



**Pacific Gas and
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February 28, 2006

Norman Shopay
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California Department of Toxic Substances Control
Geology and Corrective Action Branch
700 Heinz Avenue
Berkeley, California 94710

Subject: Well PGE-6 Decommissioning Work Plan,
PG&E Topock Compressor Station

Dear Mr. Shopay:

This letter transmits a work plan for decommissioning inactive water supply well PGE-6, as recommended by the technical memorandum *Well PGE-6 Decommissioning Evaluation*. This work plan is submitted in conformance with Condition 20 in DTSC's January 6, 2006 letter.

Please contact me at (805) 546-5243 if you have any questions.

Sincerely,

cc. Kate Burger/ DTSC

Enclosure

**Well PGE-6 Decommissioning
Work Plan
PG&E Topock Compressor Station
Needles, California**

February 28, 2006

Prepared for
**California Department of Toxic Substances
Control**

On behalf of
Pacific Gas and Electric Company

CH2MHILL
155 Grand Avenue, Suite 1000
Oakland, CA 94612

**Well PGE-6 Decommissioning Work Plan
PG&E Topock Compressor Station
Needles, California**

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On behalf of
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February 28, 2006

This work plan was prepared under supervision of a
California Certified Engineering Geologist,



Paul Bertucci, C.E.G.
Project Hydrogeologist



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Acronyms and Abbreviations

µg/L	micrograms per liter
bgs	below ground surface
BLM	U.S. Bureau of Land Management
Cr(VI)	hexavalent chromium
DTSC	California Department of Toxic Substances Control
DEHS	San Bernardino County Department of Environmental Health Services
HNWR	Havasu National Wildlife Refuge
IDW	investigation-derived waste
PG&E	Pacific Gas and Electric Company
USFWS	U.S. Fish and Wildlife Service

1.0 Introduction

Pacific Gas and Electric Company (PG&E) is addressing chromium in groundwater at the Topock Compressor Station near Needles, California, under the oversight of the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). In a January 6, 2006 letter, *Conditional Approval of the Draft Well Installation Work Plan for Interim Measures Performance Monitoring Program, dated November 30, 2005, PG&E, Topock Compressor Station*. DTSC requested a technical memorandum be submitted by February 28, 2006 with recommendations regarding whether the inactive water supply well PGE-6 should be decommissioned. If decommissioning was recommended, DTSC required that a work plan for decommissioning be submitted on the same date as the technical memorandum. This work plan is being submitted in fulfillment of that DTSC requirement.

Existing well construction, drilling logs, water level, and water quality data were reviewed for PGE-6 and nearby wells. Recommendations for the potential future use and decommissioning of PGE-6 were provided in the technical memorandum that accompanies this work plan (*Well PGE-6 Decommissioning Evaluation, PG&E Topock Compressor Station, CH2M HILL, February 28, 2006.*) The technical memorandum recommends that PGE-6 could possibly be useful as an injection or extraction well in a pilot test of in-situ remediation. After the pilot test was complete, or once it is determined that PGE-6 wouldn't be needed for the pilot test, it was recommended that the well be decommissioned. This work plan describes the methods, materials, waste management, schedule, and authorizations pertinent to the decommissioning work.

1.1 Well PGE-6 Construction Details and Present Condition

As shown on Figure 1, well PGE-6 is located approximately 400 feet northeast from the northern boundary of PG&E's Topock Compressor Station, in an area known as the MW-24 bench. PGE-6 was originally installed in 1964 as a standby industrial water supply well for the Topock Compressor Station. It has not been in service as a production well since at least 1971 and was reportedly rarely pumped prior to that time. It has been sampled periodically since 1997. Concentrations of hexavalent chromium (Cr[VI]) in samples from PGE-6 have ranged from non-detect (<10 micrograms per liter [$\mu\text{g/L}$]) to 3,100 $\mu\text{g/L}$.

The drillers log (Attachment A) indicates that the well was constructed to a depth of 180 feet bgs with 14-inch steel casing. A 20-inch diameter conductor casing extends to a depth of 19 feet. The screened interval extends from 110 feet to 180 feet bgs. A 1998 video log of PGE-6 shows the well to be filled with sediment or collapsed to a depth of 162 feet bgs. The video log of PGE-6 (logging report included in Attachment A) shows the well casing to be in very poor condition. Numerous holes are visible in the casing between about 60 and 100 feet. The well screen is heavily corroded and encrusted. The casing above the screen is in such poor condition that there is significant risk of collapse if attempts were made to clean out or rehabilitate this well.

2.0 PGE-6 Decommissioning

2.1 Site Access and Preparation

The MW-20 bench is on federal land owned by the Havasu National Wildlife Refuge (HNWR) and managed by the U.S. Fish and Wildlife Service (USFWS). Trucks and equipment needed to do the decommissioning work at PGE-6 will have to negotiate a steep, one-lane dirt road that leads from the Compressor Station down to the MW-20 bench. This road frequently becomes rutted after rains and may require some grading or filling of ruts to allow equipment access to the well site. Equipment needed for decommissioning may include a backhoe, dump truck, front loader, cement truck or trailer, and pump service truck. The decommissioning work could be accomplished in two to three days. Because of the short duration of the work and the relatively small amount of materials needed, there will be no need for an equipment or materials staging area. It may be necessary to locate some pallets of cement or sand at the work site during the decommissioning work.

Buried gas pipelines cross PG&E property just outside the north gate of the Compressor Station. An earthen berm will need to be placed over top of these pipelines to allow the safe passage of heavy vehicles across them. This berm would be removed at the completion of the decommissioning work.

Well PGE-6 is in an area that has been previously graded and is very sparsely vegetated. There are a few small creosote bushes located near the well that will be destroyed. It will not be necessary to trim or destroy any other vegetation during the course of this work.

2.2 Well Decommissioning Requirements

Well decommissioning involves filling the well with inert materials and plugging the upper portion with cement. In San Bernardino County, the area around the wellhead must be excavated and the casing removed from the uppermost 5 feet of the well. Except for this additional requirement, San Bernardino County follows the California Department of Water Resources Standards which specify the techniques and types of materials suitable for well decommissioning.

Well decommissioning typically involves perforation of the casing in the upper portion of the well to allow the grout to penetrate and seal the annular space outside the casing. Due to the poor condition of the casing in PGE-6 it is likely that attempts to perforate the well might cause it to collapse. San Bernardino County Department of Environmental Health Services (DEHS) was contacted to discuss the proper means of decommissioning PGE-6. Because there is a significant risk of collapse if attempts were made to perforate the casing and considering that the casing is already perforated by corrosion in many places, the DEHS agreed that perforation of the casing in PGE-6 would not be required (personal communication between Martin Barackman/CH2M HILL and Marvyn Cerdenio/San Bernardino County DEHS, February 17, 2006).

2.2.1 Backfill Materials

Section 23 of California Department of Water Resources Water Well Standards specifies the methods and materials to be used in decommissioning wells. For wells situated in unconsolidated material, such as the Alluvial Aquifer at the site, these standards specify that the lower portion of the well may be filled with clay, silt, sand, gravel, crushed stone, native soils, or mixtures of these materials so long as no organic matter is included. The uppermost 20 feet of the casing must be filled with impervious material with a coefficient of permeability less than 10 feet per year. San Bernardino County recommends a sand-cement grout mixture for the impervious material in the upper portion of the well. Consistent with these regulations, the following backfill materials are proposed for use in PGE-6:

- Bottom portion of well (depth greater than 100 feet) - clean sand or gravel
- Upper portion of well (depth less than 100 feet) - sand-cement grout
- Surface excavation where casing was removed - native soils

Figure 2 provides a schematic diagram of the decommissioned well.

2.2.2 Surface Excavation and Casing Removal

San Bernardino County requires removal of the top 5 feet of casing during decommissioning. This involves excavating a trench around the casing large enough and deep enough for personnel to enter and operate cutting tools. PGE-6 includes both a 20-inch diameter conductor casing and a 14-inch diameter production casing. The records do not indicate what material was used to fill the annular space between the conductor and surface casings. If concrete was used in this annular space, the size of the excavation might need to be as large as 10 feet in diameter and up to 7 feet deep to allow use of a jackhammer in the excavation. The excavation will be benched and sloped to allow workers to enter the excavation without the need for shoring. All excavation activities will meet applicable California OSHA regulations pertaining to excavation work.

The soil excavated from the hole will be placed back in the hole as backfill. Additional clean topsoil will be added as needed to re-establish the existing grade. Backfill materials will be compacted using the backhoe during emplacement. The surface will be restored to original grade and smoothed.

2.2.3 Grout Requirements

The grout requirements are as follows:

- The grout will be a sand/cement mixture in the following proportions:
 - 94 pounds of neat Type I or II Portland or American Petroleum Institute Class A cement
 - 188 pounds of sand
 - Not more than 7 gallons of potable water
- All grout will be pumped into place using a tremmie pipe. The end of the tremmie pipe will be kept at least 2 feet below the surface of the grout during emplacement.

- The grout will extend from a depth of approximately 100 feet below grade to the top of the cut off casing at approximately 5 feet below grade
- The expected volume of each ingredient in the grout mixture will be pre-calculated and documented
- Grout will be poured in a single continuous lift and will completely fill the cut off well casing and flow out into the excavation around the casing
- Grout will be allowed to cure for at least 30 minutes prior to placing any backfill in the surface excavation

San Bernardino County will be notified at least 2 hours prior to grouting to provide them the opportunity to have a representative onsite during grouting.

3.0 Waste Management

Investigation derived waste (IDW) materials that will be generated during well decommissioning include incidental trash, the 5-foot sections of steel casing that will be cut off the top of the well, and possibly a small amount of Cr(VI)-bearing groundwater.

Incidental trash typically includes empty cement and sand bags, pallets, empty drink and food containers, plastic sheeting and other disposables associated with construction work. Incidental trash will be collected at the end of each shift and hauled off the site to an appropriate disposal facility.

The 5-foot sections of well casing will be pressure washed to remove any residual contamination and, depending on the condition of the steel, either recycled as scrap metal or disposed of as solid waste.

By filling the well with sand up to the depth of the water table it is anticipated that there will be no Cr(VI)-bearing groundwater in the casing to be displaced upward during the placement of the grout. As the gravel fills the well screen, the groundwater in the well will be displaced back into the aquifer rather than up into the blank casing. As the top of the grout approaches the top of the casing, any the groundwater found to be floating on top of the grout layer will be pumped off and placed in drums or a temporary tank near the well site. No groundwater will be allowed to spill out of the top of the well casing.

Any groundwater generated during the decommissioning operation will likely have a very high pH from being in contact with the grout. If the pH is greater than 12.5, this water would be classified as hazardous waste and managed accordingly. If the pH is less than 12.5, the water would be managed in the same way as other purge water at the Topock site.

4.0 Schedule and Reporting

It is recommended that the decision to decommission this well not be made until the in-situ pilot test is completed or it is determined that PGE-6 will not be needed for the pilot test. Further, the decommissioning activities are subject to obtaining approvals and authorizations as outlined in Section 5.0. Therefore, the schedule below is presented in terms of duration of work without a definite start date being identified.

TABLE 1
Duration of Major Tasks
*Well PGE-6 Decommissioning Work Plan,
PG&E Topock Compressor Station, Needles, California*

Activity	Duration
Site Preparation Work (grading of road, berm over gas pipeline)	10 days
Mobilize Equipment to Site	7 days
Decommissioning Work	3 days
Reporting	60 days

Within 60 days of the completion of the decommissioning work, PG&E will submit a report documenting the decommissioning of the well. This report will include documentation of the decommissioning activities, quantities of materials used, photographs of the decommissioning work, and copies of the well destruction reports filed with the California Department of Water Resources and San Bernardino County.

5.0 Required and Approvals and Authorizations

Table 2 provides a listing of approvals that have been identified as applicable to the decommissioning of well PGE-6 on the HNWR land, near the PG&E Topock Compressor Station. Applicable approvals will be obtained prior to initiating any site preparation work or moving equipment to the site.

TABLE 2
Approvals for PGE-6 Decommissioning
*Well PGE-6 Decommissioning Work Plan,
PG&E Topock Compressor Station, Needles, California*

Agency	Approvals etc.
DTSC	Approval of decommissioning work plan
U.S. Fish & Wildlife Service, and Havasu National Wildlife Refuge	Approval of decommissioning work plan
San Bernardino County	Well Destruction Permit

Figures

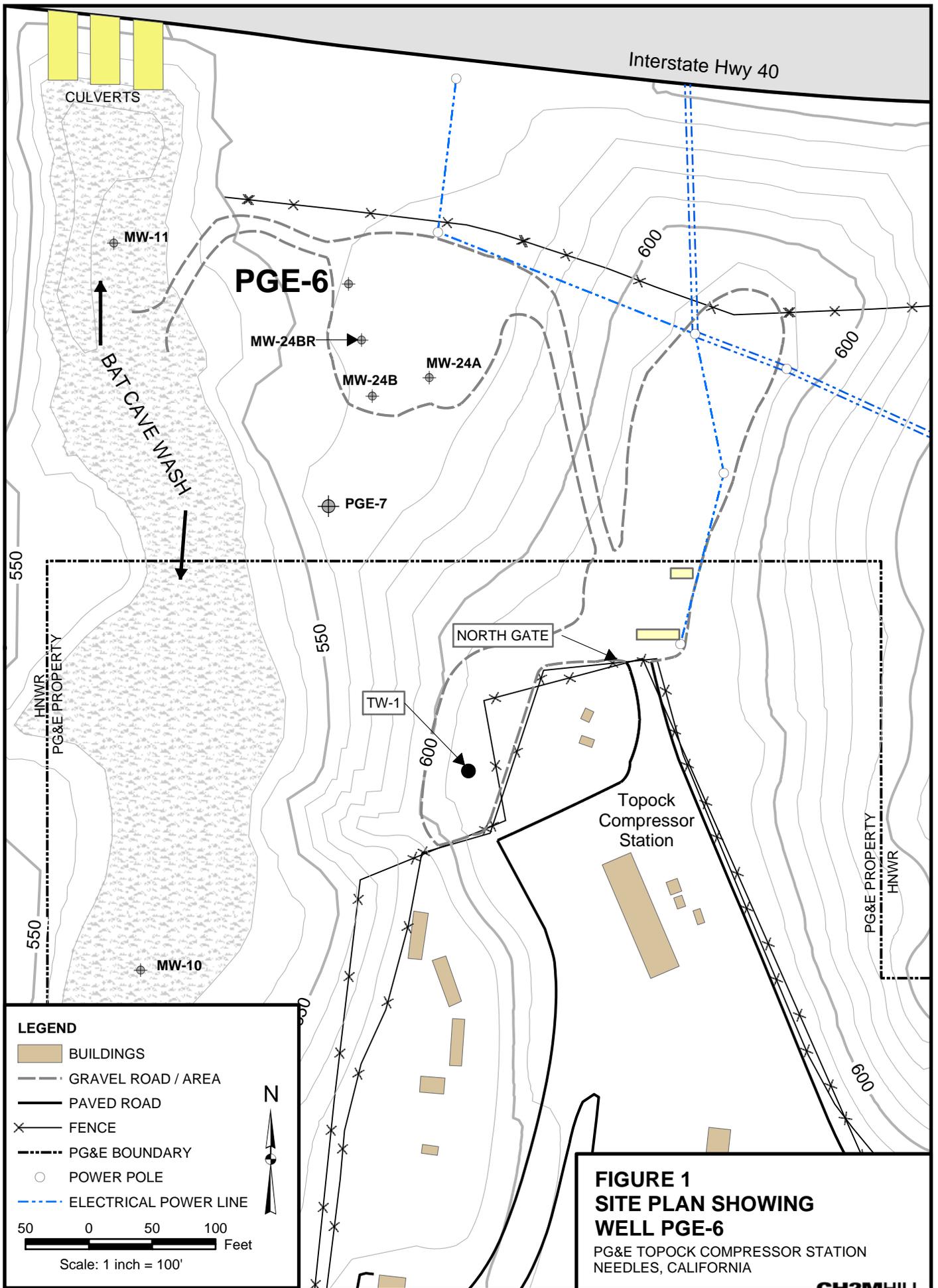
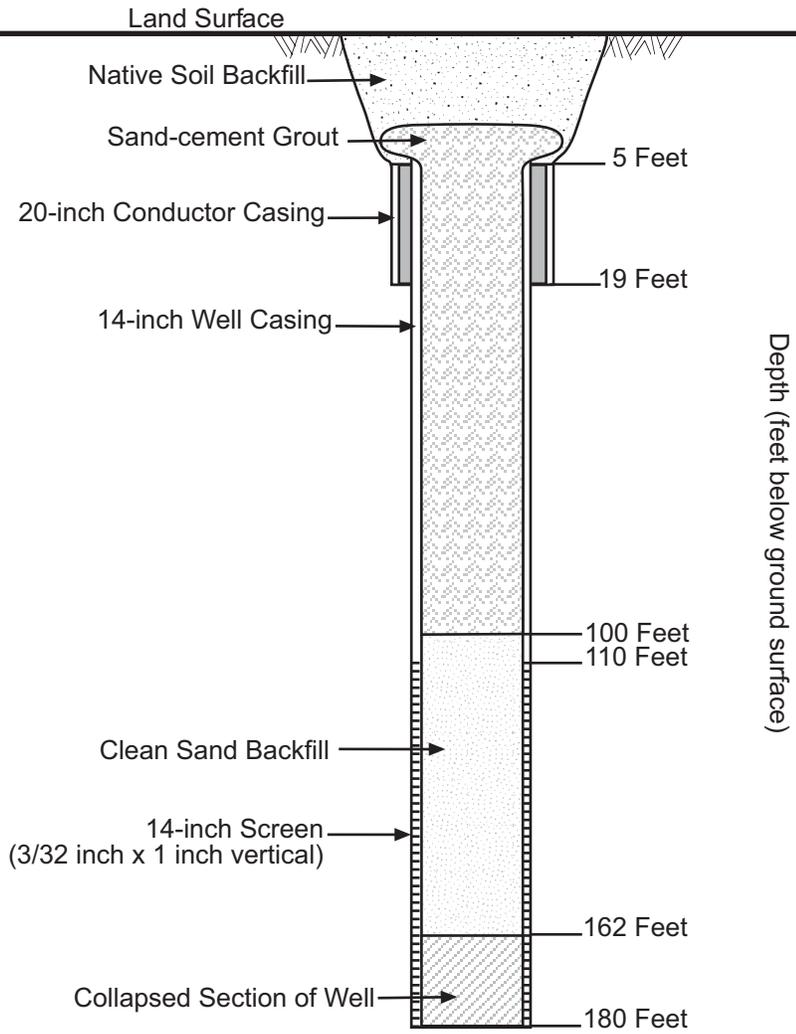


FIGURE 1
SITE PLAN SHOWING
WELL PGE-6

PG&E TOPOCK COMPRESSOR STATION
 NEEDLES, CALIFORNIA



NOT TO SCALE

FIGURE 2
SCHEMATIC DIAGRAM OF
PGE-6 DECOMMISSIONING
 PG&E TOPOCK COMPRESSOR STATION
 NEEDLES, CALIFORNIA

Attachment A

PAUL R. PEAKER

WATER WELL REPAIRING AND DRILLING

ROUTE 6, BOX 522-T • TELEPHONE THornwall 5-0823

BAKERSFIELD, CALIFORNIA

WATER WELL LOG

June 17, 1964

for

No. 6 - WELL

Pacific Gas and Electric Co., Box 488, Barstow, California
 14", 180', at Topock Compressor Station.

<u>DEPTH</u>	<u>FORMATION</u>
0 - 19'	Boulders and gravel
19 - 30'	Cobblestone and gravel
30 - 60'	Some boulders and gravel.
60 - 180'	Sand, gravel, and rocks.

CASING LOG

0 - 110'	Blank #8 gage Kai-weld
110 - 180'	Perf. 3/32 x 1", with a 3/4 x 12 x 14" shoe on bottom

There is 19' of 20" conductor pipe on top, and the water level is 106'.

PGS434692

*Refer to G.M. 159114**Contract # 11-10-64**Contract # 11-29-64*

