On Friday March 24, at approximately 1030 hours, we were notified of sewage coming out of a manhole east of NM 528 and Santiago Way. Upon our arrival we observed that sewage was coming from the Air-Vac valve that serves the force main from Lift Station #15. The 2" valve was closed until the Air-Vac valve was replaced. The VACTOR crew was immediately dispatched for cleanup.

Based on the extent of the spillage site, we estimate that no more than 100 gallons was discharged from the Air-Vac valve. All standing sewage, which had overflowed into the contained area was removed with our VACTOR and discharged back into our dump station at WWTP # 2. The area around the manhole and contained area was disinfected with granular HTH. No further problems were noted at the site.

All proper agencies where notified, Mary M. Gomez (NMED), Robert J. George (NMED), and Alex Puglisi (Sandia Pueblo).

Please contact me at 896-8811 with any questions.

Sincerely,

David Sohns, Project Director,
OMI, Inc.

Cc: John Kolessar, P. E., Director of Public Utilities, City of Rio Rancho
Larry Webb, Utilities Division Manager, City of Rio Rancho

FILE COPY

Utility Operations M...

## Western Region E-mail Notice of Violation (NOV) Form

**This form to be submitted for all regulatory non-compliance events at your project**

Department: Delivery
Sub Region (Underline/Bold): NW, CA/NV, **AZ/NM/UT**

Report No. RR2006-02-SSO
Report Date: 3-27-06
Incident Date:3-24-06
Project Location: Rio Rancho

**Project Involved:** Rio Rancho

**Department Involved:** Wastewater

**Description of violation:** SSO

Overflow from manhole at NM 528 and Santiago Way

**Initial Facts:**

- Sewage was seeping from an air vac valve that serves the force main at Lift Station 15
- The air vac valve was replaced
- < than 100 gallons were discharged onto the west side of the lift station
- Affected areas disinfected with HTH

| Correction Action | Responsibility | Timing |
|---|---|---|
| Closed the 2" valve at the Lift Station | Eddie DeLara | Immediately |
| Air vac valve replaced | Eddie DeLara | Immediately |
| Area disinfected with HTH | Eddie DeLara | Following Repair |
| Calls made to appropriate authorities | Eddie DeLara | Following Repair |

**Investigated by:** Kyle Medders

**Distribution via E-mail:** RBM, RVP, RTM, CNR person

**Timing:** This NOV form should be completed and e-mailed within 24 hours.

* - For any incident that requires medical attention, or news media involvement, please call your RBM ASAP.

# City of Rio Rancho

3900 Southern Blvd. SE • PO Box 15550
Rio Rancho, New Mexico 87174-0550
(505) 896-8715 • Fax (505) 891-5201

DEPARTMENT OF
UTILITIES

Mayor
Jim Owen

City Manager
James M. Palenick

Director of Public
Infrastructure
John Kolessar, P.E.

Utilities Division Manager
Larry W. Webb


March 27, 2006 Certified No. 7005 1820 0002 4758 3769

Mr. Robert J. George
Domestic Waste Team Leader
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Dr. / P.O. Box 26110
Santa Fe, NM 87502

**RE: Sanitary Sewer Overflow – Lift Station # 15 Force Main, Santiago Way and NM 528**

Dear Mr. George,

On Friday March 24, at approximately 1030 hours, we were notified of sewage coming out of a manhole east of NM 528 and Santiago Way. Upon our arrival we observed that sewage was coming from the Air-Vac valve that serves the force main from Lift Station #15. The 2" valve was closed until the Air-Vac valve was replaced. The VACTOR crew was immediately dispatched for cleanup.

Based on the extent of the spillage site, we estimate that no more than 100 gallons was discharged from the Air-Vac valve. All standing sewage, which had overflowed into the contained area was removed with our VACTOR and discharged back into our dump station at WWTP # 2. The area around the manhole and contained area was disinfected with granular HTH. No further problems were noted at the site.

All proper agencies where notified, Mary M. Gomez (NMED), Robert J. George (NMED), and Alex Puglisi (Sandia Pueblo).

Please contact me at 896-8811 with any questions.

Sincerely,

David Sohns, Project Director,
OMI, Inc.

Cc: John Kolessar, P. E., Director of Public Utilities, City of Rio Rancho
Larry Webb, Utilities Division Manager, City of Rio Rancho

FILE COPY

# WR E-mail Incident Notification Form

**This form to be submitted for any and all safety and vehicle incidents**

Department: Delivery
Sub Region (Underline/Bold):
NW, CA/NV, and AZ/NM/UT

Report No. :RR2006-04-SSO
Report Date: 4-17-06
Incident Date: 4-15-06
Project Location: Rio Rancho

## Project Involved: Rio Rancho

## Department Involved: Wastewater

## Description of Violation: SSO

OverFlow at L/S #15

## Initial Facts

- 2500 gallons of sewage was spilled and contained in retention pond.
- 50 gallons was spilled into the adjacent arroyo.
- Cause of spill is due to control panel failure.
- Most of the sewage was pumped back into the lift station and area was cleaned and disinfected.
- Control panel dealer is working on a permanent repair.

| Correction Action | Responsibility | Timing |
|---|---|---|
| Diverted flow to retention pond | Mark Baker | Immediately |
| Called On-call electrician and control panel manufacturer. Setup Hydraulic pump | Mark Baker | Immediately |
| Once control of pumps was regained spilled sewage was pumped back into wetwell and area was disinfected. | Mark Baker | Following Repair |
| All appropriate calls were made to regulatory agencies. | Pete English | Following cleanup |

**Investigated by:** Kyle Medders
**Date: 4-17-06**

**Distribution via E-mail:** RBM, RVP, RTM, CNR person

**Timing:** This incident form should be completed and e-mailed within 24 hours. For any incident that requires medical attention, please **call** your RBM and e-mail ASAP.

**From:** "Bill Curb" <wtc@jchinc.com>
**To:** "'STEVE GALLEGOS'" <SGALLEGOS@ci.rio-rancho.nm.us>, "'MARK S BAKER'" <MSBAKER@ci.rio-rancho.nm.us>, <jketchum@ci.rio-rancho.nm.us>
**Date:** Tue, Apr 18, 2006 2:02 PM
**Subject:** Rio RAncho Lift station 15, Summary of events on 04/15/06

Saturday, April 15 - I received a call from Mark Baker at about 1245 PM that both Pumps in Lift Station 15 had failed to run and the station was overflowing.

At 2 PM, Rick Hobson and I arrived at the station. Controls indicated both pumps had failure on Bearing Over Temperature and Motor Over Temperature and one pump showing Mechanical Seal Failure. Both pumps were not being allowed to run by the controls based upon these failures.

Jim Stone from Metro Electric and myself were able to bypass the pump sensors and manually run the pumps to pump the station down. Over the next several hours we were able to determine that the pumps would run normally and reliably in automatic with all the above protective pump sensors by-passed (except the overloads and auto megging protection). Rick Hobson and I left the station around 8 PM with the plan to return on Monday to try and determine the cause of the failure.

Monday, April 17 - On Monday afternoon at approx. 3:30 PM, Russ Caskey from JCH service and I arrived at the station with our service truck to investigate the reason for the pump failure. We were able to determine that the pump power and control cables were not secured to the top of the station and the control cables had been sucked into the pump suction on each pump and severed, causing the sensing modules in the control panel to believe that the pump sensors were signaling high bearing temperature, high stator temperature, and mechanical seal failure, resulting in pump shutdown. Jim McCarthy and Rick Hobson arrived with our other service truck at 6 PM and we all assisted Mark Baker to remove one of the pumps and to install and test the owner's spare pump.

We left the station at 11 PM, station operating in automatic, with the newly installed spare pump running normally with all sensors connected, and the other pump running with all but the auto megging protection by passed. The power and control pump cables were pulled up and tied to the top of the station with rope on a temporary basis with a more permanent and secure attachment of the cables to be accomplished by others.

The removed pump is to be inspected and repaired by JCH and returned for installation by others.

Please call or email with any questions

# City of Rio Rancho

3900 Southern Blvd. SE • PO Box 15550
Rio Rancho, New Mexico 87174-0550
(505) 896-8715 • Fax (505) 891-5201

DEPARTMENT OF
UTILITIES


April 20th , 2006

Certified No. 7005 0390 0001 6089 6905

Mr. Robert J. George
Domestic Waste Team Leader
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Dr. / P.O. Box 26110
Santa Fe, NM 87502

**RE: Sanitary Sewer Overflow – Lift Station # 15 and NM 528.**

Dear Mr. George,

On Saturday April 15, at approximately 1230 hours, we received an alarm condition from Lift Station # 15. Upon arrival it was observed that the wet well was about two feet from overflowing and both pumps were in fail mode. Operations staff and Vactor crew were immediately dispatched to set up our mobile pump and tanker trucks to contain overflow at a minimum.

The maintenance staff begin to trouble shoot the pumps and were able to replace one pump and pump down the wet well to prevent any further spillage, the maintenance staff continued to work on the lift station to resolve any other mechanical issues.

Based on the extent of the spillage site, we estimate that no more than 2500 gallons was discharged from the lift station and 50 gallons of that total was discharged into the arroyo just south of the lift station. All standing sewage, which had overflowed into the containment area was removed with our VACTOR and discharged back into the lift station.

The containment area and lift station was disinfected with granular HTH. No further problems were noted at the site.

All proper agencies where notified, Mary M. Gomez (Local NMED), Robert J. George (State NMED), Alex Puglisi (Sandia Pueblo Environmental Office), Joel Lusk (NM Fish & Wildlife).

Please contact me at 891-5022 with any further questions in this regard.

Sincerely,

Eddie De Lara Jr, Operations Manager,
OMI, Inc.

Cc: John Kolessar, P. E., Director of Public Utilities, City of Rio Rancho
Larry Webb, Utilities Division Manager, City of Rio Rancho

SAFETY *begins with me* OMI

# WR E-mail Incident Notification Form

**This form to be submitted for any and all safety and vehicle incidents**

Department: Delivery
Sub Region (Underline/Bold):
NW, CA/NV, and AZ/NM/UT

Report No. :RR2006-06-SSO
Report Date: 5-1-06
Incident Date: 4-29-06
Project Location: Rio Rancho

## Project Involved: Rio Rancho

## Department Involved: Wastewater

## Description of Violation: SSO

Overflow lift station #15

## Initial Facts

- At 8:00 AM lift stations #15, 21, 22 all showed high levels. Lift stations had just been put back into service following a force main break on 4-28-06.
- Crews started to check air vacs thinking that the main might be air locked.
- Atlas pumping was contacted to pump out lift stations before they spilled.
- Lift station #15 spilled 500 gallons into a containment pond before pumping trucks could arrive.

| Correction Action | Responsibility | Timing |
|---|---|---|
| Manually opened air vacs to relieve pressure | Mark Baker | Immediately |
| Contacted Atlas pumping service | Eddie DeLara | Immediately |
| Verified valves on force main and found one partially opened, opened valve fully. | Pete English | After Air Vacs were found to be OK |
| All appropriate calls were made to regulatory agencies. | Eddie DeLara | Following cleanup |

**Investigated by:** Kyle Medders
**Date: 4-30-06**

**Distribution via E-mail:** RBM, RVP, RTM, CNR person
**Timing:** This incident form should be completed and e-mailed within 24 hours. For any incident

# City of Rio Rancho

3900 Southern Blvd. SE • PO Box 15550
Rio Rancho, New Mexico 87174-0550
(505) 896-8715 • Fax (505) 891-5201

DEPARTMENT OF UTILITIES




May 2, 2006

Certified No. 7005 1820 0002 4758 3912

Robert George
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Dr. / P.O. Box 26110
Santa Fe, NM 87502

**RE: Sanitary Sewer Overflow – Lift Station 15 at NM 528**

Dear Mr. George,

On Saturday April 29th, at approximately 1030 hours, we received a high level alarm from Lift Station 15. Upon arrival at the lift station we found Pumps 1 and 2 were not pumping to full capacity. The VACTOR crew and tanker trucks were immediately dispatched to pump down the wet well and also the containment area at the lift station. Upon further investigation it was discovered that a valve on the 14" force main south of the lift station was left partially closed the previous night when emergency repairs were made to it. The valve was fully opened and the lift station pumps began to pump at full capacity. The lift station wet well completely pumped down and put back in service.

Based on the extent of the spillage site, we estimate that no more than 500 gallons were discharged from the lift station into the containment area. All standing sewage, which had overflowed into the contained area, was removed with a tanker truck and discharged back into the system. The area around the lift station and contained area was disinfected with granular HTH. No further problems were noted at the site.

The following agencies were notified on Month Day of this event:
Robert George at the State NMED Office at 12:30 p.m.
Mary M. Gomez at the Local NMED Office at 12:32 p.m.
Alex Puglisi at the Pueblo of Sandia's Environmental Office at 12:33 p.m.

Please contact me at 896-8811 if you have any questions.

Sincerely,

Eddie De Lara, Jr. Operations Manager
OMI, Inc.

Cc: John Kolessar, P. E., Director of Public Utilities, City of Rio Rancho
Larry Webb, Utilities Division Manager, City of Rio Rancho

FILE COPY

RioRancho
City of Vision

June 19, 2007 Certified No. 7006 2150 0005 1858 8107

Ms Mary Simmons
EPA Region 6 (6EN-WC)
Water Enforcement Branch
1445 Ross Avenue

RE: NPDES Permit # NM00272987
Sanitary Sewer Overflow – NM 528 and Santiago Way

Dear Ms. Simmons,

On Thursday June 14, 2007 at approximately 1600 hours OMI responded to a call at NM 528 and Santiago Way. Upon arrival we observed sewage flowing out of a valve box next to an air relief valve on the 12" force main.

The collections crew arrived on site as well as the maintenance crew. They mobilized a backhoe to the site to excavate the leaking area and expose the 2" supply line to the air relief valve fitting. The area was carefully exposed and cleaned up, a full circle repair clamp was put in place on the 12" force main and the old air relief valve was taken out of service. A new air relief valve will be put into service at a later date.

Based on the extent of the spill at the site, we estimate that no more than 200 gallons was discharged from the cracked 2" supply line to the air relief valve. This was due to intermittent pump cycles from the lift station feeding the force main. All standing sewage, which had overflowed into the area was removed with our VACTOR and discharged back into our system.

Public Infrastructure Department ○ Utilities Division
3900 Southern Blvd ○ Suite 206 ○ Rio Rancho ○ NM ○ 87124
(505) 896-8715 ○ Office
(505) 891-5201 ○ Fax

The area around the air relief manhole and valve box was disinfected with granular HTH. No further problems were found at the site.

Please contact me at 896-8811 if you have any questions.

Sincerely,

Cliff Leeper
Project Manager
CH2M HILL OMI

Cc: Anthony Losten, USEPA
Sandra Gabaldon, NMED
Robert George, NMED
Hiromi Martinez, NMED
Alex Puglisi, Director of Environment, Sandia Pueblo
John Kolessar, P. E., Director of Public Infrastructure, City of Rio Rancho
Larry Webb, Utilities Division Manager, City of Rio Rancho

## Other Costs

| Name | Description | Invoice # | Date | Charge |
|---|---|---|---|---|
| AAA Pumping $8,667.00 | | | 9/14/2010 | $8,667.00 |
| American Pumping | | | 9/14/2010 | $5,727.38 |
| Atlas Pumping | | | 9/14/2010 | $140,025.25 |
| Bradbury Stamm Construction | | | 9/13/2010 | $75,390.48 |
| **Other Cost Totals:** | | | | $229,810.11 |

## Totals

| Section | Charge |
|---|---|
| Labor Total | $4,750.63 |
| Materials Total | $0.00 |
| Other Costs Total | $229,810.11 |
| **Grand Total:** | $234,560.74 |

## Labor Report

**Completed:** 10/13/2010 9:51:00 AM **Failure:** DEF / Defective Part **Meter(s):**

**Report:** Split in forced main was appearantly caused by the saddle mounted air beed valve causing it to eventually split. Repairs were made by Bradbury Stahm. Section of broken line was replaced and manhole was reinstalled with concrete below it for stabilization. Bypass of the lift station was accomplished by the use of tankers which hauled all sewage to another place in the system. Wastewater and Collection staff assisted in coordinating repairs and bypass.

Forced Main Spill from LS 15 on 09-13-2010

- At entrance to Santiago subdivision in Bernalillo.
- Spill started at approximately 06:00 PM
- First to arrive was Eric Romero with vactor at approximately 06:30 PM. Vactor was ineffective in containing flow from break.
- Observed pumping from LS15 to be cycling at 3 min. on and 6 min. off during peak flow.
- At approximately 8:00 called Atlas Pumping, American Pumping, and AAA Pumping. Total trucks 7- 4000 gal and 1- 6500 gal plus CRR 6500 gal tanker.
- 09:20 called Bradbury Stahm (Evan Anderson) to mobilize equipment and personnel.
- Took down part of fence at LS15 to make room for 3 to 4 trucks to pump from wet well simultaneously.
- Trucks staged and ready to start pumping at approximately 11:00 PM.
- Light towers were set up.
- Bradbury ready to start excavating at 12:00 PM.
- Shutdown LS15 at 12:30 AM, Bradbury started excavation.
- Repairs to main completed at approximately 07:25 AM.
- LS15 started pumping at 07:29 AM
- Clean and repair of site of site to continue throughout 09-14-10 by Bradbury

AAA Pumping 978-5407
American Pumping 347-7667 - 975-4525
Atlas 898-3963

Total loads from LS15:

- Atlas = 14
- American = 6
- AAA = 12

RioRancho
City of Vision

# Work Order WW-12168

Wastewater
Printed 7/8/2011 - 12:43:30 PM

## Maintenance Details

**Requested By:** Channell, Ryan on 4/29/2011 1:14:00 PM
**Taken By:** Channell, Ryan
**Problem:** Repair (REPAIR)

**Target:** 2/14/2011 (0) hr
**Priority/Type:** Normal / Corrective
**Supervisor:** Salazar, Flavio
**Shop:** WW-MAINT

Wastewater
Lift Stations
Lift Station #15 (PUMPING STATION 15)
**Submersible Pump #1 LS 15 (PUMP-SUB-29)**

**Reason:** Submersible Pump #1 LS 15 (PUMP-SUB-29) - pump failure caused by debris stuck in the impeller

**Special Instructions:** cause of failure: debris was stuck in the impeller, causing vibration that ruined the seal and broke the volute bolt. the impeller was already worn completely through the housing from cavitation. repair: recondition stator, relace ball and thrust bearings, upper and lower seals, o-ring kit, stationary wear ring, all power and control cables, cable grommets, stainless steel bolts, pins, washers, and new impeller. parts = $22067.63 labor = $2560.50 tax = $179.24

**Contact:** Channell, Ryan
**Phone:**

☐ Warranty ☐ Shutdown ☐ Lockout ☐ Attach ☐ Charge

## Other Costs

| Name | Description | Invoice # | Account | Date | Est Cost | Actual Cost |
|---|---|---|---|---|---|---|
| Recondition stator | | 29826 | | 2/14/2011 | $ 0.00 | $ 24,807.37 |

## Labor Report

**Completed:** 4/29/2011 1:14:00 PM **Failure:** DIRT / Dirt or Foreign Matter

**Report:** Fixed and completed.

RioRancho
City of Vision

September 17, 2010

Certified No. 7008 1830 0002 5625 8867

Ms Mary Simmons
EPA Region 6 (6EN-WC)
Water Enforcement Branch
1445 Ross Avenue
Dallas, Texas 75202-2733

Re: NPDES Permit # NM00272987, Intersection of Highway 528 and Santiago Way

Dear Ms. Simmons,

On the evening of September 13, 2010, a call was received at approximately 6:00 p.m. regarding a sewer overflow near the intersection of State Highway 528 and Santiago Way. Crews responded and were on site by 6:30 p.m. The crew began using a Vactor truck to pump out a manhole where the overflow was occurring and soon understood they could not keep up with the flows from the leak. The leak was determined to be on a sewer force main running from the Enchanted Hills area subdivision.

In order to address repairs to the force main, a fleet of 8 tanker trucks were staged at the Lift Station #15 feeding the force main. In the meantime, a contractor was called to begin mobilizing additional crews and equipment to repair the force main. Emergency line spots were called before any excavation was undertaken.

At 11:00 p.m. the lift station pumps were shut down and pumping to the tanker trucks began. The tankers began taking all of the influent of the lift station and transporting the sewage to an area below not being served by the force main.

As soon as the lift station was shut down, excavation began on the force main leak and continued through the night until the force main was repaired. Excavation and repairs to the force main continued throughout the night until a new section force main was installed and the lift station was turned back to normal operations at 7:29 on the morning of September 14.

A 20-foot section of 12" force main had a fracture in the pipe, the fracture was most likely caused by pipe stress during the installation.

The area impacted by the sewage overflow was treated with granular HTH. The street areas were cleaned and swept and washed down with clean water.

The estimated volume of the overflow was 30,000 gallons based on a lift station flows and pumping cycles calculations. Calls were made to all regulatory agencies with the required 24-hour time frame.

Please contact me at 896-8811 if you have any questions.

Sincerely,

Cliff Leeper, Project Manager
CH2M HILL

CL/ab

cc: Anthony Losten, USEPA
Sandra Gabaldon, NMED
Robert George, NMED
Hiromi Martinez, NMED
Larry Webb, Utilities Division Manager, City of Rio Rancho
Scott Bulgrin, Director of Environment, Sandia Pueblo
Joel Lusk, Department of Game & Fish

RioRancho
City of Vision

September 24TH, 2010

Certified No. 7005 0390 0001 6089 6950

Ms. Mary Simmons
EPA Region 6 (6EN-WC)
Water Enforcement Branch
1445 Ross Avenue
Dallas, Texas 75202-2733

Re: NPDES Permit # NM00272987
Sanitary Sewer Overflow – State Highway 528 and Santiago Way

Dear Ms. Simmons:

A contractor was doing a hot tap on a live 12" force main at the intersection of State Highway 528 and Santiago Way. At approximately 09:00 AM the valve on the tapping device blew apart during the installation process. The sub contractor made a call to our collections crews stating that we need to bring vactors and manpower to help address the spill. Our crews arrived on the scene at 9:30 and began pumping the flooded manhole with a truck vactor, the lift station feeding the force main was shut down. This allowed crews to reenter the manhole and install a new valve. Systems were put back into normal operations at 9:55.

Approximate spill volume was 300 gallons, most of which was contained in dirt berms around the manhole. Some of the raw sewage did make it into the street. This was treated with a light dusting of granular HTH and then flushed liberally with a water truck.

All agencies were notified with required time frames.

Please contact me at 896-8811 if you have any questions.

Sincerely,

Cliff Leeper, Project Manager
CH2M HILL OMI

Cc: Anthony Losten, USEPA
Sandra Gabaldon, NMED
Robert George, NMED
Hiromi Martinez, NMED
Larry Webb, Utilities Division Manager, City of Rio Rancho
Scott Bulgrin, Director of Environment, Sandia Pueblo
Joel Lusk, Department of Game and Fish

File copy

Department of Public Infrastructure ○ Utilities Division
3200 Civic Center Circle NE – Rio Rancho, New Mexico 87144
(505) 896-8715 ○ Office
(505) 891-5201 ○ Fax

Atlas Pumping
PH. 505.898.3936
FAX 505.343.9231
P.O. BOX 10477
ALBUQUERQUE, N.M. 87184

# FAX

To: Mark From: Dee Dee

Fax: 892-5543 Pages: 3

Phone: Date: 9/16/10

Re: CC:

Urgent For Review Please Comment Please Reply Please Recycle

- Comments: Thanks

Santiago

# Atlas Pumping

NM CONTRACTOR LICENSE 51797

200 SIN NOMBRE, NE
ALBUQUERQUE, NEW MEXICO 87113

(505) 898-3936 FAX: (505) 343-9231 admin@atlaspumping.com

**No.** 55552

**DATE:** 9/13/10

**DRIVER:** LL

**BILLING NAME AND ADDRESS:**
City of Rio Rancho
Mark Bedker
Cell# 975-1565 FAX 892-5543

**LOCATION:**
Lift Station Hwy
528 Rio Rancho

| PURCHASE ORDER # | PAID BY: | CHECK NO: | VISA/MC # | CASH |
|---|---|---|---|---|
| | | | | |

**PUMPED:**

- SEPTIC TANK
- SAND TRAP
- WASTE WATER
- EXTRA HOSE
- INSPECTION
- DUMP FEE
- RISER
- LINES JETTED
- GALS
- LABOR
- SEWER RAT
- OTHER
- OTHER

Pump Lift Station
3 4000 Gal Trucks
1 7000 Gal Truck

Atlas Pumping

After Hours
Mon. 09/13/10 9:30 PM 11 HRS
Tues 09/14/10 6:30 AM
300.00 per Truck and Driver
Hauled 14 Loads

**WE APPRECIATE YOUR BUSINESS!**

| | |
|---|---|
| SUBTOTAL | 13,200.00 XX |
| TAX | -0- |
| TOTAL | 13,200.00 |

**NOTES:**

Atlas Pumping Co., Inc. its agents and employees shall not be liable and is released from any damages caused during this service.
All accounts are net 30. 1½% late fee on all past due amounts.

**CUSTOMER SIGNATURE:**

# Invoice

Number: 449887
Date: 16-Sep-2010
P.O. Number:
Job Description:
Order Num 449887
Serviced 13-Sep-2010

| BILL TO: 774 | JOB SITE |
|---|---|
| CITY OF RIO RANCHO<br>3200 CIVIC CENTER CIRCLE NE<br>RIO RANCHO, NM 87144 | Mark B<br>528 RIO RANCHO<br>LIFT STATION<br>RIO RANCHO, NM 87124 |

| Quantity | ServiceType | Amount | Tax | Extension |
|---|---|---|---|---|
| 1 | Wastewater<br>3 FOUR THOUSAND GA AND 1 SEVEN THOUSAND GALLON TRUCKS 11 HOURS AND 14 LOADS HAULED | $13,200.00 | No | $13,200.00 |

| Taxable Amount | Tax Rate | Tax | Description |
|---|---|---|---|
| $0.00 | 0 | $0.00 | EXEMPT |

| | |
|---|---|
| Subtotal NonTaxed: | $13,200.00 |
| Subtotal Taxable: | $0.00 |
| Subtotal Tax: | $0.00 |

| Payment Terms | Payment | Adjustment | Late Charge | |
|---|---|---|---|---|
| Net 30 | $0.00 | $0.00 | $0.00 | Please Pay: **$13,200.00** |

From:
CITY OF RIO RANCHO
3200 CIVIC CENTER CIRCLE NE
RIO RANCHO, NM 87144

Please detach here and return the bottom portion with your payment.

| Order No. | Invoice No. | Date | Amount Due |
|---|---|---|---|
| 449887 | 449887 | 16-Sep-2010 | **$13,200.00** |

To:

ATLAS PUMPING COMPANY, INC.
P.O BOX 10477
ALBUQ, NM 87184-0477

**AAA Pumping Service, Inc.**
P.O. Box 12186
Albuquerque, NM 87195
(505) 345-3965

Invoice #: 73994
Invoice Date: Sep 15, 2010
Page #: 1
Site PO.:
Cust. PO.:
Terms: NET10

**City Of Rio Rancho**
3200 Civic Center Circle Ne
Rio Rancho, NM 87144-4501

| Due Date | Type | Job Site Information / Description | Rate | Units | Amount |
|---|---|---|---|---|---|
| Sep 13, 2010 | | LIFT STATION PUMP - Reference Hwy 528 Lift Station<br>Job location: Hwy 528 Lift Station (City Sewer Main break)<br>9 hours @ $300.00 per hour = $2700.00 X 3 trucks<br><br>PO# Mark Baker | $ 8,100.00 | 1.00 | $ 8,100.00 |
| Sep 13, 2010 | | Sales Tax | $ 7.00 % | 7.00 % | $ 567.00 |
| | | Invoice Total | | | $ 8,667.00 |

If paying by Credit Card please circle which card type and write in your card number in the space provided below:

REMITTANCE ADVICE - PLEASE RETURN WITH YOUR PAYMENT

AAA Pumping Service, Inc.
P.O. Box 12186
Albuquerque, NM 87195

Customer #: 001219 - 000000
Invoice #: 73994
Invoice Date: Sep 15, 2010
Site PO.:
Cust. PO.:
Terms: NET10
Card Type: (Please Circle Below)
Visa / Mastercard /
Card No.: _____ Exp. _____
3 Digit Security Card Code (On Back of Card): _____
Signature: _____
Invoice Total: $ 8,667.00
Amount Enclosed

# AMERICAN PUMPING SERVICE

P.O. Box 10595
ALBUQUERQUE, NEW MEXICO 87184-0595
(505) 344-7667 Fax (505) 342-9125
License #350852

| CUSTOMER'S ORDER NO. | PHONE | DATE |
|---|---|---|
| | | 9-13-10 |

NAME: City of Rio Rancho

ADDRESS: Svc: 528 S Santiago Way
Rio Rancho N.M.

| SOLD BY | CASH | C.O.D. | CHARGE | ON ACCT. | MDSE. RET'D. | PAID OUT |
|---|---|---|---|---|---|---|
| Tony | | | | | | |

| QTY. | DESCRIPTION | PRICE | AMOUNT |
|---|---|---|---|
| 2 | Trucks Pumping Lift Station | | 5400 00 |
| | 11:00pm – 8:00am | | |
| | 9 HR | | |
| | 2 trucks / 9 hours | 300 per truck per hour | |
| | Time In _____ | | |
| | Time Out _____ | | |
| | 1½% Per month (18% per annum) service charge on past due accounts. In case of default a reasonable attorney's fee & all collection costs will be paid by purchaser. | | |
| | | TAX | 327 38 |
| | | TOTAL | 5727 38 |

RECEIVED BY

All claims and returned goods MUST be accompanied by this bill.

PO BOX 10595
ALBUQUERQUE, NM 87184-0595
PH 505-344-7667
FAX 505-342-9125

American Pumping Service

# Fax

To: Mark Baker
From: Sandra

Attn:
Pages: 2

Fax: 892-5543
Date: 9-15-10

Phone: 975-1565
cc: Invoice

☐ Urgent ☐ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

• Comments


# AAA PUMPING SERVICE, INC.
# FAX COVER SHEET

Ph: 505-345-3965/Fax: 505-243-0314
E-mail: AAAPumping@Hotmail.com
Website: www.AAAPumpingservice.com

**Date:** 9/15/10

**To:** Mark Baker **From:** *Candy*

**Co:** City of Rio Rancho

**Fax:** 892-5543 **Phone:** 975-1565

**No. of Pages:** 2 **including cover**

**Invoice for pumping at Sewer Main break on Monday 9/13/10.**

**Please advise if you need me to mail an invoice also**

**Thank you**
**Have a safe and enjoyable day**

INVOICE

City of Rio Rancho
100 Industrial Park Loop
Rio Rancho, NM 87124

RE: Emergency Forcemain Repair @ Rivers Edge II

PO #: 110966

Invoice #: 210001-13-01
Invoice Date: November 29, 2010

Work Description:

Billing for emergency work required to repair the 6" force main at Rivers Edge II on November 26, 2010. Work included exposing existing 6" SDR 26 forcemain and replacing broken section of line with new 6" C900 DR18 pipe.

Invoice Cost:

| | |
|---|---|
| 6" Forcemain line repair (see attached for detail) | $2,775.65 |
| NMGRT @ 7.1875% | 199.50 |
| | $2,975.15 |

Payment should be made to AUI Inc. referencing the invoice number above and is due upon receipt. Please feel free to forward any questions or clarifications regarding this billing.

Submitted by:

AUI Inc.

Kathryn Jordan
Project Manager

Attachment (Cost breakdown)

**TOTALS FOR FORCE ACCOUNT WORK**
CONTRACTOR: AUI INC.

***FORCE ACCOUNT T&M FOR: EMERGENCY REPAIR TO MANHOLE***

| | |
|---|---|
| **JOB NAME** | *EMERGENCY REPAIR TO 6" FORCEMAIN AT RIVERS EDGE II (PO# 110966)* |
| **AUI JOB NUMBER** | *210001-13* |
| **DATES OF T&M WORK** | *11/26/2010* |

**DESCRIPTION OF WORK:**

*Work required to repair the 6" forcemain that broke at Rivers Edge II by Riverside Dr. Costs below reflect the effort required to repair the line. Costs reflect the use of CORR backhoe for excavations.*

| | | | |
|---|---|---|---|
| **Force Account T&M Cost** | | **$** | **2,775.65** |
| **Add: Performance & Payment Bond Adjustment @** | **0%** | **$** | **-** |
| **Subtotal** | | **$** | **2,775.65** |
| **Add: NMGRT @** | **7.1875%** | **$** | **199.50** |
| **TOTAL** | | **$** | **2,975.15** |

**LABOR**

| PERSONNEL DESCRIPTION | WAGE RATE DIRECT LABOR | LBR BURDEN 50% | CONTR. FEE 20% | SUBTOTAL HOURLY RATE | STANDARD HOURS | O.T. HOURS @ 1.5 x RATE | $ LABOR EXTENSION |
|---|---|---|---|---|---|---|---|
| Wayne Jiron (Super) | $ 32.00 | $ 16.00 | $ 9.60 | $ 57.60 | 8.0 | - | $ 460.80 |
| Eugene Rael (Foreman) | $ 25.00 | $ 12.50 | $ 7.50 | $ 45.00 | 5.0 | - | $ 225.00 |
| Steve Cabrerra (Foreman) | $ 21.00 | $ 10.50 | $ 6.30 | $ 37.80 | 8.0 | - | $ 302.40 |
| Adam Contreras (operator) | $ 16.79 | $ 8.40 | $ 5.04 | $ 30.22 | 7.0 | - | $ 211.55 |
| Gilberto Borunda (labor) | $ 14.78 | $ 7.39 | $ 4.43 | $ 26.60 | 7.0 | - | $ 186.23 |
| Jesus Garcia (labor) | $ 14.78 | $ 7.39 | $ 4.43 | $ 26.60 | 5.0 | 2.0 | $ 212.83 |
| Edward Quintana (labor) | $ 14.38 | $ 7.19 | $ 4.31 | $ 25.88 | 5.0 | 2.0 | $ 207.07 |
| | | $ - | $ - | $ - | - | - | $ - |
| | | $ - | $ - | $ - | - | - | $ - |
| | | | | | **LABOR TOTAL :** | | **$ 1,805.89** |

**EQUIPMENT**

| DESCRIPTION | UNIT NUMBER | COA BLUEBK. RATE | INVOICED RENTAL RATE | CONTR. FEE 20% | SUBTOTAL HOURLY RATE | TOTAL HRS/DAYS IN USE | $ EQUIPMENT EXTENSION |
|---|---|---|---|---|---|---|---|
| F250 truck | 9176 | $ 15.75 | | $ 3.15 | $ 18.90 | 8.00 | $ 151.20 |
| F450 truck | 9346 | $ 21.30 | | $ 4.26 | $ 25.56 | 5.00 | $ 127.80 |
| F450 truck | 9342 | $ 21.30 | | $ 4.26 | $ 25.56 | 8.00 | $ 204.48 |
| | | | | $ - | $ - | | $ - |
| | | | | $ - | $ - | | $ - |
| | | | | $ - | $ - | - | $ - |
| | | | | $ - | $ - | - | $ - |
| | | | | | | **EQUIPMENT TOTAL :** | **$ 483.48** |

**MATERIALS & MISCELLANEOUS**

| DESCRIPTION | UNIT OF MEASURE | QUANTITY | UNIT COST | CONTR. FEE 20% | SUBTOTAL UNIT PRICE | $ MATERIALS EXTENSION |
|---|---|---|---|---|---|---|
| 6" C900 PVC pipe | LF | 20.00 | $ 4.45 | $ 0.89 | $ 5.34 | $ 106.80 |
| 6" MJ Sleeve | EA | 2.00 | $ 53.00 | $ 10.60 | $ 63.60 | $ 127.20 |
| 6" Megalug | EA | 4.00 | $ 35.07 | $ 7.01 | $ 42.08 | $ 168.34 |
| 6" bolt & gasket kit | EA | 2.00 | $ 16.34 | $ 3.27 | $ 19.61 | $ 39.22 |
| 6" transition gasket | EA | 2.00 | $ 18.64 | $ 3.73 | $ 22.37 | $ 44.74 |
| | | | | $ - | $ - | $ - |
| | | | | $ - | $ - | $ - |
| | | | | $ - | $ - | $ - |
| | | | | $ - | $ - | $ - |
| | | - | | $ - | $ - | $ - |
| | | | | $ - | $ - | $ - |
| | | | | | **MATERIAL TOTAL :** | **$ 486.29** |

# ELAINE ALLEN - Re: Sewer line break at Santiago's Subdivision

**From:** LARRY webb
**To:** Service, Jim
**Date:** 9.15.2010 5:33 PM
**Subject:** Re: Sewer line break at Santiago's Subdivision
**CC:** ALLEN, ELAINE; Alsop, Trevor; Casaus, Debbie; EricaBaca; GALLEGOS, STEVE; JIMENEZ, JAMES; LEEPER, CLIFF; SENSANBAUGHER, SCOTT; Stoliker, David; VORNHOLT, LISA

Jim, the description of the break and repair time lines are about what I understand. The route the sewage took through the subdivision in the storm drain feature is what I observed that night. The description of the flow is not how it was described to me nor in the pictures I received, I didn't have the opportunity to walk the arroyo. Can you get with Cliff Leeper and visit the location tomorrow so he understands where the sewage ended up. Cliff will call you in the morning. I will get with him tomorrow afternoon to go over the spill once again. Thanks for the description.

>>> Jim Service <JService@sscafca.com> 9/15/2010 5:05 PM >>>
Larry:
At about 10 a.m. this morning David told me about the force main break at the entrance to the Santiago's Subdivision and NM 528.

The crews on-site told Trevor and I the force main appears to be 12"-15" in diameter and has a force flow of approximately 2000gpm. The break was reported Monday, Sept. 13 and crews were on-site around 6pm that same day. The break was repaired by Tuesday, Sept. 14th around 7 a.m. If any of the above is incorrect please advise.

Unfortunately almost all of that sewage went onto hard surfaces and then either into a concrete lined channel to the east or into a 36" RCP to the north and thus into the Venada Arroyo.

At the end of the concrete lined channel is an energy dissipation concrete box at the Venada Arroyo which appears to be plugged and full of liquid waste and debris.

The sewage ran down the entire length of the Venada and collected in our water quality facility at the river end of the arroyo. It then overtopped the water quality feature and made it to the river channel.

This break is different from the August 23rd break in the Los Montoyas which was due to a storm event. The break at Santiago's was directly onto hard surfaces and then into the arroyo with no mitigating sediment or diluting run-off volume accompanying the flow.

Please advise us of the actions the city plans to take in order to address this situation.
Thank you,
Jim

---

**James Service**
*Field Operations Coordinator*
**Southern Sandoval County**
**Arroyo Flood Control Authority**

1041 Commercial Dr. S.E.
Rio Rancho, New Mexico 87124
505-892-RAIN (7246)
505-892-7241 (Fax)
email: jservice@sscafca.com
www.sscafca.com

---

**ELAINE ALLEN - Sewer line break at Santiago's Subdivision**

**From:** Jim Service <JService@sscafca.com>
**To:** "Lwebb@ci.rio-rancho.nm.us" <Lwebb@ci.rio-rancho.nm.us>
**Date:** 9.15.2010 5:05 PM
**Subject:** Sewer line break at Santiago's Subdivision
**CC:** "ssensanbaugher@ci.rio-rancho.nm.us" <ssensanbaugher@ci.rio-rancho.nm.us>, David Stoliker <DStoliker@sscafca.com>, "CLEEPER@ci.rio-rancho.nm.us" <CLEEPER@ci.rio-rancho.nm.us>, "EALLEN@ci.rio-rancho.nm.us" <EALLEN@ci.rio-rancho.nm.us>, "JJIMENEZ@ci.rio-rancho.nm.us" <JJIMENEZ@ci.rio-rancho.nm.us>, "LVORNHOLT@ci.rio-rancho.nm.us" <LVORNHOLT@ci.rio-rancho.nm.us>, Debbie Casaus <DCasaus@sscafca.com>, EricaBaca <EBaca@sscafca.com>, "SGALLEGOS@ci.rio-rancho.nm.us" <SGALLEGOS@ci.rio-rancho.nm.us>, Trevor Alsop <TAlsop@sscafca.com>

Larry:
At about 10 a.m. this morning David told me about the force main break at the entrance to the Santiago's Subdivision and NM 528.

The crews on-site told Trevor and I the force main appears to be 12"-15" in diameter and has a force flow of approximately 2000gpm. The break was reported Monday, Sept. 13 and crews were on-site around 6pm that same day. The break was repaired by Tuesday, Sept. 14th around 7 a.m. If any of the above is incorrect please advise.

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**James Service**
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email: jservice@sscafca.com
www.sscafca.com

---

# APPENDIX F

# ABATEMENT PLAN FOR INJECTION ACTIVITY

# Amended Stage II Abatement Plan at the Former Price's Bernalillo Dairy

By
Faith Engineering, Inc.
5701 Piedra Dr. NW
Albuquerque, NM 87114

Prepared for
VG Farms, Inc.
2 Sandia Heights Dr. NE
Albuquerque, NM 87110

and the
Ground Water Quality Bureau
New Mexico Environment Department
1190 St. Francis Dr,
Santa Fe, NM 87502

January 31, 2008

FEI | Faith Engineering, Inc.
5701 Piedra Dr. NW
Albuquerque, New Mexico 87114
(505) 898-6140 • FAX (505) 898-1132
e-mail • faithinc @flash.net

January 31, 2008 **via email and US Mail**

Mr. Bart Faris
Remediation Oversight Section
Ground Water Quality Bureau
New Mexico Environment Department
5500 San Antonio NE
Albuquerque, New Mexico 87109

RE: Amended Stage II Abatement Plan
Price's Valley Gold, North Dairy
Hwy. 528, Bernalillo, Sandoval County, NM
FEI Project No. 99-08-1180

Dear Mr. Faris:

On behalf of VG Farms, Inc. (applicant), Faith Engineering, Inc. (FEI) is pleased to submit herewith the, "Amended Stage II Abatement Plan" for the subject facility. This plan is being submitted as an alternate to the Stage II Plan, which was submitted on September 18, 2007. That plan proposed the use of Monitored Natural Attenuation (MNA) as a primary remediation option with a contingent plan utilizing carbon source nutrient injection should the primary MNA plan fail to meet expected performance monitoring objectives.

After discussion with NMED staff subsequent to the above described AP submittal, VG Farms, Inc. has elected to amend the primary MNA remediation option proposed in the 9/18/07 proposal in favor of a more aggressive abatement plan utilizing in-situ denitrification.

This plan differs from the contingent plan offered in the 9/18/07 Stage II AP submittal in both the location and the rates of ground water pumping and nutrient injection. Part of the rationale for the amended primary remediation plan is the existing development schedule for the site and the desire to reach plan performance objectives in a more expeditious manner.

The 9/18/07 Stage II AP submittal provided discussion of previous investigations and the hydrogeology of the site as it pertains to contaminant distribution and transport pathways. Therefore, this amended plan provides only the technical information related to implementation, operation and monitoring of the proposed primary denitrification plan.

VG Farms is planning to begin drilling of the proposed nutrient injection wells and the ancillary replacement monitoring wells in mid February 2008. It is anticipated that the remediation system will be ready to begin operation by the end of March 2008.

Finally, VG Farms pursuant to Section 20.6.2.3106 NMAC requests approval of a temporary discharge permit to conduct this remediation effort, and has included a check payable to the Water Quality Management Fund for $150 pursuant to Section 20.6.2.3107 NMAC.

We would like to thank you again for your continued support and cooperation in this effort. Please do not hesitate to call me should you have any questions.

Respectfully submitted,
FAITH ENGINEERING, INC.

Stuart E. Faith

Stuart E. Faith, President
NM Professional Engineer No. 6396

cc: Mr. Dudley Price, VG Farms, Inc.
Mr. John Price, VG Farms, Inc.
Mr. Ron Bohannan, Terra West, LLC
Mr. Patrick Hurley, Esq.
Ms. Tessa Davidson, Esq.

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1. Discussion of Enhanced In Situ Bioremediation (EISB) at the VG Farms Site

The previous Stage II AP provided a description of the geohydrologic boundary between the bluff forming Duranes Formation and the eastward lying Rio Grande Valley Fill. This boundary can be seen clearly on photo and topographic maps of the site where the bluff forming sediments meets its erosional contact with the Rio Grande. VG Farms proposes to complete a series of 4 inch diameter wells spaced fifty (50) ft. apart along the above described boundary, and to inject a solution of diluted sugar with supplemental additions of tri-sodium phosphate (TSP – an additional required nutrient) and sodium bromide (as a tracer) to stimulate native denitrifying bacterial growth. The objectives are to denitrify existing nitrate in the ground water and to establish a growth of biomass in the saturated sediments adjacent to and down gradient of the injection wells to inhibit future nitrate migration from this boundary between the Duranes gravel layer and the Rio Grande Valley Fill.

1.1 Location and Completion of Proposed Injection Wells

Figure 1 shows the approximate location of the boundary between the Duranes and Rio Grande Valley Fill sediments. Figure 2 provides an enlargement of that boundary area in the vicinity of the former unlined lagoon. Both Figure 1 and Figure 2 are taken from a July, 2007 satellite photomap (Google) and shows the lined temporary lagoon (which is now filled) that was constructed for purposes of conducting pumping tests on the Reclamation Well (RW) and a Duranes Formation test well (PW-1) in May 2007. The line of proposed injection wells and the route of the pipeline to the injection wells from the RW supply well is also shown on Figure 2. This line of injection wells is slightly east of a line between the former MW-13 and MW-19 monitoring wells, and will allow completion of wells with screened injection intervals below the Rio Grande Valley Fill static ground water elevation and above the buried portion of the Duranes Formation scarp as shown on Figure 3.

The injection wells will be completed using a truck mounted CME-75 with a 10-inch diameter hollow stem auger (HSA). Limited split spoon or continuous core soil sampling below the water table will be conducted to determine the boundary contact with the Lower Duranes Formation. The wells will be completed with 4-inch diameter PVC and No. 20 slot well screen below the water table to the contact with the Lower Duranes (apprx. 20 to 30 ft.). The wells will be sand packed with No 12 - 16 washed silica sand, a bentonite plug above the sand pack, and neat cement grout to the surface. Each well will be developed by bailing and/or pumping until returns are sediment free.

1.2 Nutrient Injection System

VG Farms has elected to use sugar as the carbon nutrient source because of its ease of mixing, storage, and ready commercial availability. Calculations for the stoichiometric concentrations of sugar required to treat 50 mg/l nitrate in ground water are provided in Appendix A, as well as concentrations of dry TSP and sodium bromide to be added to achieve 20/mg/l phosphate and XXX mg/l bromide. The calculations supporting the theoretical radius of nutrient injection solution from the injection wells are provided in Appendix B.

VG Farms proposes to mix dry sugar, TSP and sodium bromide periodically in a 1000-gallon trailer mounted mixing tank, which will be located adjacent to the injection wells. The periodic batch mixing will be accomplished by adding fresh make up water from the RW pumping well along with the dry nutrient/amendment ingredients followed by mixing with a recirculation pump mounted on the tank trailer. Flow from the tank to the injection line will be via a venturi eductor fitting and valve. This mixing system design is illustrated schematically in Figure 4 along with details illustrating the surface injection well completion. A valve at each wellhead will control the flow rate to each injection well and assist in balancing the water levels in each well. Prior to starting nutrient injection, fresh water will be pumped from the RW through the mixing valve and injection wells to determine the rate of mixing tank discharge and to balance flow between the injection wells.

2.0 Operation and Monitoring

VG Farms intends to operate the above described nutrient injection system for a nominal six month period, and expects to form an effective biomass barrier to existing and future ground water nitrate migration and to denitrify existing ground water nitrate east of the injection wells. This will then be followed by a two to five year ground water monitoring period to assure that nitrate remains below NMWQCC standards.

Replacement monitoring wells will be completed in late February to early March 2008. The location of the replacement monitoring wells is shown on Figure 5. Changes to the replacement monitoring well configuration since the 9/18/07 Stage II AP submittal include: (1) moving MW-19R to a location east of the proposed injection wells, (2) completing an off site and up gradient monitoring well MW-22 on the west side of NM Hwy. 528, and (3) making minor adjustments in the location of other replacement monitoring wells to accommodate site grading.

Additional detail regarding the operation of the nutrient injection system and future ground water monitoring are provided in the following sections.

## 2.1 Nutrient Injection Considerations

The pumping test conducted on the RW pumping well in May, 2007 indicates that a sustained pumping rate of 30 gpm is possible, and is the basis for calculating the mixing and nutrient injection rates for the remediation system proposed herein. A totalizing flow meter will be installed between the RW pumping well and the nutrient mixing tank as shown on Figure 4 to monitor total pumping and injection rates.

The vacuum generated by the eductor venturi mixing valve in combination with the control valve located between the mixing tank and eductor will dictate the rate at which the concentrated sucrose solution is mixed with the raw water feed from the RW well. This in turn will dictate the frequency with which the mixing tank will need to be replenished with raw sugar, TSP and sodium bromide. Additionally, periodic pumping and injection of fresh water with no nutrient or amendment additions may be necessary to ensure that the sand and gravel matrix in close radial proximity to the injection wells does not become clogged by biomass formation. Should water level increases in the injection wells suggest that the rate or severity of biomass formation in proximity to the injection wells is occurring, then consideration will be given for adding sodium hypochlorite to the injection stream to eliminate biomass formation near the injection wells. This may be done by either dosing the mixing tank or to individual wells (via the water level probe access port on each injection wellhead) exhibiting higher biofouling.

A record will be maintained of:

- the water level and dissolved oxygen (DO) in the injection wells (daily for one week, twice weekly thereafter);
- the water level and DO in the RW pumping well (daily for one week, twice weekly thereafter);
- flow totalizer reading (same frequency as above)
- water level in the mixing tank (with corresponding gallons injected – same frequency as above);
- quantity of raw sugar, TSP and sodium bromide added;
- dates and times of no nutrient/amendment injection;
- dates, times, and quantity of sodium hypochlorite added; and
- dates, times, and duration of system shutdown for maintenance or repair.

2.2 Ground Water Monitoring

The initial round of ground water sampling of the replacement monitoring wells will be conducted within one to two weeks of their completion, which is anticipated in late February to early March, 2008. All replacement monitoring wells will be surveyed by a licensed NM Surveyor. All wells will be developed by bailing and/or pumping until returns are clear of sediment and fines.

Periodic sampling will be conducted using a low flow variable speed Grundfos sampling pump after static water levels have been measured. A minimum of three well bore volumes will be purged from each well prior to sample collection. All monitor well samples will be analyzed for nitrate ($NO_3$), total Kjehldahl nitrogen (TKN), chloride (Cl), total dissolved solids (TDS), sodium (Na), potassium (K), magnesium (Mg), calcium (Ca), sulfate ($SO_4$), and bicarbonate ($HCO_3$). Monitor wells MW-11R, 14R, 15R, 16R, 18, and 21 will be sampled semi-annually. Monitor wells MW-1A, 6R, 8R, 13R, 19R, 20R, and 22 will be sampled quarterly. In addition to the routine analytes mentioned above, monitor wells MW-1A, 19R, 20R and the pumping well (RW) will be sampled weekly after the nutrient injection system startup, and will be analyzed for dissolved oxygen (DO), total organic carbon (TOC), iron (Fe), manganese (Mn), phosphate ($PO_4$), and bromide (Br).

2.3 Reporting

During operation of the nutrient injection system, VG Farms will provide monthly reports to NMED summarizing the nutrient injection parameters described in Section 2.1, monitoring results from MW-1A, MW-19R, 20R and RW as described in Section 2.2, and any proposed changes to the nutrient injection system operation. Quarterly reporting of ground water monitoring results will be provided to NMED. A summary of monitoring and reporting is provided in Table1.

3.0 Contingency

A contingency plan for the proposed MNA remediation was included in the 9/18/07 Stage II AP submittal. That contingency plan called for the construction of two pumping wells in the Lower Duranes Fine Grained Sand, the pumping and mixing of ground water from those wells with appropriate denitrification nutrients and amendments, and the reinjection of the resultant mixture into the Duranes Gravel Layer immediately west of its erosional contact with the Rio Grande Valley Fill. VG Farms proposes to keep this contingency plan as a future option should the primary nutrient injection system proposed herein require supplemental augmentation.

Additionally, consideration will be given to short term injection of denitrification nutrient solution to "hot spots" which may become evident after cessation of the primary nutrient injection system.

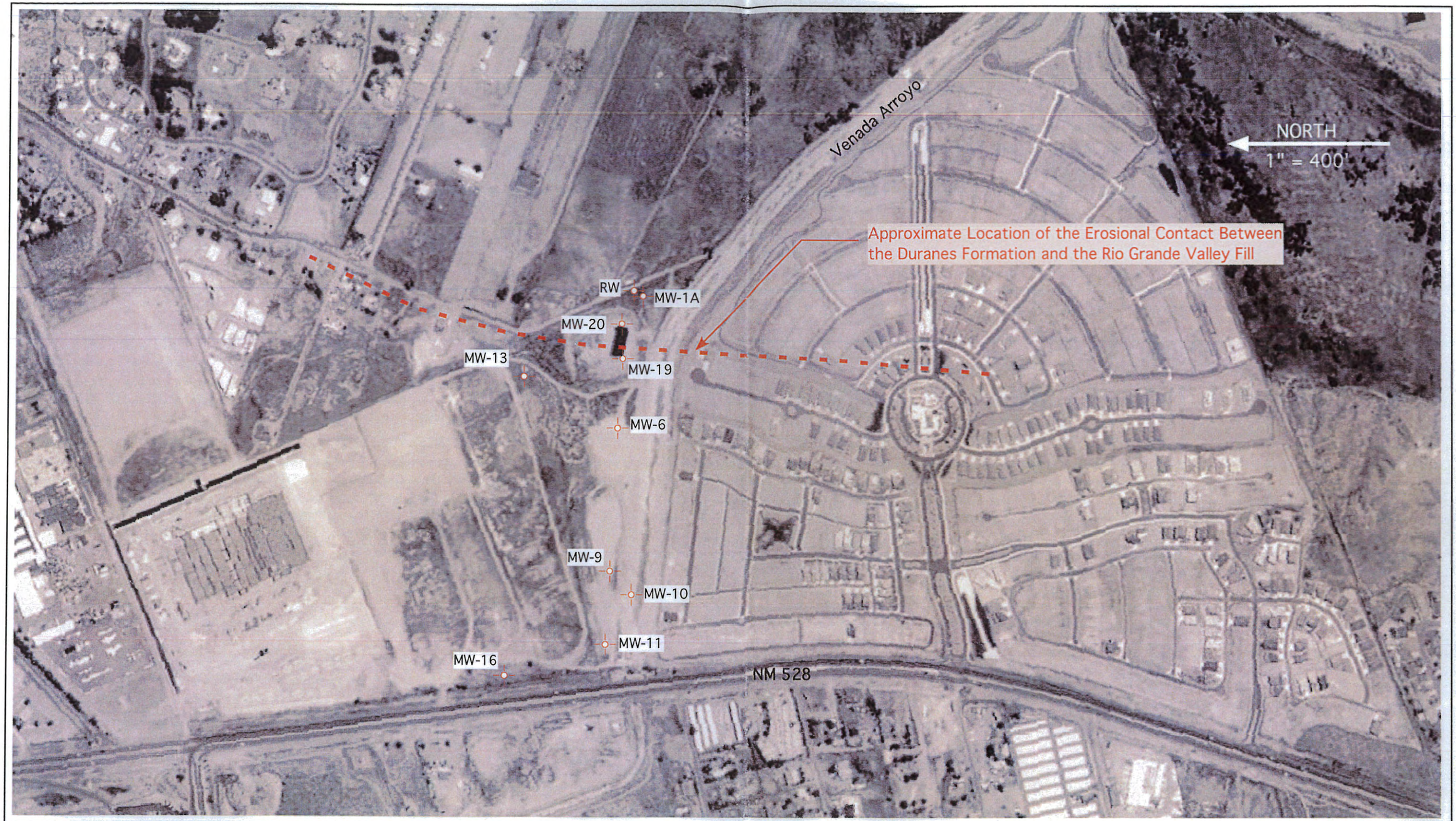
## 4.0 Conclusion

VG Farms offers this proposed primary and contingent Stage II AP remediation options as the most expedient and technically feasible means of achieving compliance with the NMWQCC regulations for ground water protection. VG Farms intends to proceed with the construction of both the injection and replacement monitoring wells within the next few weeks, and intends to start up the proposed nutrient injection system upon approval of the temporary discharge permit requested in the transmittal letter accompanying this proposal.

TABLE 1
SUMMARY OF MONITORING AND REPORTING FOR VG FARMS BERNALILLO DAIRY
STAGE II ABATEMENT PLAN

| ITEM | MEASURE | FREQUENCY | | | | | | Period |
|---|---|---|---|---|---|---|---|---|
| | | daily for first week | twice per week | weekly | monthly | quarterly | semi-annually | |
| injection wells | dissolved oxygen and water level | X | X | | X | | | 6 months of remediation |
| RW | dissolved oxygen and water level | X | X | | X | | | |
| Flow Totalizer | total flow in gallons | X | X | | X | | | |
| Mixing Tank | water level | X | X | | X | | | |
| Nutrient and Amendments | weight added | as added | | | X | | | |
| fresh water injection | flow total | as added | | | X | | | |
| Sodium Hypochlorite | weight added | as added | | | X | | | |
| System Shutdown | duration and purpose of repair or maintenance | as added | | | X | | | |
| MW-1A, 19R, 20R, RW | DO, TOC, Fe, Mn, $PO_4$, Br, Na, K, Mg, Ca, $HCO_3$, $SO_4$, $NO_3$ | | | X | X | | | |
| MW-1A, 6R, 8R, 13R, 19R, 20R, 22 | $NO_3$, TKN, Cl, TDS, Na, K, Mg, Ca, $HCO_3$, $SO_4$ | | | | | X | | 2 to 5 years of performance monitoring |
| MW-11R, 14R, 15R, 16R | $NO_3$, TKN, Cl, TDS, Na, K, Mg, Ca, $HCO_3$, $SO_4$ | | | | | | X | |

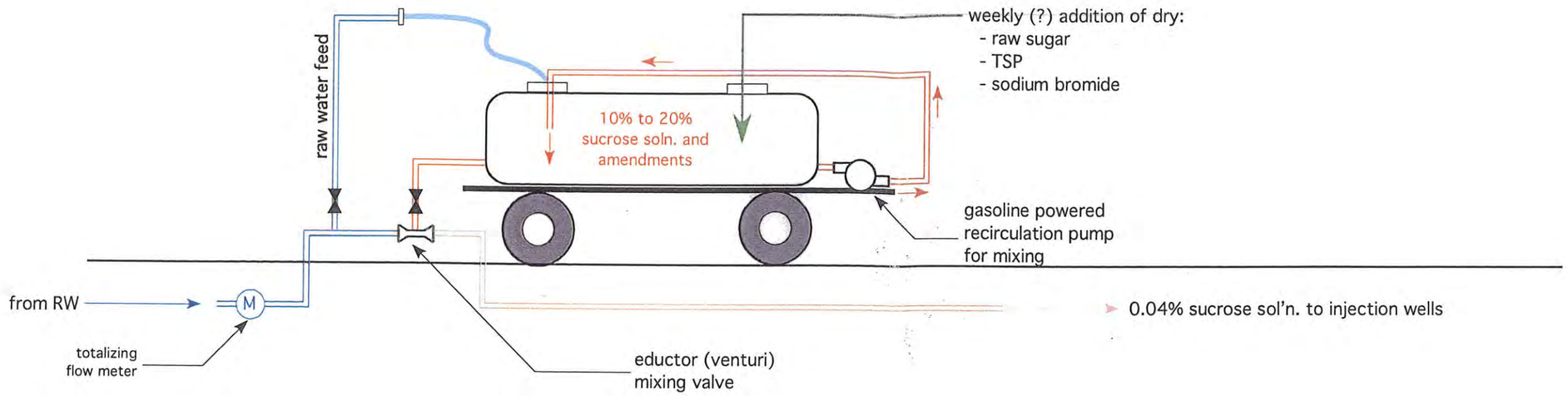
X denotes reporting frequency to NMED

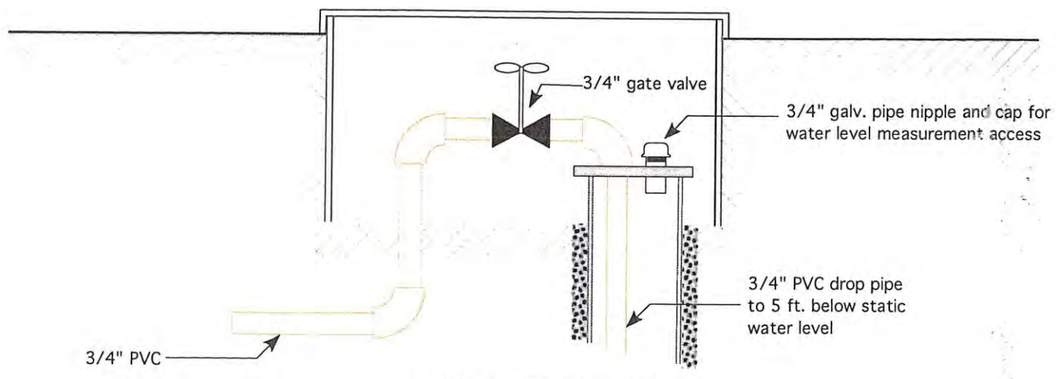



| | | | |
|---|---|---|---|
| FILE: 99-08-1180<br>DATE: 1/31/08<br>DRAWN: SEF<br>DATE OF PHOTO: July 2007 | PRICE'S VG FARMS, INC.<br>MODIFIED STAGE II AP | Figure 1<br>Duranes Fm. and Rio<br>Grande Valley Fill Contact | FEI \| Faith Engineering, Inc.<br>5701 Piedra Dr. NW<br>Albuquerque, New Mexico 87114<br>(505) 898-6140 • FAX (505) 898-1132<br>e-mail • faithinc@flash.net |

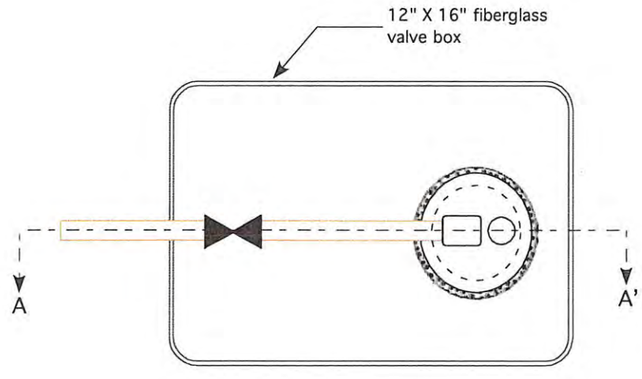

| | | | |
|---|---|---|---|
| FILE: 99-08-1180<br>DATE: 01/31/08<br>DRAWN: SEF<br>DATE OF PHOTO: July 2007 | PRICE'S DAIRY<br>Stage II Abatement Plan | Figure 2<br>Denitrification Nutrient<br>Injection Wells | FEI Faith Engineering, Inc.<br>5701 Piedra Dr. NW<br>Albuquerque, New Mexico 87114<br>(505) 898-6140 • FAX (505) 898-1132<br>e-mail • faithinc@flash.net |

## NUTRIENT AMENDMENT MIXING DETAIL




CROSS SECTION AA'
INJECTION WELL/VALVE BOX DETAIL

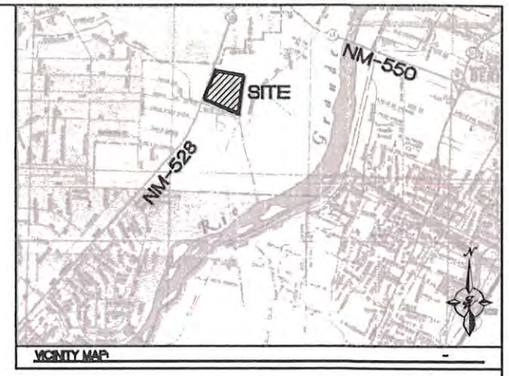


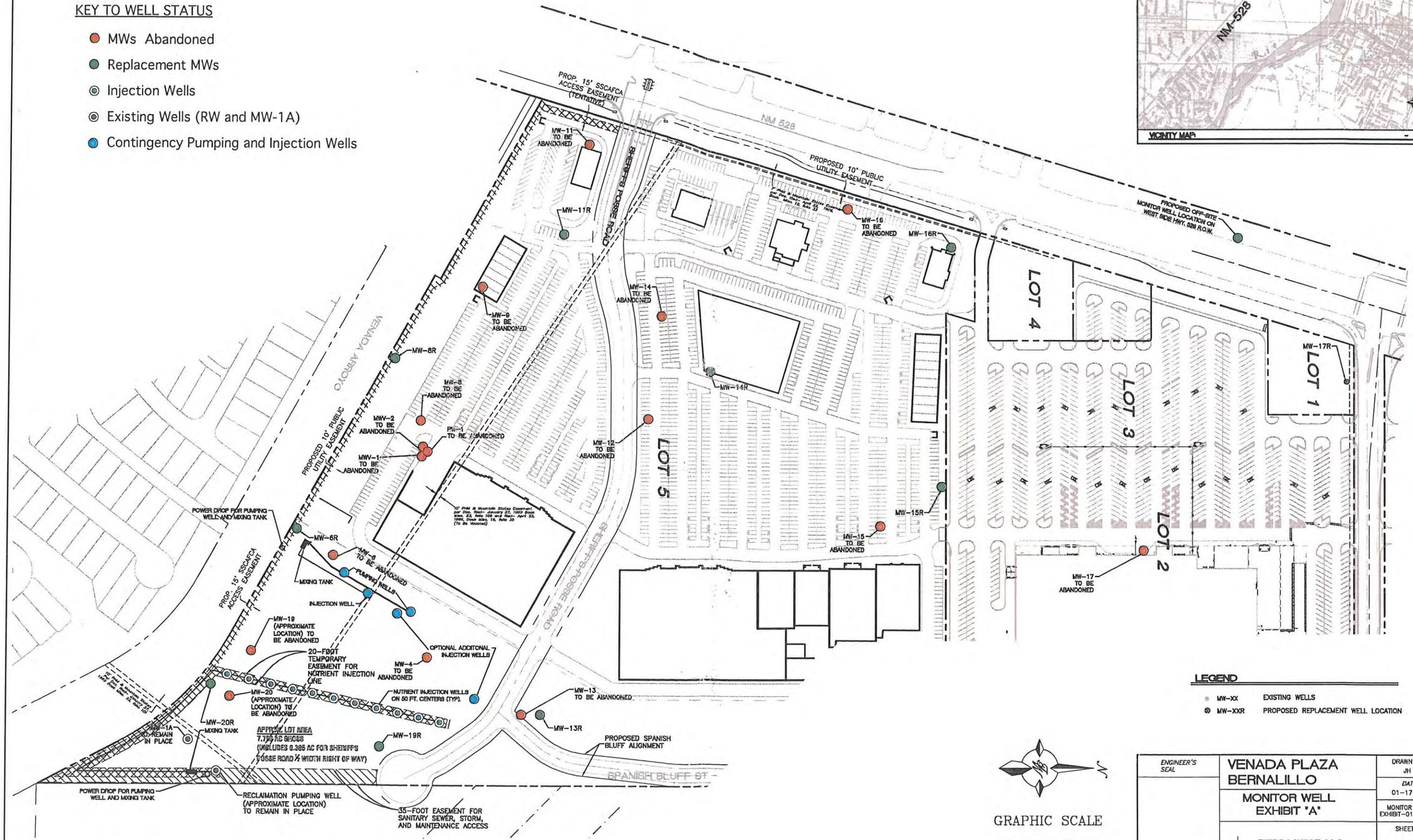

PLAN VIEW
INJECTION WELL/VALVE BOX DETAIL

| | | | |
|---|---|---|---|
| FILE: 99-08-1180<br>DATE: 01/31/08<br>DRAWN: SEF<br>NOT TO SCALE | PRICE'S DAIRY<br>Stage II Abatement Plan | Figure 4<br>Mixing Tank and<br>Injection Wellhead Detail | FEI \| Faith Engineering, Inc.<br>5701 Piedra Dr. NW<br>Albuquerque, New Mexico 87114<br>(505) 898-6140 • FAX (505) 898-1132<br>e-mail • faithinc@flash.net |

KEY TO WELL STATUS

- MWs Abandoned
- Replacement MWs
- Injection Wells
- Existing Wells (RW and MW-1A)
- Contingency Pumping and Injection Wells




LEGEND

- MW-XX EXISTING WELLS
- MW-XXR PROPOSED REPLACEMENT WELL LOCATION

GRAPHIC SCALE

100 50 0 50 100

SCALE: 1"=100'

| | | |
|---|---|---|
| ENGINEER'S SEAL | VENADA PLAZA BERNALILLO<br>MONITOR WELL EXHIBIT "A" | DRAWN BY JH<br>DATE 01-17-08<br>MONITOR WELL EXHIBIT-01-17-08<br>SHEET # C2 |
| RONALD R. BOHANNAN P.E. 7868 | TIERRA WEST, LLC<br>5571 MIDWAY PARK PLACE NE<br>ALBUQUERQUE, NM 87109<br>(505)858-3100 | JOB # 26058 |

FIGURE 5

# APPENDIX A

# NUTRIENT DOSING CALCULATIONS

PROBLEM: How much sugar (sucrose) is required for stoichiometric reduction of 50 mg/l nitrate to atmospheric nitrogen by denitrifying bacteria?

GIVEN: (1.) molecular formula for sucrose: $C_{12}H_{22}O_{11}$

(2.) molecular weight of sucrose: (12 X 12) + 22 + (11 X 8) = 254 grams/mole

(3.) molecular weight of nitrate ($NO_3$): (3 X 8) + 7 = 31 grams/mole

(4.) nitrate reduction:

$$NO_3 + {}^{5}/_{48}\, C_{12}H_{22}O_{11} \rightarrow {}^{1}/_{2}\, N_2 + {}^{5}/_{4}\, CO_2 + {}^{31}/_{48}\, H_2O + OH$$

(a) molecular concentration of nitrate:

(50 mg/liter ) X (1 mmole/31 mg ) = 1.6 mmoles/liter $NO_3$

(b) required concentration of sucrose:

(1.6 mmoles nitrate/liter) X ($^{5}/_{48}$ mmoles sucrose/mmole nitrate) X (254 mg/mmole sucrose)

= 42 mg/liter sucrose

(c) daily sucrose required at pumping rate of 30 gal/min

(42 mg/l)(1 gr/1000 mg)(2.205X10$^{-3}$ lb/gr)(3.78 l/gal)(30 gal/min)(1440 min/day)

= 14 lbs/day sugar

# APPENDIX B

# INJECTION WELL
# RADIUS OF INFLUENCE
# CALCULATIONS

# CALCULATION OF NUTRIENT INJECTION WELL SPACING AND AVAILABLE TIME FOR BIO-BARRIER FORMATION AT VG FARM'S FORMER BERNALILLO DAIRY

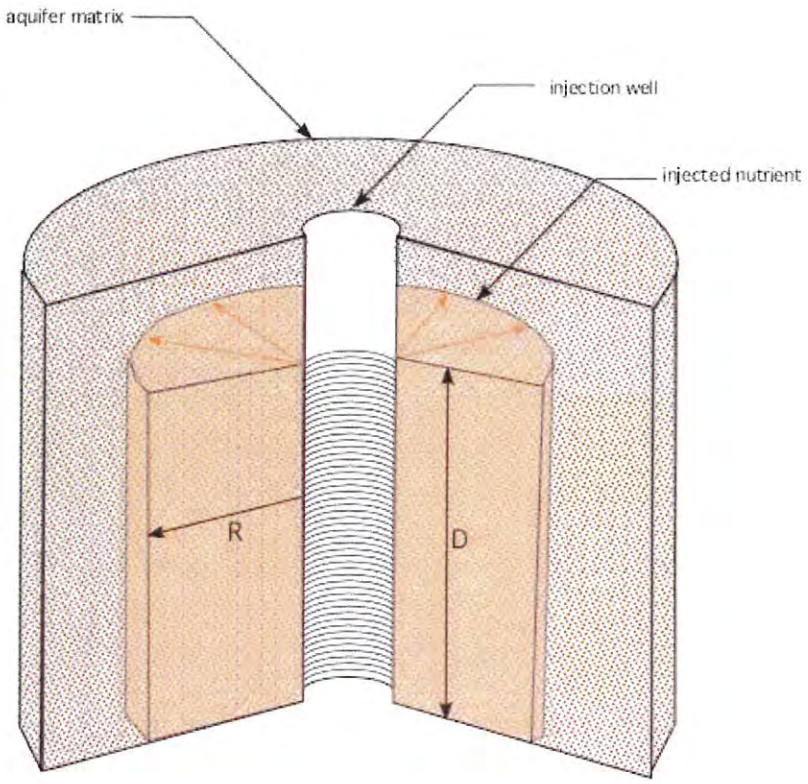
The attached figures provide a theoretical basis for determining the spacing of proposed nutrient injection wells at the former VG Farms Inc. Bernalillo Dairy. These are theoretical in that the calculations assume a uniform radial flow of injected nutrient solution away from each of the evenly spaced injection wells, which in turn assumes a uniform and homogenous sand and gravel matrix in the shallow ground water aquifer below the injection wells.

The major variables in the calculations are the aquifer porosity, the rate of nutrient injection into each well, and the length of well screen in each well. For sand and gravel aquifers, a typical range of porosity is 15% to 25%. Given the historic steady state pumping rate of the reclamation well (RW) of 30 to 35 gallons per minute (gpm) and the numbers of possible injection wells (10 to 15), an average flow to each injection well is 2 to 3 gpm. The well screen length for the line of injection wells between MW-19 and MW-13 will need to extend from the surface of the shallow ground water table in the Rio Grande fill downward to the contact with the Duranes formation, which is believed to be in the range of 20 to 30 feet.

The first figure provides the basis for calculation of the radius of injected fluid over time under the above described theoretical conditions, and the figures that follow provide radius versus time for various injection rates, well screen lengths (or depths), and porosities.

Based on these figures and the proposed 50 ft. spacing of the injection wells, it can be seen that the initial contact of injected nutrient solution between adjacent injection wells (R = 25 ft.) will occur within approximately 30 days, and complete "overlap" of injected fluid (R = 50 ft.) between adjacent wells could take up to 150 days.

Based on these calculations, it is recommended that if the injection wells are allowed to operate for the entire six months that we have proposed, that a well spacing greater than 50 ft. (70 to 80 ft.) may be appropriate, but if a shorter injection period is required to accommodate site development, then the 50 ft. spacing may be appropriate.




**Radius of Nutrient Fluid Injection**

$(\pi R^2)$ (D) (Ø) = (Q) (1440 min/day) (1 cu ft/7.48 gal) (days pumping)

$$R = \text{sq. rt.} \quad \frac{(Q)\ (1440\ \text{min/day})\ (1\ \text{cu ft}/7.48\ \text{gal})\ (\text{days pumping})}{(D)\ (Ø)\ (\pi)}$$

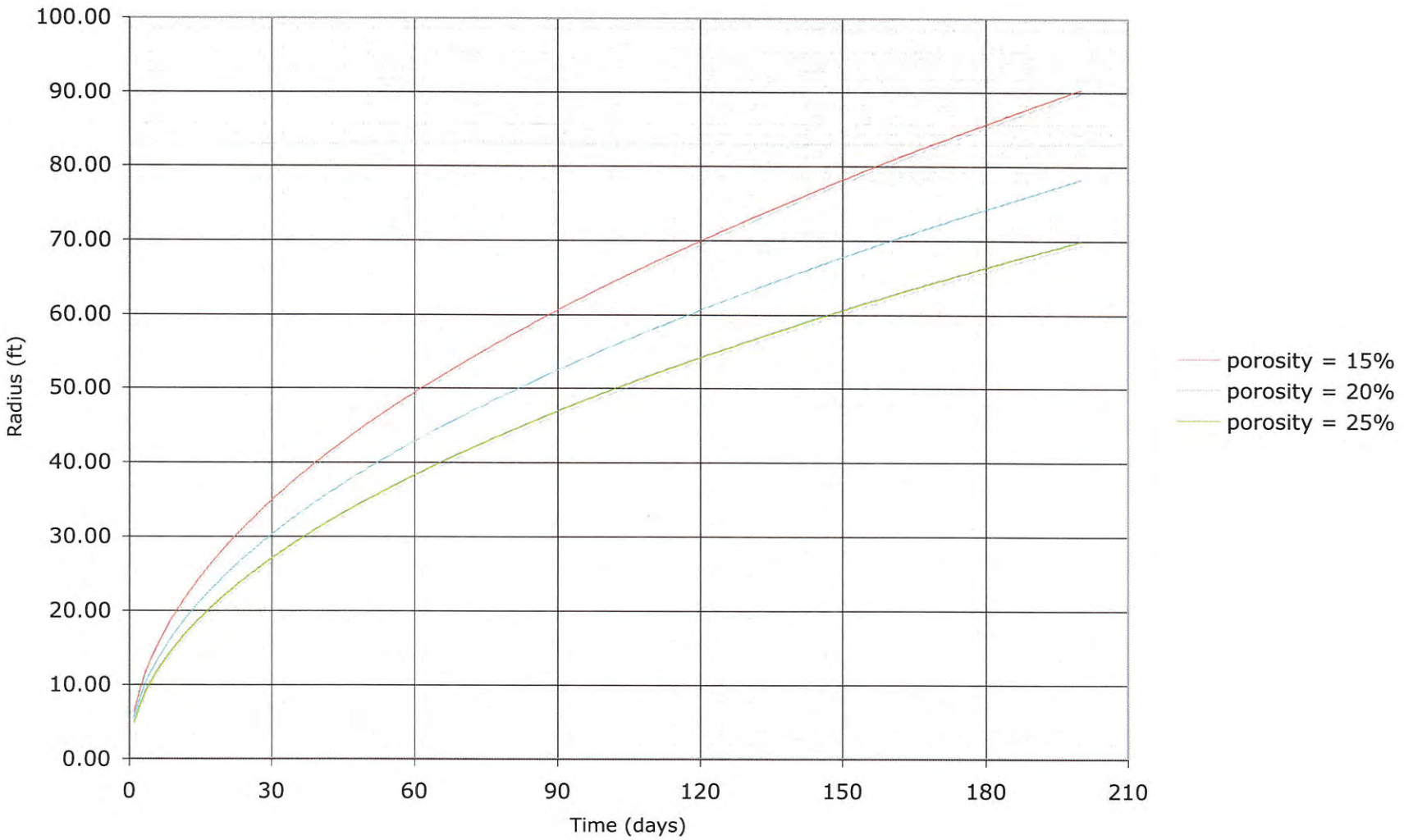
Where:

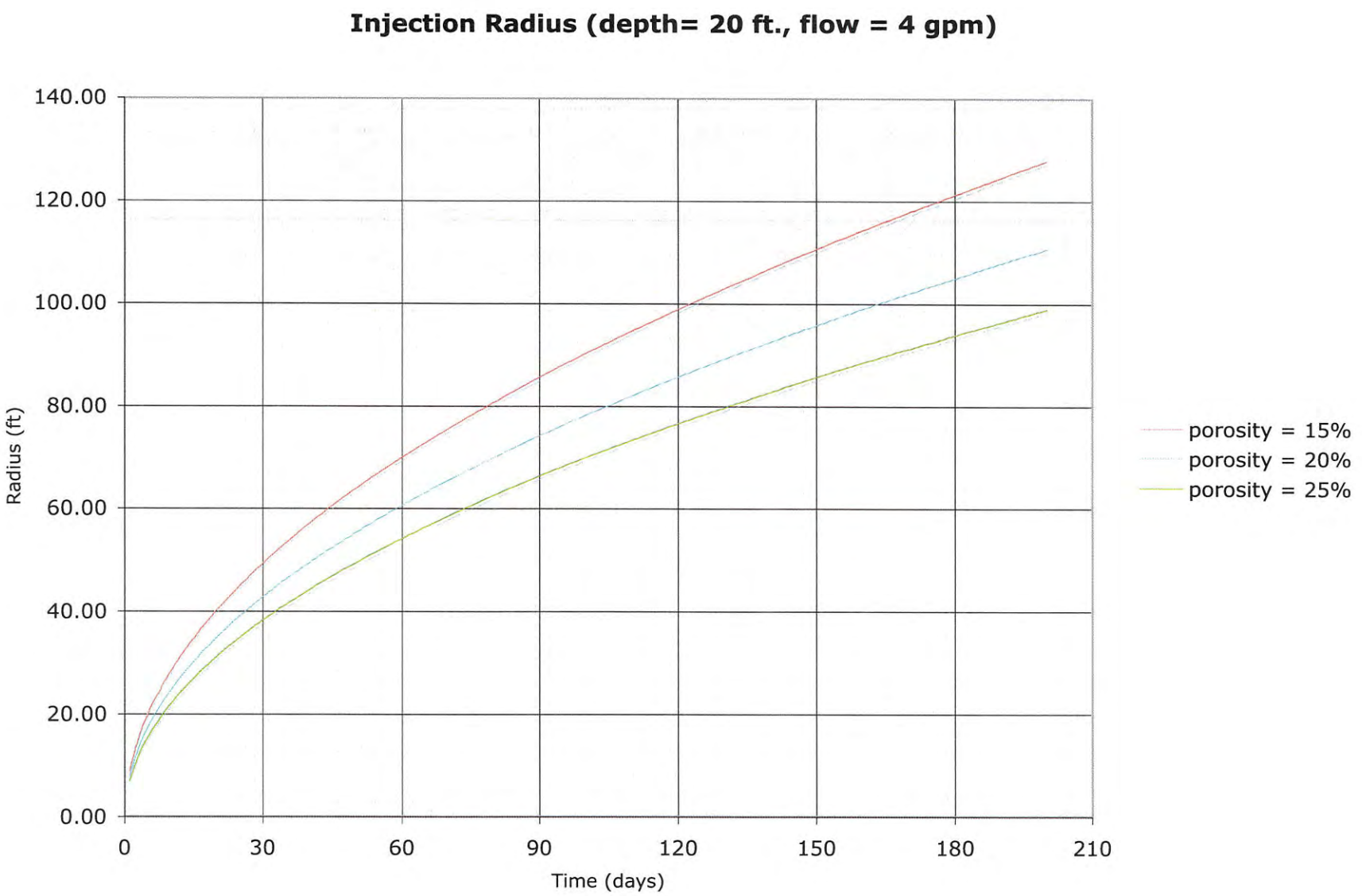
R = radius of injected fluid from injection well (ft.)

D = well screen length (ft.)

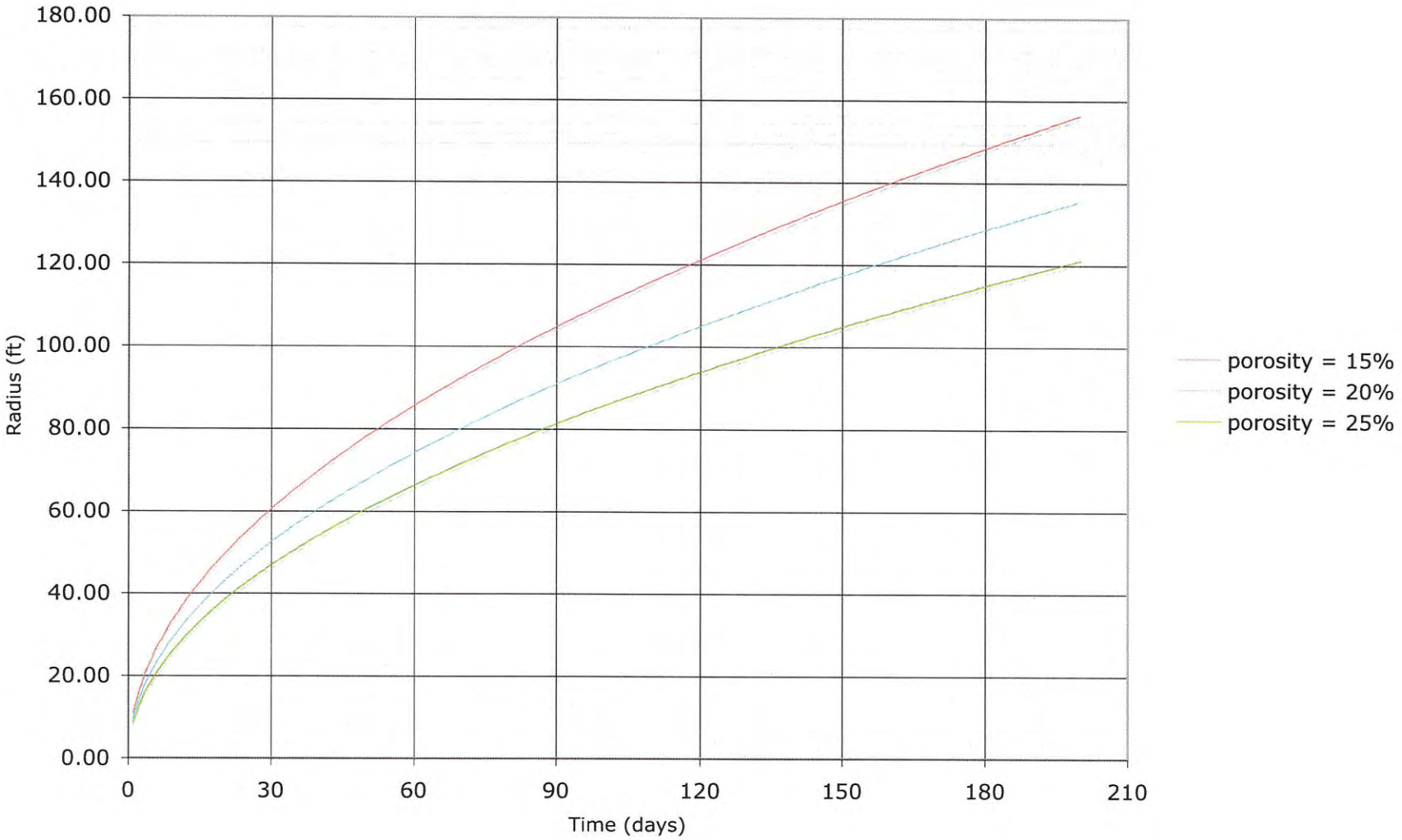
Q = injection rate (gpm).

Ø = aquifer porosity (dimensionless: aquifer intersticial void percent)

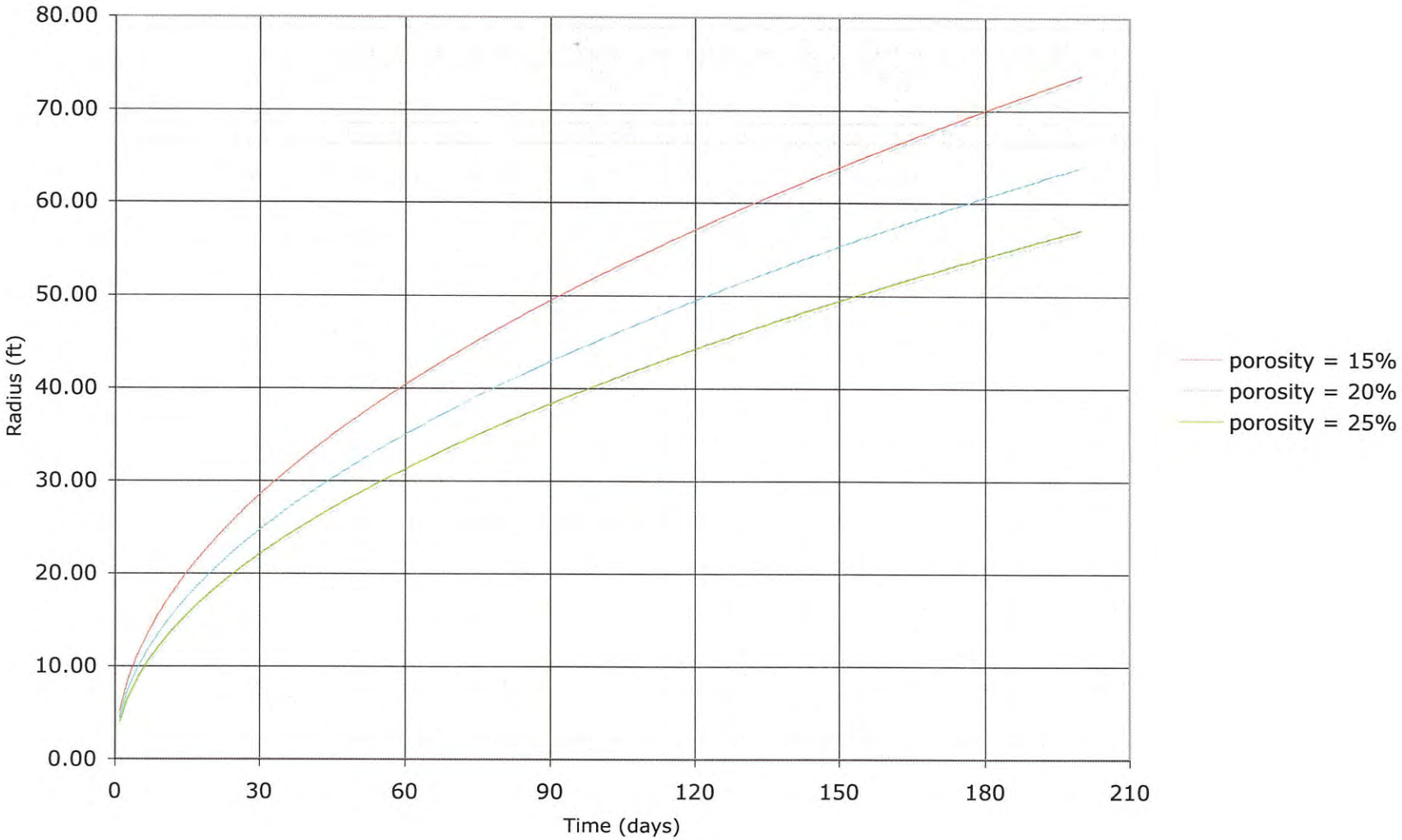

Injection Radius (depth= 20 ft., flow =2 gpm)
Radius (ft)
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
0
30
60
90
120
150
180
210
Time (days)
porosity = 15%
porosity = 20%
porosity = 25%


Injection Radius (depth= 20 ft., flow = 4 gpm)
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
Radius (ft)
0
30
60
90
120
150
180
210
Time (days)
porosity = 15%
porosity = 20%
porosity = 25%

## Injection Radius (depth= 20 ft., flow = 6 gpm)



## Injection Radius (depth= 30 ft., flow = 2 gpm)



# APPENDIX G

# DEED RECORDATION

**STATE OF NEW MEXICO**
**COUNTY OF SANDOVAL**

# DEED RECORDATION COVENANT RESTRICTING AND PROHIBITING USE OF GROUNDWATER

**THIS DEED RECORDATION** is made this 6th day of May, 2016 by D&HGP, a resident of Sandoval County, New Mexico, a NM limited partnership ("Owner(s)") with its principal place of business located at PO Box 850, Bernalillo New Mexico 87004, states that it is the legal fee owner and holds title to the below listed real property in Bernalillo County, the State of New Mexico;

**WHEREAS,** the Owner(s) has, completed the groundwater abatement at the property pursuant to an Alternative Abatement Standard approved by the New Mexico Water quality Control Commission or has an Abatement Completion Report approved by the New Mexico Environment Department and the Groundwater may contain contaminants in excess numerical of ground water quality standards set forth in 20.6.2 NMAC and related statutes and regulations;

**WHEREAS**, the Property, located at Lot 5-B, Venada Plaza, as such lot is depicted and described on a replat entitled "Lots 5-A and 5-B, Venada Plaza", which replat was filed in the Office of the County Clerk of Sandoval County, NM, on January 2, 2008 in Volume 3, Folio 2875-A (Book 411 Page 252); and hereby incorporated into this covenant, shall be used only for non-residential purposes and no wells or devices shall be installed on the property to use groundwater and no use of the groundwater shall be allowed;

**THEREFORE**, the owner of the property prohibits, for itself and all future successors or assigns of the property, installation of wells or any other device to use groundwater and any use of the groundwater is completely prohibited. This restriction and prohibition shall be recorded with the property and is binding on future successors or assigns;

**IN WITNESS WHEREOF**, the said Owner(s) has caused this instrument to be signed by its authorized representative on the day and year first above written.

**D&HGP**

By: _____
Dudley Price
General Partner

STATE OF NEW MEXICO
COUNTY OF SANDOVAL

Subscribed and sworn to before me this_____day of_____by _____

_____
Notary Public

My commission expires:

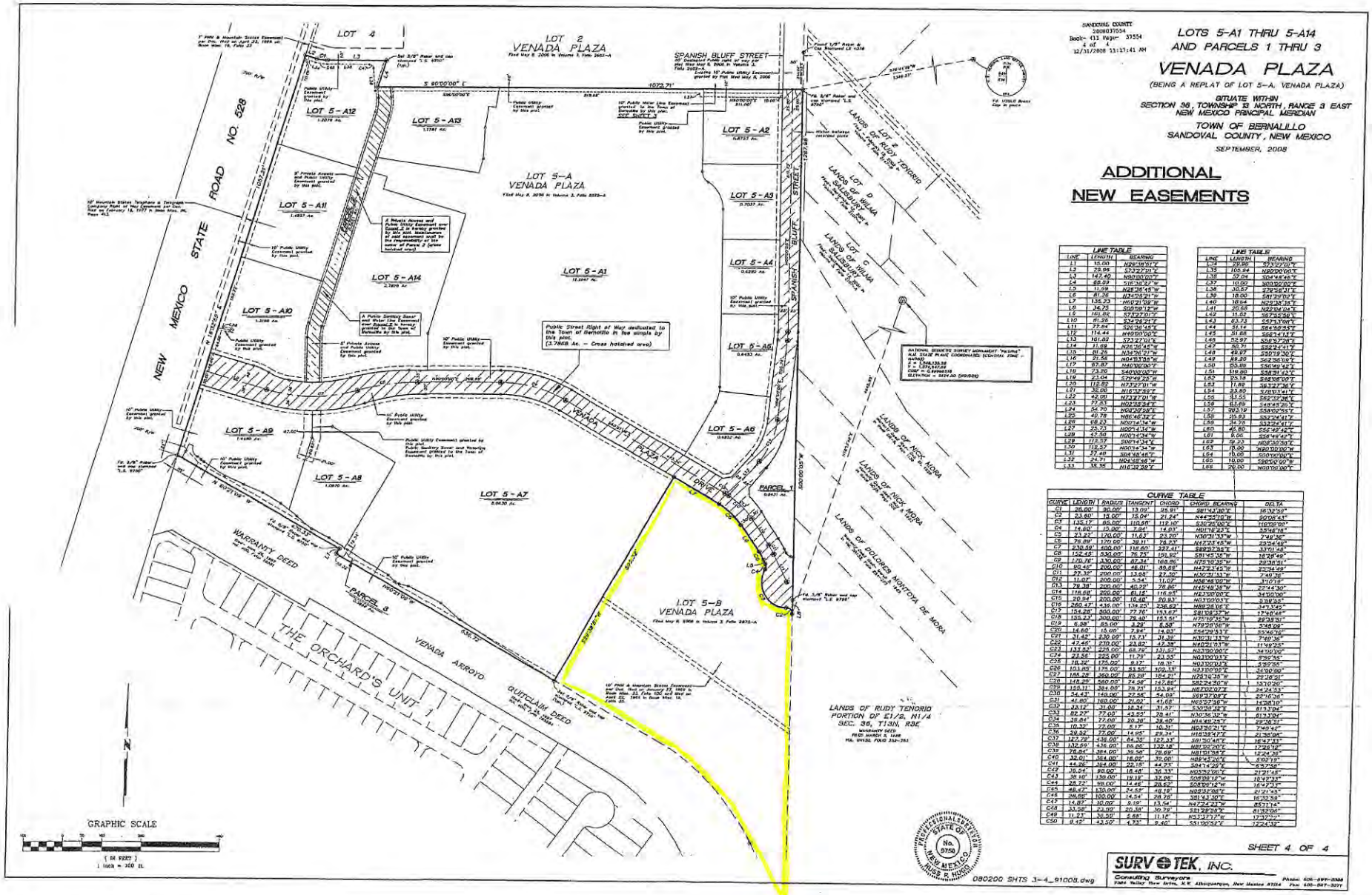
_____

## APPENDIX H

Appendix H includes the information necessary for the New Mexico Environment Department Ground Water Quality Bureau to present a recommendation to the Office of the State Engineer pursuant to 19.27.5.13.A NMAC prohibiting domestic wells on Lot B-5 and contiguous portions of Venada Plaza Drive.

The following information is provided in order to allow the Ground Water Quality Bureau to prepare the recommendation:

1. The Plat attached
2. Electronic shape files presented by CD which will identify the plume of groundwater for which the prohibition is requested




SANDOVAL COUNTY
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4 of 4
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LOTS 5-A1 THRU 5-A14
AND PARCELS 1 THRU 3

# VENADA PLAZA

(BEING A REPLAT OF LOT 5-A, VENADA PLAZA)

SITUATE WITHIN
SECTION 36, TOWNSHIP 13 NORTH, RANGE 3 EAST
NEW MEXICO PRINCIPAL MERIDIAN
TOWN OF BERNALILLO
SANDOVAL COUNTY, NEW MEXICO

SEPTEMBER, 2008

## ADDITIONAL NEW EASEMENTS

| LINE TABLE | | |
|---|---|---|
| LINE | LENGTH | BEARING |
| L1 | 15.00 | N26°18'51"E |
| L2 | 73.96 | S73°27'01"E |
| L3 | 147.40 | N90°00'00"E |
| L4 | 68.59 | S16°38'52"W |
| L5 | 11.09 | N28°36'45"W |
| L6 | 81.26 | N34°58'51"W |
| L7 | 135.23 | N90°21'09"W |
| L8 | 34.75 | S00°09'12"W |
| L9 | 161.80 | S73°27'01"E |
| L10 | 81.26 | S34°58'51"E |
| L11 | 27.64 | S26°36'45"E |
| L12 | 114.44 | N49°09'00"E |
| L13 | 161.80 | S73°27'01"E |
| L14 | 31.68 | N26°18'51"E |
| L15 | 81.26 | N34°58'51"W |
| L16 | 21.56 | N04°53'06"W |
| L17 | 87.87 | N46°09'00"E |
| L18 | 73.80 | S40°09'00"W |
| L19 | 23.04 | S79°49'25"W |
| L20 | 118.82 | N73°27'01"W |
| L21 | 32.00 | N16°32'59"E |
| L22 | 42.00 | N73°27'01"W |
| L23 | 77.51 | N02°58'34"E |
| L24 | 54.70 | N68°30'58"E |
| L25 | 40.78 | N86°46'32"E |
| L26 | 68.23 | N00°14'34"W |
| L27 | 25.73 | N00°14'34"W |
| L28 | 57.56 | N90°14'34"W |
| L29 | 112.57 | S90°14'34"E |
| L30 | 112.57 | N00°14'34"W |
| L31 | 77.40 | S04°58'46"E |
| L32 | 24.71 | N04°58'46"W |
| L33 | 35.35 | N16°32'59"E |

| LINE TABLE | | |
|---|---|---|
| LINE | LENGTH | BEARING |
| L34 | 22.80 | S73°27'01"E |
| L35 | 100.94 | N00°00'00"E |
| L36 | 57.04 | S04°48'46"E |
| L37 | 10.00 | S00°00'00"E |
| L38 | 30.67 | S29°58'11"E |
| L39 | 18.00 | S81°29'02"E |
| L40 | 18.64 | N26°18'51"E |
| L41 | 20.68 | N22°04'04"E |
| L42 | 31.62 | S87°52'50"E |
| L43 | 60.72 | S52°13'00"E |
| L44 | 51.14 | S84°56'54"E |
| L45 | 31.68 | S66°14'11"E |
| L46 | 53.97 | S09°57'28"E |
| L47 | 50.71 | S39°23'41"E |
| L48 | 49.97 | S13°07'30"E |
| L49 | 89.20 | S62°36'06"E |
| L50 | 53.89 | S50°59'42"E |
| L51 | 119.80 | S58°38'42"E |
| L52 | 23.18 | S48°06'09"E |
| L53 | 11.80 | S8°32'36"E |
| L54 | 23.80 | S78°03'41"E |
| L55 | 93.55 | S62°13'36"E |
| L56 | 63.65 | S48°45'20"E |
| L57 | 283.19 | S38°02'56"E |
| L58 | 20.93 | S32°24'41"E |
| L59 | 34.75 | S33°25'41"E |
| L60 | 45.80 | S56°46'42"E |
| L61 | 9.00 | S26°46'42"E |
| L62 | 59.23 | N08°38'56"E |
| L63 | 15.00 | N20°00'00"W |
| L64 | 15.00 | S00°00'00"W |
| L65 | 10.00 | S80°00'00"W |
| L66 | 20.00 | N00°00'00"E |

| CURVE TABLE | | | | | | |
|---|---|---|---|---|---|---|
| CURVE | LENGTH | RADIUS | TANGENT | CHORD | CHORD BEARING | DELTA |
| C1 | 36.00' | 90.00' | 18.29' | 35.91' | S81°43'38"E | 22°55'32" |
| C2 | 23.60' | 15.00' | 15.04' | 21.24' | N44°55'10"W | 90°08'43" |
| C3 | 135.17' | 85.00' | 110.88' | 112.10' | S30°29'00"E | 109°19'59" |
| C4 | 14.60' | 15.00' | 7.84' | 14.03' | N01°16'23"E | 55°46'16" |
| C5 | 23.27' | 170.00' | 11.63' | 23.25' | N36°31'33"W | 7°49'36" |
| C6 | 70.89' | 170.00' | 36.11' | 70.39' | N47°23'45"W | 23°54'48" |
| C7 | 238.49' | 400.00' | 122.80' | 232.41' | S88°25'58"E | 33°31'48" |
| C8 | 152.48' | 530.00' | 76.75' | 151.90' | S81°45'56"W | 16°28'49" |
| C9 | 170.76' | 370.00' | 87.34' | 169.25' | N75°10'35"W | 26°26'51" |
| C10 | 90.46' | 200.00' | 46.01' | 89.68' | N47°23'45"W | 25°54'38" |
| C11 | 27.32' | 200.00' | 13.68' | 27.30' | N30°31'33"W | 7°49'36" |
| C12 | 11.67' | 200.00' | 5.84' | 11.67' | N36°48'00"W | 3°20'28" |
| C13 | 78.38' | 200.00' | 40.97' | 78.86' | N45°48'38"W | 22°44'30" |
| C14 | 116.66' | 200.00' | 60.16' | 115.55' | N23°00'00"E | 34°00'00" |
| C15 | 20.94' | 200.00' | 10.48' | 20.93' | N01°00'00"E | 5°59'55" |
| C16 | 260.47' | 436.00' | 134.25' | 256.62' | N88°28'06"E | 34°13'45" |
| C17 | 154.28' | 300.00' | 77.76' | 153.67' | S81°08'37"W | 27°46'44" |
| C18 | 155.23' | 300.00' | 79.40' | 153.54' | N75°16'36"W | 29°38'51" |
| C19 | 6.28' | 85.00' | 3.29' | 6.28' | N79°26'56"W | 5°48'06" |
| C20 | 14.60' | 15.00' | 7.84' | 14.03' | S54°39'53"E | 55°46'16" |
| C21 | 31.42' | 230.00' | 15.73' | 31.39' | N30°31'33"W | 7°49'36" |
| C22 | 47.46' | 270.00' | 23.82' | 47.39' | N40°21'17"W | 10°04'00" |
| C23 | 133.52' | 225.00' | 68.79' | 131.57' | N03°00'00"E | 34°00'00" |
| C24 | 23.56' | 225.00' | 11.79' | 23.55' | N03°00'03"E | 5°59'55" |
| C25 | 16.32' | 175.00' | 8.17' | 16.31' | N03°00'03"E | 5°20'55" |
| C26 | 103.85' | 175.00' | 53.50' | 102.33' | N23°00'00"E | 34°00'00" |
| C27 | 185.28' | 260.00' | 95.20' | 184.21' | N25°42'35"W | 29°38'51" |
| C28 | 148.29' | 560.00' | 74.58' | 147.86' | S82°24'30"W | 15°10'26" |
| C29 | 155.11' | 384.00' | 78.51' | 153.99' | N87°02'07"E | 24°24'53" |
| C30 | 54.43' | 140.00' | 27.56' | 54.08' | S89°27'09"E | 22°16'34" |
| C31 | 41.80' | 169.00' | 21.02' | 41.68' | N63°27'36"W | 14°10'20" |
| C32 | 33.12' | 31.00' | 18.34' | 31.57' | S30°28'32"E | 61°13'04" |
| C33 | 82.72' | 77.00' | 45.57' | 78.41' | N30°36'32"W | 61°33'04" |
| C34 | 38.84' | 77.00' | 20.39' | 38.40' | N14°48'24"E | 28°54'51" |
| C35 | 10.32' | 77.00' | 5.17' | 10.31' | N03°39'21"E | 7°40'42" |
| C36 | 29.52' | 77.00' | 14.95' | 29.34' | N18°38'47"E | 21°58'06" |
| C37 | 127.78' | 436.00' | 64.30' | 127.33' | S81°50'46"E | 16°47'33" |
| C38 | 132.69' | 436.00' | 66.80' | 132.18' | N81°05'00"E | 17°26'12" |
| C39 | 78.84' | 384.00' | 39.58' | 78.69' | N81°01'58"E | 11°45'36" |
| C40 | 32.01' | 384.00' | 16.02' | 31.99' | N89°43'26"E | 4°46'19" |
| C41 | 44.26' | 384.00' | 22.15' | 44.23' | S84°14'29"E | 6°36'08" |
| C42 | 35.04' | 98.00' | 18.48' | 34.33' | N05°52'00"E | 21°21'45" |
| C43 | 36.16' | 138.00' | 18.18' | 32.26' | S08°39'18"W | 15°49'34" |
| C44 | 28.72' | 98.00' | 14.46' | 28.62' | S08°09'12"W | 16°47'33" |
| C45 | 48.42' | 130.00' | 24.52' | 48.12' | N05°32'06"E | 21°21'45" |
| C46 | 28.86' | 100.00' | 14.54' | 28.76' | S81°43'30"E | 16°32'56" |
| C47 | 14.83' | 10.00' | 9.18' | 13.54' | N47°24'23"W | 85°01'14" |
| C48 | 43.58' | 25.00' | 20.38' | 30.79' | S31°28'04"E | 81°39'06" |
| C49 | 11.23' | 36.50' | 5.68' | 11.18' | N53°37'17"W | 17°37'07" |
| C50 | 9.42' | 43.50' | 4.73' | 9.40' | S51°00'53"E | 12°24'42" |

PROFESSIONAL SURVEYOR
STATE OF NEW MEXICO
No. 9750
RUSS P. HUDDLESTON

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SHEET 4 OF 4

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