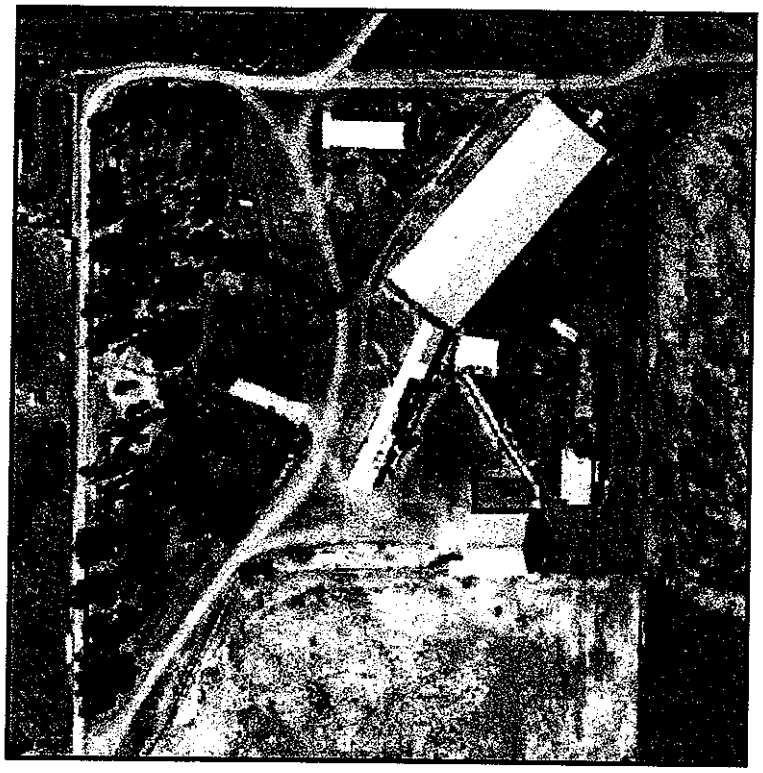
Appendix B

Monitoring Well Installation and Sampling Plan

MONITORING WELL INSTALLATION AND SAMPLING PLAN

ALSTON FARMS DAIRY NO. 2
ORLAND, CALIFORNIA



Prepared for

Alston Farms

Prepared by

VESTRA

VESTRA Resources, Inc.
5300 Aviation Drive
Redding, California 96002

DECEMBER 2008 (Rev. January 2009)

VESTRA

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January 8, 2009

70824

Ms. Jennifer LaBay
Environmental Scientist
Confined Animal Facility Unit
California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670-6114

RE: Response to Comments
Monitoring Well Installation and Sampling Plan (MWISP)
Alston Dairy No. 2
Tehama County

Dear Ms. LaBay:

Alston Dairies is in receipt of your comments on the MWISP for the proposed Alston Dairy No. 2 in Tehama County.

Based on our telephone conversation of this morning (January 7, 2009), the following revisions are hereby made to the plan:

(1) Proposed Monitoring Well Placement

The well locations have been revised to meet the December 31, 2008, RWQCB concerns. Revised well locations are shown on revised Figure 4A attached to this letter and include:

- Upgradient well (located south of production well along west property line)
- Well downgradient of wastewater application Field 3
- Well downgradient of pond
- Well downgradient of corral areas

(2) Proposed Monitoring Depth

As we discussed this morning, in the absence of perched water at the site, wells will be constructed to monitor the water quality of the regional aquifer estimated to be encountered between 50 to 75 feet below ground surface. The screened interval will be determined based on field conditions.

We hope this responds to RWQCB concerns. If you have additional questions, please call me or John Andrews at (530) 223-2585.

Sincerely,

VESTRA Resources, Inc.

Wendy Johnston
Project Manager

John Andrews, P.G. 4269
Senior Hydrologist

Attachments:

Revised Figure 4A Site Plan
Revised Figure 4B Site Plan
Revised Figure 5 Corral Area and Five Monitoring Well Locations

California Regional Water Quality Control Board
Central Valley Region
Karl E. Longley, ScD, P.E., Chair

Linda S. Adams
Secretary for Environmental Protection

11020 Sun Center Drive #200, Rancho Cordova, California 95670-6114
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http://www.waterboards.ca.gov/centralvalley

Arnold Schwarzenegger
Governor

31 December 2008

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BY:

Certified No.
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Linda Alston
Alston Farms Dairy No. 2
1010 Highway 99W
Orland, CA 95963

MONITORING WELL INSTALLATION AND SAMPLING PLAN FOR ALSTON FARMS DAIRY NO. 2, ORLAND, TEHAMA COUNTY

On 12 December 2008, Regional Board staff received a Monitoring Well Installation and Sampling Plan (MWISP) for Alston Farms Dairy No. 2 located at 22954 Christian Road in Orland, Tehama County. The plan was prepared by VESTRA Resources, Inc. on your behalf.

Regional Board staff has reviewed the work plan and have the following comments:

Proposed Monitoring Well Placement. The information provided in the MWISP indicated that you plan on installing three monitoring wells in the vicinity of the existing lagoon. The Individual Waste Discharge Requirements that will be drafted for your facility will require that monitoring wells are placed to (1) characterize natural background (unaffected by the Discharger or others) groundwater quality upgradient of the facility; and (2) characterize groundwater quality downgradient of the corrals, downgradient of the retention ponds, and downgradient of the land application areas. The proposed monitoring well locations do not meet these requirements and the MWISP will need to be updated to reflect locations that monitor the upgradient and downgradient conditions.

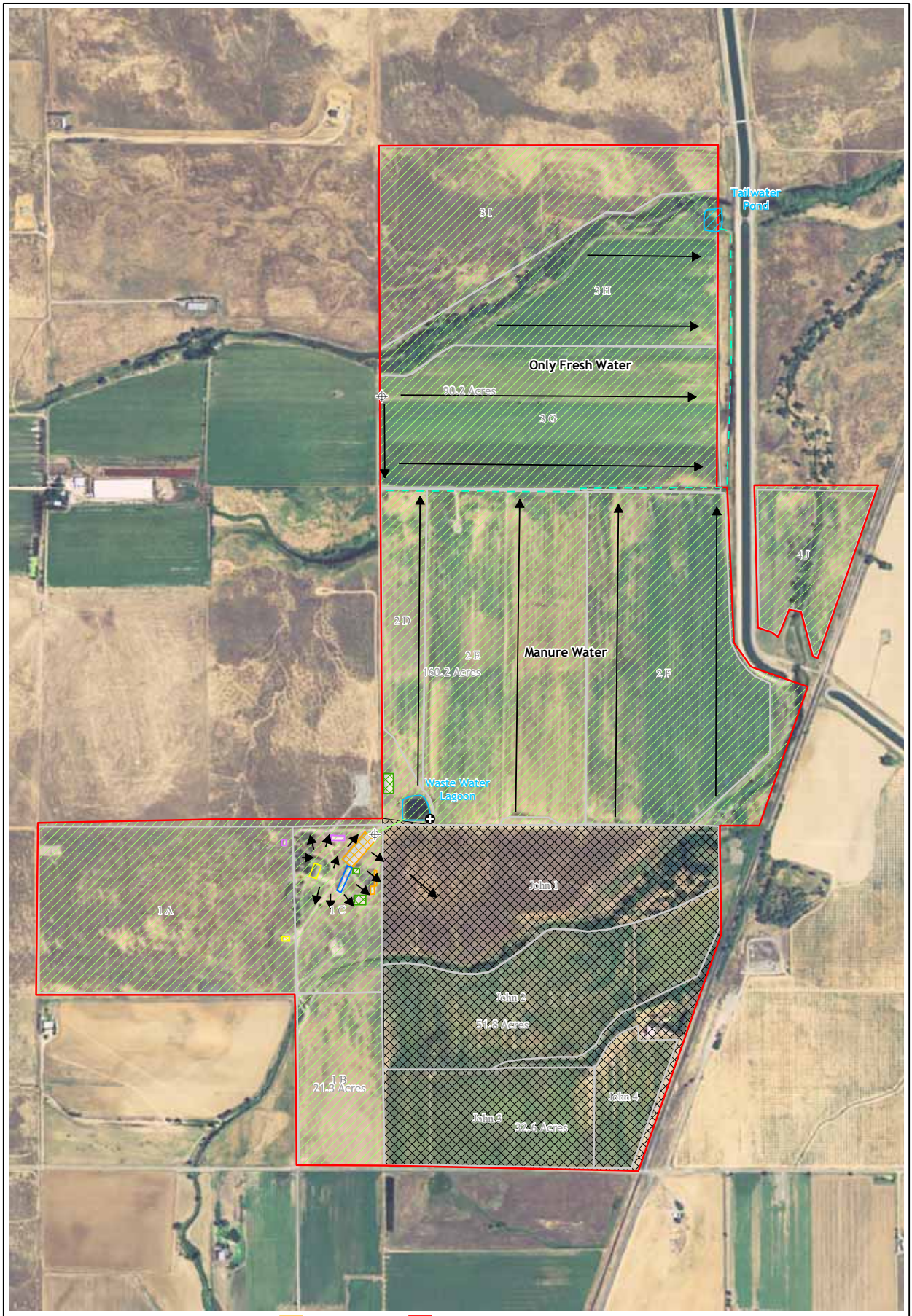
Proposed Monitoring Well Depth. The MWISP indicated that there are fluctuations in groundwater levels due to seasonal influence and pumping of irrigation wells. The test well in the vicinity shows depth to water ranging between 65 and 75 feet during normal rainfall years, and 45 and 50 feet during extremely wet years. The proposed well depth of 35 feet (Pg 3, Section 1.3.3) with a screen of 10 to 25 feet may not be deep enough to reach the groundwater if the levels are similar in depth to the vicinity test well. Please be aware that should the installed monitoring wells dry up in the future because the water is too deep, new wells will need to be installed.

The changes outlined above will need to be incorporated into the Monitoring Well Installation and Sampling Plan prior to Executive Officer approval for the construction and installation of the three monitoring wells and prior to the adoption of Waste Discharge Requirements.

If you have any questions regarding these comments, please call me at (916) 464-4735 or email me at JLaBay@waterboards.ca.gov.

JENNIFER LABAY
Environmental Scientist
Confined Animal Facility Regulatory Unit

cc: VESTRA Resources, Inc., Redding, CA



Pump
Well
Flow Direction
Milking Parlor Washwater
Tailwater
Abandoned Residence
Freestall Barn
Hay Storage
Milking Complex
Old Dilapidated Barn
Residence
Shop
Project Boundary
Field Boundary
Leased from Elsie Sewald
Original Alston Dairy Property (John Alston)

0 350 700 1,400 Feet

VESTRA

SOURCE: NAIP 2005

FIGURE 4A
SITE PLAN
ALSTON DAIRY
TEHAMA COUNTY, CALIFORNIA

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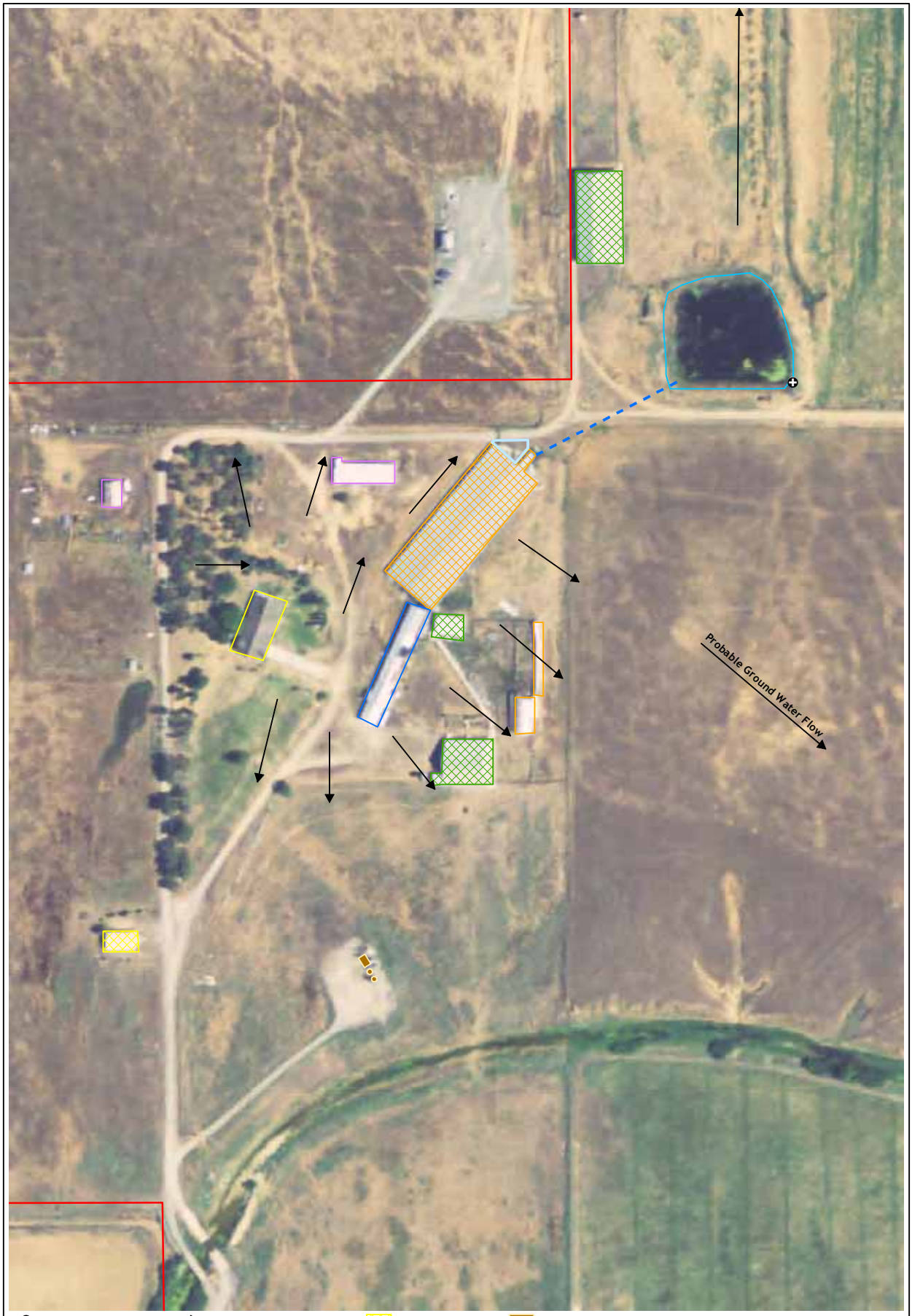

Pump
Tailwater
Milking Parlor Washwater
Surface Water Flow Direction
Area Draining To Tailwater Pond
Pond
Tailwater Pond
Abandoned Residence
Freestall Barn
Hay Storage
Milking Complex
Abandoned Natural Gas Facility
Old Dilapidated Barn
Residence
Shop
Project Boundary

0 85 170 340 Feet

VESTRA

SOURCE: NAIP 2005

FIGURE 4B
SITE PLAN CORRAL AREA
ALSTON DAIRY
TEHAMA COUNTY, CALIFORNIA

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Pump
Revised Well Location
Well
Flow Direction
Milking Parlor Washwater
Tailwater
Abandoned Residence
Freestall Barn
Hay Storage
Milking Complex
Old Dilapidated Barn
Residence
Shop
Project Boundary
Field Boundary
Leased from Elsie Sewald
Original Alston Dairy Property (John Alston)

0 420 840 1,680 Feet

VESTRA

SOURCE: NAIP 2005

FIGURE 5
PROPOSED MONITORING WELL LOCATIONS
ALSTON DAIRY
TEHAMA COUNTY, CALIFORNIA

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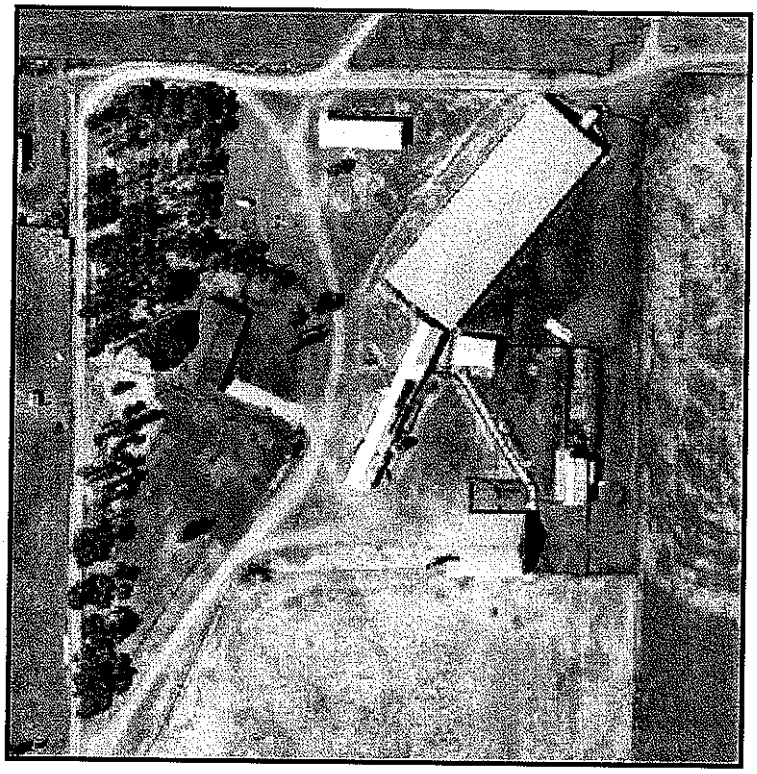
MONITORING WELL INSTALLATION AND SAMPLING PLAN

ALSTON FARMS DAIRY NO. 2
ORLAND, CALIFORNIA



Prepared for

Alston Farms

Prepared by

VESTRA

VESTRA Resources, Inc.
5300 Aviation Drive
Redding, California 96002

DECEMBER 2008

MONITORING WELL INSTALLATION AND SAMPLING PLAN

ALSTON FARMS DAIRY NO. 2
ORLAND, CALIFORNIA

Prepared for

Alston Farms

This report was prepared under the direction of a Professional Geologist.

Prepared by

VESTRA Resources, Inc.
5300 Aviation Drive
Redding, California 96002

70842

DECEMBER 2008

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A Field Sampling Forms
B Health and Safety Plan

1.0 INTRODUCTION

The following Monitoring Well Installation and Sampling Plan is prepared in accordance with the Regional Water Quality Control Board's (RWQCB) General Order for Existing Milk Cow Dairies, Monitoring and Reporting Program No. R5-2007-0035. This Plan is required to address well installation associated with an existing wastewater lagoon at the dairy. The proposed monitoring program includes the installation of three groundwater monitoring wells. Analytical data from the monitoring wells will be used to evaluate the impact of the lagoon on the underlying groundwater quality. The following plan includes a description of well installation, development, and monitoring procedures, and was designed to meet the specific requirements outlined in the General Order.

1.1 Project Description

The project is the reopening of a grade A dairy that previously operated from 1976 to 2002. The RWQCB has required that the facility obtain individual WDRs as the facility is not considered an "existing" dairy under the General Order for Milk Cow Dairies R5-2007-0035.

All appurtenances for the dairy operation are currently in place and include:

- Freestall barn
- Hay storage barn
- Shop
- Milking parlor
- Wastewater lagoon
- Residence

The operation intends to milk up to 450 cows per day. Dry cows, bred heifers, and calves will not be retained at this facility and will be located elsewhere.

The reestablished operation has two irrigation wells, both of which are elevated above a gated irrigation system in order to prevent backflows. Reestablished operations include a wash parlor, freestall housing, and exercise pens. Feed storage facilities include barns used to store concentrate feedstuffs and feed commodities. Additional storage of concentrates and feed stocks would be on concrete slabs under cover. Storage of bedding material would be under cover in a barn. Production estimates for the facilities report total yearly manure production at 36,667 cyd, of which 24,147 cyd would be dried in a storage area for field application. The reopened dairy would also generate an estimated 1,000,000 gallons of wet manure that would be flushed to the storage lagoon and another 1,422,000 gallons of milk barn wash water also flushed into the lagoon.

Milk parlor wash water is conveyed to a wastewater lagoon, mixed as necessary with fresh well water, and used to irrigate Field 1. Wastewater is not applied, has not ever been applied, and will not be applied to Field 2. Fields receiving wastewater are bermed, and barns are scraped and manure is dried, mixed with bedding, and applied to fields as available. Manure will be applied to Field 4. In addition, Fields 3a and 3b, owned by another Alston Farms facility, may be used for manure or liquid waste application in the future and are included here.

Irrigation system water is recycled into a tailwater pond. The wastewater lagoon is not lined; however, underlying soils are from the Corning-Newville series, which contain clays and have low permeabilities.

The RWQCB has required that the Report of Waste Discharge include a Monitoring Well Installation and Sampling Plan work plan. Three wells will be installed to determine impacts to underlying groundwater. The dairy operations will use two well pumps with a combined capacity of 1,700 gallons per minute for pasture irrigation water as well as animal and facilities wash water. Approximately 1,000 gallons of water available for recycling will also be used as wash water. As previously mentioned, depth to water in a test well near the site has remained constant over the past several years and continues to range between 65 and 75 feet. During extremely wet years, the well's depth ranges between 45 and 50 feet.

Tillage patterns on irrigated and unirrigated pastures, cropped fields, and grazing operations would remain the same. No changes are expected to occur along the banks or stream channel of Sour Grass Creek which lies at the north end of the project site. Other than minor building modifications, no significant increase in impervious surface will result from the execution of this project. As a result, no additional contributions of storm water are anticipated. All structures within the project area are above the 100-year floodplain, and there are no threats to existing structures attributable to flooding, seiche, tsunami, or mudflows. The field system is bermed to prohibit transfer of tailwater to adjacent surface water courses. Buffers and setbacks provide additional protection.

1.2 Site Location

The Alston Farms Dairy No. 2 is located at 22954 Christian Road, approximately 4.5 miles north of the city of Orland in Tehama County, California. The dairy is located in portions of Sections 23, 26, and 27, Township 23N, Range 03W, MDBM. Based upon U.S. Geological Survey (USGS) Orland 7.5-minute Quadrangle, the site coordinates are: Latitude: 39°40'21.04", Longitude: 122°10'30.16". The general site location is included as Figure 1. The required topographic map is included as Figure 2. Identified domestic, irrigation, municipal supply, and monitoring wells located within 2,000 feet of the site are shown on Figure 3. The required Site Plan is included as Figures 4a and 4b.

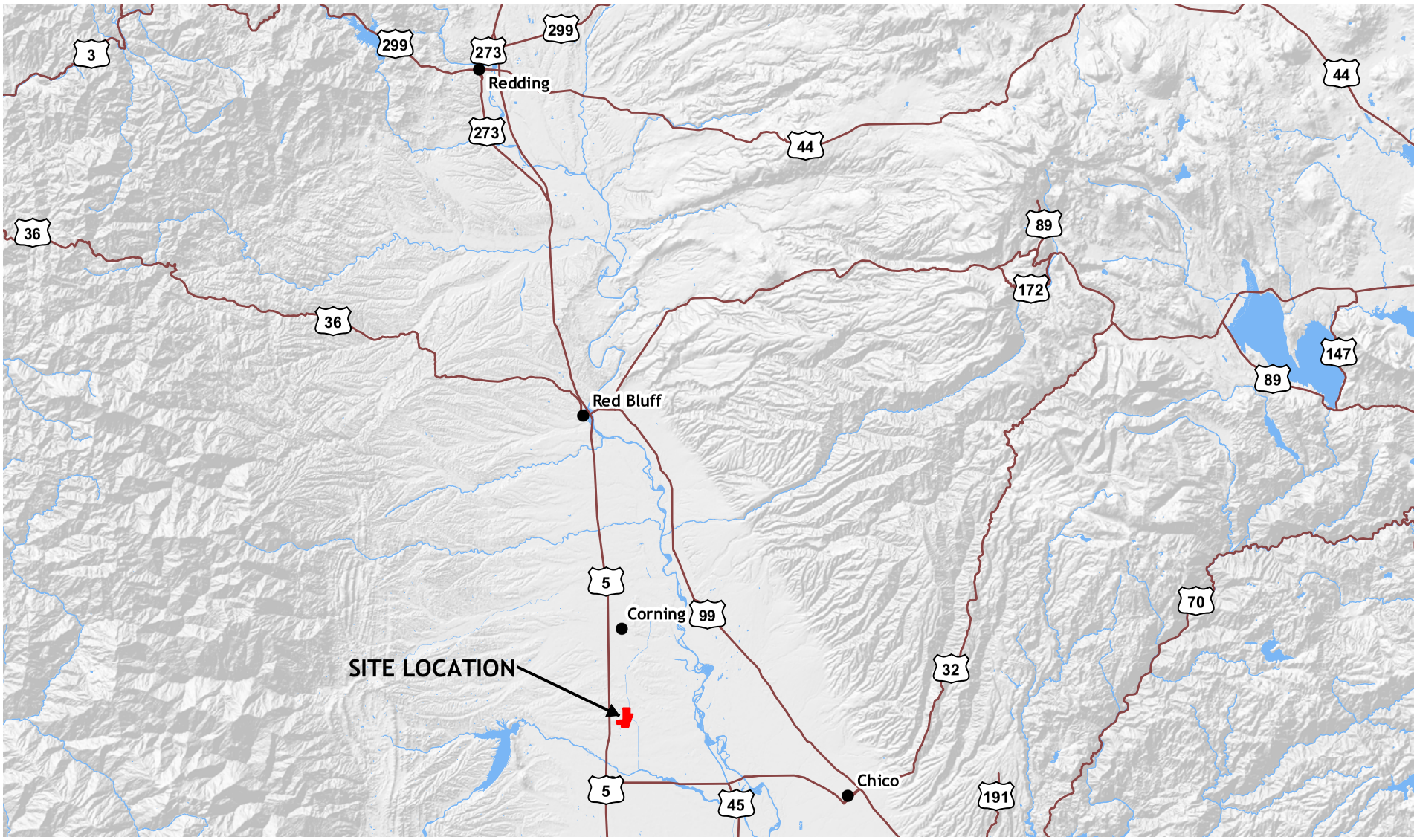
1.3 Rationale for Number of Proposed Wells

1.3.1 Well Locations

Three groundwater monitoring wells will be installed onsite. All monitoring wells will be installed for the purpose of monitoring groundwater quality in the vicinity of the existing lagoon. The monitoring wells will be located around the perimeter of the pond in areas that are accessible throughout the year to monitor water in the vicinity of the lagoon. The proposed well locations are shown on Figure 5.

1.3.2 Anticipated Depth to Groundwater

Shallow water in the vicinity of Orland is between 10 to 15 feet in depth. Deep aquifer surface water elevations are from 40 to 70 feet (DNR).



Highway
River
Alston Dairy Site Location
Lake, Pond, or Reservoir

N

Miles
0 5 10 20

VESTRA

FIGURE 1
GENERAL SITE LOCATION
ALSTON DAIRY
TEHAMA COUNTY, CALIFORNIA

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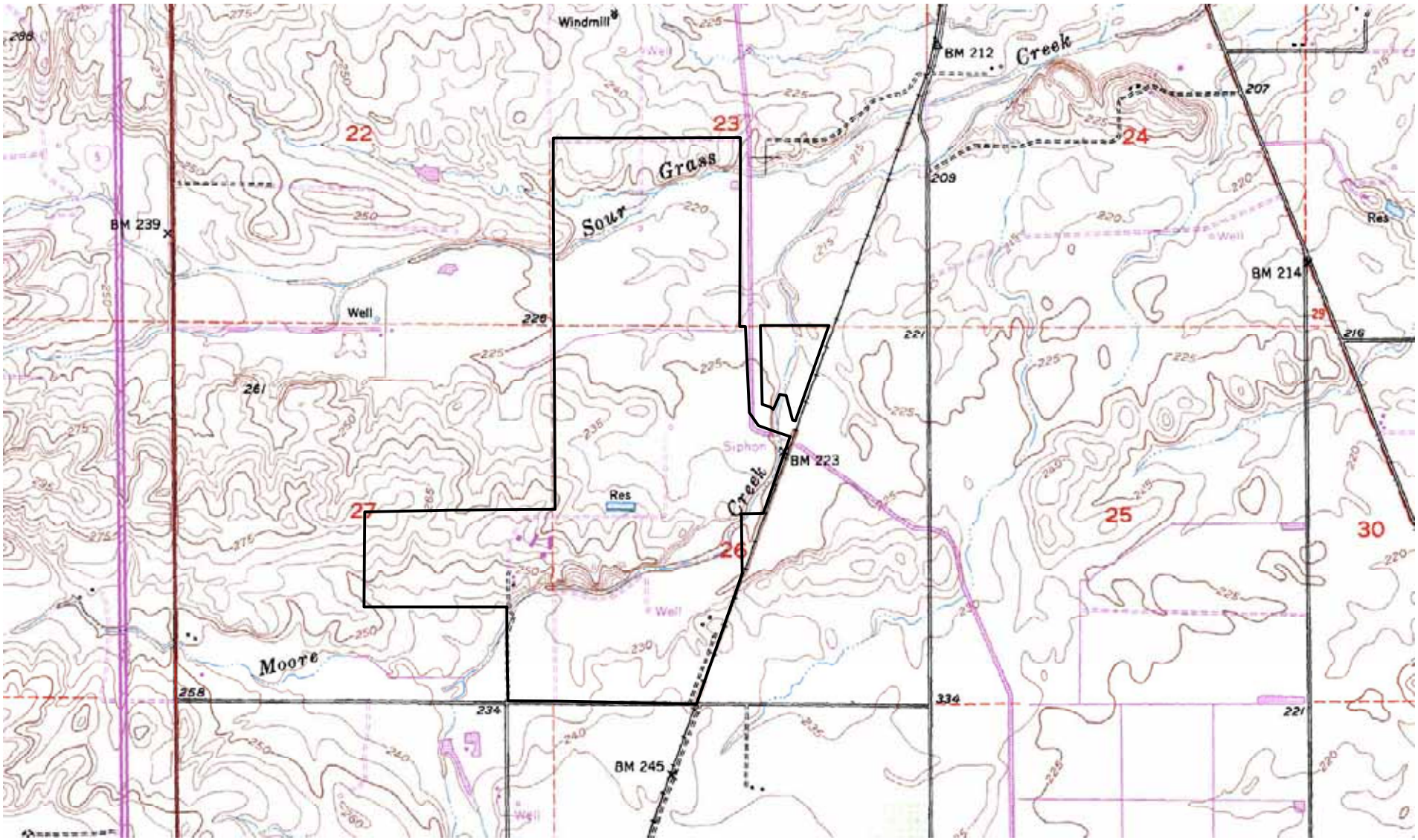

Project Boundary

VESTRA

SOURCE: USGS 7.5' TOPOGRAPHIC MAP, KIRKWOOD QUADRANGLE

0 1,000 2,000 4,000 Feet

FIGURE 2
USGS TOPOGRAPHIC MAP
ALSTON DAIRY
TEHAMA COUNTY, CALIFORNIA

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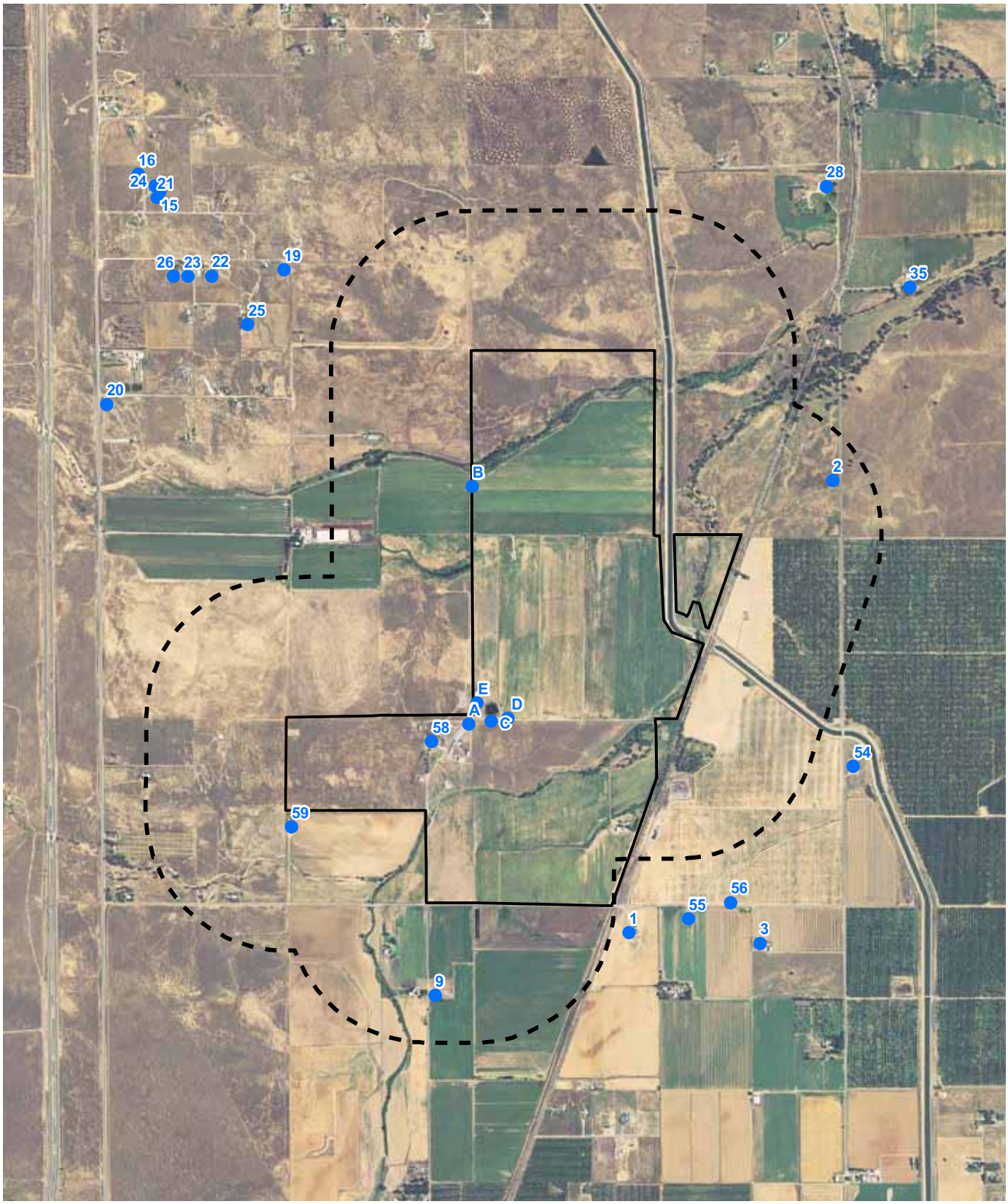

Well Location

2,000-Foot Buffer Around Project Boundary

Project Boundary

VESTRA

SOURCE: NAIP 2005

0 1,000 2,000 4,000 Feet

FIGURE 3
WELL LOCATIONS
ALSTON DAIRY
TEHAMA COUNTY, CALIFORNIA

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Pump
Well
Flow Direction
Milking Parlor Washwater
Tailwater
Abandoned Residence
Freestall Barn
Hay Storage
Milking Complex
Old Dilapidated Barn
Residence
Shop
Project Boundary
Field Boundary
Leased from Elsie Sewald
Original Alston Dairy Property (John Alston)

0 350 700 1,400 Feet

VESTRA

SOURCE: NAIP 2005

FIGURE 4A
SITE PLAN
ALSTON DAIRY
TEHAMA COUNTY, CALIFORNIA

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Monitoring Well
Pump
Well
Tailwater
Milking Parlor Washwater
Surface Water Flow Direction
Area Draining To Tailwater Pond
Pond
Tailwater Pond
Abandoned Residence
Freestall Barn
Hay Storage
Milking Complex
Abandoned Natural Gas Facility
Old Dilapidated Barn
Residence
Shop
Project Boundary

VESTRA

0 85 170 340 Feet

N

SOURCE: NAIP 2005

FIGURE 4B
SITE PLAN AND MONITORING WELL LOCATIONS
ALSTON DAIRY
TEHAMA COUNTY, CALIFORNIA

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Clean Rainwater Culvert
Ground Water Monitoring Well
Pump
Well
Tailwater
Milking Parlor Washwater
Surface Water Flow Direction
Area Draining To Tailwater Pond
Pond
Tailwater Pond
Abandoned Residence
Freestall Barn
Hay Storage
Milking Complex
Abandoned Natural Gas Facility
Old Dilapidated Barn
Residence
Shop
Project Boundary

VESTRA

0 85 170 340 Feet

SOURCE: NAIP 2005

FIGURE 5
PROPOSED MONITORING WELL LOCATIONS
ALSTON DAIRY
TEHAMA COUNTY, CALIFORNIA

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Surface Water: Scattered intermittent streams with occasional high flows best summarize the project area hydrology, with a few large reservoirs used for agricultural and fire applications. Two streams border the site, Moore Creek and Sour Grass Creek.

Groundwater: Tehama County has several water-bearing geologic formations. The Tehama Formation on the east side of the county supplies groundwater to deep wells. The Riverbank Formation occurs in patches throughout Tehama County, and provides water to shallow wells in the valley. The Modesto Formation is near the Sacramento River and also supplies water to shallow wells in the valley.

Groundwater levels in the County show seasonal drawdown because of summer crop and landscape irrigation demands. Groundwater levels decrease during the summer with larger seasonal variations in areas that use groundwater. Areas that use groundwater as the primary supply typically show increased seasonal drawdown. These areas include Aaction Tree Farm and El Camino Irrigation District.

A detailed water inventory and analysis was completed for Tehama County in 2003 by Camp Dresser McGee (CDM). The dairy is located in the Corning east water inventory unit. Groundwater in the vicinity, based on DWR wells 23N03W22Q001M (record 1950-2009) and 23N03W36M002M (record 1970-1995), the two wells closest to the dairy site, varies from 40 to 60 feet below ground surface. Based on groundwater contours from the CDM 2003 report, groundwater in the vicinity moves to the southwest, toward the Sacramento River.

1.3.3 Well Depth

Anticipated well depth is 35 feet with screened interval from 10 to 25 feet.

1.3.4 Well Design

Well construction details are included on Figure 6.

1.4 Local Permitting Information

Monitoring well installation falls under the jurisdiction of Tehama County Environmental Health Department. Permit applications and permit fees for groundwater monitoring well installation will be submitted to the County. Groundwater monitoring well installation will begin upon approval of permit applications and issuance of all relevant permits. In addition, the Environmental Health Department will be notified of monitoring well sealing in sufficient time for personnel to arrive onsite and observe the sealing process.

1.5 Drilling Details

1.5.1 Drilling Methods

Prior to drilling activities, each boring will be hand-augured to a minimum of 5 feet bgs to further ensure utility clearance beneath boring locations. Underground Service Alert will also be notified as required by law.

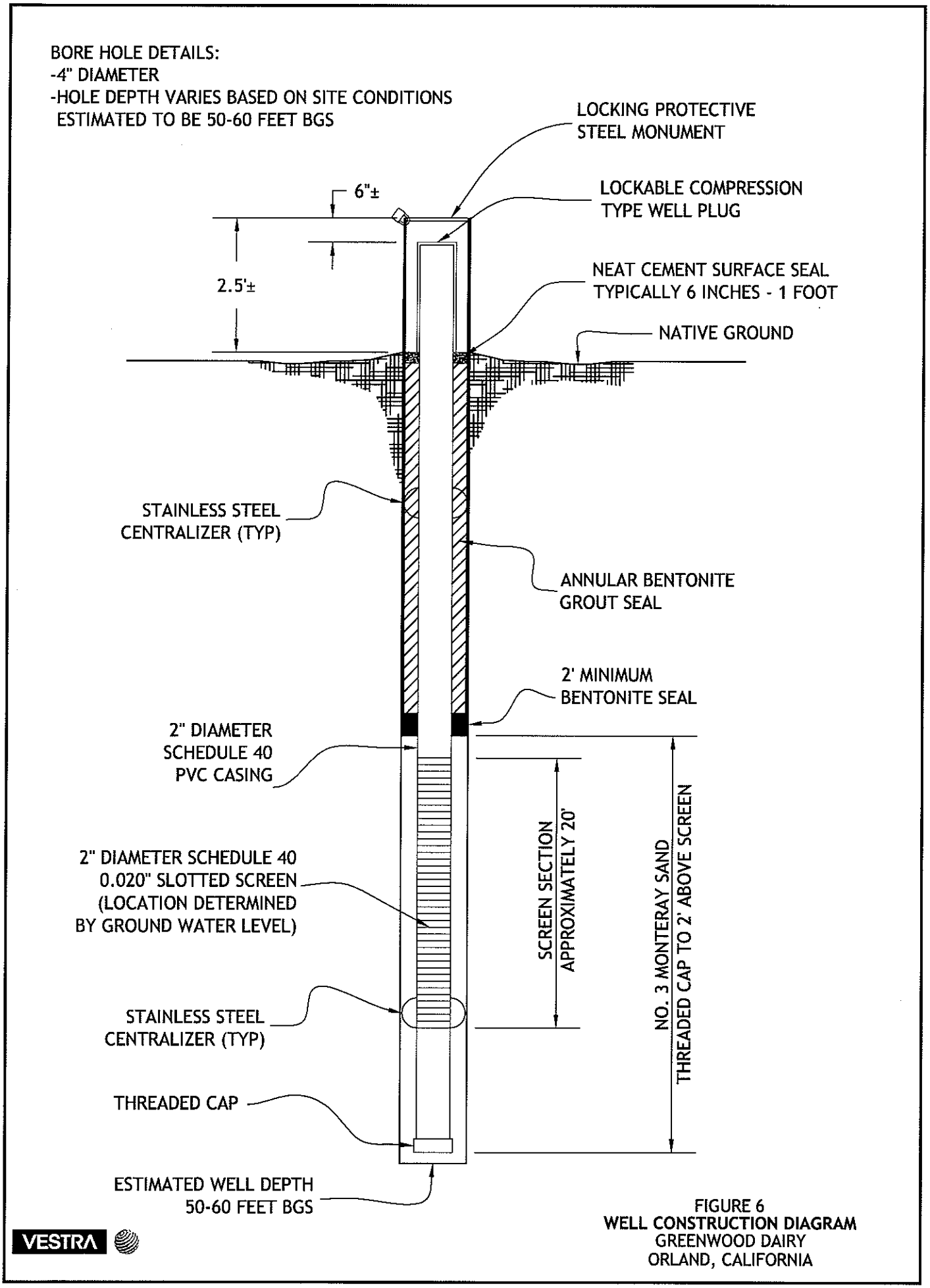


FIGURE 6
WELL CONSTRUCTION DIAGRAM
GREENWOOD DAIRY
ORLAND, CALIFORNIA

P:\CAD\70824 Alston\dwg\MW_Construction_Diagram.dwg

A drilling contractor licensed in the State of California will install the monitoring wells. Each monitoring well will be installed using air rotary or auger drilling methods in accordance with the procedures modified from *Compendium of Groundwater Sampling Procedures* (EPA/540/P-91/1007), dated January 1999, Standard Operating Procedure 2150.

1.5.2 Drilling and Logging Equipment

Soil borings will be installed using air rotary or auger drilling equipment provided by the selected drilling contractor. Monitoring wells will be installed as described on Figure 6. Sampling and logging equipment will include a ruler, water level indicator, the Munsell Book of Color and grain size chart, sample collection jars, trowels, well log sheets, and appropriate personal protection equipment. Examples of soil boring logs and other forms are included in Appendix A.

1.5.3 Equipment Decontamination

Well drilling equipment will be steam-cleaned prior to use onsite and between installation of each soil boring. Well development and purging equipment will be cleaned using a Liquinox and water solution with a distilled water rinse. Sampling equipment will be decontaminated with an Alconox solution and a distilled water rinse after each sample collection.

1.5.4 Health and Safety Plan

A Health and Safety Plan for onsite drilling and sampling activities is included in Appendix B.

2.0 DRILLING AND WELL INSTALLATION TECHNIQUES

Each monitoring well will be installed using air rotary or auger drilling techniques in accordance with the procedures modified from *Compendium of Groundwater Sampling Procedures* (EPA/540/P-91/1007), dated January 1999, Standard Operating Procedure 2150.

2.1 Drilling Techniques

Each monitoring well will be constructed of 2-inch-diameter schedule-40 PVC blank casing and 2-inch-diameter schedule-40 PVC 0.020-inch slotted screen. The screen will extend from approximately 5 feet above the groundwater level to 15 below the groundwater level, as determined by the field geologist. A diagram of the proposed monitoring well design is included as Figure 6. Construction of the monitoring wells will conform to the following standards:

- Annular space between the well screen and boring will be filled with No. 3 Monterey sand pack to act as filter media. Filter pack will be placed using a freefall method unless high water, bridging of the sand, or other conditions warrant the use of a tremie pipe (1.25-inch PVC or steel pipe) below the groundwater surface. The filter pack will fill the annular space over the span of the screened interval and to approximately 2 feet above the top of the screened interval.

- The depth and placement of the filter pack will be determined using a tremie pipe or driller's tape during construction.
- In order to ensure the proper placement of materials and to prevent the sloughing of native materials in the borehole, drill casings will be gradually removed during the emplacement of filter pack.
- A 2-foot bentonite seal will be placed above filter pack to prevent the infiltration of grouting material into filter pack. The bentonite seal will be placed around the well casing, into the annular space of the borehole. To ensure even placement, the bentonite will be poured at different points around the casing. Further, the bentonite will not be introduced faster than the rate of settling. A tremie pipe may be used to redistribute or level the seal.
- Bentonite grout slurry using Type I or II cement will be utilized as annular seal. It will be placed from above the bentonite seal to ground surface using a tremie pipe.
- Once the grout is in place, protective casing, consisting of a 5-foot iron or galvanized pipe extending 1.5 to 3 feet above ground surface, will be installed.
- The well will be capped with a lockable compression-type well plug and secured with a lock to prevent unauthorized access of the well.
- The newly installed groundwater monitoring wells will be surveyed for location (NAD83 and NAD88) and top-of-casing elevation measured in accordance with Geotracker Database requirements.

2.2 Well Logging Methods

The well borings will be logged under the direct supervision of a registered geologist in accordance with ASTM D2488-00, *Standard Practice for Description and Identification of Soils (Visual-Manual Procedures)*. Sample boring logs and additional field sampling logs are included in Appendix A.

3.0 PROPOSED MONITORING WELL DEVELOPMENT

3.1 Development Schedule

The proposed monitoring wells will be developed at least seven days after well installation completion.

3.2 Development Method

The monitoring wells will be developed using surge and purge techniques until fine materials are sufficiently filtered. During development, each well will be monitored for temperature, specific conductance, and pH using portable instrumentation.

3.3 Development Completion

Well development will be considered complete when water is clear and free of sediments and parameters, including temperature, specific conductance, and pH, have stabilized.

3.4 Parameter Monitoring

During development, each well will be monitored for temperature, specific conductance, and pH using portable instrumentation.

3.5 Development Water Discharge

Water produced during the development of the proposed monitoring wells will be discharged onsite.

4.0 SURVEY

A licensed surveyor will survey the newly installed groundwater monitoring wells for location (NAD83 and NAD88), and top-of-casing elevation in accordance with Geotracker database requirements.

5.0 PROPOSED GROUNDWATER MONITORING

1.1 Schedule

Wells will be sampled on a semi-annual basis as set forth in the Monitoring and Reporting Program to be adopted with the Waste Discharge Requirements. The first groundwater sampling will occur at least 48 hours after well development. The likely monitoring program and frequency are summarized in Table 1.

5.2 Groundwater Depth

Depth to groundwater will be measured to 0.01 feet from the top of casing using an electric groundwater level indicator. Depth to groundwater in all wells will be measured before initiating purging procedures.

5.3 Well Purging

The proposed groundwater monitoring wells will be purged of three well volumes before sampling. Groundwater parameters, including pH, specific conductance, and temperature, will be recorded before purging, between each well volume and at the completion of purging. Sample equipment used will include nylon bailing twine, disposable polyethylene bailers, disposable nitrile gloves, and portable monitoring equipment.

Table 1 PROPOSED GROUNDWATER MONITORING PROGRAM		
Parameters	**Units**	**Frequency**
Field Parameters		
Water Level	0.01 feet	Semi-Annually
pH	pH units	Semi-Annually
Specific Conductance	µmhos/cm	Semi-Annually
Temperature	°F or °C	Semi-Annually
Monitoring Parameters		
Bicarbonate	mg/l	Semi-Annually
Carbonate	mg/l	Semi-Annually
Chloride	mg/l	Semi-Annually
Nitrate as N	mg/l	Semi-Annually
Sulfate as SO4	mg/l	Semi-Annually
Ammonia as N	mg/l	Semi-Annually
Calcium	mg/l	Semi-Annually
Magnesium	mg/l	Semi-Annually
Sodium	mg/l	Semi-Annually

5.4 Sample Collection

5.4.1 Sampling Procedures

After purging the monitoring well, sample collection will commence. All samples will be collected in pre-cleaned, laboratory-supplied sample containers, placed under chain-of-custody documentation, and transferred to a State-certified labratory. Detailed sampling procedures are listed below.

- Collect samples using a disposable bailer and transfer contents from the disposable bailer into the appropriate laboratory-supplied sample containers.
- Be particularly careful when collecting samples to minimize the amount of headspace in the container.
- Immediately after collection, place sample containers in a cooler containing ice.
- Record all relevant information on the sample collection log and daily field log forms.
- Check forms before moving to the next well.
- Decontaminate any non-disposable sample equipment.
- Place disposable equipment in garbage bags for later disposal.

The type and volume of the sample containers, holding times, and preservation methods required for each analysis will be specified by the State-certified laboratory.

5.4.2 Handling Procedures

After collection, all field samples will be protected from light and placed in a cooler with frozen "blue ice" and material to protect against breakage. The amount of "blue ice" will be sufficient

to keep the samples cold until they are received by the analytical laboratory. The samples will be hand-delivered to the laboratory the day of collection.

Chain-of-custody procedures will be used to maintain and document sample possession for legal purposes. The principal documents that will be used to document possession of the samples are the chain-of custody record and field notes.

A sample label will be completely filled out and affixed to each sample container before the container is placed in the shipping cooler. The label information will include the sample identification, analytical parameter(s), preservation method, name of sampler, and date and time of sampling.

The sample identification number will also be recorded on the sample collection log and in the daily field log maintained by the supervisor. The identification number will reference the monitoring well or sample location and the date and time of sample. At least one custody seal will be placed on each sample cooler if they are left unattended. The custody seals will be signed and dated and placed on both sides of the cooler.

5.4.3 Holding Times

All samples will be delivered to the analytical laboratory within 48 hours of collection.

5.5 Quality Assurance and Quality Control

5.5.1 Sampling Quality Assurance

In order to determine if there was deviation from the sampling procedure, the site supervisor will maintain a daily field log. This daily field log will identify, at a minimum:

- Name and title of author, date and time of entry, and physical/environmental conditions during field activity.
- Sample collection method, identification numbers, and preservation method.
- Location and description of sampling points.
- Any changes in sampling or scheduling.
- Any field measurements or observations made.
- All decontamination procedures.

In addition, a sample collection log will be completed for each sample submitted to the laboratory. Typical daily and sample collection logs are included in Appendix A. These logs will be completed during the appropriate field activity, and the site supervisor will review the logs for accuracy and completeness at the close of each day.

5.5.2 Field Quality Control Samples

One duplicate sample may be taken from a randomly selected well during each sampling episode.

5.5.3 Sampling Documentation Requirements

The following documentation is required following completion of sampling activities:

- A description of the method and time of water level measurement and the method of purging.
- A description of sampling procedures.
- The type of equipment used.
- Sampling logs for individual wells and daily field logs.
- A map or aerial photograph showing the location of observation stations, monitoring points and background monitoring points.
- Laboratory statement of all analysis evaluating compliance with requirements.

5.5.4 Analytical Procedures

Unless otherwise specified, the analytical procedures will be conducted in accordance with SW-846 <http://www.epa.gov/epaoswer/hazwaste/test/main.htm>. The field sampling procedures were specified previously.

5.5.5 Equipment Decontamination

Precautions will be taken to avoid contaminating the samples from outside sources. The gloves will not be reused. Before each sample is collected, non-disposable sampling equipment will be rinsed using Liquinox and distilled water rinse. A new disposable polyurethane bailer and new nitrile gloves will be used to collect each sample.

6.0 PROPOSED SCHEDULE

6.1 Fieldwork

Groundwater monitoring wells will be installed shortly after approval of Waste Discharge Requirements. The wells will be sampled on a semi-annual basis with regard to the operator's preference. Further scheduling will be made after groundwater monitoring well installation.

6.2 Laboratory Analysis

All samples will be submitted to the analytical laboratory with standard turnaround time unless circumstances require a more rapid turnaround.

6.3 Report Submittal

Semi-annual reports will be submitted on the last day of the month following the close of the second and fourth quarters.

7.0 MONITORING WELL INSTALLATION COMPLETION REPORT

A Monitoring Well Installation Completion Report (MWICR) will be prepared and submitted to the RWQCB following well completion or in conjunction with the first monitoring report. At a minimum, the MWICR will include:

1. A brief overview of field activities including well installation summary (such as number, depths), and description and resolution of difficulties encountered during field program.
2. A topographic map showing any existing nearby domestic, irrigation, and municipal supply wells and monitoring wells, utilities, surface water bodies, drainage courses and their tributaries/destinations, and other major physical and man-made features.
3. A site plan showing monitoring well locations, other existing wells, unused and/or abandoned wells, major physical site structures (such as corrals, freestall barns, milking barns, feed storage areas, etc.), waste handling facilities (including solid separation basins, retention ponds, manure storage areas), land application area(s), and onsite surface water features.
4. The period of field activities and milestone events (e.g., distinguish between dates of well installation, development, and sampling).
5. A summary of monitoring well construction, including:

   - Number and depths of monitoring wells installed.
   - Monitoring well identification (i.e., numbers).
   - Date(s) of drilling and well installation.
   - Description of monitoring well locations including field-implemented changes (from proposed locations) due to physical obstacles or safety hazards.
   - Description of drilling and construction including equipment, methods, and difficulties encountered (such as hole collapse, lost circulation, need for fishing).
   - Name of drilling company, driller, and logger (site geologist to be identified).
   - Driller's/lithologic log.
   - As-builts for each monitoring well, presented in a tabular format, with:

     Well identification
     Total borehole and well depth
     Date of installation
     Boring diameter
     Casing material and diameter (include conductor casing, if appropriate)
     Location and thickness of slotted casing, perforation size
     Location, thickness, type and size of filter pack
     Location and thickness of bentonite seal
     Location, thickness, and type of annular seal
     Depth of surface seal
     Type of well cap

Type of surface completion
Depth to water (note any rises in water level from initial measurement)
Date of measurement
Well elevation (measuring point to nearest +- 0.01 foot) at top of casing
Well protection device (below-grade water-tight vaults, stovepipe, bollards, etc.)

All depth-to-groundwater measurements documented during field program will be included as well as all field notes from drilling, installation, and surveying activities.

Details of monitoring well development will include:

1. Date(s) and time of development.
2. Name of developer.
3. Method of development.
4. Methods used to identify completion of development.
5. Development log including volume of water purged, temperature, pH, and electrical conductivity during and after development.
6. Disposal of development water.
7. Field notes (such as bailing to dryness, recovery time, number of development cycles).

Information relative to the monitoring well survey will include:

1. Coordinate system or reference points used.
2. Description of measuring points (i.e., ground surface, top of casing, etc.).
3. Horizontal and vertical coordinates of well casing with cap removed.
4. Name, license number, and signature of California-licensed professional who conducted survey.
5. Tabulated survey data.

Appendix A

Field Sampling Forms

DAILY FIELD ACTIVITIES RECORD

PROJECT	PROJECT NO.
LOCATION	DATE
WEATHER	SUPERVISOR
PURPOSE OF EVENT	AUTHOR (Print & Sign)
OTHERS IN ATTENDANCE/ AGENCY/ COMPANY	

ADDITIONAL FORMS ATTACHED

- ☐ SURFACE WATER MONITORING RECORD
- ☐ GROUNDWATER MONITORING RECORD
- ☐ TRENCH LOG
- ☐ PERCOLATION TEST DATA
- ☐ SOIL BORING/ MONITORING WELL LOG
- ☐ STANDARD OBSERVATIONS FORM

VESTRA

GROUNDWATER ELEVATION RECORD

PROJECT	PROJECT NO.
LOCATION	DATE
WEATHER	SUPERVISOR
PURPOSE OF EVENT	DATA COLLECTED BY

WELL ID	WELL DEPTH	TOC ELEVATION	DEPTH TO WATER (Feet bgs)	WATER SURFACE ELEVATION

ADDITIONAL FORMS ATTACHED

- ☐ DAILY FIELD ACTIVITIES RECORD
- ☐ GROUNDWATER MONITORING RECORD
- ☐ SOIL BORING/ MONITORING WELL LOG
- ☐ STANDARD OBSERVATIONS FORM
- ☐ OTHER _____
- ☐ OTHER _____

VESTRA

GROUNDWATER MONITORING RECORD

PROJECT	PROJECT NO.
LOCATION	DATE
WEATHER	SUPERVISOR
PURPOSE OF MONITORING EVENT	SAMPLES COLLECTED BY

WATER LEVEL/ WELL PURGE DATA — Sample Location:

SAMPLE TYPE: ☐ Groundwater ☐ Surface Water ☐ Leachate ☐ Other _____

DEPTH TO WATER (ft):_____ TIME:_____ MEASURED FROM: ☐ Top of Well Casing ☐ Other _____

WELL DIAMETER: _____ WELL DEPTH: _____ WELL COND.: Secure (☐ yes/ ☐ no) Damaged (☐ yes/ ☐ no)

BEGIN PURGE: Date/ Time:_____ Casing Volume (gal): _____

END PURGE: Date/Time: _____ Casing Volume (gal): _____

Volume of Schedule 40 PVC Pipe	
Inner Diameter (inches)	Volume (gal/ linear ft)
2	0.17
4	0.66

PURGE WATER DISPOSAL: Filtered (☐ yes/ ☐ no) ☐ 55 gal Drum ☐ Storage Tank ☐ Ground **Gallons Purged** _____

Time	Purge Vol. (gal)	Temp	pH	EC	DO	Turb	Rate (gpm)

SAMPLE COLLECTION DATA

SAMPLE COLLECTED WITH: ☐ Bailer ☐ Pump/ Pump Type _____ ☐ Dedicated (☐ yes/ ☐ no)

MADE OF: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other _____

ELEV OF PUMP INTAKE RELATIVE TO SCREEN INTERVAL: _____

DECON PROCEDURE: ☐ Detergent Wash ☐ Tap Rinse ☐ DI Water ☐ Other _____

SAMPLE DESCRIPTION: (Color, turbidity, sheen, etc.): _____

PH METER (Model/ No.): _____ COND METER: _____ COND RANGE: _____ ATC (☐ on/ ☐ off)

METER CALIBRATION CHECK: Ph 7 Buffer Reads _____ at _____ °F after Collection

Quantity	Size	Type	Field Filtered	Laboratory Analysis
		☐ Glass ☐ Plastic	☐ Yes ☐ No	
		☐ Glass ☐ Plastic	☐ Yes ☐ No	
		☐ Glass ☐ Plastic	☐ Yes ☐ No	
		☐ Glass ☐ Plastic	☐ Yes ☐ No	

COMMENTS:

VESTRA

Appendix B

Health and Safety Plan

SITE HEALTH AND SAFETY PLAN

ALSTON FARMS DAIRY NO. 2
ORLAND, CALIFORNIA

ACTIVITIES ASSOCIATED WITH
MONITORING WELL INSTALLATION AND SAMPLING

Prepared by

VESTRA Resources, Inc.
5300 Aviation Drive
Redding, California 96002

OCTOBER 2008

SITE HEALTH AND SAFETY PLAN
ALSTON FARMS DAIRY NO. 2, ORLAND CALIFORNIA

This plan must be kept onsite during all field activities and will be reviewed and updated as necessary. The plan shall be made available to any contractor or subcontractor or their representative who will be involved with any hazardous waste operation; to employees; to employee designated representatives; and to personnel of any Federal, state, or local agencies with regulatory authority over a given site.

SITE LOCATION

The site is located at 22954 Christian Road, Orland, California.

PROJECT ORGANIZATION

Technical Advisor/ Site Safety Officer	John Andrews	Office Cell	(530) 223-2585 (530) 949-4871
Field Coordinator/ Site Safety Supervisor (SSS)	Wendy Johnston	Office Cell	(530) 223-2585 (530) 949-9704
Geologist/Field Support	Lauren Andrews Clark Maki	Office	(530) 223-2585

EMERGENCY INFORMATION

IN THE EVENT OF A POTENTIAL LIFE-THREATENING EMERGENCY, CALL 911.

Hospital/ Clinic: **Enloe Medical Center** **Phone No.** **(530) 332-7371**

Hospital Address: **1531 Esplanade, Chico CA 95926**

Paramedic: **911**

Fire Dept: **911**

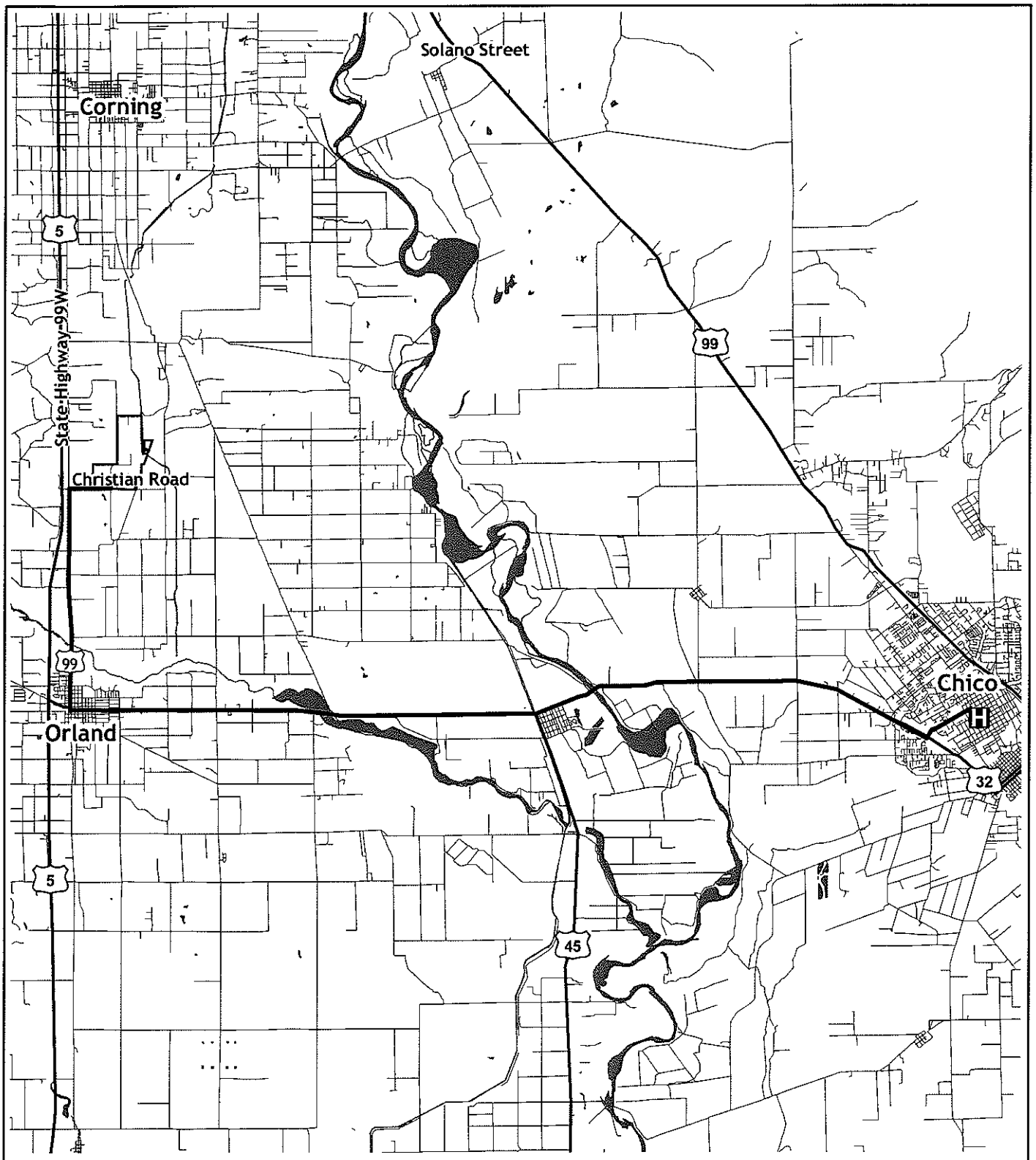
Police Dept: **911**

Hospital Directions:

A map from the site to the hospital is included.

EMERGENCY/CONTINGENCY PLAN

Coordinate evacuation procedures and remain a safe distance from the emergency. Perform First Aid/CPR as warranted by the situation. Do not move personnel with suspected neck or back injuries unless imminent danger to life exists. Report all injuries to the supervisor.



Take Christian Road to State Highway 99W.
Turn left onto State Highway 99W.
Follow State Highway 99W to Highway 32/Walker Street.
Turn left onto Highway 32/Walker Street.
Take Highway 32 to Chico.
Turn left onto W 8th Ave.
Turn right onto Esplanade.
Enloe Hospital is located at 1531 Esplanade.

H Enloe Hospital

Alston Dairy Site Location

VESTRA

0 1 2 4 Miles

MAP TO ENLOE HOSPITAL
ALSTON DAIRY
TEHAMA COUNTY, CALIFORNIA

P:\GIS\70824\Figures\70824_EmergencyRouteToHospital.mxd

TASKS TO BE PERFORMED UNDER THIS PLAN

Personnel on all projects must meet the training requirements of 8 CCR 5192 (e). Eating, drinking, and smoking are not allowed while handling substances involved with the site. Long pants, boots, and safety vests are required at all times. The tasks listed below are a general overview of possible activities to be conducted on site.

The Project Manager and Site Safety Officer are responsible for implementation of this plan, which includes a daily site safety briefing prior to initiating any onsite work.

Site activities may include but are not limited to site characterization, construction, and remediation. This plan has been developed for VESTRA personnel; it is not intended for subcontractor or client use. Activities include but are not limited to:

- Monitoring Well Installation
- Monitoring Well Development
- Groundwater sample collection

Monitoring Well Installation

Oversight of monitoring well installation to monitor groundwater quality associated with additional ponds at the dairy. Heavy equipment related to drilling activities will be onsite.

Groundwater Sampling

Groundwater sampling activities may involve contact with contaminated water. Special attention must be given to assure proper Personal Protective Equipment (PPE) is worn as required. Please review the Physical, Biological, and Chemical Hazards sections.

TRAINING PROGRAM

All onsite employees will meet the medical surveillance, and training-hour annual refresher training requirements of OSHA 29CFR1910.120. Employees designated "SSC" have received 8 hours of supervisor and 8 hours of instrument training and can serve as site safety coordinator (SSC) for the level of protection indicated. There must be one SSC present during any task performed in exclusion or decontamination zones with the potential for exposure for safety and health hazards. Employees designated "FA-CPR" are currently certified by the American Red Cross, or equivalent, in first aid and CPR. There must be one FA-CPR designed employee present during any task performed in exclusion or decontamination zones with the potential for exposure to safety and health hazards. The "buddy system" requirements of OSHA 29CFR1910.120 are to be met at all times.

MEDICAL SURVEILLANCE PROGRAM

All employees in connection with field activities will have an entrance medical exam when employment period begins. All employees engaging in field activities associated with the tasks described above that may place them in contact with hazardous materials will have annual medical surveillance that reflects the exposure to chemicals encountered in the field. The medical surveillance may include respiratory, hearing, blood work, back x-ray, and tetanus booster if needed. Upon termination, employees have an exit exam.

All personnel medical records are available for review at any time and will be retained for 30 years after the date of personnel termination. Contact the human resources manager for VESTRA Resources, Inc. at (530) 223-2585.

STANDARD OPERATING PROCEDURES

Prohibitive Work Practices

- No spark sources within exclusion or decontamination zones
- Avoid visibly contaminated areas
- No eating, drinking, or smoking in contaminated areas, exclusion, or decontamination zones
- SSC to establish areas for eating, drinking, and smoking
- No contact lenses in exclusion or decontamination zones
- No facial hair that would interfere with respirator fit if Level B or C is anticipated

Site Control Measures

SSC will conduct site safety briefing (see below) before starting field activities or as tasks and site conditions change.

- SSC records safety-briefing attendance in logbook, and documents topics discussed.
- Post CAL/OSHA job site poster in a central and conspicuous location at the site.
- Establish work zones: support, decontamination and exclusion zones, and delineate work zones with flagging or cones as appropriate.
- Establish decontamination procedures, including respirator decontamination procedures, and test the procedures.
- Utilize access control at entry and exit from each work zone.
- Chemicals are to be stored in proper containers.
- Applicable Material Safety Data Sheets (MSDS) are to be available onsite.
- Establish onsite communications. These should consist of:
    - Line of sight/hand signals
    - Air horn
    - Two-way radio or cellular phone
- Establish emergency signals. For example:
    - Grasping throat with hand – EMERGENCY! HELP ME!
    - Grasping buddy's wrist – LEAVE AREA NOW!
    - Thumbs up – OK, UNDERSTOOD
    - Two short blasts on air horn – ALL CLEAR.
    - Continuous air horn – EMERGENCY! EVACUATE!
- Establish offsite communications.
- Establish procedures of disposal of material generated onsite.
- SSC to conduct periodic inspections of work practices to determine effectiveness of this plan. Deficiencies to be noted and corrected.

- Site safety briefing topics: general discussion of health and safety plan, site specific hazards, location of work zones, PPE requirements, equipment, special procedures, and emergencies.

- Site work will be performed during daylight hours whenever possible. Any work conducted during hours of darkness will require enough illumination intensity "to read a newspaper" without difficulty.

BIOLOGICAL HAZARDS

Hazards are inherently present during fieldwork when heavy equipment is present. It is important to always be aware of the threat hazards may pose. Being aware of your surroundings will help to avoid many of the potential hazards. The typical physical hazards anticipated being present at the site and the methods for preventing injury due to these hazards is described below.

Common physical hazards include mechanical hazards; slip-trip-fall hazards associated with the field environment; water hazards; biological hazards such as snakebites and ticks; hazards associated with weather conditions; and musculoskeletal injury resulting from lifting tasks.

BIOLOGICAL HAZARDS

HAZARD	CONTROL
TICK	Check for ticks often and thoroughly. If bitten remove by carefully grasping tick close to skin with tweezers and pulling straight out. Wash hands and bitten area thoroughly when removed. Disinfect affected area. If the tick resists or cannot be completely removed, seek medical attention.
	Lyme Disease or **Rocky Mountain Spotted Fever (RMSF)** may result from tick bite. **Lyme Disease**: Rash that looks like a "bullseye" with small welt in center, several days to weeks after tick bite. **RMSF**: Rash comprising red spots under skin, 3 to 10 days after tick bite. **Symptoms for both include** chills, fever, headache, fatigue, stiff neck, bone pain. IF SYMPTOMS APPEAR, SEEK MEDICAL ATTENTION IMMEDIATELY.
RATTLESNAKE	If bitten, do not cut victim. Elevate affected area and seek medical attention immediately. Notify medical authorities as soon as possible; it takes time to prepare anti-venom.

PHYSICAL HAZARDS

HAZARD	CONTROL
SAMPLING EQUIPMENT	Operation of sampling equipment during site activities presents potential physical hazards to personnel. During all site activities, personal protective equipment (PPE) such as steel-toed shoes, safety glasses or goggles, and hard hats should be worn whenever such equipment is present.
SLIP-TRIP-FALL	Slip-trip-fall hazards are common at field sites due to open holes; muddy, slippery, or unstable surfaces; and equipment on the ground. While it is difficult to eliminate all slip-trip-fall hazards, implementing safe work practices, utilizing proper footwear, and keeping the work area free of obstructions will minimize risk of injury.
LIFTING HAZARDS	Field operations often require the performance of laborious tasks. All employees must implement proper lifting procedures, such as keeping the load close to the body, and using leg muscles instead of back muscles to perform lifting tasks. Additionally, employees will not attempt to lift large, heavy, or awkwardly shaped objects without assistance.

WEATHER	Weather conditions are an important consideration in planning and conducting site operations. Extremely hot or cold weather conditions can cause physical discomfort, loss of efficiency and personal injury. Of particular importance at sites is heat stress, often resulting from the use of impermeable protective clothing, which decreases the body's natural cooling processes.

SYMPTOMS AND TREATMENT OF HEAT AND COLD STRESS

	Heat Related		Cold Related	
	Heat Exhaustion	**Heat Stroke (More Severe)**	**Hypothermia**	**Frostbite (More Severe)**
Symptom	Pale, clammy, moist skin; profuse sweating; weakness; normal temperature; dizzy; headache; vomiting.	Red, hot, dry skin; dizziness; confusion; rapid breathing and pulse; high body temperature.	Shivering, apathy, sleepiness; rapid drop in body temperature; glassy stare; slow pulse, slow respiration.	Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.
Treatment	Get victim to cool place. Loosen clothing, place head in low position. Have victim drink cool (not cold) water. **GET MEDICAL ATTENTION!**	Cool victim rapidly by soaking in cool (not cold) water. **GET MEDICAL ATTENTION IMMEDIATELY!**	Remove victim to a warm place. Have victim drink warm fluids-not coffee or alcohol. **GET MEDICAL ATTENTION!**	Get victim to a warm place. Re-warm area quickly in warm (not hot) water. Have victim drink warm fluids-not hot coffee or alcohol. Do not break any blisters. Elevate the injured area **GET MEDICAL ATTENTION IMMEDIATELY!**

GUIDELINES FOR WORKING IN TEMPERATURE EXTREMES WHILE WEARING PPE (LEVEL C AND ABOVE)

TEMPERATURE	WORK CYCLE	REST CYCLE	CONTROL MEASURES
<32° F or <55° F & Raining	2 hrs	15 min	Review cold stress in safety meeting. Rest in a warm area. Drink at lest 8 ounces of warm non-caffeinated, non-alcoholic beverage at each rest break. Schedule a mid-day lunch break of at least 30 minutes in a warm area to begin not later than 5 hours after startup.
72° F to 77° F	2 hrs	5 min	Review heat stress in safety meeting. Take resting pulse rate before beginning work. Drink 8 ounces of cool water before beginning work, and 4 ounces at rest break. Have ice available.
77° F to 82° F	2 hrs	5 min	As above, but seated rest break. Monitor pulse rate. (See below)
82° F to 87° F	60 min	15 min	As above, with shaded rest area.
87° F to 90° F	30 min	15 min	As above, with shaded rest area.
>90° F	15 min	15 min	As above, with shaded rest area.

RADIOLOGICAL HAZARDS AND CONTROLS

HAZARD	CONTROL
NO EVIDENCE HAS BEEN DISCOVERED TO SUGGEST THAT A RADIATION HAZARD EXISTS ONSITE.	None

CHEMICAL HAZARDS AND CONTROLS

The Project Manager or Field Supervisor is to request Material Safety Data Sheets (MSDS) from suppliers for chemicals that VESTRA employees or subcontractors may be exposed to. MSDS will be stored in a readily accessible location for the duration of the project.

A table summarizing Potential Chemicals of Concern is included below: **NONE.**

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Respirators will be used if indicated by site conditions to minimize volatile and ambient air inorganic chemical exposure by inhalation, and in the case of full-face respirators to minimize exposure to the eyes. A full-face respirator provides a higher level of respiratory protection, as well as preventing vapor contact with the eyes. Organic cartridges will be used, and new cartridges will be installed daily at a minimum when used or as exposure and hours of use indicate. To prevent exposure to particulates (dust, mists, or fumes), and to extend the usability of the inorganic cartridges, dust and mist filters will be used if indicated by site conditions. Respirators, cartridges, and filters will be NIOSH approved.

Boots, protective clothing, and gloves prevent direct contact with potential contaminants in the soil, water and ambient air, and provide an easy method of personal decontamination. Splash goggles provide protection from possible liquid splashing in the eyes, and in the case of sealed goggles, limit the contact of the ambient air with the eyes.

All employees in the Work Zone will meet the minimum level of PPE when entering or working in an area of known contamination specific to the job task. If the level of contamination is unknown, the maximum level of PPE will be donned prior to entering the suspected contamination zone. Once appropriate site monitoring has been conducted to indicate the level of contamination, the level of PPE may be reduced, as appropriate. If known or suspected conditions require an increase in the level of PPE in the contamination zones or newly designated contamination zones, all operations will immediately cease until appropriate changes in PPE are made.

GENERAL SAFETY REQUIREMENTS

All persons entering and/or working in the immediate area of project activities shall follow the following general safety procedures:

1. All personnel involved with these activities shall be aware of the location of buried utilities. USA Underground Alert shall be notified, if required, at least 48 hours in advance of sampling and will mark and locate any underground utilities located within or immediately adjacent to the work area.

2. VESTRA personnel will not be allowed on site without the prior knowledge and consent of the SSS/SSO.

3. Field activities will not be conducted without sufficient VESTRA backup personnel, who currently satisfy the health and safety requirements specified in 29 CFR 1910.120 (e) must be present at the site while field activities are in progress.

4. All personnel involved in the project shall bring to the attention of the SSS/SSO or the project representative for VESTRA any unsafe condition or practice associated with site activities.

5. Team members must avoid unnecessary contamination (such as, walking through known or suspected "hot" zones or contaminated puddles, kneeling or sitting on the ground, leaning against potentially contaminated equipment).

6. Respiratory devices may not be worn with beards, or under other conditions that prevent a proper seal.

7. Respiratory devices may not be worn with contact lenses.

8. No deep test pit entry (more than 5 feet in depth) will be allowed without installation of trench shoring, or other approved means of excavation security designed and installed in conformance with current Cal OSHA/OSHA regulations.

9. Smoking will only be allowed in designated areas.

10. Hard hats will be worn within the designated work zone.

11. Proper hearing protection will be worn at all times in conformance with current Cal OSHA/OSHA regulations.

12. Proper eye protection will be worn to protect the eye area from liquid splashes or flying debris.