Schlumberger

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March 31, 2015

Mr. Jim Griswold
Environmental Bureau
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Re: 2014 Annual Groundwater Monitoring Report, Former Dowell Schlumberger Facility, 507 East Richey Avenue, Artesia, Eddy County, New Mexico. Discharge Permit GW-114.

Dear Mr. Griswold,

Enclosed please find the Annual Groundwater Monitoring Report for the Former Dowell Schlumberger Facility in Artesia, New Mexico.

The Discharge Permit GW-114 renewal application was submitted to NMOCD on July 15, 2013 and Schlumberger kindly requests a status update.

Should you have any questions regarding the enclosed submittal or the Discharge Permit renewal, please contact me at (281) 285-4747. I can also be reached by e-mail at cocianni-v@slb.com.

I look forward to our continued work with you.

Sincerely,

Virgilio Cocianni
Remediation Manager

Enclosure

c: Jim Strunk, The Dow Chemical Company
Cathy Barnett, CH2M HILL
Jeffrey Minchak, CH2M HILL

2014 Annual Groundwater Monitoring Report Former Dowell Schlumberger Facility Artesia, New Mexico

507 East Richey Avenue

Artesia, Eddy County, New Mexico

Prepared for

Schlumberger Technology Corporation and The Dow Chemical Company

March 2015

CH2MHILL®

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Acronyms and Abbreviations

bgs	below ground surface
COC	contaminant of concern
CVOC	chlorinated volatile organic compound
1,1-DCA	1,1-dichloroethane
1,1-DCE	1,1-dichloroethene
Dowell	a defunct joint venture between Schlumberger Technology Corporation and The Dow Chemical Company
GAC	granular activated carbon
ID	inside diameter
ISCO	in situ chemical oxidation
IJ	injection well
mg/L	milligrams per liter
$NaMnO_4$	sodium permanganate
NEWP	National Exploration Wells and Pumps
NMED	New Mexico Environment Department
NMOCD	New Mexico Oil Conservation Division
NMOSE	New Mexico Office of the State Engineer
NMWQCC	New Mexico Water Quality Control Commission
NTU	nephelometric turbidity units
PCE	tetrachloroethene
PVC	polyvinyl chloride
SCH40	schedule 40
site	Former Dowell Schlumberger Facility, Artesia, New Mexico
STC	Schlumberger Technology Corporation
SVE	soil vapor extraction
VOC	volatile organic compound
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
UST	underground storage tank
USTB	Underground Storage Tank Bureau
ZVI	zero-valent iron

SECTION 1

Introduction

CH2M HILL has completed the 2014 groundwater monitoring program at the Former Dowell Schlumberger Facility located in Artesia, New Mexico (the site). The site is regulated by the New Mexico Oil Conservation Division (NMOCD) under Discharge Permit GW-114 and is located at 507 East Richey Avenue, Artesia, Eddy County, New Mexico. The site location is shown in **Figure 1**, and the site plan is shown in **Figure 2**.

SECTION 2

Site Background

Section 2 provides an overview of the site background, history of operations, geology and hydrogeology, and modifications to the sitewide activities during 2014.

2.1 Site Description and History

The project site is located at 500 East Richey Avenue, Artesia, New Mexico (**Figure 1**) and was used as an oilfield service facility operated by Dowell Schlumberger Incorporated (Dowell; a defunct joint venture between Schlumberger Technology Corporation [STC] and The Dow Chemical Company) between 1969 and 1990 and in the early 2000s. In 1988, the New Mexico Environment Department (NMED) Underground Storage Tank Bureau (USTB) directed response actions in connection with fuel-related volatile organic compound (VOC) releases from underground storage tanks (USTs) at the site. During the early 1990s, NMOCD assumed responsibility for regulatory oversight of the facility. Dowell ceased facility operations during the 1990s. For a limited time between 2000 and 2010, Dowell resumed and then ceased facility operations.

In 1988, fuel-related VOC impacts to site soil and groundwater were discovered during UST removal activities and were regulated by the NMED-USTB. In 1995, a chlorinated VOC (CVOC) groundwater plume was discovered onsite near the former Wash Bay and was determined to be migrating to an adjacent downgradient property. The NMED Groundwater Protection and Remediation Bureau began oversight of the CVOC plume response and continued to regulate the pre-1995 UST impacts. In response to the discovery of the plume, Dowell purchased the downgradient property. Following the purchase of the adjacent land, it was discovered that Eddy County, New Mexico, owns right-of-way property between numerous land parcels and, as of 2014, remains the owner of the right-of-way between the two adjacent properties.

The site is currently inactive. The USTs and acid plant have been decommissioned and removed, but the office, maintenance, and storage buildings remain at the site (**Figure 2**). The remaining property outside the facility fence line is undeveloped other than for limited environmental-related infrastructure.

The adjacent properties include the following:

- Artesia Alfalfa Growers Association - property to the north
- Mr. Donald Kiddy and Chase Farms - properties to the east
- East Richey Avenue (NM 357) and residential - properties to the south
- Southeast Ready Mix Products - property to the west

Two prior remediation strategies, soil excavation and soil vapor extraction (SVE), have been implemented to remove the petroleum hydrocarbons and CVOCs from site groundwater and soil surrounding the former USTs, former Wash Bay, and former Acid Plant (**Figure 2**). During the early to mid-1990s, soil contaminated with fuel-related VOCs and CVOCs was excavated at these locations. Following soil excavation, in January 1994, SVE systems began operation at the location of the former USTs and at the former Wash Bay. The SVE system at the former USTs successfully removed fuel-related VOCs within that area, and the SVE system at that location was decommissioned in the early 2000s. The former Wash Bay SVE system last operated during 2013 and was decommissioned in November 2014. Between 2001 and 2002, pilot-scale zero-valent iron (ZVI) injections were performed in the downgradient portions of the CVOC groundwater plume. Difficulties with the ZVI injections and subsurface distribution were encountered and resulted in no significant changes in CVOC concentrations in the groundwater. A groundwater extraction and treatment system is in operation in the downgradient portion of the plume, located adjacent to monitoring well MW-30. Groundwater is treated using granular activated carbon (GAC), then discharged back into the ground by gravity at the subsurface infiltration gallery located approximately 230 yards upgradient, near the location of MW-31.

The following activities occurred at the site during 2014:

- Semiannual and annual groundwater sampling events were conducted, including depth to water measurements.
- Groundwater samples were collected for dissolved iron and manganese, and sulfate and sulfide at selected locations to determine baseline (pre-substrate injection) conditions in the aquifer to assist with substrate dosing calculations.
- Eight injection wells were drilled and installed in a linear transect near existing monitoring well MW-25, to facilitate the injection of an oxidant substrate (sodium permanganate [$NaMnO_4$]) into the groundwater. A third extraction well, EW-03, was installed near existing monitoring well MW-28. One monitoring well, MW-34, was installed downgradient of the in situ chemical oxidation (ISCO) treatment zone between the northern end of the injection transect and EW-03. The locations of the new wells are shown on **Figure 2**.
- 22,650 pounds of a 40 percent sodium permanganate solution were injected into the aquifer via the eight injection wells (IJ-1 through IJ-8).
- The former Wash Bay SVE system was permanently decommissioned and completely removed in November 2014.
- A groundwater extraction and treatment system operated in the downgradient portion of the plume located at monitoring well MW-30. Groundwater was treated using GAC, then discharged back into the ground by gravity at the infiltration gallery located approximately 230 yards upgradient, near the location of MW-31.

2.2 Geology and Hydrogeology

2.2.1 Regional Geology and Hydrogeology

The underlying geology in the area includes the east-dipping Permian San Andres Limestone. Overlying the Permian San Andres Limestone are the Artesia Group and Quaternary alluvium (Lyford 1973).

Artesia, New Mexico, is located in the Roswell groundwater basin. The basin is bounded to the north roughly 20 miles north of Roswell, to the south in the Seven Rivers area between Artesia and Carlsbad, to the east by the Pecos River, and to the west roughly 20 miles west of Artesia. The Roswell groundwater basin consists of two aquifers separated by a leaky confining layer. The upper aquifer is contained in the quartzose unit of Quaternary alluvium and the lower aquifer consists of the Permian San Andres Limestone. The upper aquifer is unconfined and is composed of Quaternary alluvial valley fill. The majority of the water-producing zones in the aquifer are located in the quartzose unit. The zones are typically sand and gravel separated by adjacent zones of silt and clay. Most zones are around 20 feet thick (Welder 1983).

The leaky confining layer between the two aquifers is formed from the lower three formations of the Artesia Group, which are mudstones. The moderately permeable layers form a leaky confining layer between the lower and upper aquifers (Hendrickson and Jones 1952). The layers vary in thickness across the basin due to erosion and solution collapse. The lower aquifer is located within the San Andres Limestone and the lower part of the Artesia Group. There are five different water-bearing zones in the deep aquifer. The thickness of the aquifer ranges from 260 to 460 feet, with water-bearing zones typically 50 feet or less in thickness. In the northern part of the basin near Roswell, the middle of the San Andres Limestone is the main water-producing zone. Near Artesia, in the middle of the basin, the main zone of production is the top of the San Andres Limestone. In the southern part of the basin, the main zone of production is the lower part of the Artesia Group (Welder 1983).

The transmissivities of the two aquifers vary due to irregular fractures, solution permeability in the deep aquifer, and erratic occurrences of sand and gravel in the shallow aquifer (Hendrickson and Jones 1952). The transmissivities range from 7,500 to 196,000 square feet per day in the deep aquifer, and 4,200 to

186,000 square feet per day in the shallow aquifer (Welder 1983). The aquifer zone yields vary greatly due to groundwater moving principally through cavities and fractures (Hendrickson and Jones 1952) at various depths. As a result, it is difficult to find specific water-bearing depth intervals in the aquifer during monitoring well installation (Welder 1983). Groundwater moves from the lower aquifer to the shallow, although Welder (1983) states that flow may reverse due to heavy pumping in the lower aquifer.
The estimated net rate of upward leakage is around 12,400 acre-feet per month (Welder 1983). Several water-bearing units in the leaky confining layer exist, and wells have been advanced and completed in the zones (Welder 1983). In general in the Roswell basin, groundwater flow is to the east; however, groundwater pumping in the Artesia area has caused a depression in the potentiometric surface of nearly 90 feet.

2.2.2 Site Geology and Hydrogeology

The geology and hydrogeology beneath the site were assessed during an investigation conducted in March 1995 by Western Water Consultants, Inc. Observations made during drilling activities described the predominant lithologies to consist of light-brown to reddish-brown silt and silty clay, interbedded with clay layers and stringers of carbonate rubble. The very fine-grained sediments were deposited in an arid, alluvial overbank environment and can be expected to be more laterally continuous than coarse-grained alluvial channel deposits (Western Water Consultants, Inc. 1995). The carbonate layers are believed to be the result of the evaporation of water containing elevated concentrations of dissolved solids. The 1991 investigation arrived at the conclusion that the stringers of carbonate rubble constitute the primary water-bearing zones. The rubble layers were observed at depths ranging from 20 to 26 feet below ground surface (bgs) (Western Water Consultants, Inc. 1995).

2.3 Modifications to the Sitewide Activities

No modifications to the sitewide activities were requested in 2014. However modifications requested in 2013 were implemented during 2014 and are described below.

On July 9, 2013, STC submitted via email a *Work Plan Amendment for the Schlumberger Oilfield Services Facility—Artesia* (STC 2013a) requesting that reporting frequency for the site be modified to annual and to include activities for the prior calendar year. The work plan amendment was conditionally approved by NMOCD in an e-mail dated July 15, 2013 (**Appendix A**). The conditional approval required that the annual report be submitted by April 1 of each following year.

On August 15, 2013, the *Work Plan Amendment, Soil Investigation and Soil Vapor Extraction System Closure, Former Dowell Schlumberger Facility, Artesia, New Mexico* (STC 2013b) was submitted to NMOCD. The work plan amendment was conditionally approved by NMOCD in an e-mail dated August 22, 2013 (**Appendix A**). The work plan amendment included a provision for taking the former Wash Bay SVE system offline pending the results of the soils investigation. The SVE system was taken offline during the fourth quarter of 2013 and was decommissioned in November 2014. The SVE decommissioning is described in the *Soil Vapor Extraction System Closure Report, Former Dowell Schlumberger Facility, Artesia, New Mexico (GW-114)* (CH2M HILL 2015).

On August 15, 2013, the *Work Plan Amendment, Groundwater Remediation Program Modifications*, *Former Dowell Schlumberger Facility, Artesia, New Mexico* (STC 2013c) was submitted to NMOCD. The work plan amendment was conditionally approved by NMOCD in an e-mail dated August 22, 2013 (**Appendix A**). The work plan amendment included provisions for modifying the existing groundwater extraction and treatment system and for evaluating and performing ISCO to enhance the removal of VOCs in site groundwater. The conditional approval required monitoring for manganese and sulfate in groundwater to demonstrate the New Mexico Water Quality Control Commission (NMWQCC) standards for those constituents are not exceeded following substrate injection. On September 17, 2013, the *Work Plan Amendment, Modifications to the Groundwater Monitoring Program, Former Dowell Schlumberger Facility, Artesia, New Mexico* (STC 2013d) was submitted to the NMOCD. The work plan amendment was conditionally approved by NMOCD in

an e-mail dated September 18, 2013 (**Appendix A**). The monitoring program modifications implemented in October 2013 and described in the *2013 Annual Groundwater Monitoring Report Former Dowell Schlumberger Facility, Artesia, New Mexico* (CH2M HILL 2014) were continued in 2014.

SECTION 3

2014 Site Activities

Section 3 summarizes the 2014 groundwater testing, well drilling and installation, groundwater treatment, and permanganate injection activities at the site.

3.1 Groundwater Monitoring Activities

The following subsections summarize the activities conducted during the semiannual groundwater monitoring events.

3.1.1 Depth-to-Water Measurements and Groundwater Sampling

Depth to water was measured at each of the 27 site wells during the semiannual events (April and October). During October 2014, southern New Mexico received a 500-year rainfall event. There was widespread flooding and localized standing water at the site. Additionally, a broken water line, unrelated to the environmental work at the site, was discovered in October 2014 near MW-9 in the former main operations area of the facility. The broken water line was subsequently repaired by others. Both of these October events resulted in significant anomalies in the depth to groundwater and groundwater table elevations and these measurements were not used to evaluate groundwater gradient and flow direction. In November 2014, the depth to water measurements were again collected at each of the 27 site monitoring wells and used to evaluate the groundwater gradient and flow direction. The groundwater elevation near MW-9 in the former main operations area of the facility remained elevated in November.

The first semiannual groundwater sampling event was conducted in April and included sample collection from 11 of the 27 monitoring wells (MW-12, MW-17C, MW-18, MW-21, MW-25, MW-26, MW-28, MW-30, MW-31, MW-32, and MW-33). The second semiannual groundwater sampling event occurred in October and included sample collection from 19 of the 27 monitoring wells (MW-1, MW-7, MW-8, MW-11, MW-12, MW-15, MW-17C, MW-18, MW-20, MW-21, MW-22, MW-26, MW-28, MW-29, MW-30, MW-31, MW-32, MW-33, and MW-34). A groundwater sample was not collected at MW-25 during the October event, because MW-25 is located adjacent to the injection transect and $NaMnO_4$ was observed in the well during the injections.

Prior to groundwater sample collection, the monitoring wells were purged with a peristaltic pump using low-flow methods. Field parameters (temperature, pH, conductivity, turbidity, dissolved oxygen, and oxidation-reduction potential) were measured and recorded during purging activities. Groundwater samples were collected following either field-parameter stabilization or the removal of three well-casing volumes. Groundwater samples were submitted for laboratory analysis of VOCs by U.S. Environmental Protection Agency (USEPA) SW-846 Method 8260B.

As a condition of NMOCD's Discharge Permit Work Plan (GW Remediation Program) Amendment Approval (**Appendix A**) to inject $NaMnO_4$ at the site, post-injection monitoring for manganese is required. A total of 11 monitoring wells are located within and adjacent to the permanganate injection target treatment zone (MW-18, MW-21, MW-22, MW-25, MW-26, MW-28, MW-29, MW-30, MW-31, MW-32, and MW-34) (**Figure 2**); these wells were selected for manganese monitoring. During the second semiannual groundwater sampling event, groundwater samples were collected at 10 of the 11 monitoring wells (MW-18, MW-21, MW-22, MW-26, MW-28, MW-29, MW-30, MW-31, MW-32, and MW-34) and submitted for laboratory analysis of dissolved manganese by USEPA Method 6020. Monitoring well MW-25 was not sampled due to the presence of $NaMnO_4$ in that well. Monitoring well MW-25 is located approximately 63 feet from the nearest injection well and given that injections were underway, the $NaMnO_4$ was likely not diluted. A decision was made to not collect a sample and send it to the laboratory. Monitoring well MW-25 will be monitored for manganese in the next semiannual event following dispersion of the oxidant beyond the injection zone.

Groundwater extracted during purging activities was contained in a 55-gallon drum and transferred to the GAC drums at the groundwater treatment system and processed through the treatment system.

3.2 Groundwater Treatment System Testing

The groundwater treatment system includes both the extraction pumping, treatment, and infiltration component and the ISCO component. From June 2 through 5, during the planning phases for the pump and treat system improvements and the injections, testing activities were conducted to evaluate aquifer pumping rates, gravity reinjection rates, and to collect groundwater samples from monitoring wells MW-25 and MW-28 for laboratory analyses of dissolved iron, dissolved manganese, sulfate, and sulfide concentrations to assist with selection of the oxidant reagent, dosing, and injection rates.

3.2.1 Groundwater Extraction and Treatment System

The groundwater extraction and treatment system operated continuously through September 18, 2014, when the groundwater treatment infrastructure was modified so the extracted groundwater could be used to deliver the $NaMnO_4$ to the aquifer via installed injection wells. From January to September the groundwater extraction and treatment system operated continuously except for roughly a 1-hour period during GAC exchanges, which occurred in April. During the monitoring event, the groundwater treatment system was inspected. The system hoses, drums, and equalization tank were examined for possible leaks or malfunctions to minimize the possibility of upset conditions or system failure; no issues were found.

Following the inspection, the system's four GAC drums were disconnected and replaced with new GAC vessels. Four spent GAC drums were transported offsite for disposal on both April 8 and November 25, 2014.

The system was shut down at the completion of injections on October 26, 2014, to allow the $NaMnO_4$ to remain in contact with the CVOCs in the aquifer.

3.3 Closure of Former Wash Bay SVE System

The former Wash Bay SVE system operated until the fourth quarter of 2013. The SVE system was taken offline in November 2013, in accordance with the NMOCD-approved work plan amendment, as discussed in Section 2.3. The system was decommissioned and completely removed in November 2014. Decommissioning is detailed in the *Soil Vapor Extraction System Closure Report, Former Dowell Schlumberger Facility, Artesia, New Mexico (GW-114)* (CH2M HILL 2015).

3.4 Well Installation

Well permit applications for non-consumptive use of water were submitted to the New Mexico Office of the State Engineer (NMOSE). Well permits were granted by the NMOSE on August 14, 2014, and are included as **Appendix B**. On August 18, 2014, National Exploration Wells and Pumps (NEWP), a licensed New Mexico driller, mobilized to the site to install eight injection wells, one downgradient monitoring well, and one extraction well. Prior to well installation, ground-penetrating radar was used at each drilling location to identify the presence of subsurface utilities within the proposed drilling area.

At the completion of well installation the wells were developed by surging with a surge block followed by bailing out the fine-grained sediment that entered the well screen during the surging step. Following the surging/bailing step, a submersible pump was placed into the well and pumped at a suitable flow rate to prevent the screen interval from dewatering, until the water's turbidity began to decrease. Development was considered complete when the measured turbidity of the groundwater was less than 10 nephelometric turbidity units (NTU). Water removed from the wells during development was containerized and transferred to the GAC system for treatment and reinjection.

3.4.1 Injection Wells

Eight injection wells were installed upgradient of monitoring well MW-25 in a linear transect, spaced 30-feet apart, as shown on **Figure 2,** using a CME 85 hollow-stem auger drill rig with a center plug; soil was logged

using the Unified Soil Classification System (USCS) from auger cuttings. Soil boring logs are included in **Appendix B**.

Injection wells were drilled to a total depth of 32-feet bgs and constructed with 2-inch inside diameter (ID) schedule 40 (SCH40) polyvinyl chloride (PVC) well casing. The screen, consisting of 2-inch ID SCH40 wire-wrapped PVC 0.040-inch slot, was set from approximately 20 to 30-feet bgs. Well construction diagrams are included in **Appendix B** and include filter pack type and size, bentonite seal depth, and grout mixture**.** Injection wells were finished with an 8-inch diameter steel protective casing and a locking cap within a 4-foot by 4-foot by 4-inch thick concrete well pad.

3.4.2 Extraction Well

An additional extraction well, EW-03, was installed near monitoring well MW-28 to a total depth of 60-feet bgs using a CME 85 hollow-stem auger drilling rig and continuous soil core barrel. The borehole was installed using 4.25-inch ID augers in conjunction with a 3-inch ID, 5-feet long continuous coring barrel. The soil retrieved from the continuous core barrel was logged using the USCS. Upon reaching the total depth of the borehole, 6.25-inch ID augers were used to over-ream the borehole to accommodate the installation of a 4-inch ID SCH40 PVC well. The screen, consisting of 4-inch ID SCH40 wire-wrapped 0.040-inch slot, was set from 15 to 55-feet bgs. The soil boring logs and well construction diagram are included in **Appendix B** and include filter pack type and size, bentonite seal depth, and grout mixture.

The extraction well casing was terminated at 2-feet bgs to accommodate the installation of a 0.5-horsepower submersible Grundfos pump and associated piping and electrical conduit. A 5-feet diameter concrete well vault and manhole was installed.

3.4.3 Monitoring Well

One additional monitoring well, MW-34, was installed to a total depth of 36.5 feet bgs between the northern end of the injection transect and new extraction well EW-03 using a CME 85 hollow-stem auger drilling rig and continuous soil core barrel. The borehole was installed using 4.25-inch ID augers in conjunction with a 3-inch ID, 5-feet long continuous coring barrel. The soil retrieved from the continuous core barrel was logged using the USCS. Upon reaching the total depth of the borehole, 6.25-inch ID augers were used to over-ream the borehole to accommodate the installation of a 4-inch ID SCH40 PVC well. The screen, consisting of 4-inch ID SCH40 0.010-inch mil slot, was set from 17 to 27-feet bgs. The soil boring log and well construction diagram are included in **Appendix B** and include filter pack type and size, bentonite seal depth, and grout mixture.

3.5 Sodium Permanganate Injections

On September 15, 2014, CH2M HILL personnel and a crew from Advanced Environmental Solutions mobilized to the site to begin construction of the temporary injection system. The injection system was installed by modifying the plumbing from the GAC drums inside the groundwater extraction and treatment facility such that treated groundwater from the GAC outlets was used as the water source for the permanganate solution. The treated groundwater was delivered to an above-grade jet pump, mixed with permanganate, and the solution was delivered to the injection wells via a piping manifold. Flow was controlled with various valves throughout the system and digital flow meters were used to measure the volume of solution injected into each well.

Injection of a 0.4 to 0.5 percent $NaMnO_4$ solution into the groundwater via eight injection wells began on September 18 and continued through October 26, 2014. Due to the 500-year rainfall event and subsequent flooding at the site, the injections did not occur continuously during this period. **Table 1** details volume of permanganate solution injected into each well. At the completion of oxidant injections, 1,000 gallons of treated water was injected into the injection wells to flush the well screens and sandpack of residual oxidant. Injection volumes and flow meter information were submitted to the NMOSE on January 6, 2015, as required by the NMOSE-issued well permits.

The temporary injection system was dismantled and removed from the site at the completion of the injections. During the October groundwater sampling event, the groundwater from monitoring wells in the downgradient portion of the plume, within and adjacent to the injection wells, was checked for the presence of $NaMnO_4$. The check was made by comparing the groundwater against a white background and observing for purple color, which indicates the presence of $NaMnO_4$.

SECTION 4

Results and Discussion

4.1 Groundwater Elevation and Gradient

The groundwater gradient was 0.004 to 0.007 foot per foot in April, with the overall direction of groundwater flow to the northeast. The gradient and groundwater flow direction were consistent with previous reports.

The groundwater extraction, treatment, and infiltration system had been off for approximately one month at the time the measurements were collected in November. As discussed in Section 3.1.1, a broken potable water line in the northeast portion of the facility artificially increased groundwater elevations in the upgradient portion of the site. Groundwater elevations near the gravity infiltration trench (near MW-31) remained locally high; very little influence was observed elsewhere at the site. The groundwater gradient was 0.006 to 0.010 foot per foot in November, with the overall direction of groundwater flow to the northeast.

Table 2 contains the 2014 groundwater elevation data. Please refer to previous annual monitoring reports for historical groundwater elevation data. Potentiometric surface maps depicting the groundwater elevation measured during the April and November 2014 semiannual gauging events are provided in **Figures 3** and **4**, respectively.

4.2 Groundwater Analytical Results

Table 3 summarizes the groundwater analytical results for 2014. Please refer to previous annual monitoring reports for historical groundwater analytical data. The 2014 laboratory analytical reports are in **Appendix C**, and the results of the data validation process are in **Appendix D**. The groundwater analytical results have been compared to the NMWQCC standards, which are shown on **Table 3**. Other analytes are reported in the analytical data, but do not have NMWQCC standards and are not shown on **Table 3**. **Table 3** generally follows the data format of prior annual reports. **Figures 5** through **11** present concentrations in groundwater for only the contaminants of concern (COCs) that exceeded NMWQCC standards during a given semiannual event. The extent of the exceedance of the NMWQCC standard is shown as an isopleth line on each figure. The following discussion summarizes the COC distribution at the site.

Concentrations of 1,1-dichloroethane (1,1-DCA) exceeded the NMWQCC standard of 0.025 milligrams per liter (mg/L) during the April sampling event at monitoring well MW-12 (**Figure 5**) and did not exceed the NMWQCC standard at monitoring well locations sampled during the October sampling event. Concentrations in wells where 1,1-DCA was detected decreased between the April and October events, except for slight increases in monitoring wells MW-28 and MW-31, however, the concentrations were still well below the NMWQCC standard.

Concentrations of 1,1-dichloroethene (1,1-DCE) exceeded the NMWQCC standard of 0.005 mg/L in multiple wells during the April and October sampling events (**Figures 6** and **7**). The exceedances are limited to the downgradient plume located outside the facility proper. 1,1-DCE is a focus of the oxidant injections and the groundwater extraction and treatment system modifications currently underway.

Concentrations of tetrachloroethene (PCE) exceeded the NMWQCC standard of 0.020 mg/L during the April and October sampling events (**Figures 8** and **9**). The exceedances are limited to the downgradient plume located outside the facility proper. The PCE is being acted upon by the groundwater extraction and treatment system and is a focus of the system modifications and oxidant injections currently underway.

Concentrations of naphthalene exceeded the NMWQCC standard of 0.030 mg/L during the April and October sampling events at MW-12 (**Figures 10** and **11**). Naphthalene concentrations are limited to the facility proper where benzene concentrations have previously exceeded NMWQCC standards.

It appears that the downgradient VOC plume is migrating beyond the current treatment system and moving further downgradient in the area of monitoring wells MW-28 and MW-29. The pumping of groundwater from EW-03 and the oxidant injections are anticipated to address CVOCs in this portion of the plume.

Dissolved manganese and sulfate samples were collected for analyses at monitoring wells MW-25 and MW-28 in June to determine baseline concentrations in the groundwater prior to oxidant injections. Samples were again collected for dissolved manganese analysis in October to demonstrate the injection of $NaMnO_4$ into the groundwater did not increase the concentration of manganese in the aquifer. No manganese exceedances were found during the October sampling event, however, this sampling event was immediately following the completion of the injections.

Baseline sulfate concentrations in the groundwater exceeded the NMWQCC standard of 600 mg/L, however a persulfate oxidant was not chosen as the injection substrate; sulfate concentrations in the aquifer were not monitored in the October sampling event. The sulfate is believed to be at background concentrations and no further sulfate monitoring is planned.

4.3 Sodium Permanganate Injections

As presented on **Table 1**, a total of 475,810 gallons of $NaMnO_4$ solution were injected into the groundwater via eight injection wells. Each of the eight injection well received an average of 232.3 gallons of $NaMnO_4$ blended with an average 59,244 gallons of treated groundwater.

During the October semiannual groundwater sampling event, the color purple, indicating the presence of $NaMnO_4$, was observed in MW-25 but was not observed in other monitoring wells at the site.

SECTION 5

Conclusions and Recommendations

The following conclusions and recommendations are presented relative to groundwater conditions at the site, based on the potentiometric and analytical data obtained during the 2014 site activities.

5.1 Conclusions

Groundwater monitoring has been conducted at the site since 1991. Most of the groundwater concentrations reported in the 2014 annual groundwater sampling period were stable or showed decreasing concentrations compared to historical data. A review of the historical analytical data indicates that VOC concentrations onsite have significantly decreased because of the former SVE systems and the groundwater extraction, treatment, and infiltration system. Most of the VOCs that persist are just slightly above NMWQCC standards; however, it appears that the downgradient VOC plume extends beyond the current groundwater extraction, treatment, and infiltration system and is moving further downgradient in the area of monitoring well MW-28.

The semiannual October sampling event was conducted less than one month after the completion of $NaMnO_4$ injections and no changes in VOCs concentrations due to the injections were observed.

5.2 Recommendations for Future Activities

5.2.1 Operate Upgraded Groundwater Treatment Facility

The updated groundwater treatment system was installed during February 2015 and included the following upgrades:

1. A larger GAC system that allows for longer time between GAC exchanges and provides an easier and more efficient process for exchanging spent GAC.
2. Remote-monitoring telemetry to allow real-time monitoring that will confirm that the system is operating correctly and that will send notifications of upset conditions.
3. Startup of the third extraction well, EW-03, near monitoring well MW-28 to manage the plume at the site boundary.

The upgraded system is expected to assist with the distribution of $NaMnO_4$ through the aquifer to maximize the treatment of CVOCs by the oxidant. Once the oxidant is observed in the extracted groundwater, the GAC will be bypassed in the groundwater system and the extracted groundwater will be sent directly to the infiltration gallery to recirculate the residual oxidant throughout the downgradient plume.

5.2.2 Groundwater Monitoring

The groundwater monitoring program will continue on a semiannual basis following the NMOSE-approved schedule. Monitored analytes will include VOCs and manganese. The monitoring wells in the downgradient portion of the plume, along with the extracted groundwater, will be monitored for the presence of $NaMnO_4$.

SECTION 6

References

CH2M HILL, Inc. 2015. *Soil Vapor Extraction System Closure Report, Former Dowell Schlumberger Facility, Artesia, New Mexico (GW-114).* March.

CH2M HILL, Inc. 2014. *2013 Annual Groundwater Monitoring Report, Former Dowell Schlumberger Facility, Artesia, NM.* March.

Hendrickson, G. E., and Jones, R. S. 1952. *Geology and Groundwater Resources of Eddy County, New Mexico*. New Mexico Bureau of Mines and Mineral Resources, Groundwater Report 3.

Lyford, F. P. 1973. *Valley Fill in the Roswell-Artesia Area, New Mexico*. USGS Open File Report.

Schlumberger Technology Corporation. 2013a. *Work Plan Amendment for the Schlumberger Oilfield Services Facility—Artesia* (via email). July 9.

Schlumberger Technology Corporation. 2013b. *Work Plan Amendment Soil Investigation and Soil Vapor Extraction System Closure Former Dowell Schlumberger Facility, Artesia, New Mexico.* August 16.

Schlumberger Technology Corporation. 2013c. *Work Plan Amendment Groundwater Remediation Program Modifications Former Dowell Schlumberger Facility, Artesia, New Mexico.* August 16.

Schlumberger Technology Corporation. 2013d. *Work Plan Amendment Modifications to the Groundwater Monitoring Program Former Dowell Schlumberger Facility, Artesia, New Mexico.* September 16.

Welder, G. E. 1983. *Geohydrologic Framework of the Roswell Groundwater Basin, Chaves and Eddy Counties, New Mexico.* USGS/New Mexico State Engineer Technical Report No. 42.

Western Water Consultants, Inc. 1995. *Quarterly Report for Additional Investigation and Remediation, Dowell Schlumberger Artesia, New Mexico.* July 13

Tables

TABLE 1

Substrate Injection Summary

2014 Annual Groundwater Monitoring Report

Former Dowell Schlumberger Facility, Artesia, New Mexico

Well ID	Substrate Injection			Substrate	Maximum Injection Flow Rate (gpm)	Maximum Injection Pressure (psi)
	Total Injection Volume (gal)	Substrate (lb)	Substrate (gal)			
IJ-1	55,721	2,496	218.5	$NaMnO_4$	2.66	2.5
IJ-2	56,566	2,516	220.3	$NaMnO_4$	3.06	3.3
IJ-3	62,445	2,784	243.8	$NaMnO_4$	2.68	4.5
IJ-4	56,864	2,547	223.0	$NaMnO_4$	2.98	9.0
IJ-5	58,264	2,600	227.7	$NaMnO_4$	2.90	8.0
IJ-6	62,731	2,794	244.7	$NaMnO_4$	2.84	2.5
IJ-7	60,215	2,686	235.2	$NaMnO_4$	3.02	2.5
IJ-8	63,004	2,796	244.8	$NaMnO_4$	2.75	4.5
Totals	**475,810**	**21,219**	**1,858**	**Maximum Values**	**3.06**	**9.0**

Notes:

gal = gallons

lb = pounds

gpm = gallon per minute

psi = pounds per square inch

$NaMnO_4$ = sodium permanganate

TABLE 2

Groundwater Elevation Data - 2014

2014 Annual Groundwater Monitoring Report

Former Dowell Schlumberger Facility, Artesia, New Mexico

Well ID	Date	Total Depth (ft btoc)	Top of Casing Elevation (ft amsl)	Depth to Water (ft btoc)	Groundwater Elevation (ft amsl)
MW-1	4/7/14	30.0	3358.52	13.99	3344.53
	10/14/14	30.0	3358.52	6.75	3351.77
	11/6/14	30.0	3358.52	7	3351.52
MW-6	4/7/14	35.0	3358.80	16.96	3341.84
	10/14/14	35.0	3358.80	4.36	3354.44
	11/6/14	35.0	3358.80	8.10	3350.70
MW-7	4/7/14	35.0	3358.19	16.84	3341.35
	10/14/14	35.0	3358.19	3.91	3354.28
	11/6/14	35.0	3358.19	8.59	3349.60
MW-8	4/7/14	35.0	3359.43	16.85	3342.58
	10/14/14	35.0	3359.43	5.92	3353.51
	11/6/14	35.0	3359.43	10.42	3349.01
MW-9	4/7/14	30.0	3357.29	14.85	3342.44
	10/14/14	30.0	3357.29	5.42	3351.87
	11/6/14	30.0	3357.29	7.35	3349.94
MW-10	4/7/14	30.0	3357.80	15.34	3342.46
	10/14/14	30.0	3357.80	4.43	3353.37
	11/6/14	30.0	3357.80	7.91	3349.89
MW-11	4/7/14	30.0	3356.16	14.83	3341.33
	10/14/14	30.0	3356.16	0.40	3355.76
	11/6/14	30.0	3356.16	6.68	3349.48
MW-12	4/7/14	25.7	3356.45	14.64	3341.81
	10/14/14	25.7	3356.45	0.70	3355.75
	11/6/14	25.7	3356.45	6.41	3350.04
MW-15	4/7/14	34.0	3357.65	14.67	3342.98
	10/14/14	34.0	3357.65	5.49	3352.16
	11/6/14	34.0	3357.65	7.00	3350.65
MW-16	4/7/14	NM	NM	13.75	NM
	10/14/14	NM	NM	6.20	NM
	11/6/14	NM	NM	6.53	NM
MW-17C	4/7/14	62.4	3356.49	14.66	3341.83
	10/14/14	62.4	3356.49	1.94	3354.55
	11/6/14	62.4	3356.49	6.35	3350.14
MW-18	4/7/14	30.1	3356.65	15.82	3340.83
	10/14/14	30.1	3356.65	3.24	3353.41
	11/6/14	30.1	3356.65	7.94	3348.71
MW-19	4/7/14	28.0	3357.02	15.56	3341.46
	10/14/14	28.0	3357.02	3.13	3353.89
	11/6/14	28.0	3357.02	6.96	3350.06
MW-20	4/7/14	28.0	3359.05	17.85	3341.20
	10/14/14	28.0	3359.05	12.21	3346.84
	11/6/14	28.0	3359.05	13.11	3345.94

TABLE 2

Groundwater Elevation Data - 2014

2014 Annual Groundwater Monitoring Report

Former Dowell Schlumberger Facility, Artesia, New Mexico

Well ID	Date	Total Depth (ft btoc)	Top of Casing Elevation (ft amsl)	Depth to Water (ft btoc)	Groundwater Elevation (ft amsl)
MW-21	4/7/14	17.41	3356.83	15.85	3340.98
	10/14/14	17.41	3356.83	9.76	3347.07
	11/6/14	17.41	3356.83	11.08	3345.75
MW-22	4/7/14	15.63	3355.11	14.62	3340.49
	10/14/14	15.63	3355.11	6.40	3348.71
	11/6/14	15.63	3355.11	8.81	3346.30
MW-23	4/7/14	25.0	3355.26	15.08	3340.18
	10/14/14	25.0	3355.26	4.43	3350.83
	11/6/14	25.0	3355.26	6.32	3348.94
MW-25	4/7/14	27.3	3355.61	17.82	3337.79
	10/14/14	27.3	3355.61	9.68	3345.93
	11/6/14	27.3	3355.61	11.05	3344.56
MW-26	4/7/14	27.35	3354.14	17.05	3337.09
	10/14/14	27.35	3354.14	9.74	3344.40
	11/6/14	27.35	3354.14	10.42	3343.72
MW-27	4/7/14	25.0	3354.17	15.29	3338.88
	10/14/14	25.0	3354.17	7.33	3346.84
	11/6/14	25.0	3354.17	9.44	3344.73
MW-28	4/7/14	27.94	3355.88	19.71	3336.17
	10/14/14	27.94	3355.88	15.25	3340.63
	11/6/14	27.94	3355.88	14.65	3341.23
MW-29	4/7/14	20.25	3354.99	19.36	3335.63
	10/14/14	20.25	3354.99	16.09	3338.90
	11/6/14	20.25	3354.99	15.32	3339.67
MW-30	4/7/14	27.89	3354.53	19.52	3335.01
	10/14/14	27.89	3354.53	15.95	3338.58
	11/6/14	27.89	3354.53	12.62	3341.91
MW-31	4/7/14	30.89	3356.32	15.63	3340.69
	10/14/14	30.89	3356.32	5.42	3350.90
	11/6/14	30.89	3356.32	8.71	3347.61
MW-32	4/7/14	38.85	3354.46	18.53	3335.93
	10/14/14	38.85	3354.46	12.63	3341.83
	11/6/14	38.85	3354.46	12.23	3342.23
MW-33	4/7/14	35.0	3349.63	16.98	3332.65
	10/14/14	35.0	3349.63	12.49	3337.14
	11/6/14	35.0	3349.63	12.78	3336.85
MW-34	10/14/14	32.0	NM	12.81	NM
	11/6/14	32.0	NM	12.82	NM

ft btoc = feet below top of casing

ft amsl = feet above mean sea level

NM = not measured, MW-16 and MW-34 have not been surveyed; groundwater elevation in ft amsl is not calculated.

TABLE 3

Summary of Groundwater Analytical Results - 2014

2014 Annual Groundwater Monitoring Report

Former Dowell Schlumberger Facility, Artesia, New Mexico

WELL NUMBER	SAMPLE DATE	Iron, Dissolved (mg/L)	Manganese, Dissolved (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	1,1,1-TCA (mg/L)	1,1,2,2-Tetrachloroethane (mg/L)	1,1,2-Trichloroethane (mg/L)	1,1-DCA (mg/L)	1,1-DCE (mg/L)	1,2-DCA (mg/L)	Benzene (mg/L)	Carbon Tetrachloride (mg/L)	Chloroform (mg/L)
NMWQCC Standards		**1.0**	**0.2**	**600**		**0.06**	**0.01**	**0.01**	**0.025**	**0.005**	**0.01**	**0.01**	**0.01**	**0.1**
MW-1	10/21/14	--	--	--	--	<0.00015	<0.00022 J	<0.00028	<0.00011	<0.00019	<0.00014	<0.00008	<0.00015	<0.00013
MW-7	10/17/14	--	--	--	--	<0.00015	<0.00022 J	<0.00028	<0.00011	<0.00019	<0.00014	<0.00008	<0.00015	<0.00013
MW-8	10/17/14	--	--	--	--	<0.00015	<0.00022 J	<0.00028	**0.00206**	**0.00125**	<0.00014	<0.00008	<0.00015	<0.00013
MW-11	10/17/14	--	--	--	--	<0.00015	<0.00022 J	<0.00028	**0.000253 J**	<0.00019	<0.00014	<0.00008	<0.00015	<0.00013
MW-12	04/08/14	--	--	--	--	<0.00075	<0.0011	<0.0014	**0.0263**	**0.00229 J**	<0.0007	**0.00621**	<0.00075	<0.00065
	10/17/14	--	--	--	--	<0.00015 J	<0.00022 J	<0.00028 J	**0.00434 J**	**0.000484 J**	<0.00014 J	<0.00265	<0.00015 J	<0.00013 J
MW-15	10/17/14	--	--	--	--	<0.00015	<0.00022 J	<0.00028	**0.000119 J**	<0.00019	<0.00014	<0.00008	<0.00015	<0.00013
MW-17C	04/08/14	--	--	--	--	<0.00015	<0.00022 J	<0.00028	**0.000221 J**	**0.000438 J**	<0.00014	<0.00008	<0.00015	<0.00013
	10/17/14	--	--	--	--	<0.00015	<0.00022 J	<0.00028	**0.000184 J**	**0.000436 J**	<0.00014	<0.00008	<0.00015	<0.00013
MW-18	04/08/14	--	--	--	--	<0.00015	<0.00022	<0.00028	**0.00118**	**0.00551**	<0.00014	<0.00008	<0.00015	<0.00013
	10/16/14	--	<0.0116	--	--	<0.00015	<0.00022 J	<0.00028	<0.00011	**0.00019 J**	<0.00014	<0.00008	<0.00015	<0.00013
MW-20	10/16/14	--	--	--	--	<0.00015	<0.00022 J	<0.00028	**0.0121**	**0.0038**	**0.000168 J**	<0.000211	<0.00015	<0.00013
MW-21	04/08/14	--	--	--	--	<0.00015	<0.00022	<0.00028	**0.000221 J**	<0.00019	<0.000187	<0.00008	<0.00015	<0.00013
	10/16/14	--	<0.0116	--	--	<0.00015	<0.00022 J	<0.00028	**0.000195 J**	**0.000196 J**	<0.00014	<0.00008	<0.00015	<0.00013
MW-22	10/16/14	--	<0.0116	--	--	<0.00015	<0.00022 J	<0.00028	**0.00187**	**0.00489**	<0.00014	<0.00008	<0.00015	<0.00013
MW-25	04/08/14	--	--	--	--	<0.00015	<0.00022	<0.00028	**0.00436**	<0.00019	<0.00023	<0.00008	<0.00015	<0.00013
	06/05/14	<0.0866	**0.000894 J**	**2140**	<0.009	--	--	--	--	--	--	--	--	--
MW-26	04/08/14	--	--	--	--	<0.00015	<0.00022	<0.00028	**0.000219 J**	**0.0011**	<0.000147	<0.00008	<0.00015	<0.00013
	10/14/14	--	<0.0116	--	--	<0.00015	<0.00022 J	<0.00028	**0.000136 J**	**0.000964 J**	<0.00014	<0.00008	<0.00015	<0.00013
MW-28	04/08/14	--	--	--	--	<0.00015	<0.00022	<0.00028	**0.00815**	**0.0241**	<0.000322	<0.00008	<0.00015	<0.00013
	06/05/14	<0.0866	**0.00314 J**	**2340**	<0.009	--	--	--	--	--	--	--	--	--
	10/15/14	--	<0.0116	--	--	<0.00015	<0.00022 J	<0.00028	**0.00889**	**0.0361**	**0.000196 J**	<0.000103	<0.00015	<0.00013
MW-29	10/15/14	--	<0.0116	--	--	<0.00015	<0.00022 J	<0.00028	**0.0037**	**0.0238**	<0.00014	<0.00008	<0.00015	<0.00013
MW-30	04/08/14	--	--	--	--	<0.00015	<0.00022	<0.00028	**0.0093**	**0.0322**	<0.000366	**0.0000842 J**	<0.00015	**0.000142 J**
	10/15/14	--	<0.0116	--	--	<0.00015	<0.00022 J	<0.00028	**0.00606**	**0.0221**	**0.000164 J**	<0.00008	<0.00015	<0.00013
MW-31	04/08/14	--	--	--	--	<0.00015	<0.00022	<0.00028	**0.000291 J**	<0.00019	<0.00014	<0.00008	<0.00015	<0.00013
	10/16/14	--	**0.138**	--	--	<0.00015	<0.00022 J	<0.00028	**0.0008 J**	**0.00122**	<0.00014	<0.00008	<0.00015	<0.00013
MW-32	04/08/14	--	--	--	--	<0.00015	<0.00022	<0.00028	**0.00089 J**	**0.00355**	<0.00014	<0.00008	<0.00015	<0.00013
	10/15/14	--	<0.0116	--	--	<0.00015	<0.00022 J	<0.00028	**0.000603 J**	**0.00296**	<0.00014	<0.00008	<0.00015	<0.00013
MW-33	04/08/14	--	--	--	--	<0.00015	<0.00022	<0.00028	<0.00011	<0.00019	<0.00014	<0.00008	<0.00015	<0.00013
	10/15/14	--	--	--	--	<0.00015	<0.00022 J	<0.00028	<0.00011	<0.00019	<0.00014	<0.00008	<0.00015	<0.00013
MW-34	10/15/14	--	<0.0116	--	--	<0.00015	<0.00022 J	<0.00028	**0.00406**	**0.0131**	<0.00014	<0.00008	<0.00015	<0.00013

NOTES:

NMWQCC = New Mexico Water Quality Control Commission

mg/L = milligrams per liter (equivalent to parts per million)

<0.001 = analyte not detected at concentration above detection limit shown

J = analyte detected at concentration above instrument detection limit but below method detection limit

-- = sample not analyzed for this analyte

0.000196 Bolded cells indicate the analyte was positively detected.

0.0241 Shaded cells indicate concentrations exceed their respective NMWQCC standards.

DCA - dichloroethane

DCE - dichloroethene

PCE - tetrachloroethene

TCE - trichloroethene

TABLE 3

Summary of Groundwater Analytical Results - 2014

2014 Annual Groundwater Monitoring Report

Former Dowell Schlumberger Facility, Artesia, New Mexico

WELL NUMBER	SAMPLE DATE	Ethylbenzene (mg/L)	Ethylene Dibromide (mg/L)	m,p-Xylene (sum of isomers) (mg/L)	Methylene Chloride (Dichloromethane) (mg/L)	Naphthalene (mg/L)	o-Xylene (mg/L)	PCE (mg/L)	Toluene (mg/L)	TCE (mg/L)	Vinyl Chloride (mg/L)	Xylenes, Total (mg/L)
NMWQCC Standards		**0.75**	**0.0001**	**0.62**	**0.1**	**0.03**	**0.62**	**0.02**	**0.75**	**0.1**	**0.001**	**0.62**
MW-1	10/21/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	<0.00013	<0.00015	<0.00018	<0.00011	<0.00026
MW-7	10/17/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	**0.000161 J**	<0.00015	<0.00018	<0.00011	<0.00026
MW-8	10/17/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	**0.00181**	<0.00015	**0.00108**	<0.00011	<0.00026
MW-11	10/17/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	<0.00013	<0.00015	**0.000211 J**	<0.00011	<0.00026
MW-12	04/08/14	**0.148**	<0.0009	**0.0486**	<0.00075 J	**0.0419 J**	**0.00127 J**	**0.00113 J**	<0.00075	**0.00367 J**	<0.00055	**0.0499**
	10/17/14	**0.00379 J**	<0.00018 J	**0.0554**	<0.00015 J	**0.104**	**0.0116 J**	**0.00083 J**	<0.00015 J	**0.000851 J**	<0.00011 J	**0.067**
MW-15	10/17/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	**0.00592**	<0.00015	**0.0154**	<0.00011	<0.00026
MW-17C	04/08/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032 J	<0.00012	**0.0002 J**	<0.00015	**0.000262 J**	<0.00011	<0.00026
	10/17/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	**0.000199 J**	<0.00015	**0.000615 J**	<0.00011	<0.00026
MW-18	04/08/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00067	<0.00012	**0.00564**	<0.00015	<0.00018	<0.00011	<0.00026
	10/16/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	**0.000361 J**	<0.00015	<0.00018	<0.00011	<0.00026
MW-20	10/16/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	**0.00263**	<0.00015	**0.0043**	**0.000374 J**	<0.00026
MW-21	04/08/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	**0.000408 J**	<0.00015	<0.00018	<0.00011	<0.00026
	10/16/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	**0.000134 J**	<0.00015	<0.00018	<0.00011	<0.00026
MW-22	10/16/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	**0.00668**	<0.00015	**0.00135**	<0.00011	<0.00026
MW-25	04/08/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	**0.0157**	<0.00015	**0.00285**	<0.00011	<0.00026
	06/05/14	--	--	--	--	--	--	--	--	--	--	--
MW-26	04/08/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	**0.000959 J**	<0.00015	**0.000369 J**	<0.00011	<0.00026
	10/14/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	**0.000261 J**	<0.00015	**0.000384 J**	<0.00011	<0.00026
MW-28	04/08/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	**0.0263**	<0.00015	**0.00721**	<0.00011	<0.00026
	06/05/14	--	--	--	--	--	--	--	--	--	--	--
	10/15/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	**0.0224**	<0.00015	**0.00873**	<0.00011	<0.00026
MW-29	10/15/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	**0.00884**	<0.00015	**0.00503**	<0.00011	<0.00026
MW-30	04/08/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	**0.0413**	<0.00015	**0.00822**	<0.00011	<0.00026
	10/15/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	**0.0205**	<0.00015	**0.0058**	<0.00011	<0.00026
MW-31	04/08/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	<0.00013	<0.00015	<0.00018	<0.00011	<0.00026
	10/16/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	**0.000499 J**	<0.00015	**0.000258 J**	<0.00011	<0.00026
MW-32	04/08/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	**0.00538**	<0.00015	**0.000963 J**	<0.00011	<0.00026
	10/15/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	**0.00341**	<0.00015	**0.000887 J**	<0.00011	<0.00026
MW-33	04/08/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	<0.00013	<0.00015	<0.00018	<0.00011	<0.00026
	10/15/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	<0.00013	<0.00015	<0.00018	<0.00011	<0.00026
MW-34	10/15/14	<0.00011	<0.00018	<0.00017	<0.00015	<0.00032	<0.00012	**0.00752**	<0.00015	**0.00266 J**	<0.00011	<0.00026

NOTES:

NMWQCC = New Mexico Water Quality Control Commission

mg/L = milligrams per liter (equivalent to parts per million)

<0.001 = analyte not detected at concentration above detection limit shown

J = analyte detected at concentration above instrument detection limit but below method detection limit

-- = sample not analyzed for this analyte

0.000196 Bolded cells indicate the analyte was positively detected.

0.0241 Shaded cells indicate concentrations exceed their respective NMWQCC standards.

DCA - dichloroethane

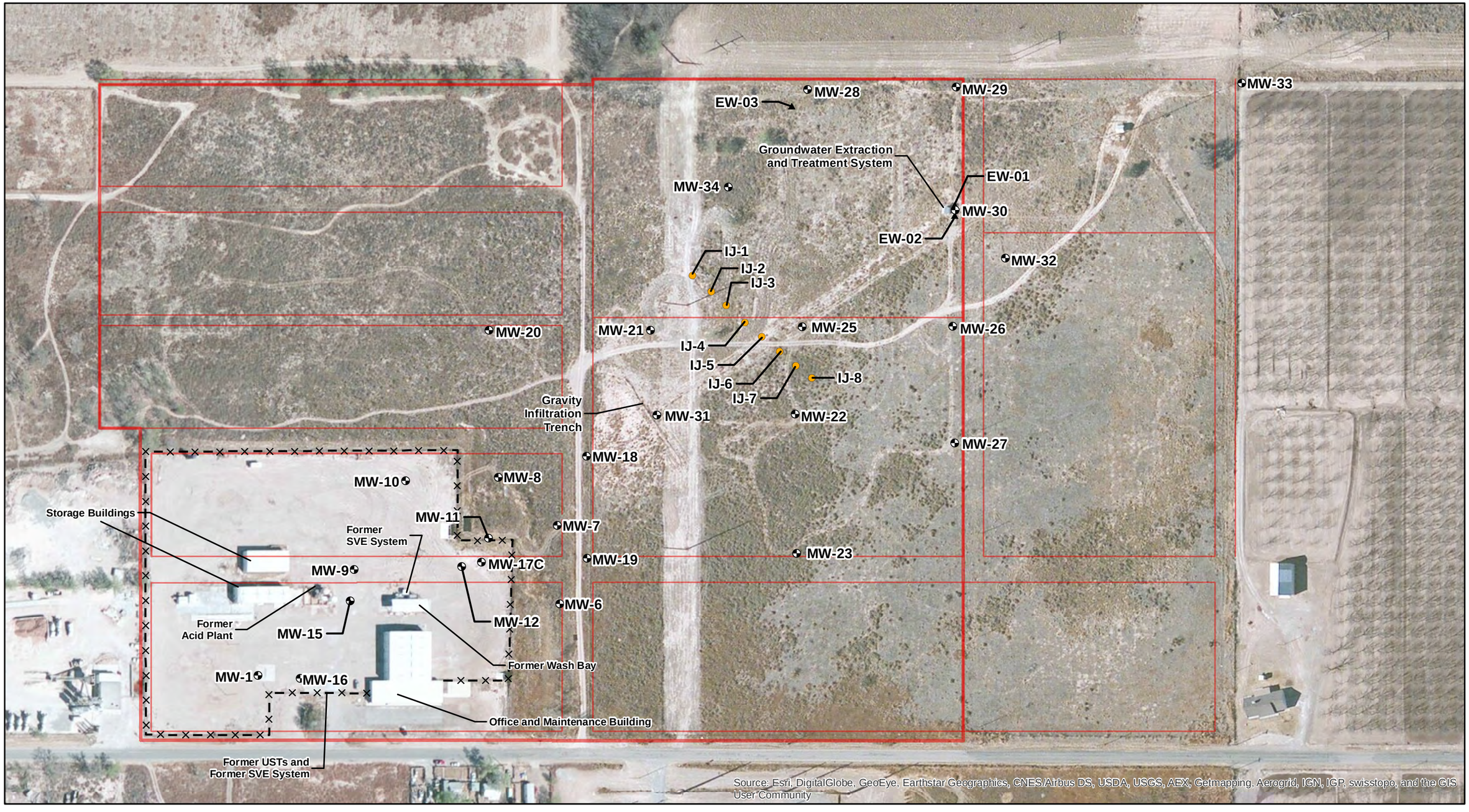
DCE - dichloroethene

PCE - tetrachloroethene

TCE - trichloroethene

Figures

FIGURE 1
Site Location Map
2014 Annual Groundwater Monitoring Report
Former Dowell Schlumberger Facility, Artesia, New Mexico



LEGEND

- Groundwater Extraction Well
- Injection Well
- Monitoring Well
- Property Line
- Right of Way Boundary
- Fence

Notes:
UST = underground storage tank
SVE = soil vapor extraction

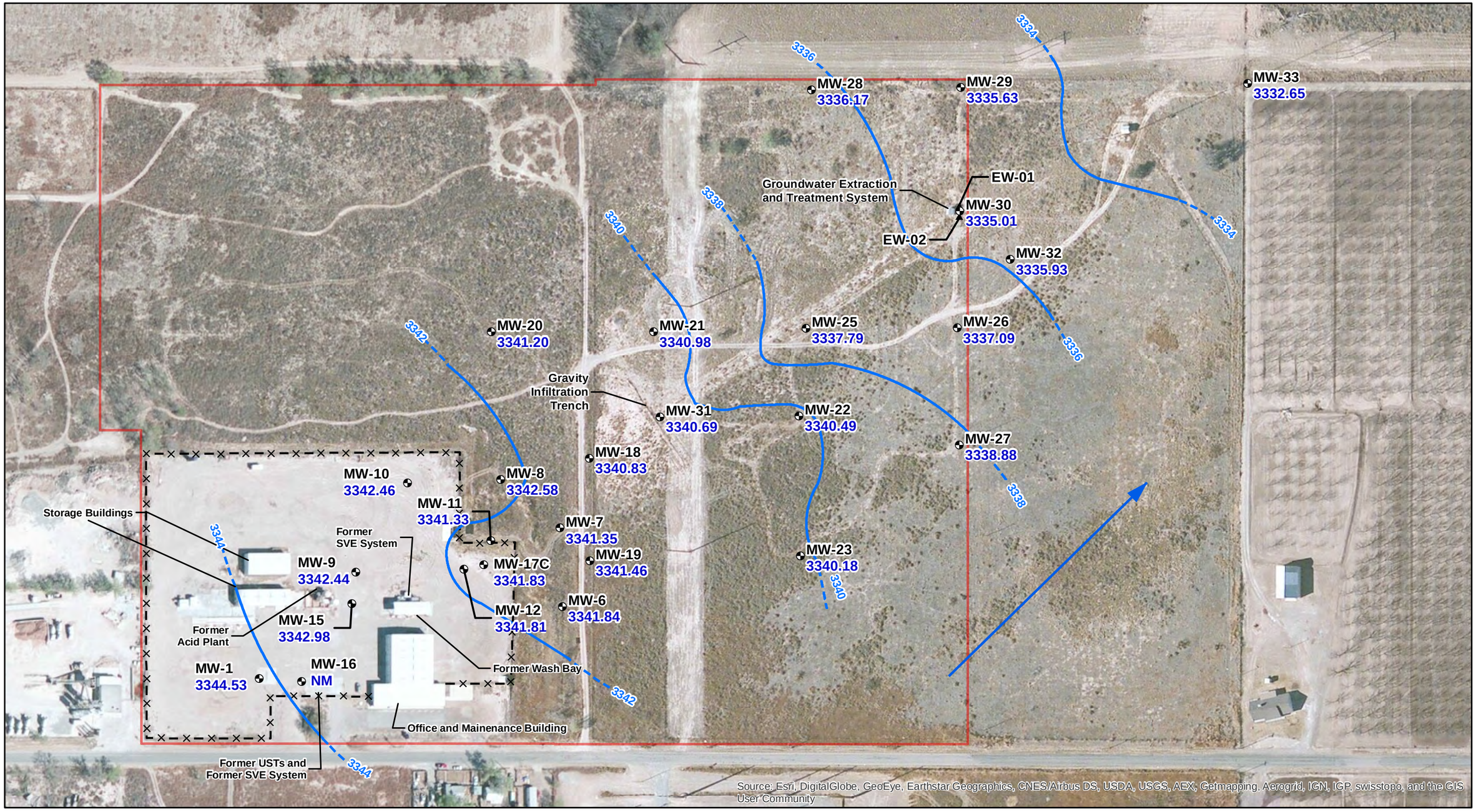
N

0 100 200
Feet

FIGURE 2
Site Plan
2014 Annual Groundwater Monitoring Report
Former Dowell Schlumberger Facility, Artesia, New Mexico

CH2MHILL

RDD \\ROSWELL\ARCINFO\AV_PROJ\DOWELL_SCHLUMBERGER\ARTESIA_469935\MAPFILES\ANN_GW_MON_2014\FIG2_SITE_PLAN_AGWM.MXD BMOAYYAD 3/2/2015 11:46:44 AM



Legend

- Property Line
- Fence
- Potentiometric Surface Contour (Dashed Where Inferred)
- Groundwater Flow Direction
- Monitoring Well
- Groundwater Extraction Well
- 3340.00 Groundwater Elevation (ft amsl)
- NM Not Measured

Notes:
UST = underground storage tank
SVE = soil vapor extraction
ft amsl = feet above mean sea level

N

0 100 200
Feet

FIGURE 3
Potentiometric Surface Map – April 2014
2014 Annual Groundwater Monitoring Report
Former Dowell Schlumberger Facility, Artesia, New Mexico

CH2MHILL.

MW-28
3341.23
EW-03
MW-29
3339.67
MW-33
3336.85
MW-34
NM
Groundwater Extraction
and Treatment System
EW-01
MW-30
3341.91
EW-02
MW-32
3342.23
IJ-1
IJ-2
IJ-3
MW-20
3345.94
MW-21
3345.75
MW-25
3344.56
MW-26
3343.72
IJ-4
IJ-5
IJ-6
IJ-8
IJ-7
Gravity
Infiltration
Trench
MW-31
3347.61
MW-22
3346.30
MW-27
3344.73
MW-18
3348.71
MW-10
3349.89
MW-8
3349.01
Storage Buildings
MW-11
3349.48
MW-7
3349.60
Former
SVE System
MW-19
3350.06
MW-9
3349.94
MW-17C
3350.14
MW-23
3348.94
MW-6
3350.70
MW-12
3350.04
Former
Acid Plant
MW-15
3350.65
Former Wash Bay
MW-1
3351.52
MW-16
NM
Office and Maintenance Building
Former USTs and
Former SVE System
3350
3348
3346
3344
3342
3340
3338

Legend

- Property Line
- Fence
- Potentiometric Surface Contour (Dashed Where Inferred)
- Groundwater Flow Direction
- ▲ Groundwater Extraction Well
- Injection Well
- Monitoring Well
- 3340.00 Groundwater Elevation (ft amsl)
- NM Not Measured

Notes:
UST = underground storage tank
SVE = soil vapor extraction
ft amsl = feet above mean sea level

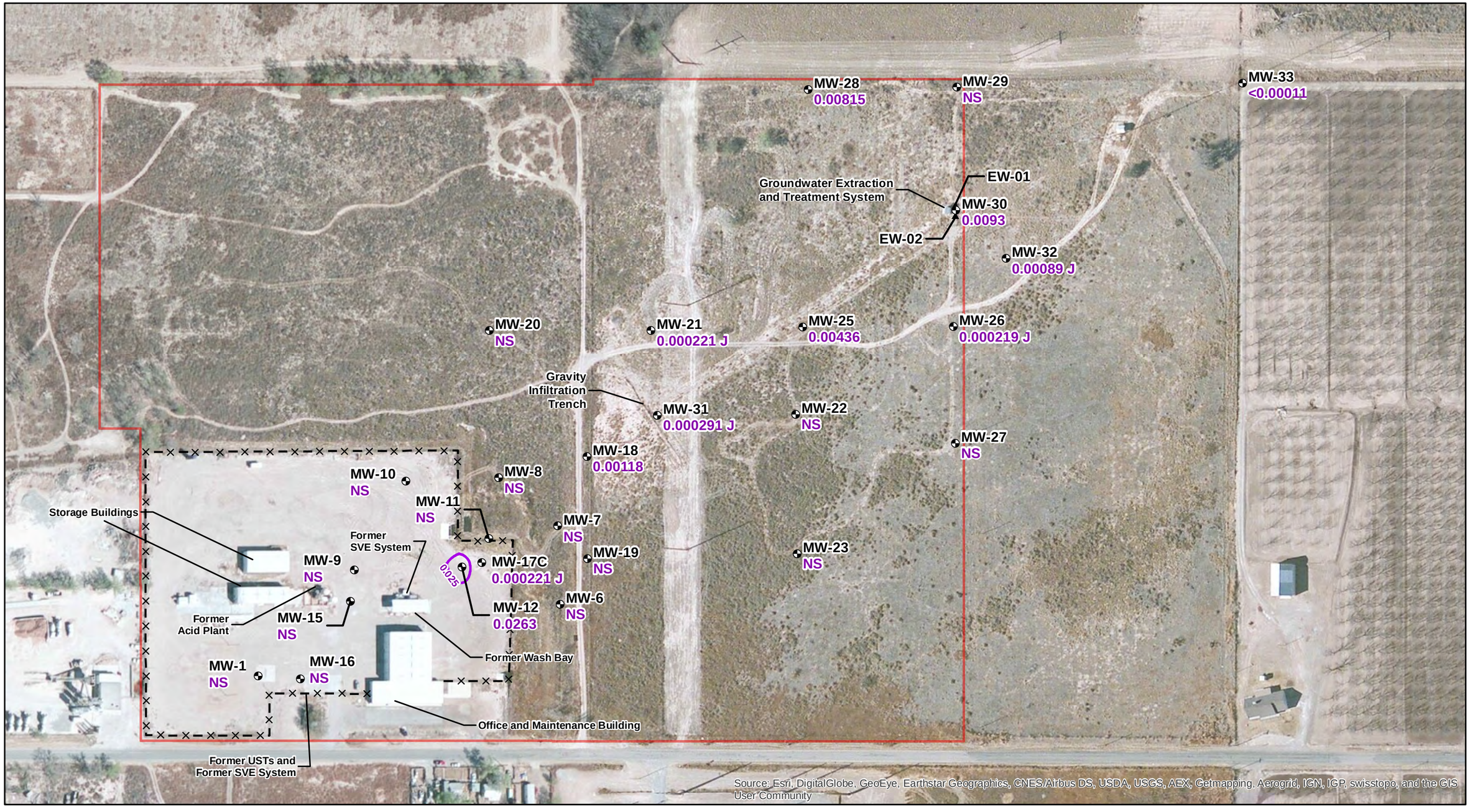
N

0 100 200
Feet

FIGURE 4
Potentiometric Surface Map – November 2014
2014 Annual Groundwater Monitoring Report
Former Dowell Schlumberger Facility, Artesia, New Mexico

CH2MHILL.

RDD \\ROSWELL\ARCINFO\AV_PROJ\DOWELL_SCHLUMBERGER\ARTESIA_469935\MAPFILES\ANN_GW_MON_2014\FIG4_POTSURF_NOV2014_AGWM.MXD BMOAYYAD 3/9/2015 2:46:13 PM



LEGEND

- Property Line
- Fence
- Monitoring Well
- Groundwater Extraction Well
- 0.025 mg/L NMWQCC Standard for 1,1-DCA Isopleth
- 0.005 1,1-DCA Concentration mg/L
- NS Not Sampled

Notes:

J = Analyte detected at concentration above instrument detection limit but below method detection limit
<0.001 = analyte not detected at concentration above detection limit shown
NMWQCC = New Mexico Water Quality Control Commission
mg/L= milligrams per liter
UST = underground storage tank
SVE = soil vapor extraction
DCA = dichloroethane

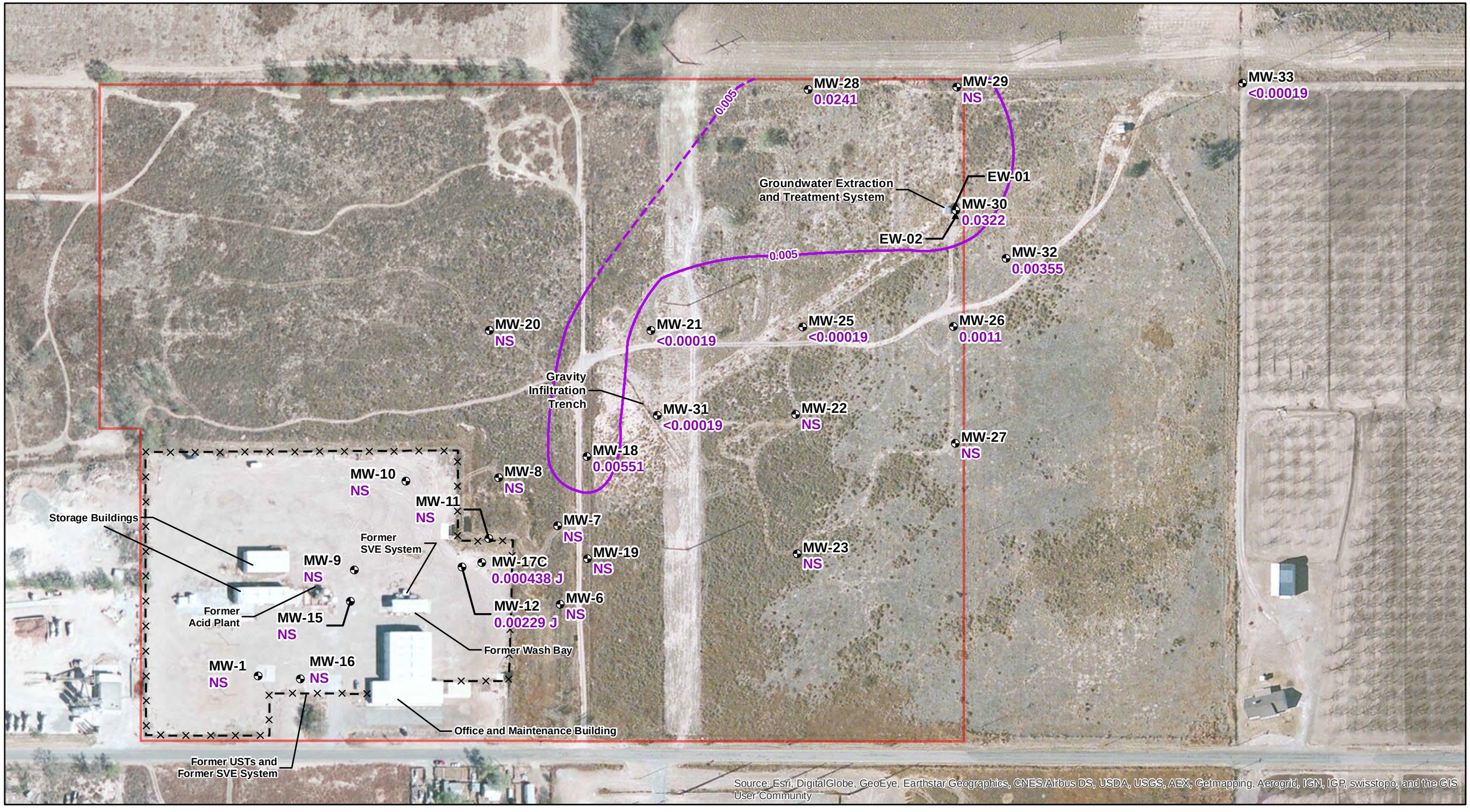
N

0 100 200
Feet

FIGURE 5
Isopleth Map for 1,1-DCA – April 2014
2014 Annual Groundwater Monitoring Report
Former Dowell Schlumberger Facility, Artesia, New Mexico

CH2MHILL.

RDD \\ROSWELL\ARCINFO\AV_PROJ\DOWELL_SCHLUMBERGER\ARTESIA_469935\MAPFILES\ANN_GW_MON_2014\FIG5_ISOCON_DCA_Q2_2014_AGWM.MXD BMOAYYAD 3/9/2015 3:17:45 PM



LEGEND

- Property Line
- Fence
- Monitoring Well
- Groundwater Extraction Well
- 0.005 mg/L NMWQCC Standard for 1,1-DCE Isopleth (Dashed where inferred)
- 0.005 1,1-DCE Concentration mg/L
- NS Not Sampled

Notes:

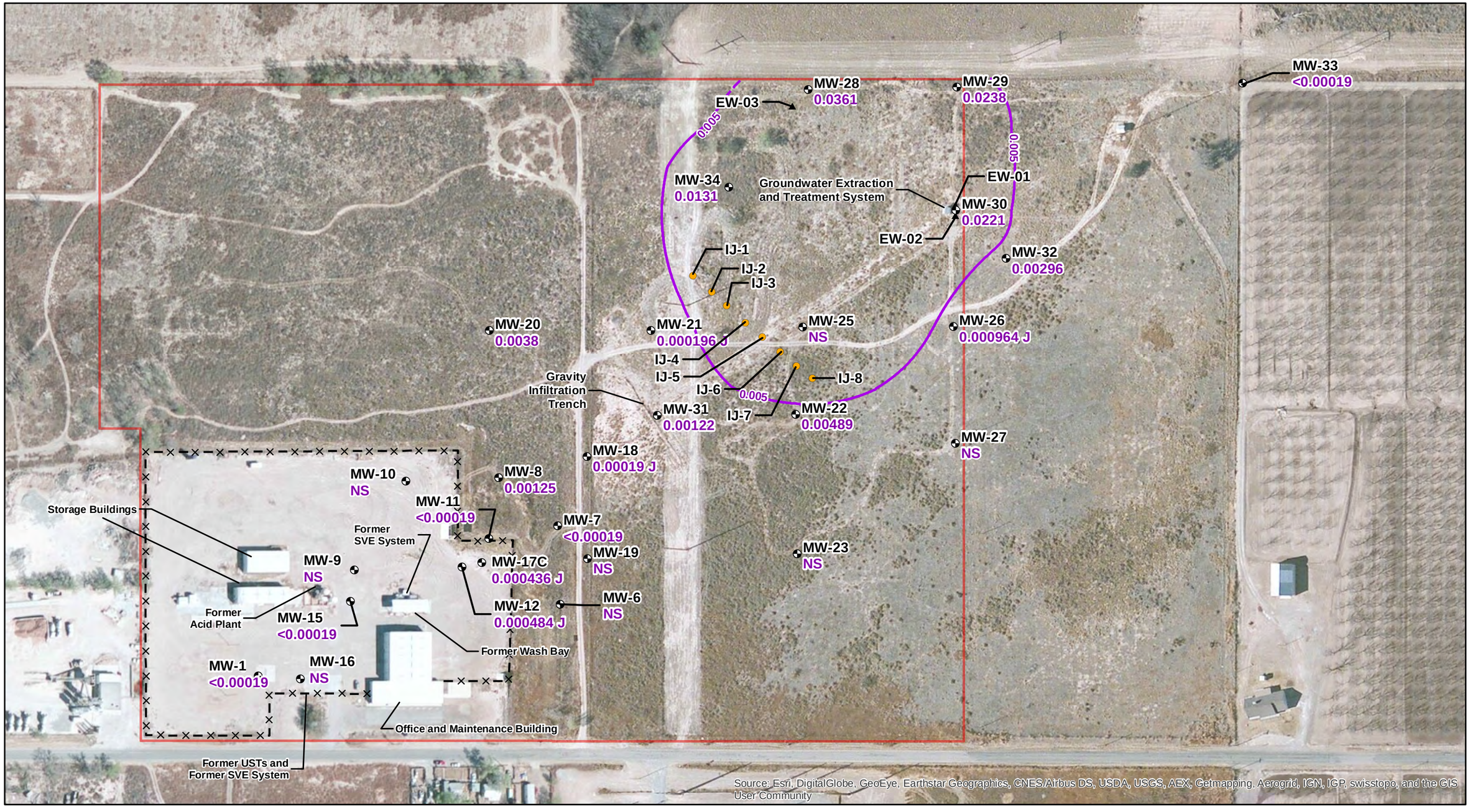
J = Analyte detected at concentration above instrument detection limit but below method detection limit
<0.001 = analyte not detected at concentration above detection limit shown
DCE = Dichloroethene
NMWQCC = New Mexico Water Quality Control Commission
mg/L= milligrams per liter
UST = underground storage tank
SVE = soil vapor extraction

N

0 100 200
Feet

FIGURE 6
Isopleth Map for 1,1-DCE – April 2014
2014 Annual Groundwater Monitoring Report
Former Dowell Schlumberger Facility, Artesia, New Mexico

CH2MHILL.



LEGEND

- Property Line
- Fence
- Groundwater Extraction Well
- Injection Well
- Monitoring Well
- 0.005 mg/L NMWQCC Standard for 1,1-DCE Isopleth (Dashed where inferred)
- 0.005 1,1-DCE Concentration mg/L
- NS Not Sampled

Notes:

J = Analyte detected at concentration above instrument detection limit but below method detection limit
<0.001 = analyte not detected at concentration above detection limit shown
DCE = Dichloroethene
NMWQCC = New Mexico Water Quality Control Commission
mg/L= milligrams per liter
UST = underground storage tank
SVE = soil vapor extraction

N

0 100 200
Feet

FIGURE 7
Isopleth Map for 1,1-DCE – October 2014
2014 Annual Groundwater Monitoring Report
Former Dowell Schlumberger Facility, Artesia, New Mexico

CH2MHILL.

RDD \\ROSWELL\ARCINFO\AV_PROJ\DOWELL_SCHLUMBERGER\ARTESIA_469935\MAPFILES\ANN_GW_MON_2014\FIG8_ISOCON_DCE_Q4_2014_AGWM.MXD BMOAYYAD 3/9/2015 3:31:38 PM

MW-28
0.0263

MW-29
NS

MW-33
< 0.00013

0.020

Groundwater Extraction
and Treatment System

EW-01

MW-30
0.0413

EW-02

MW-32
0.00538

0.020

MW-20
NS

MW-21
0.000408 J

MW-25
0.0157

MW-26
0.000959 J

Gravity
Infiltration
Trench

MW-31
< 0.00013

MW-22
NS

MW-27
NS

MW-18
0.00564

MW-10
NS

MW-8
NS

MW-11
NS

Storage Buildings

Former
SVE System

MW-7
NS

MW-19
NS

MW-23
NS

MW-9
NS

MW-17C
0.0002 J

Former
Acid Plant

MW-12
0.00113 J

MW-6
NS

MW-15
NS

Former Wash Bay

MW-1
NS

MW-16
NS

Office and Maintenance Building

Former USTs and
Former SVE System

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

- Property Line
- Fence
- Monitoring Well
- Groundwater Extraction Well
- 0.020 mg/L NMWQCC Standard for PCE Isopleth (Dashed where inferred)
- 0.005 PCE Concentration mg/L
- NS Not Sampled

Notes:

J = Analyte detected at concentration above instrument detection limit but below method detection limit
<0.001 = analyte not detected at concentration above detection limit shown
PCE = tetrachloroethene
NMWQCC = New Mexico Water Quality Control Commission
mg/L= milligrams per liter
UST = underground storage tank
SVE = soil vapor extraction

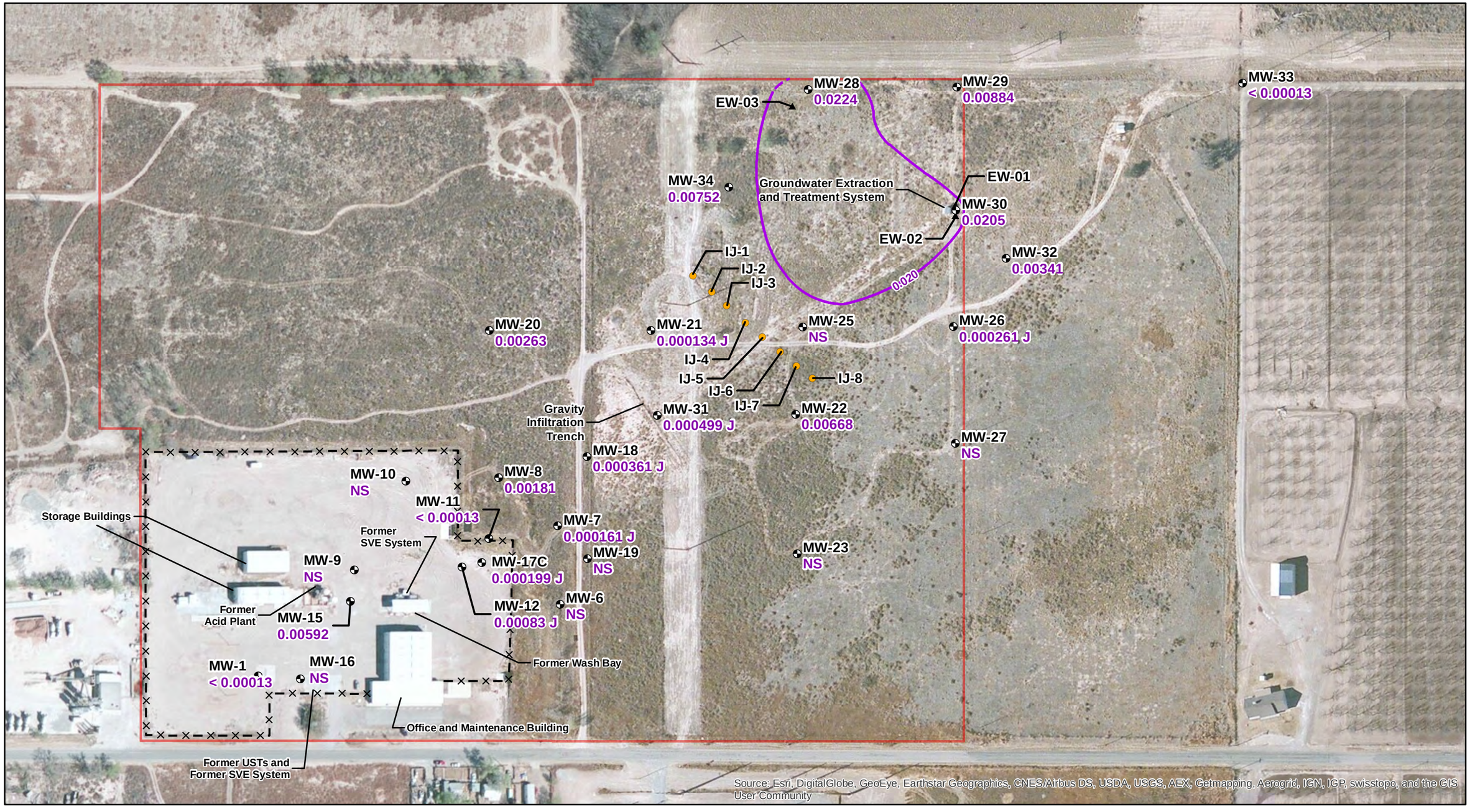
N

0 100 200
Feet

FIGURE 8
Isopleth Map for PCE – April 2014
2014 Annual Groundwater Monitoring Report
Former Dowell Schlumberger Facility, Artesia, New Mexico

CH2MHILL.

RDD \\ROSWELL\ARCINFO\AV_PROJ\DOWELL_SCHLUMBERGER\ARTESIA_469935\MAPFILES\ANN_GW_MON_2014\FIG9_ISOCON_PCE_Q2_2014_AGWM.MXD BMOAYYAD 3/9/2015 3:35:44 PM



LEGEND

- Property Line
- Fence
- Groundwater Extraction Well
- Injection Well
- Monitoring Well
- 0.020 mg/L NMWQCC Standard for PCE Isopleth (Dashed where inferred)
- 0.005 PCE Concentration mg/L
- NS Not Sampled

Notes:

J = Analyte detected at concentration above instrument detection limit but below method detection limit
<0.001 = analyte not detected at concentration above detection limit shown
PCE = tetrachloroethene
NMWQCC = New Mexico Water Quality Control Commission
mg/L= milligrams per liter
UST = underground storage tank
SVE = soil vapor extraction

N

0 100 200
Feet

FIGURE 9
Isopleth Map for PCE – October 2014
2014 Annual Groundwater Monitoring Report
Former Dowell Schlumberger Facility, Artesia, New Mexico

CH2MHILL.

RDD \\ROSWELL\ARCINFO\AV_PROJ\DOWELL_SCHLUMBERGER\ARTESIA_469935\MAPFILES\ANN_GW_MON_2014\FIG10_ISOCON_PCE_Q4_2014_AGWM.MXD BMOAYYAD 3/9/2015 3:35:10 PM

MW-28
< 0.00032

MW-29
NS

MW-33
< 0.00032

Groundwater Extraction
and Treatment System

EW-01

MW-30
< 0.00032

EW-02

MW-32
< 0.00032

MW-20
NS

MW-21
< 0.00032

MW-25
< 0.00032

MW-26
< 0.00032

Gravity
Infiltration
Trench

MW-31
< 0.00032

MW-22
NS

MW-27
NS

MW-18
< 0.00067

MW-10
NS

MW-8
NS

MW-11
NS

Storage Buildings

Former
SVE System

MW-7
NS

MW-19
NS

MW-23
NS

0.030

MW-17C
<0.00032 J

MW-9
NS

Former
Acid Plant

MW-12
0.0419 J

MW-6
NS

MW-15
NS

Former Wash Bay

MW-1
NS

MW-16
NS

Office and Maintenance Building

Former USTs and
Former SVE System

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

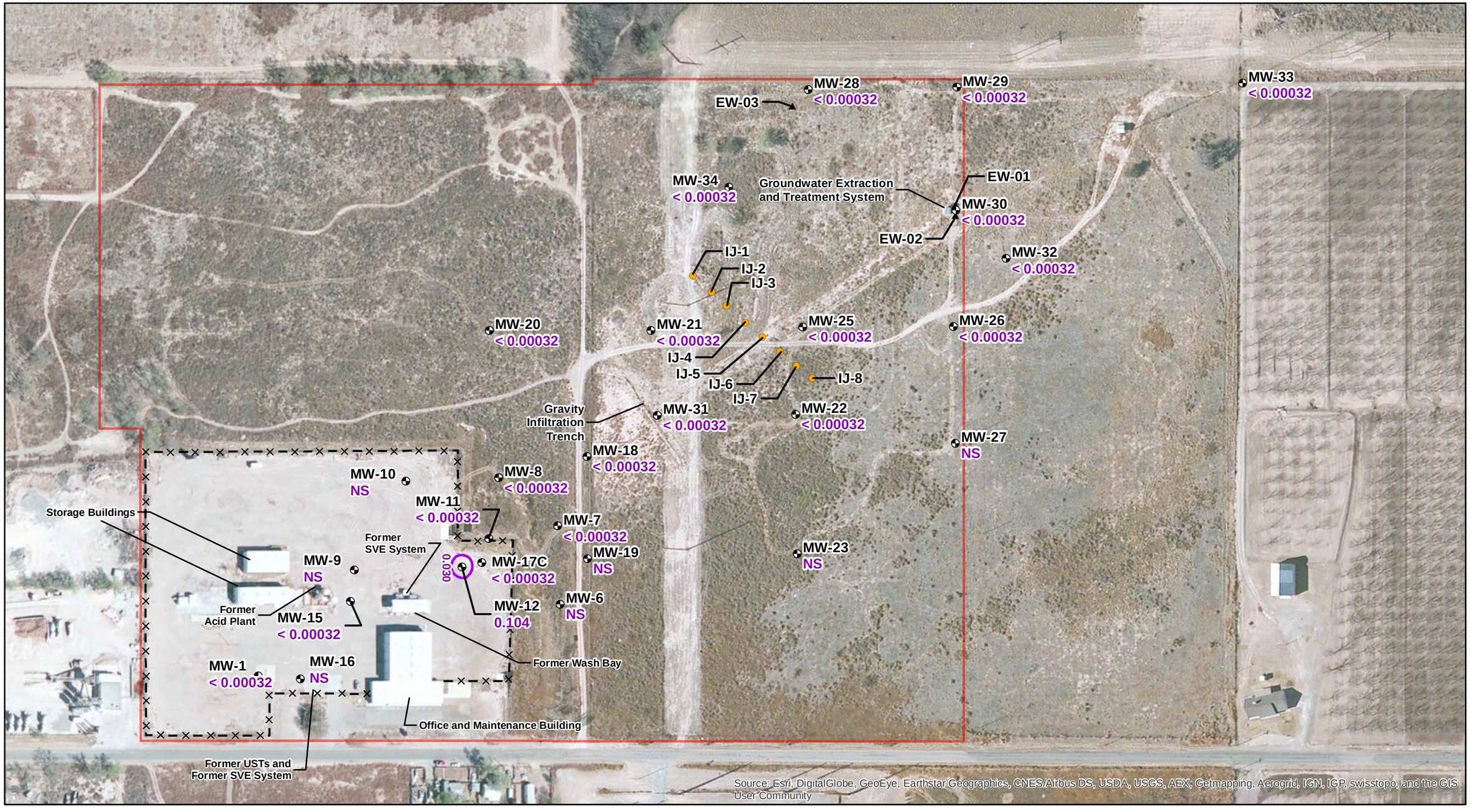
- Property Line
- Fence
- Monitoring Well
- Groundwater Extraction Well
- 0.030 mg/L NMWQCC Standard for Naphthalene Isopleth
- 0.030 Naphthalene Concentration mg/L
- NS Not Sampled

Notes:
J = Analyte detected at concentration above instrument detection limit but below method detection limit
<0.001 = analyte not detected at concentration above detection limit shown
NMWQCC = New Mexico Water Quality Control Commission
mg/L= milligrams per liter
UST = underground storage tank
SVE = soil vapor extraction

N

0 100 200
Feet

FIGURE 10
Isopleth Map for Naphthalene – April 2014
2014 Annual Groundwater Monitoring Report
Former Dowell Schlumberger Facility, Artesia, New Mexico



LEGEND

- Property Line
- Fence
- Groundwater Extraction Well
- Injection Well
- Monitoring Well
- 0.030 mg/L NMWQCC Standard for Naphthalene Isopleth
- 0.030 Naphthalene Concentration mg/L
- NS Not Sampled

Notes:

J = Analyte detected at concentration above instrument detection limit but below method detection limit
<0.001 = analyte not detected at concentration above detection limit shown
NMWQCC = New Mexico Water Quality Control Commission
mg/L= milligrams per liter
UST = underground storage tank
SVE = soil vapor extraction

N

0 100 200
Feet

FIGURE 11
Isopleth Map for Naphthalene – October 2014
2014 Annual Groundwater Monitoring Report
Former Dowell Schlumberger Facility, Artesia, New Mexico

CH2MHILL.

Appendix A
Work Plan Amendments and NMOCD Correspondence

Minchak, Jeff/ABQ

From: Hansen, Edward J., EMNRD <edwardj.hansen@state.nm.us>
Sent: Monday, July 15, 2013 2:54 PM
To: Virgilio Cocianni
Cc: VonGonten, Glenn, EMNRD; Strunk Jr, Jim (JStrunkJr@dow.com); Barnett, Cathy/STL; Minchak, Jeff/ABQ
Subject: Discharge Permit (GW-114) Work Plan Amendment Approval - Schlumberger Oilfield Services Facility - Artesia

RE: Work Plan Amendment
for the Schlumberger Oilfield Services'
Schlumberger Oilfield Services Facility - Artesia
507 E. Richey Ave., Artesia, New Mexico
Discharge Permit (GW-114) Work Plan Amendment Approval

Dear Mr. Cocianni:

The New Mexico Oil Conservation Division (OCD) has received the Work Plan Amendment for the Schlumberger Oilfield Services Facility - Artesia, dated July 9, 2013. The proposed amendment, submitted for the above-referenced site, indicates that the Schlumberger Oilfield Services (Schlumberger) is substantially complying with the requirements of 20.6.2 NMAC [Water Quality Control Commission (WQCC) Regulations]. Therefore, the OCD conditionally approves the amendment to the work plan:

Schlumberger shall continue to submit an annual report to the OCD by April 1 of the following year.

Please be advised that OCD approval of this amendment does not relieve the owner/operator of responsibility should operations pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the owner/operator of responsibility for compliance with any OCD, federal, state, or local laws and/or regulations.

Thank you for your cooperation in this matter. If you have any questions regarding this matter, please contact at 505-476-3489.

Edward J. Hansen
Hydrologist
Environmental Bureau

P.S.: The OCD has reviewed the Meeting Minutes of June 18, 2013. The OCD has two amendments to the meeting minutes:
1) The groundwater remediation for the site (including any investigation or source control) will continue under the discharge permit; i.e., the WQCC regulations, 20.6.2 NMAC (*not NMAC 19.15.29 as stated in the minutes*).
2) The discharge permit fee for remediation will be $2,600 (*not $2,400 as stated in the minutes*).

From: Virgilio Cocianni [mailto:cocianni-v@slb.com]
Sent: Tuesday, July 09, 2013 6:44 AM
To: Hansen, Edward J., EMNRD; VonGonten, Glenn, EMNRD

Cc: Strunk Jr, Jim (JStrunkJr@dow.com); Cathy Barnett (Cathy.Barnett@CH2M.com); Jeffrey.Minchak@CH2M.com
Subject: Artesia Meeting Notes

Good morning, Ed and Glenn.
Please find attached the minutes of the meeting we held in your offices on June 18th. Forgive us for the delay in getting these minutes to you. If you have any concerns about the content, please let me know.

As we discussed during the meeting, STC and Dow formally request to cease the quarterly reporting requirement and to continue only with the annual report. With your approval, the Second Quarter Monitoring Results report that you are about to receive will be the last quarterly report.

Have a wonderful week.
Best regards,
Vic.

Vic Cocianni
Schlumberger Remediation Manager
Phone: +1-281-285-4747

" Courage doesn't always roar. Sometimes courage is the little voice at the end of the day that says I'll try again tomorrow." Mary Ann Radmacher.
(Please continue to be patient with me, She is still making me).

Minchak, Jeff/ABQ

From: Hansen, Edward J., EMNRD <edwardj.hansen@state.nm.us>
Sent: Thursday, August 22, 2013 4:39 PM
To: cocianni-v@slb.com
Cc: VonGonten, Glenn, EMNRD; Strunk Jr, Jim (JStrunkJr@dow.com); Barnett, Cathy/STL; Minchak, Jeff/ABQ
Subject: Discharge Permit (GW-114) Work Plan (Soil Investigation and Soil Vapor Extraction System Closure) Amendment Approval - Schlumberger Oilfield Services Facility - Artesia

RE: Work Plan Amendment
for the Schlumberger Oilfield Services'
Schlumberger Oilfield Services Facility - Artesia
507 E. Richey Ave., Artesia, New Mexico
Discharge Permit (GW-114) Work Plan (Soil Investigation and Soil Vapor Extraction System Closure) Amendment Approval

Dear Mr. Cocianni:

The Oil Conservation Division (OCD) has received the Work Plan Amendment for the Schlumberger Oilfield Services Facility - Artesia, dated August 15, 2013. The proposed amendment, submitted for the above-referenced site, indicates that the Schlumberger Oilfield Services (Schlumberger) is substantially complying with the requirements of 20.6.2 NMAC [Water Quality Control Commission (WQCC) Regulations]. Therefore, the OCD conditionally approves the amendment to the work plan:

Schlumberger shall submit to the OCD for approval a soil investigation report and soil remediation plan prior to the Soil Vapor Extraction System Closure.

Please be advised that OCD approval of this amendment does not relieve the owner/operator of responsibility should operations pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the owner/operator of responsibility for compliance with any OCD, federal, state, or local laws and/or regulations.

Thank you for your cooperation in this matter. If you have any questions regarding this matter, please contact at 505-476-3489.

Edward J. Hansen
Hydrologist
Environmental Bureau

Minchak, Jeff/ABQ

From: Hansen, Edward J., EMNRD <edwardj.hansen@state.nm.us>
Sent: Thursday, August 22, 2013 4:44 PM
To: cocianni-v@slb.com
Cc: VonGonten, Glenn, EMNRD; Strunk Jr, Jim (JStrunkJr@dow.com); Barnett, Cathy/STL; Minchak, Jeff/ABQ
Subject: Discharge Permit (GW-114) Work Plan (GW Remediation Program) Amendment Approval - Schlumberger Oilfield Services Facility - Artesia

RE: Work Plan Amendment
for the Schlumberger Oilfield Services'
Schlumberger Oilfield Services Facility - Artesia
507 E. Richey Ave., Artesia, New Mexico
Discharge Permit (GW-114) Work Plan (GW Remediation Program) Amendment Approval

Dear Mr. Cocianni:

The Oil Conservation Division (OCD) has received the Work Plan Amendment for the Schlumberger Oilfield Services Facility - Artesia, dated August 15, 2013. The proposed amendment, submitted for the above-referenced site, indicates that the Schlumberger Oilfield Services (Schlumberger) is substantially complying with the requirements of 20.6.2 NMAC [Water Quality Control Commission (WQCC) Regulations]. Therefore, the OCD conditionally approves the amendment to the work plan:

Schlumberger shall provide to the OCD for approval a demonstration that the WQCC standards for Manganese (0.2 mg/L) or Sulfate (600.0 mg/L) will not be exceeded in ground water at the site prior to initiation of the ISCO treatment. Also, Schlumberger must monitor for Manganese or Sulfate in ground water depending on the ISCO substrate used for the treatment.

If any other substrate other than permanganate or persulfate is proposed to be used, Schlumberger must obtain OCD approval prior to such use.

Please be advised that OCD approval of this amendment does not relieve the owner/operator of responsibility should operations pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the owner/operator of responsibility for compliance with any OCD, federal, state, or local laws and/or regulations.

Thank you for your cooperation in this matter. If you have any questions regarding this matter, please contact at 505-476-3489.

Edward J. Hansen
Hydrologist
Environmental Bureau

Minchak, Jeff/ABQ

From: Hansen, Edward J., EMNRD <edwardj.hansen@state.nm.us>
Sent: Wednesday, September 18, 2013 1:52 PM
To: Virgilio Cocianni
Cc: VonGonten, Glenn, EMNRD; Strunk Jr, Jim (JStrunkJr@dow.com); Barnett, Cathy/STL; Laggan, Jennifer/DEN; Minchak, Jeff/ABQ
Subject: Discharge Permit (GW-114) Work Plan (GW Monitoring Program) Amendment Approval - Schlumberger Oilfield Services Facility - Artesia

RE: Work Plan Amendment
for the Schlumberger Oilfield Services'
Schlumberger Oilfield Services Facility - Artesia
507 E. Richey Ave., Artesia, New Mexico
Discharge Permit (GW-114) Work Plan (GW Monitoring Program) Amendment Approval

Dear Mr. Cocianni:

The Oil Conservation Division (OCD) has received the Work Plan Amendment for the Schlumberger Oilfield Services Facility - Artesia, dated September 17, 2013. The proposed amendment, submitted for the above-referenced site, indicates that the Schlumberger Oilfield Services (Schlumberger) is substantially complying with the requirements of 20.6.2 NMAC [Water Quality Control Commission (WQCC) Regulations]. Therefore, the OCD conditionally approves the amendment to the work plan:

Schlumberger shall continue to monitoring ground water at MW-1 and MW-20 at least annually.

Schlumberger may discontinue monitoring ground water at MW-19.

Schlumberger shall use a cement grout with 1% to 3% bentonite and a 3-foot cap of cement to the surface when plugging the monitoring wells.

Schlumberger shall submit to OCD a plugging report within 180 days.

Please be advised that OCD approval of this amendment does not relieve the owner/operator of responsibility should operations pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the owner/operator of responsibility for compliance with any OCD, federal, state, or local laws and/or regulations.

Thank you for your cooperation in this matter. If you have any questions regarding this matter, please contact at 505-476-3489.

Edward J. Hansen
Hydrologist
Environmental Bureau

Appendix B
NMOSE Well Permits, Soil Boring Logs, and Well Completion Diagrams

Scott A. Verhines, P.E.
State Engineer

Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 552041
File Nbr: C 03774 POD1 MONITOR

Aug. 05, 2014

Jeffrey Minchak, P.G.
Senior Project Manager
CH2M HILL
3721 Rutledge Rd. NE, Suite B-1
Albuquerque, NM 87109

RE: VIRGILIO COCIANNI, SCHLUMBERGER TECHNOLOGY CORP

Greetings:

Enclosed is your copy of the above numbered permit that has been approved subject to the conditions set forth on the approval page. In accordance with the conditions of approval, the well can only be tested for 10 cumulative days, and the well is to be plugged on or before 08/31/2015, unless a permit to use the water is acquired from this office.

A Well Record & Log (OSE Form wr-20) shall be filed in this office within twenty (20) days after completion of drilling, but no later than 08/31/2015.

Appropriate forms can be downloaded from the OSE website www.ose.state.nm.us or will be mailed upon request.

Sincerely,

for Andy Morley
(575)622-6521

Enclosure

File No. C-3774

NEW MEXICO OFFICE OF THE STATE ENGINEER

APPLICATION FOR PERMIT TO DRILL A WELL WITH NO CONSUMPTIVE USE OF WATER

(check applicable box):

For fees, see State Engineer website: http://www.ose.state.nm.us/ 2-34841

Purpose:	☐ Pollution Control And / Or Recovery	☐ Geo-Thermal
☐ Exploratory	☐ Construction Site De-Watering	☐ Other (Describe):
☒ Monitoring	☐ Mineral De-Watering	

A separate permit will be required to apply water to beneficial use.

☐ Temporary Request - Requested Start Date: Requested End Date:

Plugging Plan of Operations Submitted? ☐ Yes ☒ No

1. APPLICANT(S)

Name: **Virgilio Cocianni**	Name:
Contact or Agent: check here if Agent ☐ **Schlumberger Technology Corporation**	Contact or Agent: check here if Agent ☐
Mailing Address: **105 Industrial Boulevard**	Mailing Address:
City: **Sugar Land**	City:
State: **TX** Zip Code: **77478**	State: Zip Code:
Phone: ☐ Home ☐ Cell Phone (Work): **(281) 285-4747**	Phone: ☐ Home ☐ Cell Phone (Work):
E-mail (optional): **cocianni-v@slb.com**	E-mail (optional):

FOR OSE INTERNAL USE Application for Permit, Form wr-07, Rev 4/12/12

File Number: C-3774	Trn Number: 552041
Trans Description (optional): POD1 Monitor	
Sub-Basin: CUB	
PCW/LOG Due Date: 8-31-15	

2. **WELL(S)** Describe the well(s) applicable to this application.

Location Required: Coordinate location must be reported in NM State Plane (NAD 83), UTM (NAD 83), or Latitude/Longitude (Lat/Long - WGS84).
District II (Roswell) and District VII (Cimarron) customers, provide a PLSS location in addition to above.

☐ NM State Plane (NAD83) (Feet)
☐ NM West Zone
☐ NM East Zone
☐ NM Central Zone

☐ UTM (NAD83) (Meters)
☐ Zone 12N
☐ Zone 13N

☒ Lat/Long (WGS84) (to the nearest 1/10th of second)

Well Number (if known):	X or Easting or Longitude:	Y or Northing or Latitude:	Provide if known: -Public Land Survey System (PLSS) (*Quarters or Halves , Section, Township, Range*) OR - Hydrographic Survey Map & Tract; OR - Lot, Block & Subdivision; OR - Land Grant Name
MW-34	103.8945949	32.43942826	SW 1/4, S4, T17S, R26E

NOTE: If more well locations need to be described, complete form WR-08 (Attachment 1 – POD Descriptions)
Additional well descriptions are attached: ☐ Yes ☒ No If yes, how many_____

Other description relating well to common landmarks, streets, or other: **Former Dowell Schlumber Facility, 507 East Richey Avenue, Artesia, NM 88210**

Well is on land owned by: **Schlumberger Technology Corporation**

Well Information: NOTE: If more than one (1) well needs to be described, provide attachment. Attached? ☐ Yes ☒ No
If yes, how many_____

Approximate depth of well (feet): **35.00**	Outside diameter of well casing (inches): **4.50**
Driller Name: **National Drilling**	Driller License Number: **WD-1210**

3. **ADDITIONAL STATEMENTS OR EXPLANATIONS**

For Item 4 - The monitoring well is required to provide data related to the investigation and remediation of groundwater that contains chlorinated solvents concentrations in exceedance of New Mexico Water Quality Control Commission standards. Monitoring events are performed semi-annually and are expected to continue for up to 5-7 years.

FOR OSE INTERNAL USE

Application for Permit, Form wr-07

File Number: C-3774	Trn Number: 552041

4. SPECIFIC REQUIREMENTS: The applicant must include the following, as applicable to each well type. Please check the appropriate boxes, to indicate the information has been included and/or attached to this application:

Exploratory: ☐ Include a description of any proposed pump test, if applicable.	**Pollution Control and/or Recovery:** ☐ Include a plan for pollution control/recovery, that includes the following: ☐ A description of the need for the pollution control or recovery operation. ☐ The estimated maximum period of time for completion of the operation. ☐ The annual diversion amount. ☐ The annual consumptive use amount. ☐ The maximum amount of water to be diverted and injected for the duration of the operation. ☐ The method and place of discharge.	**Construction De-Watering:** ☐ Include a description of the proposed dewatering operation, ☐ The estimated duration of the operation, ☐ The maximum amount of water to be diverted, ☐ A description of the need for the dewatering operation, and, ☐ A description of how the diverted water will be disposed of.	**Mine De-Watering:** ☐ Include a plan for pollution control/recovery, that includes the following: ☐ A description of the need for mine dewatering. ☐ The estimated maximum period of time for completion of the operation. ☐ The source(s) of the water to be diverted. ☐ The geohydrologic characteristics of the aquifer(s). ☐ The maximum amount of water to be diverted per annum. ☐ The maximum amount of water to be diverted for the duration of the operation. ☐ The quality of the water. ☐ The method of measurement of water diverted. ☐ The recharge of water to the aquifer. ☐ Description of the estimated area of hydrologic effect of the project. ☐ The method and place of discharge. ☐ An estimation of the effects on surface water rights and underground water rights from the mine dewatering project. ☐ A description of the methods employed to estimate effects on surface water rights and underground water rights. ☐ Information on existing wells, rivers, springs, and wetlands within the area of hydrologic effect.
Monitoring: ☒ Include the reason for the monitoring well, and, ☒ The duration of the planned monitoring.	☐ The method of measurement of water produced and discharged. ☐ The source of water to be injected. ☐ The method of measurement of water injected. ☐ The characteristics of the aquifer. ☐ The method of determining the resulting annual consumptive use of water and depletion from any related stream system. ☐ Proof of any permit required from the New Mexico Environment Department. ☐ An access agreement if the applicant is not the owner of the land on which the pollution plume control or recovery well is to be located.	**Geo-Thermal:** ☐ Include a description of the geothermal heat exchange project, ☐ The amount of water to be diverted and re-injected for the project, ☐ The time frame for constructing the geothermal heat exchange project, and, ☐ The duration of the project. ☐ Preliminary surveys, design data, and additional information shall be included to provide all essential facts relating to the request.	

ACKNOWLEDGEMENT

I, We (name of applicant(s)), **Virgilio Cocianni**
Print Name(s)

affirm that the foregoing statements are true to the best of (my, our) knowledge and belief.

Applicant Signature

Applicant Signature

ACTION OF THE STATE ENGINEER

This application is:

☒ approved ☐ partially approved ☐ denied

provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare and further subject to the attached conditions of approval.

Witness my hand and seal this 5th day of August 20 14, for the State Engineer,

Scott A Verhines, P.E., State Engineer

By: Andy Morley
Signature

Print

Title: Andy Morley, District II Manager

FOR OSE INTERNAL USE

Application for Permit, Form wr-07

File Number: C-3774	Trn Number: 552041

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

SPECIFIC CONDITIONS OF APPROVAL

4 No water shall be appropriated and beneficially used under this permit.

6 The well shall be plugged upon completion of the permitted use, and a plugging report shall be filed with the State Engineer within 10 days.

7 The Permittee shall utilize the highest and best technology available to ensure conservation of water to the maximum extent practical.

B The well shall be drilled by a driller licensed in the State of New Mexico in accordance with Section 72-12-12 New Mexico Statutes Annotated.

C Driller's well record must be filed with the State Engineer within 20 days after the well is drilled or driven. Well record forms will be provided by the State Engineer upon request.

C2 No water shall be diverted from this well except for testing purposes which shall not exceed ten (10) cumulative days, and well shall be plugged or capped on or before , unless a permit to use water from this well is acquired from the Office of the State Engineer.

P The well shall be constructed, maintained, and operated to prevent inter-aquifer exchange of water and to prevent loss of hydraulic head between geologic zones.

LOG The Point of Diversion C 03774 POD1 must be completed and the Well Log filed on or before 08/31/2015.

Trn Desc: C 03774 POD1 MONITOR

File Number: C 03774
Trn Number: 552041

Locator Tool Report

General Information:

Application ID: 29 Date: 08-04-2014 Time: 15:34:52

WR File Number: C-MW34
Purpose: OTHER

Applicant First Name: VIRGILIO COCIANNI
Applicant Last Name: SCHLUMBERGER TECH CORP

GW Basin: CARLSBAD
County: EDDY

Critical Management Area Name(s): NONE
Special Condition Area Name(s): NONE
Land Grant Name: NON GRANT

PLSS Description (New Mexico Principal Meridian):

NE 1/4 of NE 1/4 of SE 1/4 of NE 1/4 of Section 32, Township 21S, Range 30E.

Coordinate System Details:

Geographic Coordinates:

Latitude:	32 Degrees	26 Minutes	21.9 Seconds	N
Longitude:	103 Degrees	53 Minutes	40.5 Seconds	W

Universal Transverse Mercator Zone: 13N

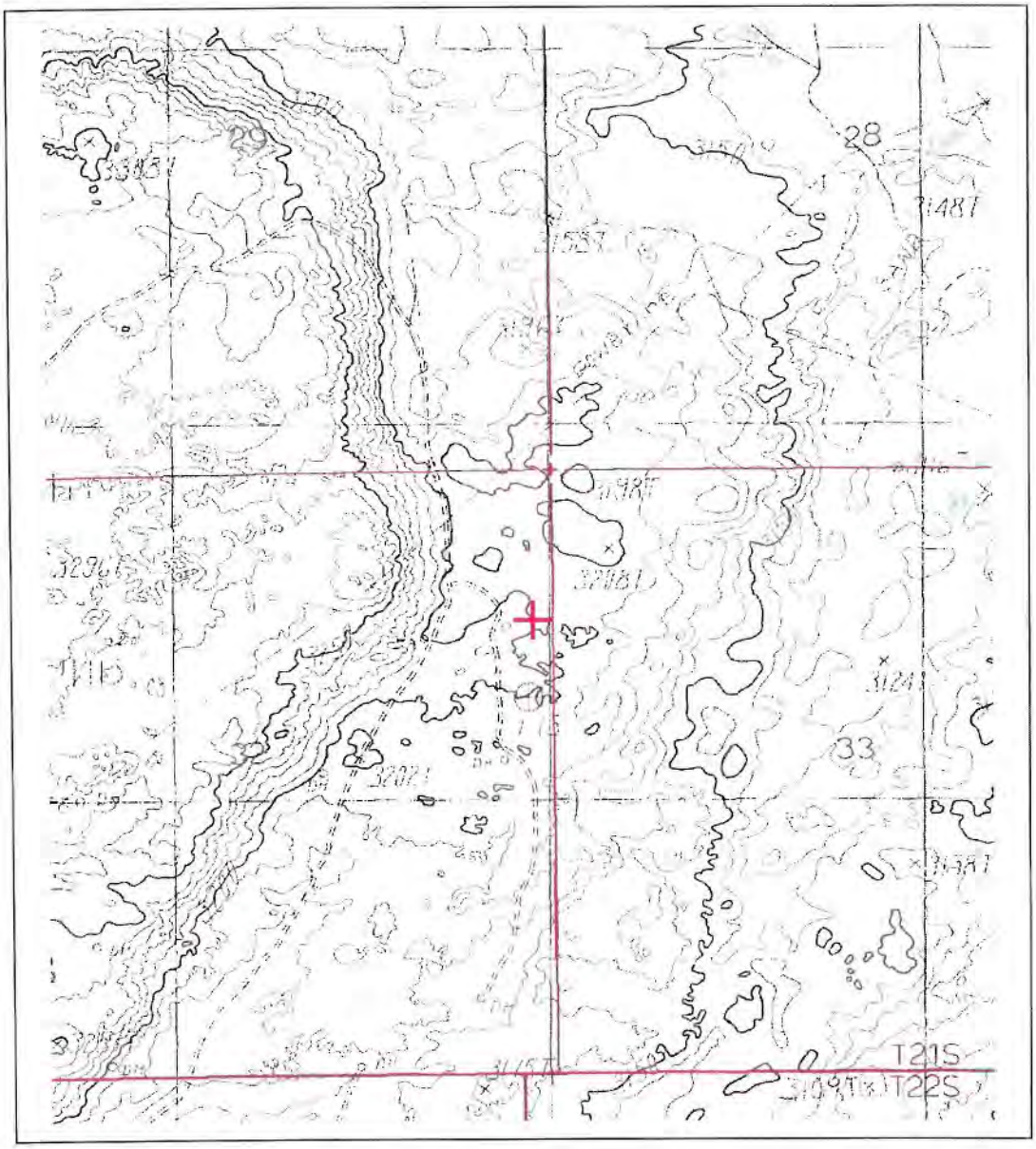
NAD 1983(92) (Meters)	N: 3,589,682	E: 603,913
NAD 1983(92) (Survey Feet)	N: 11,777,150	E: 1,981,339
NAD 1927 (Meters)	N: 3,589,480	E: 603,962
NAD 1927 (Survey Feet)	N: 11,776,486	E: 1,981,499

State Plane Coordinate System Zone: New Mexico East

NAD 1983(92) (Meters)	N: 159,677	E: 206,255
NAD 1983(92) (Survey Feet)	N: 523,873	E: 676,689
NAD 1927 (Meters)	N: 159,658	E: 193,703
NAD 1927 (Survey Feet)	N: 523,812	E: 635,508

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: C-MW34 Scale: 1:19,134

Northing/Easting: UTM83(92) (Meter): N: 3,589,682 E: 603,913

Northing/Easting: SPCS83(92) (Feet): N: 523,873 E: 676,689

GW Basin: Carlsbad

Print Date: 08/04/2014

Scott A. Verhines, P.E.
State Engineer

Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 552040
File Nbr: C 03773 POD1 POLLUTION CONTROL

Aug. 05, 2014

Jeffrey Minchak, P.G.
Senior Project Manager
CH2M HILL
3721 Rutledge Rd. NE, Suite B-1
Albuquerque, NM 87109

RE: VIRGILIO COCIANNI, SCHLUMBERGER TECHNOLGY CORP

Greetings:

Enclosed is your copy of the above numbered permit that has been approved subject to the conditions set forth on the approval page. In accordance with the conditions of approval, the well can only be tested for 10 cumulative days, and the well is to be plugged on or before 08/31/2015, unless a permit to use the water is acquired from this office.

A Well Record & Log (OSE Form wr-20) shall be filed in this office within twenty (20) days after completion of drilling, but no later than 08/31/2015.

Appropriate forms can be downloaded from the OSE website www.ose.state.nm.us or will be mailed upon request.

Sincerely,

Andy Morley
(575)622-6521

Enclosure

File No. C-3773

NEW MEXICO OFFICE OF THE STATE ENGINEER

APPLICATION FOR PERMIT TO DRILL A WELL WITH NO CONSUMPTIVE USE OF WATER

(check applicable box):

2-3841

For fees, see State Engineer website: http://www.ose.state.nm.us/

Purpose:	☒ Pollution Control And / Or Recovery	☐ Geo-Thermal
☐ Exploratory	☐ Construction Site De-Watering	☐ Other (Describe):
☐ Monitoring	☐ Mineral De-Watering	

A separate permit will be required to apply water to beneficial use.

☐ Temporary Request - Requested Start Date: Requested End Date:

Plugging Plan of Operations Submitted? ☐ Yes ☒ No

1. APPLICANT(S)

Name: **Virgilio Cocianni**	Name:
Contact or Agent: check here if Agent ☐ **Schlumberger Technology Corporation**	Contact or Agent: check here if Agent ☐
Mailing Address: **105 Industrial Boulevard**	Mailing Address:
City: **Sugar Land**	City:
State: **TX** Zip Code: **77478**	State: Zip Code:
Phone: ☐ Home ☐ Cell Phone (Work): **(281) 285-4747**	Phone: ☐ Home ☐ Cell Phone (Work):
E-mail (optional): **cocianni-v@slb.com**	E-mail (optional):

STATE ENGINEER OFFICE

FOR OSE INTERNAL USE Application for Permit, Form wr-07, Rev 4/12/12

File Number: C-3773	Trn Number: 552040
Trans Description (optional): POD1	Pol Control
Sub-Basin: CUB	
PCW/LOG Due Date: 8-31-15	

2. **WELL(S)** Describe the well(s) applicable to this application.

Location Required: Coordinate location must be reported in NM State Plane (NAD 83), UTM (NAD 83), or Latitude/Longitude (Lat/Long - WGS84).
District II (Roswell) and District VII (Cimarron) customers, provide a PLSS location in addition to above.

☐ NM State Plane (NAD83) (Feet)
☐ NM West Zone
☐ NM East Zone
☐ NM Central Zone

☐ UTM (NAD83) (Meters)
☐ Zone 12N
☐ Zone 13N

☒ Lat/Long (WGS84) (to the nearest 1/10th of second)

Well Number (if known):	X or Easting or Longitude:	Y or Northing or Latitude:	Provide if known: -Public Land Survey System (PLSS) (*Quarters or Halves , Section, Township, Range*) OR - Hydrographic Survey Map & Tract; OR - Lot, Block & Subdivision; OR - Land Grant Name
EW-03	103.8941086	32.4399139	SW 1/4, S4, T17S, R26E

NOTE: If more well locations need to be described, complete form WR-08 (Attachment 1 – POD Descriptions)
Additional well descriptions are attached: ☐ Yes ☒ No **If yes, how many**_____

Other description relating well to common landmarks, streets, or other: **Former Dowell Schlumber Facility, 507 East Richey Avenue, Artesia, NM 88210**

Well is on land owned by: **Schlumberger Technology Corporation**

Well Information: NOTE: If more than one (1) well needs to be described, provide attachment. **Attached?** ☐ Yes ☒ No
If yes, how many_____

Approximate depth of well (feet): **60.00**	Outside diameter of well casing (inches): **4.50**
Driller Name: **National EWP**	Driller License Number: **WD-1210**

3. **ADDITIONAL STATEMENTS OR EXPLANATIONS**

FOR OSE INTERNAL USE

Application for Permit, Form wr-07

File Number: C-3773	Trn Number: 552040

Pollution Control/Recovery Plan
Former Dowell Schlumberger Facility
507 East Richey Avenue, Artesia, New Mexico

The following information is provided to captures the applicable items under Section 4. Specific Requirements, of the Application for Permit to Drill a Well with No Consumptive Use of Water.

1. Description of the need for the pollution control or recovery operation.

The remediation system operation is required to remediate chlorinated hydrocarbons present in groundwater as a result of historical site operations as an oil and gas support facility. Chlorinated hydrocarbons are currently present in groundwater at concentrations that exceed New Mexico Water Quality Control Commission standards. The investigation and remediation of the site is being performed under Groundwater Discharge Permit GW-114, under the New Mexico Oil Conservation Division Environmental Bureau.

2. Estimated maximum period of time for completion of the operation.

Injection to be completed in a single operation expected to take 6-8 weeks. Groundwater extraction, treatment, and horizontal well injection system to operate for up to 5 years.

3. Annual diversion amount.

Groundwater extraction, treatment, and horizontal well injection system – 7,884,000 gallons (15 gpm)

Injections, 1st year only – 930,000 gallons maximum anticipated. This water is to come from the groundwater extraction system and is included in the 7,884,000 gallons total above.

4. Annual consumptive use amount.

Zero gallons; no consumptive use will occur. The system is a closed-loop and water will be pumped onsite and re-injected onsite using horizontal and vertical injection wells.

5. Maximum amount of water to be diverted and injected for the duration of the operation.

Injections – One time maximum of 930,000 gallons, anticipated during 2014.

Groundwater extraction, treatment, and horizontal well injection – 39,420,000 gallons (7,884,000 gallons per year x 5 years)

6. Method and place of discharge

Vertical Injections – 8 injection wells in a linear transect roughly 300 feet long. Each injection well will receive a maximum of 116,250 gallons of 1% potassium permanganate solution.

Horizontal Injection - the groundwater extraction and treatment system discharges to a buried 200 ft long horizontal injection well. The vertical component of the horizontal injection well will be sealed with a bentonite clay seal to prevent downward vertical migration adjacent to the pipe.

4. SPECIFIC REQUIREMENTS: The applicant must include the following, as applicable to each well type. Please check the appropriate boxes, to indicate the information has been included and/or attached to this application:

Exploratory: ☐ Include a description of any proposed pump test, if applicable.	**Pollution Control and/or Recovery:** ☒ Include a plan for pollution control/recovery, that includes the following: ☒ A description of the need for the pollution control or recovery operation. ☒ The estimated maximum period of time for completion of the operation. ☒ The annual diversion amount. ☒ The annual consumptive use amount. ☒ The maximum amount of water to be diverted and injected for the duration of the operation. ☒ The method and place of discharge.	**Construction De-Watering:** ☐ Include a description of the proposed dewatering operation, ☐ The estimated duration of the operation, ☐ The maximum amount of water to be diverted, ☐ A description of the need for the dewatering operation, and, ☐ A description of how the diverted water will be disposed of.	**Mine De-Watering:** ☐ Include a plan for pollution control/recovery, that includes the following: ☐ A description of the need for mine dewatering. ☐ The estimated maximum period of time for completion of the operation. ☐ The source(s) of the water to be diverted. ☐ The geohydrologic characteristics of the aquifer(s). ☐ The maximum amount of water to be diverted per annum. ☐ The maximum amount of water to be diverted for the duration of the operation. ☐ The quality of the water. ☐ The method of measurement of water diverted. ☐ The recharge of water to the aquifer. ☐ Description of the estimated area of hydrologic effect of the project. ☐ The method and place of discharge. ☐ An estimation of the effects on surface water rights and underground water rights from the mine dewatering project. ☐ A description of the methods employed to estimate effects on surface water rights and underground water rights. ☐ Information on existing wells, rivers, springs, and wetlands within the area of hydrologic effect.
Monitoring: ☐ Include the reason for the monitoring well, and, ☐ The duration of the planned monitoring.	☒ The method of measurement of water produced and discharged. ☒ The source of water to be injected. ☒ The method of measurement of water injected. ☒ The characteristics of the aquifer. ☒ The method of determining the resulting annual consumptive use of water and depletion from any related stream system. ☒ Proof of any permit required from the New Mexico Environment Department. ☒ An access agreement if the applicant is not the owner of the land on which the pollution plume control or recovery well is to be located.	**Geo-Thermal:** ☐ Include a description of the geothermal heat exchange project, ☐ The amount of water to be diverted and re-injected for the project, ☐ The time frame for constructing the geothermal heat exchange project, and, ☐ The duration of the project. ☐ Preliminary surveys, design data, and additional information shall be included to provide all essential facts relating to the request.	

ACKNOWLEDGEMENT

I, We (name of applicant(s)), **Virgilio Cocianni**
Print Name(s)

affirm that the foregoing statements are true to the best of (my, our) knowledge and belief.

Applicant Signature

Applicant Signature

ACTION OF THE STATE ENGINEER

This application is:

☒ approved ☐ partially approved ☐ denied

provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare and further subject to the attached conditions of approval.

Witness my hand and seal this 5th day of August 20 14, for the State Engineer,

Scott A Verhines, P.E., State Engineer

By: Andy Morley
Signature

Print

Title: Andy Morley, District II Manager

FOR OSE INTERNAL USE

Application for Permit, Form wr-07

File Number: C-3773	Trn Number: 552040

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

SPECIFIC CONDITIONS OF APPROVAL

4 No water shall be appropriated and beneficially used under this permit.

5B A totalizing meter shall be installed before the first branch of the discharge line from the well and the installation shall be acceptable to the State Engineer; the Engineer shall be advised of the make, model, serial number, date of installation, and initial reading of the meter prior to appropriation of water; pumping records shall be submitted to the District Supervisor on or before the 10th of Jan., April, July, and Oct. of each year for the 3 preceding calendar months.

7 The Permittee shall utilize the highest and best technology available to ensure conservation of water to the maximum extent practical.

B The well shall be drilled by a driller licensed in the State of New Mexico in accordance with Section 72-12-12 New Mexico Statutes Annotated.

C Driller's well record must be filed with the State Engineer within 20 days after the well is drilled or driven. Well record forms will be provided by the State Engineer upon request.

C2 No water shall be diverted from this well except for testing purposes which shall not exceed ten (10) cumulative days, and well shall be plugged or capped on or before , unless a permit to use water from this well is acquired from the Office of the State Engineer.

Trn Desc: C 03773 POD1 POLLUTION CONTROL

File Number: C 03773
Trn Number: 552040

Locator Tool Report

General Information:

Application ID: 29 Date: 08-04-2014 Time: 15:36:33

WR File Number: C-EW-03
Purpose: OTHER

Applicant First Name: VIRGILIO COCIANNI
Applicant Last Name: SCHLUMBERGER TECH CORP

GW Basin: CARLSBAD
County: EDDY

Critical Management Area Name(s): NONE
Special Condition Area Name(s): NONE
Land Grant Name: NON GRANT

PLSS Description (New Mexico Principal Meridian):

SE 1/4 of SE 1/4 of NE 1/4 of NE 1/4 of Section 32, Township 21S, Range 30E.

Coordinate System Details:

Geographic Coordinates:

Latitude:	32 Degrees	26 Minutes	23.7 Seconds	N
Longitude:	103 Degrees	53 Minutes	38.8 Seconds	W

Universal Transverse Mercator Zone: 13N

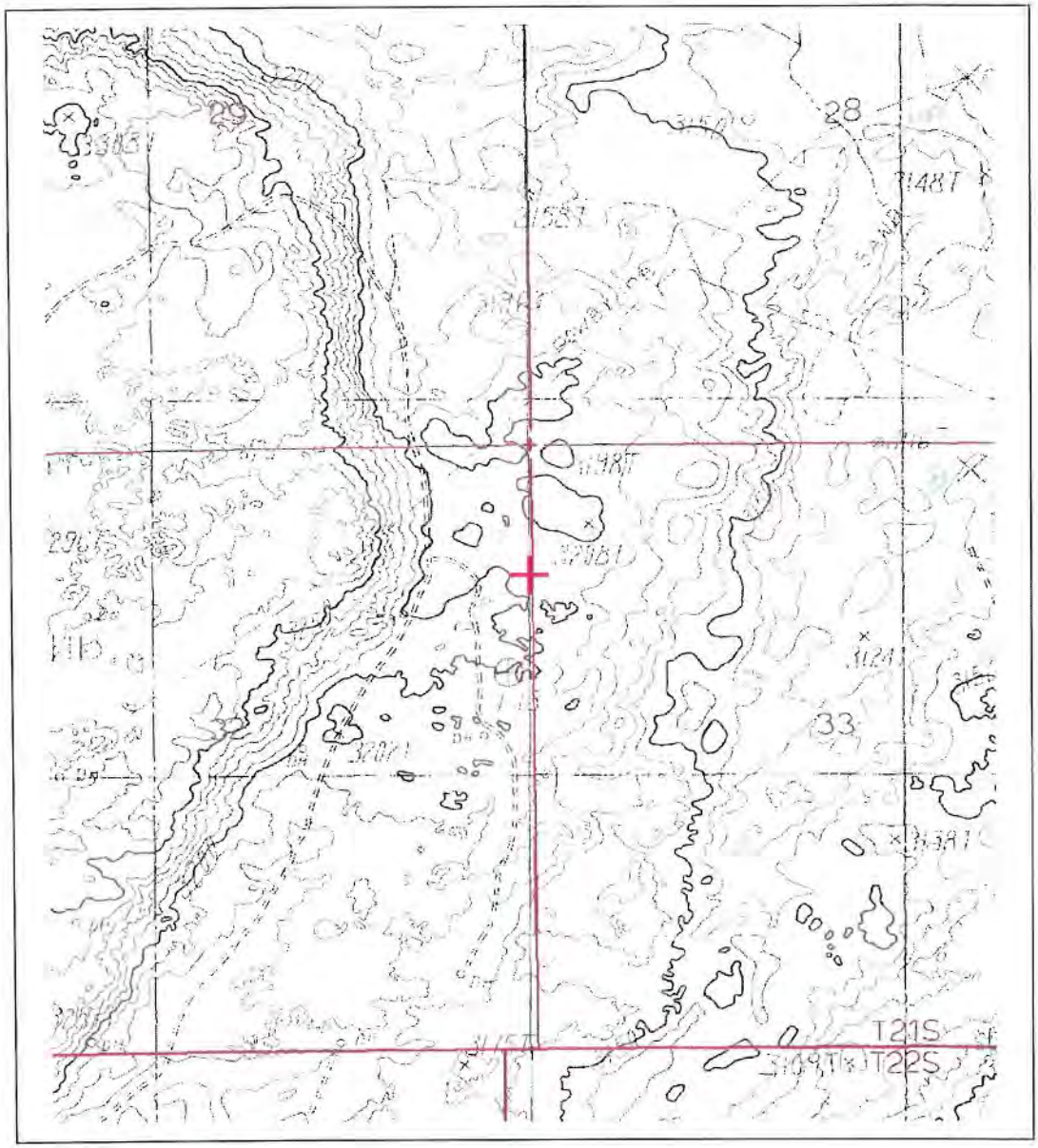
NAD 1983(92) (Meters)	N: 3,589,737	E: 603,958
NAD 1983(92) (Survey Feet)	N: 11,777,328	E: 1,981,487
NAD 1927 (Meters)	N: 3,589,535	E: 604,007
NAD 1927 (Survey Feet)	N: 11,776,665	E: 1,981,647

State Plane Coordinate System Zone: New Mexico East

NAD 1983(92) (Meters)	N: 159,731	E: 206,301
NAD 1983(92) (Survey Feet)	N: 524,050	E: 676,838
NAD 1927 (Meters)	N: 159,712	E: 193,749
NAD 1927 (Survey Feet)	N: 523,990	E: 635,657

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: C-EW-03 Scale: 1:19,134

Northing/Easting: UTM83(92) (Meter): N: 3,589,737 E: 603,958

Northing/Easting: SPCS83(92) (Feet): N: 524,050 E: 676,838

GW Basin: Carlsbad

Print Date: 08/04/2014

METER INSTALLATION AND
INSPECTION FORM

STATE ENGINEER OFFICE
Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 552040
File Nbr: C 03773
Well File Nbr: C 03773 POD1

VIRGILIO COCIANNI
SCHLUMBERGER TECHNOLOGY CORP
105 INDUSTRIAL BOULEVARD
SUGAR LAND, TX 77478

1. WATER METER INFORMATION:

Well File Nbr: C 03773 POD1

Serial Number: _____ Meter Make: _____

Number of Dials: _____
Number of dials that move on the left side of dial on meter.

Multiplier: (0) (00) (000)
Circle number of zeros that don't move on right side of dial on meter.

Unit of Measure: (GALLONS) (CUBIC FEET) (BARRELS) (ACRE-FEET) ( )
Circle appropriate unit of measure. Specify Other

Initial Reading: _____ Initial Reading Date: _____

2. COMMENTS:

_____

_____

_____

_____

_____

Submitted By: _____

Date: _____

wellcon5

Scott A. Verhines, P.E.
State Engineer

Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 552039
File Nbr: C 03772 POD1-8 POLLUTION CONTROL

Aug. 05, 2014

Jeffrey Minchak, P.G.
Senior Project Manager
CH2M HILL
3721 Rutledge Rd. NE, Suite B-1
Albuquerque, NM 87109

RE: VIRGILIO COCIANNI, SCHLUMBERGER TECHNOLOGY CORP

Greetings:

Enclosed is your copy of the above numbered permit that has been approved subject to the conditions set forth on the approval page. In accordance with the conditions of approval, the well can only be tested for 10 cumulative days, and the well is to be plugged on or before 08/31/2015, unless a permit to use the water is acquired from this office.

A Well Record & Log (OSE Form wr-20) shall be filed in this office within twenty (20) days after completion of drilling, but no later than 08/31/2015.

Appropriate forms can be downloaded from the OSE website www.ose.state.nm.us or will be mailed upon request.

Sincerely,

fw Andy Morley
(575)622-6521

Enclosure

File No. C- 3772

NEW MEXICO OFFICE OF THE STATE ENGINEER

APPLICATION FOR PERMIT TO DRILL A WELL WITH NO CONSUMPTIVE USE OF WATER

(check applicable box):

For fees, see State Engineer website: http://www.ose.state.nm.us/ 2-34841

Purpose:	☒ Pollution Control And / Or Recovery	☐ Geo-Thermal
☐ Exploratory	☐ Construction Site De-Watering	☐ Other (Describe):
☐ Monitoring	☐ Mineral De-Watering	

A separate permit will be required to apply water to beneficial use.

☐ Temporary Request - Requested Start Date: Requested End Date:

Plugging Plan of Operations Submitted? ☐ Yes ☒ No

STATE ENGINEER OFFICE
2015 JUL -4 AM 11:52

1. APPLICANT(S)

Name: **Virgilio Cocianni**	Name:
Contact or Agent: check here if Agent ☐ **Schlumberger Technology Corporation**	Contact or Agent: check here if Agent ☐
Mailing Address: **105 Industrial Boulevard**	Mailing Address:
City: **Sugar Land**	City:
State: **TX** Zip Code: **77478**	State: Zip Code:
Phone: ☐ Home ☐ Cell Phone (Work): **(281) 285-4747**	Phone: ☐ Home ☐ Cell Phone (Work):
E-mail (optional): **cocianni-v@slb.com**	E-mail (optional):

FOR OSE INTERNAL USE

Application for Permit, Form wr-07, Rev 4/12/12

File Number: C-3772	Trn Number: 552039
Trans Description (optional): POD-1-8 Pol Control	
Sub-Basin: CUB	
PCW/LOG Due Date: 8-31-15	

2. WELL(S) Describe the well(s) applicable to this application.

Location Required: Coordinate location must be reported in NM State Plane (NAD 83), UTM (NAD 83), or Latitude/Longitude (Lat/Long - WGS84).
District II (Roswell) and District VII (Cimarron) customers, provide a PLSS location in addition to above.

☐ NM State Plane (NAD83) (Feet)
☐ NM West Zone
☐ NM East Zone
☐ NM Central Zone

☐ UTM (NAD83) (Meters)
☐ Zone 12N
☐ Zone 13N

☒ Lat/Long (WGS84) (to the nearest 1/10th of second)

Well Number (if known):	X or Easting or Longitude:	Y or Northing or Latitude:	Provide if known: -Public Land Survey System (PLSS) (*Quarters or Halves , Section, Township, Range)* OR - Hydrographic Survey Map & Tract; OR - Lot, Block & Subdivision; OR - Land Grant Name
INJ. WELL	103.8951655	32.43937252	SW 1/4, S4, T17S, R26E
INJ. WELL	103.8952709	32.43946595	SW 1/4, S4, T17S, R26E
INJ. WELL	103.8953684	32.43955935	SW 1/4, S4, T17S, R26E
INJ. WELL	103.895466	32.43965275	SW 1/4, S4, T17S, R26E
INJ. WELL	103.8955596	32.43974281	SW 1/4, S4, T17S, R26E
INJ. WELL	103.8956532	32.43982955	SW 1/4, S4, T17S, R26E
INJ. WELL	103.8957469	32.43991961	SW 1/4, S4, T17S, R26E
INJ. WELL	103.8958366	32.44000301	SW 1/4, S4, T17S, R26E

STATE ENGINEER OFFICE 2017 NOV -4 PM 11:52

NOTE: If more well locations need to be described, complete form WR-08 (Attachment 1 – POD Descriptions)
Additional well descriptions are attached: ☐ **Yes** ☒ **No** **If yes, how many_______**

Other description relating well to common landmarks, streets, or other: **Former Dowell Schlumber Facility, 507 East Richey Avenue, Artesia, NM 88210**

Well is on land owned by: **Schlumberger Technology Corporation**

Well Information: NOTE: If more than one (1) well needs to be described, provide attachment. **Attached?** ☐ **Yes** ☒ **No**
If yes, how many_______

Approximate depth of well (feet): **32.00**	Outside diameter of well casing (inches): **2.375**
Driller Name: **National Ewp**	Driller License Number: **WD-1210**

3. ADDITIONAL STATEMENTS OR EXPLANATIONS

FOR OSE INTERNAL USE

Application for Permit, Form wr-07

File Number: C-3772	Trn Number: 552039

4. SPECIFIC REQUIREMENTS: The applicant must include the following, as applicable to each well type. Please check the appropriate boxes, to indicate the information has been included and/or attached to this application:

Exploratory: ☐ Include a description of any proposed pump test, if applicable.	**Pollution Control and/or Recovery:** ☒ Include a plan for pollution control/recovery, that includes the following: ☒ A description of the need for the pollution control or recovery operation. ☒ The estimated maximum period of time for completion of the operation. ☒ The annual diversion amount. ☒ The annual consumptive use amount. ☒ The maximum amount of water to be diverted and injected for the duration of the operation. ☒ The method and place of discharge. ☒ The method of measurement of water produced and discharged. ☒ The source of water to be injected. ☒ The method of measurement of water injected. ☒ The characteristics of the aquifer. ☒ The method of determining the resulting annual consumptive use of water and depletion from any related stream system. ☒ Proof of any permit required from the New Mexico Environment Department. ☒ An access agreement if the applicant is not the owner of the land on which the pollution plume control or recovery well is to be located.	**Construction De-Watering:** ☐ Include a description of the proposed dewatering operation, ☐ The estimated duration of the operation, ☐ The maximum amount of water to be diverted, ☐ A description of the need for the dewatering operation, and, ☐ A description of how the diverted water will be disposed of.	**Mine De-Watering:** ☐ Include a plan for pollution control/recovery, that includes the following: ☐ A description of the need for mine dewatering. ☐ The estimated maximum period of time for completion of the operation. ☐ The source(s) of the water to be diverted. ☐ The geohydrologic characteristics of the aquifer(s). ☐ The maximum amount of water to be diverted per annum. ☐ The maximum amount of water to be diverted for the duration of the operation. ☐ The quality of the water. ☐ The method of measurement of water diverted. ☐ The recharge of water to the aquifer. ☐ Description of the estimated area of hydrologic effect of the project. ☐ The method and place of discharge. ☐ An estimation of the effects on surface water rights and underground water rights from the mine dewatering project. ☐ A description of the methods employed to estimate effects on surface water rights and underground water rights. ☐ Information on existing wells, rivers, springs, and wetlands within the area of hydrologic effect.
Monitoring: ☐ Include the reason for the monitoring well, and, ☐ The duration of the planned monitoring.		**Geo-Thermal:** ☐ Include a description of the geothermal heat exchange project, ☐ The amount of water to be diverted and re-injected for the project, ☐ The time frame for constructing the geothermal heat exchange project, and, ☐ The duration of the project. ☐ Preliminary surveys, design data, and additional information shall be included to provide all essential facts relating to the request.	

ACKNOWLEDGEMENT

I, We (name of applicant(s)), **Virgilio Cocianni**
Print Name(s)

affirm that the foregoing statements are true to the best of (my, our) knowledge and belief.

Applicant Signature

Applicant Signature

ACTION OF THE STATE ENGINEER

This application is:

☒ approved ☐ partially approved ☐ denied

provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare and further subject to the attached conditions of approval.

FOR OSE INTERNAL USE

Application for Permit, Form wr-07

File Number: C-3772	Trn Number: 552039

Pollution Control/Recovery Plan
Former Dowell Schlumberger Facility
507 East Richey Avenue, Artesia, New Mexico

The following information is provided to captures the applicable items under Section 4. Specific Requirements, of the Application for Permit to Drill a Well with No Consumptive Use of Water.

1. Description of the need for the pollution control or recovery operation.

The remediation system operation is required to remediate chlorinated hydrocarbons present in groundwater as a result of historical site operations as an oil and gas support facility. Chlorinated hydrocarbons are currently present in groundwater at concentrations that exceed New Mexico Water Quality Control Commission standards. The investigation and remediation of the site is being performed under Groundwater Discharge Permit GW-114, under the New Mexico Oil Conservation Division Environmental Bureau.

2. Estimated maximum period of time for completion of the operation.

Injection to be completed in a single operation expected to take 6-8 weeks. Groundwater extraction, treatment, and horizontal well injection system to operate for up to 5 years.

3. Annual diversion amount.

Groundwater extraction, treatment, and horizontal well injection system – 7,884,000 gallons (15 gpm)

Injections, 1st year only – 930,000 gallons maximum anticipated. This water is to come from the groundwater extraction system and is included in the 7,884,000 gallons total above.

4. Annual consumptive use amount.

Zero gallons; no consumptive use will occur. The system is a closed-loop and water will be pumped onsite and re-injected onsite using horizontal and vertical injection wells.

5. Maximum amount of water to be diverted and injected for the duration of the operation.

Injections – One time maximum of 930,000 gallons, anticipated during 2014.

Groundwater extraction, treatment, and horizontal well injection – 39,420,000 gallons (7,884,000 gallons per year x 5 years)

6. Method and place of discharge

Vertical Injections – 8 injection wells in a linear transect roughly 300 feet long. Each injection well will receive a maximum of 116,250 gallons of 1% potassium permanganate solution.

Horizontal Injection - the groundwater extraction and treatment system discharges to a buried 200 ft long horizontal injection well. The vertical component of the horizontal injection well will be sealed with a bentonite clay seal to prevent downward vertical migration adjacent to the pipe.

Witness my hand and seal this 5th day of August 20 14, for the State Engineer,

Scott A Verhines, P.E., State Engineer

By: Andy Morley
Signature

Print

Title: Andy Morley, District II Manager
Print

FOR OSE INTERNAL USE

Application for Permit, Form wr-07

File Number: C. 3772	Trn Number: 552039

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

SPECIFIC CONDITIONS OF APPROVAL

4 No water shall be appropriated and beneficially used under this permit.

5B A totalizing meter shall be installed before the first branch of the discharge line from the well and the installation shall be acceptable to the State Engineer; the Engineer shall be advised of the make, model, serial number, date of installation, and initial reading of the meter prior to appropriation of water; pumping records shall be submitted to the District Supervisor on or before the 10th of Jan., April, July, and Oct. of each year for the 3 preceding calendar months.

7 The Permittee shall utilize the highest and best technology available to ensure conservation of water to the maximum extent practical.

B The well shall be drilled by a driller licensed in the State of New Mexico in accordance with Section 72-12-12 New Mexico Statutes Annotated.

C Driller's well record must be filed with the State Engineer within 20 days after the well is drilled or driven. Well record forms will be provided by the State Engineer upon request.

C2 No water shall be diverted from this well except for testing purposes which shall not exceed ten (10) umulative days, and well shall be plugged or capped on or before , unless a permit to use water from this well is acquired from the Office of the State Engineer.

Trn Desc: C 03772 POD1-8 POLLUTION CONTR

File Number: C 03772
Trn Number: 552039

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

ACTION OF STATE ENGINEER

Notice of Intention Rcvd: Date Rcvd. Corrected:
Formal Application Rcvd: 08/04/2014 Pub. of Notice Ordered:
Date Returned - Correction: Affidavit of Pub. Filed:

This application is approved provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare of the state; and further subject to the specific conditions listed previously.

Witness my hand and seal this 5th day of Aug A.D., 2014

Scott A. Verhines, P.E., State Engineer

By: Andy Morley
Andy Morley

Trn Desc: C 03772 POD1-8 POLLUTION CONTR

File Number: C 03772
Trn Number: 552039

METER INSTALLATION AND
INSPECTION FORM

STATE ENGINEER OFFICE
Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 552039
File Nbr: C 03772
Well File Nbr: C 03772 POD1

VIRGILIO COCIANNI
SCHLUMBERGER TECHNOLOGY CORP
105 INDUSTRIAL BOULEVARD
SUGAR LAND, TX 77478

1. WATER METER INFORMATION:

Well File Nbr: C 03772 POD1

Serial Number: _____ Meter Make: _____

Number of Dials: _____
Number of dials that move on the left side of dial on meter.

Multiplier: (0) (00) (000)
Circle number of zeros that don't move on right side of dial on meter.

Unit of Measure: (GALLONS) (CUBIC FEET) (BARRELS) (ACRE-FEET) ( )
Circle appropriate unit of measure. Specify Other

Initial Reading: _____ Initial Reading Date: _____

2. COMMENTS:

_____

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Submitted By: _____

Date: _____

wellcon5

METER INSTALLATION AND
INSPECTION FORM

STATE ENGINEER OFFICE
Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 552039
File Nbr: C 03772
Well File Nbr: C 03772 POD2

VIRGILIO COCIANNI
SCHLUMBERGER TECHNOLOGY CORP
105 INDUSTRIAL BOULEVARD
SUGAR LAND, TX 77478

1. WATER METER INFORMATION:

Well File Nbr: C 03772 POD2

Serial Number: _____ Meter Make: _____

Number of Dials: _____
Number of dials that move on the left side of dial on meter.

Multiplier: (0) (00) (000)
Circle number of zeros that don't move on right side of dial on meter.

Unit of Measure: (GALLONS) (CUBIC FEET) (BARRELS) (ACRE-FEET) ( )
Circle appropriate unit of measure. Specify Other

Initial Reading: _____ Initial Reading Date: _____

2. COMMENTS:

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Submitted By: _____

Date: _____

wellcon5

METER INSTALLATION AND
INSPECTION FORM

STATE ENGINEER OFFICE
Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 552039
File Nbr: C 03772
Well File Nbr: C 03772 POD3

VIRGILIO COCIANNI
SCHLUMBERGER TECHNOLOGY CORP
105 INDUSTRIAL BOULEVARD
SUGAR LAND, TX 77478

1. WATER METER INFORMATION:

Well File Nbr: C 03772 POD3

Serial Number: _____ Meter Make: _____

Number of Dials: _____
Number of dials that move on the left side of dial on meter.

Multiplier: (0) (00) (000)
Circle number of zeros that don't move on right side of dial on meter.

Unit of Measure: (GALLONS) (CUBIC FEET) (BARRELS) (ACRE-FEET) ( )
Circle appropriate unit of measure. Specify Other

Initial Reading: _____ Initial Reading Date: _____

2. COMMENTS:

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Submitted By: _____

Date: _____

wellcon5

METER INSTALLATION AND
INSPECTION FORM

STATE ENGINEER OFFICE
Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 552039
File Nbr: C 03772
Well File Nbr: C 03772 POD4

VIRGILIO COCIANNI
SCHLUMBERGER TECHNOLOGY CORP
105 INDUSTRIAL BOULEVARD
SUGAR LAND, TX 77478

1. WATER METER INFORMATION:

Well File Nbr: C 03772 POD4

Serial Number: _____ Meter Make: _____

Number of Dials: _____
Number of dials that move on the left side of dial on meter.

Multiplier: (0) (00) (000)
Circle number of zeros that don't move on right side of dial on meter.

Unit of Measure: (GALLONS) (CUBIC FEET) (BARRELS) (ACRE-FEET) ( )
Circle appropriate unit of measure. Specify Other

Initial Reading: _____ Initial Reading Date: _____

2. COMMENTS:

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Submitted By: _____

Date: _____

wellcon5

METER INSTALLATION AND
INSPECTION FORM

STATE ENGINEER OFFICE
Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 552039
File Nbr: C 03772
Well File Nbr: C 03772 POD5

VIRGILIO COCIANNI
SCHLUMBERGER TECHNOLOGY CORP
105 INDUSTRIAL BOULEVARD
SUGAR LAND, TX 77478

1. WATER METER INFORMATION:

Well File Nbr: C 03772 POD5

Serial Number: _____ Meter Make: _____

Number of Dials: _____ Multiplier: (0) (00) (000)
Number of dials that move on the left side of dial on meter. Circle number of zeros that don't move on right side of dial on meter.

Unit of Measure: (GALLONS) (CUBIC FEET) (BARRELS) (ACRE-FEET) ( )
Circle appropriate unit of measure. Specify Other

Initial Reading: _____ Initial Reading Date: _____

2. COMMENTS:

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Submitted By: _____

Date: _____

wellcon5

METER INSTALLATION AND
INSPECTION FORM

STATE ENGINEER OFFICE
Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 552039
File Nbr: C 03772
Well File Nbr: C 03772 POD6

VIRGILIO COCIANNI
SCHLUMBERGER TECHNOLOGY CORP
105 INDUSTRIAL BOULEVARD
SUGAR LAND, TX 77478

1. WATER METER INFORMATION:

Well File Nbr: C 03772 POD6

Serial Number: _____ Meter Make: _____

Number of Dials: _____
Number of dials that move on the left side of dial on meter.

Multiplier: (0) (00) (000)
Circle number of zeros that don't move on right side of dial on meter.

Unit of Measure: (GALLONS) (CUBIC FEET) (BARRELS) (ACRE-FEET) ( )
Circle appropriate unit of measure. Specify Other

Initial Reading: _____ Initial Reading Date: _____

2. COMMENTS:

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Submitted By: _____

Date: _____

wellcon5

METER INSTALLATION AND
INSPECTION FORM

STATE ENGINEER OFFICE
Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 552039
File Nbr: C 03772
Well File Nbr: C 03772 POD7

VIRGILIO COCIANNI
SCHLUMBERGER TECHNOLOGY CORP
105 INDUSTRIAL BOULEVARD
SUGAR LAND, TX 77478

1. WATER METER INFORMATION:

Well File Nbr: C 03772 POD7

Serial Number: _____ Meter Make: _____

Number of Dials: _____
Number of dials that move on the left side of dial on meter.

Multiplier: (0) (00) (000)
Circle number of zeros that don't move on right side of dial on meter.

Unit of Measure: (GALLONS) (CUBIC FEET) (BARRELS) (ACRE-FEET) ( )
Circle appropriate unit of measure. Specify Other

Initial Reading: _____ Initial Reading Date: _____

2. COMMENTS:

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Submitted By: _____

Date: _____

wellcon5

METER INSTALLATION AND
INSPECTION FORM

STATE ENGINEER OFFICE
Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 552039
File Nbr: C 03772
Well File Nbr: C 03772 POD8

VIRGILIO COCIANNI
SCHLUMBERGER TECHNOLOGY CORP
105 INDUSTRIAL BOULEVARD
SUGAR LAND, TX 77478

1. WATER METER INFORMATION:

Well File Nbr: C 03772 POD8

Serial Number: _____ Meter Make: _____

Number of Dials: _____
Number of dials that move on the left side of dial on meter.

Multiplier: (0) (00) (000)
Circle number of zeros that don't move on right side of dial on meter.

Unit of Measure: (GALLONS) (CUBIC FEET) (BARRELS) (ACRE-FEET) ( )
Circle appropriate unit of measure. Specify Other

Initial Reading: _____ Initial Reading Date: _____

2. COMMENTS:

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Submitted By: _____

Date: _____

wellcon5

OFFICE OF THE STATE ENGINEER/INTERSTATE STREAM COMMISSION – ROSWELL OFFICE

OFFICIAL RECEIPT NUMBER: 2- 34841 DATE: Aug 4, 2014 FILE NO.: _____

TOTAL: 50.00 RECEIVED: _____ DOLLARS CHECK NO.: 3169 CASH: _____

PAYOR: Jeffrey Mincheck ADDRESS: 14416 Skyline Rd NE CITY: Albuquerque STATE: NM

ZIP: 87123 RECEIVED BY: _____

INSTRUCTIONS: Indicate the number of actions to the left of the appropriate type of filing. Complete the receipt information. **Original** to payor; **pink** copy to Program Support/ASD; **yellow** copy remains in district office, and **goldenrod** copy to accompany application being filed. If you make an error, void original and all copies and submit to Program Support/ASD along with other valid receipts.

A. Ground Water Rights Filing Fees

___ 1.	Declaration of Water Right	$ 1.00
___ 2.	Application to Appropriate or Supplement Domestic 72-12-1 Well	$125.00
___ 3.	Application for Stock Well	$ 5.00
___ 4.	Application to Repair or Deepen 72-12-1 Well	$ 75.00
___ 5.	Application for Replacement 72-12-1 Well	$ 75.00
___ 6.	Application to Change Purpose of Use 72-12-1 Well	$ 75.00
___ 7.	Application to Appropriate Irrig., Mun., or Comm. Use	$ 25.00
___ 8.	Application for Supplemental Non 72-12-1 Well	$ 25.00
___ 9.	Application to Change Location of Non 72-12-1 Well	$ 25.00
___10.	Application to Change Place or Purpose of Use Non 72-12-1 Well	$ 25.00
___11.	Application to Change Location of Well and Place and/or Purpose of Use	$ 50.00
___12.	Application for Extension of Time	$ 25.00
___13.	Proof of Application to Beneficial Use	$ 25.00
___14.	Application to Change Point of Diversion and Place and/or Purpose of Use from Surface Water to Ground Water	$ 50.00
10 15.	Application for Test, Expl. Observ. Well	$ 5.00
___16.	Change of Ownership of Water Right	$ 2.00
___17.	Application to Repair or Deepen Non 72-12-1 Well	$ 5.00

B. Surface Water Rights Filing Fees

___ 1.	Declaration of Water Right	$ 10.00
___ 2.	Amended Declaration	$ 25.00
___ 3.	Declaration of Livestock Water Impoundment	$ 10.00
___ 4.	Application for Livestock Water Impoundment	$ 10.00
___ 5.	Application to Appropriate	$ 25.00
___ 6.	Notice of Intent to Appropriate	$ 25.00
___ 7.	Application to Change Point of Diversion	$100.00
___ 8.	Application to Change Place and/or Purpose of Use	$100.00
___ 9.	Application to Change Point of Diversion and Place and/or Purpose of Use	$200.00
___10.	Application to Change Point of Diversion and Place and/or Purpose of Use from Ground Water to Surface Water	$200.00
___11.	Application for Extension of Time	$ 50.00
___12.	Supplemental Well to a Surface Right	$100.00
___13.	Return Flow Credit	$100.00
___14.	Proof of Completion of Works	$ 25.00
___15.	Proof of Application of Water to Beneficial Use	$ 25.00
___16.	Water Development Plan	$100.00
___17.	Change of Ownership of Water Right	$ 5.00

C. Miscellaneous Fees

___ 1.	Application for Well Driller's License	$50.00
___ 2.	Application for Renewal of Well Driller's License	$50.00
___ 3.	Application to Amend Well Driller's License	$50.00

D. Reproduction of Documents

_____ @ 0.25¢/copy $_____

_____ Map(s) $_____

E. Certification $_____

E. Other $_____

G. Comments:

* Fed ex

_____

_____

_____

_____

_____

Locator Tool Report

General Information:

Application ID:29 Date: 08-04-2014 Time: 15:37:49

WR File Number: C-POD1
Purpose: OTHER

Applicant First Name: VIRGILIO COCIANNI
Applicant Last Name: SCHLUMBERGER TECH CORP

GW Basin: CARLSBAD
County: EDDY

Critical Management Area Name(s): NONE
Special Condition Area Name(s): NONE
Land Grant Name: NON GRANT

PLSS Description (New Mexico Principal Meridian):

NW 1/4 of NE 1/4 of SE 1/4 of NE 1/4 of Section 32, Township 21S, Range 30E.

Coordinate System Details:

Geographic Coordinates:

Latitude:	32 Degrees	26 Minutes	21.7 Seconds	N
Longitude:	103 Degrees	53 Minutes	42.6 Seconds	W

Universal Transverse Mercator Zone: 13N

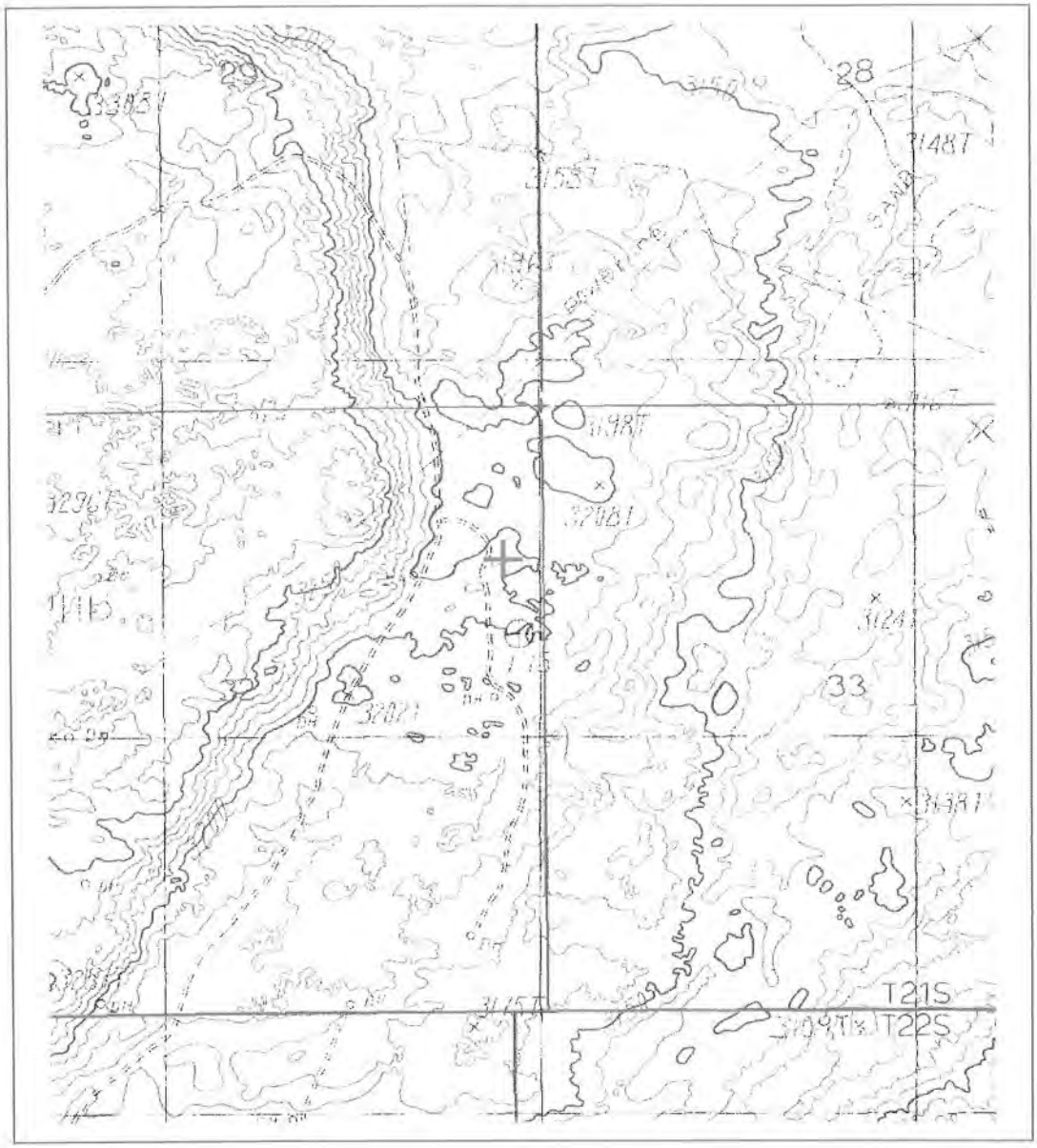
NAD 1983(92) (Meters)	N: 3,589,676	E: 603,860
NAD 1983(92) (Survey Feet)	N: 11,777,127	E: 1,981,162
NAD 1927 (Meters)	N: 3,589,473	E: 603,908
NAD 1927 (Survey Feet)	N: 11,776,464	E: 1,981,323

State Plane Coordinate System Zone: New Mexico East

NAD 1983(92) (Meters)	N: 159,670	E: 206,202
NAD 1983(92) (Survey Feet)	N: 523,852	E: 676,513
NAD 1927 (Meters)	N: 159,652	E: 193,649
NAD 1927 (Survey Feet)	N: 523,791	E: 635,331

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: C-POD1 Scale: 1:19,134

Northing/Easting: UTM83(92) (Meter): N: 3,589,676 E: 603,860

Northing/Easting: SPCS83(92) (Feet): N: 523,852 E: 676,513

GW Basin: Carlsbad

Print Date: 08/04/2014

Locator Tool Report

General Information:

Application ID: 29 Date: 08-04-2014 Time: 15:39:09

WR File Number: C-POD2
Purpose: OTHER

Applicant First Name: VIRGILIO COCIANNI
Applicant Last Name: SCHLUMBERGER TECH CORP

GW Basin: CARLSBAD
County: EDDY

Critical Management Area Name(s): NONE
Special Condition Area Name(s): NONE
Land Grant Name: NON GRANT

PLSS Description (New Mexico Principal Meridian):

SW 1/4 of SE 1/4 of NE 1/4 of NE 1/4 of Section 32, Township 21S, Range 30E.

Coordinate System Details:

Geographic Coordinates:

Latitude:	32 Degrees	26 Minutes	22.1 Seconds	N
Longitude:	103 Degrees	53 Minutes	43.0 Seconds	W

Universal Transverse Mercator Zone: 13N

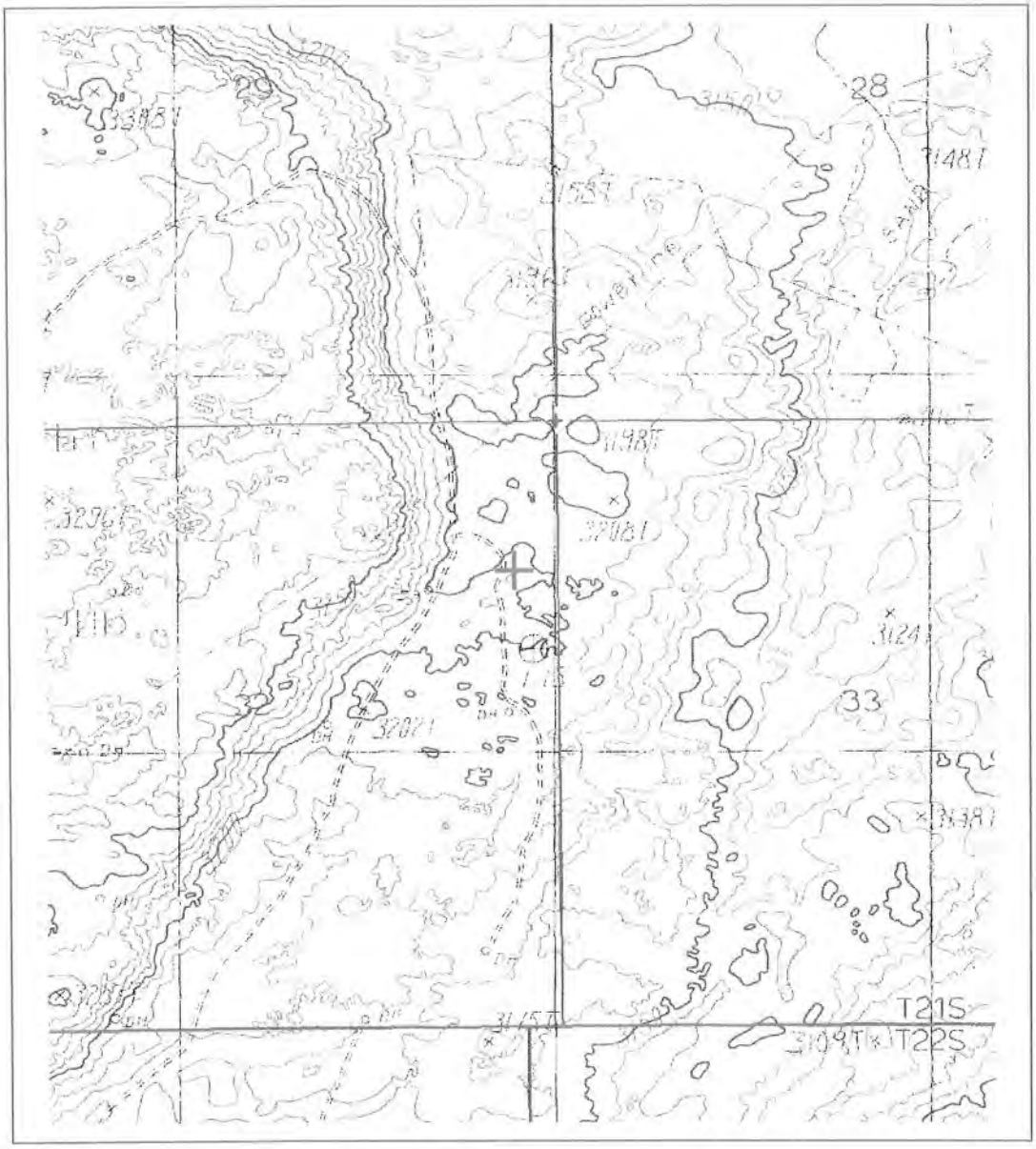
NAD 1983(92) (Meters)	N: 3,589,686	E: 603,850
NAD 1983(92) (Survey Feet)	N: 11,777,161	E: 1,981,130
NAD 1927 (Meters)	N: 3,589,484	E: 603,898
NAD 1927 (Survey Feet)	N: 11,776,498	E: 1,981,290

State Plane Coordinate System Zone: New Mexico East

NAD 1983(92) (Meters)	N: 159,681	E: 206,192
NAD 1983(92) (Survey Feet)	N: 523,886	E: 676,481
NAD 1927 (Meters)	N: 159,662	E: 193,639
NAD 1927 (Survey Feet)	N: 523,825	E: 635,299

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: C-POD2 Scale: 1:19,134

Northing/Easting: UTM83(92) (Meter): N: 3,589,686 E: 603,850

Northing/Easting: SPCS83(92) (Feet): N: 523,886 E: 676,481

GW Basin: Carlsbad

Print Date: 08/04/2014

Locator Tool Report

General Information:

Application ID: 29 Date: 08-04-2014 Time: 15:39:52

WR File Number: C-POD3
Purpose: OTHER

Applicant First Name: VIRGILIO COCIANNI
Applicant Last Name: SCHLUMBERGER TECH CORP

GW Basin: CARLSBAD
County: EDDY

Critical Management Area Name(s): NONE
Special Condition Area Name(s): NONE
Land Grant Name: NON GRANT

PLSS Description (New Mexico Principal Meridian):

SW 1/4 of SE 1/4 of NE 1/4 of NE 1/4 of Section 32, Township 21S, Range 30E.

Coordinate System Details:

Geographic Coordinates:

Latitude:	32 Degrees	26 Minutes	22.4 Seconds	N
Longitude:	103 Degrees	53 Minutes	43.3 Seconds	W

Universal Transverse Mercator Zone: 13N

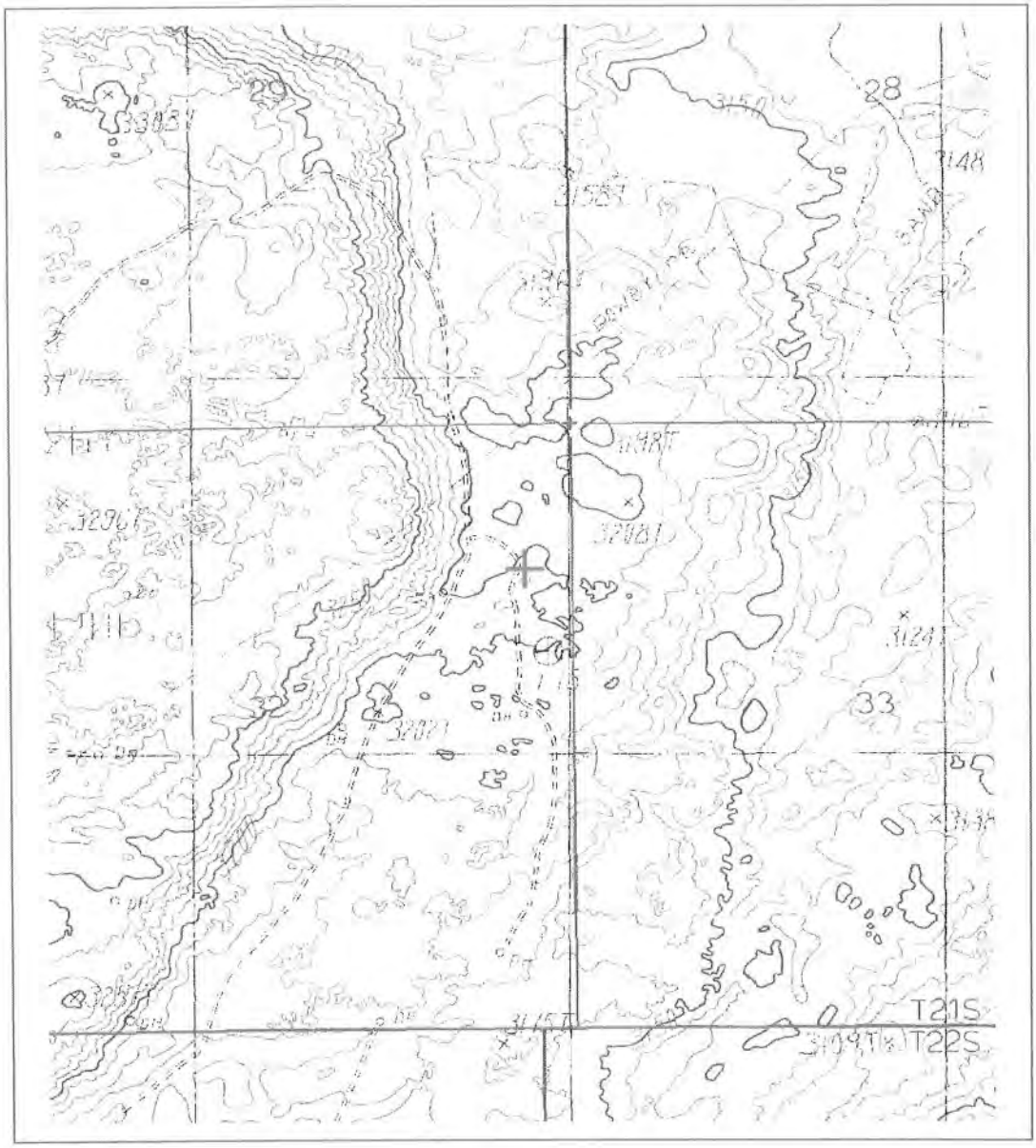
NAD 1983(92) (Meters)	N: 3,589,696	E: 603,840
NAD 1983(92) (Survey Feet)	N: 11,777,195	E: 1,981,099
NAD 1927 (Meters)	N: 3,589,494	E: 603,889
NAD 1927 (Survey Feet)	N: 11,776,532	E: 1,981,260

State Plane Coordinate System Zone: New Mexico East

NAD 1983(92) (Meters)	N: 159,691	E: 206,183
NAD 1983(92) (Survey Feet)	N: 523,920	E: 676,450
NAD 1927 (Meters)	N: 159,672	E: 193,630
NAD 1927 (Survey Feet)	N: 523,859	E: 635,269

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: C-POD3 Scale: 1:19,134

Northing/Easting: UTM83(92) (Meter): N: 3,589,696 E: 603,840

Northing/Easting: SPCS83(92) (Feet): N: 523,920 E: 676,450

GW Basin: Carlsbad

Print Date: 08/04/2014

Locator Tool Report

General Information:

Application ID: 29 Date: 08-04-2014 Time: 15:40:31

WR File Number: C-POD4
Purpose: OTHER

Applicant First Name: VIRGILIO COCIANNI
Applicant Last Name: SCHLUMBERGER TECH CORP

GW Basin: CARLSBAD
County: EDDY

Critical Management Area Name(s): NONE
Special Condition Area Name(s): NONE
Land Grant Name: NON GRANT

PLSS Description (New Mexico Principal Meridian):

SW 1/4 of SE 1/4 of NE 1/4 of NE 1/4 of Section 32, Township 21S, Range 30E.

Coordinate System Details:

Geographic Coordinates:

Latitude:	32 Degrees	26 Minutes	22.8 Seconds	N
Longitude:	103 Degrees	53 Minutes	43.7 Seconds	W

Universal Transverse Mercator Zone: 13N

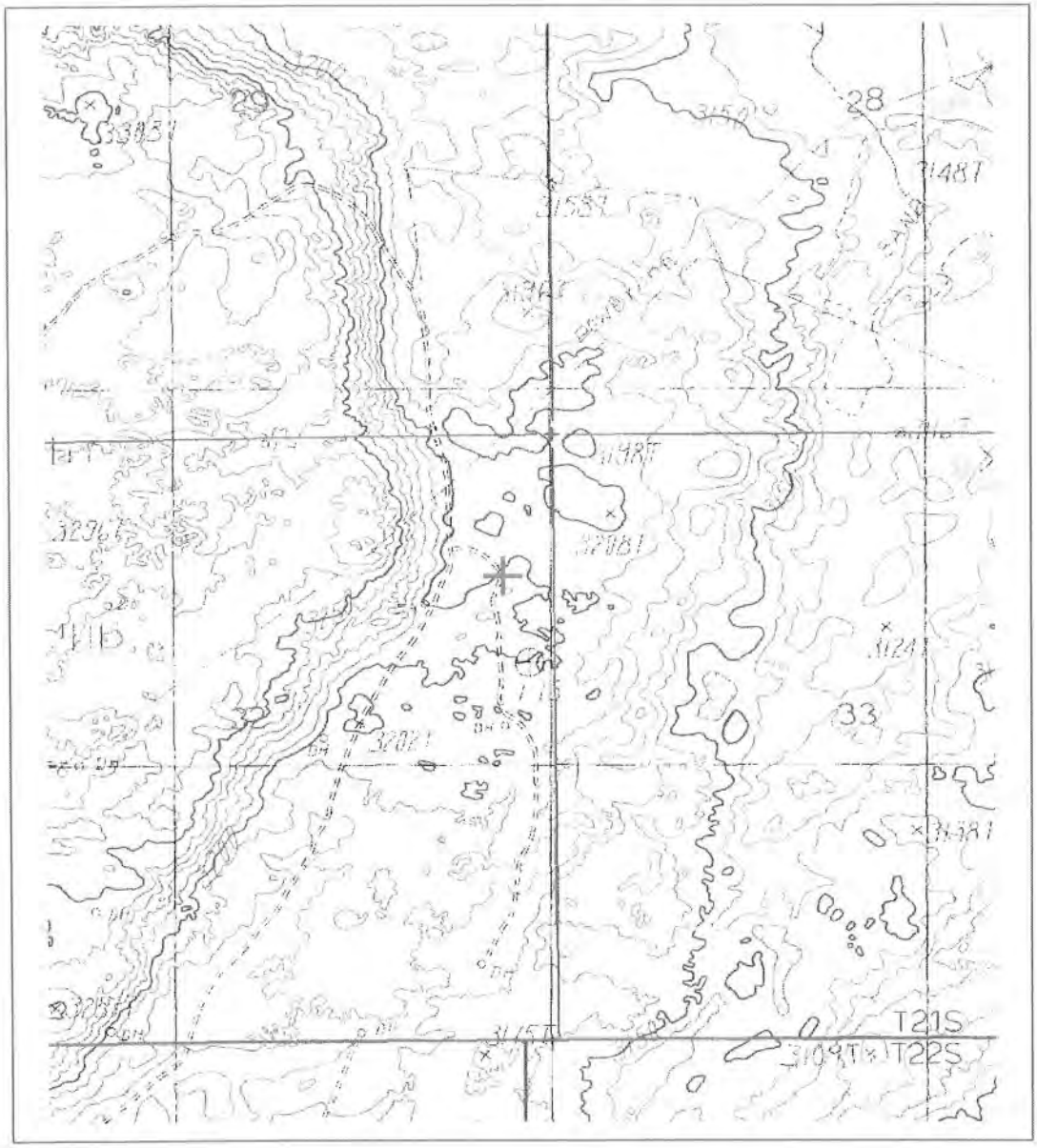
NAD 1983(92) (Meters)	N: 3,589,706	E: 603,831
NAD 1983(92) (Survey Feet)	N: 11,777,229	E: 1,981,069
NAD 1927 (Meters)	N: 3,589,504	E: 603,880
NAD 1927 (Survey Feet)	N: 11,776,565	E: 1,981,229

State Plane Coordinate System Zone: New Mexico East

NAD 1983(92) (Meters)	N: 159,701	E: 206,173
NAD 1983(92) (Survey Feet)	N: 523,954	E: 676,420
NAD 1927 (Meters)	N: 159,683	E: 193,621
NAD 1927 (Survey Feet)	N: 523,893	E: 635,238

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: C-POD4 Scale: 1:19,134

Northing/Easting: UTM83(92) (Meter): N: 3,589,706 E: 603,831

Northing/Easting: SPCS83(92) (Feet): N: 523,954 E: 676,420

GW Basin: Carlsbad

Print Date: 08/04/2014

Locator Tool Report

General Information:

Application ID: 29 Date: 08-04-2014 Time: 15:41:35

WR File Number: C-POD5
Purpose: OTHER

Applicant First Name: VIRGILIO COCIANNI
Applicant Last Name: SCHLUMBERGER TECH CORP

GW Basin: CARLSBAD
County: EDDY

Critical Management Area Name(s): NONE
Special Condition Area Name(s): NONE
Land Grant Name: NON GRANT

PLSS Description (New Mexico Principal Meridian):

SW 1/4 of SE 1/4 of NE 1/4 of NE 1/4 of Section 32, Township 21S, Range 30E.

Coordinate System Details:

Geographic Coordinates:

Latitude:	32 Degrees	26 Minutes	23.1 Seconds	N
Longitude:	103 Degrees	53 Minutes	44.0 Seconds	W

Universal Transverse Mercator Zone: 13N

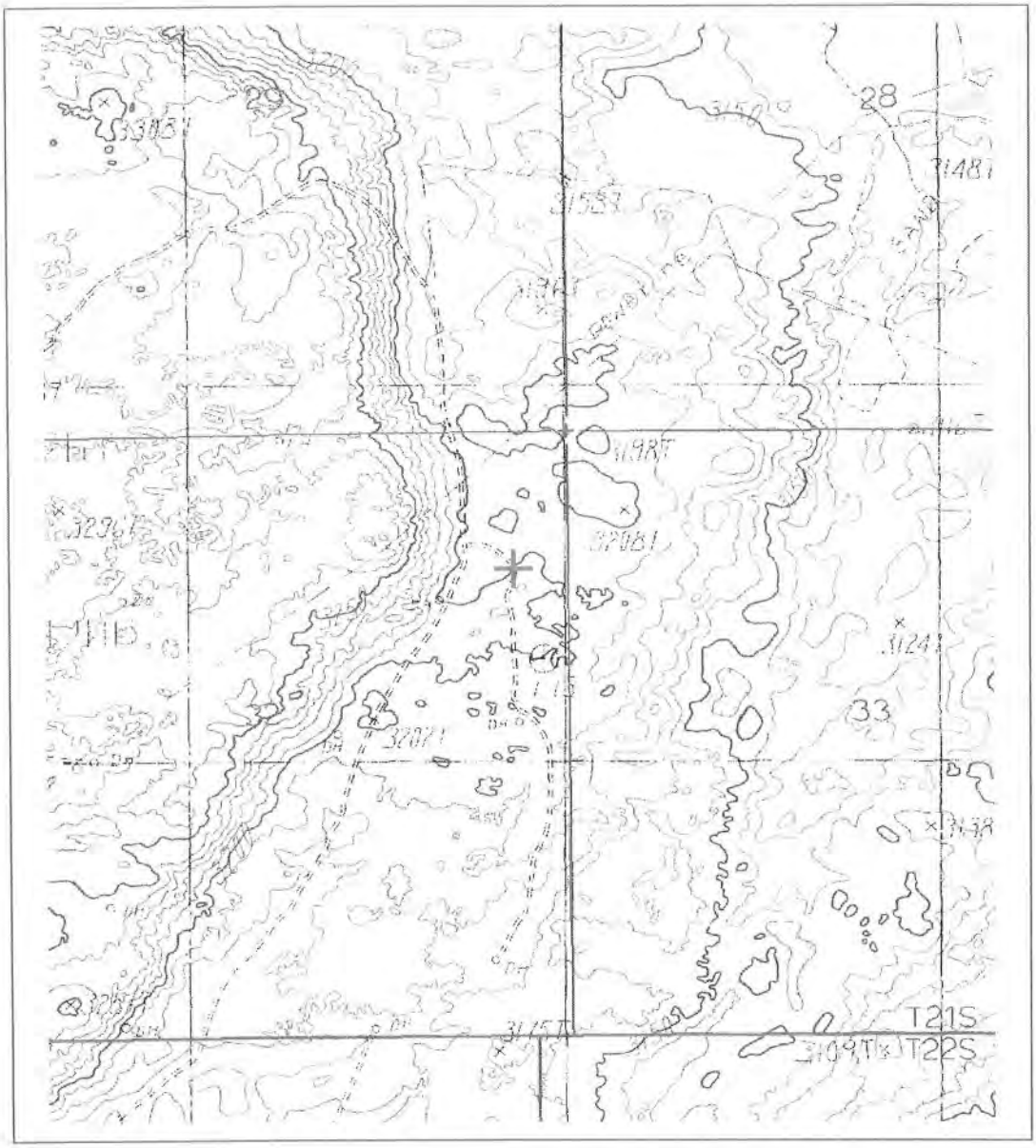
NAD 1983(92) (Meters)	N: 3,589,716	E: 603,822
NAD 1983(92) (Survey Feet)	N: 11,777,261	E: 1,981,040
NAD 1927 (Meters)	N: 3,589,514	E: 603,871
NAD 1927 (Survey Feet)	N: 11,776,598	E: 1,981,200

State Plane Coordinate System Zone: New Mexico East

NAD 1983(92) (Meters)	N: 159,711	E: 206,164
NAD 1983(92) (Survey Feet)	N: 523,986	E: 676,391
NAD 1927 (Meters)	N: 159,693	E: 193,612
NAD 1927 (Survey Feet)	N: 523,925	E: 635,209

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: C-POD5 Scale: 1:19,134

Northing/Easting: UTM83(92) (Meter): N: 3,589,716 E: 603,822

Northing/Easting: SPCS83(92) (Feet): N: 523,986 E: 676,391

GW Basin: Carlsbad

Print Date: 08/04/2014

Locator Tool Report

General Information:

Application ID: 29 Date: 08-04-2014 Time: 15:42:16

WR File Number: C-POD6
Purpose: OTHER

Applicant First Name: VIRGILIO COCIANNI
Applicant Last Name: SCHLUMBERGER TECH CORP

GW Basin: CARLSBAD
County: EDDY

Critical Management Area Name(s): NONE
Special Condition Area Name(s): NONE
Land Grant Name: NON GRANT

PLSS Description (New Mexico Principal Meridian):

SW 1/4 of SE 1/4 of NE 1/4 of NE 1/4 of Section 32, Township 21S, Range 30E.

Coordinate System Details:

Geographic Coordinates:

Latitude:	32 Degrees	26 Minutes	23.4 Seconds	N
Longitude:	103 Degrees	53 Minutes	44.4 Seconds	W

Universal Transverse Mercator Zone: 13N

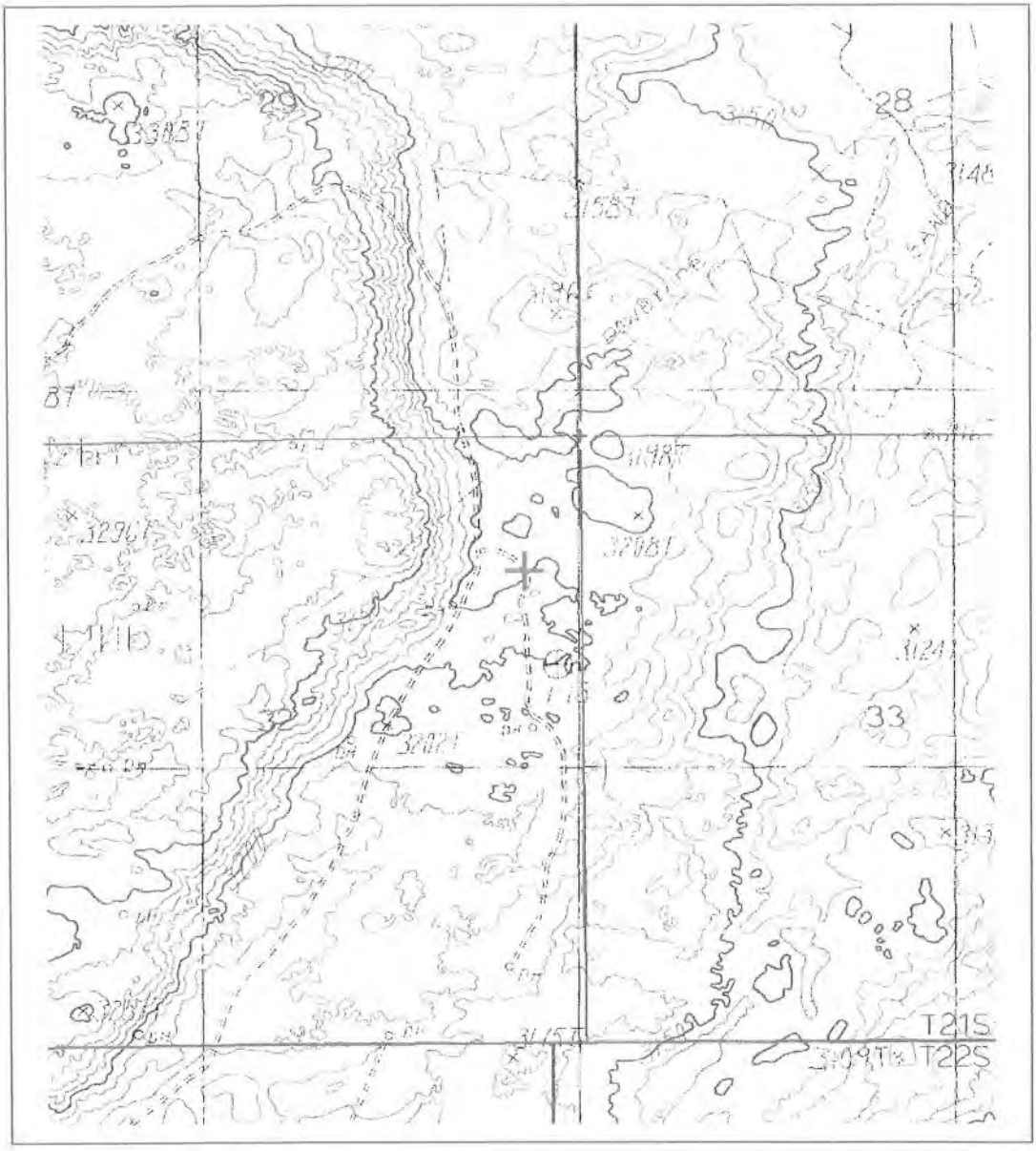
NAD 1983(92) (Meters)	N: 3,589,726	E: 603,813
NAD 1983(92) (Survey Feet)	N: 11,777,293	E: 1,981,011
NAD 1927 (Meters)	N: 3,589,524	E: 603,862
NAD 1927 (Survey Feet)	N: 11,776,629	E: 1,981,171

State Plane Coordinate System Zone: New Mexico East

NAD 1983(92) (Meters)	N: 159,721	E: 206,156
NAD 1983(92) (Survey Feet)	N: 524,018	E: 676,362
NAD 1927 (Meters)	N: 159,702	E: 193,603
NAD 1927 (Survey Feet)	N: 523,957	E: 635,180

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: C-POD6 Scale: 1:19,134

Northing/Easting: UTM83(92) (Meter): N: 3,589,726 E: 603,813

Northing/Easting: SPCS83(92) (Feet): N: 524,018 E: 676,362

GW Basin: Carlsbad

Print Date: 08/04/2014

Locator Tool Report

General Information:

Application ID: 29 Date: 08-04-2014 Time: 15:43:00

WR File Number: C-POD7
Purpose: OTHER

Applicant First Name: VIRGILIO COCIANNI
Applicant Last Name: SCHLUMBERGER TECH CORP

GW Basin: CARLSBAD
County: EDDY

Critical Management Area Name(s): NONE
Special Condition Area Name(s): NONE
Land Grant Name: NON GRANT

PLSS Description (New Mexico Principal Meridian):

SW 1/4 of SE 1/4 of NE 1/4 of NE 1/4 of Section 32, Township 21S, Range 30E.

Coordinate System Details:

Geographic Coordinates:

Latitude:	32 Degrees	26 Minutes	23.7 Seconds	N
Longitude:	103 Degrees	53 Minutes	44.7 Seconds	W

Universal Transverse Mercator Zone: 13N

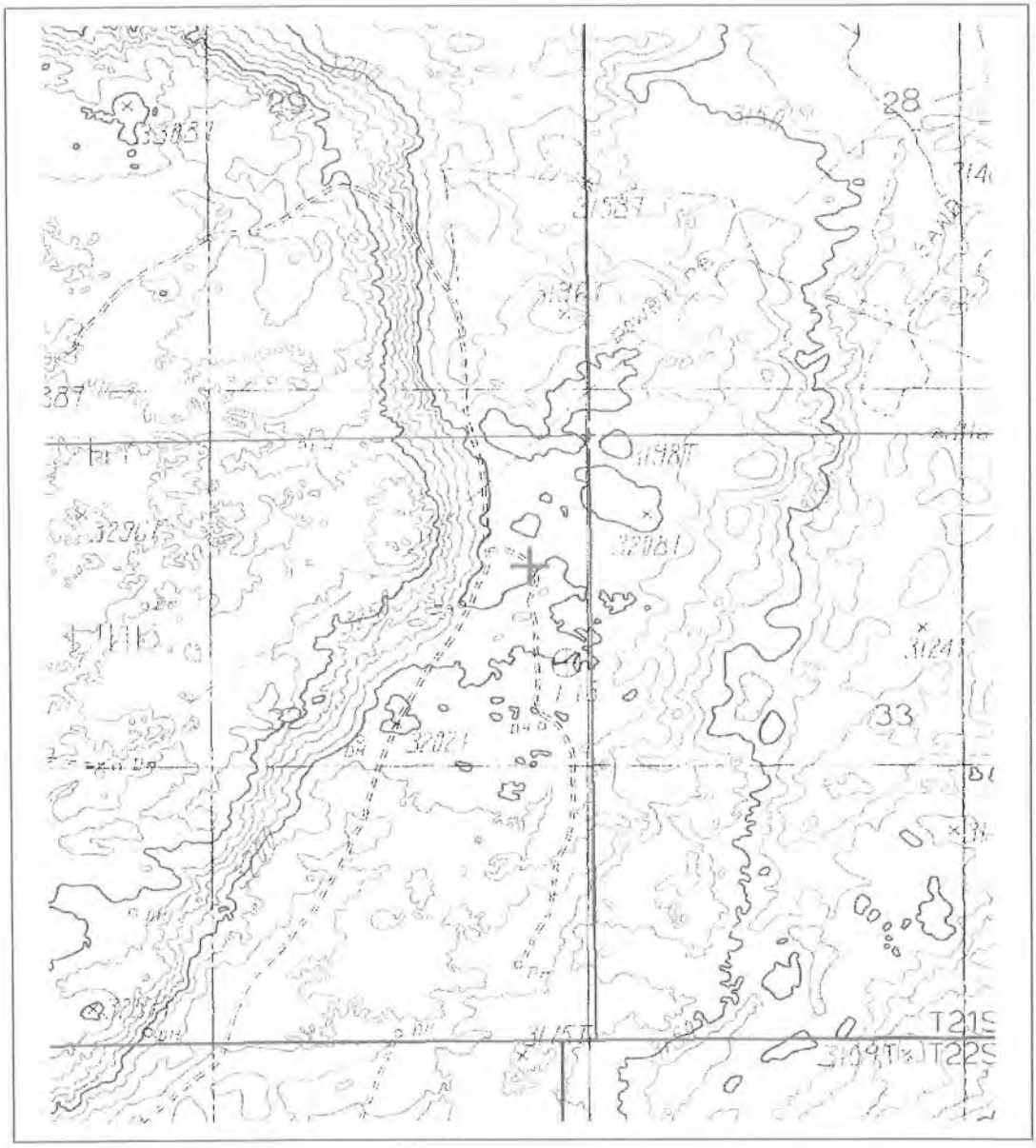
NAD 1983(92) (Meters)	N: 3,589,736	E: 603,804
NAD 1983(92) (Survey Feet)	N: 11,777,325	E: 1,980,981
NAD 1927 (Meters)	N: 3,589,534	E: 603,853
NAD 1927 (Survey Feet)	N: 11,776,662	E: 1,981,142

State Plane Coordinate System Zone: New Mexico East

NAD 1983(92) (Meters)	N: 159,731	E: 206,147
NAD 1983(92) (Survey Feet)	N: 524,050	E: 676,333
NAD 1927 (Meters)	N: 159,712	E: 193,594
NAD 1927 (Survey Feet)	N: 523,990	E: 635,151

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: C-POD7 Scale: 1:19,134

Northing/Easting: UTM83(92) (Meter): N: 3,589,736 E: 603,804

Northing/Easting: SPCS83(92) (Feet): N: 524,050 E: 676,333

GW Basin: Carlsbad

Print Date: 08/04/2014

Locator Tool Report

General Information:

Application ID:29 Date: 08-04-2014 Time: 15:43:36

WR File Number: C-POD8
Purpose: OTHER

Applicant First Name: VIRGILIO COCIANNI
Applicant Last Name: SCHLUMBERGER TECH CORP

GW Basin: CARLSBAD
County: EDDY

Critical Management Area Name(s): NONE
Special Condition Area Name(s): NONE
Land Grant Name: NON GRANT

PLSS Description (New Mexico Principal Meridian):

SW 1/4 of SE 1/4 of NE 1/4 of NE 1/4 of Section 32, Township 21S, Range 30E.

Coordinate System Details:

Geographic Coordinates:

Latitude:	32 Degrees	26 Minutes	24.0 Seconds	N
Longitude:	103 Degrees	53 Minutes	45.0 Seconds	W

Universal Transverse Mercator Zone: 13N

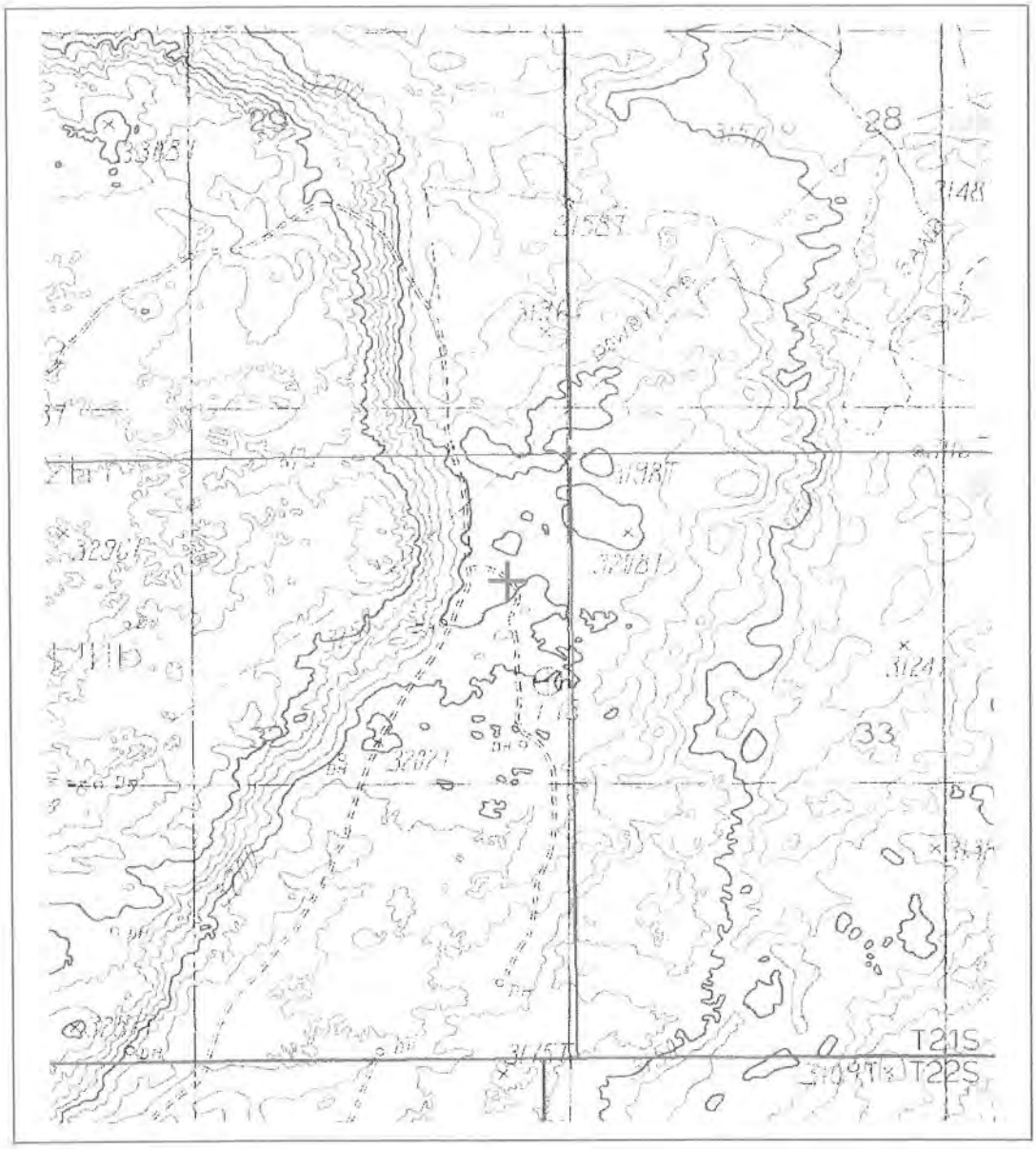
NAD 1983(92) (Meters)	N: 3,589,745	E: 603,796
NAD 1983(92) (Survey Feet)	N: 11,777,355	E: 1,980,953
NAD 1927 (Meters)	N: 3,589,543	E: 603,845
NAD 1927 (Survey Feet)	N: 11,776,692	E: 1,981,114

State Plane Coordinate System Zone: New Mexico East

NAD 1983(92) (Meters)	N: 159,740	E: 206,138
NAD 1983(92) (Survey Feet)	N: 524,080	E: 676,305
NAD 1927 (Meters)	N: 159,722	E: 193,586
NAD 1927 (Survey Feet)	N: 524,020	E: 635,123

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: C-POD8 Scale: 1:19,134

Northing/Easting: UTM83(92) (Meter): N: 3,589,745 E: 603,796

Northing/Easting: SPCS83(92) (Feet): N: 524,080 E: 676,305

GW Basin: Carlsbad

Print Date: 08/04/2014

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:	
469935.14.04.02	EW-03	SHEET 1 OF 2

Soil Boring Log

PROJECT : Former Dowell Schlumberger Facility
LOCATION : Artesia, New Mexico

ELEVATION : not measured
DRILLING CONTRACTOR AND DRILL RIG : National Exploration Wells and Pumps, CME 85

COORDINATES : N 32.44, E -103.89, (estim)
DRILLING METHOD AND EQUIPMENT : 4.25-in ID HSA with continuous core

WATER LEVEL : not measured
START : 8/22/14 10:07 END : 8/22/14 12:05 LOGGER : Aleeca Forsberg

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DRILLING DETAILS
			Soil removed with hand auger during utility clearance	
	0.0			
5			**SANDY SILT (ML)** light reddish brown (5YR 6/3), dry, low plasticity, cohesive, mottled white-caliche	Soil logged from continuous core
	5.0		**SILT (ML)** white / pinkish gray (5YR 8/1), dry, low plasticity, cohesive, mottled with light red nodules and mottled white-caliche, nodules get fewer grading down core	Headspace=0.0 ppm
10				Headspace=0.0 ppm
			No recovery	
	3.0		**SILT (ML)** white / pinkish gray (5YR 8/1), dry, low plasticity, cohesive, mottled with light red nodules (as above) with less grading deeper	Headspace=0.0 ppm
			SILTY SAND (SM) reddish brown / moderate brown (5YR 4/4), dry, very loose, mostly very fine grained - up to 10% medium and coarse grained	Headspace=0.0 ppm
15			**SANDY LEAN CLAY (CL)** reddish brown (2.5YR 5/4), dry, noncohesive, non plastic, mottled grey 1" layer of coarse gravel at top of interval	Headspace=0.0 ppm
	4.0		No recovery	
			LEAN CLAY (CL) white / pinkish gray (5YR 8/1), partially cemented caliche, laminated, trace black organic stringers	Headspace=0.0 ppm
			SANDY SILT (ML) reddish brown (2.5YR 4/4), dry, low plasticity, cohesive, very fine sand, few (5%) fine gravel, laminated	
20			**POORLY GRADED SAND (SP)** light reddish brown (2.5YR 7/3), moist, loose to dense at shoe, 5% fine gravel	
	3.0		No recovery	Headspace=0.0 ppm
			WELL GRADED GRAVEL WITH CLAY (GW-GC) reddish brown (2.5YR 5/4), moist, low plasticity, coarse gravel to 4 cm diameter, grading to gravelly clay (CL)	Headspace=0.0 ppm
			SILT (ML) red (2.5YR 5/6), low plasticity, cohesive, laminated, 2% medium gravel	
25			**LEAN CLAY (CL)** red (2.5YR 5/6), low plasticity, cohesive, dense, 2% medium gravel	
	5.0		**POORLY GRADED SAND (SP)** reddish brown (2.5YR 5/4), wet, partially cemented, 5-7% fine gravel	
			WELL GRADED GRAVEL WITH CLAY AND SAND (GW-GC) light reddish brown (2.5YR 7/3) to reddish brown (2.5YR 4/4) interbedded with silt, wet, low plasticity, cohesive, silt is stiff and has 5% sand and gravel	
30			**SILT (ML)** red (2.5YR 4/6), wet, low plasticity, cohesive, medium stiff	Headspace=0.0 ppm
			SILT (ML) red (2.5YR 4/6), moist, low plasticity, cohesive, very soft, 2% medium gravel	
	5.0		**WELL GRADED GRAVEL WITH CLAY AND SAND (GW-GC)** pale red (2.5YR 7/2), wet, very loose, partially cemented at top	Headspace=0.0 ppm
			SILT (ML) red (2.5YR 4/6), moist, low plasticity, cohesive, very soft, 2% medium gravel	
35				

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:	
469935.14.04.02	EW-03	SHEET 2 OF 2

Soil Boring Log

PROJECT : Former Dowell Schlumberger Facility
LOCATION : Artesia, New Mexico

ELEVATION : not measured
DRILLING CONTRACTOR AND DRILL RIG : National Exploration Wells and Pumps, CME 85

COORDINATES : N 32.44, E -103.89, (estim)
DRILLING METHOD AND EQUIPMENT : 4.25-in ID HSA with continuous core

WATER LEVEL : not measured
START : 8/22/14 10:07 END : 8/22/14 12:05 LOGGER : Aleeca Forsberg

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DRILLING DETAILS
	5.0		**SILT (ML)** reddish brown (2.5YR 4/4), wet, low plasticity, cohesive, dense, 5-10% clay	
			SILT (ML) reddish brown (2.5YR 5/3), wet, low plasticity, cohesive, soft, 1" medium gravel layers (white) at 36' and 37.5'	Headspace=0.0 ppm
40			**SILTY SAND (SM)** reddish brown (2.5YR 4/4), wet, medium dense, 2% medium gravel, mottled grey, very fine sand	Headspace=0.0 ppm
	5.0		**CLAYEY SAND (SC)** light red (2.5YR 6/6), wet, loose, blocky, very fine sand	
			LEAN CLAY (CL) white (2.5YR 8/1), wet, medium plastic, cohesive, very soft	
			CLAYEY SAND (SC) reddish brown (2.5YR 4/4), wet, loose, predominantly very fine sand with 5% fine gravel	
45			**LEAN CLAY WITH SAND (CL)** variagated reddish brown (2.5YR 4/4), white (2.5YR 8/1), and grey (5YR 6/1) wet, low plasticity, cohesive, soft	
			GRAVELLY SILT WITH SAND (ML) pinkish gray / grayish orange pink (5YR 7/2), wet, partially cemented	
	4.5		No recovery	
			CALICHE pinkish white (5YR 8/2), wet, cemented to partially cemented	
			LEAN CLAY WITH SAND (CL) yellowish red / light brown (5YR 5/6), wet, low plasticity, cohesive, stiff, 10% silt, laminated	
50			**POORLY GRADED SAND (SP)** light reddish brown (2.5YR 6/4), wet, loose, predominantly fine grained	
	5.0		**POORLY GRADED SAND (SP)** light reddish brown (2.5YR 6/4), wet, loose, mostly fine grained	
			POORLY GRADED SAND WITH SILT (SP-SM) reddish yellow (5YR 6/6), wet, loose, thinly bedded, fine grained	
			POORLY GRADED SAND (SP) light greenish gray (10Y 8/1), wet, partially cemented, fine to medium grained	
55			**POORLY GRADED SAND WITH CLAY (SP-SC)** reddish yellow (5YR 6/6), wet, loose, thinly bedded, fine grained	
	5.0		**LEAN CLAY (CL)** white / yellowish gray (5Y 8/1), wet, non plastic, noncohesive, 5% fine sand	
			POORLY GRADED SAND (SP) white / yellowish gray (5Y 8/1), wet, very loose, predominantly fine and medium sand, laminated, 5-7% lean clay	
60			**LEAN CLAY (CL)** reddish brown (5YR 5/4), wet, low plasticity, cohesive, medium dense, gravel to 4 cm diameter speckled throughout	
			Boring terminated at 60.0 ft bgs.	
65				
70				

NEW SOIL BORING LOG; CH2M GEOTECH_12_COMMERCIAL.GLB; COMMERCIAL_PROJECT.GPJ; CH2M GEOTECH_12_CG.GDT; 2/11/15

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:	
469935.14.04.02	IJ-1	SHEET 1 OF 1

Soil Boring Log

PROJECT : Former Dowell Schlumberger Facility | LOCATION : Artesia, New Mexico

ELEVATION : not measured | DRILLING CONTRACTOR AND DRILL RIG : National Exploration Wells and Pumps, CME 85

COORDINATES : N 32.44, E -103.90, (estim) | DRILLING METHOD AND EQUIPMENT : 4.25-in ID HSA with center plug

WATER LEVEL : not measured | START : 8/21/14 09:36 | END : 8/21/14 09:52 | LOGGER : Aleeca Forsberg

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DRILLING DETAILS
0			**SILT (ML)** pale red (2.5YR 7/2), dry, non plastic, noncohesive, like flour	Soil logged from auger cuttings Headspace=4.7 ppm
5			**SILT (ML)** pale red (2.5YR 7/2), dry, non plastic, noncohesive, like flour, with white clay/caliche chunks	Headspace=0.2 ppm
10			**LEAN CLAY (CL)** light reddish brown (2.5YR 6/3), dry, low plasticity, cohesive, trace (5-7%) medium to coarse sand, white clay/caliche chunks (15%)	Headspace=0.0 ppm
15			**LEAN CLAY (CL)** reddish brown (2.5YR 4/4), moist, low plasticity, cohesive, few (10-12%) fine to coarse sand	Headspace=0.0 ppm
20			**SILT (ML)** reddish brown (2.5YR 5/4), wet, low plasticity, cohesive, few (10-12%) fine to coarse sand	Headspace=0.0 ppm
25			**SILT (ML)** reddish brown (2.5YR 5/4), wet, low plasticity, cohesive, few (10-12%) fine to coarse sand, trace rust colored mottles	Headspace=0.0 ppm
30			Boring terminated at 31.5 ft bgs.	
35				

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:	
469935.14.04.02	IJ-2	SHEET 1 OF 1

Soil Boring Log

PROJECT : Former Dowell Schlumberger Facility
LOCATION : Artesia, New Mexico
ELEVATION : not measured
DRILLING CONTRACTOR AND DRILL RIG : National Exploration Wells and Pumps, CME 85
COORDINATES : N 32.44, E -103.90, (estim)
DRILLING METHOD AND EQUIPMENT : 4.25-in ID HSA with center plug
WATER LEVEL : not measured
START : 8/21/14 08:00 END : 8/21/14 08:19 LOGGER : Aleeca Forsberg

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DRILLING DETAILS
			Soil removed with hand auger during utility clearance	Soil logged from auger cuttings
5			**SILT (ML)** light reddish brown (2.5YR 6/4), dry, non-plastic, noncohesive	Headspace=0.0 ppm
10			**SILT (ML)** reddish brown (2.5YR 5/4), dry, medium plasticity, cohesive, trace (5-7%) white clay nodules and caliche chunks, little medium to coarse sand	
15			Not Logged	
20			**LEAN CLAY (CL)** reddish brown (2.5YR 4/4), moist, low plasticity, noncohesive, little (8-12%) fine to coarse angular sand	Headspace=0.0 ppm
25			**SILT (ML)** reddish brown (2.5YR 4/3), wet, non plastic, noncohesive, trace (5-7%) fine to coarse sand	
30			Boring terminated at 31.5 ft bgs.	
35				

NEW SOIL BORING LOG; CH2M GEOTECH_12_COMMERCIAL.GLB; COMMERCIAL_PROJECT.GPJ; CH2M GEOTECH_12_CG.GDT; 2/11/15

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:	
469935.14.04.02	IJ-3	SHEET 1 OF 1

Soil Boring Log

PROJECT : Former Dowell Schlumberger Facility
LOCATION : Artesia, New Mexico

ELEVATION : not measured
DRILLING CONTRACTOR AND DRILL RIG : National Exploration Wells and Pumps, CME 85

COORDINATES : N 32.44, E -103.90, (estim)
DRILLING METHOD AND EQUIPMENT : 4.25-in ID HSA with center plug

WATER LEVEL : not measured
START : 8/20/14 16:13 END : 8/20/14 04:43 LOGGER : Aleeca Forsberg

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DRILLING DETAILS
0			**SILT (ML)** pale red (2.5YR 7/2), dry, non plastic, noncohesive, almost like flour	Soil logged from auger cuttings Headspace=0.0 ppm
5			**SILT (ML)** pale red (2.5YR 7/2), dry, non plastic, noncohesive, almost like flour, trace fine gravel, 5-7% clay	Headspace=0.0 ppm
10			**LEAN CLAY (CL)** reddish brown (2.5YR 5/3), dry, low plasticity, cohesive, few fine to medium gravel, trace fine to coarse sand	Headspace=0.0 ppm
15			Not logged	
20			**SILT (ML)** reddish brown (2.5YR 5/3), wet, low plasticity, cohesive, trace fine to medium gravel, few fine to coarse sand	
25			**SILT (ML)** reddish brown (2.5YR 5/3), wet, low plasticity, cohesive, trace fine to medium gravel, few fine to coarse sand	
30			Boring terminated at 32.0 ft bgs.	
35				

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:	
469935.14.04.02	IJ-4	SHEET 1 OF 1

Soil Boring Log

PROJECT : Former Dowell Schlumberger Facility
LOCATION : Artesia, New Mexico

ELEVATION : not measured
DRILLING CONTRACTOR AND DRILL RIG : National Exploration Wells and Pumps, CME 85

COORDINATES : N 32.44, E -103.90, (estim)
DRILLING METHOD AND EQUIPMENT : 4.250-in ID HSA with center plug

WATER LEVEL : not measured
START : 8/20/14 14:52 END : 8/20/14 15:10 LOGGER : Aleeca Forsberg

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DRILLING DETAILS
0			**SILT (ML)** light reddish brown (2.5YR 7/3), dry, non plastic, noncohesive, trace medium gravel	Soil logged from auger cuttings Headspace=0.0 ppm
5			**SILT (ML)** light reddish brown (2.5YR 7/3), dry, non plastic, noncohesive, trace medium gravel, with white caliche-like nodules/chunks up to 2.54 cm diameter though some are very soft and friable	Headspace=0.1 ppm
10			**LEAN CLAY (CL)** light reddish brown (2.5YR 7/3), low plasticity, cohesive, abundant white nodules/chunks as above	Headspace=0.1 ppm
15			**LEAN CLAY (CL)** reddish brown (2.5YR 5/3), moist, low plasticity, cohesive, 5% fine to coarse sand	Headspace=0.0 ppm
20			**SILT (ML)** reddish brown (2.5YR 5/3), moist, low plasticity, cohesive, 5-7% fine to coarse sand	Headspace=0.0 ppm
25			**LEAN CLAY (CL)** reddish brown (2.5YR 5/3), wet, low plasticity, cohesive, 5-7% fine to coarse sand, 10% silt	Headspace=0.0 ppm
30			Boring terminated at 31.0 ft bgs.	
35				

NEW SOIL BORING LOG; CH2M GEOTECH_12_COMMERCIAL.GLB; COMMERCIAL_PROJECT.GPJ; CH2M GEOTECH_12_CG.GDT; 2/11/15

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:	
469935.14.04.02	IJ-5	SHEET 1 OF 1

Soil Boring Log

PROJECT : Former Dowell Schlumberger Facility
LOCATION : Artesia, New Mexico
ELEVATION : not measured
DRILLING CONTRACTOR AND DRILL RIG : National Exploration Wells and Pumps, CME 85
COORDINATES : N 32.44, E -103.90, (estim)
DRILLING METHOD AND EQUIPMENT : 4.25-in ID HSA with center plug
WATER LEVEL : not measured
START : 8/19/14 11:51
END : 8/19/2014
LOGGER : Aleeca Forsberg

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DRILLING DETAILS
0			**SILT (ML)** light reddish brown (2.5YR 6/3), dry, non plastic, noncohesive, few medium sands	Soil logged from auger cuttings Headspace=0.1 ppm
5			**SILT (ML)** reddish brown (2.5YR 5/4), dry, non plastic, noncohesive, few medium sands, 5-7% clay	Headspace=0.2 ppm
10			**LEAN CLAY (CL)** light reddish brown (2.5YR 6/3), moist, non plastic, noncohesive, trace fine sands	Headspace=0.1 ppm
15			**LEAN CLAY (CL)** reddish brown (2.5YR 4/4), wet, non plastic, cohesive, few medium sand	Headspace=0.2 ppm
20			**SILT (ML)** reddish brown (2.5YR 5/3), wet, low plasticity, cohesive, 10% clay	Headspace=0.1 ppm
25			**SILT (ML)** reddish brown (2.5YR 5/4), wet, low plasticity, cohesive, few well graded sands	Headspace=0.6 ppm
30			Boring terminated at 31.5 ft bgs.	
35				

NEW SOIL BORING LOG; CH2M GEOTECH_12_COMMERCIAL.GLB; COMMERCIAL_PROJECT.GPJ; CH2M GEOTECH_12_CG.GDT; 2/11/15

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:	
469935.14.04.02	IJ-6	SHEET 1 OF 1

Soil Boring Log

PROJECT : Former Dowell Schlumberger Facility
LOCATION : Artesia, New Mexico
ELEVATION : not measured
DRILLING CONTRACTOR AND DRILL RIG : National Exploration Wells and Pumps, CME 85
COORDINATES : N 32.44, E -103.90, (estim)
DRILLING METHOD AND EQUIPMENT : 4.25-in ID HSA with center plug
WATER LEVEL : not measured
START : 8/19/14 10:44 END : 8/19/14 10:58 LOGGER : Aleeca Forsberg

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DRILLING DETAILS
0			**SANDY SILT (ML)** reddish brown (2.5YR 4/3), dry, non plastic, noncohesive, roots	Soil logged from auger cuttings Headspace=0.1 ppm
5			**SILT (ML)** pale red (2.5YR 6/2), dry, non plastic, noncohesive, clay nodules up to 2.5 cm - white with mottled grey and reddish brown when broken	Headspace=0.1 ppm
10			**LEAN CLAY (CL)** pale red (2.5YR 6/2), dry, low plasticity, noncohesive, white clay nodules to 1 cm, few coarse sand, trace fine gravel	Headspace=0.2 ppm
15			**LEAN CLAY (CL)** reddish brown (2.5YR 4/4), moist, low plasticity, noncohesive, trace fine to medium sand	Headspace=0.2 ppm
20			**SILT (ML)** reddish brown (2.5YR 4/3), wet, low plasticity, cohesive, few fine gravel	Headspace=0.3 ppm
25			**SILT (ML)** reddish brown (2.5YR 5/4), wet, low plasticity, cohesive, few fine gravel	Headspace=0.3 ppm
30			Boring terminated at 31.0 ft bgs.	
35				

NEW SOIL BORING LOG; CH2M GEOTECH_12_COMMERCIAL.GLB; COMMERCIAL_PROJECT.GPJ; CH2M GEOTECH_12_CG.GDT; 2/11/15

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:	
469935.14.04.02	IJ-7	SHEET 1 OF 1

Soil Boring Log

PROJECT : Former Dowell Schlumberger Facility | LOCATION : Artesia, New Mexico

ELEVATION : not measured | DRILLING CONTRACTOR AND DRILL RIG : National Exploration Wells and Pumps, CME 85

COORDINATES : N 32.44, E -103.90, (estim) | DRILLING METHOD AND EQUIPMENT : 4.25-in ID HSA with center plug

WATER LEVEL : not measured | START : 8/19/14 10:00 | END : 8/19/14 10:12 | LOGGER : Aleeca Forsberg

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DRILLING DETAILS
			No recovery, soil removed with hand auger during utility clearance	Soil logged from auger cuttings
5			**SILT (ML)** light reddish brown (2.5YR 7/3), dry, non plastic, noncohesive, 10-15% fine and medium sands, 5% fine gravel	Headspace=0.2 ppm
10			**LEAN CLAY (CL)** reddish brown (2.5YR 5/3), dry, low plasticity, noncohesive, 5-10% silt, 5% medium sands	Headspace=0.2 ppm
15			**LEAN CLAY WITH SAND (CL)** reddish brown (2.5YR 5/4), moist, low plasticity, cohesive, fine to coarse sands, few fine angular gravel with 2.5YR 5/6, dark red nodules	Headspace=0.1 ppm
20			**SILT (ML)** reddish brown (2.5YR 5/4), wet, medium plasticity, cohesive, few coarse sand	Headspace=0.2 ppm
25			**SILT (ML)** reddish brown (2.5YR 5/4), wet, medium plasticity, cohesive, few coarse sand, few fine gravel	Headspace=0.1 ppm
30			Boring terminated at 31.0 ft bgs.	
35				

NEW SOIL BORING LOG; CH2M GEOTECH_12_COMMERCIAL.GLB; COMMERCIAL_PROJECT.GPJ; CH2M GEOTECH_12_CG.GDT; 2/11/15

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:	
469935.14.04.02	IJ-8	SHEET 1 OF 1

Soil Boring Log

PROJECT : Former Dowell Schlumberger Facility
LOCATION : Artesia, New Mexico
ELEVATION : not measured
DRILLING CONTRACTOR AND DRILL RIG : National Exploration Wells and Pumps, CME 85
COORDINATES : N 32.44, E -103.90, (estim)
DRILLING METHOD AND EQUIPMENT : 4.25-in ID HSA with center plug
WATER LEVEL : not measured
START : 8/19/14 08:50 END : 8/19/14 09:06 LOGGER : Aleeca Forsberg

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DRILLING DETAILS
			No recovery, soil removed with hand auger during utility clearance	Soil logged from auger cuttings
5			Not logged	
10			**LEAN CLAY (CL)** light reddish brown (2.5YR 6/3), dry, low plasticity, noncohesive, 10-15% clay, little medium gravel	
15			**LEAN CLAY (CL)** reddish brown (2.5YR 5/3), moist, low plasticity, noncohesive, few medium sands	Headspace=0.1 ppm
20			**SILT (ML)** weak red (2.5YR 4/2), wet, low plasticity, noncohesive, few medium sands, 5-10% fine sand	Headspace=0.0 ppm
25			**SILT (ML)** reddish brown (2.5YR 4/4), wet, medium plasticity, cohesive, 5-7% fine sand, trace coarse sand	Headspace=0.0 ppm
30			Boring terminated at 30.5 ft bgs.	
35				

NEW SOIL BORING LOG; CH2M GEOTECH_12_COMMERCIAL.GLB; COMMERCIAL_PROJECT.GPJ; CH2M GEOTECH_12_CG.GDT; 2/11/15

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:	
469935.14.04.02	MW-34	SHEET 1 OF 1

Soil Boring Log

PROJECT : Former Dowell Schlumberger Facility
LOCATION : Artesia, New Mexico

ELEVATION : not measured
DRILLING CONTRACTOR AND DRILL RIG : National Exploration Wells and Pumps, CME 85

COORDINATES : N 32.44, E -103.89, (estim)
DRILLING METHOD AND EQUIPMENT : 4.25 ID HSA With Continuous Core

WATER LEVEL : not measured
START : 8/21/14 13:30 END : 8/21/14 14:50 LOGGER : Aleeca Forsberg

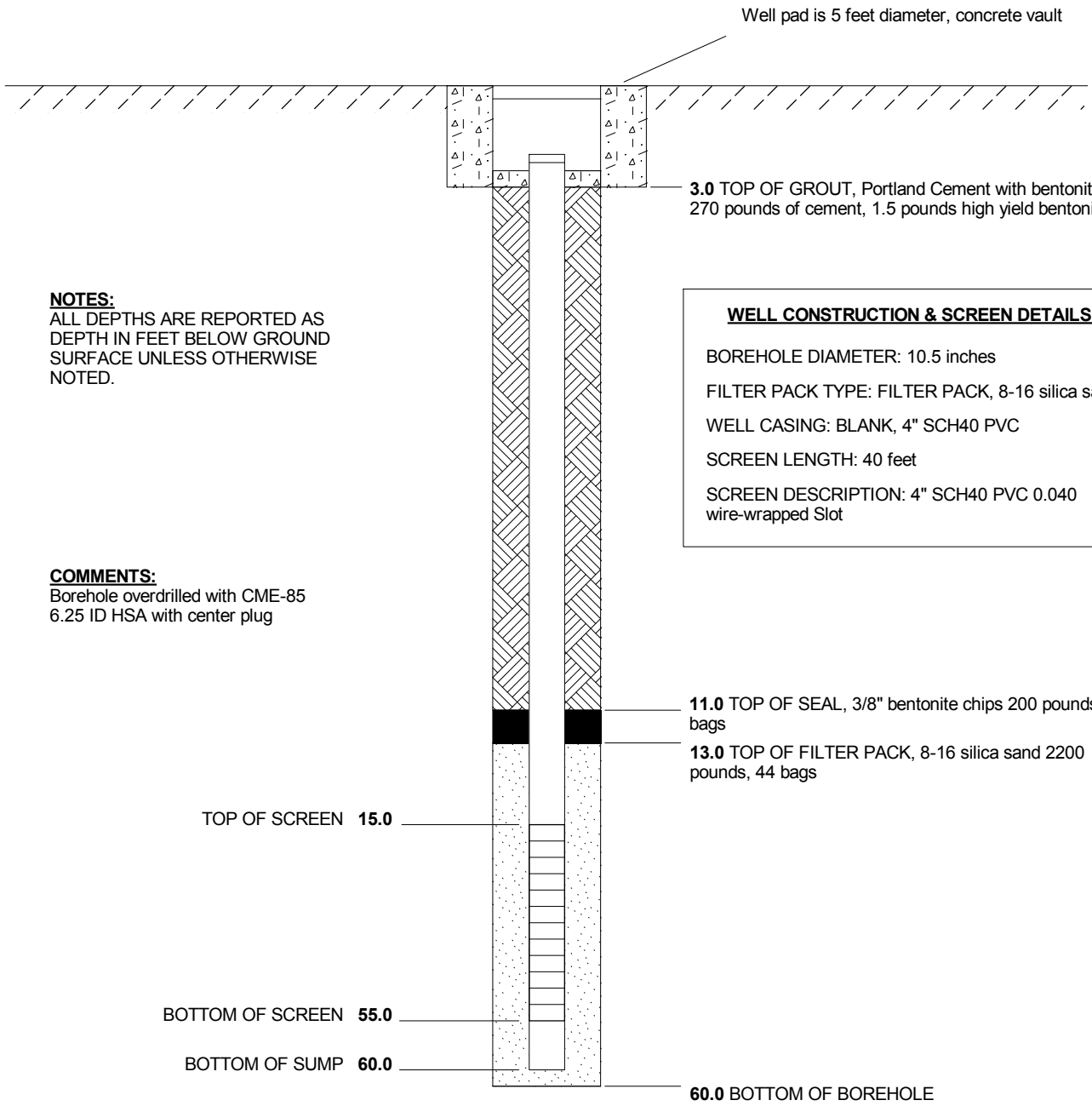
DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DRILLING DETAILS
	0.0		No recovery, soil removed with hand auger during utility clearance	Soil logged from continuous core
5	5.0		**SILT (ML)** light reddish gray (2.5YR 7/1), dry, non plastic, noncohesive, caliche-like throughout **SILT (ML)** light reddish gray (2.5YR 7/1), as above, less caliche-like **LEAN CLAY (CL)** white (2.5YR 8/1), dry, non plastic, noncohesive, hard **SILT (ML)** light reddish gray (2.5YR 7/1), dry, non plastic, noncohesive, caliche-like throughout	
10	3.0		No recovery **SILT (ML)** red (2.5YR 5/6), dry, non plastic, noncohesive, white caliche-like throughout, laminated at top 2 ft, chunky at bottom foot	Headspace=0.0 ppm
15	4.5		No recovery **POORLY GRADED SAND (SP)** yellowish red / light brown (5YR 5/6), moist, laminated, very loose, laminated mottled-oxidized, 5-10% silt, very fine sand **WELL GRADED GRAVEL WITH CLAY (GW-GC)** light reddish brown / light brown (5YR 6/4), moist, subrounded gravel **SILT (ML)** pinkish gray / grayish orange pink (5YR 7/2), moist, low plasticity, cohesive, 5% clay	Headspace=0.0 ppm
20	2.5		No recovery **SILT (ML)** reddish brown (2.5YR 4/4), wet, low plasticity, cohesive, soft, 10% medium gravel **CALICHE** pale red (2.5YR 7/2), dry, hard	Headspace=0.0 ppm
25	2.5		**LEAN CLAY (CL)** reddish brown (2.5YR 4/4), moist, low plasticity, cohesive, stiff **POORLY GRADED SAND (SP)** pink (2.5YR 8/4), dry, non plastic, very loose, very fine No recovery **SILT (ML)** light reddish brown / light brown (5YR 6/4), wet, low plasticity, cohesive soft	
30			**SILTY SAND (SM)** light reddish brown (5YR 6/3), wet, very loose, predominantly fine sand **SILT (ML)** light reddish brown (5YR 6/4) to reddish brown (5YR 5/4), wet, low plasticity, cohesive, 10-12% fine to medium sand No recovery	
35			Boring terminated at 36.5 ft bgs.	
40				

CH2MHILL

PROJECT NUMBER:	WELL NUMBER:
469935.14.04.02	EW-03

Well Completion Diagram

PROJECT : Former Dowell Schlumberger Facility		LOCATION : Artesia, New Mexico	
ELEVATION : not measured	TOC : not measured	DRILLING CONTRACTOR AND DRILL RIG : National Exploration Wells and Pumps, CME 85	
COORDINATES : N 32.44, E -103.89, (estim)		DRILLING METHOD AND EQUIPMENT : 6.25-in ID HSA with center plug	
WATER LEVEL : 18.75 ft bgs (measured before development)		START : 8/22/14 14:38	END : 8/23/2014 LOGGER : A. Forsberg



NOTES:
ALL DEPTHS ARE REPORTED AS DEPTH IN FEET BELOW GROUND SURFACE UNLESS OTHERWISE NOTED.

COMMENTS:
Borehole overdrilled with CME-85
6.25 ID HSA with center plug

WELL CONSTRUCTION & SCREEN DETAILS

BOREHOLE DIAMETER: 10.5 inches

FILTER PACK TYPE: FILTER PACK, 8-16 silica sand

WELL CASING: BLANK, 4" SCH40 PVC

SCREEN LENGTH: 40 feet

SCREEN DESCRIPTION: 4" SCH40 PVC 0.040 wire-wrapped Slot

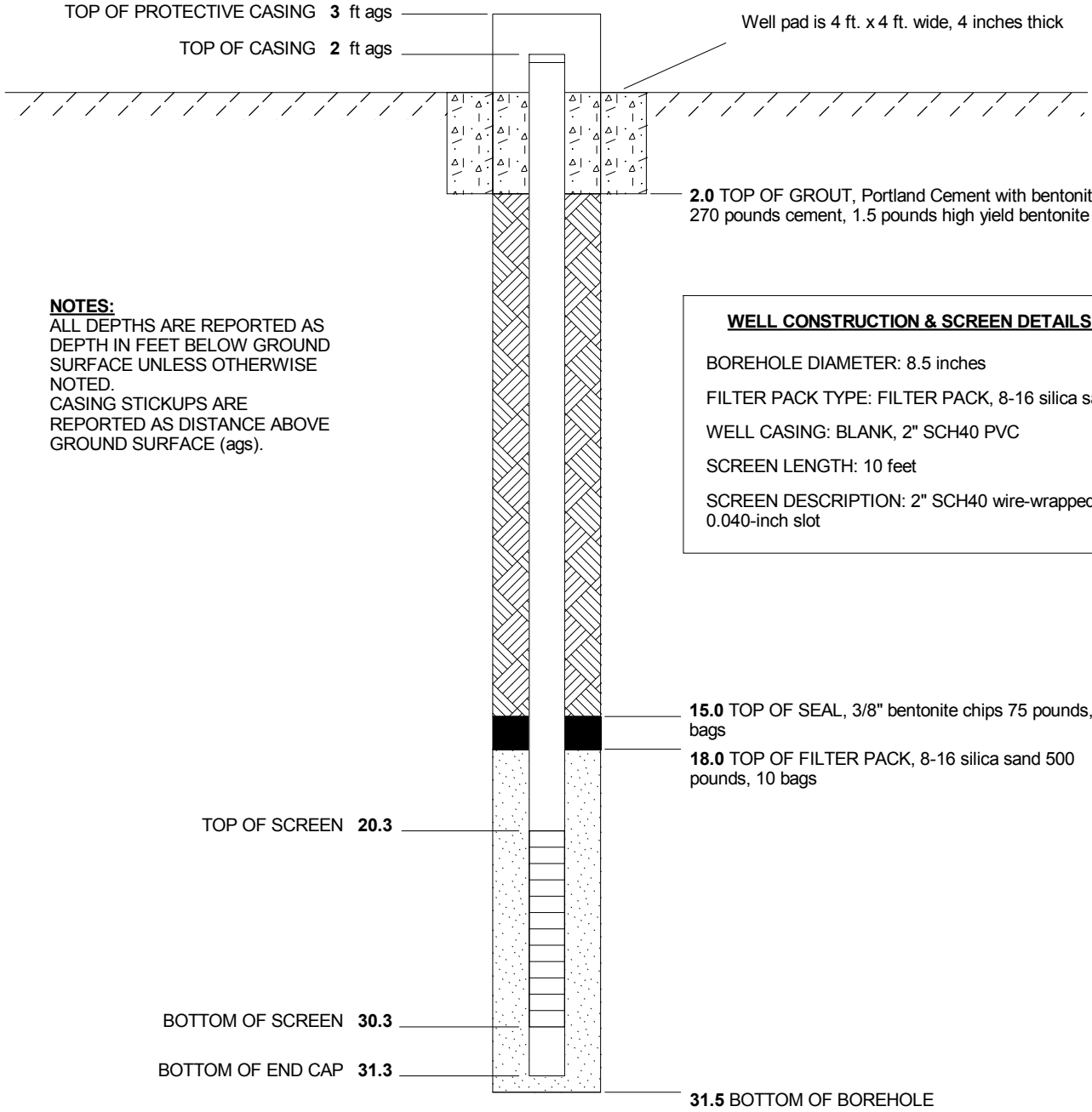
WELL DIAGRAM IS NOT TO SCALE

CH2MHILL

PROJECT NUMBER:	WELL NUMBER:
469935.14.04.02	IJ-1

Well Completion Diagram

PROJECT : Former Dowell Schlumberger Facility		LOCATION : Artesia, New Mexico	
ELEVATION : not measured	TOC : not measured	DRILLING CONTRACTOR AND DRILL RIG : National Exploration Wells and Pumps, CME 85	
COORDINATES : N 32.44, E -103.90, (estim)		DRILLING METHOD AND EQUIPMENT : 4.25-in ID HSA with center plug	
WATER LEVEL : 17.20 ft bgs (measured before development)		START : 8/21/14 09:56	END : 8/23/14 08:10 LOGGER : A. Forsberg



NOTES:
ALL DEPTHS ARE REPORTED AS DEPTH IN FEET BELOW GROUND SURFACE UNLESS OTHERWISE NOTED.
CASING STICKUPS ARE REPORTED AS DISTANCE ABOVE GROUND SURFACE (ags).

WELL CONSTRUCTION & SCREEN DETAILS

BOREHOLE DIAMETER: 8.5 inches

FILTER PACK TYPE: FILTER PACK, 8-16 silica sand

WELL CASING: BLANK, 2" SCH40 PVC

SCREEN LENGTH: 10 feet

SCREEN DESCRIPTION: 2" SCH40 wire-wrapped PVC 0.040-inch slot

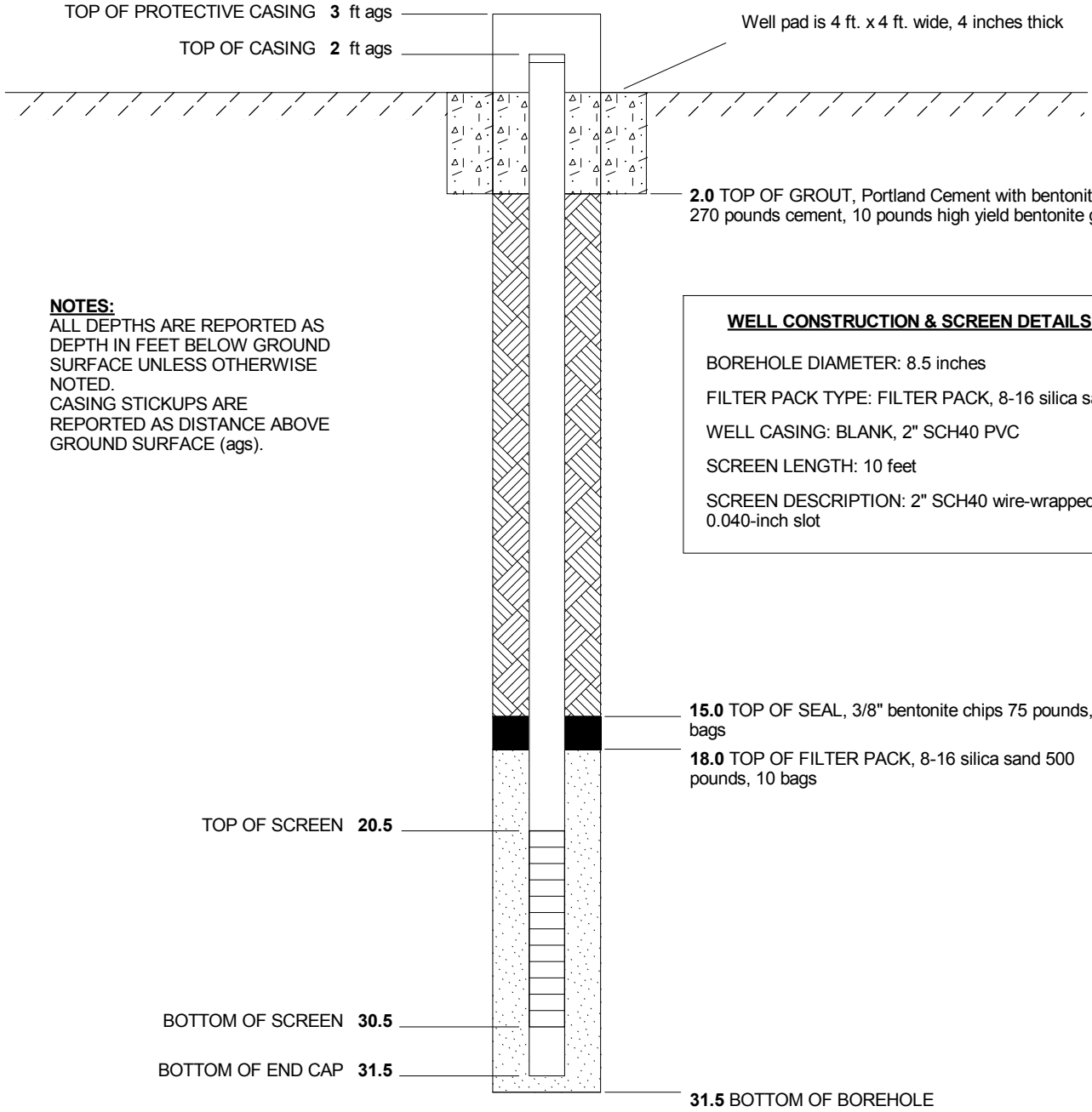
WELL DIAGRAM IS NOT TO SCALE

CH2MHILL

PROJECT NUMBER:	WELL NUMBER:
469935.14.04.02	IJ-2

Well Completion Diagram

PROJECT : Former Dowell Schlumberger Facility		LOCATION : Artesia, New Mexico	
ELEVATION : not measured	TOC : not measured	DRILLING CONTRACTOR AND DRILL RIG : National Exploration Wells and Pumps, CME 85	
COORDINATES : N 32.44, E -103.90, (estim)		DRILLING METHOD AND EQUIPMENT : 4.25-in ID HSA with center plug	
WATER LEVEL : 17.42 ft bgs (measured on 8/21/14)		START : 8/21/14 08:21	END : 8/21/2014 LOGGER : A. Forsberg



NOTES:
ALL DEPTHS ARE REPORTED AS DEPTH IN FEET BELOW GROUND SURFACE UNLESS OTHERWISE NOTED.
CASING STICKUPS ARE REPORTED AS DISTANCE ABOVE GROUND SURFACE (ags).

WELL CONSTRUCTION & SCREEN DETAILS

BOREHOLE DIAMETER: 8.5 inches

FILTER PACK TYPE: FILTER PACK, 8-16 silica sand

WELL CASING: BLANK, 2" SCH40 PVC

SCREEN LENGTH: 10 feet

SCREEN DESCRIPTION: 2" SCH40 wire-wrapped PVC 0.040-inch slot

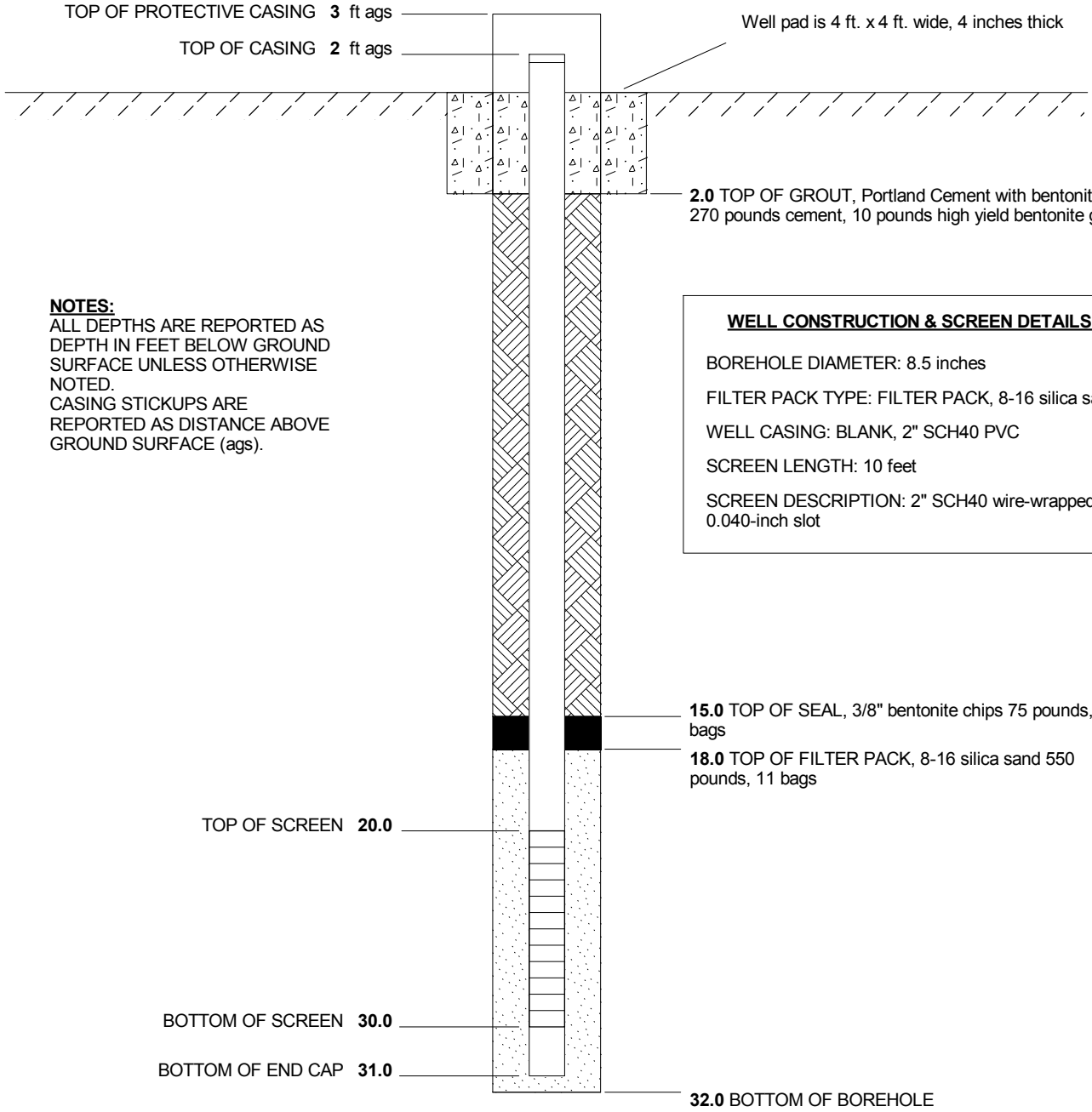
WELL DIAGRAM IS NOT TO SCALE

CH2MHILL

PROJECT NUMBER:	WELL NUMBER:
469935.14.04.02	IJ-3

Well Completion Diagram

PROJECT : Former Dowell Schlumberger Facility		LOCATION : Artesia, New Mexico	
ELEVATION : not measured	TOC : not measured	DRILLING CONTRACTOR AND DRILL RIG : National Exploration Wells and Pumps, CME 85	
COORDINATES : N 32.44, E -103.90, (estim)		DRILLING METHOD AND EQUIPMENT : 4.25-in ID HSA with center plug	
WATER LEVEL : 16.68 ft bgs (measured on 8/21/14)		START : 8/20/14 16:50	END : 8/21/14 10:25 LOGGER : A. Forsberg



NOTES:
ALL DEPTHS ARE REPORTED AS DEPTH IN FEET BELOW GROUND SURFACE UNLESS OTHERWISE NOTED.
CASING STICKUPS ARE REPORTED AS DISTANCE ABOVE GROUND SURFACE (ags).

WELL CONSTRUCTION & SCREEN DETAILS

BOREHOLE DIAMETER: 8.5 inches

FILTER PACK TYPE: FILTER PACK, 8-16 silica sand

WELL CASING: BLANK, 2" SCH40 PVC

SCREEN LENGTH: 10 feet

SCREEN DESCRIPTION: 2" SCH40 wire-wrapped PVC 0.040-inch slot

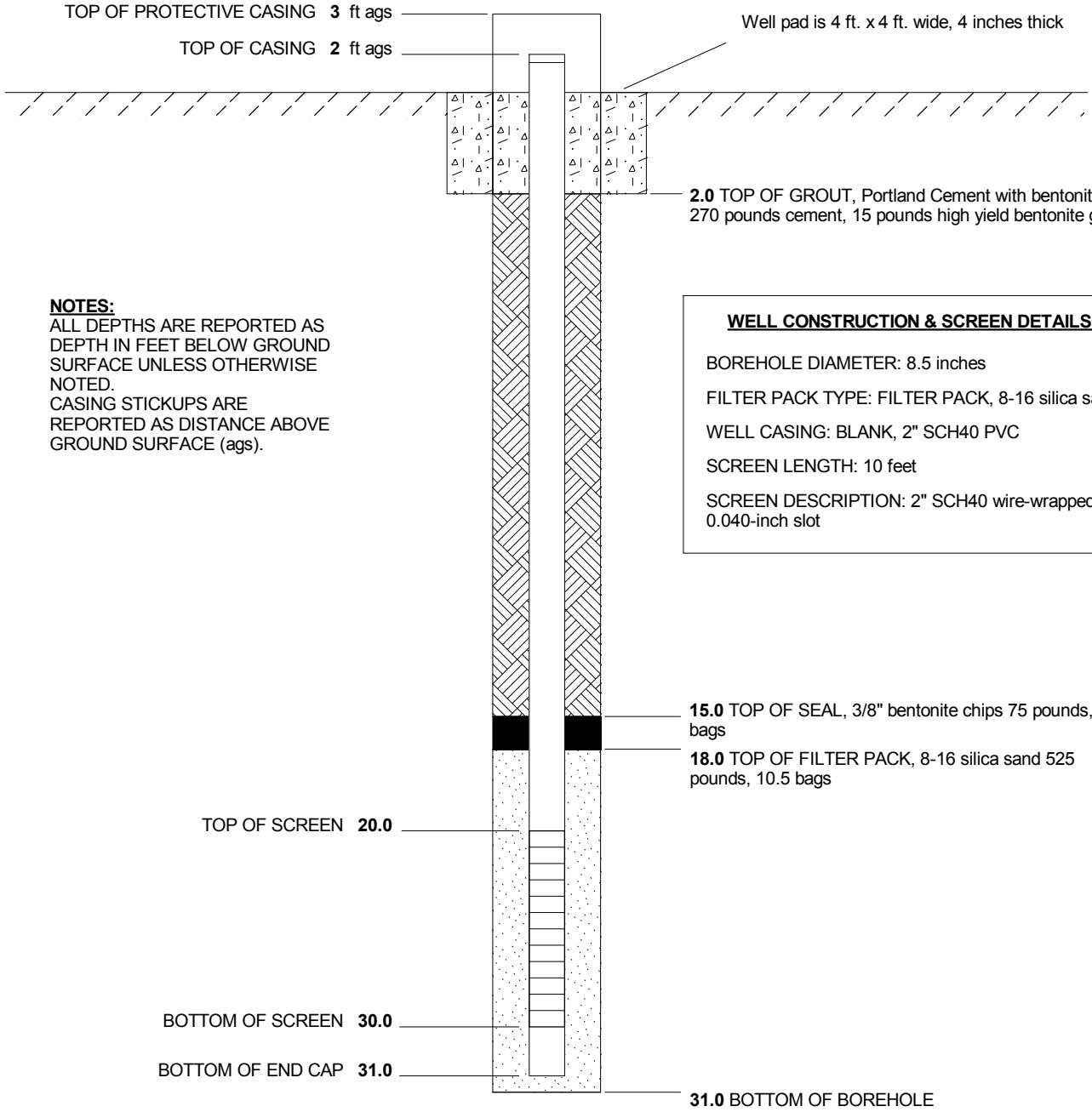
WELL DIAGRAM IS NOT TO SCALE

CH2MHILL

PROJECT NUMBER:	WELL NUMBER:
469935.14.04.02	IJ-4

Well Completion Diagram

PROJECT : Former Dowell Schlumberger Facility		LOCATION : Artesia, New Mexico	
ELEVATION : not measured	TOC : not measured	DRILLING CONTRACTOR AND DRILL RIG : National Exploration Wells and Pumps, CME 85	
COORDINATES : N 32.44, E -103.90, (estim)		DRILLING METHOD AND EQUIPMENT : 4.25-in ID HSA with center plug	
WATER LEVEL : 16.74 ft bgs (measured before well development)		START : 8/20/14 15:21	END : 8/20/14 15:40 LOGGER : A. Forsberg



NOTES:
ALL DEPTHS ARE REPORTED AS DEPTH IN FEET BELOW GROUND SURFACE UNLESS OTHERWISE NOTED.
CASING STICKUPS ARE REPORTED AS DISTANCE ABOVE GROUND SURFACE (ags).

WELL CONSTRUCTION & SCREEN DETAILS

BOREHOLE DIAMETER: 8.5 inches

FILTER PACK TYPE: FILTER PACK, 8-16 silica sand

WELL CASING: BLANK, 2" SCH40 PVC

SCREEN LENGTH: 10 feet

SCREEN DESCRIPTION: 2" SCH40 wire-wrapped PVC 0.040-inch slot

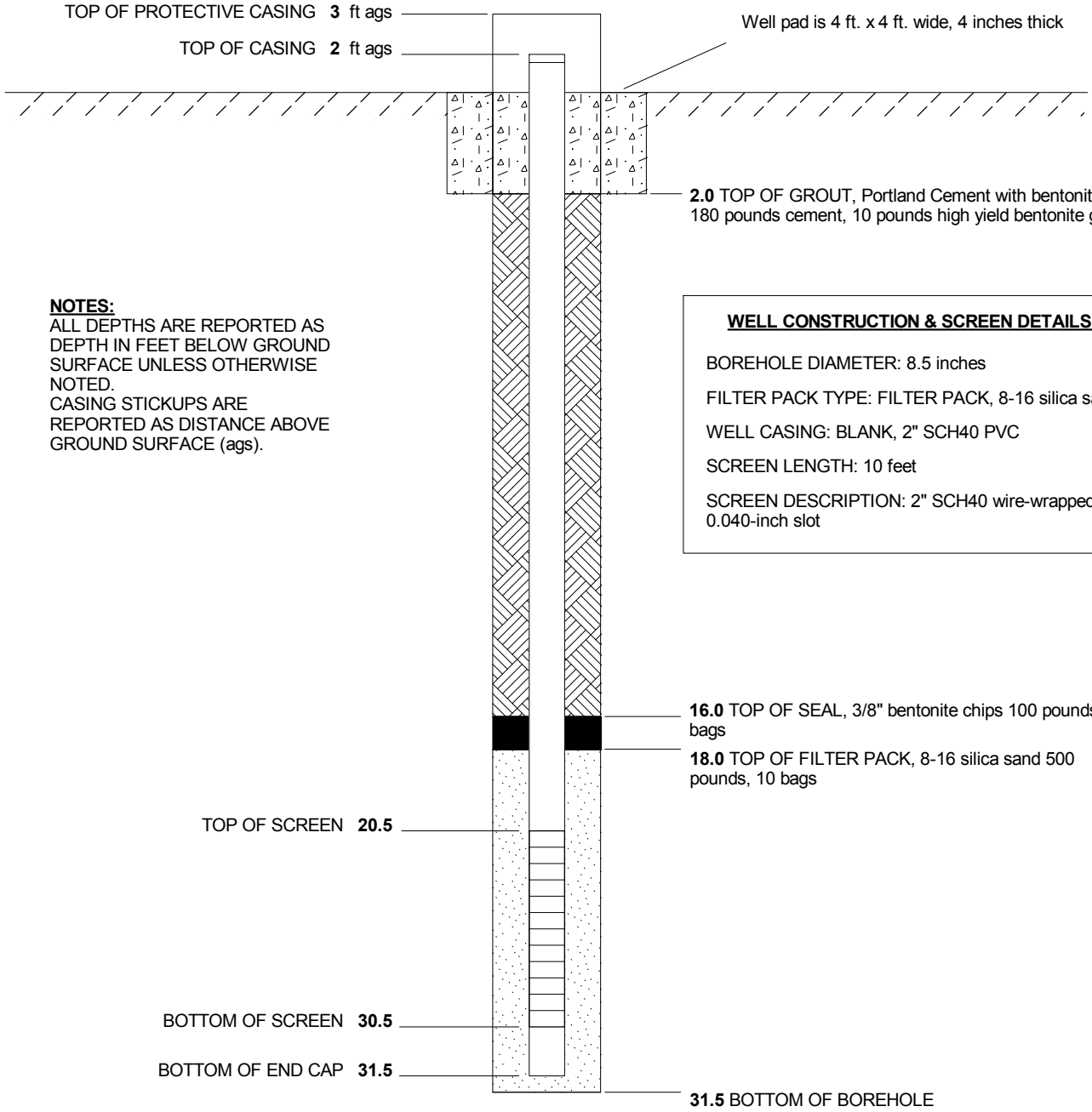
WELL DIAGRAM IS NOT TO SCALE

CH2MHILL

PROJECT NUMBER:	WELL NUMBER:
469935.14.04.02	IJ-5

Well Completion Diagram

PROJECT : Former Dowell Schlumberger Facility		LOCATION : Artesia, New Mexico	
ELEVATION : not measured	TOC : not measured	DRILLING CONTRACTOR AND DRILL RIG : National Exploration Wells and Pumps, CME 85	
COORDINATES : N 32.44, E -103.90, (estim)		DRILLING METHOD AND EQUIPMENT : 4.25-in ID HSA with center plug	
WATER LEVEL : 15.00 ft bgs (measured after well development)		START : 8/20/14 07:53	END : 8/20/14 09:03 LOGGER : A. Forsberg



NOTES:
ALL DEPTHS ARE REPORTED AS DEPTH IN FEET BELOW GROUND SURFACE UNLESS OTHERWISE NOTED.
CASING STICKUPS ARE REPORTED AS DISTANCE ABOVE GROUND SURFACE (ags).

WELL CONSTRUCTION & SCREEN DETAILS

BOREHOLE DIAMETER: 8.5 inches

FILTER PACK TYPE: FILTER PACK, 8-16 silica sand

WELL CASING: BLANK, 2" SCH40 PVC

SCREEN LENGTH: 10 feet

SCREEN DESCRIPTION: 2" SCH40 wire-wrapped PVC 0.040-inch slot

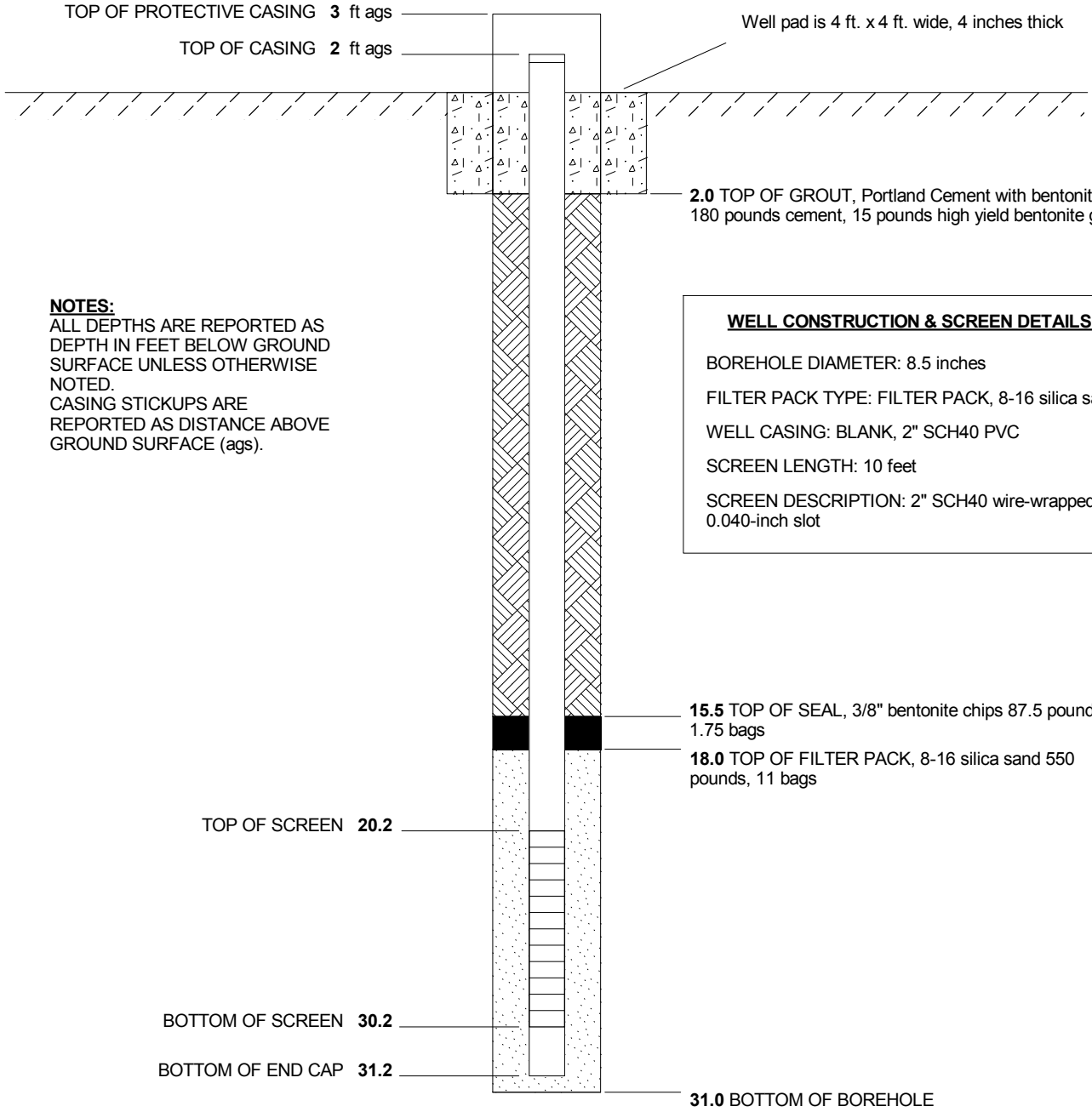
WELL DIAGRAM IS NOT TO SCALE

CH2MHILL

PROJECT NUMBER:	WELL NUMBER:
469935.14.04.02	IJ-6

Well Completion Diagram

PROJECT : Former Dowell Schlumberger Facility		LOCATION : Artesia, New Mexico	
ELEVATION : not measured	TOC : not measured	DRILLING CONTRACTOR AND DRILL RIG : National Exploration Wells and Pumps, CME 85	
COORDINATES : N 32.44, E -103.90, (estim)		DRILLING METHOD AND EQUIPMENT : 4.25-in ID HSA with center plug	
WATER LEVEL : 16.60 ft bgs (measured before well development)		START : 8/20/14 09:24	END : 8/20/2014 LOGGER : A. Forsberg



NOTES:
ALL DEPTHS ARE REPORTED AS DEPTH IN FEET BELOW GROUND SURFACE UNLESS OTHERWISE NOTED.
CASING STICKUPS ARE REPORTED AS DISTANCE ABOVE GROUND SURFACE (ags).

WELL CONSTRUCTION & SCREEN DETAILS

BOREHOLE DIAMETER: 8.5 inches

FILTER PACK TYPE: FILTER PACK, 8-16 silica sand

WELL CASING: BLANK, 2" SCH40 PVC

SCREEN LENGTH: 10 feet

SCREEN DESCRIPTION: 2" SCH40 wire-wrapped PVC 0.040-inch slot

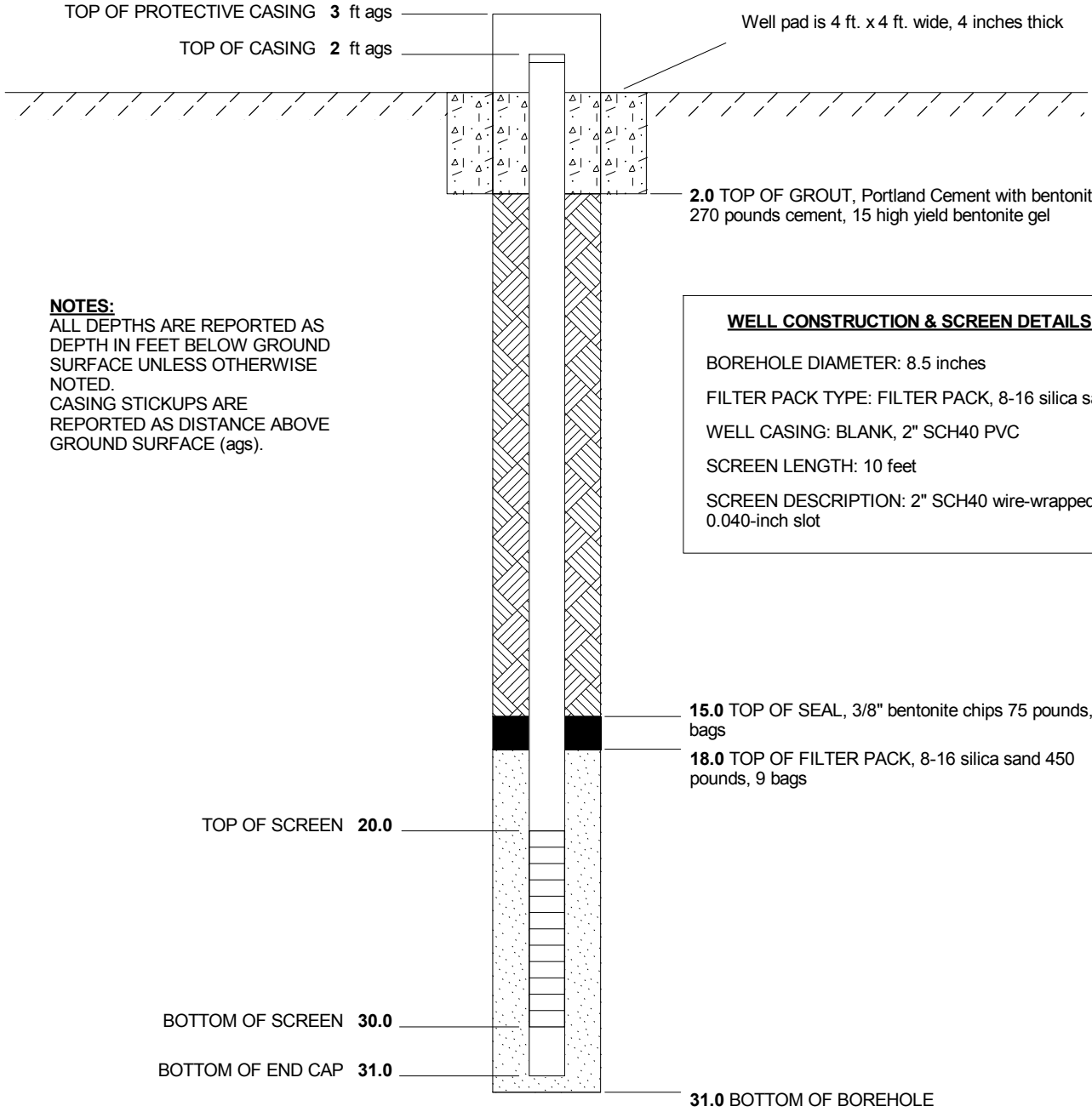
WELL DIAGRAM IS NOT TO SCALE

CH2MHILL

PROJECT NUMBER:	WELL NUMBER:
469935.14.04.02	IJ-7

Well Completion Diagram

PROJECT : Former Dowell Schlumberger Facility		LOCATION : Artesia, New Mexico	
ELEVATION : not measured	TOC : not measured	DRILLING CONTRACTOR AND DRILL RIG : National Exploration Wells and Pumps, CME 85	
COORDINATES : N 32.44, E -103.90, (estim)		DRILLING METHOD AND EQUIPMENT : 4.25-in ID HSA with center plug	
WATER LEVEL : 15.86 ft bgs (measured on 8/21/14)		START : 8/20/14 11:20	END : 8/20/14 14:06 LOGGER : A. Forsberg



NOTES:
ALL DEPTHS ARE REPORTED AS DEPTH IN FEET BELOW GROUND SURFACE UNLESS OTHERWISE NOTED.
CASING STICKUPS ARE REPORTED AS DISTANCE ABOVE GROUND SURFACE (ags).

WELL CONSTRUCTION & SCREEN DETAILS

BOREHOLE DIAMETER: 8.5 inches

FILTER PACK TYPE: FILTER PACK, 8-16 silica sand

WELL CASING: BLANK, 2" SCH40 PVC

SCREEN LENGTH: 10 feet

SCREEN DESCRIPTION: 2" SCH40 wire-wrapped PVC 0.040-inch slot

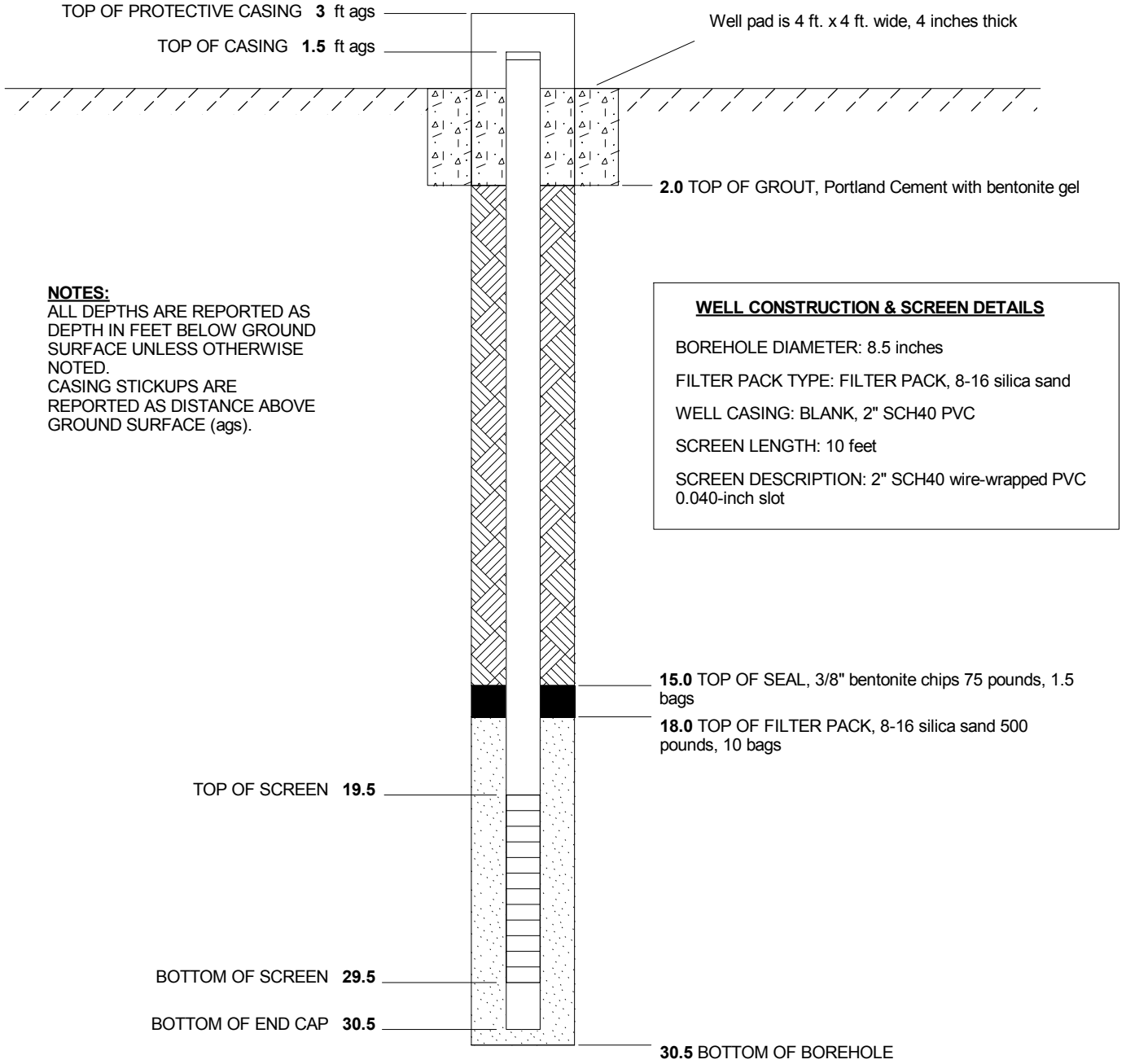
WELL DIAGRAM IS NOT TO SCALE

CH2MHILL

PROJECT NUMBER:	WELL NUMBER:
469935.14.04.02	IJ-8

Well Completion Diagram

PROJECT : Former Dowell Schlumberger Facility		LOCATION : Artesia, New Mexico	
ELEVATION : not measured	TOC : not measured	DRILLING CONTRACTOR AND DRILL RIG : National Exploration Wells and Pumps, CME 85	
COORDINATES : N 32.44, E -103.90, (estim)		DRILLING METHOD AND EQUIPMENT : 4.25-in ID HSA with center plug	
WATER LEVEL : 15.14 ft bgs (measured on 8/21/14)		START : 8/20/14 12:43	END : 8/20/2014 LOGGER : A. Forsberg



NOTES:
ALL DEPTHS ARE REPORTED AS DEPTH IN FEET BELOW GROUND SURFACE UNLESS OTHERWISE NOTED.
CASING STICKUPS ARE REPORTED AS DISTANCE ABOVE GROUND SURFACE (ags).

WELL CONSTRUCTION & SCREEN DETAILS

BOREHOLE DIAMETER: 8.5 inches

FILTER PACK TYPE: FILTER PACK, 8-16 silica sand

WELL CASING: BLANK, 2" SCH40 PVC

SCREEN LENGTH: 10 feet

SCREEN DESCRIPTION: 2" SCH40 wire-wrapped PVC 0.040-inch slot

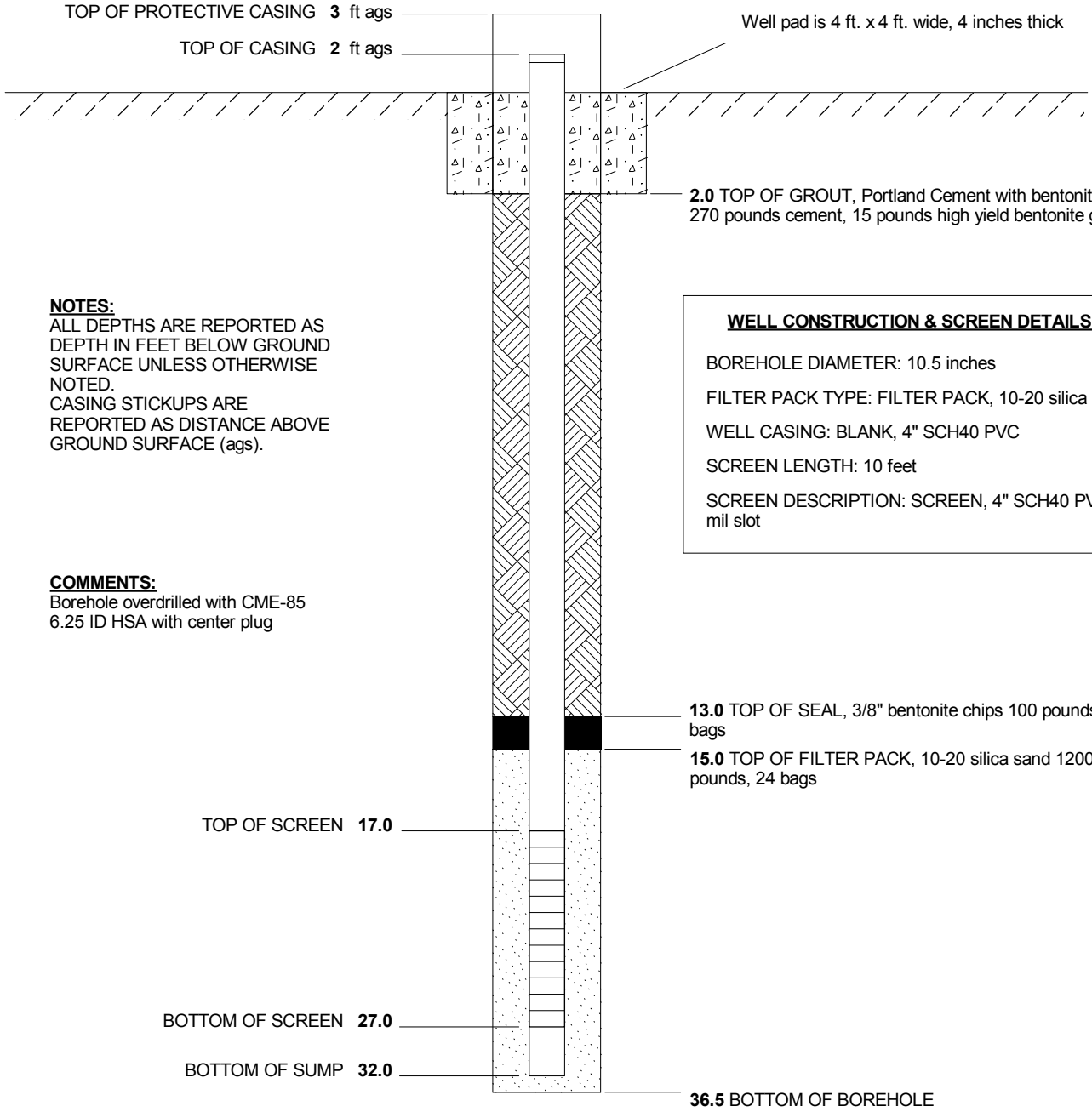
WELL DIAGRAM IS NOT TO SCALE

CH2MHILL

PROJECT NUMBER:	WELL NUMBER:
469935.14.04.02	MW-34

Well Completion Diagram

PROJECT : Former Dowell Schlumberger Facility		LOCATION : Artesia, New Mexico	
ELEVATION : not measured	TOC : not measured	DRILLING CONTRACTOR AND DRILL RIG : National Exploration Wells and Pumps, CME 85	
COORDINATES : N 32.44, E -103.89, (estim)		DRILLING METHOD AND EQUIPMENT : 4.25 ID HSA With Continuous Core	
WATER LEVEL : 18.10 ft bgs		START : 8/21/14 13:30	END : 8/22/2014 LOGGER : A. Forsberg



NOTES:
ALL DEPTHS ARE REPORTED AS DEPTH IN FEET BELOW GROUND SURFACE UNLESS OTHERWISE NOTED.
CASING STICKUPS ARE REPORTED AS DISTANCE ABOVE GROUND SURFACE (ags).

COMMENTS:
Borehole overdrilled with CME-85 6.25 ID HSA with center plug

WELL CONSTRUCTION & SCREEN DETAILS

BOREHOLE DIAMETER: 10.5 inches

FILTER PACK TYPE: FILTER PACK, 10-20 silica sand

WELL CASING: BLANK, 4" SCH40 PVC

SCREEN LENGTH: 10 feet

SCREEN DESCRIPTION: SCREEN, 4" SCH40 PVC 0.010 mil slot

WELL DIAGRAM IS NOT TO SCALE

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NUMBER (WELL NUMBER)	OSE FILE NUMBER(S)
Pod-1 MW-34	C-3774
WELL OWNER NAME(S)	PHONE (OPTIONAL)
Schlumberger Technology Corporation	
WELL OWNER MAILING ADDRESS	CITY / STATE / ZIP
105 Industrial Boulevard Sugar Land	Sugar Land / TX / 77478

WELL LOCATION (FROM GPS)	DEGREES	MINUTES	SECONDS	
LATITUDE	32.	439	42826	N
LONGITUDE	103.	894	5949	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND

* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHJIP, RANGE) WHERE AVAILABLE

2. DRILLING & CASING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD-1210	Bryan Nydoske	National EWP

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
8-21-14	8-21-14	32	36.5	NA

COMPLETED WELL IS: ( ) ARTESIAN ( ) DRY HOLE ( ) SHALLOW (UNCONFINED) — STATIC WATER LEVEL IN COMPLETED WELL (FT): NA

DRILLING FLUID: ( ) AIR ( ) MUD ADDITIVES – SPECIFY:

DRILLING METHOD: ( ) ROTARY ( ) HAMMER ( ) CABLE TOOL (•) OTHER – SPECIFY: Auger

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	17	8 1/4	PVC	Flush	4	40	
17	27	8 1/4	PVC	Flush	4	40	.040
27	32	8 1/4	PVC	Flush	4	40	

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
			See Attached		

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
			See Attached	◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: ◯ PUMP ◯ AIR LIFT ◯ BAILER ◯ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm):

5. TEST; RIG SUPERVISION

WELL TEST — TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

MISCELLANEOUS INFORMATION:

PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:

Mark Green

6. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:

[signature] Mark Green — 7-8-14

SIGNATURE OF DRILLER / PRINT SIGNEE NAME — DATE

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 2 OF 2

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
469935.04.04.02	MW-34	1	1

SOIL BORING LOG

PROJECT Dowell-Schlumberger - Artesia LOCATION Artesia, NM

ELEVATION NM DRILLING CONTRACTOR NEWP / I Sapien

DRILLING METHOD AND EQUIPMENT CME-85, 4.25 in HSA w/ cont core

WATER LEVELS 18.1 ft bgs @ install START 8/21/14 1330 FINISH 8/21/14 1450 LOGGER A Tursberg

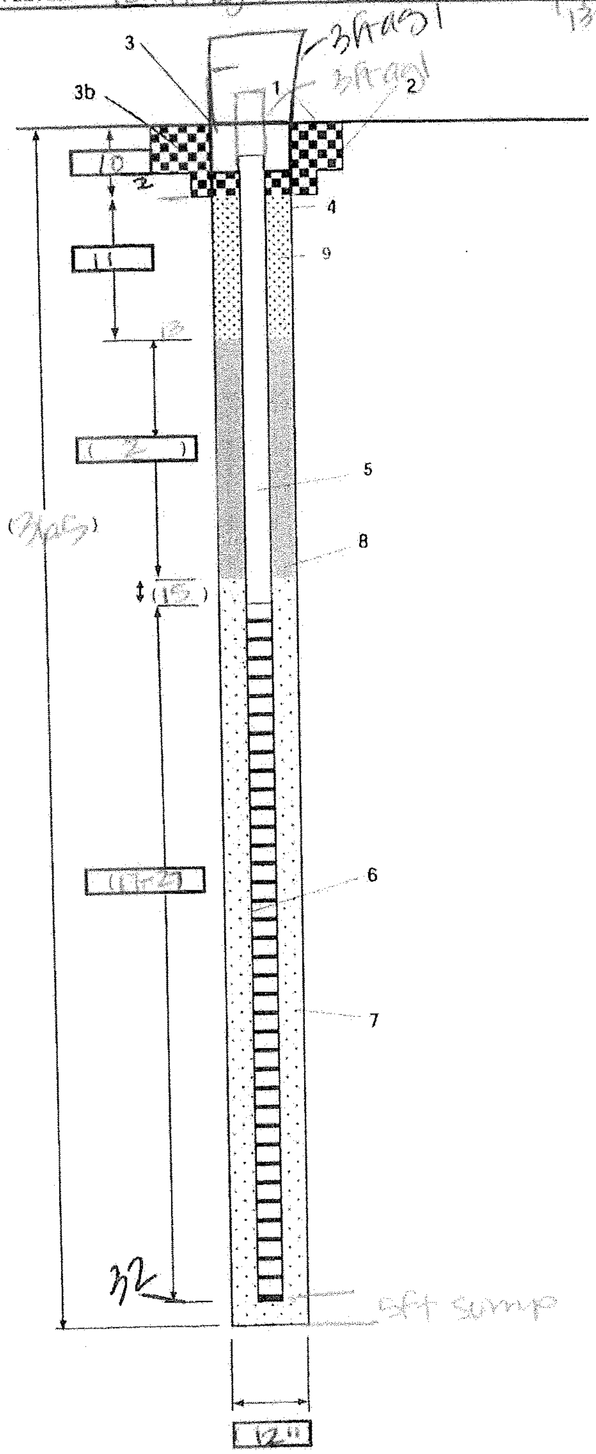
DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0–5					Not logged hand augered for utility clearance	
5	1'		5'	NA	SILT (ML) 2.5YR 7/1 light reddish gray, dry, nonplstc, noncohesive, caliche-like throughout, abrasive, less caliche-like	
	1.0"				CALICHE (ML) 2.5YR 8/1 white, dry, ...	
	12"					
	3				SILT (ML) same as 5-6	
10	10-12		0'		No recovery	
	12-15		3'		SILT (ML) 2.5YR 5/6 red, dry, nonplastic, non cohesive, white caliche-like throughout, laminated @ top 2ft, chunky at bottom ~~foot~~	PID=0.0ppm
15	6"				No recovery	
	1.5		4.5		POORLY GRADED SAND (SP) 5YR 5/6, yellowish red, moist, laminated, loose, mottled - oxidized, 5-10% silt very fine	
	6"			wet	~~POORLY~~ GRADED GRAVEL w/ CLAY (GW-GC), 5YR 6/4 lt reddish brn, moist, subrounded gravel	GW-GC
	2				SILT (ML) 5YR 7/2 pinkish gray, moist, low plstz, cohesive, 5% clay	PID=0.0
20	2.5		2.5	NA	No recovery	
	8"				SILT (ML) 2.5YR 4/4 reddish brown, wet, low plst, cohesive, soft, 10% med grained	
	1				CALICHE, 2.5YR 7/2 pale red, hard, dry	
	6"				LEAN CLAY (CL) 2.5YR 4/6 reddish brn, moist, low plstz, cohesive, stiff	
	6"				POORLY GRADED SAND (SP) 2.5YR 8/4, pink, dry, nonplstz, ~~noncohesive~~, very loose, very fine	PID=0.0
25	2.5		2.5	NA	No recovery	
	6"				SILT (ML) 5YR 6/4 lt reddish brn, wet, low plstz, cohesive, soft	PID=0.0
	1				SILTY SAND (SP) 5YR 6/3 lt reddish brn, wet, very loose, predom fine sand	
	1				SILT (ML), 5YR 6/4 to 5YR 5/4 light reddish brn to reddish brn, wet, low plstz, cohesive, 10-12% fine to med sand	1450

CH2MHILL

PROJECT NUMBER	WELL NUMBER	SHEET 1 OF 1
469935.IA.04.02	MW-34	

GROUND WATER MONITORING WELL COMPLETION DIAGRAM

PROJECT : Darwell - Schlumberger - Artesia
LOCATION : Artesia, NM
ELEVATION: NM
DRILLING CONTRACTOR : ~~WDC~~ NEWP | I Sapiens
DRILLING METHOD AND EQUIPMENT USED: ~~NB~~ CME-85 HSA w/ 6.25 in ID augers
WATER LEVELS : 18.1 ft bgs
START : 9/21/14 1330
END : 9/22/14
LOGGER : A Forsberg



1- Ground elevation at well: NM

2- Top of casing elevation: NM

3- Wellhead protection cover type: stovepipe 8 in x 5 ft
   a) drain tube? NO
   b) concrete pad dimensions: 4' x 4' x 4"
   depth of surface concrete: NA

4- Dia./type surface casing: NA

5- Dia./type of well casing: 4 in SCH 40 PVC

6- Type/slot/size of screen: 4 in 0.010 in slot SCH 40 PVC

7- Type screen filter: 10/20 colorado silica sand
   quantity used: 24 x 50 lb bags

8- Type of seal: 3/8-in bentonite chips
   quantity used: 2 x 50 lb bags

9- Grout
   a) Grout mix used: 3x 90 lb bags Portland Type I/II, 15 lbs high yield bent., 19 gal H_2O
   b) Method of placement: free pour
   c) Vol. of surface casing grout: NA
   d) Vol. of well casing grout:

Development method: swab & bail + overpump

Development time: 2 hrs

Estimated purge volume: 55 w/ s&b, 100 pump

Comments: drilled to 35 ft. tagged DTW pulled well up to set screen from 17-27 ft bgs to account for high H_2O

Illustration not to scale.

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

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1. GENERAL AND WELL LOCATION

OSE POD NUMBER (WELL NUMBER): Pod-1 EW-03	OSE FILE NUMBER(S): C-3773
WELL OWNER NAME(S): Schlumberger Technology Corporation	PHONE (OPTIONAL):
WELL OWNER MAILING ADDRESS: 105 Industrial Boulevard Sugar Land	CITY: Sugar Land STATE: TX ZIP: 77478

WELL LOCATION (FROM GPS)	DEGREES	MINUTES	SECONDS	
LATITUDE	32.	439	42826	N
LONGITUDE	103.	894	5949	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND

* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE

2. DRILLING & CASING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD-1210	Bryan Nydoske	National EWP

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
8-22-14	8-22-14	55	61	NA

COMPLETED WELL IS: ( ) ARTESIAN ( ) DRY HOLE ( ) SHALLOW (UNCONFINED) — STATIC WATER LEVEL IN COMPLETED WELL (FT): NA

DRILLING FLUID: ( ) AIR ( ) MUD ADDITIVES – SPECIFY:

DRILLING METHOD: ( ) ROTARY ( ) HAMMER ( ) CABLE TOOL (•) OTHER – SPECIFY: Auger

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	15	12 1/4	PVC	Flush	4	40	
15	55	12 1/4	PVC	Flush	4	40	.040
55	60	12 1/4	PVC	Flush	4	40	

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
			See Attached		

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES **(attach supplemental sheets to fully describe all units)**	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
			See Attached	○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
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				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: ○ PUMP ○ AIR LIFT ○ BAILER ○ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm):

5. TEST; RIG SUPERVISION

WELL TEST — TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

MISCELLANEOUS INFORMATION:

PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:

Mark Green

6. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:

Mark Green — 9-8-14

SIGNATURE OF DRILLER / PRINT SIGNEE NAME — DATE

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 2 OF 2

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
409935.44.C4.02	FW-09	1	2

SOIL BORING LOG

PROJECT Dowell-Schlumberger-Artesia LOCATION Artesia, NM
ELEVATION NM DRILLING CONTRACTOR NEWPIT Sapien
DRILLING METHOD AND EQUIPMENT CME 85, HSA w/ 4.25in ID cont. core augers
WATER LEVELS NM START 8/22/14 1007 FINISH 8/22/14 1205 LOGGER A Forsberg

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0–5					Not logged soil removed w/ hand auger	
5	5-7	CC-1	5		SANDY SILT (ML) 5YR 4/3 light reddish brn, dry, low plstc, cohesive, mottled white-caliche	
	7-10				SILT (ML) 5YR 8/1 white, dry, low plstc, cohesive, moddled w/ light red (above), moddles get less grading down	PID=0.0
10	10-12	CC-2	0		No recovery	PID=0.0 1016
	12-13.5		3		SILT (ML) same as above @ 7-10	PID=0.0
13.5-14.5	13.5-14.5				SILTY SAND (SM) 5YR 4/4, reddish brn, dry, v. loose, medium v. fine grained, up to 10% ...	PID=0.0 med & coarse grained
14.5-15	14.5-15				SILTY CLAY (CL) 2.5YR 5/4 reddish brn, dry, ... cohesive, med plstc, moddled grey	1022 1" layer of coarse sand @ top of interval
15	15-16	CC-3	4		No recovery	
	16-17.5				LEAN CLAY (CL) 5YR 8/1 white, partially cemented caliche, laminated, trace black organic stringers	PID=0
	17.5-19				SANDY SILT (ML) 2.5YR 4/4 reddish brn, dry, low plstc, cohesive, v fine sand, few (5%) fine gravel, laminated	PID=0
	19-20				POORLY GRADED SAND (SP) 2.5YR 7/3 lt reddish brn, moist, loose-dense, silice, 5% fine gravel	1025
20	20-22	CC-4	3		No recovery	
	22-23				WELL GRADED GRAVEL W/ CLAY (GW-GC) 2.5YR 5/4 reddish brown, grading to GRAVELLY CLAY (CL), moist, med. low plstc, cohesive gravel to 4 cm	PID=0
	23-24				SILT (ML) 2.5YR 5/6 red, low plstc, cohesive, laminated, 2% med gravel	PID=0 dry ... 1032 24-25: LEAN CLAY (CL) 2.5YR 5/6 red, low plstc, cohesive, dense, 2% med grav
25	25-25.8	CC-5	5		POORLY GRADED SAND (SP) 2.5YR 5/4 reddish brn, wet, partially cemented, 5-10% fine gravel	caliche
	25.8-29				Interbedded WELL GRADED GRAVEL w/ CLAY & SAND (GW-GC) 2.5YR 7/3 lt reddish brown, poorly... and SILT (ML) 2.5YR 4/4 reddish brn, wet, silt is stiff, dense, ... 5% sand & gravel, low plstc, cohesive	
30	29-30				SILT (ML) 2.5YR 4/6 red, wet, low plstc, cohesive, med stiff	

(8.30)

REV 12/01 FORM D1586

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
469935.04.04.02	EW-01	2	2

SOIL BORING LOG

PROJECT Artesia, Dowell-Schlumberger LOCATION Artesia, NM

ELEVATION NM DRILLING CONTRACTOR NEWP / I Sapien

DRILLING METHOD AND EQUIPMENT CME-85, 4.25 in ID HSA w/ continuous core

WATER LEVELS NM START 8/22/14 1007 FINISH 8/22/14 1215 LOGGER A. Forsberg

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	30-31	CC-6	5		SILT (ML) 2.5YR 4/6 red, moist, low plstc, cohesive, very soft, 2% med gravel	1042 PID=0.0
	31-32				WELL GRADED GRAVEL w/ SAND & clay (GW-GC) 2.5YR 7/2 pale red, wet, very loose, partially cemented @ top	PID=0.0
	32-34				SILT (ML) as above	
	34-35				SILT (ML) 2.5YR 4/4 reddish brn, wet, low plstc, cohesive, dense, 5-10% clay	1046 H_2O break
35	35-39	CC-7	5		SILT (ML) 2.5YR 5/2 reddish brown, wet, low plstc, cohesive, soft, 1 in med gravel layers (white) @ 36.1 & 37.5 ft	PID=0
	39-40				SILTY SAND (SM) 2.5YR 4/4 reddish brn, wet, med dense, 2% med gravel, mottled	PID=0 v. grey, fine sand
40	40-41	CC-8	5		CLAYEY SAND (SC) 2.5YR 6/6 light red, wet, loose, blocky, v. fine sand	
	41-41.5				LEAN CLAY (CL) 2.5YR 8/1 white, wet, med plstc, cohesive, v. soft	
	41.5-43				CLAYEY SAND (SC), 2.5YR 4/4 reddish brn, wet, loose, predom v. fine sand, 5% fine gravel	
	43-44				LEAN CLAY w/ SAND (CL), variegated, 2.5YR 4/4 reddish brn, 2.5YR 8/1 white & 5YR 6/1 gray, wet, low plstc, cohesive, soft	
	44-45				GRAVELLY SILT w/ SAND (ML) 5YR 7/2 pinkish gray, wet, partially cemented	1104/1115
45	45-45.5	CC-9	4.5		NO RECOVERY	rig chatter
	45.5-46				CALICHE, 5YR 8/2 pinkish white, cemented to partially cemented, wet	
	46-47				LEAN CLAY w/ SAND (CL) 10YR 5/6 yellowish red, wet, low plstc, cohesive, soft, 10% silt, laminated	Chatter stops, easier drilling
	47-50				POORLY GRADED SAND (SP) 5YR 6/4 light reddish brn, wet, loose, predom fine grained	1130 1135
50	50-51.5	CC-10	5		POORLY GRADED SAND (SP), same as above	
	51.5-52.5				POORLY GRADED SAND w/ CLAY (SP-SM) 5YR 6/6 reddish yellow, wet, loose; thinly bedded, fine grained, 10% 5YR 7/1 light greenish grey, wet, partially cemented, fine-medium gr.	
	52.5-53				POORLY GRADED SAND (SP) [illegible]	
	53-54				POORLY GRADED sand w/ clay (SP-SM) as at 51.5-52.5	
	54-55				LEAN CLAY (CL) 5Y 8/1 white, wet, non plstc, noncohesive, 5% fine sand	
55	55-56	CC-11	5		POORLY GRADED SAND (SP) (2.5Y) 8/1 white, wet, very loose, predom fine & med sand, laminated 4.5-7% clay	1145
	56-60				LEAN CLAY (CL) 5YR 5/4 reddish brn, wet, low plstc, cohesive, med dense, gravel to 4 cm speckled throughout	
60						1156

1151 pulling rod

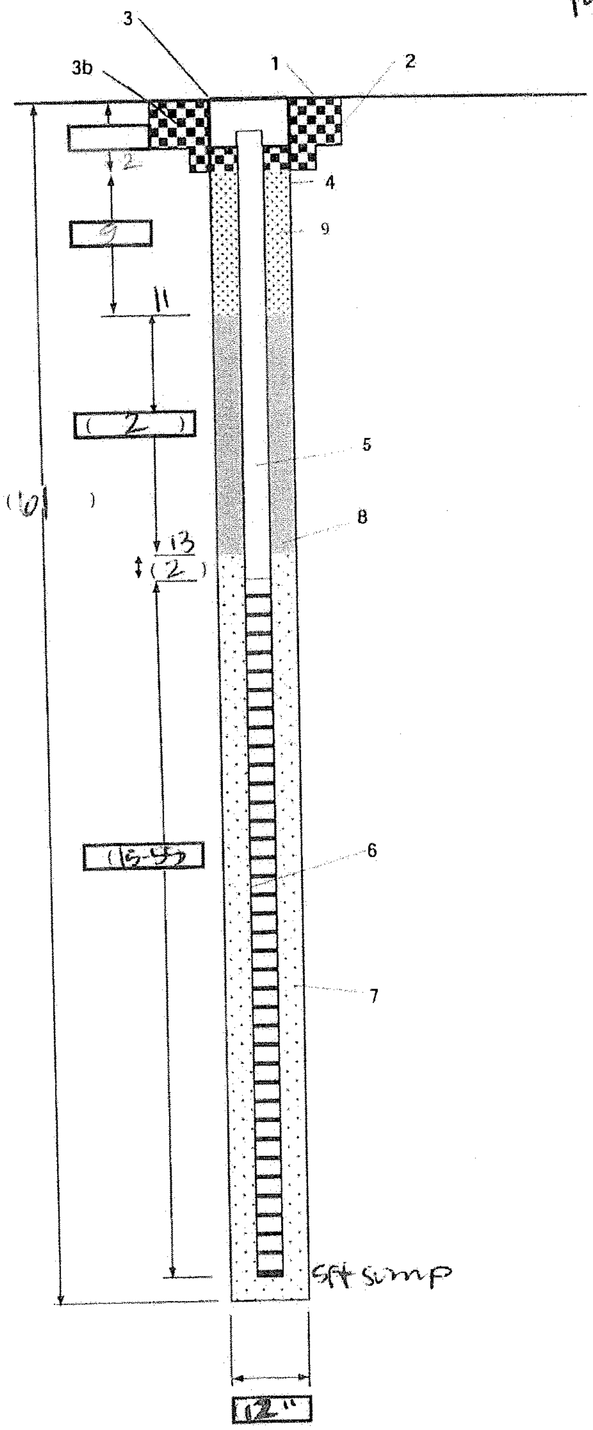
REV 12/01 FORM D1586

CH2MHILL

PROJECT NUMBER	WELL NUMBER	
469925.14.04.02	EW-06	SHEET 1 OF 1

GROUND WATER MONITORING WELL COMPLETION DIAGRAM

PROJECT : Dowell-Schlumberger, Artesia
LOCATION : Artesia, NM
ELEVATION: NM
DRILLING CONTRACTOR : ~~WDC~~ NGWP | ISupren
DRILLING METHOD AND EQUIPMENT USED: CME-85 w/ 6.25 in ID w/ CR plug
WATER LEVELS : 18.75 ft bgs before development
START : 5/22/14 1930
END : 5/23/14
LOGGER : A. Sperry



1- Ground elevation at well: NM

2- Top of casing elevation: NM

3- Wellhead protection cover type: Steel plate & sand
 a) drain tube? NA
 b) concrete pad dimensions; NA
 depth of surface concrete: NA

4- Dia./type surface casing: NA

5- Dia./type of well casing: 4 in sch 40

6- Type/slot/size of screen: 0.040 slot WR 4 in sch 40

7- Type screen filter: 8-16 colorado silica
 quantity used: ~~44~~ 50 lb bags

8- Type of seal: 3/8 in bento chips
 quantity used: 4

9- Grout
 a) Grout mix used: 15 lbs gal, 1 gal H2O, 3x50 lbs Portland, L 2 bags used
 b) Method of placement: free pour
 c) Vol.of surface casing grout: NA
 d) Vol. of well casing grout

Development method: bail & swab + over pump

Development time: 6.5 hrs

Estimated purge volume: 55 gal w/ s&b + 330 gal

Comments: during pumping, pulled pump up 5-10 ft when turbidity was able to be measured by instrument

Illustration not to scale.

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NUMBER (WELL NUMBER)	OSE FILE NUMBER(S)
Pod-1 IJ-1	C-3772
WELL OWNER NAME(S)	PHONE (OPTIONAL)
Schlumberger Technology Corporation	
WELL OWNER MAILING ADDRESS	CITY / STATE / ZIP
105 Industrial Boulevard Sugar Land	Sugar Land / TX / 77478

WELL LOCATION (FROM GPS)	DEGREES	MINUTES	SECONDS	
LATITUDE	32.	439	7252	N
LONGITUDE	103.	895	1655	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND

* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE

2. DRILLING & CASING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD-1210	Bryan Nydoske	National EWP

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
8-21-14	8-21-14	30	31.5	NA

COMPLETED WELL IS: ( ) ARTESIAN ( ) DRY HOLE ( ) SHALLOW (UNCONFINED) — STATIC WATER LEVEL IN COMPLETED WELL (FT): NA

DRILLING FLUID: ( ) AIR ( ) MUD ADDITIVES – SPECIFY:

DRILLING METHOD: ( ) ROTARY ( ) HAMMER ( ) CABLE TOOL (•) OTHER – SPECIFY: Auger

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	20.3	8 1/4	PVC	Flush	2	40	
20.3	30.3	8 1/4	PVC	Flush	2	40	.040

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
			See Attached		

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES **(attach supplemental sheets to fully describe all units)**	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
			See Attached	◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
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				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: ◯ PUMP

◯ AIR LIFT ◯ BAILER ◯ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm):

5. TEST; RIG SUPERVISION

WELL TEST: TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

MISCELLANEOUS INFORMATION:

PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:

Mark Green

6. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:

[signature] Mark Green — 9-8-14

SIGNATURE OF DRILLER / PRINT SIGNEE NAME — DATE

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		

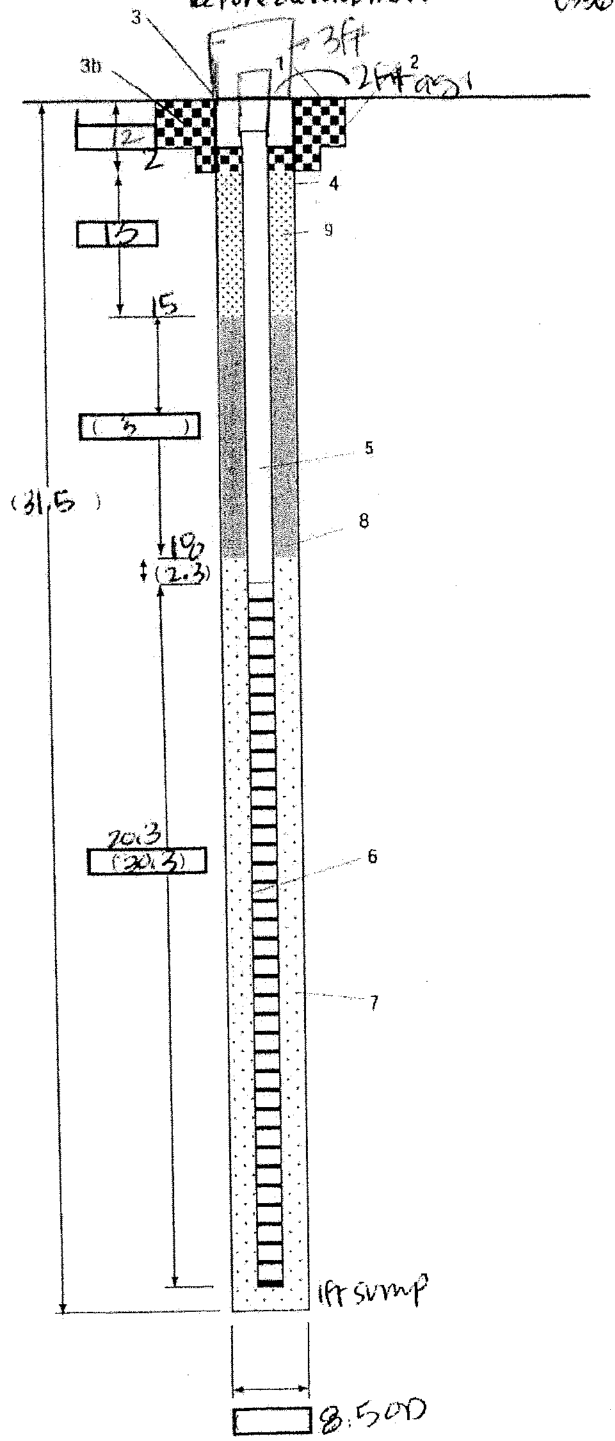
CH2MHILL

PROJECT NUMBER	WELL NUMBER
460935.14.04.02	IT-1

SHEET 1 OF 1

GROUND WATER MONITORING WELL COMPLETION DIAGRAM

PROJECT: Dowell-Schlumberger, Artesia
LOCATION: Artesia, NM
ELEVATION: NM
DRILLING CONTRACTOR: ~~WDC~~ NEWP / T Sapien
DRILLING METHOD AND EQUIPMENT USED: CME 85, w/ 4.25 in ID HSA w/ cre plug
WATER LEVELS: ~~[illegible]~~ 17.2 ft bgs before development
START: 8/21/14 0956
END: 8/21/14 0810 8/23/14 0810
LOGGER: A Frysinger



1- Ground elevation at well: NM

2- Top of casing elevation: NM

3- Wellhead protection cover type: 8" x 5 ft steel stovepipe
   a) drain tube? NO
   b) concrete pad dimensions: 4' x 4' x 4"
   depth of surface concrete: 4"

4- Dia./type surface casing: NA

5- Dia./type of well casing: 2 in SCH 40 PVC

6- Type/slot/size of screen: 2 in SCH 40, 0.040 WR slot

7- Type screen filter: 8-16 colorado silica sand
   quantity used: 10 x 50 lb bags

8- Type of seal: 3/8 in bentonite chips
   quantity used: 1.5 x 50 lb bags

9- Grout: 17 gal H_2O + 3 x 90 lb Portland
   a) Grout mix used: 15 lbs high yield benton
   b) Method of placement: free pour
   c) Vol. of surface casing grout
   d) Vol. of well casing grout

Development method: Swab bail + pump

Development time: 30 gal S/B + 50 gal pump 2.5 hrs

Estimated purge volume

Comments

Illustration not to scale.

31.3
17.2

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
469935.14.04.02	IJ-1	1	1

SOIL BORING LOG

PROJECT Dowell-Schlumberger - Artesia LOCATION Artesia, NM

ELEVATION NM DRILLING CONTRACTOR NEWP / E. Salpren

DRILLING METHOD AND EQUIPMENT CME-85 HSA w/4.25in augers & Ctr plug

WATER LEVELS NM START 8/21/14 0930 FINISH 8/21/14 0952 LOGGER Afforsberg

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0–5					SILT(ML), 7.5YR 7/2 pale red, dry, non plstc, noncohesive, like flour,	Soil logged from augers BZ=0.0 PID=9.7 ppm 0938
5–10					SILT(ML), same as above, w/ white clay/caliche chunks	PID=0.2 ppm 0940
10–15					~~CLAY~~ CLAY(CL) 2.5YR 6/3 light reddish brown, dry, low plstc, cohesive, trace (5-7%) med to coarse sand, white clay/caliche chunks (15%)	PID=0.0 0942
15–20					~~LEAN~~ CLAY(CL) 2.5YR 4/4 reddish brown, moist, low plstc, cohesive, few (10-12%) fine to coarse sand	PID=0.0 0945
20–25					SILT(ML) 2.5YR 4/4 reddish brown, wet, low plstc, cohesive, 10-12% fine to coarse ~~silt~~ sand.	PID=0.0 0946
25–30					SILT(ML) 2.5YR 5/4 reddish brown, wet, low plstc, cohesive, 10-12% fine to coarse sand, trace rust colored mottles.	PID=0.0 0950

REV 12/01 FORM D1586

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NUMBER (WELL NUMBER)	OSE FILE NUMBER(S)
Pod-2 IJ-2	C-3772
WELL OWNER NAME(S)	PHONE (OPTIONAL)
Schlumberger Technology Corporation	
WELL OWNER MAILING ADDRESS	CITY / STATE / ZIP
105 Industrial Boulevard Sugar Land	Sugar Land / TX / 77478

WELL LOCATION (FROM GPS)	DEGREES	MINUTES	SECONDS	
LATITUDE	32.	439	6595	N
LONGITUDE	103.	895	2709	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND

* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE

2. DRILLING & CASING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD-1210	Bryan Nydoske	National EWP

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
8-21-14	8-21-14	30	31.5	NA

COMPLETED WELL IS: ( ) ARTESIAN ( ) DRY HOLE ( ) SHALLOW (UNCONFINED) — STATIC WATER LEVEL IN COMPLETED WELL (FT): NA

DRILLING FLUID: ( ) AIR ( ) MUD ADDITIVES – SPECIFY:

DRILLING METHOD: ( ) ROTARY ( ) HAMMER ( ) CABLE TOOL (•) OTHER – SPECIFY: Auger

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	20.3	8 1/4	PVC	Flush	2	40	
20.3	30.3	8 1/4	PVC	Flush	2	40	.040

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
			See Attached		

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
			See Attached	Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: ◯ PUMP ◯ AIR LIFT ◯ BAILER ◯ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm):

5. TEST; RIG SUPERVISION

WELL TEST: TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

MISCELLANEOUS INFORMATION:

PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:

Mark Green

6. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:

[signature] / Mark Green — 9-8-14

SIGNATURE OF DRILLER / PRINT SIGNEE NAME — DATE

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
469935.14.00.02	IJ-2	1	1

SOIL BORING LOG

PROJECT Dowell Schlumberger Artesia LOCATION Artesia, NM

ELEVATION ______ DRILLING CONTRACTOR NEWP / I Sapien

DRILLING METHOD AND EQUIPMENT CME-85, HSA 9.25 in ID augers w/ CR plug

WATER LEVELS NM START 8/21/14 0800 FINISH 8/21/14 0819 LOGGER A Forsberg

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0					NOT LOGGED	soil logged from auger cuttings
5					SILT (ML), 2.5YR 6/4 light reddish brown, dry, non plastic, noncohesive	PID=0.0ppm
10					SILT (ML) ~~...~~, 2.5YR 4/4 reddish brown, dry, med plstc, cohesive 5% white clay nodules & calcite chunks, 5% silt, ~~...~~ little med to coarse sand	0804
						PID=0.0
15					NOT LOGGED - missing 5ft section	0810
20					~~...~~ CLAY (CL) 2.5YR 4/4 reddish brown, moist, low plstc, noncohesive little (fine to coarse angular sand) (8-12%)	08__ PID=0.0
25					SILT (ML) 2.5YR 4/3 reddish brown, wet, low plstc, non cohesive, trace (5-7%) fine to coarse sand	0813
30						0816

REV 12/01 FORM D1586

CH2MHILL

PROJECT NUMBER: 469935.14.04.02

WELL NUMBER: IJ-2

SHEET 1 OF 1

GROUND WATER MONITORING WELL COMPLETION DIAGRAM

PROJECT: Dowell-Schlumberger -Artesia

LOCATION: Artesia, NM

ELEVATION: NM

DRILLING CONTRACTOR: ~~WDC~~ NEWP | I. Sapien

DRILLING METHOD AND EQUIPMENT USED: ~~NEWP~~ CME-85, HSA 1/4.25in ID 4Cft plug

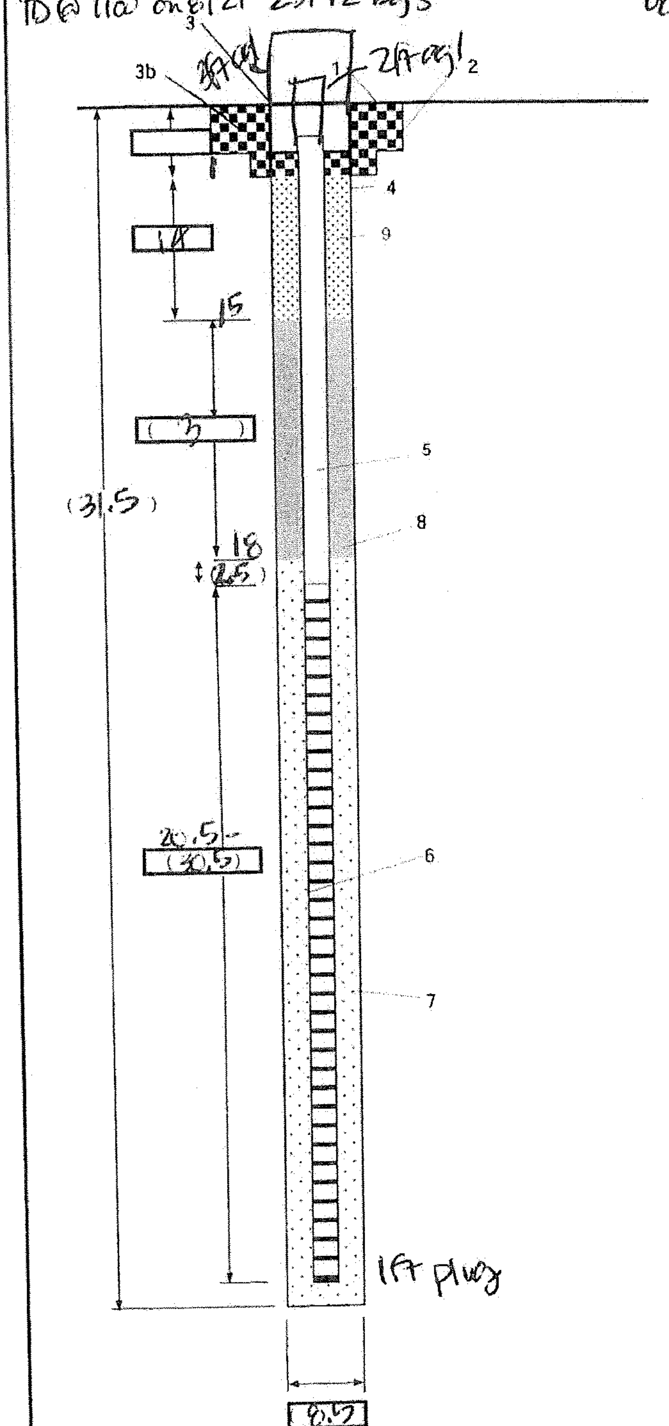
WATER LEVELS: 17.42 on 8/21

START: 8/21/14 0821

END: 8/21/14

LOGGER: AForsberg

TD @ 110 on 8/21 29.72 bags



1- Ground elevation at well ______

2- Top of casing elevation ______

3- Wellhead protection cover type: 8in x 5ft steel casing

a) drain tube? NO

b) concrete pad dimensions: ______

depth of surface concrete ______

4- Dia./type surface casing: NA

5- Dia./type of well casing: 2 in SCH 40 PVC

6- Type/slot/size of screen: 8-16 sand

7- Type screen filter: 2in SCH 40 0.040 wire

quantity used: 10 x 50 lb bags

8- Type of seal: 3/8 in bento chips

quantity used: 1.5 x 50 lb bags

9- Grout: 10 lbs high yield bento, 3x 90 lbs portland

a) Grout mix used: 15 lbs H2O

b) Method of placement: free pour

c) Vol. of surface casing grout: NA

d) Vol. of well casing grout ______

Development method: bail & swab + overpump

Development time: 35 60

Estimated purge volume: 25 gal + 8 gal

Comments ______

Illustration not to scale.

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NUMBER (WELL NUMBER)	OSE FILE NUMBER(S)
Pod-3 IJ-3	C-3772
WELL OWNER NAME(S)	PHONE (OPTIONAL)
Schlumberger Technology Corporation	
WELL OWNER MAILING ADDRESS	CITY / STATE / ZIP
105 Industrial Boulevard Sugar Land	Sugar Land / TX / 77478

WELL LOCATION (FROM GPS)	DEGREES	MINUTES	SECONDS	
LATITUDE	32.	439	5935	N
LONGITUDE	103.	895	3684	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND

* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE

2. DRILLING & CASING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD-1210	Bryan Nydoske	National EWP

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
8-20-14	8-20-14	30	31.5	NA

COMPLETED WELL IS: ( ) ARTESIAN ( ) DRY HOLE ( ) SHALLOW (UNCONFINED) — STATIC WATER LEVEL IN COMPLETED WELL (FT): NA

DRILLING FLUID: ( ) AIR ( ) MUD ADDITIVES – SPECIFY:

DRILLING METHOD: ( ) ROTARY ( ) HAMMER ( ) CABLE TOOL (•) OTHER – SPECIFY: Auger

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	20.3	8 1/4	PVC	Flush	2	40	
20.3	30.3	8 1/4	PVC	Flush	2	40	.040

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
			See Attached		

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES **(attach supplemental sheets to fully describe all units)**	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
			See Attached	○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
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				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: ○ PUMP ○ AIR LIFT ○ BAILER ○ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm):

5. TEST; RIG SUPERVISION

WELL TEST — TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

MISCELLANEOUS INFORMATION:

PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:

Mark Green

6. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:

Mark Green — 9-8-14

SIGNATURE OF DRILLER / PRINT SIGNEE NAME — DATE

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 2 OF 2

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
469935.14.04.02	IJ-3	1	1

SOIL BORING LOG

PROJECT Dowell-Schlumberger Artesia LOCATION Artesia, NM

ELEVATION NM DRILLING CONTRACTOR NEWP | Superior

DRILLING METHOD AND EQUIPMENT CME-85 HSA w/ 4.25 in ID w/ CTR Pilot

WATER LEVELS NM START 8/20/14 1613 FINISH 8/20/14 1625 LOGGER APorsbaugh

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: NUMBER AND TYPE	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0					SILT (ML) 2.5YR 7/2, pale pink, dry, non plastic, non cohesive, almost like flour	PID=0.0ppm soil logged from cuttings
5					same as above, trace fine gravel 5-7% clay	1615 PID=0.0ppm
10					(LEAN CLAY (CL) 2.5YR 5/3, reddish brown, dry, low plast, cohesive, few fine to med gravel, trace fine to coarse sand	1616 BZ=0.0 PID=0.0ppm
15					Not logged. Went to get camera for photo of frayed cable	1619
20					SILT (ML) 2.5YR 5/3, reddish brown, wet, low plast, cohesive, trace fine to med gravel, few fine to coarse sand	1621 frayed cable on downhole hammer- removed hammer to fix
25					SILT (ML) 2.5 YR 5/3 reddish brown, same as above	1626
30						1628

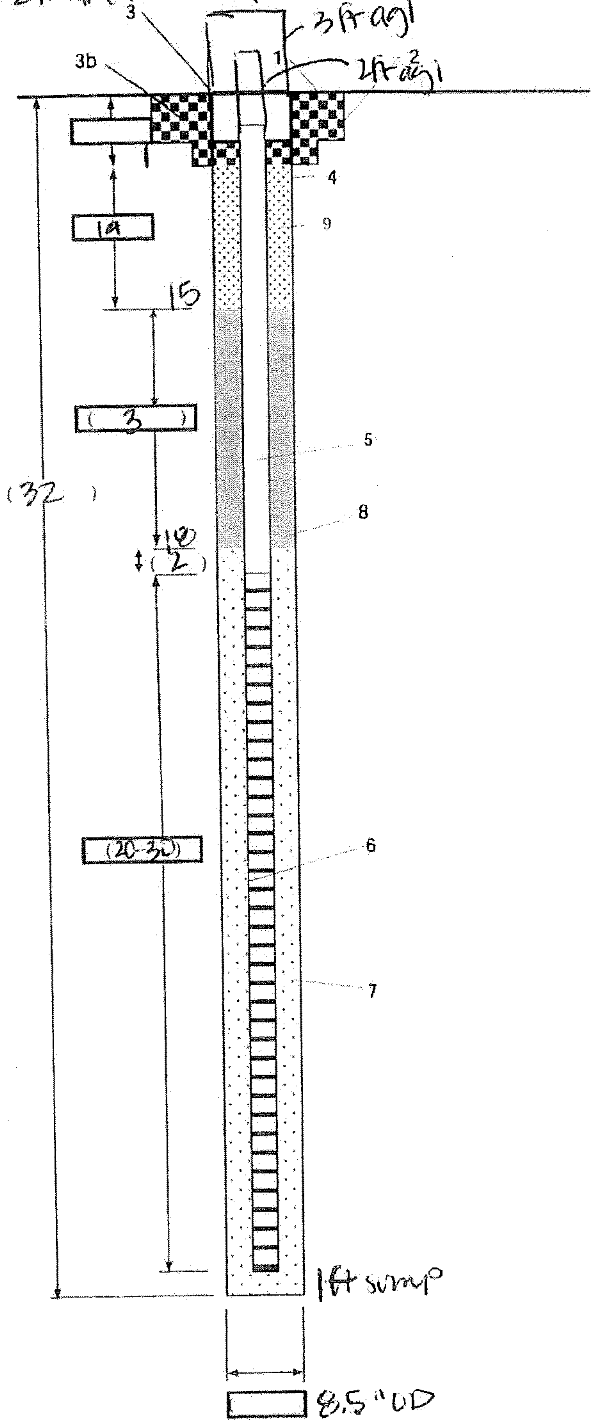
CH2MHILL

PROJECT NUMBER	WELL NUMBER	
469935.14.04.02	IJ-3	SHEET 1 OF 1

GROUND WATER MONITORING WELL COMPLETION DIAGRAM

PROJECT : Dowell-Schlumberger Artesia
LOCATION : Artesia, NM
ELEVATION: NM
DRILLING CONTRACTOR : ~~WDC~~ NEWP | I Sapien
DRILLING METHOD AND EQUIPMENT USED: CME 85 w/ 4.25 in ID HSA w/ ctr plug
WATER LEVELS : NMG 16.68 bgs on 8/21
START : 8/20/14 1650
END : 8/21/14 1025
LOGGER : A Forsberg

TD=27.79 @ 1055 on 8/21



1- Ground elevation at well: NM

2- Top of casing elevation: NM

3- Wellhead protection cover type: 8 in x 5 ft steel casing
a) drain tube? NO
b) concrete pad dimensions: 4' x 4' x 4"
depth of surface concrete: 4"

4- Dia./type surface casing: NA

5- Dia./type of well casing: 2in SCH 40 PVC

6- Type/slot/size of screen: 2in SCH 40 0.040 MR

7- Type screen filter: 8-16 colorado silica
quantity used: 11 x 50lb bags

8- Type of seal: 3/8 inch bentonite chips
quantity used: 1.5 x 50lbs bags

9- Grout: 10 lbs high yield bento
a) Grout mix used: 3 x 90lbs Portland, 17 gal H_2O
b) Method of placement: free pour
c) Vol. of surface casing grout: NA
d) Vol. of well casing grout:

Development method: Swab, bail, over pump

Development time:

Estimated purge volume: 35 gal + 55 gal

Comments:

Illustration not to scale.

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NUMBER (WELL NUMBER)	OSE FILE NUMBER(S)
Pod-4 IJ-4	C-3772
WELL OWNER NAME(S)	PHONE (OPTIONAL)
Schlumberger Technology Corporation	
WELL OWNER MAILING ADDRESS	CITY / STATE / ZIP
105 Industrial Boulevard Sugar Land	Sugar Land / TX / 77478

WELL LOCATION (FROM GPS)	DEGREES	MINUTES	SECONDS	
LATITUDE	32.	439	5275	N
LONGITUDE	103.	895	5466	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND

* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE

2. DRILLING & CASING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD-1210	Bryan Nydoske	National EWP

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
8-19-14	8-19-14	30	31.5	NA

COMPLETED WELL IS: ( ) ARTESIAN ( ) DRY HOLE ( ) SHALLOW (UNCONFINED) — STATIC WATER LEVEL IN COMPLETED WELL (FT): NA

DRILLING FLUID: ( ) AIR ( ) MUD ADDITIVES – SPECIFY:

DRILLING METHOD: ( ) ROTARY ( ) HAMMER ( ) CABLE TOOL (•) OTHER – SPECIFY: Auger

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	20.3	8 1/4	PVC	Flush	2	40	
20.3	30.3	8 1/4	PVC	Flush	2	40	.040

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
			See Attached		

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES **(attach supplemental sheets to fully describe all units)**	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
			See Attached	○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
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				○ Y ○ N	
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				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: ○ PUMP ○ AIR LIFT ○ BAILER ○ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm):

5. TEST; RIG SUPERVISION

WELL TEST — TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

MISCELLANEOUS INFORMATION:

PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:

Mark Green

6. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:

Mark Green — 4-8-14

SIGNATURE OF DRILLER / PRINT SIGNEE NAME — DATE

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 2 OF 2

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
409235.14.04.02	IJ-A	1	1

SOIL BORING LOG

PROJECT Dowell-Schlumberger Artesia LOCATION Artesia, NM

ELEVATION NM DRILLING CONTRACTOR NEWP | Sapen

DRILLING METHOD AND EQUIPMENT CME-85 HSA w/ 4.25 in ID augers & CR plug

WATER LEVELS NM START 8/19/14 1452 FINISH 8/19/14 1510 LOGGER A Forstner

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: NUMBER AND TYPE	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0					SILT(ML) 2.5YR 7/3 light reddish brown, dry, non plastic, non cohesive trace med gravel	PID=0.0ppm Soil logged from augers
5					same as above, w/ white caliche-like nodules/chunks up to 2.54cm diam though some are very soft & friable	PID=0.1 ppm
10					LEAN CLAY (CL) 2.5YR 7/3, light reddish brown, low plastic, cohesive, abundant white nodules/chunks as above	1454 PID=0.1ppm
15					LEAN CLAY (CL) 2.5YR 5/3, reddish brown, moist, low plastic, cohesive, 5%. fine to coarse sand	1456 PID=0.0 ppm
20					SILT(ML) 2.5YR 5/3, reddish brown, moist, low plastic, cohesive, 5-7%. fine to coarse sand	1458 PID=0.0ppm
25					LEAN CLAY (CL) 2.5YR 5/3, reddish brown, wet, low plastic, cohesive, 5-7%. fine to coarse sand, 10%. silt	1500 PID=0.0 ppm Note throttle cable disconnected stop drilling to fix
30						1510

(8.30)

REV 12/01 FORM D1586

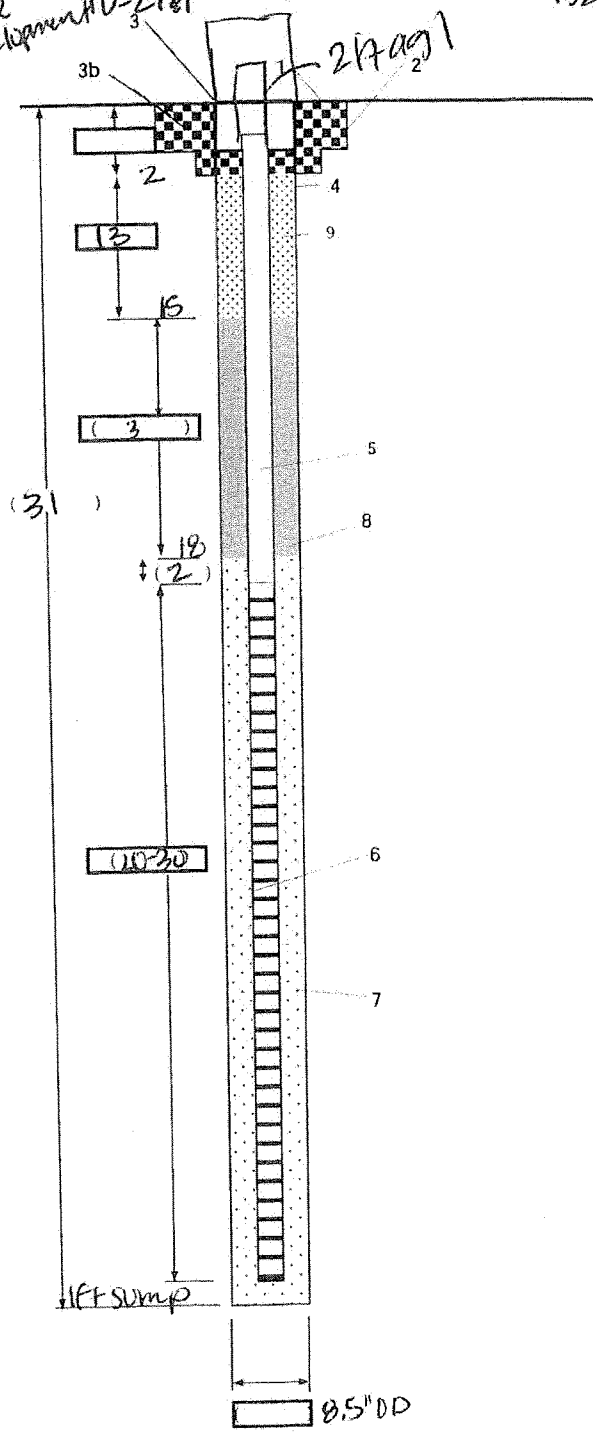
CH2MHILL

PROJECT NUMBER	WELL NUMBER	
469035 14.CA.02	IJ-4	SHEET 1 OF 1

GROUND WATER MONITORING WELL COMPLETION DIAGRAM

PROJECT: Dowell-Schlumberger-Artesia
LOCATION: Artesia, NM
ELEVATION: NM
DRILLING CONTRACTOR: ~~WDC~~ NEW IT sapiens
DRILLING METHOD AND EQUIPMENT USED: CME-85 HSA w/4.25in ID w/ cap plug
WATER LEVELS: 16.74 on 8/21
START: 8/20/14 1521 END: 8/20/14 1540
LOGGER: AForsberg

before development TD=27.9



1- Ground elevation at well: NM
2- Top of casing elevation: NM
3- Wellhead protection cover type: 8"in x 5ft steel casing
a) drain tube? NO
b) concrete pad dimensions; 4' x 4' x 4"
depth of surface concrete: NA
4- Dia./type surface casing: NA
5- Dia./type of well casing: 2in SCH 40 PVC
6- Type/slot/size of screen: 0.040 slot WR, 2in SCH 40 PVC
7- Type screen filter: 8/16 sand
quantity used: 10.5 x 50lb bags
8- Type of seal: 3/8 in bentonite chips
quantity used: 1.5 x 50lb bags
9- Grout: 15lbs high yield bent,
a) Grout mix used: 3x 94lb bags portland, 17gal H2O
b) Method of placement: free pour
c) Vol. of surface casing grout: NA
d) Vol. of well casing grout:
Development method: bail & swab + overpump
Development time: 35gal + 30gal
Estimated purge volume:
Comments:

Illustration not to scale.

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NUMBER (WELL NUMBER)	OSE FILE NUMBER(S)
Pod-5 IJ-5	C-3772
WELL OWNER NAME(S)	PHONE (OPTIONAL)
Schlumberger Technology Corporation	
WELL OWNER MAILING ADDRESS	CITY / STATE / ZIP
105 Industrial Boulevard Sugar Land	Sugar Land / TX / 77478

WELL LOCATION (FROM GPS)	DEGREES	MINUTES	SECONDS	
LATITUDE	32.	439	4281	N
LONGITUDE	103.	895	5596	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND

* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHJIP, RANGE) WHERE AVAILABLE

2. DRILLING & CASING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD-1210	Bryan Nydoske	National EWP

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
8-19-14	8-19-14	30	31.5	NA

COMPLETED WELL IS: ( ) ARTESIAN ( ) DRY HOLE ( ) SHALLOW (UNCONFINED) — STATIC WATER LEVEL IN COMPLETED WELL (FT): NA

DRILLING FLUID: ( ) AIR ( ) MUD ADDITIVES – SPECIFY:

DRILLING METHOD: ( ) ROTARY ( ) HAMMER ( ) CABLE TOOL (•) OTHER – SPECIFY: Auger

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	20.3	8 1/4	PVC	Flush	2	40	
20.3	30.3	8 1/4	PVC	Flush	2	40	.040

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
			See Attached		

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES **(attach supplemental sheets to fully describe all units)**	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
			See Attached	◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
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				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	
				◯ Y ◯ N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: ◯ PUMP ◯ AIR LIFT ◯ BAILER ◯ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm):

5. TEST; RIG SUPERVISION

WELL TEST — TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

MISCELLANEOUS INFORMATION:

PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:

Mark Green

6. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:

[signature] Mark Green — 4-8-14

SIGNATURE OF DRILLER / PRINT SIGNEE NAME — DATE

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
460935.04.04.02	IJ-5	1	1

SOIL BORING LOG

PROJECT Dowell Schlumberger Artesia LOCATION Artesia, NM

ELEVATION NM DRILLING CONTRACTOR NEWP I Caplen

DRILLING METHOD AND EQUIPMENT CME 85 + HSA, 4.25-in ID w/ CME plug

WATER LEVELS NM START 8/12/14 1151 FINISH 8/12/14 1200 LOGGER ATurskey

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0					SILT(ML) 2.5YR 6/3 light reddish brn, dry, non plstc, noncohesive, few med sands	PID=0 ppm Soil logged from augers
5					SILT(ML) 2.5YR 6/4 reddish brn, dry, non plstc, non cohesive, few med sands, 5-7% clay	1152 PID=0.2ppm
10					Clay (CL) 2.5YR 6/3, light reddish brn, very stiff, non plstc, noncohesive, trace fine sands	1157 PID=0.1ppm
15					Lean CLAY (CL), 2.5YR 4/4, reddish brn, wet, low plstc, cohesive, few med sand	1157 PID=0.2ppm
20					SILT(ML) 2.5YR 5/3, reddish brown, wet, low plstc, noncohesive 10% clay	1200 PID=0.1 ppm Some light rig chatter @ ~22 ft bgs
25					SILT(ML) 2.5YR 6/4, reddish brown, wet, low plastic, cohesive, few well graded sands	1202 PID=0.6
30						

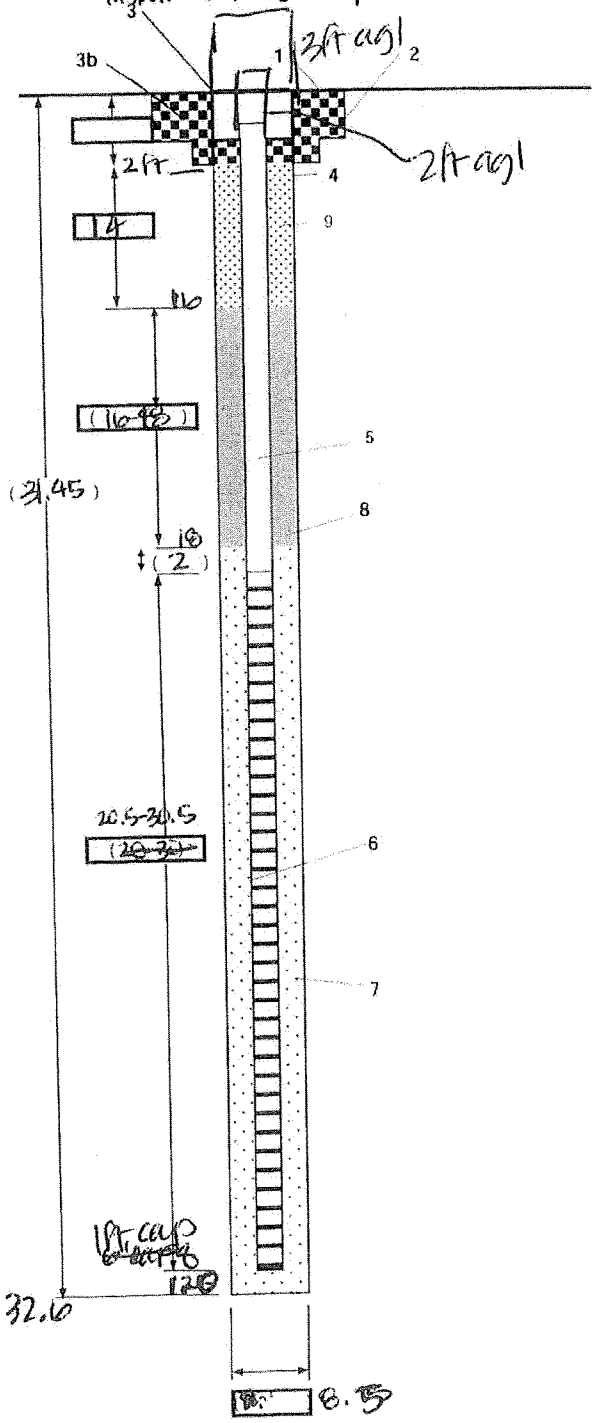
CH2MHILL

PROJECT NUMBER	WELL NUMBER	
469235.14.02A.02	IJ-5	SHEET 1 OF 1

GROUND WATER MONITORING WELL COMPLETION DIAGRAM

PROJECT: Dowell-Schlumberger - Artesia
LOCATION: Artesia, NM
ELEVATION: NM
DRILLING CONTRACTOR: ~~WDC~~ LEWD / Layne
DRILLING METHOD AND EQUIPMENT USED: CME-85, HSA w/ 4.25-in ID augers
WATER LEVELS: 15ft bgl - after well
START: 8/20/14 END: 8/20/14
LOGGER: APerkins

Install - before development 0753 0903



1- Ground elevation at well: NM
2- Top of casing elevation: NM
3- Wellhead protection cover type: 8in x 5ft steel casing
a) drain tube? NO
b) concrete pad dimensions; depth of surface concrete:
4- Dia./type surface casing: NA
5- Dia./type of well casing: 2-in SCH 40
6- Type/slot/size of screen: 0.040 wire wrapped
7- Type screen filter quantity used: #16 sand 10 x 50 lb bags
8- Type of seal quantity used: 3/8 in bentonite chips 2 x 50 lb bags
9- Grout
a) Grout mix used: 2 x 90 lb bags w/ 10 gal H2O + 10 lbs high bento yield
b) Method of placement: freepour
c) Vol. of surface casing grout: NA
d) Vol. of well casing grout: NA
Development method: surge block + submersible pump
Development time: 5hr
Estimated purge volume: 55 gal + 10 gal

Comments:

Illustration not to scale

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NUMBER (WELL NUMBER)	OSE FILE NUMBER(S)
Pod-6 IJ-6	C-3772
WELL OWNER NAME(S)	PHONE (OPTIONAL)
Schlumberger Technology Corporation	
WELL OWNER MAILING ADDRESS	CITY / STATE / ZIP
105 Industrial Boulevard Sugar Land	Sugar Land / TX / 77478

WELL LOCATION (FROM GPS)	DEGREES	MINUTES	SECONDS	
LATITUDE	32.	439	2955	N
LONGITUDE	103.	895	6532	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND

* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE

2. DRILLING & CASING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD-1210	Bryan Nydoske	National EWP

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
8-19-14	8-19-14	30	31.5	NA

COMPLETED WELL IS: ( ) ARTESIAN ( ) DRY HOLE ( ) SHALLOW (UNCONFINED) — STATIC WATER LEVEL IN COMPLETED WELL (FT): NA

DRILLING FLUID: ( ) AIR ( ) MUD ADDITIVES – SPECIFY:

DRILLING METHOD: ( ) ROTARY ( ) HAMMER ( ) CABLE TOOL (•) OTHER – SPECIFY: Auger

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	20.3	8 1/4	PVC	Flush	2	40	
20.3	30.3	8 1/4	PVC	Flush	2	40	.040

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
			See Attached		

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES **(attach supplemental sheets to fully describe all units)**	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
			See Attached	○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
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				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: ○ PUMP ○ AIR LIFT ○ BAILER ○ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm):

5. TEST; RIG SUPERVISION

WELL TEST — TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

MISCELLANEOUS INFORMATION:

PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:

Mark Green

6. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:

Mark Green — 9-8-14

SIGNATURE OF DRILLER / PRINT SIGNEE NAME — DATE

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER	
LOCATION			PAGE 2 OF 2

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
409935.14.04.02	IJ-6	1	1

SOIL BORING LOG

PROJECT Dowell-Schlumberger Artesia LOCATION Artesia, NM

ELEVATION NM DRILLING CONTRACTOR NDWP - I Saplan

DRILLING METHOD AND EQUIPMENT CME 85 HSA w/ Cyr pilot 4.25-in ID augers

WATER LEVELS NM START 2/10/14 1044 FINISH 2/10/14 1058 LOGGER APorsberg

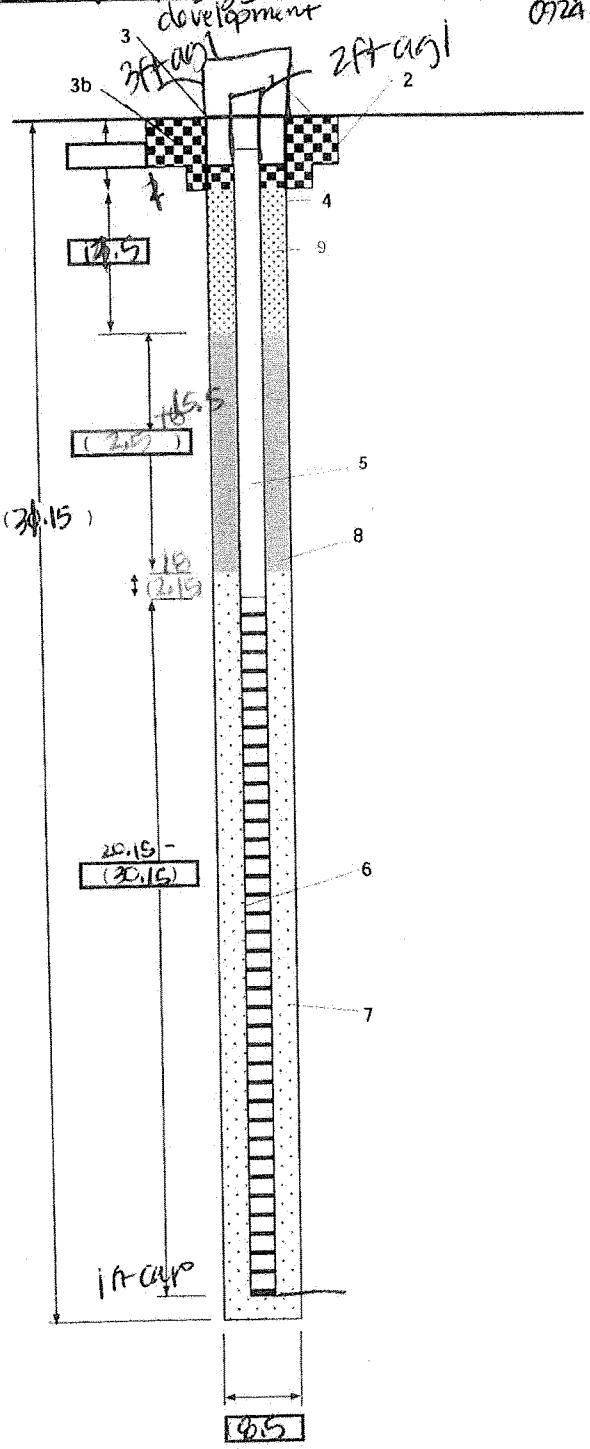
DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: NUMBER AND TYPE	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0					SANDY SILT (ML) 2.5YR 4/3, reddish brn, dry, non-plastic, non-cohesive, roots HA	PID=0.1ppm Soil cuttings from augers
5					SILT (ML) 2.5YR 6/2, pink, dry; non plastic, non-cohesive, clay nodules up to 2.5cm - white w/ mottled grey & reddish brown when broken	1046 PID=0.1ppm
10					LEAN CLAY (CL) 2.5YR 6/2, pale red, dry, low non-plastic, non-cohesive, white clay nodules nodules to 1cm, few coarse sand, trace med-fine gravel.	1048 PID=0.2ppm
15					LEAN CLAY (CL) 2.5YR 4/4 reddish brn, moist, low plastic, non-cohesive, trace fine to med sand	1050 PID=0.2ppm BZ=0.0ppm
20					SILT (ML), 2.5YR 4/3 reddish brn, wet, low plastic, cohesive, few fine gravel	1052 PID=0.3ppm
25					SILT (ML) 2.5YR 5/4, reddish brn, wet, low plastic, cohesive, few fine gravel	1053 PID=0.3ppm
30						

CH2MHILL

PROJECT NUMBER	WELL NUMBER	
469935.M4.04.02	IJ-B	SHEET 1 OF 1

GROUND WATER MONITORING WELL COMPLETION DIAGRAM

PROJECT: Dowell-Schlumberger Artesia
ELEVATION: NM
DRILLING METHOD AND EQUIPMENT USED: CHEES, HSA w 4.25-in ID
WATER LEVELS: 16.44 ft bgs before development
LOCATION: Artesia, NM
DRILLING CONTRACTOR: ~~WDC~~ NEWP | Isaacson
START 8/20/14 0724 END: 8/20/14
LOGGER: Aforsberg



1- Ground elevation at well: NM
2- Top of casing elevation: NM
3- Wellhead protection cover type: 8 inx6ft steel casing - ABOVE ground
a) drain tube? ND
b) concrete pad dimensions; depth of surface concrete: 4'x4'x4"
4- Dia./type surface casing: NA
5- Dia./type of well casing: 2in SCH40
6- Type/slot/size of screen: 0.040 mire wrap
7- Type screen filter quantity used: 8-16 colorado silica 11 x50lb bags
8- Type of seal quantity used: 3/8 in bentonite chips 1 3/4 x 50lb bags
9- Grout
a) Grout mix used: 15lbs high yield agents, 1 gallon, 2 x 90lb bags Portland
b) Method of placement: free pour
c) Vol. of surface casing grout: NA
d) Vol. of well casing grout:
Development method: swab/bail + overpump
Development time:
Estimated purge volume: 45 gal + 50 gal
Comments:

Illustration not to scale.

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

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1. GENERAL AND WELL LOCATION

OSE POD NUMBER (WELL NUMBER)	OSE FILE NUMBER(S)
Pod-7 IJ-7	C-3772
WELL OWNER NAME(S)	PHONE (OPTIONAL)
Schlumberger Technology Corporation	
WELL OWNER MAILING ADDRESS	CITY / STATE / ZIP
105 Industrial Boulevard Sugar Land	Sugar Land / TX / 77478

WELL LOCATION (FROM GPS)	DEGREES	MINUTES	SECONDS	
LATITUDE	32.	439	1961	N
LONGITUDE	103.	895	7469	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND

* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHJIP, RANGE) WHERE AVAILABLE

2. DRILLING & CASING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD-1210	Bryan Nydoske	National EWP

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
8-19-14	8-19-14	30	31.5	NA

COMPLETED WELL IS: ( ) ARTESIAN ( ) DRY HOLE ( ) SHALLOW (UNCONFINED) — STATIC WATER LEVEL IN COMPLETED WELL (FT): NA

DRILLING FLUID: ( ) AIR ( ) MUD ADDITIVES – SPECIFY:

DRILLING METHOD: ( ) ROTARY ( ) HAMMER ( ) CABLE TOOL (•) OTHER – SPECIFY: Auger

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	20.3	8 1/4	PVC	Flush	2	40	
20.3	30.3	8 1/4	PVC	Flush	2	40	.040

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
			See Attached		

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES **(attach supplemental sheets to fully describe all units)**	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
			See Attached	○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
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				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: ○ PUMP ○ AIR LIFT ○ BAILER ○ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm):

5. TEST; RIG SUPERVISION

WELL TEST — TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

MISCELLANEOUS INFORMATION:

PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:

Mark Green

6. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:

Mark Green — 4-8-14

SIGNATURE OF DRILLER / PRINT SIGNEE NAME — DATE

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 2 OF 2

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
469935.14.04.02	IJ-7	1	1

SOIL BORING LOG

PROJECT Dowell-Schlumberger Artesia LOCATION Artesia, NM

ELEVATION NM DRILLING CONTRACTOR New P I Sapien

DRILLING METHOD AND EQUIPMENT HSA w/4 1/2-in ID augers w/ CTR plugs

WATER LEVELS NM START 8/12/14 1000 FINISH 8/12/14 1012 LOGGER APorsberg

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: NUMBER AND TYPE	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
					NOT LOGGED	Soil logged from augers
5					SILT(ML) 2.5YR 7/3 light reddish brown, dry, non-plstc, non cohesive, 10-15% fine & med sands, 5% fine gravel	B2 = 0.0 ppm PID = 0.2 ppm
10					CLAY(CL) 2.5YR 6/3, reddish brown, dry, low plstc, non cohesive, 5-10% silt 5% med sands	1003 am PID = 0.2 ppm
15					CLAY(CL) w/sand (CL-SP) 2.5YR 5/4, reddish brown, moist, low plstc, cohesive, fine to coarse sands, few fine gravel (angular) w/ 2.5YR 5/6, dark red, nodules	1006 am PID = 0.1 ppm
20					SILT(ML) 2.5YR 5/4, reddish brown, wet, med plstc, cohesive, few coarse sand	1008 am PID = 0.2 ppm
25					SILT(ML) 2.5YR 5/4, reddish brn, wet, med plstc, cohesive, few coarse sand, few fine gravel	1010 am PID = 0.1 ppm
30						

CH2MHILL

PROJECT NUMBER: 469935.14.04.02

WELL NUMBER: IJ-7

SHEET 1 OF 1

GROUND WATER MONITORING WELL COMPLETION DIAGRAM

PROJECT: Owell-Schlumberger-Artesia

LOCATION: Artesia, NM

ELEVATION: NM

DRILLING CONTRACTOR: ~~WDC~~ NEWP / Isapien

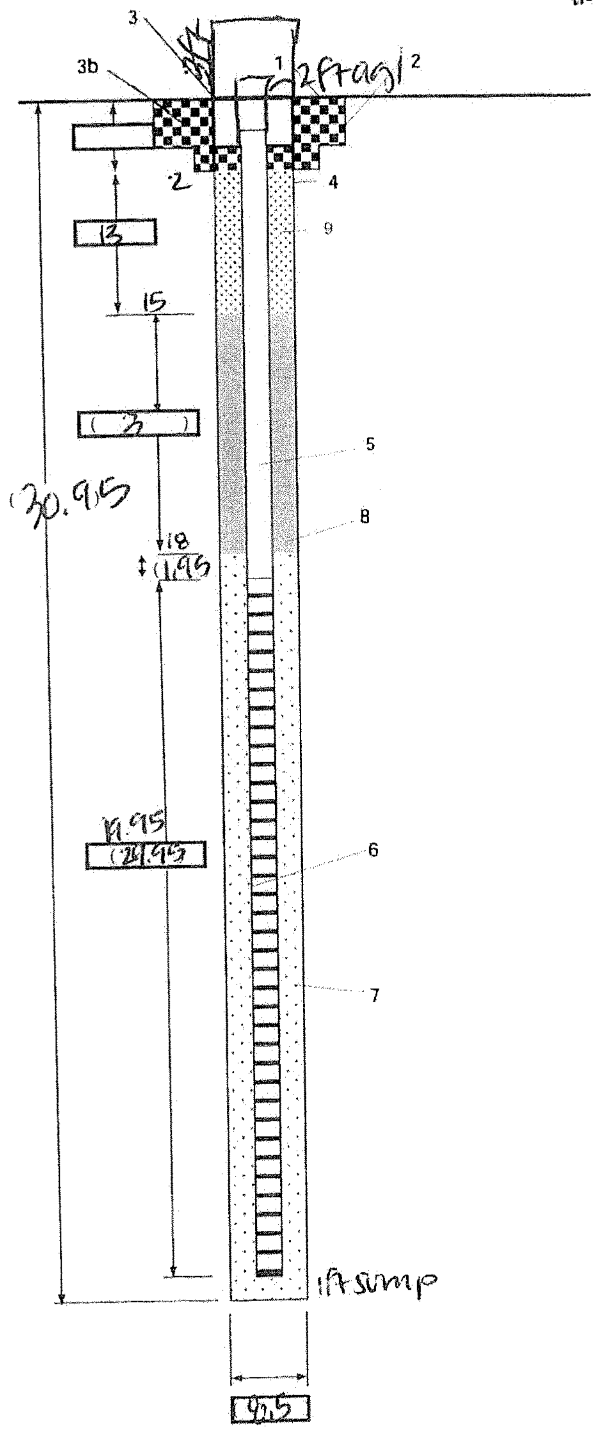
DRILLING METHOD AND EQUIPMENT USED: CME-85 w/ 4.25-in augers

WATER LEVELS: 16.86 on 8/21

START: 8/20/14 1120

END: 8/20/14 1400

LOGGER: AForsberg



1- Ground elevation at well: NM

2- Top of casing elevation: NM

3- Wellhead protection cover type: 8"x5' steel casing

a) drain tube?: NO

b) concrete pad dimensions; depth of surface concrete: 4'x4'x4"

4- Dia./type surface casing: NA

5- Dia./type of well casing: 2 in SCH 40

6- Type/slot/size of screen: 0.040 wire wrapped

7- Type screen filter: 8-16 Colorado silica sand

quantity used: 9 x 50lb bags

8- Type of seal: 3/8 in bentonite chips

quantity used: 1.5 x 50 lbs bags

9- Grout

a) Grout mix used: 15lbs gel, 17gal H2O, 3x90lbs portland

b) Method of placement: free pour

c) Vol. of surface casing grout: NA

d) Vol. of well casing grout:

Development method: bail & swab + overpump

Development time:

Estimated purge volume: 55gal + 50gal

Comments:

Illustration not to scale.

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NUMBER (WELL NUMBER)	OSE FILE NUMBER(S)
Pod-8 IJ-8	C-3772
WELL OWNER NAME(S)	PHONE (OPTIONAL)
Schlumberger Technology Corporation	
WELL OWNER MAILING ADDRESS	CITY / STATE / ZIP
105 Industrial Boulevard Sugar Land	Sugar Land / TX / 77478

WELL LOCATION (FROM GPS)	DEGREES	MINUTES	SECONDS	
LATITUDE	32.	439	0301	N
LONGITUDE	103.	895	8366	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND

* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHJIP, RANGE) WHERE AVAILABLE

2. DRILLING & CASING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD-1210	Bryan Nydoske	National EWP

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
8-19-14	8-19-14	30	31.5	NA

COMPLETED WELL IS: ( ) ARTESIAN ( ) DRY HOLE ( ) SHALLOW (UNCONFINED) — STATIC WATER LEVEL IN COMPLETED WELL (FT): NA

DRILLING FLUID: ( ) AIR ( ) MUD ADDITIVES – SPECIFY:

DRILLING METHOD: ( ) ROTARY ( ) HAMMER ( ) CABLE TOOL (•) OTHER – SPECIFY: Auger

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	20.3	8 1/4	PVC	Flush	2	40	
20.3	30.3	8 1/4	PVC	Flush	2	40	.040

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
			See Attached		

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES **(attach supplemental sheets to fully describe all units)**	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
			See Attached	○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
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				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: ○ PUMP ○ AIR LIFT ○ BAILER ○ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm):

5. TEST; RIG SUPERVISION

WELL TEST — TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

MISCELLANEOUS INFORMATION:

PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:

Mark Green

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Mark Green — SIGNATURE OF DRILLER / PRINT SIGNEE NAME

4-8-14 — DATE

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER	
LOCATION			PAGE 2 OF 2

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
469935.14.CA.02	IJ-8	1	1

SOIL BORING LOG

PROJECT O-S Artesia LOCATION Artesia, NM
ELEVATION NM DRILLING CONTRACTOR NEWP
DRILLING METHOD AND EQUIPMENT HSA CME 85 4 1/4 in ID Rig 146 I. Sapien Driller
WATER LEVELS NM START 0850 8/12/14 FINISH 0906 8/12/14 LOGGER A Forsberg

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0–5					NOT LOGGED	Soil logged from outside of augers
5					NOT LOGGED	
10					LEAN CLAY (CL) ~~SILT (ML)~~, 2.5YR 6/3, light reddish brown, dry, low plstc, cohesive 10-15% clay, little med gravel	
15					LEAN CLAY (CL), 2.5YR 5/3 reddish brown, moist, low plstc, noncohesive, few med sands	VOCs = 0 ppm BZ = 0.0 ppm
20					SILT (ML) 2.5YR 4/2, weak red, wet, low plstc, noncohesive, few med sand, 5-10% fine sand	0902 VOCs = 0.0
25					SILT (ML) 2.5YR 4/4 reddish brown, wet, med plstc, cohesive, 5% fine sand, trace coarse sand	0904 VOCs = 0.0
30						0906 BZ = 0.0

REV 12/01 FORM D1586

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CH2MHILL

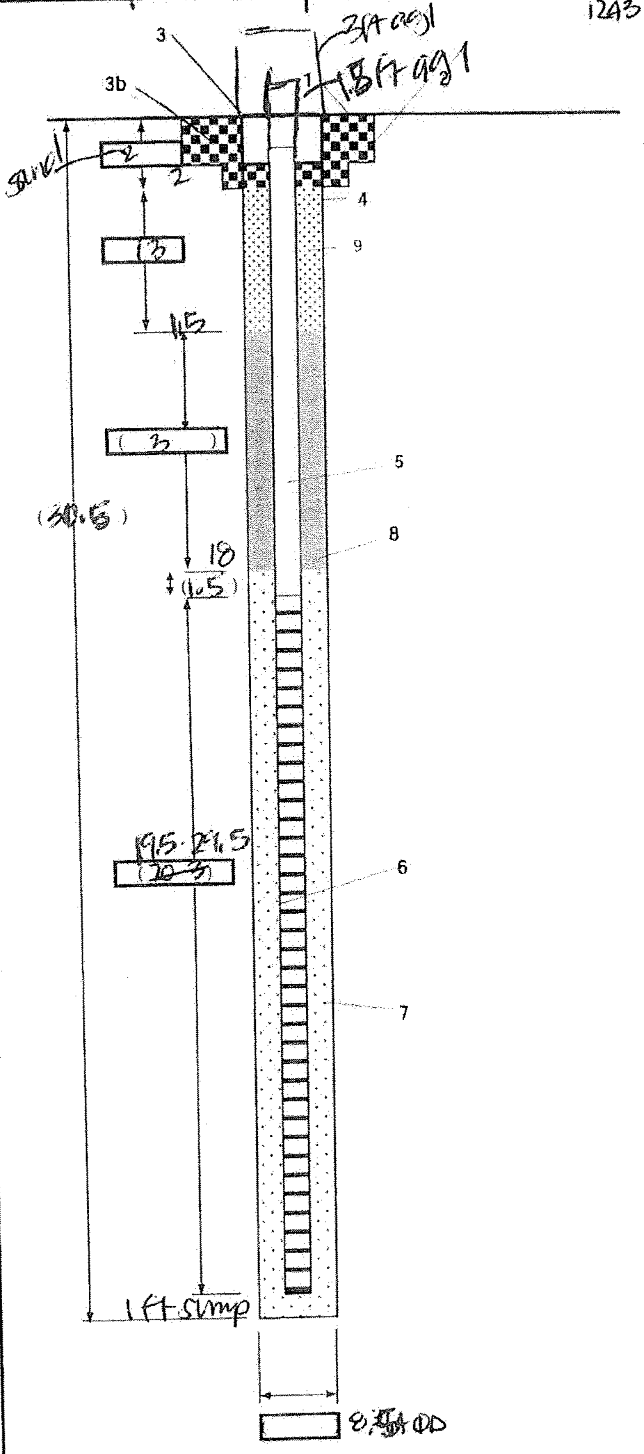
PROJECT NUMBER: 469935.14.04.02

WELL NUMBER: IJ-8

SHEET 1 OF 1

GROUND WATER MONITORING WELL COMPLETION DIAGRAM

PROJECT :
LOCATION :
ELEVATION:
DRILLING CONTRACTOR : ~~WDC~~ NEWP | I Sapien
DRILLING METHOD AND EQUIPMENT USED: CME-85 w/4.25 in ID HSA augers
WATER LEVELS : 15.14 on 8/21
START : 8/20/14 1243
END : 8/20/14
LOGGER : A Forsberg



1- Ground elevation at well: NM

2- Top of casing elevation: NM

3- Wellhead protection cover type: 8 in x 5 ft steel casing
a) drain tube? NO
b) concrete pad dimensions: 4' x 4' x 4"
depth of surface concrete:

4- Dia./type surface casing: NA

5- Dia./type of well casing: 2 in SCH40 PVC

6- Type/slot/size of screen: 2 in SCH40 0.010 slot MR

7- Type screen filter: 8/16 sand
quantity used: 10 x 50 lb bags

8- Type of seal: 3/8 in bentonite chips
quantity used: 1.5 x 50 lb bags

9- Grout
a) Grout mix used: ~~16lbs gel, 3x90lbs portland~~ & 17gal H2O
b) Method of placement: free pour
c) Vol.of surface casing grout: NA
d) Vol. of well casing grout:

Development method: swab & bail + overpump

Development time:

Estimated purge volume: 55 gal + 40 gal

Comments:

Illustration not to scale.