National Aeronautics and Space Administration

Lyndon B. Johnson Space Center White Sands Test Facility P.O. Box 20 Las Cruces, NM 88004-0020



March 21, 2023

Reply to Attn of: RE-23-051

Mr. Dave Cobrain, Acting Bureau Chief New Mexico Environment Department Hazardous Waste Bureau 2905 Rodeo Park Drive East, Building 1 Santa Fe, NM 87505

Subject: Reconfiguration Report for NASA Wells 200-SG-2 and 200-SG-3

In January 2023, NASA abandoned the groundwater monitoring portions of White Sands Test Facility wells 200-SG-2 and 200-SG-3 in accordance with the *NASA WSTF Well Plugging Plan of Operations for Multiport Soil Vapor Groundwater Monitoring Wells 200-SG-2 and 200-SG-3*, approved by NMED on January 10, 2022. NASA is providing this well reconfiguration report for wells 200-SG-2 and 200-SG-3 as directed by NMED in the approval. This reporting format includes a paper copy of the report as Enclosure 1 and a CD-ROM with the report in PDF as Enclosure 2.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions or comments concerning this submittal, please contact Antonette Doherty of my staff at 575-202-5406.

AMANDA SKARSGARD For: Timothy J. Davis Chief, Environmental Office RE-23-051

2 Enclosures

cc: Mr. Gabriel Acevedo Hazardous Waste Bureau New Mexico Environment Department 2905 Rodeo Park Drive East, Building 1 Santa Fe, NM 87505 National Aeronautics and Space Administration



### Reconfiguration Report for Wells 200-SG-2 and 200-SG-3

### March 2023

NM8800019434

### NASA Johnson Space Center White Sands Test Facility Reconfiguration Report for Wells 200-SG-2 and 200-SG-3

March 2023

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

### AMANDA SKARSGARD

Digitally signed by AMANDA SKARSGARD Date: 2023.03.21 08:49:35 -06'00'

See Electronic Signature Date

For: Timothy J. Davis Chief, NASA Environmental Office

National Aeronautics and Space Administration

Johnson Space Center White Sands Test Facility 12600 NASA Road Las Cruces, NM 88012 www.nasa.gov/centers/wstf

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bgs	Below ground surface
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
Freon 11	Trichlorofluoromethane
Freon 113	1,1,2-Trichloro-1,2,2-trifluoroethane
ft	Feet/Foot
NASA	National Aeronautics and Space
	Administration
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMOSE	New Mexico Office of the State
	Engineer
PCE	Tetrachloroethene
PFE	Plume Front Extraction
PPE	Personal Protective Equipment
PVC	Polyvinyl Chloride
TCE	Trichloroethene
WSTF	White Sands Test Facility
YJD	Yellow Jacket Drilling Services, LLC

### 1.0 Introduction

This well reconfiguration report summarizes activities associated with the reconfiguration of National Aeronautics and Space Administration (NASA) wells 200-SG-2 and 200-SG-3. Both wells are located at the NASA White Sands Test Facility (WSTF). The reconfiguration of 200-SG-2 and 200-SG-3 was part of a larger abandonment effort completed between January 4 and January 30, 2023. Yellow Jacket Drilling Services, LLC (YJD) was contracted to perform the abandonment activities. YJD is a licensed driller in the State of New Mexico (WD-1458) that is qualified to perform well abandonment in the state.

### 2.0 Facility Location and Description

WSTF is located approximately 16 miles northeast of Las Cruces in southern New Mexico (<u>Figure 2.1</u>). WSTF's primary activities in support of the United States space program are:

- 1. Development, qualification, refurbishment, and testing of spacecraft propulsion systems, subsystems, and ground support equipment.
- 2. Investigation of flight hardware anomalies.
- 3. Testing of materials and components.
- 4. Performance of hazard and failure analyses.

Following the completion of construction of WSTF in 1964, many wastes were historically managed in hazardous waste management units, including surface impoundments, within the WSTF industrial area. These hazardous waste management units contributed to groundwater contamination. As a result of the groundwater contamination, NASA operates a network of groundwater monitoring wells throughout the site.

### 3.0 Plugging and Abandonment Overview

On January 25, 2021, NMED directed NASA to prepare and submit a work plan for the abandonment of groundwater monitoring portion of wells 200-SG-2 and 200-SG-3 (NMED, 2021). NASA submitted a plugging plan for the wells on November 30, 2021, which was approved by NMED on January 10, 2022 (NASA, 2021; NMED, 2022). Plugging Plans of Operations were submitted to the New Mexico Office of the State Engineer (NMOSE) on May 24, 2022 (NASA, 2022). NMOSE approved the plugging plans on June 10, 2022 (NMOSE, 2022; <u>Appendix A</u>).

NASA and the subcontract drilling company completed reconfiguration activities in accordance with the NMOSE-approved Well Plugging Plans for each well (<u>Appendix A</u>). Wells 200-SG-2 and 200-SG-3 are located in the 200 Area (<u>Figure 3.1</u>) and were originally installed to monitor groundwater and soil-gas. However, the static groundwater level has dropped significantly and are now unproductive for sample collection at these two locations.

Plugging activities were completed using a Central Mine Equipment Company (CME)<sup>®1</sup> 95 auger rig. Equipment used included a 1,500-gallon water tank, 10-ft sections of 1-inch PVC tremie pipe, air compressor, diaphragm pump, grout tank, and a power drill fitted with a mixing attachment.

<sup>&</sup>lt;sup>1</sup> CME is a registered trademark of Central Mine Equipment Company.

In general, the following process was utilized in the decommissioning of the groundwater monitoring portions of the wells:

- 1. Soil vapor ports were carefully covered to reduce potential damage from plugging activities.
- 2. The rig was backed into place over the well, the mast was raised, and tremie pipe was lowered into the well casing to within 20 feet (ft) of the bottom of casing.
- 3. Grout was hand mixed onsite using Phoenix Cement<sup>®2</sup>, Portland Type II, mixed with 5% by weight Halliburton<sup>®3</sup> Quick-Gel Bentonite and approximately 4.52 gallons of water per 50-pound bag of cement.
- 4. Grout was pumped downhole via diaphragm pump and tremie pipe to approximately top of casing. Sections of the tremie pipe were removed periodically as grout filled the casing.

### 3.1 Well 200-SG-2

### 3.1.1 Well Summary

Well 200-SG-2 (Figure 3.2), completed in August 2000, does not have a well number registered with NMOSE. The well is located within the footprint of the known trichloroethene (TCE) groundwater contaminant plume at WSTF. The well was completed with a nominal 2-inch schedule 40 polyvinyl chloride (PVC) casing to a depth of 100.3 ft below ground surface (bgs) and includes three soil vapor ports located in the annular space outside of the 2-inch PVC well casing. The well is equipped with a 15 ft well screen from 85 to 100 ft bgs. Water levels in the area have dropped since well installation and NASA has determined that the water levels in this well are no longer conducive to representative groundwater sampling.

### 3.1.2 Plugging and Abandonment

Prior to YJD's arrival at WSTF, NASA performed well site maintenance at 200-SG-2 to provide a safe work environment. Plugging and abandonment activities were performed at well 200-SG-2 on January 30, 2023. Tremie pipe was lowered into the casing to a depth of approximately 80 ft bgs. Plugging was completed by pumping grout down the tremie pipe to fill the well casing from the bottom up. Approximately 29 gallons of grout was used to plug well 200-SG-2, which was nearly double the calculated volume of the well casing. Grout in excess of the calculated casing volume was likely displaced into the filter pack around the screened interval. Surface features associated with 200-SG-2 were left intact for the continued monitoring of the soil vapor ports.

Although there was the potential to displace up to 2 gallons of water, no groundwater was discharged during plugging activities.

YJD submitted the Well Plugging Record for well 200-SG-2 to the NMOSE on February 2, 2023 (<u>Appendix B</u>). An updated well completion diagram is included in <u>Appendix C</u>.

<sup>&</sup>lt;sup>2</sup> Phoenix Cement is a registered trademark of Salt River Pima-Maricopa Indian Community.

<sup>&</sup>lt;sup>3</sup> Halliburton is a registered trademark of Halliburton Energy Services, Inc.

Reconfiguration Report for Wells 200-SG-2 and 200-SG-3

### 3.2 Well 200-SG-3

### 3.2.1 Well Summary

Well 200-SG-3 (Figure 3.3), completed in August 2000, does not have a well number registered with NMOSE. The well is located within the footprint of the known TCE groundwater contaminant plume at WSTF. The well was completed with a nominal 2-inch schedule 40 PVC casing to a depth of 170.3 ft bgs and includes five soil vapor ports located in the annular space outside of the 2-inch PVC well casing. The well is equipped with a 15 ft well screen from 155 to 170 ft bgs. Water levels in the area have dropped since installation and NASA has determined that the water levels in this well are no longer conducive to representative groundwater sampling.

### 3.2.2 Plugging and Abandonment

Prior to YJD's arrival at WSTF, NASA performed well site maintenance at 200-SG-3 to provide a safe work environment. Plugging and abandonment activities were performed at well 200-SG-3 on January 30, 2023. Tremie pipe was lowered into the casing to a depth of approximately 160 ft bgs. Plugging was completed by pumping grout down the tremie pipe to fill the well casing from the bottom up. Approximately 29 gallons of grout was used to plug well 200-SG-3, which is only slightly more than the 27.8 gallons calculated to fill the well casing. Surface features associated with 200-SG-3 were left intact for the continued monitoring of the soil vapor ports.

Although there was the potential to displace up to 1 gallon of water, no groundwater was discharged during plugging activities.

YJD submitted the Well Plugging Record for well 200-SG-3 to the NMOSE on February 2, 2023 (<u>Appendix B</u>). An updated well completion diagram is included in <u>Appendix C</u>.

### 4.0 Waste Management

Wells 200-SG-2 and 200-SG-3 are located within the extent of the known WSTF groundwater contaminant plume. Groundwater within the WSTF contaminant plume is characterized as hazardous waste when it is actively managed through application of the Environmental Protection Agency's (EPA) contained-in policy (EPA, 1998) and 40 Code of Federal Regulations (CFR) 261.31. The EPA "Contained-In" Policy states that groundwater, soil, and other environmental media is not solid waste but is subject to regulation as hazardous waste when it contains listed waste (EPA, 1996). The specific F001 and F002 contaminants of concern are TCE, tetrachloroethene (PCE), trichlorofluoromethane (Freon 11), and 1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113). Therefore, any environmental media and debris that has been contacted by the contaminated groundwater was characterized as hazardous waste and will only carry the F001 and F002 hazardous waste codes. Contaminated groundwater does not exhibit the characteristics of hazardous waste codified in 40 CFR 261, Subpart D.

Waste that was not contacted by contaminated groundwater was characterized as non-hazardous solid waste. Nonhazardous waste consisted primarily of spent disposable personal protective equipment (PPE), concrete debris, and empty commercial packaging from the cement and bentonite products used during plugging and abandonment activities. Non-hazardous waste was managed in accordance with New Mexico Solid Waste Regulations in 20.9 New Mexico Administrative Code (NMAC). Following completion of plugging and abandonment activities, non-hazardous solid waste was disposed of at the Corralitos Regional Landfill.

Environmental media and debris suspected of contact with contaminated groundwater was characterized as a hazardous solid waste. Hazardous waste generated included contaminated debris (e.g., plastic drop sheet, concrete debris, and PPE), environmental media (e.g., soil), and decontamination fluids. Similarly, hydrocarbon contaminated debris (e.g., plastic sheeting and wipes) that may have come into contact with petroleum-based lubricants, coolants, and/ or fuels were accumulated separately, and managed as hazardous waste. Hazardous wastes were accumulated in appropriately sized, Department of Transportation-compliant containers. The containers were managed in accordance with the requirements of 20.4.1.300 NMAC and 40 CFR 262.17. Within permissible accumulation time limits, the aqueous-phase decontamination fluids were transferred to the Mid-plume Interception and Treatment System for treatment and discharge in accordance with Discharge Permit-1255 (NMED, 2017). Land disposal restriction notifications and disposal facility profiles were completed as required for the solid-phase environmental media and debris characterized as hazardous waste. Within 90 days from the initial accumulation, the solid phase-hazardous waste will be manifested off-site and transported for treatment and disposal at a permitted RCRA Treatment Storage and Disposal Facility.

### 5.0 References

Adoption of 40 CFR Part 261, Environmental Improvement Board, 20.4.1.200 NMAC (12-1-18).

Adoption of 40 CFR Part 262, Environmental Improvement Board, 20.4.1.300 NMAC (12-01-18).

- EPA. (1996, April 29). Requirements for Management of Hazardous Contaminated Media (HWIRMedia). Federal Register 61, No. 83: 18780. https://www.govinfo.gov/content/pkg/FR-1996-04-29/pdf/96-10096.pdf
- EPA. (1998, October). *Management of Remediation Waste Under RCRA*. Solid Waste and Emergency Response. Washington, D.C.
- NASA Johnson Space Center White Sands Test Facility. (2021, November 30). Well Plugging Plan of Operations for Multiport Soil Vapor Groundwater Monitoring Wells 200-SG-2 and 200-SG-3. Las Cruces, NM.
- NASA Johnson Space Center White Sands Test Facility. (2022, May 24). Well Plugging Plan of Operations for NASA Wells 200-SG-2, 200-SG-3, 400-KV-142, 400-LV-125, BLM-2-482, NASA 8, PFE-4, and PFE-6. Las Cruces, NM.
- NMED Ground Water Quality Bureau. (2017, July 14). Discharge Permit Renewal and Modification, DP-1255, NASA White Sands Testing Facility. Santa Fe, NM.
- NMED Hazardous Waste Bureau. (2021, January 25). *Approval with Modifications Groundwater Monitoring Plan.* Santa Fe, NM.
- NMED Hazardous Waste Bureau. (2022, January 10). Approval Well Plugging Plan of Operations for Multiport Soil Vapor Groundwater Monitoring Wells 200-SG-2 and 200-SG-3. Santa Fe, NM.
- NM Office of the State Engineer. (2022, June 10). *Plugging Plan Approval for LRG-10454, LRG-10456, LRG-18412 POD1 et al.* Las Cruces, NM.

Solid Waste, New Mexico Environmental Improvement Board, 20.9 NMAC (08-02-07).

Figures

Figure 2.1



Figure 3.1



Figure 3.2 Monitoring Well 200-SG-2 Construction Diagram



## WELL COMPLETION DIAGRAM

### MULTI-PORT SOIL GAS GROUNDWATER MONITORING WELL

#### Location ID: 200-SG-2

### Site ID: NASA-WSTF, Doña Ana County, NM

Township and Range: SE 1/4, NW 1/4, NE 1/4, Se Site Coordinates (NAD 83 in meters): 168043.75 N Elevation (Brass Cap): 1465.31 m (4807.5') Elevation (Top of Casing): 1466.35 m (4810.9') Drilling Contractor: Layne Christensen Environm Driller: Martin Quiñones Total Depth of Borehole (bgs): 74.7 m (245') Borehole Diameter: 7" Dual Wall Percussion Air Depth to Bedrock (bgs): 27.4 m (90') (Limestone Depth to Groundwater: 25.3 m (83'; taken 5/24/0 Total Depth Surface Casing (bgs): N/A Diameter and Type Surface Casing: N/A Date(s) Well Installed: 11/19/97-11/24/97	c 2, T21S, R3EDate(s) Well Developed: 3/23/00 - 8/29/00/ 466847.81 EField Representative(s): Mary Canavan, Pa Total Depth Well Casing (bgs): 30.6 m (100. Type of Casing: Schedule 40 PVCental ServicesDiameter Well Casing: Nominal 2" Soil Gas Port(s)(bgs): 9.1 m (30'); 18.3 m (6 Soil Gas Sampling Zone(s)(bgs): (58'-61'); a Water Sampling Zone(s)(bgs): 25.9-30.5 m Comments: Supervised by Jeff Forbes (Da Soil Gas Ports and 1/4" stainle outside PVC and secured to c Soil Gas port at 25.6 m (84') w	m Egan, Geoff Giles, and Molly Russell 3') 0'); 25.6 m (84') :: 8.5-11.3 m (28'-37'); 17.7-18.6 m nd 26.8-~23.8 m (81'-SWL); (85'-100') iniel B. Stephens & Associates) ess steel tubing (to surface) installed asing with plastic straps. as lost; (submerged 11/24/97)
Surface Casing	Casing Explanation: Cement	Bentonite Seal
Nominal 2" PVC	1/4" Stainless Steel Tubing	10/20 Sand
└─ I Nominal 2" PVC End Cap	Slough	10/20 Sand Bentonite Mix
Feet/Meters	Well Descriptions	Annular/Borehole Descriptions
	All deplits listed are bys (utiless floted)	
0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 -	Multiport Soil Gas/Groundwater Well Stick-Up = 1.04 m (3.41') Well completed with 6" x 5' steel well protector with locking cap, 4' x 4' concrete well pad, and barrier posts above ground surface Depth of Soil Gas Sampling Port = 9.1 m (30')	Top of Bentonite Chips = 0' Top of Slough = $1.5 \text{ m} (5')$ Top of Bentonite Chips = $2.7 \text{ m} (9')$ Top of Slough = $3.4 \text{ m} (11')$ Top of $10/20 \text{ Sand-Bentonite Powder}$ Mix (1:1 Ratio by weight) = $6.4 \text{ m} (21')$ Top of $10/20 \text{ Sand} = 8.5 \text{ m} (28')$ Top of $10/20 \text{ Sand-Bentonite Powder}$ Mix = $11.3 \text{ m} (37')$
60	Depth of Soil Gas Sampling Port = 18.3 m (60')	Top of 10/20 Sand = 17.7 m (58') Top of 10/20 Sand-Bentonite Powder Mix = 18.6 m (61')
80 - 25 <b>•</b> 90 - 30 100 - 30 110 - 35 120 - 40 140 - 40	Depth of Soil Gas Sampling Port = 25.6 m (84') (Port is submerged and not usable). Static Water Level = 25.3 m (83'-Measured 5/24/00 below ground surface (bgs) Top of Nominal 2" Schedule 40 PVC 0.010"-Slot Screen = 25.9 m (85') Bottom of Nominal 2" Schedule 40 PVC 0.010"-Slot Screen = 30.5 m (100') Nominal 2" Schedule 40 PVC Casing TD = 30.6 m (100.3')	Top of 10/20 Sand (to cover lower soil gas port and groundwater screen) = 24.7 m (81') Fractured Limestone Bedrock = 27.4 m (90')



Location ID: 200-SG-2

Page 2 of 2

Figure 3.3 Monitoring Well 200-SG-3 Construction Diagram



### WELL COMPLETION DIAGRAM

### MULTI-PORT SOIL GAS GROUNDWATER MONITORING WELL





Location ID: 200-SG-3

Page 2 of 2

Appendix A New Mexico Office of the State Engineer Approved Well Plugging Plans John R. D'Antonio, P.E. State Engineer



Las Cruces Office- Dist 4 1680 HICKORY LOOP, SUITE J LAS CRUCES, NM 88005

### **STATE OF NEW MEXICO** OFFICE OF THE STATE ENGINEER

June 10, 2022

File No. LRG-10454, LRG-10456, LRG-18412 et al

NASA Johnson Space Center White Sands Test Facility Attention: Timothy Davis PO Box 20 Las Cruces, NM 88004

RE: Plugging Plan Approval for LRG-10454, LRG-10456, LRG-18412 POD1 et al

Greetings:

Enclosed is your copy of the Well Plugging Plan of Operations for wells LRG-10454, LRG-10456, LRG-18412 POD1 et al, approved subject to the attached conditions. You are responsible for submitting a properly completed Plugging Record to the office within thirty (30) days after plugging is completed. The Plugging record is available at:

http://www.ose.state.nm.us/STST/Forms/WD-11%20Plugging%20Record 2009-09-08 final.pdf

Please let us know if you have any questions.

Sincerely,

Cheryl S. Thacker Water Resources Manager WRAP, District IV

Encl: Well Plugging Plans of Operations and Conditions of Approval



### WELL PLUGGING PLAN OF OPERATIONS



NOTE: A Well Plugging Plan of Operations shall be filed with and accepted by the Office of the State Engineer prior to plugging. This form may be used to plug a single well, or if you are plugging multiple monitoring wells on the same site using the same plugging methodology.

Alert! Your well may be eligible to participate in the Aquifer Mapping Program (AMP)-NM Bureau of Geology geoinfo.nmt.edu/resources/water/ cgmn/ if within an area of interest and meets the minimum construction requirements, such as there is still water in your well, and the well construction reflected in a well record and log is not compromised, contact AMP at 575-835-5038 or -6951, or by email nmbg-waterlevels@nmt.edu, prior to completing this prior form. Showing proof to the OSE that your well was accepted in this program, may delay the plugging of your well until a later date.

I. FILING FEE: There is no filing fee for this form.

II. GENERAL / WELL OWNERSHIP: Check here if proposing one plan for multiple monitoring wells on the same site and attaching WD-08m

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: PFE-4 (NMOSE LRG-1045) Name of well owner: NASA Johnson Space Center White Sands Test Facility (Contact: Timothy Davis)

Mailing address: P.O. Box 20		County:	Dona Ana
City: Las Cruces	State:	NM	Zip code88004
Phone number: (575) 524-5024	E-mail:	timothy.j.davis@nasa.go	v
III. WELL DRILLER INFORMATION:			2022 H
Well Driller contracted to provide plugging service	s: Not contracted ye	t	
New Mexico Well Driller License No.: NA		Expiration Date:	NA Ch m
<b>IV. WELL INFORMATION:</b> Check here if thi supplemental for Note: A copy of the existing Well Record for the w	s plan describes method m WD-08m and skip to # /ell(s) to be plugged s	for plugging multiple monitor #2 in this section. hould be attached to this p	ing wells on the same site and attach
1) GPS Well Location: Latitude: Longitude:	38 deg, -106 deg,	30         min,         35.707           38         min,         48.811	_sec _sec, NAD 83
2) Reason(s) for plugging well(s):			
Well PFE-4 is located outside the known co	ontaminant plume and	d has no value as a polluti	on recovery well.
3) Was well used for any type of monitoring what hydrogeologic parameters were monitorization from the New Mexico	program? Yes nitored. If the well Environment Depart	If yes, please use sectio was used to monitor co ment may be required prior	n VII of this form to detail intaminated or poor quality or to plugging.
4) Does the well tap brackish, saline, or other	rwise poor quality wa	tter? Yes If ye	es, provide additional detail.
including analytical results and/or laborator	ry report(s): Refer to	PFE-4 analytical data (En	closure 9)
5) Static water level:503.5feet be	low land surface / fee	t above land surface (ci	rcle one)
6) Depth of the well: 876.5 feet			

LRG-10454 TRN: 727442 WD-08 Well Plugging Plan Version: March 07, 2022 Page 1 of 5

7) I	nside diameter	of innermost casin	ng: 7.85	inches.
------	----------------	--------------------	----------	---------

### 8) Casing material: CertainTeed Standard Dimension Ratio (SDR) 17 PVC

9)	The well was constructed with:	LAST	2022	
	an open-hole production interval, state the open interval:	Sh	12 I	100 miles
	a well screen or perforated pipe, state the screened interval(s): 397.4-856.2 ft	gi.	N	Ó
	NA.			110
10)	What annular interval surrounding the artesian casing of this well is cement-grouted?	22 · · · · ·	TR.	123
11)	Was the well built with surface casing?Yes If yes, is the annulus surrounding the su	rface casin	ng grou	ted or
	otherwise sealed?Yes If yes, please describe:	0.	<b>G</b> 1	
	Nominal 20-in. surface casing set to 110 ft in a 26-in. diameter borehole and cemented to surf	ace.		

12) Has all pumping equipment and associated piping been removed from the well? <u>Yes</u> If not, describe remaining equipment and intentions to remove prior to plugging in Section VII of this form.

### V. DESCRIPTION OF PLANNED WELL PLUGGING:

Note: If this plan proposes to plug an artesian well in a way other than with cement grout, placed bottom to top with a tremie pipe, a detailed diagram of the well showing proposed final plugged configuration shall be attached, as well as any additional technical information, such as geophysical logs, that are necessary to adequately describe the proposal. Attach a copy of any signed OSE variance to this plugging plan.

Also, if this planned plugging plan requires a variance to 19.27.4 NMAC, attach a detailed variance request signed by the applicant.

1) Describe the method by which cement grout shall be placed in the well, or describe requested plugging methodology

proposed for the well:

The well casing will be cemented from bottom up using tremie pipe, including all screened intervals and blank casing.

2) Will well head be cut-off below land surface after plugging? Yes, 6 inches below ground surface

#### VI. PLUGGING AND SEALING MATERIALS:

Note: The plugging of a well that taps poor quality water may require the use of a specialty cement or specialty sealant. Attach a copy of the batch mix recipe from the cement company and/or product description for specialty cement mixes or any sealant that deviates from the list of OSE approved sealants.

- 1) For plugging intervals that employ cement grout, complete and attach Table A.
- 2) For plugging intervals that will employ approved non-cement based sealant(s), complete and attach Table B.
- 3) Theoretical volume of grout required to plug the well to land surface: 2,203.7 gallons (294.6 cubic ft)
- 4) Type of Cement proposed: Portland Type II neat cement with 5% bentonite by weight
- 5) Proposed cement grout mix: 8.5 gallons of water per 94 pound sack of Portland cement.
- 6) Will the grout be: X batch-mixed and delivered to the site

\_\_\_\_\_ mixed on site

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7)	Grout additives requested, and percent by dry weight relative to cement:
	5% by weight Bentonite powder (~4.7 lbs/94 lb bag of Portland Type II cement)
8)	Additional notes and calculations:
	The mix of neat cement and 5% bentonite will require 8.5 gallons of water per 94 lb bag of cement; 5.2 gallons per 94 lb bag of cement and 0.7 gallons per percent of bentonite.

### VII. ADDITIONAL INFORMATION: List additional information below, or on separate sheet(s):

		59	2022
			MAY
		Sig r	N CT
			AM 9
		No. F	មា បា

#### VIII. SIGNATURE:

I, <u>Amanda Skarsgard for: Timothy J. Davis</u>, say that I have carefully read the foregoing Well Plugging Plan of Operations and any attachments, which are a part hereof; that I am familiar with the rules and regulations of the State Engineer pertaining to the plugging of wells and will comply with them, and that each and all of the statements in the Well Plugging Plan of Operations and attachments are true to the best of my knowledge and belief.

05/24/2022

Signature of Applicant

Date

RECEIVED

### IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

Approved subject to the attached conditions. Not approved for the reasons provided on the attached letter. Witness my hand and official seal this day of NEW MET OF Mike A. Hamman, STATE ENGINEER w Mexico State Engineer 72 BY Ś **Cheryl Thacker** Water Resource Manager WD-08 Well Plugging Plan ENG Version: March 07, 2022 Page 3 of 5

## TABLE A - For plugging intervals that employ cement grout. Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			Ground Surface
Bottom of proposed interval of grout placement (ft bgl)			876.5 ft
Theoretical volume of grout required per interval (gallons)			2,203.7 galions
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			8.5 gallons of water per 94 lb bag of Portland Type II cement with 5% bentonite powder.
Mixed on-site or batch- mixed and delivered?			Delivered
Grout additive 1 requested			Powdered bentonite
Additive 1 percent by dry weight relative to cement			5%
Grout additive 2 requested			1022 HAY 25 50, 1 - 51 1/3 (11023)
Additive 2 percent by dry weight relative to cement			NA HEAL

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# TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of sealant placement (ft bgl)			NA
Bottom of proposed sealant of grout placement (ft bgl)			NA
Theoretical volume of sealant required per interval (gallons)			NA
Proposed abandonment sealant (manufacturer and trade name)			NA
			20221 LAS

ST. J. S. MAY 25 AM 9: 55

### Attachment Conditions of Approval

### Well Plugging Plan of Operations Well Number LRG-10454

### File No.: LRG-10454

- 1) Well LRG-10454 shall be plugged using the methods and materials identified in the State Engineer approved Well Plugging Plan of Operations filed on May 25, 2022.
- In addition, well LRG-10454 shall be plugged completely using the following method per <u>Rules and Regulations Governing Well Driller Licensing, Construction, Repair</u> and Plugging of Wells; Subsection C of 19.27.4.30 NMAC:

All pumping appurtenances shall be removed from the well prior to plugging. To plug a well, the entire well shall be filled from the bottom upwards to ground surface using a tremie pipe. The bottom of the tremie shall remain submerged in the sealant throughout the entire sealing process; other placement methods may be acceptable and approved by the State Engineer

The well shall be plugged with an Office of the State Engineer approved sealant for use in the plugging of non-artesian wells.

The well driller shall cut the casing off at least four (4) feet below ground surface and fill the open hole with at least two (2) vertical feet of approved sealant.

Wells that do not encounter a water bearing stratum shall at a minimum be plugged by filling the well with drill cuttings or clean native fill to within 10 feet of land surface and by plugging the remaining 10 feet of the well to ground surface with a plug of the office of the state engineer approved sealant.

The driller must fill or cover any open annulus with sealant. Once the sealant has cured, the well driller or well owner may cover the seal with soil.

A plugging report for said well shall be filed with the Office of the State Engineer in the District IV office in Las Cruces within thirty (30) days of completion of the plugging.

- 2) A licensed well driller shall keep a record of the plugging work as it progresses and file a complete Plugging Record (Office of the State Engineer Form No.: WR-20) with the State Engineer no later than thirty (30) days after completion of plugging.
- 3) New Mexico Office of the State Engineer (NMOSE) witnessing of the plugging will not be required unless artesian conditions are encountered but shall be facilitated if a NMOSE observer is onsite. NMOSE witnessing may be requested during normal

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Well: LRG-10454 Plugging Plan of Operations

work hours by calling the District IV NMOSE office at 575-524-6161 at least 48 hours in advance. NMOSE inspection will occur dependent of personnel availability.

4) Should another regulatory agency sharing jurisdiction of the project authorize or by regulation require more stringent requirements than stated herein, the more stringent procedure shall be followed. This in part includes provisions regarding preauthorization to proceed, type of methods and materials used, inspection, or prohibition of free discharge of any fluid or other material to or from the well that is related to the plugging process.

Date: 6/10/2022

Cheryl S. Thacker Water Resources Manager WRAP District IV



NOTE: A Well Plugging Plan of Operations shall be filed with and accepted by the Office of the State Engineer prior to plugging. This form may be used to plug a single well, or if you are plugging multiple monitoring wells on the same site using the same plugging methodology.

Alert! Your well may be eligible to participate in the Aquifer Mapping Program (AMP)-NM Bureau of Geology geoinfo.nmt.edu/resources/water/ cgmn/ if within an area of interest and meets the minimum construction requirements, such as there is still water in your well, and the well construction reflected in a well record and log is not compromised, contact AMP at 575-835-5038 or -6951, or by email nmbg-waterlevels@nmt.edu, prior to completing this prior form. Showing proof to the OSE that your well was accepted in this program, may delay the plugging of your well until a later date.

I. FILING FEE: There is no filing fee for this form.

II. GENERAL / WELL OWNERSHIP: Check here if proposing one plan for multiple monitoring wells on the same site and attaching WD-08m

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: PFE-6 (LRG-10456, cancel Name of well owner: NASA Johnson Space Center White Sands Test Facility (Contact: Timothy Davis)

Mailing	address:	ress: P.O. Box 20		County:	Dona Ana
City: Las Cruces			State:	NM	Zip code88004
Phone number: (575) 524-5024		E-mail:	timothy.j.davis@nasa.g	jov	

#### III. WELL DRILLER INFORMATION:

Now	Mavico Wall Drillor Licon	NA NA				P!.	de Die	NIA		
INCW.	Mexico wen Dinier Licen	ISE NO.: 101				Expir	ation Date			
<u>IV. V</u>	VELL INFORMATION	Check here if t	this plan des form WD-08	cribes metho m and skip	od for plu; to #2 in th	gging mult is section.	iple monito	ring wells of the s	2020 H	and atta
Note:	A copy of the existing W	ell Record for the	well(s) to	be plugge	d should	be attach	ed to this	plan.	AY 29	
1)	GPS Well Location:	Latitude: Longitude:	32 -106	deg, deg,	31 38	min, min,	12.504 54.918	sec _sec, NAD 83	AM	
2)	Reason(s) for plugging	g well(s):						AEXICO	9:55	5 2 m ] 5 2 m ]
	Poor production (~5 gp	m). Not suitable a	s a pollutio	n recover	v well. Th	nere is or	lv 30 ft of	water in the we	ell due te	
3)	Was well used for any what hydrogeologic pawater, authorization fro	type of monitoring arameters were m	g program ionitored.	P <u>No</u> If the wo	If ye ell was	s, please used to p	use section monitor c	on VII of this ontaminated o	form to r poor	detail quality
3) 4)	dropping water levels. Was well used for any what hydrogeologic pawater, authorization from Does the well tap brack including analytical res	type of monitoring arameters were m om the New Mexic kish, saline, or oth sults and/or labora	g program nonitored. co Environ nerwise poo tory report	No If the we ment Depa or quality (s): No an	If ye ell was artment i water? alytical o	s, please used to may be re Yes data avail	use section monitor c equired prime If y able per it	on VII of this ontaminated o ior to plugging. ves, provide ad- tem 2. No samp	form to r poor ditional	detail quality detail,
3) 4) 5)	dropping water levels. Was well used for any what hydrogeologic pawater, authorization from Does the well tap brack including analytical results Static water level:	type of monitoring arameters were m om the New Mexic kish, saline, or oth sults and/or labora 502.1 feet l	g program nonitored. co Environ nerwise poo tory report pelow land	P <u>No</u> If the wo ment Depa or quality (s): No an surface /	If ye ell was artment i water? alytical o feet abov	s, please used to may be re Yes data avail ve land su	use section monitor c equired pri If y able per it	on VII of this ontaminated o ior to plugging. ves, provide ad- rem 2. No samp ircle one)	form to r poor ditional	detail quality detail, en.
3) 4) 5) 6)	dropping water levels. Was well used for any what hydrogeologic pawater, authorization from Does the well tap brack including analytical restrict water level:	type of monitoring arameters were m om the New Mexic kish, saline, or oth sults and/or labora 502.1 feet l 539.4 feet	g program ionitored. co Environ nerwise poo tory report pelow land	Mo If the we ment Depa or quality (s): No an surface /	If ye ell was artment i water? alytical o feet abov	s, please used to may be re <u>Yes</u> data avail ve land su	use section monitor c equired pri If y able per it urface (c	on VII of this ontaminated o ior to plugging. ves, provide ad- tem 2. No samp ircle one)	form to r poor ditional	) detail quality detail, en.

7)	Inside diameter of innermost casing:7.85inches.							
8)	Casing material: CertainTeed Standard Dimension Ratio (SDR) 17 PVC							
9)	The well was constructed with: an open-hole production interval, state the open interval: a well screen or perforated pipe, state the screened interval(s): 434.5 - 534.1 ft							
10) 11)	What annular interval surrounding the artesian casing of this well is cement-grouted? <u>NA</u> Was the well built with surface casing? <u>Yes</u> If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? <u>Yes</u> If yes, please describe:							
	Nominal 20-in. surface casing set to 101 ft in a 26-in. diameter borehole and cemented to surface.							
12)	Has all pumping equipment and associated piping been removed from the well? Yes If not, describe remaining equipment and intentions to remove prior to plugging in Section VII of this form.							
V. D	ESCRIPTION OF PLANNED WELL PLUGGING:							

Note: If this plan proposes to plug an artesian well in a way other than with cement grout, placed bottom to top with a tremie pipe, a detailed diagram of the well showing proposed final plugged configuration shall be attached, as well as any additional technical information, such as geophysical logs, that are necessary to adequately describe the proposal. Attach a copy of any signed OSE variance to this plugging plan.

Also, if this planned plugging plan requires a variance to 19.27.4 NMAC, attach a detailed variance request signed by the applicant.

1) Describe the method by which cement grout shall be placed in the well, or describe requested plugging methodology

proposed for the well:

The well casing will be cemented from bottom up using tremie pipe, including all screened intervals and blank casing.

2) Will well head be cut-off below land surface after plugging? Yes, 6 inches below ground surface

#### VI. PLUGGING AND SEALING MATERIALS:

Note: The plugging of a well that taps poor quality water may require the use of a specialty cement or specialty sealant. Attach a copy of the batch mix recipe from the cement company and/or product description for specialty cement mixes or any sealant that deviates from the list of OSE approved sealants.

1) For plugging intervals that employ cement grout, complete and attach Table A.

2) For plugging intervals that will employ approved non-cement based sealant(s), complete and attach Table B.

3)	Theoretical volume of grout required to plug the well to land surface: 1,356.2 gallons (181.3 cut	lic ft)	02	
4)	Type of Cement proposed: Portland Type II neat cement with 5% bentonite by weight		ZHAY	1
5)	Proposed cement grout mix: 8.5 gallons of water per 94 pound sack of Portland co	ement.	25	() III
6)	Will the grout be:batch-mixed and delivered to the site	5.7	AM	< m
	mixed on site		ទួ	D

WD-08 Well Plugging Plan Version: March 07, 2022 Page 2 of 5

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7)	Grout additives requested, and percent by dry weight relative to cement:				
	5% by weight Bentonite powder (~4.7 lbs/94 lb bag of Portland Type II cement)				
8)	Additional notes and calculations:				
	The mix of neat cement and 5% bentonite will require 8.5 gallons of water per 94 lb bag of cement; 5.2 gallons per 94 lb bag of cement and 0.7 gallons per percent of bentonite.				

### VII. ADDITIONAL INFORMATION: List additional information below, or on separate sheet(s):

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				AN	
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			Sm	CT 60	

### VIII. SIGNATURE:

I, <u>Amanda Skarsgard for: Timothy J. Davis</u>, say that I have carefully read the foregoing Well Plugging Plan of Operations and any attachments, which are a part hereof; that I am familiar with the rules and regulations of the State Engineer pertaining to the plugging of wells and will comply with them, and that each and all of the statements in the Well Plugging Plan of Operations and attachments are true to the best of my knowledge and belief.

	Digitally signed by AMANDA SKARSGARD	05/04/0000
AMANDA SNANSGAND	Date: 2022.05 24 10:27:55 -06'00'	05/24/2022

Signature of Applicant

Date

#### **IX. ACTION OF THE STATE ENGINEER:**

This Well Plugging Plan of Operations is:

\_\_\_\_\_ Approved subject to the attached conditions. \_\_\_\_\_\_ Not approved for the reasons provided on the attached letter.

Witness my hand and official seal this 10th day of June	2672
OF NEW MEL Mike A. Hamman, P.E., STATE ENGINEER	xico State Engineer
STATE ENGINE	WD-08 Well Plugging Plan Version: March 07, 2022 Page 3 of 5

## TABLE A - For plugging intervals that employ cement grout. Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 - most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			Ground Surface
Bottom of proposed interval of grout placement (ft bgl)			539.4 ft
Theoretical volume of grout required per interval (gallons)			1356.2 gallons
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			8.5 gailons of water per 94 lb bag of Portland Type II cement with 5% bentonite powder.
Mixed on-site or batch- mixed and delivered?			Delivered
Grout additive 1 requested			Powdered bentonite
Additive 1 percent by dry weight relative to cement			5% <b>2022</b>
Grout additive 2 requested			RECEIVEI MAY 25 AM 9 GRUCCS, NEW EL
Additive 2 percent by dry weight relative to cement			NA CO S

WD-08 Well Plugging Plan Version: March 07, 2022 Page 4 of 5

# TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 - most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of sealant placement (ft bgl)			NA
Bottom of proposed sealant of grout placement (ft bgl)			NA
Theoretical volume of sealant required per interval (gallons)			NA
Proposed abandonment sealant (manufacturer and trade name)			NA

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### Attachment Conditions of Approval

### Well Plugging Plan of Operations Well Number LRG-10456

### File No.: LRG-10456

- 1) Well LRG-10456 shall be plugged using the methods and materials identified in the State Engineer approved Well Plugging Plan of Operations filed on May 25, 2022.
- In addition, well LRG-10456 shall be plugged completely using the following method per <u>Rules and Regulations Governing Well Driller Licensing</u>, Construction, <u>Repair</u> and <u>Plugging of Wells</u>; Subsection C of 19.27.4.30 NMAC:

All pumping appurtenances shall be removed from the well prior to plugging. To plug a well, the entire well shall be filled from the bottom upwards to ground surface using a tremie pipe. The bottom of the tremie shall remain submerged in the sealant throughout the entire sealing process; other placement methods may be acceptable and approved by the State Engineer

The well shall be plugged with an Office of the State Engineer approved sealant for use in the plugging of non-artesian wells.

The well driller shall cut the casing off at least four (4) feet below ground surface and fill the open hole with at least two (2) vertical feet of approved sealant.

Wells that do not encounter a water bearing stratum shall at a minimum be plugged by filling the well with drill cuttings or clean native fill to within 10 feet of land surface and by plugging the remaining 10 feet of the well to ground surface with a plug of the office of the state engineer approved sealant.

The driller must fill or cover any open annulus with sealant. Once the sealant has cured, the well driller or well owner may cover the seal with soil.

A plugging report for said well shall be filed with the Office of the State Engineer in the District IV office in Las Cruces within thirty (30) days of completion of the plugging.

- A licensed well driller shall keep a record of the plugging work as it progresses and file a complete Plugging Record (Office of the State Engineer Form No.: WR-20) with the State Engineer no later than thirty (30) days after completion of plugging.
- 3) New Mexico Office of the State Engineer (NMOSE) witnessing of the plugging will not be required unless artesian conditions are encountered but shall be facilitated if a NMOSE observer is onsite. NMOSE witnessing may be requested during normal

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Well: LRG-10456 Plugging Plan of Operations

work hours by calling the District IV NMOSE office at 575-524-6161 at least 48 hours in advance. NMOSE inspection will occur dependent of personnel availability.

4) Should another regulatory agency sharing jurisdiction of the project authorize or by regulation require more stringent requirements than stated herein, the more stringent procedure shall be followed. This in part includes provisions regarding preauthorization to proceed, type of methods and materials used, inspection, or prohibition of free discharge of any fluid or other material to or from the well that is related to the plugging process.

Date: 6/10/2022

Cheryl S. Thacker Water Resources Manager WRAP District IV

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Alert! cgmn/ constr prior t a later	Your well may be eligible to pa if within an area of interest and action reflected in a well record o completing this prior form. Si date.	rticipate in the Aqu t meets the minimu and log is not com howing proof to the	ifer Mappin n constructi promised, co OSE that ye	g Program (A ion requirement ontact AMP at our well was a	MP)-NM Bur ats, such as th 575-835-5038 ccepted in thi	reau of Geolog here is still wa l or -6951, or s program, m	y geoinfo.r ter in your by email nr ay delay th	well, and the w nbg-waterlevel e plugging of y	ces/wate vell s@nmt.c
I. FI	ING FEE: There is no fi	lling fee for this	form.						
11. G	ENERAL / WELL OWN	ERSHIP:	Check here	if proposing or	ne plan for mu	ltiple monitori	ng wells on	the same site an	d attachi
Exist	ng Office of the State Er	igineer POD Nu	mber (We	ell Number)	for well to	o be plugge	ed: N/A; I	NASA well N	ASA-8
Name	of well owner: NASA J	ohnson Space C	enter Whit	e Sands Te	st Facility (0	Contact: Tim	nothy Dav	ris)	
Mailin	g address: P.O. Box 2	0				County:	Don	na Ana	
City:	Las Cruces		9	State:	N	M		Zip code	8004
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New N <u>IV. V</u> Note: 1) 2) 3) 4) 5)	Driller contracted to provid Mexico Well Driller Licens Mexico Well Driller Licens Mexico Well Driller Licens Mexico Well Driller Licens Well Cocation: Reason(s) for plugging The groundwater level r Was well used for any ty what hydrogeologic pai water, authorization from Does the well tap brack including analytical resu Static water level;	le plugging servi se No.: NA Check here if supplemental ell Record for the Latitude: Longitude: well(s): mas dropped below ype of monitoring rameters were re- m the New Mexi ish, saline, or othalts and/or laborar 185.82 feet	this plan des form WD-08 well(s) to 32 -106 w the scree g program nonitored. co Enviror herwise por tory repor	scribes method 8m and skip to be plugged deg, deg, deg, deg, reened interva ? Yes If the web ment Depar bor quality w t(s): Refer to d surface / fe	et for plugging \$2 in this sec should be a 30 m 36 m al and the w If yes, pl If was used rtment may vater? Ye 0 NASA 8 a set above la	Expiration I s multiple mo- stion. attached to to min, <u>31.7</u> in, <u>50.1</u> rell can no ke lease use se to monitor be required S malytical da nd surface	Date: NA nitoring we his plan. 28 sec 1 sec, 28 sec, 28 sec 1 sec, 28 sec 1 sec, 28 sec 1 sec, 28 sec 1 sec, 28 sec 1 sec, 28 sec 1 sec, 29 sec 1 sec, 20 sec 1 sec, 20 sec 1 sec, 20 sec 1 sec, 20 sec 1 sec, 20 sec 1 sec, 20 sec 20	NAD 83 sampled. I of this forr inated or po plugging. ovide addition sure 9)	n to oor o

7)	Inside diameter of innermost casing:inches.	5.0	202	
8)	Casing material: Schedule 80 PVC to 162.00 ft; Schedule 40 stainless steel to 197.00 ft	S.	24	
9)	The well was constructed with: an open-hole production interval, state the open interval:	autors, 1	N 25	
	a well screen or perforated pipe, state the screened interval(s): 172-192 ft	TO F	F	there a
10)	What annular interval surrounding the artesian casing of this well is cement-grouted? NA	NO	9: 5 6	
11)	Was the well built with surface casing? <u>Yes</u> If yes, is the annulus surrounding the su otherwise sealed? <u>Yes</u> If yes, please describe:	urface casin	ig groute	d or
12)	Has all pumping equipment and associated piping been removed from the well? Yes remaining equipment and intentions to remove prior to plugging in Section VII of this form.	If not	, descrit	De
V. DI	ESCRIPTION OF PLANNED WELL PLUGGING: form must be completed for each method.	le wells on sai	ne site, a :	separate
Note: 1 diagran as geop	If this plan proposes to plug an artesian well in a way other than with cement grout, placed bottom to top wi n of the well showing proposed final plugged configuration shall be attached, as well as any additional hysical logs, that are necessary to adequately describe the proposal. Attach a copy of any signed OSE variance to	ith a tremie p technical info o this plugging	vipe, a de ormation, g plan.	tailed such

Also, if this planned plugging plan requires a variance to 19.27.4 NMAC, attach a detailed variance request signed by the applicant.

1) Describe the method by which cement grout shall be placed in the well, or describe requested plugging methodology

proposed for the well:

The well casing will be cemented from bottom up using tremie pipe, including all screened intervals and blank casing.

2) Will well head be cut-off below land surface after plugging? Yes, 6 inches below ground surface

#### VL PLUGGING AND SEALING MATERIALS:

Note: The plugging of a well that taps poor quality water may require the use of a specialty cement or specialty sealant. Attach a copy of the batch mix recipe from the cement company and/or product description for specialty cement mixes or any sealant that deviates from the list of OSE approved sealants.

- 1) For plugging intervals that employ cement grout, complete and attach Table A.
- 2) For plugging intervals that will employ approved non-cement based sealant(s), complete and attach Table B.
- 3) Theoretical volume of grout required to plug the well to land surface: 32.15 gallons (4.30 cubic ft)
- 4) Type of Cement proposed: <u>Portland Type II neat cement with 5% bentonite by weight</u>
- 5) Proposed cement grout mix: <u>8.5</u> gallons of water per 94 pound sack of Portland cement.
- 6) Will the grout be: \_\_\_\_\_batch-mixed and delivered to the site

X mixed on site

Inco	at dedicites requested, and percent by dry weight relative to content.		~
5%	by weight Bentonite powder (~4.7 lbs/94 lb bag of Portland Type II cement)	LAS CRU	D22 MAY
			25
The	mix of neat cement and 5% bentonite will require 8.5 gallons of water per 94 lb bag of the	ement 52	
94	b bag of cement and 0.7 gallons per percent of bentonite.	NICO	un en

#### **<u>VII. ADDITIONAL INFORMATION:</u>** List additional information below, or on separate sheet(s):

Well NASA 8 was equipped with a low-flow bladder pump sampling system. Due to declining groundwater water levels, the well can no longer be sampled, and it is unlikely the groundwater will return to previous levels. The last two sampling events were in 2014 and 2018.

#### VIII. SIGNATURE:

I. Amanda Skarsgard for: Timothy J. Davis

\_, say that I have carefully read the foregoing Well Plugging Plan of Operations and any attachments, which are a part hereof; that I am familiar with the rules and regulations of the State Engineer pertaining to the plugging of wells and will comply with them, and that each and all of the statements in the Well Plugging Plan of Operations and attachments are true to the best of my knowledge and belief.

> AMANDA SKARSGARD Digitally signed by AMANDA SKARSGARD Date: 2022.05.24 10:30:23 -06'00' 05/24/2022

> > Signature of Applicant

Chery Thacker Water Resource Manager

Date

#### **IX. ACTION OF THE STATE ENGINEER:**

This Well Plugging Plan of Operations is:

Approved subject to the attached conditions. Not approved for the reasons provided on the attached letter.

Witness my hand and official seal this	Othday of	June	2632
SE NEW METE	Mike A. Hamman,	P.E, STATE ENGINEER	exico State Engineer

BY

WD-08 Well Plugging Plan Version: March 07, 2022 Page 3 of 5

### TABLE A - For plugging intervals that employ cement grout. Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			Ground Surface
Bottom of proposed interval of grout placement (ft bgl)			197 ft
Theoretical volume of grout required per interval (gallons)			32.15 gallons
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			8.5 gallons of water per 94 lb bag of Portland Type II cement with 5% bentonite powder.
Mixed on-site or batch- mixed and delivered?			On Site
Grout additive 1 requested			Powdered bentonite
Additive 1 percent by dry weight relative to cement			5%
Grout additive 2 requested	12		NA 2022
Additive 2 percent by dry weight relative to cement			NA CHIVES AN 9: 50 CAUCES, HEW ACKNO

WD-08 Well Plugging Plan Version: March 07, 2022 Page 4 of 5

### TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of sealant placement (ft bgl)			NA
Bottom of proposed sealant of grout placement (ft bgl)			NA
Theoretical volume of sealant required per interval (gallons)			NA
Proposed abandonment sealant (manufacturer and trade name)			NA



WD-08 Well Plugging Plan Version: March 07, 2022 Page 5 of 5

#### Attachment Conditions of Approval

#### Well Plugging Plan of Operations Well Number LRG-18412 POD1

#### File No.: LRG-18412

- 1) Well LRG-18412 POD1 shall be plugged using the methods and materials identified in the State Engineer approved Well Plugging Plan of Operations filed on May 25, 2022.
- In addition, well LRG-18412 POD1 shall be plugged completely using the following method per <u>Rules and Regulations Governing Well Driller Licensing</u>, Construction, <u>Repair and Plugging of Wells</u>; Subsection C of 19.27.4.30 NMAC:

All pumping appurtenances shall be removed from the well prior to plugging. To plug a well, the entire well shall be filled from the bottom upwards to ground surface using a tremie pipe. The bottom of the tremie shall remain submerged in the sealant throughout the entire sealing process; other placement methods may be acceptable and approved by the State Engineer

The well shall be plugged with an Office of the State Engineer approved sealant for use in the plugging of non-artesian wells.

The well driller shall cut the casing off at least four (4) feet below ground surface and fill the open hole with at least two (2) vertical feet of approved sealant.

Wells that do not encounter a water bearing stratum shall at a minimum be plugged by filling the well with drill cuttings or clean native fill to within 10 feet of land surface and by plugging the remaining 10 feet of the well to ground surface with a plug of the office of the state engineer approved sealant.

The driller must fill or cover any open annulus with sealant. Once the sealant has cured, the well driller or well owner may cover the seal with soil.

A plugging report for said well shall be filed with the Office of the State Engineer in the District IV office in Las Cruces within thirty (30) days of completion of the plugging.

- 2) A licensed well driller shall keep a record of the plugging work as it progresses and file a complete Plugging Record (Office of the State Engineer Form No.: WR-20) with the State Engineer no later than thirty (30) days after completion of plugging.
- 3) New Mexico Office of the State Engineer (NMOSE) witnessing of the plugging will not be required unless artesian conditions are encountered but shall be facilitated if a NMOSE observer is onsite. NMOSE witnessing may be requested during normal

1

Well: LRG-18412 POD1 Plugging Plan of Operations

work hours by calling the District IV NMOSE office at 575-524-6161 at least 48 hours in advance. NMOSE inspection will occur dependent of personnel availability.

4) Should another regulatory agency sharing jurisdiction of the project authorize or by regulation require more stringent requirements than stated herein, the more stringent procedure shall be followed. This in part includes provisions regarding preauthorization to proceed, type of methods and materials used, inspection, or prohibition of free discharge of any fluid or other material to or from the well that is related to the plugging process.

Date: 6/10/2022

Cheryl S./Thacker Water Resources Manager WRAP District IV



NOTE: A Well Plugging Plan of Operations shall be filed with and accepted by the Office of the State Engineer prior to plugging. This form may be used to plug a single well, or if you are plugging multiple monitoring wells on the same site using the same plugging methodology.

Alert! Your well may be eligible to participate in the Aquifer Mapping Program (AMP)-NM Bureau of Geology geoinfo.nmt.edu/resources/water/ cgmn/ if within an area of interest and meets the minimum construction requirements, such as there is still water in your well, and the well construction reflected in a well record and log is not compromised, contact AMP at 575-835-5038 or -6951, or by email nmbg-waterlevels@nmt.edu, prior to completing this prior form. Showing proof to the OSE that your well was accepted in this program, may delay the plugging of your well until a later date.

I. FILING FEE: There is no filing fee for this form.

II. GENERAL / WELL OWNERSHIP: Check here if proposing one plan for multiple monitoring wells on the same site and attaching WD-08m

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: <u>N/A; NASA well BLM-2-482</u> (POD)

Mailing	address:	P.O. Box 20		County:	Dona Ana
City: La	is Cruces		State:	NM	Zip code88004
Phone nu	mber: (57	5) 524-5024	E-mail:	timothy.j.davis@nasa.g	gov

#### **III. WELL DRILLER INFORMATION:**

Well Driller contracted to provide plugging services:	Not contracted yet	
New Mexico Well Driller License No · NA	Expiration Date: NA	1

IV. WELL INFORMATION: Check here if this plan describes method for plugging multiple monitoring wells on the same site and attach supplemental form WD-08m and skip to #2 in this section.

Note: A copy of the existing Well Record for the well(s) to be plugged should be attached to this plan.

1)	GPS Well Location:	Latitude:	32deg	, 33	min,	42.348	sec
		Longitude:	<u>-106</u> deg	, 38	min,	54.827	sec, NAD 83

#### 2) Reason(s) for plugging well(s):

The groundwater level has dropped below the screened interval and the well can no longer be sampled.

3) Was well used for any type of monitoring program? Yes If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

- 4) Does the well tap brackish, saline, or otherwise poor quality water? Yes If yes, provide additional detail, including analytical results and/or laboratory report(s): Refer to BLM-2-482 analytical data (Enclosure 9)
- 5) Static water level: <u>492.95</u> feet below land surface / feet above land surface (circle one)
- 6) Depth of the well: <u>498.4</u> feet

LRG-18413 TRN:727453 LRG-18413-POD1

WD-08 Well Plugging Plan Version: March 07, 2022 Page 1 of 5

7)	Inside diameter of innermost casing: <u>3.75</u> inches. RECEIVED
8)	Casing material: Stainless steel SCD 5 to 382.3 ft; SCD 10 to 498.4 ft 2022 MAY 25 AM 9: 57
9)	The well was constructed with:
	an open-hole production interval, state the open interval:
10)	What annular interval surrounding the artesian casing of this well is cement-grouted? NA
11)	Was the well built with surface casing? <u>Yes</u> If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? <u>Yes</u> If yes, please describe:
	Nominal 10-inch surface casing set to 100 ft in a 12 1/4 in. diameter borehole and cemented to surface.
12)	Has all pumping equipment and associated piping been removed from the well? <u>Yes</u> If not, describe remaining equipment and intentions to remove prior to plugging in Section VII of this form.
V, DI	ESCRIPTION OF PLANNED WELL PLUGGING:
Note: 1 diagran as geop	If this plan proposes to plug an artesian well in a way other than with cement grout, placed bottom to top with a tremie pipe, a detailed n of the well showing proposed final plugged configuration shall be attached, as well as any additional technical information, such hysical logs, that are necessary to adequately describe the proposal. Attach a copy of any signed OSE variance to this plugging plan.

Also, if this plauned plugging plan requires a variance to 19.27.4 NMAC, attach a detailed variance request signed by the applicant.

1) Describe the method by which cement grout shall be placed in the well, or describe requested plugging methodology

proposed for the well:

The well casing will be cemented from bottom up using tremie pipe, including all screened intervals and blank casing.

2) Will well head be cut-off below land surface after plugging? Yes, 6 inches below ground surface

#### VI. PLUGGING AND SEALING MATERIALS:

Note: The plugging of a well that taps poor quality water may require the use of a specialty cement or specialty sealant. Attach a copy of the batch mix recipe from the cement company and/or product description for specialty cement mixes or any sealant that deviates from the list of OSE approved sealants.

- 1) For plugging intervals that employ cement grout, complete and attach Table A.
- 2) For plugging intervals that will employ approved non-cement based sealant(s), complete and attach Table B.
- 3) Theoretical volume of grout required to plug the well to land surface: 286 gallons (38.2 cubic ft)
- 4) Type of Cement proposed: Portland Type II neat cement with 5% bentonite by weight
- 5) Proposed cement grout mix: 8.5 gallons of water per 94 pound sack of Portland cement.
- 6) Will the grout be: \_\_\_\_\_ batch-mixed and delivered to the site

X mixed on site

Grout additives requested	and percent by dry	weight relative to cement:
---------------------------	--------------------	----------------------------

5% by weight Bentonite powder (~4.7 lbs/94 lb bag of Portland Type II cement)

8)

7)

Additional notes and calculations:

The mix of neat cement and 5% bentonite will require 8.5 gallons of water per 94 lb bag of cement; 5.2 gallons per 94 lb bag of cement and 0.7 gallons per percent of bentonite.

#### **<u>VII. ADDITIONAL INFORMATION:</u>** List additional information below, or on separate sheet(s):

Well BLM-2-482 was equipped with a low-flow sampling system with the pump intake set at ~487.5 ft bgs. Well BLM-2-482 was sampled annually until 2012, when water level dropped below the lowest possible pump intake.

#### VIII. SIGNATURE:

I, <u>Amanda Skarsgard for: Timothy J. Davis</u>, say that I have carefully read the foregoing Well Plugging Plan of Operations and any attachments, which are a part hereof; that I am familiar with the rules and regulations of the State Engineer pertaining to the plugging of wells and will comply with them, and that each and all of the statements in the Well Plugging Plan of Operations and attachments are true to the best of my knowledge and belief.

AMANDA SKARSGARD Digitally signed by AMANDA SKARSGARD Date: 2022.05.24 10:31:26 -06:00'		05/24/202	22
Signature of Applicant	50	Date 202	
IX. ACTION OF THE STATE ENGINEER;		2 MAY	
This Well Plugging Plan of Operations is: Approved subject to the attached conditions. Not approved for the reasons provided on the attached letter.	DOS, HEN WO	25 AM 9	
Witness my hand and official seal this 10th day of June,	-202	:57	
Mike A. Hamman, P.E., STATE ENGINEER	xico Stat	e Enginee	r
Cheryl Thacker Water Resource Manager	7D-08 Wel Version: 1	l Plugging I March 07, 2 Page 3 (	Plan 022 of 5

### TABLE A - For plugging intervals that employ cement grout. Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			Ground Surface
Bottom of proposed interval of grout placement (ft bgl)			498.4 ft
Theoretical volume of grout required per interval (gallons)			286 gallons
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			8.5 gailons of water per 94 lb bag of Portland Type II cement with 5% bentonite powder.
Mixed on-site or batch- mixed and delivered?			On Site
Grout additive 1 requested			Powdered bentonite
Additive 1 percent by dry weight relative to cement			5%
Grout additive 2 requested			NA LAS CRUCES,
Additive 2 percent by dry weight relative to cement			NA PU HENICO

WD-08 Well Plugging Plan Version: March 07, 2022 Page 4 of 5

# TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 - most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of sealant placement (ft bgl)			NA
Bottom of proposed sealant of grout placement (ft bgl)			NA
Theoretical volume of sealant required per interval (gallons)			NA
Proposed abandonment sealant (manufacturer and trade name)			NA

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WD-08 Well Plugging Plan Version: March 07, 2022 Page 5 of 5

#### Attachment Conditions of Approval

#### Well Plugging Plan of Operations Well Number LRG-18413 POD1

#### File No.: LRG-18413

- 1) Well LRG-18413 POD1 shall be plugged using the methods and materials identified in the State Engineer approved Well Plugging Plan of Operations filed on May 25, 2022.
- 2) In addition, well LRG-18413 POD1 shall be plugged completely using the following method per <u>Rules and Regulations Governing Well Driller Licensing, Construction,</u> <u>Repair and Plugging of Wells</u>; Subsection C of 19.27.4.30 NMAC:

All pumping appurtenances shall be removed from the well prior to plugging. To plug a well, the entire well shall be filled from the bottom upwards to ground surface using a tremie pipe. The bottom of the tremie shall remain submerged in the sealant throughout the entire sealing process; other placement methods may be acceptable and approved by the State Engineer

The well shall be plugged with an Office of the State Engineer approved sealant for use in the plugging of non-artesian wells.

The well driller shall cut the casing off at least four (4) feet below ground surface and fill the open hole with at least two (2) vertical feet of approved sealant.

Wells that do not encounter a water bearing stratum shall at a minimum be plugged by filling the well with drill cuttings or clean native fill to within 10 feet of land surface and by plugging the remaining 10 feet of the well to ground surface with a plug of the office of the state engineer approved sealant.

The driller must fill or cover any open annulus with sealant. Once the sealant has cured, the well driller or well owner may cover the seal with soil.

A plugging report for said well shall be filed with the Office of the State Engineer in the District IV office in Las Cruces within thirty (30) days of completion of the plugging.

- 2) A licensed well driller shall keep a record of the plugging work as it progresses and file a complete Plugging Record (Office of the State Engineer Form No.: WR-20) with the State Engineer no later than thirty (30) days after completion of plugging.
- 3) New Mexico Office of the State Engineer (NMOSE) witnessing of the plugging will not be required unless artesian conditions are encountered but shall be facilitated if a NMOSE observer is onsite. NMOSE witnessing may be requested during normal

1

Well: LRG-18413 POD1 Plugging Plan of Operations

work hours by calling the District IV NMOSE office at 575-524-6161 at least 48 hours in advance. NMOSE inspection will occur dependent of personnel availability.

4) Should another regulatory agency sharing jurisdiction of the project authorize or by regulation require more stringent requirements than stated herein, the more stringent procedure shall be followed. This in part includes provisions regarding preauthorization to proceed, type of methods and materials used, inspection, or prohibition of free discharge of any fluid or other material to or from the well that is related to the plugging process.

Date: 6/10/2022

Cheryl S. Thacker Water Resources Manager WRAP District IV



NOTE: A Well Plugging Plan of Operations shall be filed with and accepted by the Office of the State Engineer prior to plugging. This form may be used to plug a single well, or if you are plugging multiple monitoring wells on the same site using the same plugging methodology.

Alert! Your well may be eligible to participate in the Aquifer Mapping Program (AMP)-NM Bureau of Geology geoinfo.nmt.edu/resources/water/ cgmn/ if within an area of interest and meets the minimum construction requirements, such as there is still water in your well, and the well construction reflected in a well record and log is not compromised, contact AMP at 575-835-5038 or -6951, or by email nmbg-waterlevels@nmt.edu, prior to completing this prior form. Showing proof to the OSE that your well was accepted in this program, may delay the plugging of your well until a later date.

I. FILING FEE: There is no filing fee for this form.

**II. GENERAL / WELL OWNERSHIP:** Check here if proposing one plan for multiple monitoring wells on the same site and attaching WD-08m

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: N/A; NASA well 400-LV-125 (POD)

Mailing ad	ddress:	P.O. Box 20		County:	Dona Ana
City: Las C	Cruces		State:	NM	Zip code88004
Phone numb	er: (57	5) 524-5024	E-mail:	timothy.j.davis@nasa.g	jov

#### **III. WELL DRILLER INFORMATION:**

Well Driller contracted to provide plugging services:	Not contracted yet	
New Mexico Well Driller License No.: NA	Expiration Date: NA	

IV. WELL INFORMATION: Check here if this plan describes method for plugging multiple monitoring wells on the same site and attach supplemental form WD-08m and skip to #2 in this section.

Note: A copy of the existing Well Record for the well(s) to be plugged should be attached to this plan.

1)	GPS Well Location:	Latitude:	32	deg,	31	 29.891	sec	
		Longitude:	-106	deg,	36	 19.51	sec, NAD 83	3

#### Reason(s) for plugging well(s):

Water was not encountered during drilling of this well and no pump was ever set in this borehole. Well is not part of sampling schedule.

3) Was well used for any type of monitoring program? <u>No</u> If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

- 4) Does the well tap brackish, saline, or otherwise poor quality water? Yes If yes, provide additional detail, including analytical results and/or laboratory report(s): No analytical data available per item 2. No samples taken.
- 5) Static water level: <u>NA</u> feet below land surface / feet above land surface (circle one)
- 6) Depth of the well: <u>145.3</u> feet

LRG-18414 TRN:727457

LEG-18414-POD 1

WD-08 Well Plugging Plan Version: March 07, 2022 Page 1 of 5

### RECEIVED

7)	Inside diameter of innermost casing:2inches.	2022 MAY 25 AM 9: 58						
8)	Casing material: Schedule 40 PVC	ų, <del>2</del> .						
9)	The well was constructed with: an open-hole production interval, state the open interv	LAS CRUCES, MEH HEXICO						
	a well screen or perforated pipe, state the screened int	erval(s): 125-140ft						
10)	What annular interval surrounding the artesian casing of this w	ell is cement-grouted? NA						
11)	<ol> <li>Was the well built with surface casing? <u>No</u> If yes, is the annulus surrounding the surface casing grouted otherwise sealed? <u>NA</u> If yes, please describe:</li> </ol>							
12)	Has all pumping equipment and associated piping been removed from the well? <u>NA</u> If not, describe remaining equipment and intentions to remove prior to plugging in Section VII of this form.							
V. DE	SCRIPTION OF PLANNED WELL PLUGGING:	ing method differs between multiple wells on same site, a separat ust be completed for each method.						
Note: If diagram as geophy	this plan proposes to plug an artesian well in a way other than with cem of the well showing proposed final plugged configuration shall be atta ysical logs, that are necessary to adequately describe the proposal. Attach a	ent grout, placed bottom to top with a tremie pipe, a detailed ched, as well as any additional technical information, such copy of any signed OSE variance to this plugging plan.						
Also, if th	his planned plugging plan requires a variance to 19.27.4 NMAC, attach a de	tailed variance request signed by the applicant.						
1)	Describe the method by which cement grout shall be placed in t	he well, or describe requested plugging methodology						
	proposed for the well:							
	The well casing will be cemented from bottom up using tremie p	pipe, including all screened intervals and blank casing.						
2)	Will well head be cut-off below land surface after plugging?	es, 6 inches below ground surface						
<u>VI. PL</u>	UGGING AND SEALING MATERIALS:							

Note: The plugging of a well that taps poor quality water may require the use of a specialty cement or specialty sealant. Attach a copy of the batch mix recipe from the cement company and/or product description for specialty cement mixes or any sealant that deviates from the list of OSE approved sealants.

- 1) For plugging intervals that employ cement grout, complete and attach Table A.
- 2) For plugging intervals that will employ approved non-cement based sealant(s), complete and attach Table B.
- 3) Theoretical volume of grout required to plug the well to land surface: 23.7 gallons (3.2 cubic ft)
- 4) Type of Cement proposed: Portland Type II neat cement with 5% bentonite by weight
- 5) Proposed cement grout mix: 8.5 gallons of water per 94 pound sack of Portland cement.
- 6) Will the grout be: \_\_\_\_\_batch-mixed and delivered to the site

X mixed on site

7)	Grout additives requested, and percent by dry weight relative to cement:
	5% by weight Bentonite powder (~4.7 lbs/94 lb bag of Portland Type II cement)
8)	Additional notes and calculations:
0)	Additional notes and calculations:
	The mix of neat cement and 5% bentonite will require 8.5 gallons of water per 94 lb bag of cement; 5.2 gallons per 94 lb bag of cement and 0.7 gallons per percent of bentonite.

### VII. ADDITIONAL INFORMATION: List additional information below, or on separate sheet(s):

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#### VIII. SIGNATURE:

I, <u>Amanda Skarsgard for: Timothy J. Davis</u>, say that I have carefully read the foregoing Well Plugging Plan of Operations and any attachments, which are a part hereof; that I am familiar with the rules and regulations of the State Engineer pertaining to the plugging of wells and will comply with them, and that each and all of the statements in the Well Plugging Plan of Operations and attachments are true to the best of my knowledge and belief.

AMANDA SKARSGARD	Digitally signed by AMANDA SKARSGARD Date: 2022.05.24 10:32:19 -06'00'	05/24/202
------------------	---	-----------

Signature of Applicant

Date

#### IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

\_\_\_\_\_ Approved subject to the attached conditions. \_\_\_\_\_\_ Not approved for the reasons provided on the attached letter.

Witness my hand and official seal this	10th	day of June		62-2
OF NEW ME	Mike A	Hamman, P.E. STATE ENGIN	NEER Mexic	o State Engineer
S		cheryl Thacker Water Resource Manager		-08 Well Plugging Plan
ATE ENGINE			V	ersion: March 07, 2022 Page 3 of 5

### TABLE A - For plugging intervals that employ cement grout. Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			Ground Surface
Bottom of proposed interval of grout placement (ft bgl)			145.3 ft
Theoretical volume of grout required per interval (gallons)			23.7 gallons
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			8.5 gallons of water per 94 lb bag of Portland Type II cement with 5% bentonite powder.
Mixed on-site or batch- mixed and delivered?			On Site
Grout additive 1 requested			Powdered bentonite
Additive 1 percent by dry weight relative to cement			5%
Grout additive 2 requested			NA NA PECE
Additive 2 percent by dry weight relative to cement			NA 9:50

# TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 - most shallow
1			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of sealant placement (ft bgl)			NA
Bottom of proposed sealant of grout placement (ft bgl)			NA
Theoretical volume of sealant required per interval (gallons)			NA
Proposed abandonment sealant (manufacturer and trade name)			NA



#### Attachment Conditions of Approval

#### Well Plugging Plan of Operations Well Number LRG-18414 POD1

#### File No.: LRG-18414

- 1) Well LRG-18414 POD1 shall be plugged using the methods and materials identified in the State Engineer approved Well Plugging Plan of Operations filed on May 25, 2022.
- In addition, well LRG-18414 POD1 shall be plugged completely using the following method per <u>Rules and Regulations Governing Well Driller Licensing</u>, Construction, <u>Repair and Plugging of Wells</u>; Subsection C of 19.27.4.30 NMAC:

All pumping appurtenances shall be removed from the well prior to plugging. To plug a well, the entire well shall be filled from the bottom upwards to ground surface using a tremie pipe. The bottom of the tremie shall remain submerged in the sealant throughout the entire sealing process; other placement methods may be acceptable and approved by the State Engineer

The well shall be plugged with an Office of the State Engineer approved sealant for use in the plugging of non-artesian wells.

The well driller shall cut the casing off at least four (4) feet below ground surface and fill the open hole with at least two (2) vertical feet of approved sealant.

Wells that do not encounter a water bearing stratum shall at a minimum be plugged by filling the well with drill cuttings or clean native fill to within 10 feet of land surface and by plugging the remaining 10 feet of the well to ground surface with a plug of the office of the state engineer approved sealant.

The driller must fill or cover any open annulus with sealant. Once the sealant has cured, the well driller or well owner may cover the seal with soil.

A plugging report for said well shall be filed with the Office of the State Engineer in the District IV office in Las Cruces within thirty (30) days of completion of the plugging.

- 2) A licensed well driller shall keep a record of the plugging work as it progresses and file a complete Plugging Record (Office of the State Engineer Form No.: WR-20) with the State Engineer no later than thirty (30) days after completion of plugging.
- 3) New Mexico Office of the State Engineer (NMOSE) witnessing of the plugging will not be required unless artesian conditions are encountered but shall be facilitated if a NMOSE observer is onsite. NMOSE witnessing may be requested during normal

1

Well: LRG-18414 POD1 Plugging Plan of Operations

work hours by calling the District IV NMOSE office at 575-524-6161 at least 48 hours in advance. NMOSE inspection will occur dependent of personnel availability.

4) Should another regulatory agency sharing jurisdiction of the project authorize or by regulation require more stringent requirements than stated herein, the more stringent procedure shall be followed. This in part includes provisions regarding preauthorization to proceed, type of methods and materials used, inspection, or prohibition of free discharge of any fluid or other material to or from the well that is related to the plugging process.

Date: <u>4/10/2022</u>

Cheryl S. Thacker Water Resources Manager WRAP District IV



NOTE: A Well Plugging Plan of Operations shall be filed with and accepted by the Office of the State Engineer prior to plugging. This form may be used to plug a single well, or if you are plugging multiple monitoring wells on the same site using the same plugging methodology.

Alert! Your well may be eligible to participate in the Aquifer Mapping Program (AMP)-NM Bureau of Geology geoinfo.nmt.edu/resources/water/ cgmv/ if within an area of interest and meets the minimum construction requirements, such as there is still water in your well, and the well construction reflected in a well record and log is not compromised, contact AMP at 575-835-5038 or -6951, or by email nmbg-waterlevels@nmt.edu, prior to completing this prior form. Showing proof to the OSE that your well was accepted in this program, may delay the plugging of your well until a later date.

I. FILING FEE: There is no filing fee for this form.

II. GENERAL / WELL OWNERSHIP: Check here if proposing one plan for multiple monitoring wells on the same site and attaching WD-08m

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: N/A; NASA well 400-KV-142 (POD)

Mailing	address:	P.O. Box 20		County:	Dona Ana
City: Las Cruces			State:	NM	Zip code88004
Phone number: (575) 524-5024		E-mail:	timothy.j.davis@nasa.g	jov	

#### **III. WELL DRILLER INFORMATION:**

Well Driller contracted to provide plugging services:	Not contracted yet		
New Mexico Well Driller License No.: NA		Expiration Date:	NA

IV. WELL INFORMATION: Check here if this plan describes method for plugging multiple monitoring wells on the same site and attach supplemental form WD-08m and skip to #2 in this section.

Note: A copy of the existing Well Record for the well(s) to be plugged should be attached to this plan.

1)	GPS Well Location:	Latitude:	32	deg,	31	min,	29.225	sec
		Longitude:	-106	deg,	36	min,	21.685	sec. NAD 83

#### Reason(s) for plugging well(s):

The well has insufficient recharge to warrant installing a dedicated sampling system. Well is not part of sampling schedule.

- 3) Was well used for any type of monitoring program? <u>No</u> If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.
- 4) Does the well tap brackish, saline, or otherwise poor quality water? Yes If yes, provide additional detail, including analytical results and/or laboratory report(s): No analytical data available per item 2. No samples taken.
- 5) Static water level: \_\_\_\_\_\_\_ feet below land surface / feet above land surface (circle one)

LRG-18415-PODI

6) Depth of the well: \_\_\_\_\_\_feet

LRG-18415 TRN:727461 WD-08 Well Plugging Plan Version: March 07, 2022 Page 1 of 5

0	13	T.M.	ł	5 1	-	38944
3.5.5.	Sec. 2.	277-148 289-444	1	Â.	1.744	

7)	Inside diameter of innermost casing:2inches.	2022 MAY 25 AM 9: 58
8)	Casing material: Schedule 40 PVC	рана — 2
9)	The well was constructed with: an open-hole production interval, state the open interval: a well screen or perforated pipe, state the screened interval(	LAO CRUDEO, NEW INEXICO
10)	What annular interval surrounding the artesian casing of this well is o	cement-grouted? NA
11)	Was the well built with surface casing? <u>No</u> If yes, is the an otherwise sealed? <u>NA</u> If yes, please describe:	nulus surrounding the surface casing grouted or
12) V D	Has all pumping equipment and associated piping been removed from remaining equipment and intentions to remove prior to plugging in Section 2005 CRIPTION OF PLANNED WELL PLUGGING:	n the well? Yes If not, describe ection VII of this form. thod differs between multiple wells on same site, a separat
Note: diagram	If this plan proposes to plug an artesian well in a way other than with cement gro am of the well showing proposed final plugged configuration shall be attached, is ophysical logs, that are necessary to adequately describe the proposal. Attach a copy of	ut, placed bottom to top with a tremie pipe, a detailed as well as any additional technical information, such fany signed OSE variance to this plugging plan.
Also, if	if this planned plugging plan requires a variance to 19.27.4 NMAC, attach a detailed v	ariance request signed by the applicant.
1)	Describe the method by which cement grout shall be placed in the we proposed for the well:	ll, or describe requested plugging methodology
	The well casing will be cemented from bottom up using tremie pipe, in	ncluding all screened intervals and blank casing.
2)	Will well head be cut-off below land surface after plugging? Yes, 6	inches below ground surface
<u>VI. P</u>	PLUGGING AND SEALING MATERIALS:	
Note: from ti	The plugging of a well that taps poor quality water may require the use of a specialty the cement company and/or product description for specialty cement mixes or any sea	cement or specialty sealant. Attach a copy of the batch milant that deviates from the list of OSE approved sealants.
1)	For plugging intervals that employ cement grout, complete and attach	Table A.
2)	For plugging intervals that will employ approved non-cement based s	sealant(s), complete and attach Table B.
		OF 7 and and (O A suble A)

- 3) Theoretical volume of grout required to plug the well to land surface: 25.7 gallons (3.4 cubic ft)
- 4) Type of Cement proposed: Portland Type II neat cement with 5% bentonite by weight
- 5) Proposed cement grout mix: 8.5 gallons of water per 94 pound sack of Portland cement.
- 6) Will the grout be: \_\_\_\_\_batch-mixed and delivered to the site

X mixed on site

recipe

7) Grout additives requested, and percent by dry weight relative to cement:

5% by weight Bentonite powder (~4.7 lbs/94 lb bag of Portland Type II cement)

Additional notes and calculations:

The mix of neat cement and 5% bentonite will require 8.5 gallons of water per 94 lb bag of cement; 5.2 gallons per 94 lb bag of cement and 0.7 gallons per percent of bentonite.

#### VII. ADDITIONAL INFORMATION: List additional information below, or on separate sheet(s):

# RECEVED NED MAY 25 NM Q. 201

#### VIII. SIGNATURE:

8)

I. Amanda Skarsgard for: Timothy J. Davis

\_\_\_\_, say that I have carefully read the foregoing Well Plugging Plan of Operations and any attachments, which are a part hereof; that I am familiar with the rules and regulations of the State Engineer pertaining to the plugging of wells and will comply with them, and that each and all of the statements in the Well Plugging Plan of Operations and attachments are true to the best of my knowledge and belief.

AMANDA SKARSGARD Digitally signed by AMANDA SKARSGARD Date: 2022.05.24 10:33:08 -06'00'	05/24/2022
Signature of Applicant	Date

#### **IX. ACTION OF THE STATE ENGINEER:**

This Well Plugging Plan of Operations is:

Approved subject to the attached conditions. Not approved for the reasons provided on the attached letter.

Witness my hand and official seal this 10th day of June	
Mike A. Hamman, P.E. STATE ENGINEER	Mexico State Engineer
Cheryl Thacker Water Resource Manager	<u></u>
BATE ENGINEER	WD-08 Well Plugging Plan Version: March 07, 2022 Page 3 of 5

### TABLE A - For plugging intervals that employ cement grout. Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow			
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.			
Top of proposed interval of grout placement (ft bgl)			Ground Surface			
Bottom of proposed interval of grout placement (ft bgl)			157.3 ft			
Theoretical volume of grout required per interval (gallons)			25.7 gallons			
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			8.5 gallons of water per 94 lb bag of Portland Type II cement with 5% bentonite powder.			
Mixed on-site or batch- mixed and delivered?			On Site			
Grout additive 1 requested			Powdered bentonite			
Additive 1 percent by dry weight relative to cement			5%			
Grout additive 2 requested			NA NA			
Additive 2 percent by dry weight relative to cement			NA M 9:58			

# TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of sealant placement (ft bgl)			NA
Bottom of proposed sealant of grout placement (ft bgl)			NA
Theoretical volume of sealant required per interval (gallons)			NA
Proposed abandonment sealant (manufacturer and trade name)			NA

# VALUES AN SE SE 2022 MAY 25 AM SE SE STAR ELEMANT STOLE

#### Attachment Conditions of Approval

#### Well Plugging Plan of Operations Well Number LRG-18415 POD1

#### File No.: LRG-18415

- 1) Well LRG-18415 POD1 shall be plugged using the methods and materials identified in the State Engineer approved Well Plugging Plan of Operations filed on May 25, 2022.
- In addition, well LRG-18415 POD1 shall be plugged completely using the following method per <u>Rules and Regulations Governing Well Driller Licensing</u>. Construction, <u>Repair and Plugging of Wells</u>; Subsection C of 19.27.4.30 NMAC:

All pumping appurtenances shall be removed from the well prior to plugging. To plug a well, the entire well shall be filled from the bottom upwards to ground surface using a tremie pipe. The bottom of the tremie shall remain submerged in the sealant throughout the entire sealing process; other placement methods may be acceptable and approved by the State Engineer

The well shall be plugged with an Office of the State Engineer approved sealant for use in the plugging of non-artesian wells.

The well driller shall cut the casing off at least four (4) feet below ground surface and fill the open hole with at least two (2) vertical feet of approved sealant.

Wells that do not encounter a water bearing stratum shall at a minimum be plugged by filling the well with drill cuttings or clean native fill to within 10 feet of land surface and by plugging the remaining 10 feet of the well to ground surface with a plug of the office of the state engineer approved sealant.

The driller must fill or cover any open annulus with sealant. Once the sealant has cured, the well driller or well owner may cover the seal with soil.

A plugging report for said well shall be filed with the Office of the State Engineer in the District IV office in Las Cruces within thirty (30) days of completion of the plugging.

- 2) A licensed well driller shall keep a record of the plugging work as it progresses and file a complete Plugging Record (Office of the State Engineer Form No.: WR-20) with the State Engineer no later than thirty (30) days after completion of plugging.
- 3) New Mexico Office of the State Engineer (NMOSE) witnessing of the plugging will not be required unless artesian conditions are encountered but shall be facilitated if a NMOSE observer is onsite. NMOSE witnessing may be requested during normal

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Well: LRG-18415 POD1 Plugging Plan of Operations

work hours by calling the District IV NMOSE office at 575-524-6161 at least 48 hours in advance. NMOSE inspection will occur dependent of personnel availability.

4) Should another regulatory agency sharing jurisdiction of the project authorize or by regulation require more stringent requirements than stated herein, the more stringent procedure shall be followed. This in part includes provisions regarding preauthorization to proceed, type of methods and materials used, inspection, or prohibition of free discharge of any fluid or other material to or from the well that is related to the plugging process.

Date: 6/10/2022

1Sph

Cheryl S. Thacker Water Resources Manager WRAP District IV



NOTE: A Well Plugging Plan of Operations shall be filed with and accepted by the Office of the State Engineer prior to plugging. This form may be used to plug a single well, or if you are plugging multiple monitoring wells on the same site using the same plugging methodology.

Alert! Your well may be eligible to participate in the Aquifer Mapping Program (AMP)-NM Bureau of Geology geoinfo.nmt.edu/resources/water/ cgmn/ if within an area of interest and meets the minimum construction requirements, such as there is still water in your well, and the well construction reflected in a well record and log is not compromised, contact AMP at 575-835-5038 or -6951, or by email nmbg-waterlevels@nmt.edu, prior to completing this prior form. Showing proof to the OSE that your well was accepted in this program, may delay the plugging of your well until a later date.

I. FILING FEE: There is no filing fee for this form.

II. GENERAL / WELL OWNERSHIP:

Check here if proposing one plan for multiple monitoring wells on the same site and attaching WD-08m

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: N/A; NASA well 200-SG-3 (POD) Name of well owner; NASA Johnson Space Center White Sands Test Facility (Contact: Timothy Davis)

Mailing address: City: Las Cruces		P.O. Box 20		County:	Dona Ana
			State:	NM	Zip code88004
Phone nu	mber: (57	5) 524-5024	E-mail:	timothy.j.davis@nasa.g	IOV

#### III. WELL DRILLER INFORMATION:

						DApin			~	
( <u>V. V</u>	VELL INFORMATION:	Check here if t supplemental f	his plan des orm WD-08	cribes meth m and skip	od for plu to #2 in th	gging mult is section.	iple monitori	ng wells on the s	ainesite	and atta
Note:	A copy of the existing W	ell Record for the	well(s) to	be plugge	d should	be attach	ed to this p	olan.	1	1.7
								Got.	23	1.8 4
1)	GPS Well Location:	Latitude: Longitude:	32 -106	deg, deg,	31 36	min, min,	0.37 9.312	sec, NAD 83		2
									Ģ	1
2)	Reason(s) for plugging	well(s):						Sin	10	
	NMED directed NASA	to P&A the well.								

- 3) Was well used for any type of monitoring program? <u>Yes</u> If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.
- 4) Does the well tap brackish, saline, or otherwise poor quality water? Yes If yes, provide additional detail, including analytical results and/or laboratory report(s): Refer to 200-SG-3 analytical data (Enclosure 9)
- 5) Static water level: 163.55 feet below land surface / feet above land surface (circle one)
- 6) Depth of the well: <u>170.3</u> feet

LRG-18416 TEN:727483

WD-08 Well Plugging Plan Version: March 07, 2022 Page 1 of 5

7)	Inside diameter of innermost casing:	2	inches.
	ALADINE WINITED AL ALADINITION CONTINUE		TIDICON

8)	Casing material: Schedule 40 PVC		2	
9)	The well was constructed with:	AS CAUC	22 MAY	
	a well screen or perforated pipe, state the screened interval(s): 155-170 ft	0.25	cn	111
10)	What annular interval surrounding the artesian casing of this well is cement-grouted? <u>NA</u>		AH 9:	VED
11)	Was the well built with surface casing? <u>No</u> If yes, is the annulus surrounding the su otherwise sealed? <u>NA</u> If yes, please describe:	urface casin	ng grout	ed or

12) Has all pumping equipment and associated piping been removed from the well? <u>Yes</u> If not, describe remaining equipment and intentions to remove prior to plugging in Section VII of this form.

### V. DESCRIPTION OF PLANNED WELL PLUGGING:

Note: If this plan proposes to plug an artesian well in a way other than with cement grout, placed bottom to top with a tremie pipe, a detailed diagram of the well showing proposed final plugged configuration shall be attached, as well as any additional technical information, such as geophysical logs, that are necessary to adequately describe the proposal. Attach a copy of any signed OSE variance to this plugging plan.

Also, if this planned plugging plan requires a variance to 19.27.4 NMAC, attach a detailed variance request signed by the applicant.

1) Describe the method by which cement grout shall be placed in the well, or describe requested plugging methodology

proposed for the well:

The well casing will be cemented from bottom up using tremie pipe, including all screened intervals and blank casing.

2) Will well head be cut-off below land surface after plugging? Yes, 6 inches below ground surface

#### VI. PLUGGING AND SEALING MATERIALS:

Note: The plugging of a well that taps poor quality water may require the use of a specialty cement or specialty sealant. Attach a copy of the batch mix recipe from the cement company and/or product description for specialty cement mixes or any sealant that deviates from the list of OSE approved sealants.

- 1) For plugging intervals that employ cement grout, complete and attach Table A.
- 2) For plugging intervals that will employ approved non-cement based sealant(s), complete and attach Table B.
- 3) Theoretical volume of grout required to plug the well to land surface: 27.8 gallons (3.7 cubic ft)
- 4) Type of Cement proposed: Portland Type II neat cement with 5% bentonite by weight
- 5) Proposed cement grout mix: <u>8.5</u> gallons of water per 94 pound sack of Portland cement.
- 6) Will the grout be: \_\_\_\_\_batch-mixed and delivered to the site

X mixed on site

Gro	ut additives requested, and percent by dry weight relative to cement:	-	20		
5%	by weight Bentonite powder (~4.7 lbs/94 lb bag of Portland Type II cement)	S Cal	22 MAY		
			No.		
Add	litional notes and calculations:	the first	-75		
The 94 I	The mix of neat cement and 5% bentonite will require 8.5 gallons of water per 94 lb bag of cement 52 gallons per 94 lb bag of cement and 0.7 gallons per percent of bentonite.				

#### VII. ADDITIONAL INFORMATION: List additional information below, or on separate sheet(s):

Well 200-SG-3 was sampled using a Bennett pump or Teflon bailer. Following well installation, it was determined that the monitoring zone was above the contaminant plume. The well has no value as a groundwater monitoring well. The well was last sampled in 2014.

#### VIII. SIGNATURE:

I, <u>Amanda Skarsgard for: Timothy J. Davis</u>, say that I have carefully read the foregoing Well Plugging Plan of Operations and any attachments, which are a part hereof; that I am familiar with the rules and regulations of the State Engineer pertaining to the plugging of wells and will comply with them, and that each and all of the statements in the Wel

Engineer pertaining to the plugging of wells and will comply with them, and that each and all of the statements in the Well Plugging Plan of Operations and attachments are true to the best of my knowledge and belief.

AMANDA SKARSGARD Digitally signed by AMANDA SKARSGARD 05/24/2022

// 20/

Signature of Applicant

Date

#### IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

Approved subject to the attached conditions. Not approved for the reasons provided on the attached letter.

Witness my hand and official seal this 10th day of June	, 2022
OF NEW Mike A. Hamman, P.E., STATE ENGINEER	exico State Engineer
O Cheryl Thacker Water Resource Manager	· · · · · · · · · · · · · · · · · · ·
STE ENGINEE	WD-08 Well Plugging Plan Version: March 07, 2022 Page 3 of 5

### TABLE A - For plugging intervals that employ cement grout. Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow	
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.	
Top of proposed interval of grout placement (ft bgl)			Ground Surface	
Bottom of proposed interval of grout placement (ft bgl)			170.3 ft	
Theoretical volume of grout required per interval (gallons)			27.8 gallons	
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			8.5 gailons of water per 94 lb bag of Portland Type II cement with 5% bentonite powder.	
Mixed on-site or batch- mixed and delivered?			On Site	
Grout additive 1 requested			Powdered bentonite	
Additive 1 percent by dry weight relative to cement			5%	
Grout additive 2 requested			NA NA CAUCE, HE	
Additive 2 percent by dry weight relative to cement			NA 99	

### TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of sealant placement (ft bgl)			NA
Bottom of proposed sealant of grout placement (ft bgl)			NA
Theoretical volume of sealant required per interval (gallons)			NA
Proposed abandonment sealant (manufacturer and trade name)			NA



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#### Attachment Conditions of Approval

#### Well Plugging Plan of Operations Well Number LRG-18416 POD1

#### File No.: LRG-18416

- 1) Well LRG-18416 POD1 shall be plugged using the methods and materials identified in the State Engineer approved Well Plugging Plan of Operations filed on May 25, 2022.
- In addition, well LRG-18416 POD1 shall be plugged completely using the following method per <u>Rules and Regulations Governing Well Driller Licensing, Construction,</u> <u>Repair and Plugging of Wells</u>; Subsection C of 19.27.4.30 NMAC:

All pumping appurtenances shall be removed from the well prior to plugging. To plug a well, the entire well shall be filled from the bottom upwards to ground surface using a tremie pipe. The bottom of the tremie shall remain submerged in the sealant throughout the entire sealing process; other placement methods may be acceptable and approved by the State Engineer

The well shall be plugged with an Office of the State Engineer approved sealant for use in the plugging of non-artesian wells.

The well driller shall cut the casing off at least four (4) feet below ground surface and fill the open hole with at least two (2) vertical feet of approved sealant.

Wells that do not encounter a water bearing stratum shall at a minimum be plugged by filling the well with drill cuttings or clean native fill to within 10 feet of land surface and by plugging the remaining 10 feet of the well to ground surface with a plug of the office of the state engineer approved sealant.

The driller must fill or cover any open annulus with sealant. Once the sealant has cured, the well driller or well owner may cover the seal with soil.

A plugging report for said well shall be filed with the Office of the State Engineer in the District IV office in Las Cruces within thirty (30) days of completion of the plugging.

- 2) A licensed well driller shall keep a record of the plugging work as it progresses and file a complete Plugging Record (Office of the State Engineer Form No.: WR-20) with the State Engineer no later than thirty (30) days after completion of plugging.
- 3) New Mexico Office of the State Engineer (NMOSE) witnessing of the plugging will not be required unless artesian conditions are encountered but shall be facilitated if a NMOSE observer is onsite. NMOSE witnessing may be requested during normal

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Well: LRG-18416 POD1 Plugging Plan of Operations

work hours by calling the District IV NMOSE office at 575-524-6161 at least 48 hours in advance. NMOSE inspection will occur dependent of personnel availability.

4) Should another regulatory agency sharing jurisdiction of the project authorize or by regulation require more stringent requirements than stated herein, the more stringent procedure shall be followed. This in part includes provisions regarding preauthorization to proceed, type of methods and materials used, inspection, or prohibition of free discharge of any fluid or other material to or from the well that is related to the plugging process.

Date: 6/10/2022

Cheryl S./Thacker Water Resources Manager WRAP District IV


NOTE: A Well Plugging Plan of Operations shall be filed with and accepted by the Office of the State Engineer prior to plugging. This form may be used to plug a single well, or if you are plugging multiple monitoring wells on the same site using the same plugging methodology.

Alert! Your well may be eligible to participate in the Aquifer Mapping Program (AMP)-NM Bureau of Geology geoinfo.nmt.edu/resources/water/ cgmn/ if within an area of interest and meets the minimum construction requirements, such as there is still water in your well, and the well construction reflected in a well record and log is not compromised, contact AMP at 575-835-5038 or -6951, or by email nmbg-waterlevels@nmt.edu, prior to completing this prior form. Showing proof to the OSE that your well was accepted in this program, may delay the plugging of your well until a later date.

I. FILING FEE: There is no filing fee for this form.

Check here if proposing one plan for multiple monitoring wells on the same site and attaching WD-08m

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: N/A; NASA well 200-SG-2 (POD)

Mailing	address:	P.O. Box 20	County: Dona Ar		Dona Ana
City: Las Cruces		State:	State: NM Zip code		
Phone nu	umber: <u>(57</u>	5) 524-5024	E-mail:	timothy.j.davis@nasa.g	jov

#### III. WELL DRILLER INFORMATION:

II. GENERAL / WELL OWNERSHIP:

Well Driller contracted to provide plugging services:	Not contracted yet		
New Mexico Well Driller License No.: NA		Expiration Date: NA	

**IV. WELL INFORMATION:** Check here if this plan describes method for plugging multiple monitoring wells on the same site and attach supplemental form WD-08m and skip to #2 in this section.

Note: A copy of the existing Well Record for the well(s) to be plugged should be attached to this plan.

1)	GPS Well Location:	Latitude:	32	deg,	30	min,	54.641	sec	
		Longitude:	-106	deg,	36		10.262	_sec,	NAD 83

Reason(s) for plugging well(s):

NMED directed NASA to P&A the well.

- 3) Was well used for any type of monitoring program? Yes If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.
- 4) Does the well tap brackish, saline, or otherwise poor quality water? Yes If yes, provide additional detail, including analytical results and/or laboratory report(s): Refer to 200-SG-2 analytical data (Enclosure 9)
- 5) Static water level: 84 feet below land surface / feet above land surface (circle one)
- 6) Depth of the well: <u>100.3</u> feet

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7)	Inside diameter of innermost casing:	2	inches.
11	Inside diameter of innermost casing,		11101100.

Casing material: Schedule 40 PVC	5- 60	202	
The well was constructed with:	S Citte	2 MAY	
an open-hole production interval, state the open interval:	<u>ř</u> ří	N	1)
a well screen or perforated pipe, state the screened interval(s): 85-100 ft	atter S	CI	1 2 3 2 2 2 4 2 2 2 4 2 2 2 4 2 2 2 4 2 2 4 2 2 4 2 4
		And a second	171
What annular interval surrounding the artesian casing of this well is cement-grouted? <u>NA</u>		Ģ	1
Was the well built with surface casing? No If yes, is the annulus surrounding the s	Sin and the surface car	رت sing gro	uted or
otherwise sealed? NA If yes, please describe:			

12) Has all pumping equipment and associated piping been removed from the well? <u>res</u> If not, describe remaining equipment and intentions to remove prior to plugging in Section VII of this form.

#### V. DESCRIPTION OF PLANNED WELL PLUGGING:

If plugging method differs between multiple wells on same site, a separate form must be completed for each method.

Note: If this plan proposes to plug an artesian well in a way other than with cement grout, placed bottom to top with a tremie pipe, a detailed diagram of the well showing proposed final plugged configuration shall be attached, as well as any additional technical information, such as geophysical logs, that are necessary to adequately describe the proposal. Attach a copy of any signed OSE variance to this plugging plan.

Also, if this planned plugging plan requires a variance to 19.27.4 NMAC, attach a detailed variance request signed by the applicant.

1) Describe the method by which cement grout shall be placed in the well, or describe requested plugging methodology

proposed for the well:

The well casing will be cemented from bottom up using tremie pipe, including all screened intervals and blank casing.

2) Will well head be cut-off below land surface after plugging? Yes, 6 inches below ground surface

#### VI. PLUGGING AND SEALING MATERIALS:

Note: The plugging of a well that taps poor quality water may require the use of a specialty cement or specialty sealant. Attach a copy of the batch mix recipe from the cement company and/or product description for specialty cement mixes or any sealant that deviates from the list of OSE approved sealants.

- 1) For plugging intervals that employ cement grout, complete and attach Table A.
- 2) For plugging intervals that will employ approved non-cement based sealant(s), complete and attach Table B.
- 3) Theoretical volume of grout required to plug the well to land surface: 16.37 gallons (2.19 cubic ft)
- 4) Type of Cement proposed: Portland Type II neat cement with 5% bentonite by weight
- 5) Proposed cement grout mix: <u>8.5</u> gallons of water per 94 pound sack of Portland cement.
- 6) Will the grout be: \_\_\_\_\_batch-mixed and delivered to the site

X mixed on site

Grout additives requested,	and percent by	w dry weight relative to cement:
Utout auditives requested,	and percent by	y usy weight relative to cement

5% by weight Bentonite powder (~4.7 lbs/94 lb bag of Portland Type II cement)

8) Additional notes and calculations:

7)

The mix of neat cement and 5% bentonite will require 8.5 gallons of water per 94 lb bag of cement; 5.2 gallons per 94 lb bag of cement and 0.7 gallons per percent of bentonite.

#### VII. ADDITIONAL INFORMATION: List additional information below, or on separate sheet(s):

Well 200-SG-2 well was sampled using a Bennett pump and Teflon bailer. Following installation, it was determined that the monitoring zone had been installed above the contaminant plume. The well has no value as a groundwater monitoring well. Well 200-SG-2 was last sampled in 2014.

VIII. SIGNATURE:	<b>60</b> m 33	
		Just 1
	2022 LAS	

I, Amanda Skarsgard for: Timothy J. Davis

\_\_, say that I have carefully read the foregoing Well Plugging Plan of Operations and any attachments, which are a part hereof; that I am familiar with the rules and regulations of the State Engineer pertaining to the plugging of wells and will comply with them, and that each and all of the statements in the Well Plugging Plan of Operations and attachments are true to the best of my knowledge and belief.

	AMANDA SKARSGARD Digitally signed by AMANDA SKARSGARD Date: 2022.05.24 10:34:50 -06'00'	05/24/2022
	Signature of Applicant	Date
IX. ACTION OF THE STATE ENGIN	EER:	
This Well Plugging Plan of Operations is:		
Approved subject to the Not approved for the rea	attached conditions. sons provided on the attached letter.	
Witness my hand and official seal	this 10th day of June	, 2022



Page 3 of 5

# TABLE A - For plugging intervals that employ cement grout. Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow	
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.	
Top of proposed interval of grout placement (ft bgl)			Ground Surface	
Bottom of proposed interval of grout placement (ft bgl)			100.3 ft	
Theoretical volume of grout required per interval (gallons)			16.37 gallons	
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			8.5 gailons of water per 94 lb bag of Portland Type II cement with 5% bentonite powder.	
Mixed on-site or batch- mixed and delivered?			On Site	
Grout additive 1 requested			Powdered bentonite	
Additive 1 percent by dry weight relative to cement			5% 2 MAY 2	
Grout additive 2 requested			NA NEW GENERAL	
Additive 2 percent by dry weight relative to cement			NA	

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# TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 - most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of sealant placement (ft bgl)			NA
Bottom of proposed sealant of grout placement (ft bgl)			NA
Theoretical volume of sealant required per interval (gallons)			NA
Proposed abandonment sealant (manufacturer and trade name)			NA



#### Attachment Conditions of Approval

#### Well Plugging Plan of Operations Well Number LRG-18417 POD1

#### File No.: LRG-18417

- 1) Well LRG-18417 POD1 shall be plugged using the methods and materials identified in the State Engineer approved Well Plugging Plan of Operations filed on May 25, 2022.
- 2) In addition, well LRG-18417 POD1 shall be plugged completely using the following method per <u>Rules and Regulations Governing Well Driller Licensing</u>, <u>Construction</u>, <u>Repair and Plugging of Wells</u>; Subsection C of 19.27.4.30 NMAC:

All pumping appurtenances shall be removed from the well prior to plugging. To plug a well, the entire well shall be filled from the bottom upwards to ground surface using a tremie pipe. The bottom of the tremie shall remain submerged in the sealant throughout the entire sealing process; other placement methods may be acceptable and approved by the State Engineer

The well shall be plugged with an Office of the State Engineer approved sealant for use in the plugging of non-artesian wells.

The well driller shall cut the casing off at least four (4) feet below ground surface and fill the open hole with at least two (2) vertical feet of approved sealant.

Wells that do not encounter a water bearing stratum shall at a minimum be plugged by filling the well with drill cuttings or clean native fill to within 10 feet of land surface and by plugging the remaining 10 feet of the well to ground surface with a plug of the office of the state engineer approved sealant.

The driller must fill or cover any open annulus with sealant. Once the sealant has cured, the well driller or well owner may cover the seal with soil.

A plugging report for said well shall be filed with the Office of the State Engineer in the District IV office in Las Cruces within thirty (30) days of completion of the plugging.

- 2) A licensed well driller shall keep a record of the plugging work as it progresses and file a complete Plugging Record (Office of the State Engineer Form No.: WR-20) with the State Engineer no later than thirty (30) days after completion of plugging.
- 3) New Mexico Office of the State Engineer (NMOSE) witnessing of the plugging will not be required unless artesian conditions are encountered but shall be facilitated if a NMOSE observer is onsite. NMOSE witnessing may be requested during normal

1

Well: LRG-18417 POD1 Plugging Plan of Operations

work hours by calling the District IV NMOSE office at 575-524-6161 at least 48 hours in advance. NMOSE inspection will occur dependent of personnel availability.

4) Should another regulatory agency sharing jurisdiction of the project authorize or by regulation require more stringent requirements than stated herein, the more stringent procedure shall be followed. This in part includes provisions regarding preauthorization to proceed, type of methods and materials used, inspection, or prohibition of free discharge of any fluid or other material to or from the well that is related to the plugging process.

Date: 6/10/2022

Cheryl S. Thacker Water Resources Manager WRAP District IV

### Appendix B New Mexico Office of the State Engineer Well Plugging Records



# PLUGGING RECORD



NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

#### I. GENERAL / WELL OWNERSHIP:

State En	ngineer Well Number: 200-5G-2 Pobl	
Well ow	VINET: NASA JOUNSON SPACE CENTER WHITE SANDS FACKITYPhone No.: (575	)-524-5024
Mailing	address: <u>P.D. BOX ZO</u>	
City: _	LAS CRUCES State: NM	Zip code: 88004
II. WEI	LL PLUGGING INFORMATION:	
1)	Name of well drilling company that plugged well: YELLOW JACKET DEILING SET	nces, LLC
2)	New Mexico Well Driller License No.: WD-1458 Expiratio	n Date: 10/31/24
3)	Well plugging activities were supervised by the following well driller(s)/rig supervisor(s):	
4)	Date well plugging began: Date well plugging concluded:	/30/2023
5)	GPS Well Location:Latitude: $32$ deg, $30$ min, $54.644$ subscript stateLongitude: $-106$ deg, $36$ min, $10.262$ subscript state	ec ec, WGS 84
6)	Depth of well confirmed at initiation of plugging as: ft below ground level (bgl) by the following manner: <b>TREME PIPE</b>	),
7)	Static water level measured at initiation of plugging:ft bgl	
8)	Date well plugging plan of operations was approved by the State Engineer: <u>5-25-22</u>	
9)	Were all plugging activities consistent with an approved plugging plan? <u>YES</u> I differences between the approved plugging plan and the well as it was plugged (attach additional structure).	f not, please describe ional pages as needed):

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.



#### For each interval plugged, describe within the following columns:

I, <u>nevere</u>, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

AC. 2 0

1/31/

Signature of Well Driller

Date

Version: September 8, 2009 Page 2 of 2



# PLUGGING RECORD



NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

<u>I.</u> G	ENERAL / WELL OWNERSHIP:
State	Engineer Well Number: 200-SG-3 Pobl
Well	OWNER: NASA JOHNSON SPACE CENTER WHITE SANDS FACKITYPhone No.: (575)-524-5024
Maili	ng address: P.D. BOX 20
City:	LAS CRUCES State: NM Zip code: 88004
<u>II.</u> W	ELL PLUGGING INFORMATION
1)	Name of well drilling company that plugged well: YELLOW JACKET DEILING STRUCTS
2)	New Mexico Well Driller License No.: WD-1458 Expiration Date: 10/21/21/
3)	Well plugging activities were supervised by the following well driller(s)/rig supervisor(s):
4)	Date well plugging began: 1/30/23 Date well plugging concluded: 1/30/23
5)	GPS Well Location:Latitude: $32$ Longitude:deg, $31$ min, $0.37$ min,sec $9.312$ GPS Well Location:Longitude: $-106$ deg,deg, $36$ min, $9.312$ sec,WGS 84
6)	Depth of well confirmed at initiation of plugging as: ft below ground level (bgl), by the following manner: <b>TREMIE PIPE</b>
7)	Static water level measured at initiation of plugging: 163 ft bgl
8)	Date well plugging plan of operations was approved by the State Engineer: 5-25-22
9)	Were all plugging activities consistent with an approved plugging plan? <u>Yes</u> If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.



### For each interval plugged, describe within the following columns:

I, <u>provident</u>, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

C 1-c

Signature of Well Driller

Date

Version: September 8, 2009 Page 2 of 2

### Appendix C Updated Well Completion Diagrams



#### MULTI-PORT SOIL VAPOR MONITORING WELL

Well ID: 200-SG-2		Site ID: NASA-N	NSTF, D	oña Ana County	ι, NM		
Township and Range: SE 1/4, NW 1/4, NE 1/4, S	Dates of Drilling: 6/14 - 6/25/14						
Site Coordinates (NAD 83) (ft): N 551323.717	Dates Well Installed: 1	1/19 -11/24	/97				
Elevation (Brass Cap): 4807.5 ft amsl		Dates Well Developed:	3/23 - 8/29	9/00			
Elevation (Top of Casing): 4810.9 ft amsl	Field Representative(s)	Field Representative(s): Mary Canavan, Pam Egan, Geoff Giles, Molly Russell					
Drilling Contractor: Layne Christensen Environmental Services		Total Depth Well Casin	Total Depth Well Casing (bgs): 100.3 ft				
Driller: Martin Quiñones		Type of Casing: Scheo	dule 40 PVC	Casing			
Drilling Method: Dual Wall Percussion Air Rota	iry	Diameter Well Casing:	Nominal	2-in.			
Total Depth of Borehole (bgs): 245 ft		Soil Vapor Port (ft bgs):	30, 60, an	d 84 ft			
Borehole Diameter: 7-in. to 245 ft		Groundwater Screened	Zone (ft bg	s): 85 - 100 ft			
Depth to Bedrock (bgs): 90 ft (Limestone)		Comments: Soil Gas	port at 84 f	t was lost; (submer	ged 11/24/97)		
Depth to Groundwater: 83 ft ; (5/24/00)		*Reconfigured 1/20/2	023 Grou	ndwater portion plu	Inded		
Total Depth Surface Casing (bgs): N/A		Reconfigured 1/20/2	.025, 0100		uggeu		
Diameter and Type Surface Casing: N/A							
Completion Casing	Mat	erials Explanation:	/////	Neat			
Nominal 2-in.	Water Level	1		Cement	10/20 Cand		
Schedule 40 PVC Casing		3/8-in. Steel Guide Wire			Bontonito Mix		
- Well Screen	1/4" Stainless Steel Tubing	1	ビンビン	Bentonite			
Nominal 2-in		Ā	ó. ó.	Chip Seal 🔔	40/00 5**		
PVC Screen with 0 020" Slots		Cable Weight		•	12/20 Filter		
	Soil Vapor Port			Slouah	Pack Sand		
2-in. Schedule 40 PVC End Cap			• • •				
Elevation (ft amsl)		Borehole/Well Description		Annular Mate	rials Description		
/ Depth (it bgs)		All depths listed are bgs			listed are bys		
1000 - 10 100 - 10 100 - 20 100	Multiport Soil ( Well complete cap, 4' x 4' cor surface	Gas/Groundwater Well Stick-Up = 3.41 f d with 6" x 5' steel well protector with loc acrete well pad, and barrier posts above Gas Sampling Port = 30 ft	ft ground	Top of Bentonite ( Top of Slough = 5 Top of Bentonite ( Top of Slough = 1 Top of 10/20 Sand Mix (1:1 Ratio by w Top of 10/20 Sand Top of 10/20 Sand Mix = 37 ft	Chips = 0 ft ft Chips = 9 ft 1 ft d-Bentonite Powder weight) = 21 ft d = 28 ft d-Bentonite Powder		
	Depth of Soil C	Gas Sampling Port = 60 ft		Top of 10/20 Sand Top of 10/20 Sand Mix = 61 ft	d = 58 ft d-Bentonite Powder		

Well ID: 200-SG-2



Well ID: 200-SG-2					Site ID: NASA-	WSTF, Do	oña Ana C	ounty, NM	
Township and Range: SE 1/4, NW 1/4, NE 1/4, Sec 2, T21S, R3E			Dates of Drilling: 6/14 - 6/25/14						
Site Coordinates (NAD 83) (ft): N 551323.717 / E 1531650.439			Dates Well Installed: 11/19 -11/24/97						
Elevation (Brass Cap): 480	7.5 ft amsl				Dates Well Developed	3/23 - 8/29	/00		
Elevation (Top of Casing): 4	810.9 ft amsl				Field Representative(s	): Mary Car	avan, Pam Eg	gan, Geoff Gi	les, Molly Russell
Drilling Contractor: Layne (	Christensen Environ	mental Se	ervices		Total Depth Well Casir	ng (bgs): <b>10</b>	0.3 ft		
Driller: Martin Quiñones					Type of Casing: Sche	dule 40 PVC	Casing		
Drilling Method: Dual Wall F	Percussion Air Rotar	У			Diameter Well Casing:	Nominal 2	2-in.		
Total Depth of Borehole (bg	s): 245 ft				Soil Vapor Port (ft bgs)	: 30, 60, an	d 84 ft		
Depth to Bedrock (bgs): 90	ft (Limestone)				Groundwater Screened	Zone (ft bg	s): 8 <b>5 - 100 f</b>	t	
Depth to Groundwater: 83 f	t : (5/24/00)				Comments: Soll Gas	port at 84 r	t was lost; (si	ubmerged 11/	24/97)
Total Depth Surface Casing	(bgs): N/A				*Reconfigured 1/20/2	2023, Grou	ndwater port	ion plugged	
Diameter and Type Surface	Casing: N/A								
			Material	s Expla	anation:				
Completion Casing							Neat		
Nominal 2-in.		Water Le	evel		3/8-in. Steel Guide Wire		Cement	• •	10/20 Sand
Schedule 40 PVC Casi	ng						Dantanita		Bentonite Mix
Well Screen		1/4" Stain	less Steel Tubing	-		X0X0	Chin Sool		
Nominal 2-in.					Cable Weight		Chip Sear		12/20 Filter
PVC Screen with 0.020	" Slots	Soil Vap	or Port	Ų	easis reight		<u>.</u>	••	Pack Sand
2-in. Schedule 40 PVC	End Cap 🖳 🖳					00.	Slough		
Elevation (ft amsl)			Bore	hole/W	ell Description		Annula	r Materials De	escription
/ Depth (ft bgs)			All	depths	listed are bgs		All	depths listed a	are bgs
4730 - 105 4770 - 105 4700 - 115 4690 - 125 4680 - 130			Water Level = 83 ft Depth of Soil Gas S and not usable). Top of Nominal 2" ft Bottom of Nominal 100 ft Nominal 2" Schedu	: (Meas Samplii Schedu 2'' Sch ile 40 F	sured 5/24/00) ng Port = 84 ft (Port is subm ule 40 PVC 0.010"-Slot Scre nedule 40 PVC 0.010"-Slot S PVC Casing TD = 100.3 ft	erged en = 85 creen =	Top of 10/2 gas port and ft Fractured L	0 Sand (to co d groundwate	over lower soil er screen) = 81 drock = 90 ft
÷ 135									



Well ID: 200-SG-2	Site ID: NASA-WSTF, Doña Ana County, NM
Township and Range: SE 1/4, NW 1/4, NE 1/4, Sec 2, T21S, R3E Site Coordinates (NAD 83) (ft): N 551323.717 / E 1531650.439 Elevation (Brass Cap): 4807.5 ft amsl Elevation (Top of Casing): 4810.9 ft amsl Drilling Contractor: Layne Christensen Environmental Services Driller: Martin Quiñones Drilling Method: Dual Wall Percussion Air Rotary Total Depth of Borehole (bgs): 245 ft Borehole Diameter: 7-in. to 245 ft Depth to Bedrock (bgs): 90 ft (Limestone) Depth to Groundwater: 83 ft ; (5/24/00) Total Depth Surface Casing (bgs): N/A Diameter and Type Surface Casing: N/A	Dates of Drilling: 6/14 - 6/25/14 Dates Well Installed: 11/19 -11/24/97 Dates Well Developed: 3/23 - 8/29/00 Field Representative(s): Mary Canavan, Pam Egan, Geoff Giles, Molly Russ Total Depth Well Casing (bgs): 100.3 ft Type of Casing: Schedule 40 PVC Casing Diameter Well Casing: Nominal 2-in. Soil Vapor Port (ft bgs): 30, 60, and 84 ft Groundwater Screened Zone (ft bgs): 85 - 100 ft Comments: Soil Gas port at 84 ft was lost; (submerged 11/24/97) *Reconfigured 1/20/2023, Groundwater portion plugged
	riala Evaluation
Completion Casing       Water Level         Nominal 2-in.       Water Level         Schedule 40 PVC Casing       1/4" Stainless Steel Tubing         Well Screen       1/4" Stainless Steel Tubing         Nominal 2-in.       PVC Screen with 0.020" Slots         2-in. Schedule 40 PVC End Cap       Soil Vapor Port	3/8-in. Steel Guide Wire       Neat Cement       10/20 Sand Bentonite Mix         Cable Weight       Image: Cable Weight       12/20 Filter Pack Sand
Elevation (ft amsl) / Depth (ft bgs)	Annular Materials Description       All depths listed are bgs
$ \begin{array}{c} 4670 \\ 4670 \\ 4660 \\ 4$	



Well ID: 200-SG-2	Site ID: NASA-	WSTF, Do	oña Ana Co	ounty, NM		
Township and Range: SE 1/4, NW 1/4, NE 1/4, S Site Coordinates (NAD 83) (ft): N 551323.717 / Elevation (Brass Cap): 4807.5 ft amsl Elevation (Top of Casing): 4810.9 ft amsl Drilling Contractor: Layne Christensen Environ Driller: Martin Quiñones Drilling Method: Dual Wall Percussion Air Rotar Total Depth of Borehole (bgs): 245 ft Borehole Diameter: 7-in. to 245 ft Depth to Bedrock (bgs): 90 ft (Limestone) Depth to Groundwater: 83 ft ; (5/24/00) Total Depth Surface Casing (bgs): N/A Diameter and Type Surface Casing: N/A	ec 2, T21S, R3E E 1531650.439 mental Services Y	Dates of Drilling: 6/14 Dates Well Installed: Dates Well Developed Field Representative(s Total Depth Well Casin Type of Casing: Sche Diameter Well Casing: Soil Vapor Port (ft bgs) Groundwater Screened Comments: Soil Gas *Reconfigured 1/20/2	- 6/25/14 11/19 -11/24/ : 3/23 - 8/29 ): Mary Can ng (bgs): 100 dule 40 PVC : Nominal 2 : 30, 60, and d Zone (ft bgs : port at 84 ff 2023, Grour	97 /00 avan, Pam Eg 0.3 ft Casing !-in. d 84 ft d 84 ft t was lost; (su ndwater porti	an, Geoff Gild bmerged 11/2 on plugged	es, Molly Russell 24/97)
	Materialo	s Explanation:				
Completion Casing Nominal 2-in.	Water Level	3/8-in. Steel Guide Wire		Neat Cement Bentonite		10/20 Sand Bentonite Mix
Well Screen Nominal 2-in. PVC Screen with 0.020" Slots 2-in. Schedule 40 PVC End Cap	Soil Vapor Port	Cable Weight		Chip Seal	•••	12/20 Filter Pack Sand
Elevation (ft amsl)	Bore	hole/Well Description		Annular	Materials De	scription
/ Depth (ft bgs)	All	depths listed are bgs		All c	lepths listed a	re bgs
1600       1       210         1590       215       1         1590       220       1         1225       1       1         1580       230       1         1235       1       1						
1570 - 240 - 245 - 245				Borehole To	tal Depth = 2	45 ft



vveil ID. 200-SG-3		Site ID: NASA-WSTF	, Dona Ana County, NM			
I ownship and Range: SE 1/4, NW 1/4, NE 1/4, S	Sec 2, T21S, R3E	Dates of Drilling: 11/25 - 12/3/97 Dates Well Installed: 12/1 -12/3/97				
Site Coordinates (NAD 83) (ft): N 551908.428 /	E 1531/41.25					
Elevation (Top of Casing): 4861.1 ft amsi		Eigld Depresentative(a):	0/20/00			
Drilling Contractor: Launa Christenson Environ	montal Services	Total Dopth Mall Cosing (here)	• 170.2 ft			
Driller: Martin Quiñones		Type of Cosing: Schodule 40				
Drilling Method: Dual Wall Percussion Air Rota	<b>v</b>	Diameter Well Cosing Mami	nal 2-in			
Total Depth of Borehole (bgs): 250 ft	,	Soil Vapor Port (ff bas): 30 6	0 90 120 and 154 ft			
Borehole Diameter: 7-in. to 250 ft		Groundwater Screened Zone (	ft bas): 155-170 ft			
Depth to Bedrock (bgs): 80 ft (Limestone)		Comments:				
Depth to Groundwater: 164 ft (5/24/00)		*Reconfigured 1/20/2023	roundwater portion plugged			
Total Depth Surface Casing (bgs): N/A		10001111garea 11202020, a	roundwater perion plagged			
Diameter and Type Surface Casing: N/A						
Completion Coping	Material	s Explanation:				
Nominal 2-in	Water Level		Neat			
Schedule 40 PVC Casing	**a(6) L6*61	3/8-in. Steel Guide Wire	Cement 10/20 Sand			
	1/4" Stoiplose Steel Tubles		Bentonite Mix			
Well Screen	1/4 Stainless Steel Tubing		Chip Seal			
BVC Sereen with 0.010" State		Cable Weight	• • 12/20 Filter			
2-in. Schedule 40 PVC End Cap	Soil Vapor Port		Slough			
Elevation (ft amsl)	Bore	ehole/Well Description	Annular Materials Description			
/ Depth (ft bgs)	All	depths listed are bgs	All depths listed are bgs			
350 + 10 + 10 + 10 + 10 + 10 + 10 + 10 +	Well completed wit cap, 4' x 4' concret surface Depth of Soil Gas	th 6" x 5' steel well protector with locking e well pad, and barrier posts above ground Sampling Port = 30 ft	Top of 10/20 Sand-Bentonite Powder Mix (1:1 Ratio by weight) = 18 ft Top of 10/20 Sand = 28 ft Top of 10/20 Sand-Bentonite Powder Mix = 33 ft			
45 310 45 310 45 300 45 45 45 45 45 45 45 45 45 45	Depth of Soil Gas	Sampling Port = 60 ft	Top of 10/20 Sand = 58 ft Top of 10/20 Sand-Bentonite Powder Mix = 63 ft			



Toxinship and Range: BE 14, NW 14, NE 14, Bet 2, T218, R3E         Sho Continues Q40 83 (i): N 951900428 (1 BIST41.25         Emendior (Tay of Casing: MASS ft and Diming Cathedric Layse Christmann Environmental Services Diming Cathedric Layse Christmann Cathedric Layse Christmann Environmental Services Diming Cathedric Layse Christmann Environmental Services Diming Cathedric Layse Christmann Environmental Services Diming Cathedric Layse Christmann Cathedric Layse C	Well ID: 200-SG-3		Site ID: NASA-WSTF.	Doña Ana County, NM
Materials Explanation:       Materials Explanation:       Neat       Occompletion Casing       Mail         Nominul 2-in:       Schedule 40 PVC Casing       Image: Materials Explanation:       Image: Materials Explan	VVEITID: 200-SG-3 Township and Range: SE 1/4, NW 1/4, NE 1/4, Set Site Coordinates (NAD 83) (ft): N 551908.428 / E Elevation (Brass Cap): 4861.1 ft amsl Elevation (Top of Casing): 4863.6 ft amsl Drilling Contractor: Layne Christensen Environm Driller: Martin Quiñones Drilling Method: Dual Wall Percussion Air Rotary Total Depth of Borehole (bgs): 250 ft Borehole Diameter: 7-in. to 250 ft Depth to Bedrock (bgs): 80 ft (Limestone) Depth to Groundwater: 164 ft (5/24/00) Total Depth Surface Casing (bgs): N/A Diameter and Type Surface Casing: N/A	2, T21S, R3E 1531741.25 ental Services	Site ID: NASA-WSTF, Dates of Drilling: 11/25 - 12/3/97 Dates Well Installed: 12/1 -12/3/ Dates Well Developed: 3/22 - 8/ Field Representative(s): Mary C Total Depth Well Casing (bgs): ' Type of Casing: Schedule 40 P' Diameter Well Casing: Nomina Soil Vapor Port (ft bgs): 30, 60, Groundwater Screened Zone (ft Comments: *Reconfigured 1/20/2023, Gro	Doña Ana County, NM 97 28/00 anavan, Geoff Giles, Molly Russell I70.3 ft /C Casing al 2-in. 90, 120, and 154 ft ogs): 155-170 ft pundwater portion plugged
advance to P P C screen       1/4" Stainless Steel Tubing       Bentonite Chip Seal       12/20 Filter         Poc Screen with 0.010" Stots       Soil Vapor Port       Soil Vapor Port       Stough         Elevation (fr amst)       / Depth (ft bgs)       Annular Materials Description       Annular Materials Description         4780       60       Fractured Limestone Bedrock = 80 ft       Top of 10/20 Sand = 88 ft         4780       65       Image: Steel Tubing       Depth of Soil Gas Sampling Port = 90 ft       Top of 10/20 Sand = 88 ft         4760       100       Image: Steel Tubing       Depth of Soil Gas Sampling Port = 120 ft       Top of 10/20 Sand = 115 ft         4760       110       Image: Steel Tubing       Depth of Soil Gas Sampling Port = 120 ft       Top of 10/20 Sand = 81 ft	Completion Casing Nominal 2-in.	Materials Expl	anation: 3/8-in. Steel Guide Wire	Neat Cement 10/20 Sand
Elevation (t ams) / Depth (t bgs)       Borehole/Well Description All depths listed are bgs       Annular Materials Description All depths listed are bgs         4790       70       75       76       75         4780       90       75       76       76         4780       90       75       76       76         4780       90       75       76       76         4700       90       76       76       76         4700       90       76       76       76         4700       100       76       76       76         4700       100       76       76       76         4700       100       76       76       76         4700       105       76       76       76         4700       110       76       76       76         4700       110       76       76       76         4700       1120       76       76       76         4740       120       76       76       76         4740       125       76       76       76         4740       125       76       76       76         4700       10	Well Screen 1 Nominal 2-in. PVC Screen with 0.010" Slots 2-in. Schedule 40 PVC End Cap	4" Stainless Steel Tubing oil Vapor Port	Cable Weight	Bentonite Mix Chip Seal Slough
4790       4790       4760       4760       4760       4760       Fractured Limestone Bedrock = 80 ft         4770       90       4760       4760       4760       4760       10/20 Sand = 88 ft         4770       100       100       100       100       100       100         4760       100       100       100       100       100       100         4760       110       100       100       100       100       100         4760       110       100       100       100       100       100         4760       110       100       100       100       100       100         4760       110       110       100       100       100       100         4760       110       110       100       110       100       110         4760       1120       110       110       110       110       110         4760       1120       110       110       110       110       110         120       110       110       110       110       110       110       110         120       1100       110       110       110       110	Elevation (ft amsl)	Borehole/A All depts	Nell Description	Annular Materials Description All depths listed are bgs
$\pm$ Mix = 124 ft	4790       70         75       80         4780       88         4770       99         995       0         4760       0         105       0         4750       0         110       0         4770       0         4760       0         1105       0         4770       0         1105       0         4740       120         125       0	Depth of Soil Gas Sampl	ing Port = 90 ft ing Port = 120 ft	Fractured Limestone Bedrock = 80 ft Top of 10/20 Sand = 88 ft Top of 10/20 Sand-Bentonite Powder Mix = 93 ft Top of 10/20 Sand = 115 ft Top of 10/20 Sand-Bentonite Powder Mix = 124 ft



Well ID: 200-SG-3		Site ID: NASA-WSTF, D	oña Ana County, NM			
Township and Range: SE 1/4, NW 1/4, NE 1/4, S	ec 2, T21S, R3E	Dates of Drilling: 11/25 - 12/3/97				
Site Coordinates (NAD 83) (ft): N 551908.428 /	E 1531741.25	Dates Well Installed: 12/3/07				
Elevation (Brass Cap): 4861.1 ft amsl		Dates Well Developed: 3/22 - 8/28/00				
Elevation (Top of Casing): 4863.6 ft amsl		Field Representative(s): Mary Canavan. Geoff Giles. Molly Russell				
Drilling Contractor: Layne Christensen Environ	mental Services	Total Depth Well Casing (bgs): 17	0.3 ft			
Driller: Martin Quiñones		Type of Casing: Schedule 40 PVG	C Casing			
Drilling Method: Dual Wall Percussion Air Rotar	у	Diameter Well Casing: Nominal	2-in.			
Total Depth of Borehole (bgs): 250 ft		Soil Vapor Port (ft bgs): 30, 60, 90	), 120, and 154 ft			
Borehole Diameter: 7-in. to 250 ft		Groundwater Screened Zone (ft bg	ıs): 155-170 ft			
Depth to Bedrock (bgs): 80 ft (Limestone)		Comments:				
Total Dopth Surface Casing (bgs): N(A		*Reconfigured 1/20/2023, Grou	ndwater portion plugged			
Diameter and Type Surface Casing: N/A						
Completion Casing	Materia	Is Explanation:	Next			
Nominal 2-in.	Water Level		Cement 10/20 Cand			
Schedule 40 PVC Casing		3/8-in. Steel Guide Wire	Bentonite Mix			
— Well Screen	1/4" Stainless Steel Tubing		Bentonite			
Nominal 2-in.	ů	10×01	Chip Seal			
PVC Screen with 0.010" Slots		Cable Weight	• • Pack Sand			
1 in Schodulo 40 DV/C End Con	Soil Vapor Port	₽ ₽	Slough			
		• • •				
Elevation (ft amsl)	Bor	ehole/Well Description	Annular Materials Description			
/ Depth (it bgs)						
4720 $145$ $4710$ $155$ $4700$ $165$ $4680$ $175$ $4680$ $185$ $4670$ $190$ $195$ $4660$ $200$	Depth of Soil Gas Top of Nominal 2" 155 ft Water Level = 164 Bottom of Nominal 170 ft Nominal 2" Schedu	Sampling Port = 154 ft Schedule 40 PVC 0.010"-Slot Screen = ft (5/24/00) 1 2" Schedule 40 PVC 0.010"-Slot Screen = ule 40 PVC Casing TD = 170.3 ft	Top of 10/20 Sand (to cover lower soil gas port and groundwater screen) = 152 ft			
<u></u> 205 <b>· · · · · · · · ·</b> · · · · · · · · · ·						



Transition of Range. SE 14, NW 14, NE 14, Sec 2, T215, R3E Sate Coordinates (RAD 83) (in: N651906.423 / E 1531741.25 Elevation (Rass. 268.5 ft ams] Dates of Drillie; 1125 - 122397 Dates Well Insalide: 121 - 122397 Dates Well Dates Well Dates (Dates Well Well Well Well Well Well Well We	Well ID: 200-SG-3		Site ID: NASA M	STE Doña A	na County, NM			
Lookaning and Kalige Security With (2004) 287 (F 1851741.25 Elevation (Try of Casing): 485 111 and Elevation (Casing Casing): 485 111 and Elevation (Casing Casing): 485 111 and Elevation (Casing): 487 (Enterstands): May Canavan, Ceoff Glies, Molly Russell Toillo Dgith Bercussion Air Rotary Table Barbanolo (Damater: T-An, 1250 f) Borthol Damater: T-An, 1250 f) Depth to Econoche Casing (Dig): 125-120 R Competion Casing Competion Casing (Dig): 125-120 R Competion Casing Competion Casing Well Science Casing (Dig): 155-170 R Competion Casing Competion Casing Well Science Casing (Dig): 155-170 R Competion Casing Competion Casing Well Science Casing (Dig): 155-170 R Competion Casing Well Science Casing (Dig): 155-170 R Comments: "Reconfigured 1/20/2023, Groundwater portion plugged Damater and Type Surface Casing (Dig): 155-170 R Competion Casing Well Science Casing (Dig): 155-170 R Competion Casing Well Science Casing (Dig): 155-170 R Competion Casing Well Science Casing (Dig): 155-170 R Comments: "Reconfigured 1/20/2023, Groundwater portion plugged Damater and Type Surface Casing (Dig): 122-20 Filter Well Science Type Surface Casing (Dig): 122-20 Filter Well Science Casing Well Science Sold Vapor Port Sold Vapor Mater Vapor And Applis, Intel Are by All depths Intel Are by All depths Intel Are by Borehole Vall Description All depths Intel Are by Borehole Total Depth = 250 ft Borehole Total Depth = 250 ft		00 2 T215 D25						
Date Understanding under Upp (1), if upp date Upp (1), if up	Site Coordinates (NAD 83) (#). N 551909 429 / 1	EU 2, 1213, ROE	Dates of Drilling: 11/25	- 12/3/97				
Lending Conductor, Layne Christensen Environmental Services Driller Mart Galandia, Gass R ansi Driller Mart Galandia, Gass R ansi Dameter and Type Surface Casing type: 1703 th Total Depth Total Casing type: 1703 th Total Depth Total Casing type: 1703 th Total Depth Total Casing type: 1704 Total Gass R defined 49 EVC Casing Wolf Science Normal 2:n. Science with 0.010° Stols Total Casing type: 1704 Total Science with 0.010° Stols Total Casing type: 1704 Total Casing Total Casing type: 1704 Total Casing	Elevation (Brass Can): 4861 1 ft amsl	L 1001/41.20	Dates Well Installed: 12	/1 -12/3/97 3/22 - 8/28/00				
Location ( <i>spin</i> ) <i>decange</i> , <i>inclusion</i> Diffing <i>Ordination</i> , <i>even inclusion</i> Diffing <i>Ordination</i> , <i>even inclusion</i> , <i>even</i> , <i>inclusion</i> , <i>even</i> ,	Elevation (Top of Casing): 4863 6 ft ame	Field Representative(c):	Mary Canavan	Geoff Giles Molly P	المععد			
During Journals California During Journals California Diffice Martin Quinches Diffice Martin Quinches Depth to Borchole Ubgs): 200 T Depth to Borchole Chains (Diffice Diffice Martin Quinches): 804 (Linestone) Depth to Borchole Chains (Diffice Depth to Borchole Chains (Diffice Depth to Borchole Chains (Diffice Compation Casing Neal Comments: Table Diffice Casing Neal Comments: Table Diffice Depth to Borchole Casing Neal Comments: Table Diffice Diffice Casing Diffice Diffice Casing Diffice Diffice Casing Diffice	Drilling Contractor: Lawne Christensen Environ	montal Sorvices	Field Representative(s): Mary Canavan, Geoff Giles, Molly Russell					
Dimension during Methods (2023) 250 ft Branche Zander (2014) of Bochole (2023) 250 ft Branche Zander (2014) of Bochole (2023) 250 ft Branche Zander (2014) of Bochole (2023) 250 ft Branche Zander (2014) 250 ft (2014) 250 ft Dimension (2014) 250 ft (2014) 250 ft Dimension (2014) 250 ft (2014) 250 ft Dimension (2014	Driller: Martin Quiñenen	mental Services	Turne of Cosing: School	(bys). 170.3 ft	~			
To Burgh of Bareholic (bg): 250 ft Boochole Diameter: 74. to 250 ft Depth to Bolicok (bg): 80 ft (Imestane) Depth to Bolicok (Imestane) Depth to Bolicok (Imestane) Depth to Bolicok (Imestane) Depth to Bolic	Drilling Method: Dual Wall Percussion Air Rotary	M	Dismotor Moll Cosing	Nominal 2 in	9			
Borehole Demoter: 74n. to 250 ft Depth to Bedrock (Ops): 801 (Unestone) Depth to Bed	Total Depth of Borehole (bgs): 250 ft	<u>}</u>	Sail Venes Part (# bre):	Nominal 2-III.	nd 151 ft			
Depth Dedrok (top): 80 ft (Linestone) Depth Poerturbate: 194 ft (Statusce Casing: NA Dameter and Type Surface Casing: NA Dameter and Type Surface Casing: NA Daminal 2-m. PVC Screen with 0.010° Stots 2 -th. Schedule 40 PVC Casing 2 -th. Schedule 4	Borehole Diameter: 7-in. to 250 ft		Soli Vapor Port (it bys). Groundwater Screened 2	20, 60, 90, 120, a	10 154 ft 5-170 ft			
Depth to Groundwater: 1911 (G/2020)       Materials Explanation:       Next         Orapletion Casing       Water Level       38-in. Steel Guide Wire       Next         Water Steel       Water Level       38-in. Steel Guide Wire       Dentonite         Well Screen       1/4" Stainless Steel Tubing       Cable Weight       Dentonite       12/20 Filter         PxC Screen with 0.01° Stots       0       Valor Port       Desthole/Vell Description       Annular Materials Description         All depths listed are bgs         500       400       425       400       600       All depths listed are bgs       All depths listed are bgs         600       400       425       600       600       600       All depths listed are bgs       All depths listed are bgs	Depth to Bedrock (bgs): 80 ft (Limestone)		Comments:					
Total Depth Surface Casing: WA Demeter and Type Surface Casing: WA Completion Casing Completion Casing Well Screen Well Screen Well Screen Well Screen Schedule 40 PVC End Cap 24:n. Schedule 40 PVC End Cap Soil Vapor Port Soil Vapor P	Depth to Groundwater: 164 ft (5/24/00)		*Beconfigured 1/20/20	22 Groundwate	r portion pluggod			
Diameter and Type Surface Casing: NA	Total Depth Surface Casing (bgs): N/A		Reconfigured 1/20/20	izo, Groundwale	a portion plugged			
Materials Explanation:       Neat       Neat       Completion Casing       Neat       Cement       Direction Casing       Nominal 2-in.       Direction Casing       Neat       Cement       Direction Casing       Direction Casing       Direction Casing       Nominal 2-in.       Direction Casing       Di	Diameter and Type Surface Casing: N/A							
Completion Casing Schedule 40 PVC Casing Nominal 2-in. Schedule 40 PVC Casing Well Screen Nominal 2-in. PVC Screen with 0.010° Slots 2 -in. Schedule 40 PVC End Cap       Value 1 Level 1/4" Stainless Steel Tubing Soil Vapor Port       3/8-in. Steel Guide Wire Cable Weight       Meat Cernent Completion Casing Neminal 2-in. Cable Weight       Image: Completion Casing Completion Casing Neminal 2-in. PVC Screen with 0.010° Slots 2 -in. Schedule 40 PVC End Cap       Image: Casing								
Wominal 24n. Schedule 40 PVC Casing       Vater Level       3/8-in. Steel Guide Wire       Neat Cement       10/20 Sand Bentonite         Well Screen Nominal 24n. PVC Screen with 0.010° Stots       Soil Vapor Port       Cable Weight       Image: Cable Weight       Image: Cable Weight         2 -in. Schedule 40 PVC End Cap       Soil Vapor Port       Cable Weight       Image: Cable Weight <td>Completion Casing</td> <td>Materials</td> <td>Explanation:</td> <td></td> <td></td> <td></td>	Completion Casing	Materials	Explanation:					
Writer Level       Value Level       38-in. Steel Guide Wire       Cement       10/20 Sand         Well Screen       1/4" Stainless Steel Tubing       Cable Weight       Entionite Mix         PVC Screen with 0.010" Stots       Soil Vapor Port       Cable Weight       12/20 Filter         Pack Sand       Soil Vapor Port       Slough       12/20 Filter         Pack Sand       Soil Vapor Port       Slough       Annular Materials Description         All depths listed are bgs       All depths listed are bgs       All depths listed are bgs         650       220       All depths listed are bgs       All depths listed are bgs         650       220       Stain Schele Tubing       All depths listed are bgs         650       220       Stain Schele Tubing       All depths listed are bgs         650       220       Stain Schele Tubing       All depths listed are bgs         650       220       Stain Schele Tubing       All depths listed are bgs         650       220       Stain Schele Tubing       Stain Schele Tubing	Nominal 2 in	Water Level		Neat				
Well Stren       1/4" Stainless Steel Tubing       Cable Weight       Entionite       Image: Cable Weight         Well Stren       Soil Vapor Port       Cable Weight       Image: Cable Weight       Image: Cable Weight         Elevation (ft amsi)       Soil Vapor Port       Soil Vapor Port       Soil Vapor Port         Elevation (ft amsi)       Annuter Materials Description       Annuter Materials Description         All depths listed are bgs       All depths listed are bgs       All depths listed are bgs         640       220       Image: Cable Weight       All depths listed are bgs         640       220       Image: Cable Weight       Annuter Materials Description         640       220       Image: Cable Weight       All depths listed are bgs         640       220       Image: Cable Weight       Annuter Materials Description         640       220       Image: Cable Weight       Image: Cable Weight         640       220       Image: Cable Weight       Image: Cable Weight         640       220       Image: Cable Weight       Image: Cable Weight         640       225       Image: Cable Weight       Image: Cable Weight         640       250       Image: Cable Weight       Image: Cable Weight         640       250       Image: Cable Weight	Sobodulo 40 BVC Casing		3/8-in. Steel Guide Wire	Ceme	ent · · ·	10/20 Sand		
Well Streen Nominal 21:n. PVC Screen with 0.010° Slots       14° Stainless Steel Tubing       Cable Weight       12/20 Filter Pack Sand         2 :n. Schedule 40 PVC End Cap       Soil Vapor Port       Slough       Slough         Elevation (ft amst) / Depth (ft bgs)       Annular Materials Description All depths listed are bgs       Annular Materials Description All depths listed are bgs       Annular Materials Description All depths listed are bgs         650       220       30       30       230       30       40         230       230       30       230       30       Borehole Total Depth = 250 ft         310       250       250       30       Borehole Total Depth = 250 ft	Schedule 40 PVC Casing			Bonto	,	Bentonite Mix		
Norminal 2-in.       PVC Screen with 0.010° Slots       Soil Vapor Port       Cable Weight       Image: Cable Weight	Well Screen	1/4" Stainless Steel Tubing	x	Chin S	Seal			
Pucc Screen with 0.010*Slots     Soil Vapor Port     Pack Sand       Slough     Slough     Slough	Nominal 2-in.		Cable Weight		•••	12/20 Filter		
Stolught     Stolught       Elevation (ft amsi)     Borehole/Well Description     Annular Materials Description       All depths listed are bgs     All depths listed are bgs     All depths listed are bgs	PVC Screen with 0.010" Slots	Soil Vapor Port	· · · · · · · · · · · · · · · · · · ·			Pack Sand		
Borehole/Well Description     Annular Materials Description       All depths listed are bgs     All depths listed are bgs	📓 2-in. Schedule 40 PVC End Cap 🗒			• o	IN			
All depths listed are bgs     All depths listed are bgs       650     210       210     215       640     225       630     235       630     235       620     245       620     245       620     245       620     255       620     80rehole Total Depth = 250 ft	Elevation (ft amsl)	Boreh	nole/Well Description	4	Annular Materials De	escription		
650 640 215 640 225 330 235 620 240 310 255 Borehole Total Depth = 250 ft	/ Depth (ft bgs)	All c	lepths listed are bgs		All depths listed a	re bgs		
610 = 250 Borehole Total Depth = 250 ft	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$							
				Boreh	ole Total Depth = 2	250 ft		