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Basic Data Report for Well Plugging and Abandonment Fiscal Year 2020

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Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831
(865) 576-8401

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CHANGE HISTORY SUMMARY

REVISION NUMBER	DATE ISSUED	DESCRIPTION OF CHANGES
0	02/03/21	• Initial issue.

ABBREVIATIONS AND ACRONYMS

Acronym	Term
AIS	Air Intake Shaft
AMSL	Above Mean Sea Level
bgl	below ground level
BLM	Bureau of Land Management
cm	centimeter
DOE	Department of Energy
ft	feet
FY	fiscal year
gal	gallon
gm	gram
JHA	Job Hazard Analysis
lb	pound
NMOSE	New Mexico Office of the State Engineer
OSE	Office of the State Engineer
P&A	plugging and abandonment
PBTD	plug back the depth
PIP	production injection packers
PPE	personal protective equipment
psi	pounds per square inch
PVC	polyvinyl chloride
SNL	Sandia National Laboratories
STR	Subcontract Technical Representative
TD	total depth
WIPP	Waste Isolation Pilot Plant
RES	Regulatory and Environmental Services
WTS	Washington TRU Solutions, LLC

1.0 INTRODUCTION

The Waste Isolation Pilot Plant (WIPP) is a U.S. Department of Energy (DOE) facility for disposal of transuranic mixed waste under a permit issued by the New Mexico Environment Department. WIPP is 26 miles southeast of Carlsbad, New Mexico, in eastern Eddy County. Disposal panels are mined in the Permian Salado Formation at a depth of 2,150 feet below ground level (bgl).

Field activities for this Basic Data Report were completed from April 21 through April 30, 2020. The Fiscal Year (FY) 2020 program included the plugging and abandonment (P&A) of five monitoring wells, which permanently removed them from the monitoring network.

This Basic Data Report presents the summary of procedures followed for each well completion as documented by the on-site Subcontract Technical Representative (STR).

2.0 PROGRAM METHODOLOGY

The general approach to the work was the same for each well, and health and safety standards were maintained throughout the program, as described below.

A Job Hazard Analysis (JHA) was submitted by the subcontractor to the STR and approved by WIPP safety before the start of any work at the WIPP site. The JHA documented the commitment of participating contractors and their personnel to providing a healthy and safe work environment. The JHA included specific operations that might create a safety hazard and the preventive measures necessary to eliminate the hazard. Personnel working on the program were required to read and sign the JHA before working. Tailgate safety meetings were held before the start of each day's work. Job safety items were covered, such as the wearing of personal protective equipment (PPE), trip and fall hazards, falling object hazards, slip hazards, pinch points, and heat stress. Whenever a change in operations occurred, additional tailgate safety meetings were held to review any new specific hazards that might arise.

The WIPP facility provides highly trained 24-hour emergency and nonemergency response teams dispatched from the Central Monitoring Room. Notification procedures and emergency and nonemergency phone numbers were available throughout the program.

Permitting documents were submitted by Regulatory and Environmental Services (RES) and approved by the New Mexico Office of the State Engineer (NMOSE) before work commenced on these wells.

The P&A well and the reconfigured well were processed by removing appurtenances, the wellhead, and tubing. Wells were scraped to remove oxidation scale from the casing to allow sufficient bonding between the casing and cement. After scraping, tremie pipe was installed to mid screen and the wells were circulated with fresh water to remove any deleterious material from the total depth of the well. Once the well was circulated and clean water appeared on surface cement was tremied into the well from screen depth to surface.

For P&A and reconfiguration processes, a closed loop system was used for all work water.

RES managed this program, which included technical, regulatory, contractual, financial, and field oversight. The prime subcontractors for this process were Stewart Brothers Drilling Co. of Milan, New Mexico.

3.0 PLUGGING AND ABANDONMENT

All wells were plugged and abandoned according to the scope of work submitted with the work package and as directed by OSE permits.

3.1 Well H-2b2

H-2b2 borehole was completed as C-2763 in July 1983 as a Culebra monitoring well south west of the WIPP facility. The well penetrated to a total depth (TD) of 660 ft bgl with 5.5 inch steel casing to 620 ft bgl leaving 40 ft of open hole completion.

Plugging of well H-2b2 began on April 26, 2020 and was completed on April 27, 2020. The surface casing was removed and the well casing scraped to ensure the cement would have a good bond. The well was then circulated through the use of tremie pipe to remove and deleterious material. Once the well produced clear circulation fluids cement was tremied from TD to surface.

H-2b2 Plugged Configuration
Figure not to scale

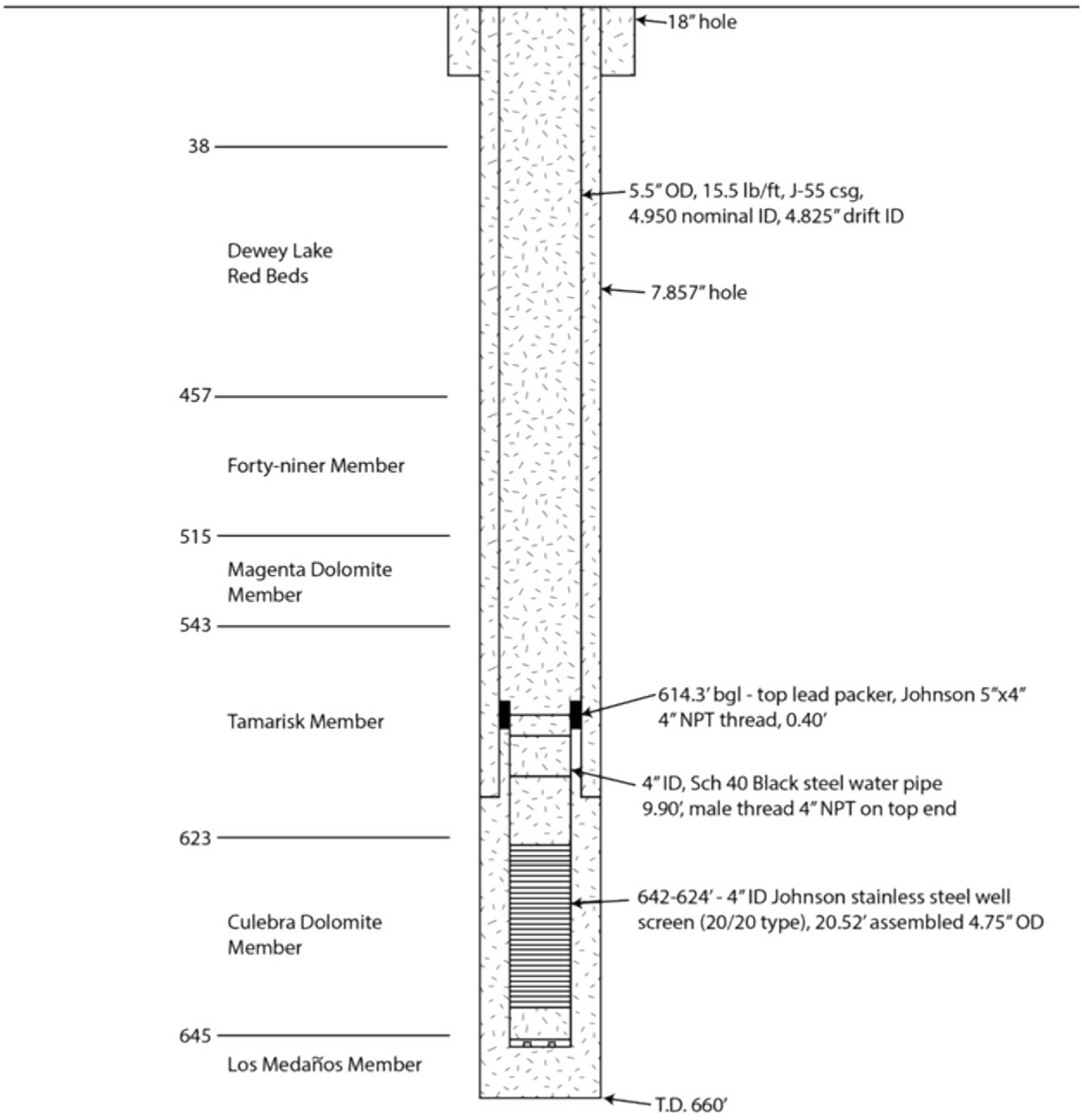

Figure 1: H-2b2 Plugged Configuration



Figure 2: H-2b2 Clear Circulation Fluids



Figure 3: H-2b2 Plugged to Surface

3.2 Well H-3b2

H-3b2 (C-2760) was completed November 8, 1983 as a Culebra monitoring well directly south of the WIPP site. It was completed as an open hole monitoring well from 725-673 ft bgl. Steel casing (5.5 in) was cemented in place from 673 to surface.
The plugging process began on April 27, 2020 and was completed on April 28, 2020 after scraping, circulating and cementing from TD to surface.

H-3b2 Plugged Configuration
Figure not to scale

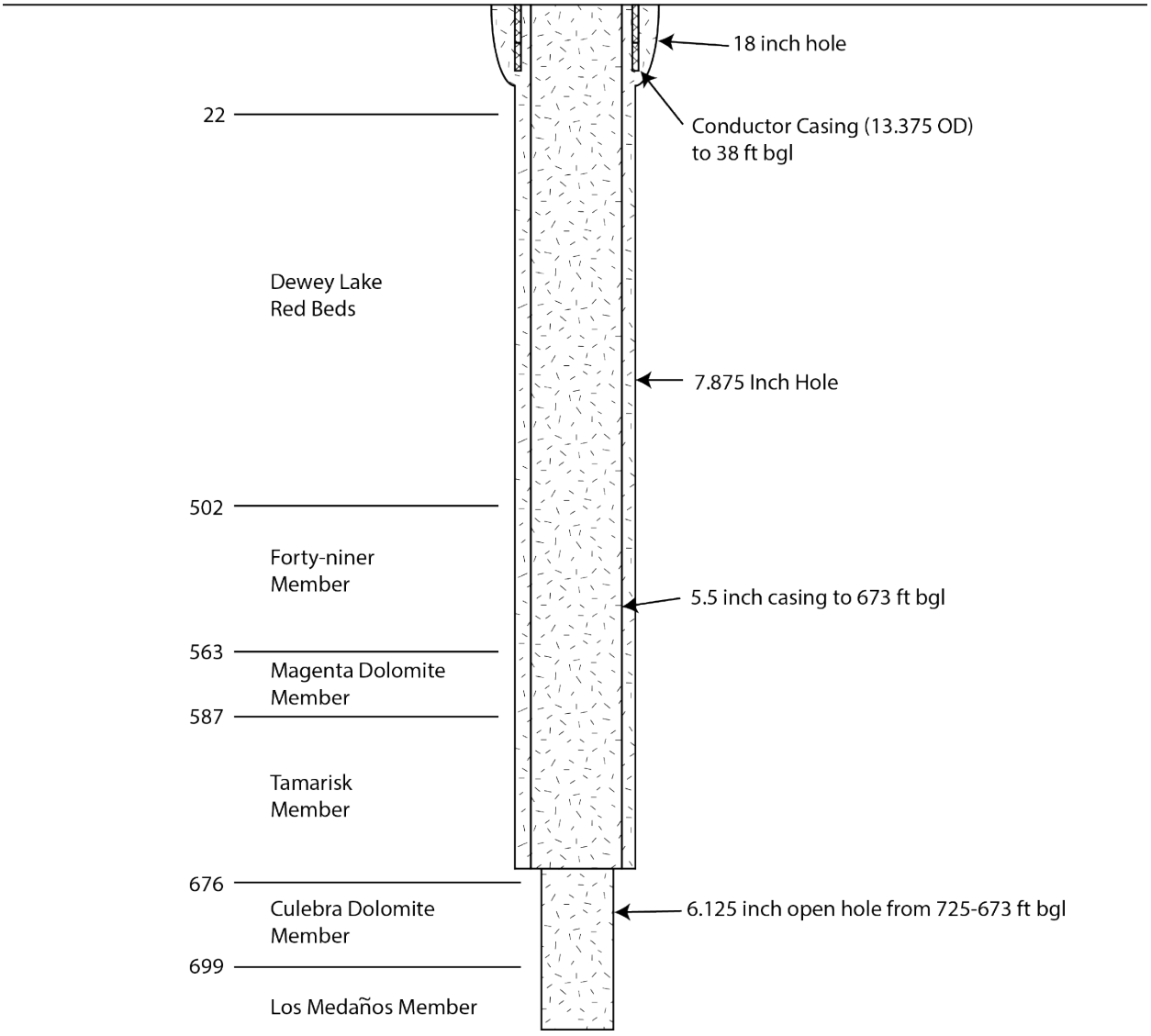

Figure 4: H-3b2 Plugged Configuration



Figure 5: H-3b2 Clear Circulation Fluids



Figure 6: H-3b2 Plugged to Surface

3.3 Well H-7b1

H-7b1 (C-2770) was drilled and completed from 07/18/79-09/13/79 south west of the WIPP site close to the GNOME project. This well was completed as a Culebra monitoring well with an open hole from 237-283. The well was located across a road that had been destroyed by pipeline operations. This meant we could not get the rig into the location. Due to this, the OSE was contacted and asked for permission to plug without scraping, which was approved. PVC was used to tremie cement from TD to surface from 04/29/20-04/30/20.

H-7b1 Plugged Configuration
Figure not to scale

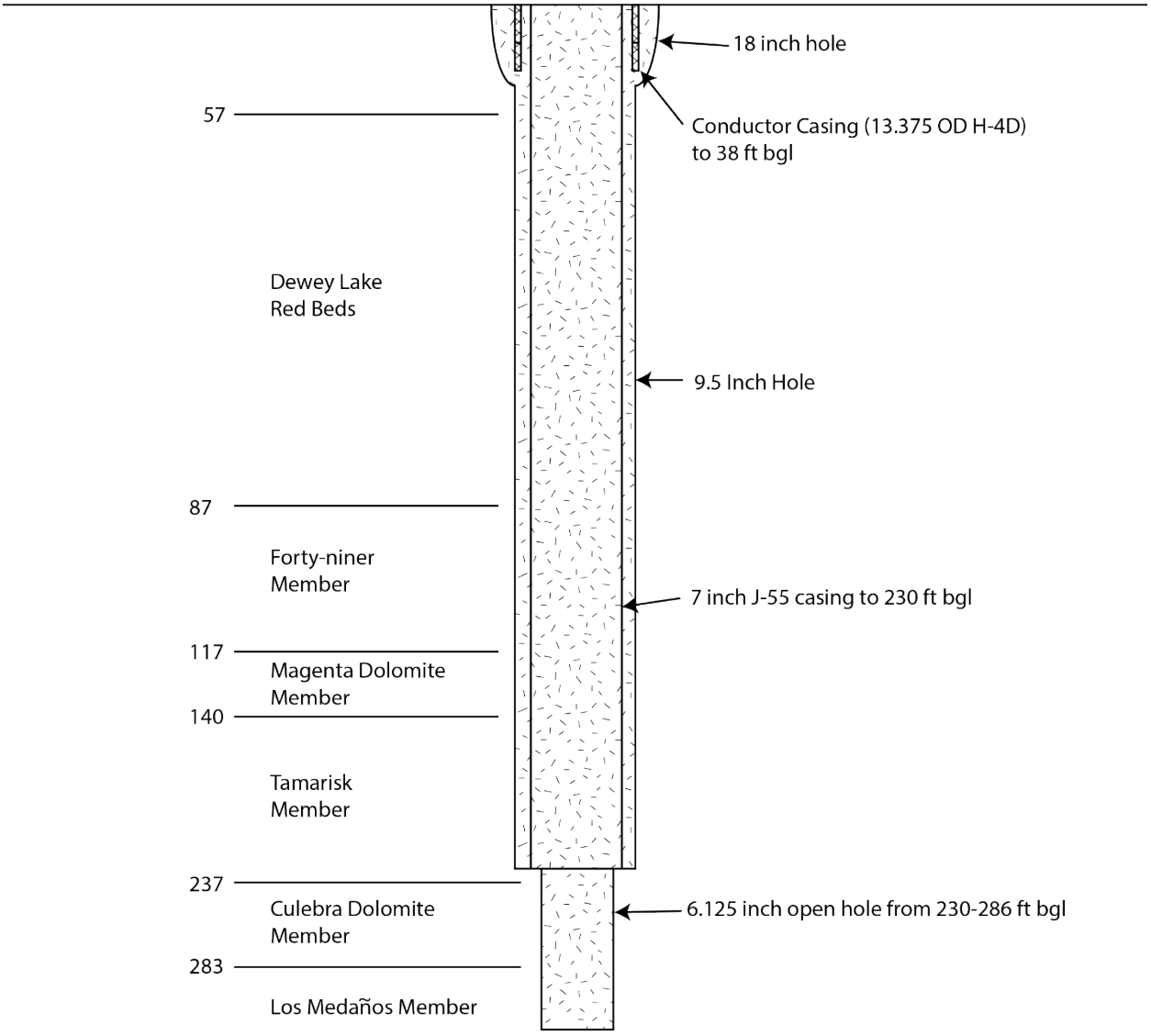

Figure 7: H-7b1 Plugged Configuration



Figure 8: H-7b1 Plugged to Surface

3.4 Well H-17

H-17 (C-2773) was drilled and completed from 09/21/87-11/04/87 south of the WIPP site as an open hole Culebra monitoring well. The well had a completion interval from 706-731 and had a TD of 880 ft bgl. The well was scraped, circulated and then plugged from TD to surface through tremie pipe. The plugging process was completed on 04/23/20.

H-17 Plugged Configuration
Figure not to scale

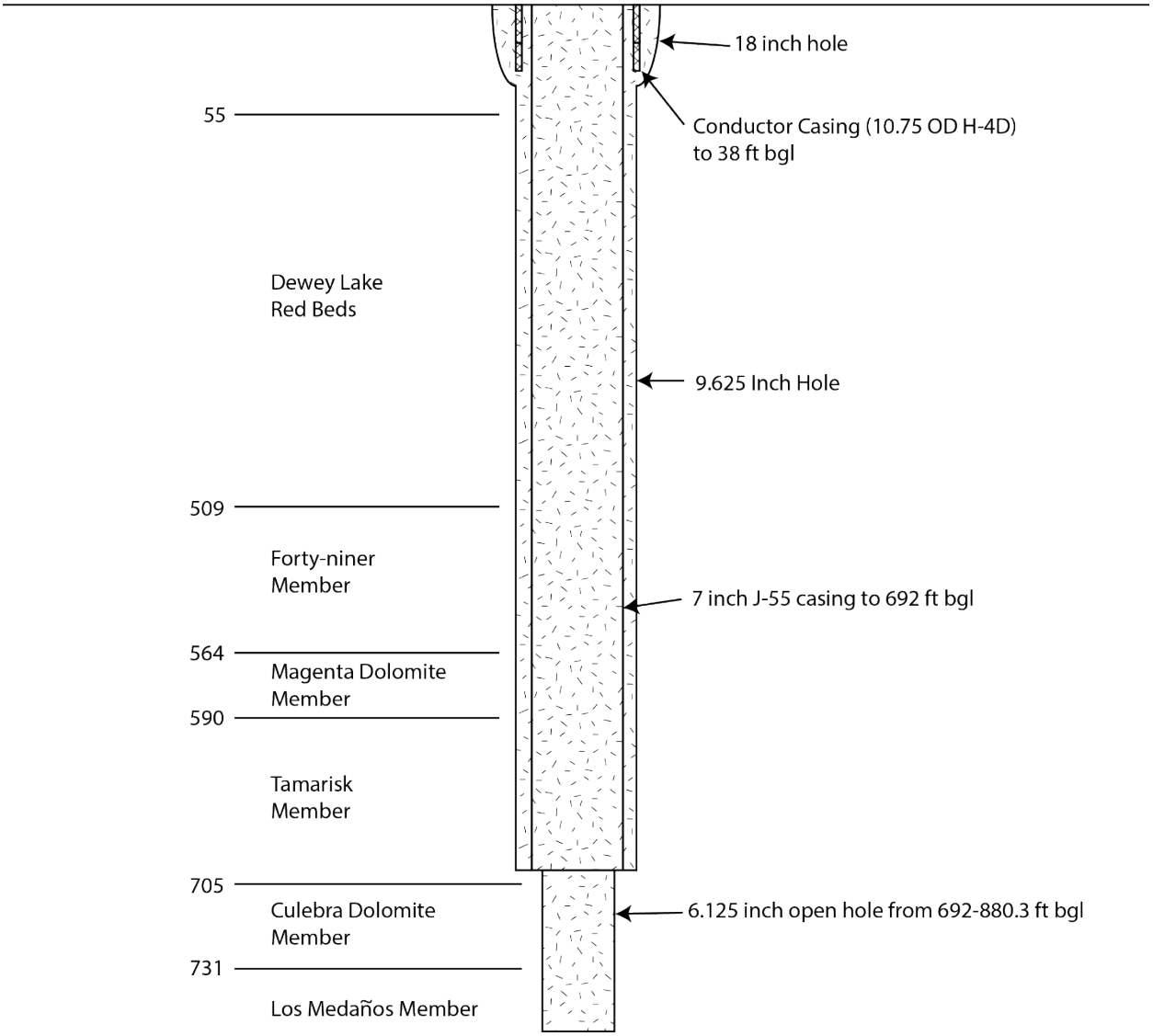

Figure 9: H-17 Plugged Configuration



Figure 10: H-17 Clear Circulation Fluids



Figure 11: H-17 Plugged to Surface

3.5 Well WIPP-19

WIPP-19 (C-2755) was drilled and completed from 04/06/78-05/08/78 as a Culebra monitoring well just north of the WIPP site. Originally the well was drilled to 1034 ft bgl and then plugged back to 895 ft bgl with cement. The casing was perforated to monitor the Culebra from 754-780 ft bgl. This well was plugged by scraping, circulating, and pumping cement from 780 ft bgl to surface through tremie.

WIPP-19 Plugged Configuration
Figure not to scale

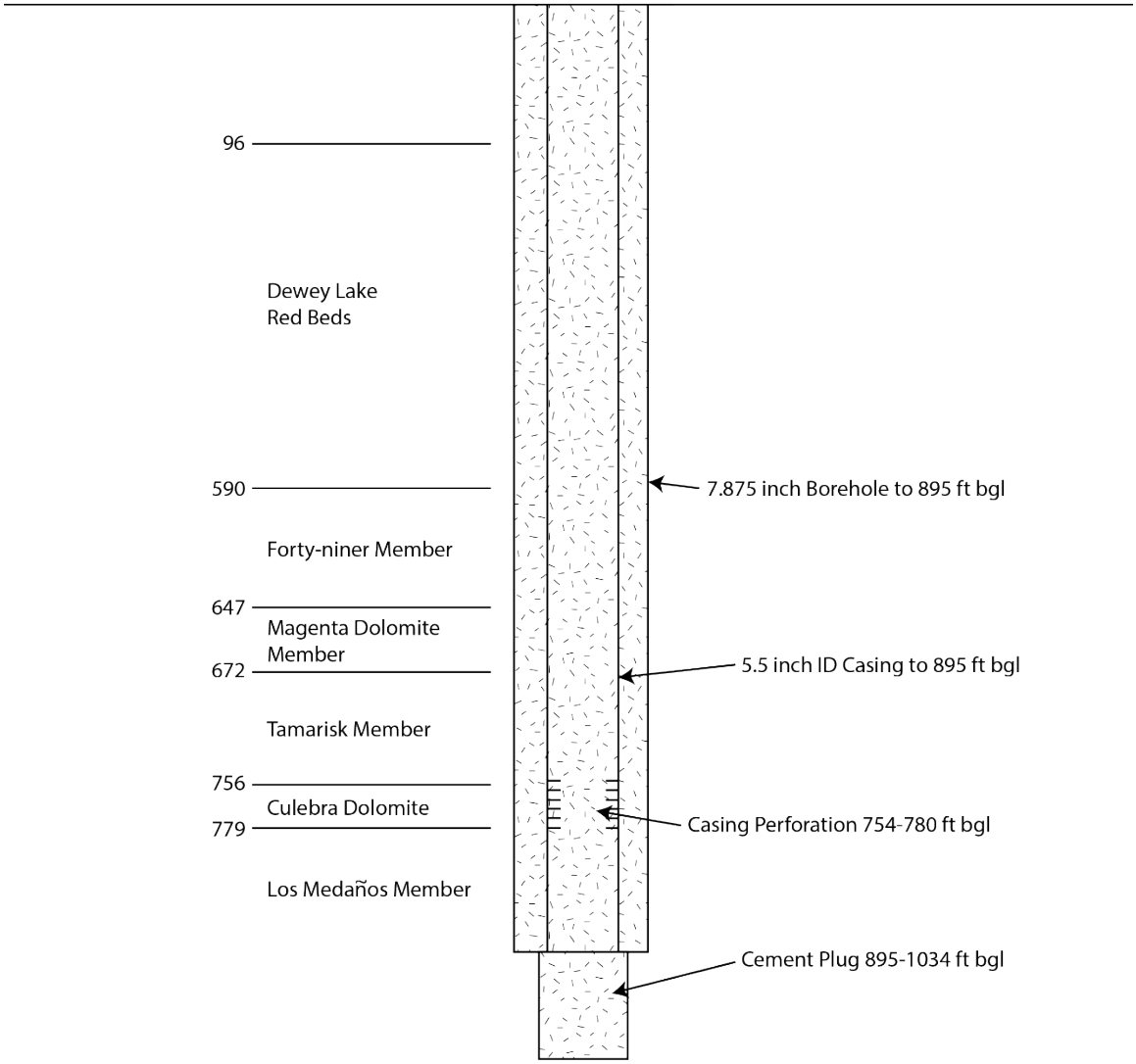

Figure 12: WIPP-19 Plugged Configuration



Figure 13: WIPP-19 Circulation Fluids



Figure 14: WIPP-19 Plugged to Surface

4.0 FIELD NOTES

04/21/20

At 1131 TFH arrived to deliver a frac tank to the H-3 pad, followed by the H-17 waste tank at 1203. A safety inspection was conducted on the rig, maco pump, water truck, flat bed, and company pickups at 1235. The initial frac tank deliver to H-17 was inspected and rejected due to missing bolts and ladder supports being broken. At 1326 SBDC arrived on site to drop off equipment and left.

04/22/20

SBDC arrived on site and a pre-job was conducted at 0643 followed by moving equipment into place. A new frac tank was delivered to replace the rejected one at 0743. At 0807 another safety inspection was completed on the rest of the equipment that had arrived. At 0852 the wellhead was cut off and a new 7” casing scraper was made. Scraping began at 1425, and flagpoles at 1825 at approximately 728.5 ft bgl. The rig was shut down at 1828 and SBDC left the pad at 1836.

04/23/20

SBDC arrives on the H-17 pad at 0647 and a pre-job is completed. At 0658 the scraper was removed from the well and SBDC fixed problems pointed out by safety. The scraper was at surface at 1015 and tremie was tripped back in to circulate. Circulation began at 1228 followed by cement at 1413. Once cement was on surface the pipe was tripped out and the well topped off with cement at 1630. The surface casing was cut off at 1649 and SBDC left the pad at 1809.

04/24/20

At 0656 SBDC arrived on site and a pre-job was conducted before loading equipment to move at WIPP-19. At 0910 a call was made to the OSE to notify about plugging. At 0940 a trip was made out to H-7 to inspect the road and returned to WIPP-11 at 1113. At 1220 the surface casing at WIPP-19 was cut off and the PVC sleeve was removed, followed by scraping at 1315. The rig began overheating at 1700 and was shut down, with SBDC leaving the pad.

04/25/20

A pre-job was conducted at 0640 and brushing continued at 0646. The brush was tripped out at 0759 and 28 joints of tremie was tripped in at 0947. Tripping in was completed at 1113 and set up to circulate began. Circulation began at 1239 and was completed at 1323. Cement was tremied in at 1420 and cement reached the top at 1517. Tremie pipe was removed and cement topped off as the level dropped. Trip out was completed at 1624 and rigged down at 1627. The casing was then cut off below the pad elevation and cement topped off. SBDC left the site at 1720.

04/26/20

Pre-job was completed at 0620 and equipment was moved to H-2b2. The casing was cut off at 0738 and equipment was rigged up for scraping. The tremie was tripped in at 0749 and it was decided the brush would get stuck in the screen, so brushing stopped just above screen at 1033 and then tripped out. Trip in with tremie began at 1145 and circulation started at 1330. Maintenance on the rig pump occurred at 1430 and crew was offsite at 1614.

04/27/20

Arrived at H-2b2 and conducted a safety briefing at 0615. Cement arrived at 0830 and tremied in. Plugging was completed at 1030. At 1050 SBDC mobilized to H-3b2 and scraping began at 1145. Brush reached 675' at 1315 and was tripped out. Trip in began at 1400 and circulation began when the OSE arrived at 1427. Circulation ended at 1555, and SBDC left the pad.

04/28/20

SBDC arrived at the pad and a pre-job was completed at 0635. The OSE was called to schedule cementing. At 1245 SBDC left to get the cement truck. Wait for OSE to get on site, then begin cementing at 1309. Cementing was completed at 1340 after 4 yards was added. OSE left the site at 1500 and casing was cut off. SBDC left the pad at 1514 to get cement for H-7b1.

04/29/20

SBDC arrived at the H-3 pad at 630 and a pre-job was completed followed by topping off the cement at H-3b2. The equipment was then loaded up and we mobilized to H-7b1. At 0904, it was decided that the road was too soft for a cement truck or the rig, so OSE (Chris Angel) was contacted and said to tremie the cement, but scraping wasn't needed. SBDC unloaded cement and then left to get tremie materials for H-7b1. They returned at 1316 and prepared to trip in tremie. At 1447 SBDC began pumping in cement and ended up pumping 550 gallons of cement into the well. The well lost most of the cement to formation. At 1648 SBDC was out of cement so the location was cleaned up and work completed at 1652.

04/30/20

SBDC arrived on site at 0811 after purchasing more cement and a pre-job was completed. At 0815 we topped off the truck bed water tank and began prepping for cementing. At 0843 we pumped in 100 gallons and were still losing to formation. Another batch of cement was mixed and pumped into the well. After another 300 gallons cement arrived on surface at 0934, and the pad was cleaned up while we monitored subsidence. Cement was topped off and the pad was cleared at 1011. At 1123 H-3b2 was topped off followed by H-2b2 at 1135. At 1158 WIPP-19 was checked for cement level, and at 1222 H-17 was topped off. SBDC left the site at 1253.