

Central Valley Dairy Representative Monitoring Program

2014 Monitoring Well Installation Completion Report

Central Area

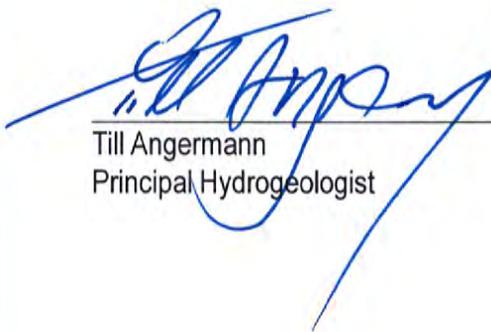


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2014 Monitoring Well Installation Completion Report

Central Area

February 26, 2015



Till Angermann
Principal Hydrogeologist

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Introduction

This Monitoring Well Installation Completion Report (MWICR) has been prepared by Luhdorff and Scalmanini, Consulting Engineers (LSCE) on behalf of the Central Valley Dairy Representative Monitoring Program (CVDRMP) to satisfy requirements for the documentation of monitoring well installations set forth in Revised Monitoring and Reporting Program (CVRWQCB, 2011), which was reissued in Reissued General Order R5-2013-0122 (CVRWQCB, 2013). Specifically, the MWICR was prepared to document completion of the well installation project described in the 2014 Monitoring Well Installation and Sampling Plan – Central Area (LSCE, 2014b).

The RMP undergoes continuous assessment as part of the data analysis and interpretation process and annually as part of the external review provided by the Groundwater Technical Advisory Committee and the Multidisciplinary Advisory Committee to identify critical data gaps (LSCE, 2012). Based on the review of monthly groundwater level information collected at Phase 1 RMP dairies¹ between January 2012 and December 2013, the Central Valley Dairy Representative Monitoring Program Year 2 Annual Report (2013) (LSCE, 2014a) identified five dairies (**Table 1**) in the Central Area (**Figure 1**) where the utility of the existing RMP well networks can be improved with the installation of supplementary monitoring wells. In addition, GEN-MW4 was proposed to be properly destroyed without replacement².

Table 1: 2014 Well installations and destruction

Dairy	County	Location	Scope of Work
MEN	Stanislaus	Crows Landing	Construction of one nested monitoring facility with two wells in one borehole
BEA	Merced	Livingston	Construction of two single-casing wells (§)
COT	Merced	Atwater	Construction of one single-casing well
MAC	Merced	Los Banos	Construction of one nested monitoring facility with two wells in one borehole
NUN	Merced	Los Banos	
GEN	Stanislaus	Modesto	Destruction of one well

§ The MWISP proposed installation of three wells. One well could not be installed due to the new owners' construction plans to expand the animal housing area.

Field work was concluded on January 12, 2015 with the last wellhead survey. The regulatory reporting deadline for this MWICR is 45 days after completion of field activities, i.e., February 26, 2015.

¹ Phase 1 RMP dairies are those where groundwater data collection efforts commenced in January 2012.

² This well is non-critical to the monitoring well network at this dairy.

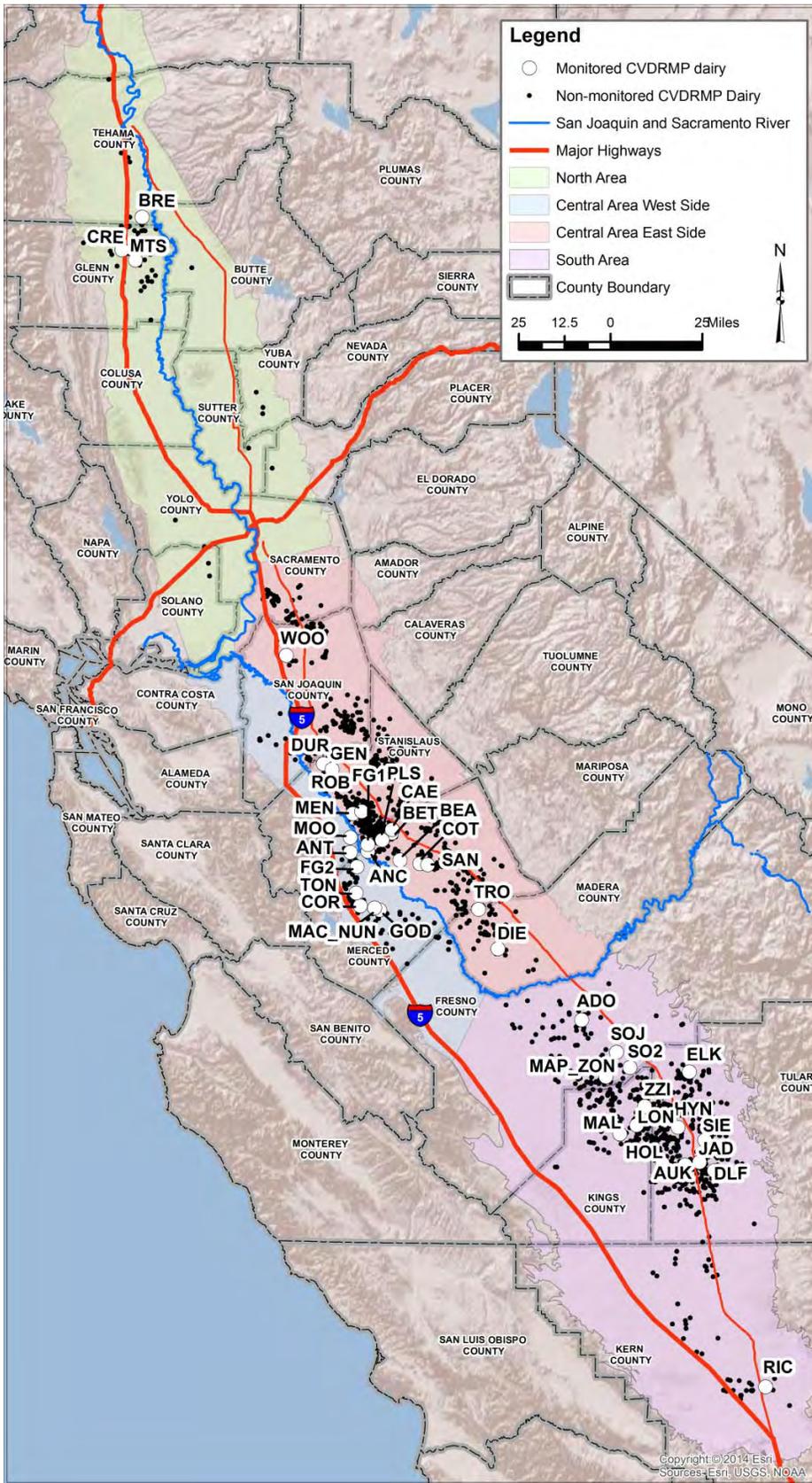


Figure 1: Location Map of Monitored CVDRMP Dairies.

Drilling and Monitoring Well Installation

Wells were installed as proposed or with non-substantive modifications (e.g., change of the side of a road or intersection corner) with the exception of BEA-MW3dd. This well could not be installed due to the new owners' plans to modify the animal housing area and expand the corrals. This facility was converted to a heifer ranch in early 2013. GEN-MW4 was destroyed as proposed.

Drilling and construction services were provided by PeneCore Drilling, L.P. (State Contractor's License C-57 No. 906899). The first monitoring well was installed on October 13, 2014, and the last monitoring well was installed on October 20, 2014. The wells were drilled and installed with a CME-75 rig.

Eight-inch diameter test holes were drilled using the hollow stem auger method. The inside diameter of the 5-foot auger flights was 4.25 inches. Discrete samples were retrieved every 5 feet using ASTM D1586-11 "Standard Penetration Test and Split-Barrel Sampling of Soils" (however, blow counts were not recorded). ASTM describes this procedure to drive "a split-barrel sampler to obtain a representative disturbed soil sample for identification purposes, and measure the resistance of the soil to penetration of the sampler". The split-barrel sampler has standardized outside and inside diameters of 2 and 1.5 inches, respectively. The chamber for soil collection was 18 inches in length. Therefore, the maximum core length was 18 inches. Cores of less than 18 inches length can occur in non-cohesive soils (i.e., the soil sample falls out of the open shoe while pulling the split-barrel out of the borehole), due to refusal (i.e., the sampler cannot be advanced 18 inches), or blockage (e.g., large rock fragments blocking the opening; or excessively high friction preventing the sample from sliding through the full length of the chamber). In addition to the retrieval of the split-barrel samples, drill cuttings were continuously observed as they surfaced from the rotation of the auger-column.

Subsurface materials were sampled, described and logged in the field by LSCE geologists under the direct supervision of Till Angermann (California Professional Geologist 7789).

Upon reaching target depth, samples were reviewed and the monitoring well designs were finalized. The 8-inch augers were retrieved and the test hole was reamed to 12 inches prior to the installation of nested wells at MEN and NUN. Twelve-inch augers were used in combination with 13.25-inch diameter drill bits. The drill bit was equipped with a wooden plug to prevent drill cuttings from entering the drill pipe at MEN. The inside diameter of the auger column was 8.25 inches.

Prior to installation, well construction materials were laid out on a tarp next to the borehole, the auger plug was punched out (if applicable), and the casing was installed inside of the auger. At the nested wells, the shallow well casing was attached to the blank deep well casing by its end cap and just above the screen, using 4-inch lengths of 2-inch diameter PVC pipe and zip ties to ensure a minimum separation between the casings. The auger served as a tremie pipe for the annular materials such that the level of the annular material in the pipe was maintained above the bottom of the auger. Installation of well casing through the auger also ensures a minimum distance between the well casing and the borehole wall. After placement of the lower sand pack, a bentonite seal was placed, the upper sand pack was completed, the fine sand transition seal was placed, and then the neat cement surface seal was placed.

In addition to the above, the monitoring wells share the following specifications:

- ❑ 2-inch diameter Schedule 40 PVC ASTM F-480-88A threaded, blank casing (2.375 inch outside diameter)
- ❑ 2-inch diameter Schedule 40 PVC ASTM F-480-88A threaded, screened casing (2.375 inch outer diameter) with 0.030-inch slot size
- ❑ Threaded PVC end caps (with slot in the bottom to prevent stagnant water from collecting in the cap)
- ❑ Sand pack # 8 sand (Silica Resources Industries)
- ❑ Bentonite chip seal between deep and shallow screen
- ❑ Fine sand transition seal between the top of the shallow screen and the surface seal
- ❑ Neat cement grout for surface seals
- ❑ Steel-reinforced (5 by 5 feet) concrete surface pads (12 inches thick, approximately 6 inches below and 6 inches above ground)
- ❑ Vented PVC slip caps

The wells were completed with 8-inch diameter steel surface monuments equipped with steel lids and padlocks. Wellheads were protected with bollards (4-inch diameter steel pipe filled with concrete).

Locations of the new monitoring wells are shown on site maps in **Attachment 1**. Monitoring well construction information is detailed in **Table 2**. Scaled as-built construction drawings and lithologic logs are provided in **Attachment 2**. The logs indicate the depth intervals where split-barrel samples were retrieved, the soil classification according to the Unified Soil Classification System (USCS), the Munsell color system, and additional description of subsurface materials. The logs identify lithologic changes observed within soil cores with solid horizontal lines. Lithologic changes between two soil cores are depicted with dashed lines. The driller's daily work reports are provided in **Attachment 3**.

Well Development, Wellhead Improvements and Survey

Monitoring wells were initially developed by LSCE staff 2 to 10 days after installation using heavy bailers to identify potential problems with wells (such as the presence of cement grout in the well casing) and to remove settled sediment from the well bottoms. Following the initial development, Del-Tech Geotechnical Support, Inc. completed well development using stainless steel bailers, air lifting, surge blocks, submersible pumps, inertial and centrifugal pumps, as applicable. Chemicals were not used in the well development activities. Well development was concluded prior to the November 2014 monitoring campaign.

The wells were developed until they produced water free of sand and with the goal to achieve turbidity values of 100 NTUs or less. As shown in **Table 4**, the turbidity goal proved too ambitious in some cases. This table provides a summary of well development information for the new monitoring wells. The table includes depth-to-water readings, amount of sediment and water removed from the well casings during Del-Tech's development, and measurements of water quality indicator parameters during the polishing phase of the development when the wells were pumped at variable rates. Purged water was spread on the ground at a sufficient distance to avoid the potential for purge water to re-enter the well during the development. Del-Tech's well development documentation is provided in **Attachment 4**.

Wellhead surveys were conducted by EPIC Land Surveying, Inc. (**Attachment 5**). Field work was concluded on January 12, 2015 with the last wellhead survey.

References

- Central Valley Regional Water Quality Control Board. **2007**. *Waste Discharge Requirements General Order No. R5-2007-0035 for Existing Milk Cow Dairies*. May 3, 2007.
- Central Valley Regional Water Quality Control Board. **2011**. *Revised Monitoring and Reporting Program General Order No. R5-2007-0035 for Existing Milk Cow Dairies*. February 23, 2011.
- Central Valley Regional Water Quality Control Board. **2013**. *Reissued Waste Discharge Requirements General Order No. R5-2013-0122 for Existing Milk Cow Dairies*. October 3, 2013.
- Luhdorff and Scalmanini, Consulting Engineers. **2012**. *Monitoring and Reporting Workplan and Monitoring Well Installation and Sampling Plan Phase 1: Initiation of Representative Groundwater Monitoring Network Design & Monitoring Program, Existing Milk Cow Dairies – Stanislaus and Merced Counties, California*. Public Review Draft. Prepared for Central Valley Dairy Representative Monitoring Program. June 16, 2011. Finalized without changes January 11, 2012.
- Luhdorff & Scalmanini Consulting Engineers. **2014a**. *Central Valley Dairy Representative Monitoring Program Year 2 Annual Report (2013)*. April 1, 2014, bound in six parts.
- Luhdorff and Scalmanini, Consulting Engineers. **2014b**. *Central Valley Dairy Representative Monitoring Program – 2014 Monitoring Well Installation and Sampling Plan, Central Area*. June 19, 2014.

Attachment 1

Monitoring Well Location Maps

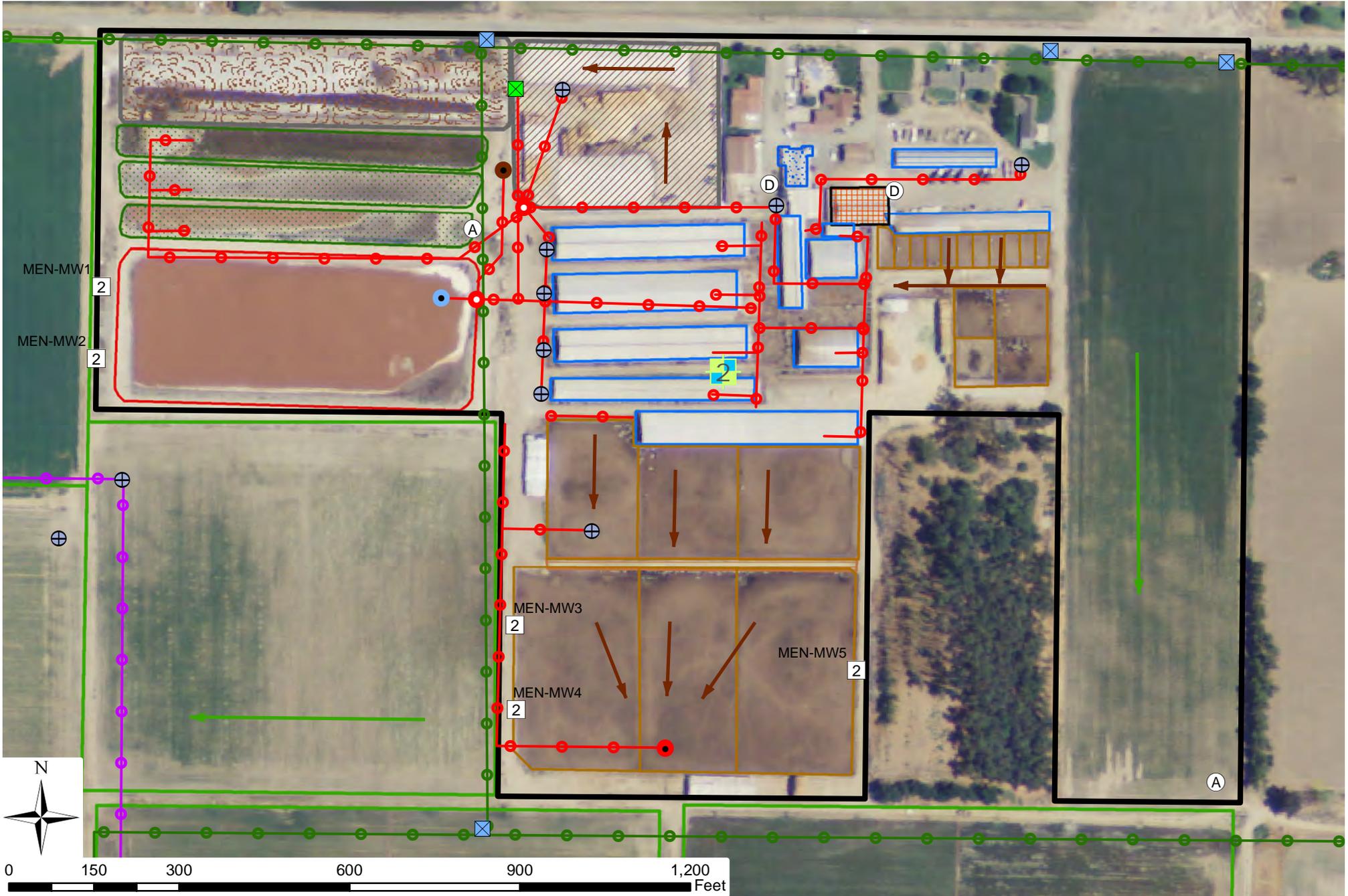
Legend

	Installed 1-Pipe Monitoring Well		Box, Irrigation Control		Berms/Levees		Animal Housing/Shade
	Installed 2-Pipe Monitoring Well		Box, Mixing		Canal, Concrete		Calf Barn
	Pre-Existing 1-Pipe Monitoring Well		Capped		Canal, Earthen		Calf Hutches
	Pre-Existing 2-Pipe Monitoring Well		Dam		Culvert		Milk Barn
	Pre-Existing 3-Pipe Monitoring Well		Drain		Ditch, Concrete		Corral
	Ag Well		Drain Box, Settling Box		Ditch, Concrete - Community		Hay Barn
	Domestic Well		Drop Box		Ditch, Earthen		Commodity Barn
	Unknown Type Well		Flow Meter		Ditch, Earthen - Community		Shed/Shop
	Abandoned Well		Flush Return Inlet Pipe		River or Creek		Other Structure
	New 1-Pipe Monitoring Well		Mechanical Separator		Swale, Drainage		Feed Storage (Roofed)
	New 2-Pipe Monitoring Well		Microjet Irrigation Filtration and Pumping Station		Swale, Drainage - non-manure		Feed Storage (on Concrete Slab)
	Dairy Production Area		Pump		Flow Direction, Irrigation Flow		Feed Storage (on Earth)
	Soil Characteristic Units		Pump, Floating		Flow Direction, Surface Drainage		Field
			Pump, Portable		Flow Direction, Tailwater Flow		Field, Tiled
			Pump, Tailwater		Pipeline, Freshwater		Earthen Tailwater Pond
			Pump, Tile Drain		Pipeline, Irrigation		Stormwater Retention Pond
			Pump, Wastewater		Pipeline, Tailwater		Dry Scrape Alley
			Stand Pipe		Pipeline, Tailwater/Tile Drain		Manure Stacking Area (on Concrete Slab)
			TID Inlet		Pipeline, Tile Drain		Manure Stacking Area (on Earth)
			Tank, Flush		Pipeline, Wastewater		Solids Settling Basin
			Tank, Water Storage		Setback/Physical Barrier		Flush Lane
			Valve				Liquid Manure Storage
			Wastewater Mixing Point				Earthen Stacking Area
							Equipment Storage
							Concrete Processing Pit
							Concrete Sand Trap
							Digester
							Weir Box
							Waterbody

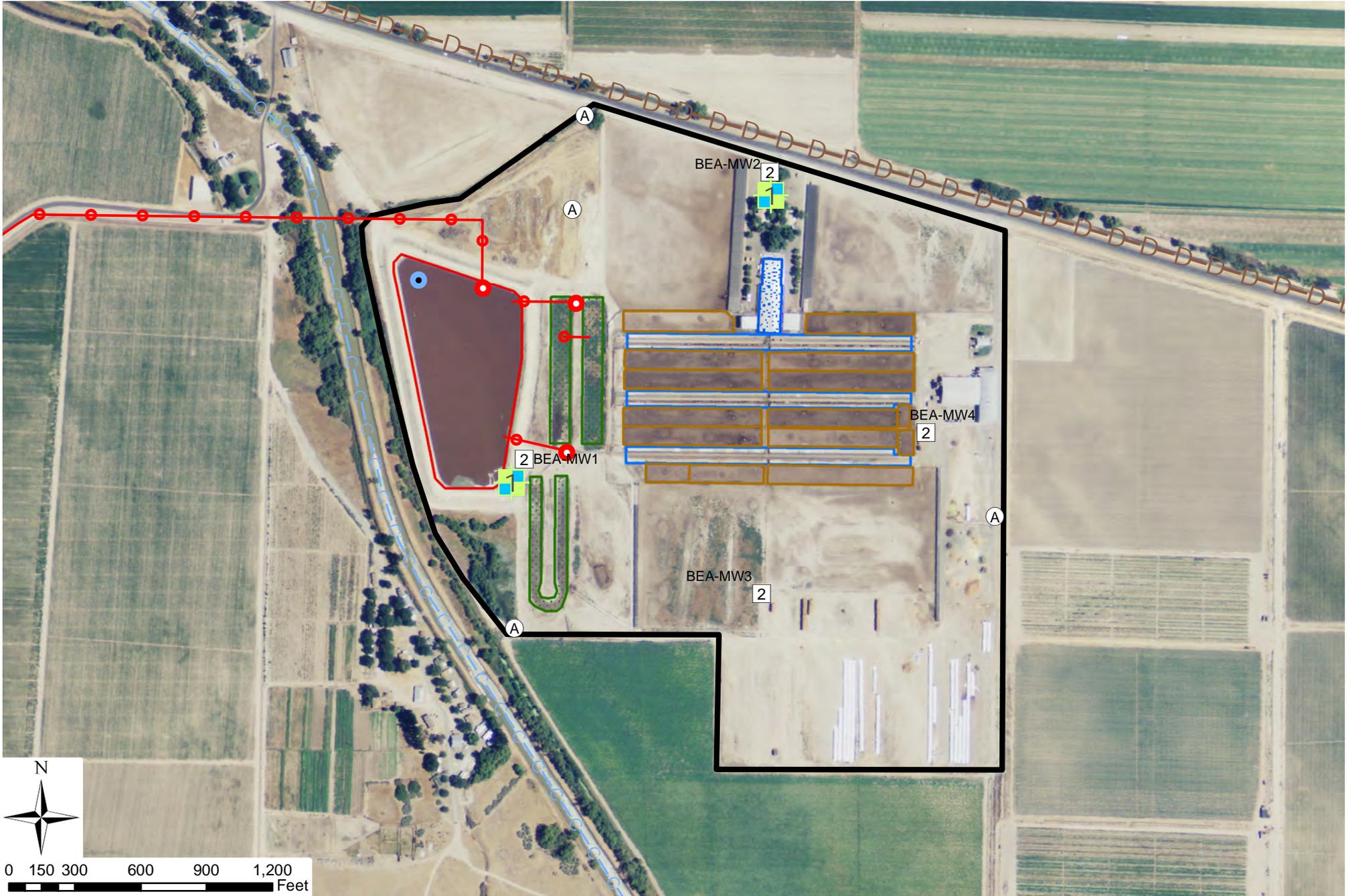
Field Crop Data on "Dairy Production Area and Associated Fields" map series are shown in black lettering on maps and organized as shown below:

CROP | Lagoon Liquor Applied (Y/N)? | Solid Manure Applied (Y/N)? | Synthetic Fertilizer Applied (Y/N)? | Irrigation Depth (inches) | N applied (lbs/acre) | Dry Yield (tons/acre) | N Application/Removal Ratio

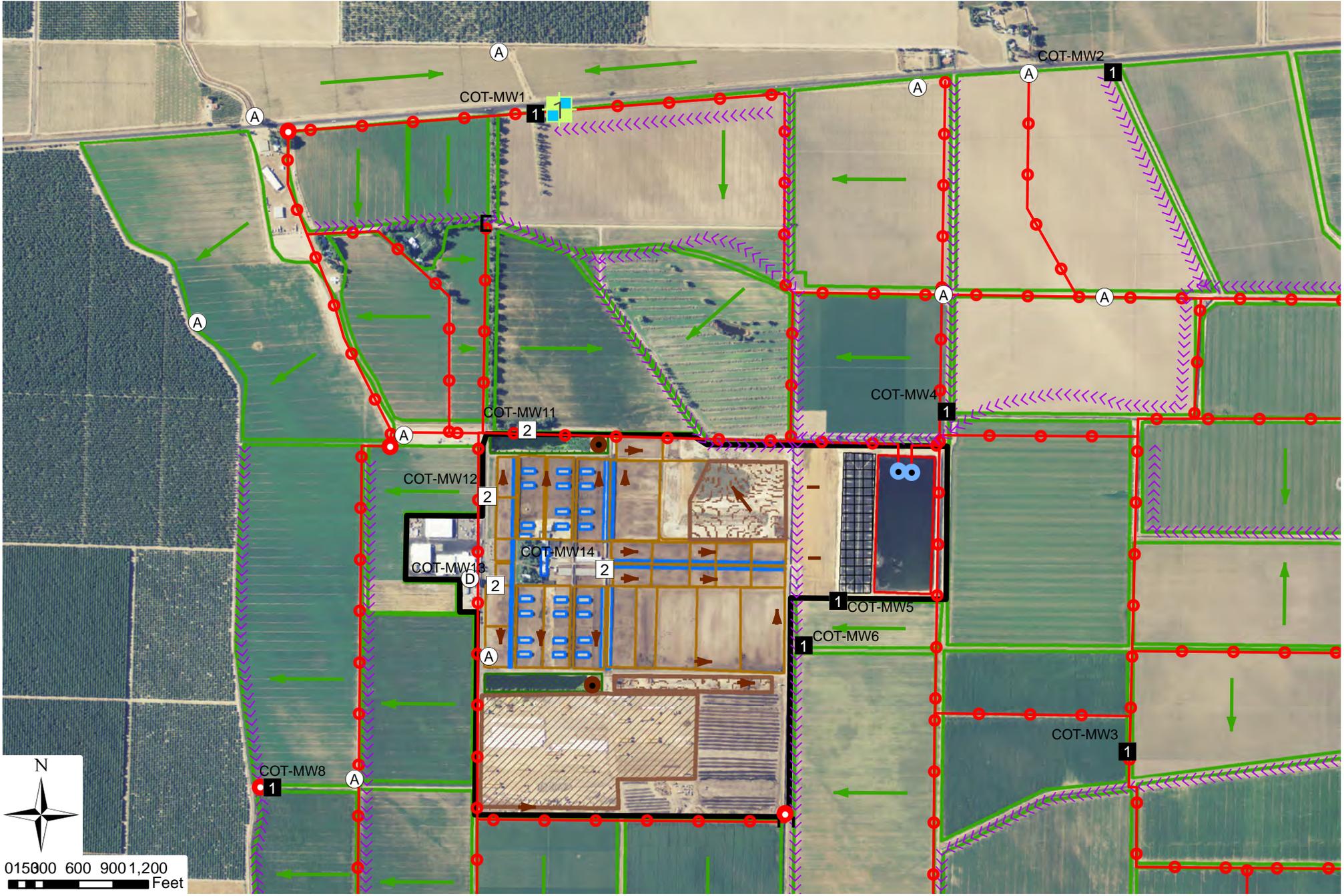
A – Alfalfa	AH – Alfalfa Hay	C – Corn	CE – Corn Ears	CS – Corn Silage	F – Winter Forage
FA – Fallow	FM – Forage Mix	G – Grapes	L – Almonds	O – Oats Silage Soft Dough	OG – Oats Grain
OH – Oats Hay	P – Pasture	S – Sudangrass	SP – Sweet Potato	SS – Sudan Silage	SO – Sorghum
T – Triticale	W – Wheat Silage	WH – Wheat			



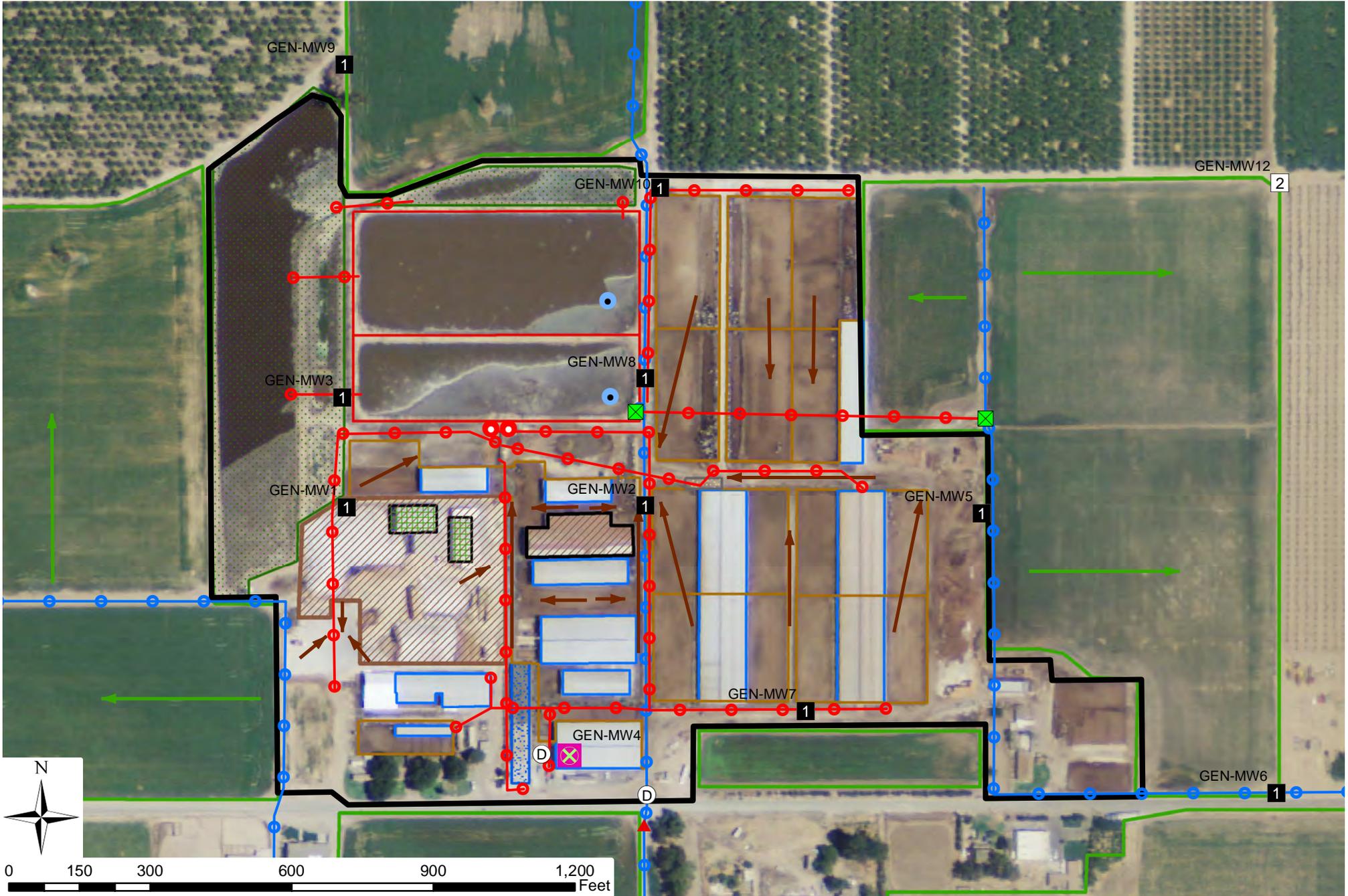
Y:\Dairy GIS\pd_New_Well_Installs_140418.mxd



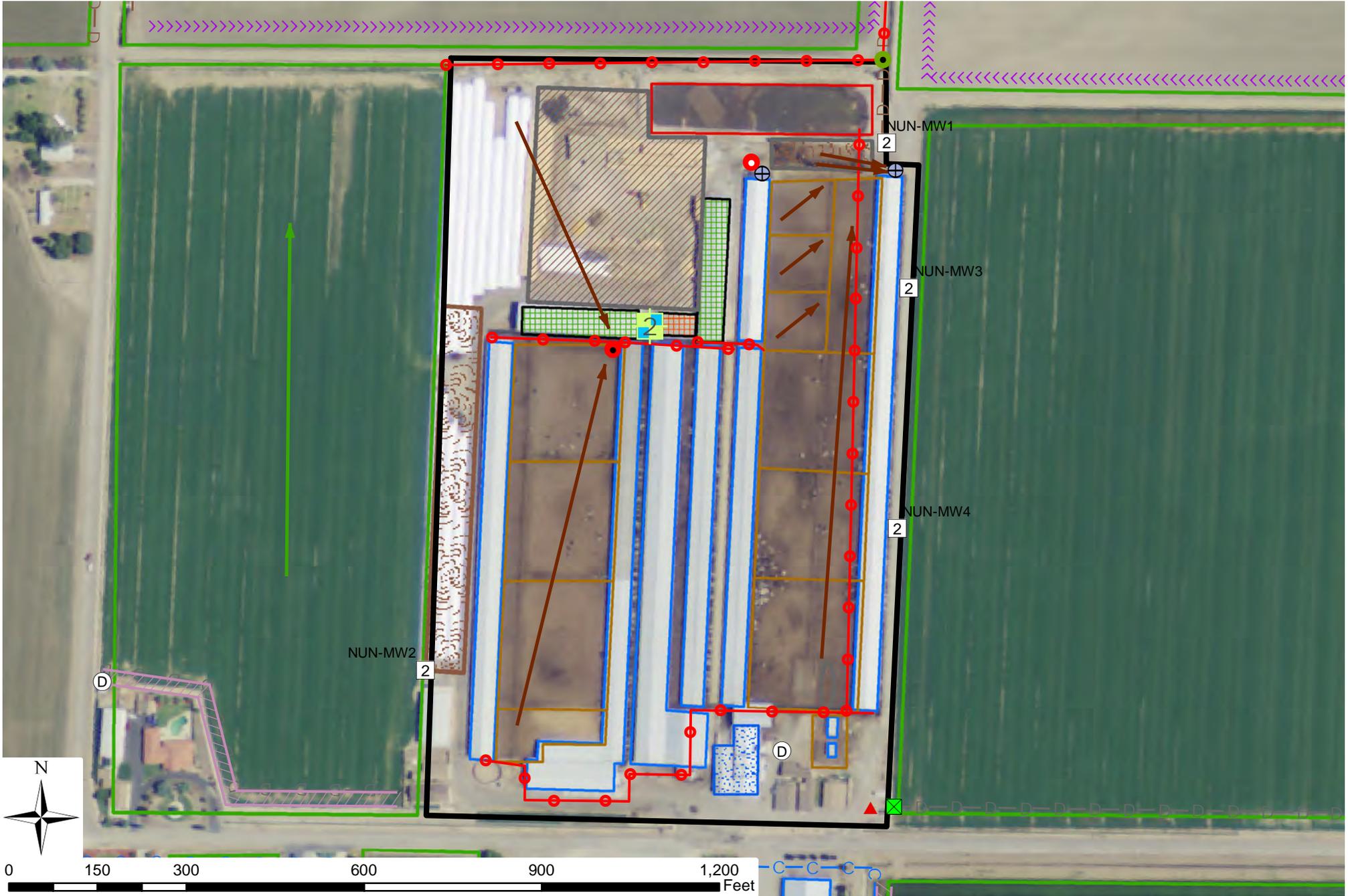
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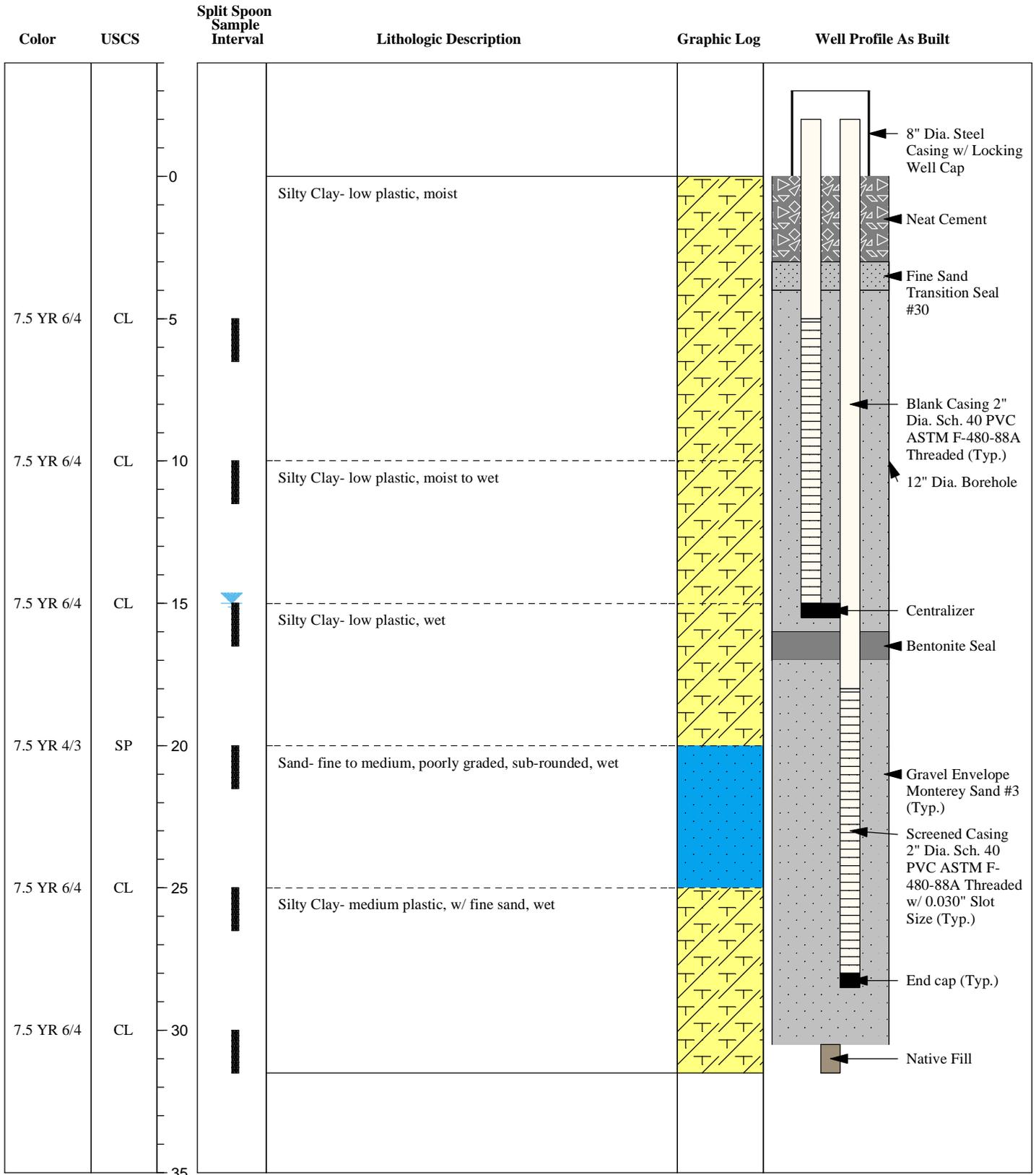
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Attachment 2

As-Built Well Profiles and Lithologic Logs

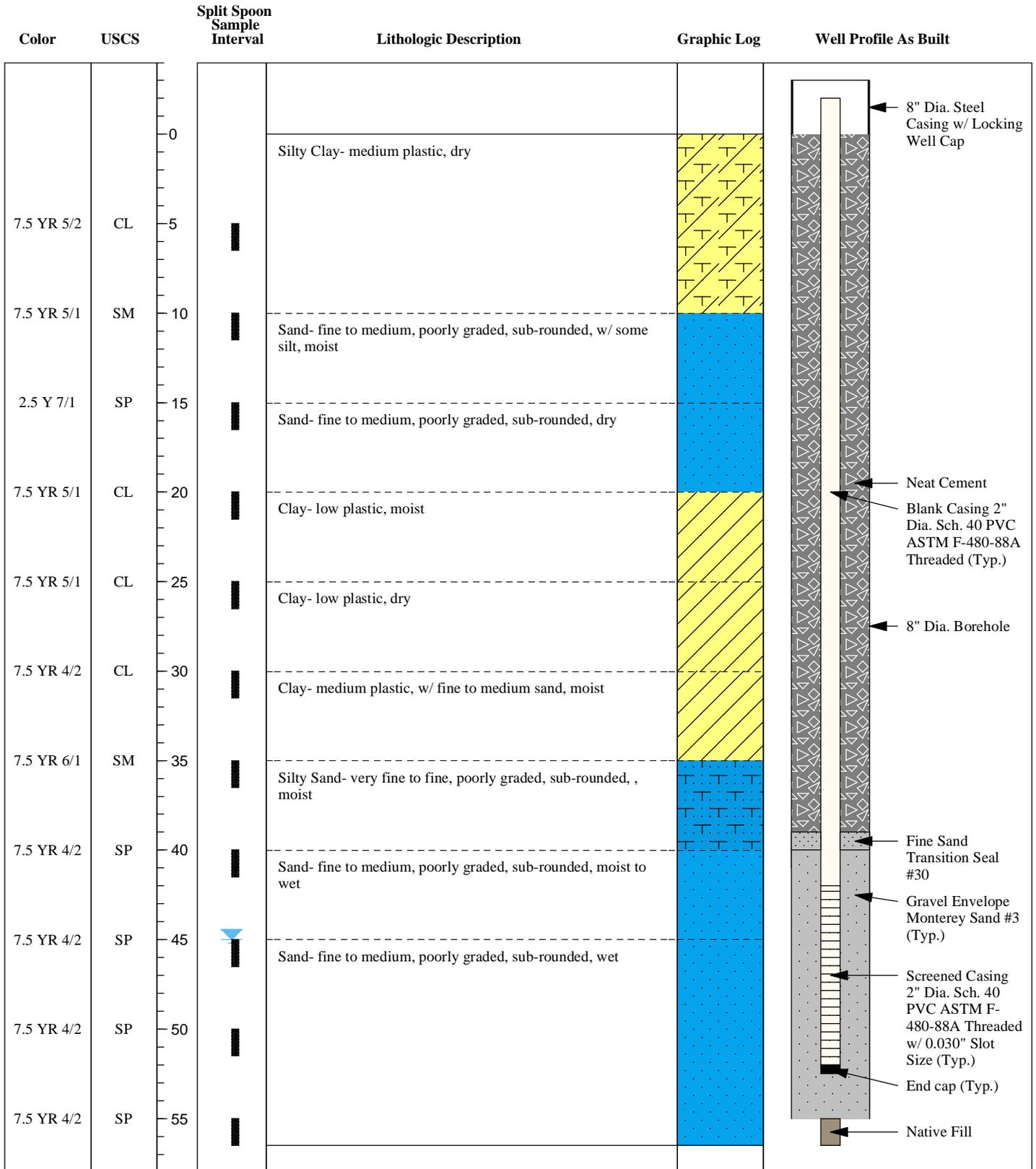
Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: Albert Mendes Dairy- 1100 Ruble Rd, Crows Landing, CA 95313, Stanislaus Co.
 Well Name: MEN-MW8 Drilling Method: Hollow Stem Auger; pilot hole nominal 8"- diameter with 9.5" drill bit
 Lat./Long.: 37.48417/-121.00940* reamed hole nominal 12"-diameter with 13.25" drill bit
 Drilled By: Penecore Drilling Sampling Method: ASTM D1586-11 Split-Barrel Sampling
 Driller: Norman Dewberry Drilling/Installation Date: 10/20/2014 Well Depth (ft): 15, 28
 Site Geologist: Wesley Andrews Boring Depth (ft): 31.5 Well Screen (ft): 5-15, 18-28



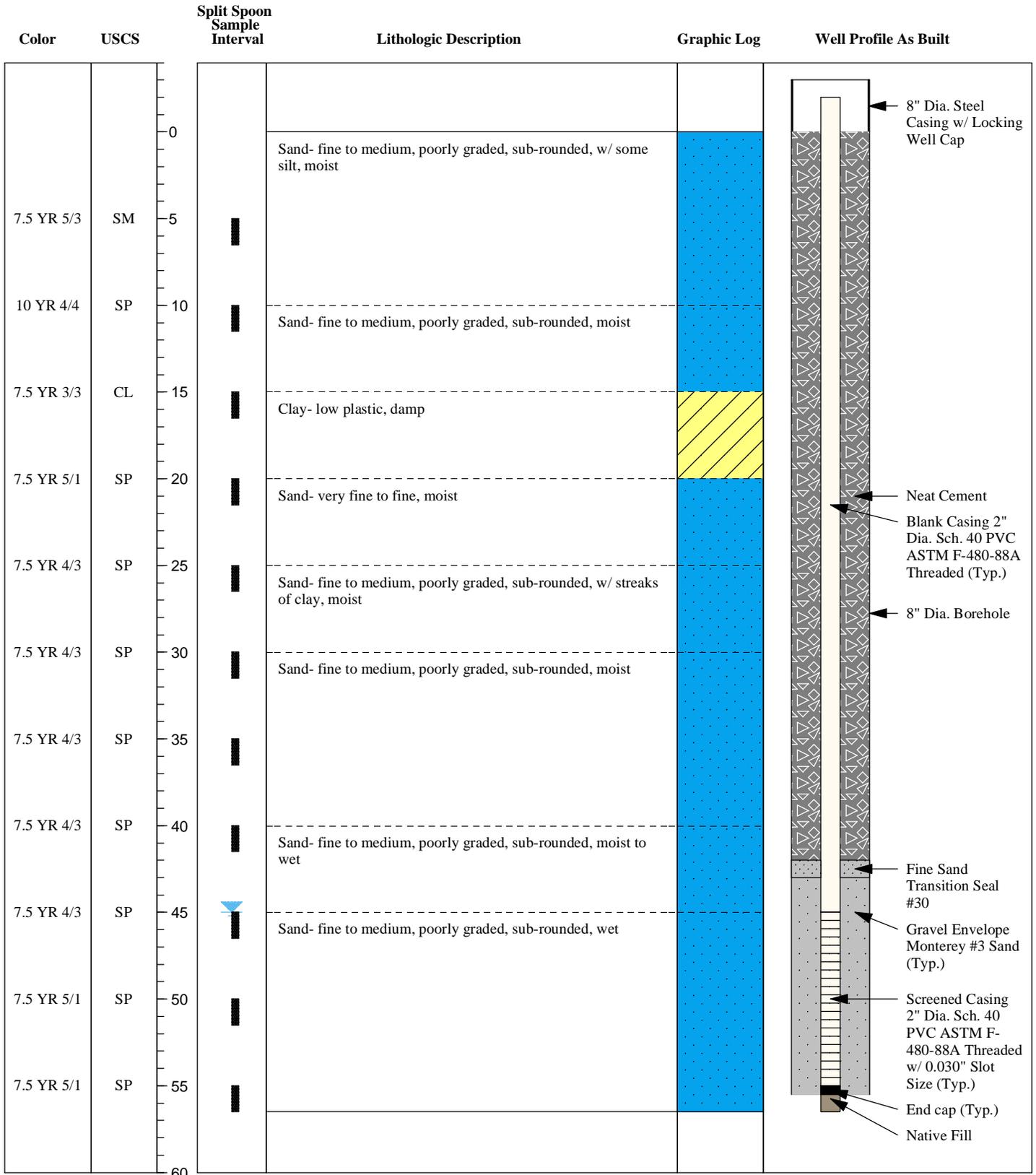
Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: Bear Creek Dairy- 15751 W. Highway 140, Livingston, CA 95334, Merced Co.
 Well Name: BEA-MW2dd Drilling Method: Hollow Stem Auger; pilot hole nominal 8"- diameter with 9.5" drill bit
 Lat./Long.: 37.30427/-120.77092*
 Drilled By: Penecore Drilling Sampling Method: ASTM D1586-11 Split-Barrel Sampling
 Driller: Norman Dewberry Drilling/Installation Date: 10/13/2014 Well Depth (ft): 52
 Site Geologist: Wesley Andrews Boring Depth (ft): 56.5 Well Screen (ft): 42-52



Central Valley Dairy Representative Monitoring Program

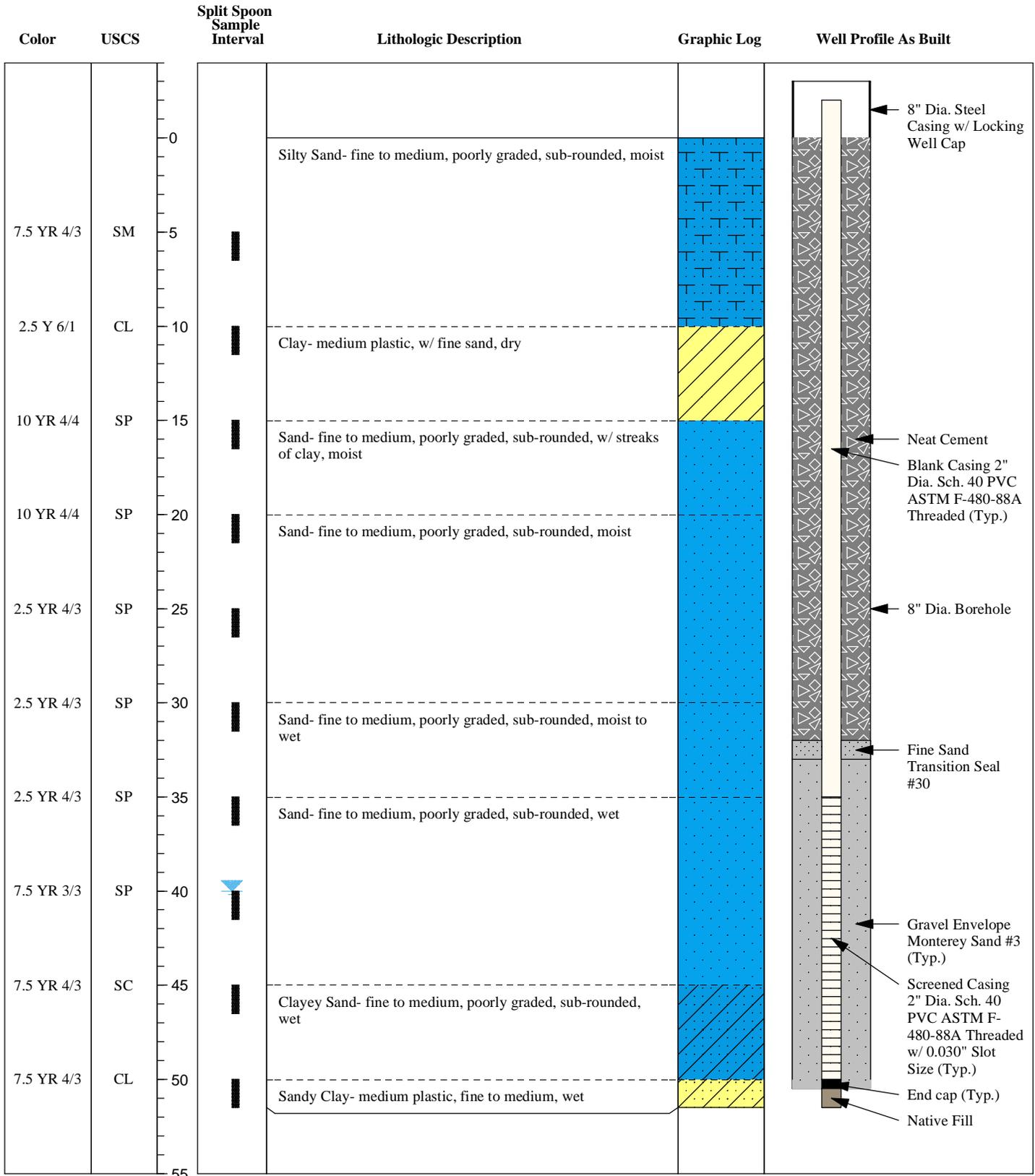
LSCE Project No. 13-7-099 Site: Bear Creek Dairy- 15751 W. Highway 140, Livingston, CA 95334, Merced Co.
 Well Name: BEA-MW1dd Drilling Method: Hollow Stem Auger; pilot hole nominal 8"- diameter with 9.5" drill bit
 Lat./Long.: 37.30066/-120.77475*
 Drilled By: Penecore Drilling Sampling Method: ASTM D1586-11 Split-Barrel Sampling
 Driller: Norman Dewberry Drilling/Installation Date: 10/13/14 - 10/14/14 Well Depth (ft): 55
 Site Geologist: Wesley Andrews Boring Depth (ft): 56.5 Well Screen (ft): 45-55



*Measurement from Google Earth

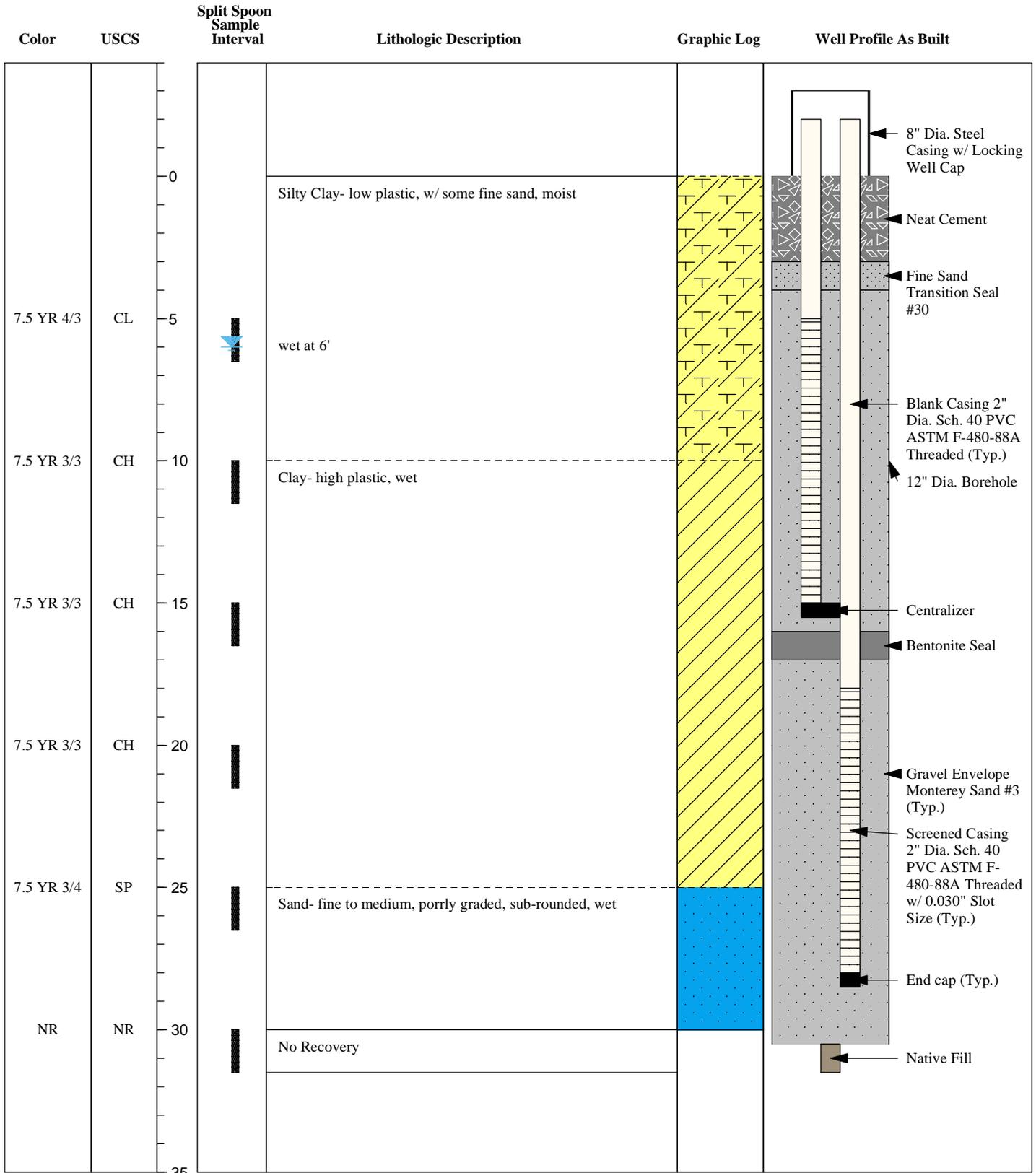
Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: Cottonwood Dairy- 10561 Highway 140, Atwater, CA 95301, Merced Co.
 Well Name: COT-MW1d Drilling Method: Hollow Stem Auger; pilot hole nominal 8"- diameter with 9.5" drill bit
 Lat./Long.: 37.30071/-120.67264*
 Drilled By: Penecore Drilling Sampling Method: ASTM D1586-11 Split-Barrel Sampling
 Driller: Norman Dewberry Drilling/Installation Date: 10/15/2014 Well Depth (ft): 50
 Site Geologist: Wesley Andrews Boring Depth (ft): 51.5 Well Screen (ft): 35-50



Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: Jose Nunes Dairy- 22484 W. China Camp Rd., Los Banos, CA 93635, Merced Co.
 Well Name: NUN-MW5 Drilling Method: Hollow Stem Auger; pilot hole nominal 8"- diameter with 9.5" drill bit
 Lat./Long.: 37.11700/-120.89452* reamed hole nominal 12"-diameter with 13.25" drill bit
 Drilled By: Penecore Drilling Sampling Method: ASTM D1586-11 Split-Barrel Sampling
 Driller: Norman Dewberry Drilling/Installation Date: 10/16/2014 Well Depth (ft): 15, 28
 Site Geologist: Wesley Andrews Boring Depth (ft): 31.5 Well Screen (ft): 5-15, 18-28



Attachment 3

Driller's Work Reports



220 N. East Street • Woodland, CA 95776
Office: 530-661-3600 • www.PeneCore.com

Date: 10-13-14
Project Address: 15751 W. Hwy 140, LIVINGSTON, CA
Project # _____
Equipment # CME 75 - 375

Client: LSCE
Field Rep: _____
Client Project # _____

Daily Field Log

Start	End	Notes
5:00	9:00	LOAD UP & MOB TO JOB SITE
		SAFETY MEETING
9:00		GO WITH CLIENT TO LOOK AT 1 st LOCATION
		OVERHEAD ISSUES POWERLINES
		MOB TO NEW LOCATION.
		HSA w/ 4.25 ID AUGERS TO 55'
		SAMPLE EVERY 5', SET WELL AT 52'
		10' OF 0.030 SCREEN. TRAN. SAND 2-16
		GROUT LOCATION. 8" MONUMENT (2) BOLLARDS
		SET 5'x5'x1 PAD AROUND MONUMENT 30 BABS
		OF CONCRETE. + 4 BABS FOR BOLLARDS
		HSA w/ 4.25 ID AUGERS TO 20' SAMPLE EVERY 5'
	7:10	LEAVE AUGERS IN GROUND.
7:10		JESSIE & JOHN MOB BACK TO SHOP.

Total Hours:

Total DPT Borings:	Total Footage: 1	Rig Operator: <u>Nonman</u>	# Hrs:
Total Auger Borings: 2	Total Footage: 75	Tech 1: <u>JESSIE</u>	# Hrs:
Hand Auger Borings:	Total Footage:	Tech 2: <u>JUAN B</u>	# Hrs:
Wells Installed: 1	Total Footage: 55	Tech 3:	# Hrs:
Wells Abandoned:	Total Footage:	Tech 4:	# Hrs:

Consumables Used

Item	Diameter	Schedule	Qty 5' Sections	Qty 10' Sections
PVC Riser:	2"	40	10	
PVC Screen: .010	2"	40		
PVC Screen: .010 0.030	2"	40	2	

Cement: <u>(175) 20 BABS</u>	Drums:
Concrete: <u>(50) 12 BABS</u>	Well Bore: <u>MONUMENT 8" (1)</u>
Asphalt:	DT22 Liners:
Sand: <u>(1) #3 (2) 2-16</u> Size:	DT32 Liners: <u>(2) BOLLARDS</u>
Bentonite: Chips: Crumbles: Powder:	MC Liners:
Concrete Coring:	Expendable Tips:
Rental Equipment:	Tubing:
Comments & Additional Consumables:	Others:

(2x6) (4)

Penecore Representative: Nonman Dewberry Client Representative: Wendy



220 N. East Street • Woodland, CA 95776
Office: 530-661-3600 • www.PeneCore.com

Date: 10-14-14
Project Address: 15751 W. Hwy 140, Livingston, CA
Project # _____
Equipment # CME 75-375

Client: USP
Field Rep: WEST
Client Project # _____

Daily Field Log

Start	End	
7:00	7:15	JUAN B - JESSIE LOAD UP AT SHOP MOB TO JOB SITE.
7:15		HSA w/4.25 FROM 20' TO 55' SAMPLE EVERY 5' FROM 20' TO 55', GET WELL AT 55' WITH 10' .030 SCREEN, 2-16 SAND FOR SEAL. WAITED FROM 9:45 TO 2:30 GO TO FIRST LOCATION TAKE FRAME APART. CLEAN UP LOCATION. LEAVE AUGERS IN GROUND AT 2 ND LOCATION.
	2:30	MOB TO MOTEL.
	1:00	
12:00	12:00	LUNCH

Total Hours:			
Total DPT Borings:	Total Footage: <u>1</u>	Rig Operator: <u>Norman D</u>	# Hrs:
Total Auger Borings: <u>1</u>	Total Footage: <u>35</u>	Tech 1: <u>JESSIE</u>	# Hrs:
Hand Auger Borings:	Total Footage: <u>1</u>	Tech 2: <u>JUAN B</u>	# Hrs:
Wells Installed: <u>1</u>	Total Footage: <u>35</u>	Tech 3:	# Hrs:
Wells Abandoned:	Total Footage:	Tech 4:	# Hrs:

Consumables Used			
PVC Riser:	Diameter: <u>2</u>	Schedule: <u>40</u>	Qty 5' Sections: <u>10</u> Qty 10' Sections:
PVC Screen: .010	Diameter:	Schedule:	Qty 5' Sections: Qty 10' Sections:
PVC Screen: .020 .030	Diameter: <u>2</u>	Schedule: <u>40</u>	Qty 5' Sections: <u>2</u> Qty 10' Sections:
Cement:	Drums:		
Concrete:	Well Box: Size:		
Asphalt:	DT22 Liners:		
Sand: <u>(6) #3 (1) 2-16</u> Size:	DT32 Liners:		
Bentonlite: Chips: Crumbles: Powder:	MC Liners:		
Concrete Coring:	Expendable Tips:		
Rental Equipment:	Tubing:		
Comments & Additional Consumables:	Others:		

~~(1) MOUNTAIN 8"~~
~~(2) BOLLARDS~~

PeneCore Representative: Norman DeBenedictis Client Representative: Wally



220 N. East Street • Woodland, CA 95776
Office: 530-661-3600 • www.PeneCore.com

Date: 10-15-14
Project Address: 13751 W. Highway 140, Livingston, CA
Project # _____
Equipment # CME 75 - Support truck

Client: USC
Field Rep: WEST
Client Project # _____

Daily Field Log

Start	End	
7:00		Great location from 10-14-14
		Jesse & Juan set 8" monument
		2 Boulders, 5x5x1 Concrete Pad
		Now started 3 rd well.
		ASA w/ 4.25 10 Augers to 50'
		Set 2" well 50', 10' of 1030
		screen, drilled location.
	6:30	MOB to Hotel.
12:00	12:30	Lunch

Total Hours:			
Total DPT Borings:	Total Footage:	Rig Operator: <u>NORMAN</u>	# Hrs:
Total Auger Borings:	Total Footage:	Tech 1: <u>JESSE</u>	# Hrs:
Hand Auger Borings:	Total Footage:	Tech 2: <u>JUAN B</u>	# Hrs:
Wells Installed: <u>1</u>	Total Footage: <u>50</u>	Tech 3:	# Hrs:
Wells Abandoned:	Total Footage:	Tech 4:	# Hrs:

Consumables Used					
PVC Riser:	Diameter: <u>2</u>	Schedule: <u>40</u>	Qty 5' Sections: <u>9</u>	Qty 10' Sections:	
PVC Screen: .010	Diameter:	Schedule:	Qty 5' Sections:	Qty 10' Sections:	
PVC Screen: <u>.020</u>	Diameter: <u>2</u>	Schedule: <u>40</u>	Qty 5' Sections: <u>2</u>	Qty 10' Sections:	
Cement: <u>(47 LBS) 46</u>	Size:	Crumbles:	Drums:	Well Box:	Size:
Concrete: <u>(50 LBS) 56</u>	Size:	Chips:	DT22 Liners:	DT32 Liners:	
Asphalt:	Size:	Chips:	MC Liners:	Expendable Tips:	
Sand:	Size:	Chips:	MC Liners:	Expendable Tips:	
Bentonite:	Size:	Chips:	MC Liners:	Expendable Tips:	
Concrete Coring:	Size:	Chips:	MC Liners:	Expendable Tips:	
Rental Equipment:	Size:	Chips:	MC Liners:	Expendable Tips:	
Comments & Additional Consumables:	<u>(2x6) 4 Frames</u>				

Comments & Additional Consumables:	<u>(2x6) 4 Frames</u>

PeneCore Representative: _____ Client Representative: [Signature]



220 N. East Street • Woodland, CA 95776
Office: 530-661-3600 • www.PeneCore.com

Date: 10-16-14 Client: USEE
Project Address: 22484 W. SHINA Campa RD Field Rep: WEST
Project # LOS BANOS, CA Client Project # _____
Equipment # EME 75 -

Daily Field Log

Start	End	
7:00		START THE PAD FOR 3 RD WELL IN LUGGESTON, 5X5X1, 8" MONUMENT (4) BOLLARDS.
		THEN MOVE TO NEXT JOB IN LOS BANOS, CA
12:00	12:30	MUNCH HSA w/ 12" AUGERS TO 20 25' SAMPLE FROM 5' TO 25' SET WELL AT 20', 10' OF .030 SAND TO 17', BENTONITE TO 16', SAND TO 15', SET WELL AT 15', 10' OF .030
	6:00	SAND TO 4', BENTONITE TO 3'

Total Hours:

Total DPT Borings:	Total Footage:	Rig Operator: <u>UNMAN</u>	# Hrs:
Total Auger Borings:	Total Footage:	Tech 1: <u>JESSE</u>	# Hrs:
Hand Auger Borings:	Total Footage: <u>1</u>	Tech 2: <u>JUAN B</u>	# Hrs:
Wells Installed: <u>1</u>	Total Footage: <u>29</u>	Tech 3:	# Hrs:
Wells Abandoned:	Total Footage:	Tech 4:	# Hrs:

Consumables Used

PVC Riser:	Diameter: <u>2</u>	Schedule: <u>40</u>	Qty 5' Sections: <u>8</u>	Qty 10' Sections:
PVC Screen: .010	Diameter:	Schedule:	Qty 5' Sections:	Qty 10' Sections:
PVC Screen: <u>.020</u>	Diameter: <u>2</u>	Schedule: <u>40</u>	Qty 5' Sections: <u>4</u>	Qty 10' Sections:
Cement: <u>(UNMAN) 240</u>	Size:	Crumbles:	Powder:	Drums:
Concrete: <u>56 Bags</u>	Size:	Chips:		Well Box: Size:
Asphalt:	Size:	Crumbles:	Powder:	DT22 Liners:
Sand:	Size:	Chips:	Powder:	DT32 Liners:
Bentonite:	Size:	Crumbles:	Powder:	MC Liners:
Concrete Coring:	Size:	Crumbles:	Powder:	Expendable Tips:
Rental Equipment:	Size:	Crumbles:	Powder:	Tubing:
Comments & Additional Consumables:	Size:	Crumbles:	Powder:	Others:

(1) 8" MONUMENT
(4) BOLLARDS

Penecore Representative: [Signature] Client Representative: [Signature]



220 N. East Street • Woodland, CA 95776
Office: 530-661-3600 • www.PeneCore.com

Date: 10-17-14 Client: USCE
Project Address: 22484 W. CHINA CAMP RD, LOS BANOS, CA Field Rep: WEST
Project # _____ Client Project # _____
Equipment # CME - Support truck

Daily Field Log

Start	End	
7:00		Jesse & Juan B - m3 to Home Depot
		to get 2x6 - for concrete pad
		Norman went to Central Concrete
		to get concrete a trailer
		set 5x5x1 concrete slab
		(1) 10" monument (2) bollards
	1:30	m3s back to shop

Total Hours:

Total DPT Borings:	Total Footage:	Rig Operator: <u>Norman D</u>	# Hrs:
Total Auger Borings:	Total Footage:	Tech 1: <u>Jesse</u>	# Hrs:
Hand Auger Borings:	Total Footage:	Tech 2: <u>Juan B</u>	# Hrs:
Wells Installed:	Total Footage:	Tech 3:	# Hrs:
Wells Abandoned:	Total Footage:	Tech 4:	# Hrs:

Consumables Used

PVC Riser:	Diameter:	Schedule:	Qty 5' Sections:	Qty 10' Sections:
PVC Screen: .010	Diameter:	Schedule:	Qty 5' Sections:	Qty 10' Sections:
PVC Screen: .020	Diameter:	Schedule:	Qty 5' Sections:	Qty 10' Sections:
Cement:	Drums:			
Concrete: <u>(1) yard of concrete</u>	Well Box:	Size:		
Asphalt:	DT22 Liners:			
Sand:	DT32 Liners:			
Bentonite:	MC Liners:			
Concrete Coring:	Expendable Tips:			
Rental Equipment: <u>concrete truck</u>	Tubing:			
Comments & Additional Consumables:	Others:			

5x5x1 concrete pad

(1) 10" monument
(2) bollards

PeneCore Representative: [Signature]

Client Representative: [Signature]



220 N. East Street • Woodland, CA 95776
Office: 530-661-3600 • www.PeneCore.com

Date: 10-20-14
Project Address: 1100 Ruble Rd. Crows Landing, CA
Project # _____
Equipment # CME-75

Client: LSCE
Field Rep: WEST
Client Project # _____

Daily Field Log

Start	End	
5:00	8:00	check load, mob to job site
8:00		Safety meeting - Job Set up
		HSA w/ 42" Augers to 20'
		Set nested well at 20' 10' 10' of screen
		.030, 15', 10' of screen, 10' monument
		4 ballards, 5x5x1 slab,
		mob back to PeneCore, Woodland, CA

Total Hours:			
Total DPT Borings:	Total Footage:	Rig Operator: <u>Norman</u>	# Hrs:
Total Auger Borings:	Total Footage:	Tech 1: <u>Jesse</u>	# Hrs:
Hand Auger Borings:	Total Footage:	Tech 2: <u>Juan B</u>	# Hrs:
Wells Installed:	Total Footage:	Tech 3:	# Hrs:
Wells Abandoned:	Total Footage:	Tech 4:	# Hrs:

Consumables Used				
PVC Riser:	Diameter: <u>2"</u>	Schedule: <u>40</u>	Qty 5' Sections: <u>6</u>	Qty 10' Sections:
PVC Screen: .010	Diameter: <u>2"</u>	Schedule: <u>40</u>	Qty 5' Sections:	Qty 10' Sections:
PVC Screen: .020 .030	Diameter: <u>2"</u>	Schedule: <u>40</u>	Qty 5' Sections: <u>4</u>	Qty 10' Sections:
Cement: <u>(47035) 4</u>			Drums:	
Concrete:			Well Box:	Size:
Asphalt:			DT22 Liners:	
Sand: <u>21</u>	Size: <u>#3</u>	<u>(1) 2-16</u>	DT32 Liners:	
Bentonlite:	Chips: <u>1</u>	Crumbles:	MC Liners:	
		Powder:	Expendable Tips:	
Concrete Coring:			Tubing:	
Rental Equipment:			Others:	

Comments & Additional Consumables:
Jesse - start time 5:15am

PeneCore Representative: Norman Dewberry Client Representative: Wally King

Attachment 4

Well Development Records – Del-Tech Geotechnical Support, Inc.

Attachment 5

Wellhead Survey Report

Project information		Coordinate System	
Name:	North San Joaquin Valley CVDRMP 2014 Additions	Name:	US State Plane
Client:	Luhdorff & Scalmanini Consulting Engineers	Datum:	NAD 83
Consultant:	Epic Land Surveying, Inc.	Zone:	CSPCS Zone 3 (0403)
Survey Date:	Jan. 12th, 2015	Epoch Date:	2011.00
Report Date:	Jan. 18 th , 2015	Vertical datum:	NAVD 88
Job Number:	141364	Survey Instruments/Methods:	Trimble R10 GNSS, Trimble Dini Digital Level/ RTK (Horizontal), Differential Leveling (Vertical)

Point List

Point ID	Northing (US survey foot)	Easting (US survey foot)	Elevation (US survey foot)	Feature Code	Latitude	Longitude
101	1932007.87	6511451.928	113.945	COT-MW1D	N37°18'02.53999"	W120°40'21.49820"
102	1933368.908	6482864.887	98.958	BEA-MW2DD	N37°18'15.32712"	W120°46'15.36168"
105	1865313.588	6446637.487	96.441	NUN-MW5S	N37°07'01.17280"	W120°53'40.20761"
108	1999152.31	6413904.987	61.255	MEN-MW8D	N37°29'02.89769"	W121°00'33.32422"
205	1865313.821	6446637.826	96.553	NUN-MW5D	N37°07'01.17511"	W120°53'40.20344"
208	1999152.388	6413905.281	61.139	MEN-MW8S	N37°29'02.89848"	W121°00'33.32057"
301	1932061.022	6481752.172	99.429	BEA-MW1DD	N37°18'02.36363"	W120°46'29.08660"

The horizontal coordinates of each monitoring well listed were surveyed on the above date within +/- one-foot lateral accuracy. The elevation of each monitoring well was surveyed within an absolute accuracy of +/- 0.5 foot and a relative accuracy between monitoring wells of +/- 0.01 of a foot.

