

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 Multipoint 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

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AMANDA SKARSGARD
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RE-23-051

2

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**

For: Timothy J. Davis
Chief, NASA Environmental Office

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Date: 2023.03.21 08:49:35 -06'00'

See Electronic Signature
Date

National Aeronautics and Space Administration

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List of Acronyms

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 ([Figure 2.1](#)). 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; [Appendix A](#)).

NASA and the subcontract drilling company completed reconfiguration activities in accordance with the NMOSE-approved Well Plugging Plans for each well ([Appendix A](#)). Wells 200-SG-2 and 200-SG-3 are located in the 200 Area ([Figure 3.1](#)) 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)¹ 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.

¹ 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^{®2}, Portland Type II, mixed with 5% by weight Halliburton^{®3} 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 ([Appendix B](#)). An updated well completion diagram is included in [Appendix C](#).

² Phoenix Cement is a registered trademark of Salt River Pima-Maricopa Indian Community.

³ Halliburton is a registered trademark of Halliburton Energy Services, Inc.

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 ([Appendix B](#)). An updated well completion diagram is included in [Appendix C](#).

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

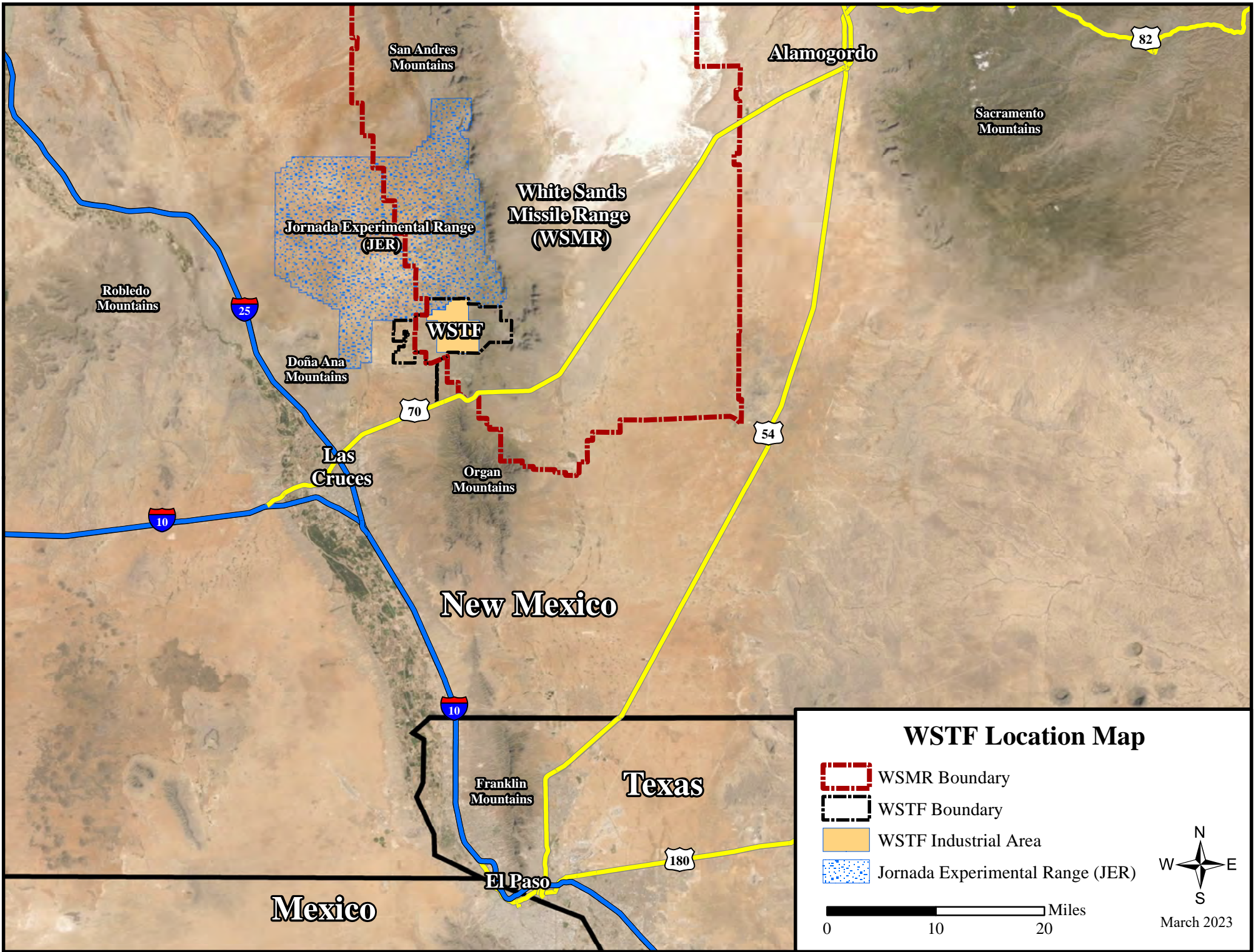
- Adoption of 40 CFR Part 261, Environmental Improvement Board, 20.4.1.200 NMAC (12-1-18).
- Adoption of 40 CFR Part 262, Environmental Improvement Board, 20.4.1.300 NMAC (12-01-18).
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- NM Office of the State Engineer. (2022, June 10). *Plugging Plan 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

WSTF Location Map


(SEE NEXT PAGE)



WSTF Location Map

-  WSMR Boundary
-  WSTF Boundary
-  WSTF Industrial Area
-  Jornada Experimental Range (JER)

0 10 20 Miles

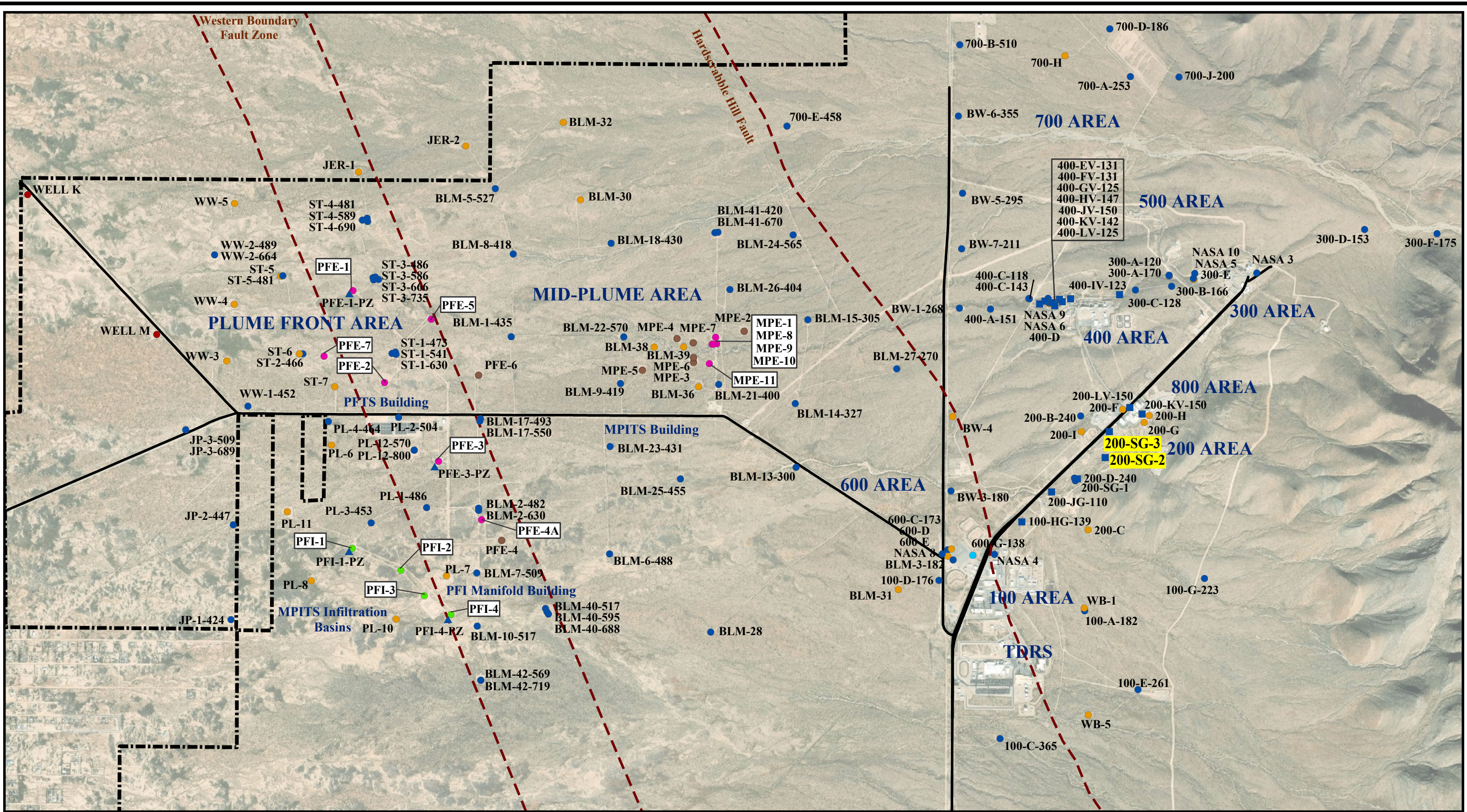
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Figure 3.1

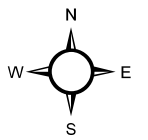
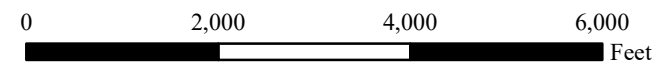
200-SG-2 and 200-SG-3 Well Location Map

(SEE NEXT PAGE)



200-SG-2 and 200-SG-3 Monitoring Well Locations

- | | | | | |
|---|--|---|---|---|
| ● Multiport | ■ MSVGM Well | ▲ Piezometer | Main Road | WSTF Boundary |
| ● Conventional Well | ● Extraction Well | ● Exploration Well | Faults | |
| ● Perched Well | ● Injection Well | ● Production Well | | |



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Figure 3.2 Monitoring Well 200-SG-2 Construction Diagram

(SEE NEXT PAGE)

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, Sec 2, T21S, R3E**
 Site Coordinates (NAD 83 in meters): **168043.75 N / 466847.81 E**
 Elevation (Brass Cap): **1465.31 m (4807.5')**
 Elevation (Top of Casing): **1466.35 m (4810.9')**
 Drilling Contractor: **Layne Christensen Environmental Services**
 Driller: **Martin Quiñones**
 Total Depth of Borehole (bgs): **74.7 m (245')**
 Borehole Diameter: **7" Dual Wall Percussion Air Rotary**
 Depth to Bedrock (bgs): **27.4 m (90') (Limestone)**
 Depth to Groundwater: **25.3 m (83'; taken 5/24/00 bgs)**
 Total Depth Surface Casing (bgs): **N/A**
 Diameter and Type Surface Casing: **N/A**
 Date(s) Well Installed: **11/19/97-11/24/97**

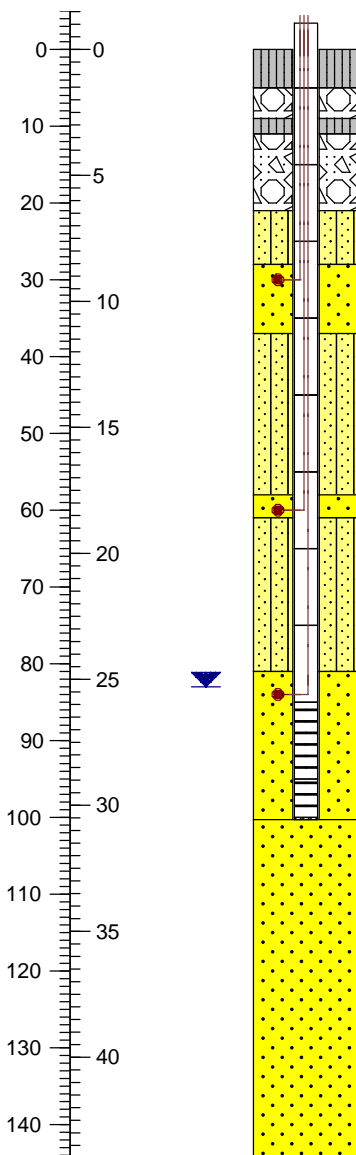
Date(s) Well Developed: **3/23/00 - 8/29/00**
 Field Representative(s): **Mary Canavan, Pam Egan, Geoff Giles, and Molly Russell**
 Total Depth Well Casing (bgs): **30.6 m (100.3')**
 Type of Casing: **Schedule 40 PVC**
 Diameter Well Casing: **Nominal 2"**
 Soil Gas Port(s)(bgs): **9.1 m (30'); 18.3 m (60'); 25.6 m (84')**
 Soil Gas Sampling Zone(s)(bgs): **Sand Pack: 8.5-11.3 m (28'-37'); 17.7-18.6 m**
 Soil Gas Sampling Zone(s)(bgs): **(58'-61'); and 26.8--23.8 m (81'-SWL);**
 Water Sampling Zone(s)(bgs): **25.9-30.5 m (85'-100')**
 Comments: **Supervised by Jeff Forbes (Daniel B. Stephens & Associates)**
Soil Gas Ports and 1/4" stainless steel tubing (to surface) installed outside PVC and secured to casing with plastic straps.
Soil Gas port at 25.6 m (84') was lost; (submerged 11/24/97)

Casing Explanation:			
 Surface Casing	 Soil Port	 Cement	 Bentonite Seal
N/A	 1/4" Stainless Steel Tubing	 Alluvium	 10/20 Sand
 Nominal 2" PVC	 Static Water Level (SWL)	 Slough	 10/20 Sand Bentonite Mix
 Nominal 2" PVC End Cap			

Feet/Meters

Well Descriptions
All depths listed are bgs (unless noted)

Annular/Borehole Descriptions
All depths listed are bgs



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')

Depth of Soil Gas Sampling Port = 18.3 m (60')

Depth of Soil Gas Sampling Port = 25.6 m (84') (Port is submerged and not usable).

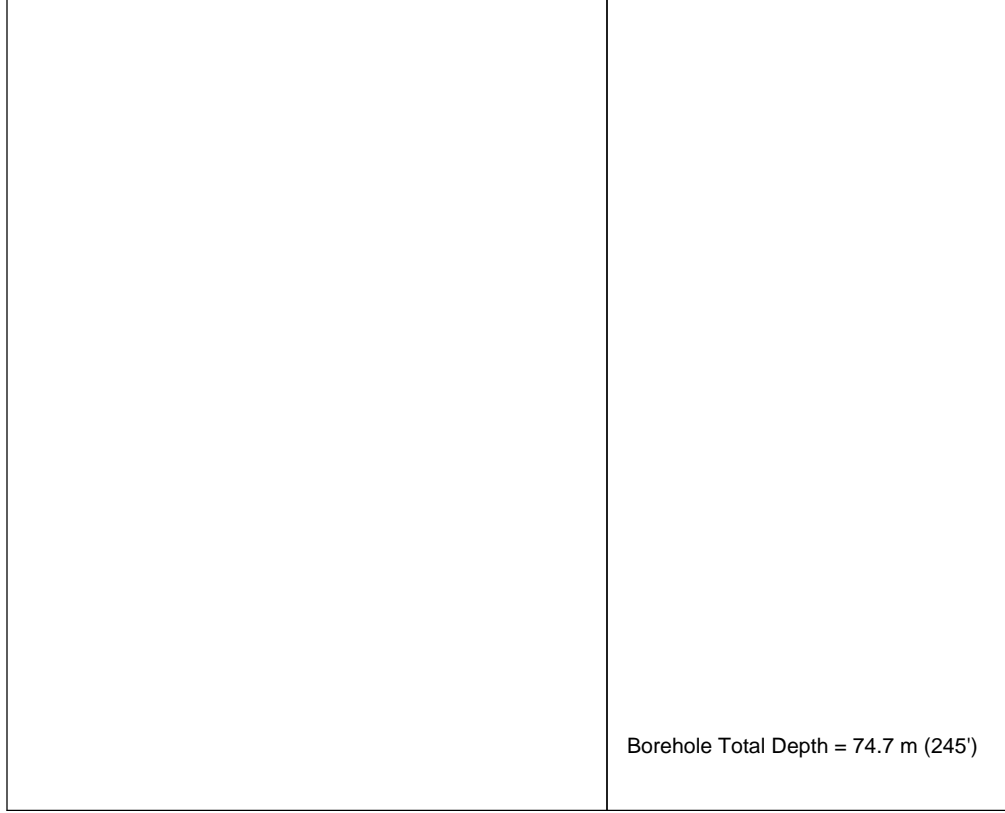
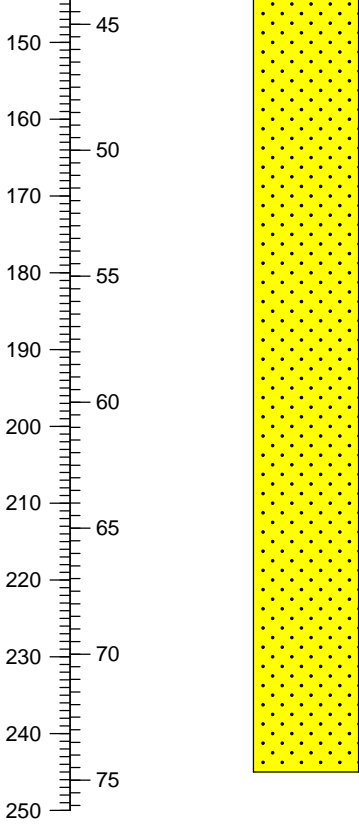
Static Water Level = 25.3 m (83'-Measured 5/24/00 below ground surface (bgs)

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 Bentonite Chips = 0'
 Top of Slough = 1.5 m (5')
 Top of Bentonite Chips = 2.7 m (9')
 Top of Slough = 3.4 m (11')
 Top of 10/20 Sand-Bentonite Powder Mix (1:1 Ratio by weight) = 6.4 m (21')
 Top of 10/20 Sand = 8.5 m (28')
 Top of 10/20 Sand-Bentonite Powder Mix = 11.3 m (37')
 Top of 10/20 Sand = 17.7 m (58')
 Top of 10/20 Sand-Bentonite Powder Mix = 18.6 m (61')
 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')



Borehole Total Depth = 74.7 m (245')

Figure 3.3 **Monitoring Well 200-SG-3 Construction Diagram**

(SEE NEXT PAGE)













WELL COMPLETION DIAGRAM

MULTI-PORT SOIL GAS GROUNDWATER MONITORING WELL

Location ID: **200-SG-3**

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

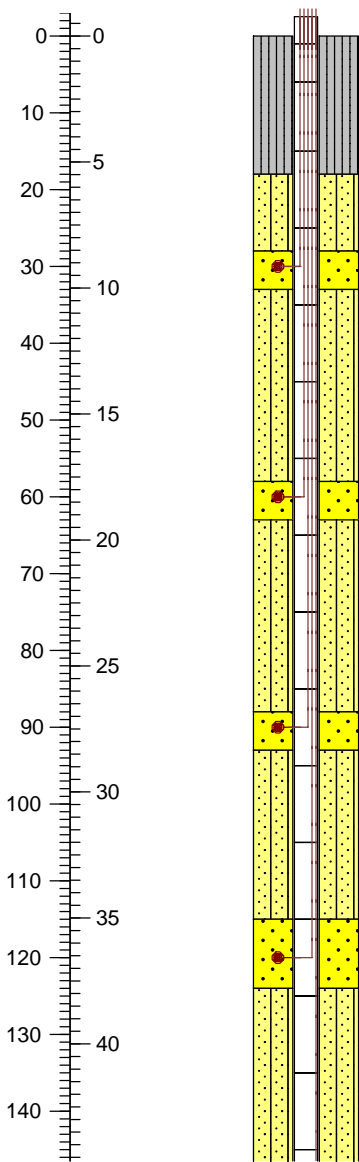
<p>Township and Range: NW 1/4, SW 1/4, NE 1/4, Sec 2, T21S, R3E</p> <p>Site Coordinates (NAD 83 in meters): 168221.97 N / 466875.49 E</p> <p>Elevation (Brass Cap): 1481.66 m (4861.1')</p> <p>Elevation (Top of Casing): 1482.43 m (4863.6')</p> <p>Drilling Contractor: Layne Christensen Environmental Services</p> <p>Driller: Martin Quiñones</p> <p>Total Depth of Borehole (bgs): 76.2 m (250')</p> <p>Borehole Diameter: 7" Dual Wall Percussion Air Rotary</p> <p>Depth to Bedrock (bgs): 24.4 m (80') (Limestone)</p> <p>Depth to Groundwater: 50.0 m (164'; taken 5/24/00 bgs)</p> <p>Total Depth Surface Casing (bgs): N/A</p> <p>Diameter and Type Surface Casing: N/A</p> <p>Date(s) Well Installed: 12/1/97-12/3/97</p>	<p>Date(s) Well Developed: 3/22/00 - 8/28/00</p> <p>Field Representative(s): Mary Canavan, Geoff Giles, and Molly Russell</p> <p>Total Depth Well Casing (bgs): 51.9 m (170.3')</p> <p>Type of Casing: Schedule 40 PVC</p> <p>Diameter Well Casing: Nominal 2"</p> <p>Soil Gas Port(s)(bgs): 9.1 m(30'); 18.3 m(60'); 27.4 m(90'); 36.6 m(120'); 46.9 m(154')</p> <p>Soil Gas Sampling Zone(s)(bgs): Sand Pack: 8.5-10.1 m (28'-33'); 17.7-19.2 m</p> <p>Soil Gas Sampling Zone(s)(bgs): (58-63'); 26.8-28.3 m (88'-93'); and 35.1-37.8 m (115'-124')</p> <p>Water Sampling Zone(s)(bgs): 47.2-51.8 m (155'-170')</p> <p>Comments: Supervised by Jeff Forbes (Daniel B. Stephens & Associates) Soil Gas Ports and 1/4" stainless steel tubing (to surface) installed outside PVC and secured to casing with plastic straps. Soil Sampling Zones continued: and 46.3--48.8 m (152'-SWL)</p>
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<p> Surface Casing N/A</p> <p> Nominal 2" PVC</p> <p> Nominal 2" PVC End Cap</p>	<p>Casing Explanation:</p> <p> Soil Port</p> <p> 1/4" Stainless Steel Tubing</p> <p> Static Water Level (SWL)</p>	<p> Cement</p> <p> Alluvium</p> <p> Slough</p> <p> Bentonite Seal</p> <p> 10/20 Sand</p> <p> 10/20 Sand Bentonite Mix</p>
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Feet/Meters

Well Descriptions
All depths listed are bgs (unless noted)

Annular/Borehole Descriptions
All depths listed are bgs



Multiport Soil Gas/Groundwater Well Stick-Up = 0.77 m (2.53')

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')

Depth of Soil Gas Sampling Port = 18.3 m (60')

Depth of Soil Gas Sampling Port = 27.4 m (90')

Depth of Soil Gas Sampling Port = 36.6 m (120')

Top of Bentonite Chips = 0'

Top of 10/20 Sand-Bentonite Powder Mix (1:1 Ratio by weight) = 5.5 m (18')

Top of 10/20 Sand = 8.5 m (28')

Top of 10/20 Sand-Bentonite Powder Mix = 10.1 m (33')

Top of 10/20 Sand = 17.7 m (58')

Top of 10/20 Sand-Bentonite Powder Mix = 19.2 m (63')

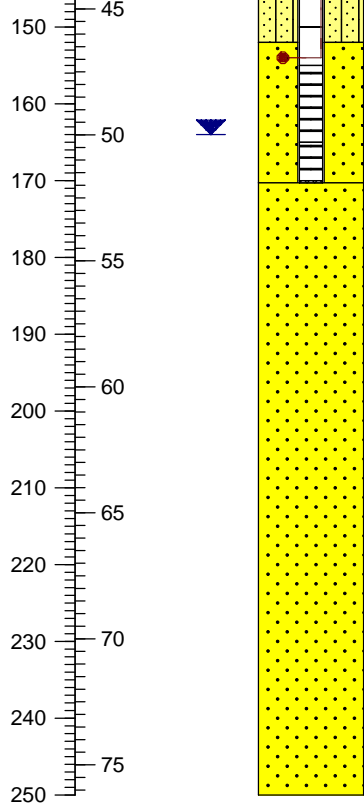
Fractured Limestone Bedrock = 24.4 m (80')

Top of 10/20 Sand = 26.8 m (88')

Top of 10/20 Sand-Bentonite Powder Mix = 28.3 m (93')

Top of 10/20 Sand = 35.1 m (115')

Top of 10/20 Sand-Bentonite Powder Mix = 37.8 m (124')



Depth of Soil Gas Sampling Port = 46.9 m (154')

Top of Nominal 2" Schedule 40 PVC 0.010"-Slot Screen = 47.2 m (155')

Static Water Level = 50.0 m (164'-Measured 5/24/00; below ground surface (bgs)

Bottom of Nominal 2" Schedule 40 PVC 0.010"-Slot Screen = 51.8 m (170')

Nominal 2" Schedule 40 PVC Casing TD = 51.9 m (170.3')

Top of 10/20 Sand (to cover lower soil gas port and groundwater screen) = 46.3 m (152')

Borehole Total Depth = 76.2 m (250')

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,

A handwritten signature in cursive script, appearing to read "Cheryl S. Thacker".

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-10454)

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 code: 88004

Phone number: (575) 524-5024 E-mail: timothy.j.davis@nasa.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

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: 38 deg, 30 min, 35.707 sec
Longitude: -106 deg, 38 min, 48.811 sec, NAD 83

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

Well PFE-4 is located outside the known contaminant plume and has no value as a pollution recovery 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 PFE-4 analytical data (Enclosure 9)

5) Static water level: 503.5 feet below land surface / feet above land surface (circle one)

6) Depth of the well: 876.5 feet

LRG-10454
TRN: 727442

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LAS CRUCES

- 7) Inside diameter of innermost casing: 7.85 inches.
- 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): 397.4-856.2 ft
- 10) What annular interval surrounding the artesian casing of this well is cement-grouted? NA
- 11) Was the well built with surface casing? Yes If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? Yes If yes, please describe:

Nominal 20-in. surface casing set to 110 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. 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: 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: batch-mixed and delivered to the site
 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:

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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LAS ALAMOS, NEW MEXICO

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 10:29:29 -06'00'

05/24/2022

Signature of Applicant

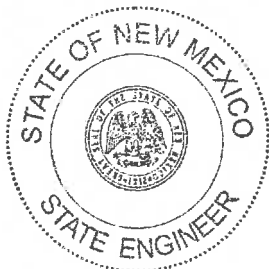
Date

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, 2022



Mike A. Hamman, STATE ENGINEER

BY

Cheryl Thacker
Cheryl Thacker
Water Resource Manager

State Engineer

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 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?			Delivered
Grout additive 1 requested			Powdered bentonite
Additive 1 percent by dry weight relative to cement			5%
Grout additive 2 requested			NA
Additive 2 percent by dry weight relative to cement			NA

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 LAS CRUCES, NEW MEXICO

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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 STATE AGRICULTURE OFFICE
 LAS CRUCES, NEW MEXICO

**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.
- 2) In addition, well LRG-10454 shall be plugged completely using the following method per Rules and Regulations Governing Well Driller Licensing, Construction, Repair 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

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



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-6 (LRG-10456, cancelled)

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 code: 88004

Phone number: (575) 524-5024 E-mail: timothy.j.davis@nasa.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

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, 12.504 sec
Longitude: -106 deg, 38 min, 54.918 sec, NAD 83

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

Poor production (~5 gpm). Not suitable as a pollution recovery well. There is only 30 ft of water in the well due to dropping water levels.

3) Was well used for any type of monitoring program? No 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: 502.1 feet below land surface / feet above land surface (circle one)

6) Depth of the well: 539.4 feet

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NEW MEXICO

LRG-10456
TRN: 727441

- 7) Inside diameter of innermost casing: 7.85 inches.
- 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) What annular interval surrounding the artesian casing of this well is cement-grouted? NA
- 11) Was the well built with surface casing? Yes If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? Yes 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. 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: 1,356.2 gallons (181.3 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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 WATER RESOURCES DIVISION

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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LAS CRUCES, NEW MEXICO

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 10:27:55 -06'00'

05/24/2022

Signature of Applicant

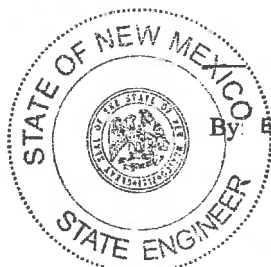
Date

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, 2022



Mike A. Hamman, P.E., STATE ENGINEER

State Engineer

By: BY

Cheryl Thacker
Cheryl Thacker
Water Resource Manager

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 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			NA
Additive 2 percent by dry weight relative to cement			NA

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 LAS CRUCES, NEW MEXICO

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 or 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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 STATE DEPARTMENT OF
 LAS CRUCES, NEW MEXICO

**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.
- 2) In addition, well LRG-10456 shall be plugged completely using the following method per Rules and Regulations Governing Well Driller Licensing, Construction, Repair 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.

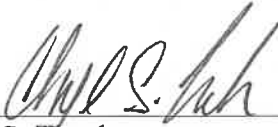
A plugging report for said well shall be filed with the Office of the State Engineer in the District IV office in Las Cruces within thirty (30) days of completion of the plugging.

- 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

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



WELL PLUGGING PLAN OF OPERATIONS



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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 NASA-8 (POD1)

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 code: 88004

Phone number: (575) 524-5024 E-mail: timothy.j.davis@nasa.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

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, 31.728 sec
Longitude: -106 deg, 36 min, 50.11 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 NASA 8 analytical data (Enclosure 9)

5) Static water level: 185.82 feet below land surface / feet above land surface (circle one)

6) Depth of the well: 197 feet

LRG-18412
TRN: 727449

LRG-18412-POD 1

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STATE ENGINEER
LAS CRUCES, NEW MEXICO

- 7) Inside diameter of innermost casing: 2 inches.
- 8) Casing material: Schedule 80 PVC to 162.00 ft; Schedule 40 stainless steel to 197.00 ft
- 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): 172-192 ft
- 10) What annular interval surrounding the artesian casing of this well is cement-grouted? NA
- 11) Was the well built with surface casing? Yes If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? Yes If yes, please describe:

Nominal 6-inch surface casing set to 30 ft in an (unrecorded) 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. 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: 32.15 gallons (4.30 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:

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.

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STATE ENGINEER
LAS CRUCES, NEW MEXICO

VII. ADDITIONAL INFORMATION: 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

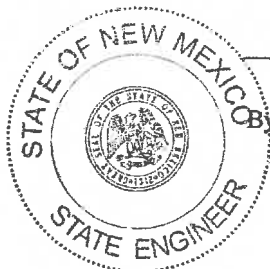
Date

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



Mike A. Hamman, P.E, STATE ENGINEER

exico State Engineer

BY

Cheryl Thacker

Cheryl Thacker
Water Resource Manager

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			NA
Additive 2 percent by dry weight relative to cement			NA

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 LAS CRUCES, NEW MEXICO

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 or 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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 LAS CRUCES, NEW MEXICO

**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.
- 2) In addition, well LRG-18412 POD1 shall be plugged completely using the following method per Rules and Regulations Governing Well Driller Licensing, Construction, Repair 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.

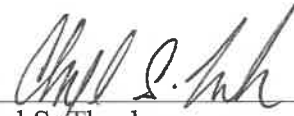
A plugging report for said well shall be filed with the Office of the State Engineer in the District IV office in Las Cruces within thirty (30) days of completion of the plugging.

- 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

work hours by calling the District IV NMOSE office at 575-524-6161 at least 48 hours in advance. NMOSE inspection will occur dependant 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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**WELL PLUGGING
 PLAN OF OPERATIONS**



STATE ENGINEER OFFICE
 LAS CRUCES, NEW MEXICO

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/egmn/ 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 BLM-2-482 (POD1)
 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 code: 88004
 Phone number: (575) 524-5024 E-mail: timothy.j.davis@nasa.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

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, 33 min, 42.348 sec
 Longitude: -106 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: 492.95 feet below land surface / feet above land surface (circle one)

6) Depth of the well: 498.4 feet

LRG-18413
 TRN: 727453

LRG-18413-POD1

- 7) Inside diameter of innermost casing: 3.75 inches.
- 8) Casing material: Stainless steel SCD 5 to 382.3 ft; SCD 10 to 498.4 ft
- 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): 482.4-492.8 ft
- 10) What annular interval surrounding the artesian casing of this well is cement-grouted? NA
- 11) Was the well built with surface casing? Yes If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? Yes 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? Yes If not, describe remaining equipment and intentions to remove prior to plugging in Section VII of this form.

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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: 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

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):

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, 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 10:31:28 -06'00'

05/24/2022

Signature of Applicant

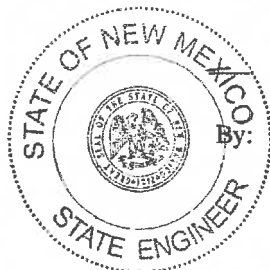
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LAS CRUCES, NEW MEXICO

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



Mike A. Hamman, P.E, STATE ENGINEER

xico State Engineer

By: [Signature]
Cheryl Thacker
Water Resource Manager

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 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
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

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**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 Rules and Regulations Governing Well Driller Licensing, Construction, Repair 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

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



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: N/A; NASA well 400-LV-125 (POD 1)

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 code: 88004

Phone number: (575) 524-5024 E-mail: timothy.j.davis@nasa.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

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, 29.891 sec
Longitude: -106 deg, 36 min, 19.51 sec, NAD 83

2) 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? No 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: NA feet below land surface / feet above land surface (circle one)

6) Depth of the well: 145.3 feet

LRG-18414
TRN: 727457

LRG-18414-POD 1

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LAS CRUCES, NEW MEXICO

- 7) Inside diameter of innermost casing: 2 inches.
- 8) Casing material: Schedule 40 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): 125-140ft
- 10) What annular interval surrounding the artesian casing of this well is cement-grouted? NA
- 11) Was the well built with surface casing? No If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? NA If yes, please describe:
- 12) Has all pumping equipment and associated piping been removed from the well? NA 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: 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:
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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LAS CRUCES, NEW MEXICO

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 10:32:19 -06'00'

05/24/2022

Signature of Applicant

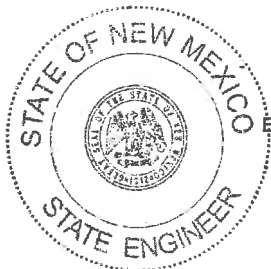
Date

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, 2022



Mike A. Hamman, P.E, STATE ENGINEER

Mexico State Engineer

BY Cheryl S. Thacker
Cheryl Thacker
Water Resource Manager

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
Additive 2 percent by dry weight relative to cement			NA

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 STATE OF NEW MEXICO
 LAS ALBUQUERQUE OFFICE

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 or 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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 STATE COMMISSIONER OF
 LANDS AND NATURAL RESOURCES
 LAS CRUCES, NEW MEXICO

**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.
- 2) In addition, well LRG-18414 POD1 shall be plugged completely using the following method per Rules and Regulations Governing Well Driller Licensing, Construction, Repair 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

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



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: N/A; NASA well 400-KV-142 (POD 1)

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 code: 88004

Phone number: (575) 524-5024 E-mail: timothy.j.davis@nasa.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

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

2) 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? No 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: 155 feet below land surface / feet above land surface (circle one)

6) Depth of the well: 157.3 feet

LRG-18415
TRN: 727461

LRG-18415-POD1

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2022 MAY 25 AM 9:58

STATE ENGINEER OFFICE
LAS CRUCES, NEW MEXICO

- 7) Inside diameter of innermost casing: 2 inches.
- 8) Casing material: Schedule 40 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): 142-157 ft
- 10) What annular interval surrounding the artesian casing of this well is cement-grouted? NA
- 11) Was the well built with surface casing? No If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? NA If yes, please describe:
- 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. 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: 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

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):

[Empty box for additional information]

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LAS CRUCES, NEW MEXICO

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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 10:33:08 -06'00'

05/24/2022

Signature of Applicant

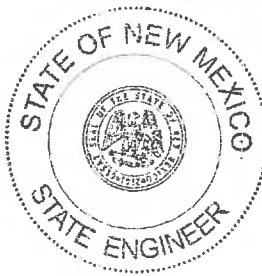
Date

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, 2022



Mike A. Hamman, P.E., STATE ENGINEER

Mexico State Engineer

BY

[Handwritten signature]

Cheryl Thacker
Water Resource Manager

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
Additive 2 percent by dry weight relative to cement			NA

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State Environmental
LAS CRUCES, NEW MEXICO

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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 STATE PATROL OFFICE
 LAS CRUCES, NEW MEXICO

**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.
- 2) In addition, well LRG-18415 POD1 shall be plugged completely using the following method per Rules and Regulations Governing Well Driller Licensing, Construction, Repair 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

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



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/egmn/ 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 (POD1)

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 code: 88004

Phone number: (575) 524-5024 E-mail: timothy.j.davis@nasa.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

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, 0.37 sec
Longitude: -106 deg, 36 min, 9.312 sec, NAD 83

2) 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-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: 170.3 feet

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STATE ENGINEER
OFFICE OF THE STATE ENGINEER
LAS CRUCES, NEW MEXICO

LRG-18416
TRN: 727483

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2022 MAY 25 AM 9:59
STATE DEPARTMENT OF
NATURAL RESOURCES
WATER DIVISION
1400 EAST CHURCH
SALT LAKE CITY, UT 84143

- 7) Inside diameter of innermost casing: 2 inches.
- 8) Casing material: Schedule 40 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): 155-170 ft
- 10) What annular interval surrounding the artesian casing of this well is cement-grouted? NA
- 11) Was the well built with surface casing? No If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? NA If yes, please describe:
- 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. 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: 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: 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)

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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):

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, 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 10:34:00 -06'00'

05/24/2022

Signature of Applicant

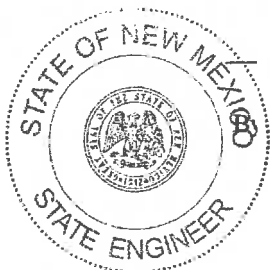
Date

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, 2022



Mike A. Hamman, P.E, STATE ENGINEER

exico State Engineer

BY

Cheryl Thacker
Cheryl Thacker
Water Resource Manager

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 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
Additive 2 percent by dry weight relative to cement			NA

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 STATE DEPARTMENT OF
 LAS CERRAS, NEW MEXICO

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 or 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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 STATE ENGINEER OFFICE
 LAS CRUCES, NEW MEXICO

**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.
- 2) In addition, well LRG-18416 POD1 shall be plugged completely using the following method per Rules and Regulations Governing Well Driller Licensing, Construction, Repair 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.

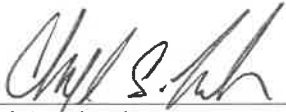
A plugging report for said well shall be filed with the Office of the State Engineer in the District IV office in Las Cruces within thirty (30) days of completion of the plugging.

- 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

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



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 ambg-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-2 (POD1)

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 code: 88004

Phone number: (575) 524-5024 E-mail: timothy.j.davis@nasa.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

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 min, 10.262 sec, NAD 83

2) 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: 100.3 feet

LRG-18417
TRN: 727486

- 7) Inside diameter of innermost casing: 2 inches.
- 8) Casing material: Schedule 40 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): 85-100 ft
- 10) What annular interval surrounding the artesian casing of this well is cement-grouted? NA
- 11) Was the well built with surface casing? No If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? NA If yes, please describe:

- 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.

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 STATE OF NEW YORK
 DEPARTMENT OF ENVIRONMENTAL CONSERVATION

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: 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:

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.

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2022 MAY 25 AM 10:00
STATE ENGINEER OFFICE
LAS CRUCES, NEW MEXICO

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 10:34:50 -06'00'

05/24/2022

Signature of Applicant

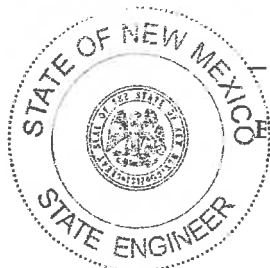
Date

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, 2022



Mike A. Hamman, P.E., STATE ENGINEER

Mexico State Engineer

BY

Cheryl Thacker
Cheryl Thacker
Water Resource Manager

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 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
Additive 2 percent by dry weight relative to cement			NA

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 MINERAL SERVICES
 LAS CRUCES, NEW MEXICO

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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 2022 MAY 25 AM 10:00
 STATE OF NEW MEXICO
 LAS CRUCES, NEW MEXICO

**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 Rules and Regulations Governing Well Driller Licensing, Construction, Repair 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

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

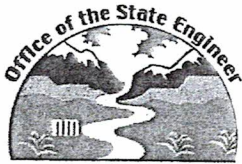
- 4) Should another regulatory agency sharing jurisdiction of the project authorize or by regulation require more stringent requirements than stated herein, the more stringent procedure shall be followed. This in part includes provisions regarding preauthorization to proceed, type of methods and materials 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 Engineer Well Number: 200-SG-2 POD1

Well owner: NASA JOHNSON SPACE CENTER WHITE SANDS FACILITY Phone No.: (575)-524-5624

Mailing address: P.O. BOX 20

City: LAS CRUCES State: NM Zip code: 88004

II. WELL PLUGGING INFORMATION:

- 1) Name of well drilling company that plugged well: YELLOW JACKET DRILLING SERVICES, LLC
- 2) New Mexico Well Driller License No.: WD-1458 Expiration Date: 10/31/24
- 3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s):
SEAN CARRIGAN
- 4) Date well plugging began: 1/25/23 Date well plugging concluded: 1/30/2023
- 5) GPS Well Location: Latitude: 32 deg, 30 min, 54.64 sec
Longitude: -106 deg, 36 min, 10.262 sec, WGS 84
- 6) Depth of well confirmed at initiation of plugging as: _____ ft below ground level (bgl),
by the following manner: TREMIE PIPE
- 7) Static water level measured at initiation of plugging: 84 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? YES 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:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments (“casing perforated first”, “open annular space also plugged”, etc.)
	<p style="text-align: center;">CEMENT GROUT 5% BETONITE</p>	<p style="text-align: center;">29 GAL.</p>	<p style="text-align: center;">16.37 GAL</p>	<p style="text-align: center;">TREMIE PIPE</p>	<p style="text-align: center;">ABANDON</p>

MULTIPLY	BY	AND OBTAIN
cubic feet x	7.4805	= gallons
cubic yards x	201.97	= gallons

III. SIGNATURE:

I, Richard LeBlanc, 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.

R. LeBlanc

Signature of Well Driller

1/31/23

Date



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 Engineer Well Number: 200-SG-3 POD1
 Well owner: NASA JOHNSON SPACE CENTER WHITE SANDS FACILITY Phone No.: (575)-524-5024
 Mailing address: P.O. BOX 20
 City: LAS CRUCES State: NM Zip code: 88004

II. WELL PLUGGING INFORMATION:

- 1) Name of well drilling company that plugged well: YELLOW JACKET DRILLING SERVICES, LLC
- 2) New Mexico Well Driller License No.: WD-1458 Expiration Date: 10/31/24
- 3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s):
SEAN CARRIGAN
- 4) Date well plugging began: 1/30/23 Date well plugging concluded: 1/30/23
- 5) GPS Well Location: Latitude: 32 deg, 31 min, 0.37 sec
Longitude: -106 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: TREMIE PIPE
- 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? YES 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:

<u>Depth</u> (ft bgl)	<u>Plugging Material Used</u> (include any additives used)	<u>Volume of Material Placed</u> (gallons)	<u>Theoretical Volume of Borehole/ Casing</u> (gallons)	<u>Placement Method</u> (tremie pipe, other)	<u>Comments</u> ("casing perforated first", "open annular space also plugged", etc.)
	<p style="text-align: center;">CEMENT GROUT 5% BETONITE</p>	<p style="text-align: center;">29 GAL.</p>	<p style="text-align: center;">27.8 GAL</p>	<p style="text-align: center;">TREMIE PIPE</p>	<p style="text-align: center;">ABANDON</p>

MULTIPLY	BY	AND OBTAIN
cubic feet x	7.4805	= gallons
cubic yards x	201.97	= gallons

III. SIGNATURE:

I, Richard LeBlanc, 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.

R. LeBlanc

Signature of Well Driller

1/31/23

Date

Appendix C
Updated Well Completion Diagrams

WELL COMPLETION DIAGRAM

MULTI-PORT SOIL VAPOR MONITORING WELL
















Well ID: **200-SG-2**

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

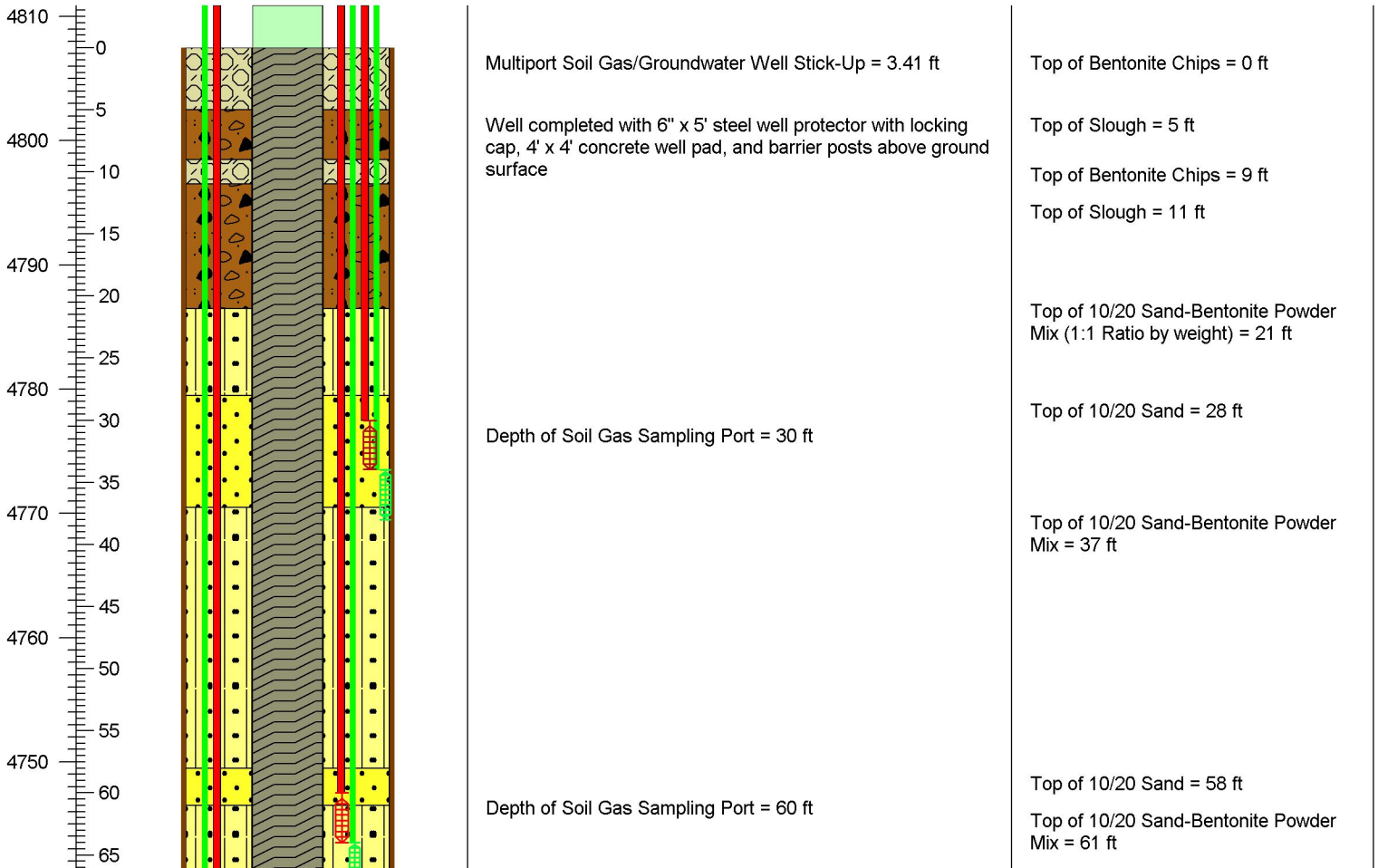
Township and Range: **SE 1/4, NW 1/4, NE 1/4, Sec 2, T21S, R3E**
 Site Coordinates (NAD 83) (ft): **N 551323.717 / E 1531650.439**
 Elevation (Brass Cap): **4807.5 ft amsl**
 Elevation (Top of Casing): **4810.9 ft amsl**
 Drilling Contractor: **Layne Christensen Environmental Services**
 Driller: **Martin 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 - 3/29/00**
 Field Representative(s): **Mary Canavan, Pam Egan, Geoff Giles, Molly Russell**
 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**

Materials Explanation:

 Completion Casing	 Water Level	 3/8-in. Steel Guide Wire	 Neat Cement	 10/20 Sand Bentonite Mix
 Nominal 2-in. Schedule 40 PVC Casing	 1/4" Stainless Steel Tubing	 Cable Weight	 Bentonite Chip Seal	 12/20 Filter Pack Sand
 Well Screen	 Soil Vapor Port		 Slough	
 Nominal 2-in. PVC Screen with 0.020" Slots				
 2-in. Schedule 40 PVC End Cap				

Elevation (ft amsl) / Depth (ft bgs)	Borehole/Well Description All depths listed are bgs	Annular Materials Description All depths listed are bgs
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WELL COMPLETION DIAGRAM

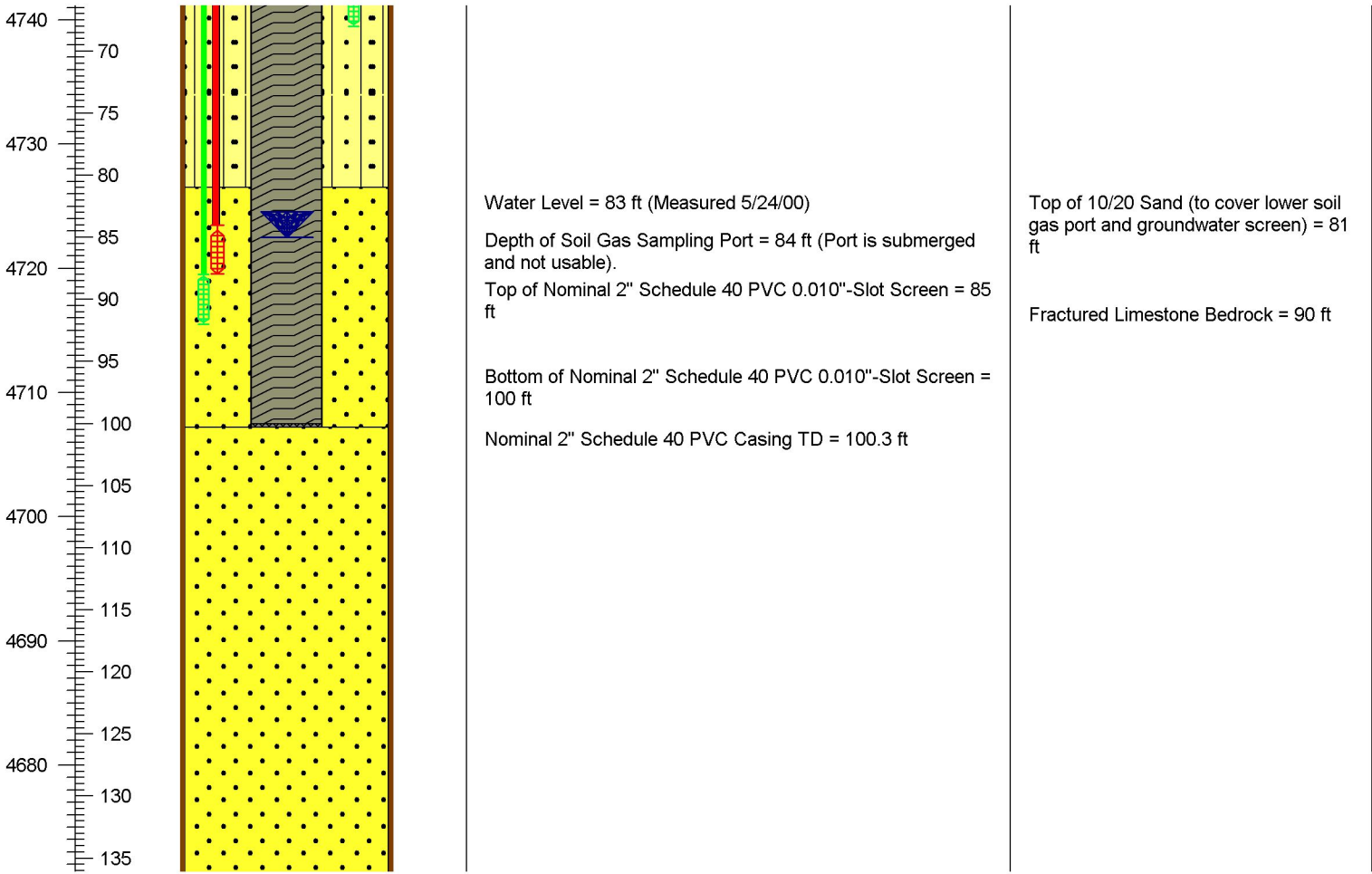
MULTI-PORT SOIL VAPOR MONITORING WELL

Well ID: **200-SG-2** Site ID: **NASA-WSTF, Doña Ana County, NM**

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

Elevation (ft amsl) / Depth (ft bgs)	Borehole/Well Description All depths listed are bgs	Annular Materials Description All depths listed are bgs
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





WELL COMPLETION DIAGRAM

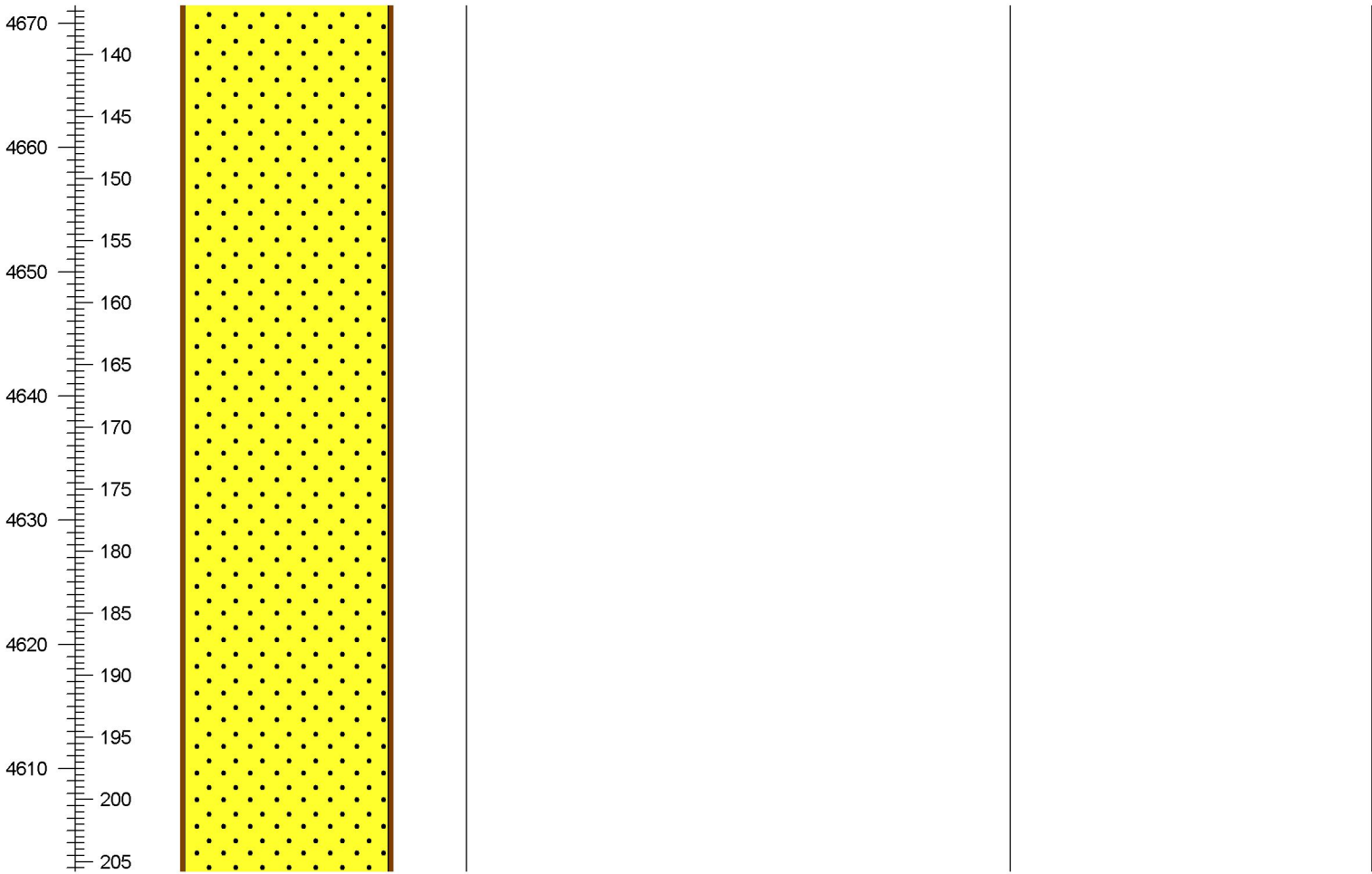
MULTI-PORT SOIL VAPOR MONITORING WELL

Well ID: **200-SG-2** Site ID: **NASA-WSTF, Doña Ana County, NM**

<p>Township and Range: SE 1/4, NW 1/4, NE 1/4, Sec 2, T21S, R3E</p> <p>Site Coordinates (NAD 83) (ft): N 551323.717 / E 1531650.439</p> <p>Elevation (Brass Cap): 4807.5 ft amsl</p> <p>Elevation (Top of Casing): 4810.9 ft amsl</p> <p>Drilling Contractor: Layne Christensen Environmental Services</p> <p>Driller: Martin Quiñones</p> <p>Drilling Method: Dual Wall Percussion Air Rotary</p> <p>Total Depth of Borehole (bgs): 245 ft</p> <p>Borehole Diameter: 7-in. to 245 ft</p> <p>Depth to Bedrock (bgs): 90 ft (Limestone)</p> <p>Depth to Groundwater: 83 ft ; (5/24/00)</p> <p>Total Depth Surface Casing (bgs): N/A</p> <p>Diameter and Type Surface Casing: N/A</p>	<p>Dates of Drilling: 6/14 - 6/25/14</p> <p>Dates Well Installed: 11/19 -11/24/97</p> <p>Dates Well Developed: 3/23 - 3/29/00</p> <p>Field Representative(s): Mary Canavan, Pam Egan, Geoff Giles, Molly Russell</p> <p>Total Depth Well Casing (bgs): 100.3 ft</p> <p>Type of Casing: Schedule 40 PVC Casing</p> <p>Diameter Well Casing: Nominal 2-in.</p> <p>Soil Vapor Port (ft bgs): 30, 60, and 84 ft</p> <p>Groundwater Screened Zone (ft bgs): 85 - 100 ft</p> <p>Comments: Soil Gas port at 84 ft was lost; (submerged 11/24/97)</p> <p style="color: red;">*Reconfigured 1/20/2023, Groundwater portion plugged</p>
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Materials Explanation:			
 Completion Casing Nominal 2-in. Schedule 40 PVC Casing	 Water Level	 3/8-in. Steel Guide Wire	 Neat Cement
 Well Screen Nominal 2-in. PVC Screen with 0.020" Slots	 1/4" Stainless Steel Tubing	 Cable Weight	 Bentonite Chip Seal
 2-in. Schedule 40 PVC End Cap	 Soil Vapor Port		 10/20 Sand Bentonite Mix
			 12/20 Filter Pack Sand
			 Slough

Elevation (ft amsl) / Depth (ft bgs)	Borehole/Well Description All depths listed are bgs	Annular Materials Description All depths listed are bgs
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





WELL COMPLETION DIAGRAM

MULTI-PORT SOIL VAPOR MONITORING WELL

Well ID: **200-SG-2** Site ID: **NASA-WSTF, Doña Ana County, NM**

<p>Township and Range: SE 1/4, NW 1/4, NE 1/4, Sec 2, T21S, R3E</p> <p>Site Coordinates (NAD 83) (ft): N 551323.717 / E 1531650.439</p> <p>Elevation (Brass Cap): 4807.5 ft amsl</p> <p>Elevation (Top of Casing): 4810.9 ft amsl</p> <p>Drilling Contractor: Layne Christensen Environmental Services</p> <p>Driller: Martin Quiñones</p> <p>Drilling Method: Dual Wall Percussion Air Rotary</p> <p>Total Depth of Borehole (bgs): 245 ft</p> <p>Borehole Diameter: 7-in. to 245 ft</p> <p>Depth to Bedrock (bgs): 90 ft (Limestone)</p> <p>Depth to Groundwater: 83 ft ; (5/24/00)</p> <p>Total Depth Surface Casing (bgs): N/A</p> <p>Diameter and Type Surface Casing: N/A</p>	<p>Dates of Drilling: 6/14 - 6/25/14</p> <p>Dates Well Installed: 11/19 -11/24/97</p> <p>Dates Well Developed: 3/23 - 8/29/00</p> <p>Field Representative(s): Mary Canavan, Pam Egan, Geoff Giles, Molly Russell</p> <p>Total Depth Well Casing (bgs): 100.3 ft</p> <p>Type of Casing: Schedule 40 PVC Casing</p> <p>Diameter Well Casing: Nominal 2-in.</p> <p>Soil Vapor Port (ft bgs): 30, 60, and 84 ft</p> <p>Groundwater Screened Zone (ft bgs): 85 - 100 ft</p> <p>Comments: Soil Gas port at 84 ft was lost; (submerged 11/24/97)</p> <p style="color: red;">*Reconfigured 1/20/2023, Groundwater portion plugged</p>
--	--

Materials Explanation:			
 Completion Casing Nominal 2-in. Schedule 40 PVC Casing	 Water Level	 3/8-in. Steel Guide Wire	 Neat Cement
 Well Screen Nominal 2-in. PVC Screen with 0.020" Slots	 1/4" Stainless Steel Tubing	 Cable Weight	 Bentonite Chip Seal
 2-in. Schedule 40 PVC End Cap	 Soil Vapor Port		 10/20 Sand Bentonite Mix
			 12/20 Filter Pack Sand
			 Slough

Elevation (ft amsl) / Depth (ft bgs)	Borehole/Well Description All depths listed are bgs	Annular Materials Description All depths listed are bgs
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WELL COMPLETION DIAGRAM

MULTI-PORT SOIL VAPOR MONITORING WELL














Well ID: **200-SG-3**

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

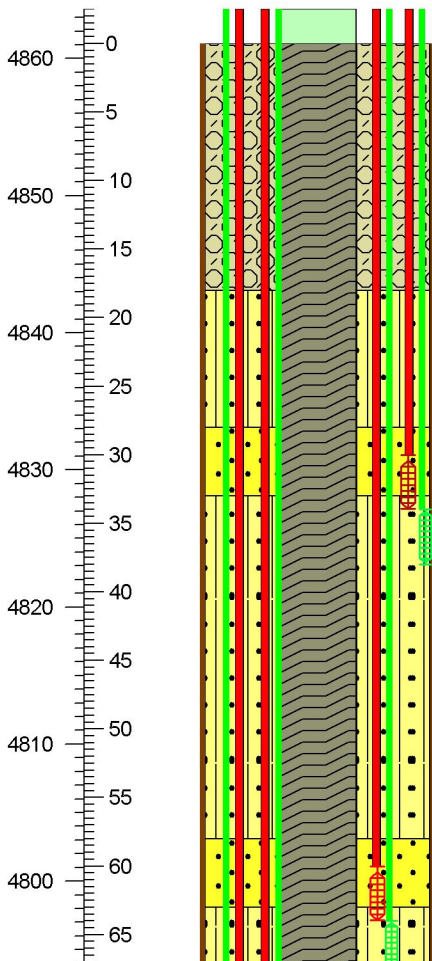
Township and Range: **SE 1/4, NW 1/4, NE 1/4, Sec 2, T21S, R3E**
 Site Coordinates (NAD 83) (ft): **N 551908.428 / E 1531741.25**
 Elevation (Brass Cap): **4861.1 ft amsl**
 Elevation (Top of Casing): **4863.6 ft amsl**
 Drilling Contractor: **Layne Christensen Environmental Services**
 Driller: **Martin 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**

Dates of Drilling: **11/25 - 12/3/97**
 Dates Well Installed: **12/1 - 12/3/97**
 Dates Well Developed: **3/22 - 3/28/00**
 Field Representative(s): **Mary Canavan, Geoff Giles, Molly Russell**
 Total Depth Well Casing (bgs): **170.3 ft**
 Type of Casing: **Schedule 40 PVC Casing**
 Diameter Well Casing: **Nominal 2-in.**
 Soil Vapor Port (ft bgs): **30, 60, 90, 120, and 154 ft**
 Groundwater Screened Zone (ft bgs): **155-170 ft**
 Comments:

***Reconfigured 1/20/2023, Groundwater portion plugged**

Completion Casing		Materials Explanation:			
	Nominal 2-in. Schedule 40 PVC Casing		Water Level		3/8-in. Steel Guide Wire
	Well Screen Nominal 2-in. PVC Screen with 0.010" Slots		1/4" Stainless Steel Tubing		Cable Weight
	2-in. Schedule 40 PVC End Cap		Soil Vapor Port		Neat Cement
					Bentonite Chip Seal
					Slough
					10/20 Sand Bentonite Mix
					12/20 Filter Pack Sand

Elevation (ft amsl) / Depth (ft bgs)	Borehole/Well Description All depths listed are bgs	Annular Materials Description All depths listed are bgs
---	--	--



Multiport Soil Gas/Groundwater Well Stick-Up = 2.53 ft

Top of Bentonite Chips = 0 ft

Well completed with 6" x 5' steel well protector with locking cap, 4' x 4' concrete well pad, and barrier posts above ground surface

Top of 10/20 Sand-Bentonite Powder Mix (1:1 Ratio by weight) = 18 ft

Depth of Soil Gas Sampling Port = 30 ft

Top of 10/20 Sand = 28 ft

Depth of Soil Gas Sampling Port = 60 ft

Top of 10/20 Sand-Bentonite Powder Mix = 33 ft

Top of 10/20 Sand = 58 ft

Top of 10/20 Sand-Bentonite Powder Mix = 63 ft

WELL COMPLETION DIAGRAM

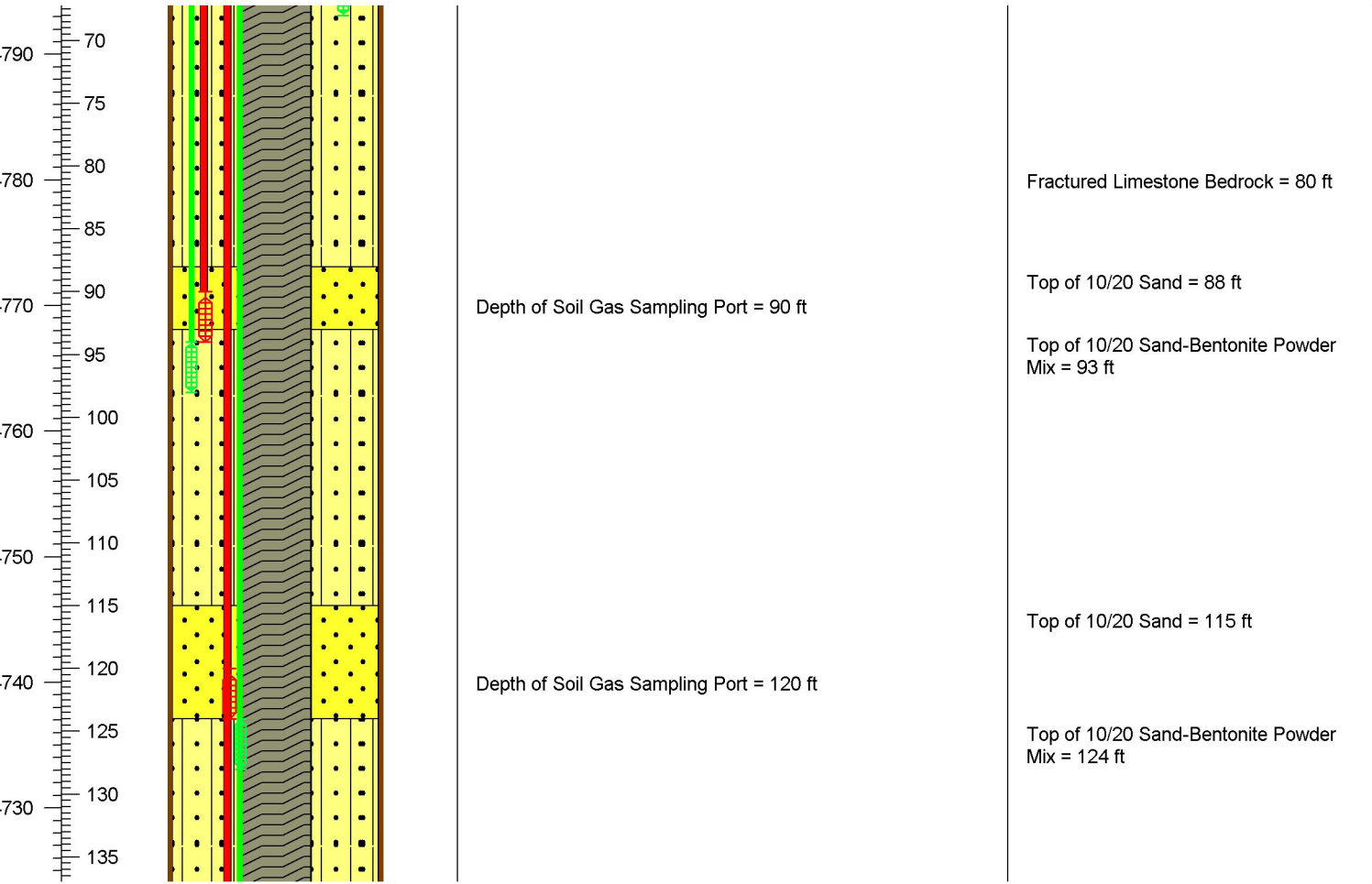
MULTI-PORT SOIL VAPOR MONITORING WELL

Well ID: **200-SG-3** Site ID: **NASA-WSTF, Doña Ana County, NM**

<p>Township and Range: SE 1/4, NW 1/4, NE 1/4, Sec 2, T21S, R3E</p> <p>Site Coordinates (NAD 83) (ft): N 551908.428 / E 1531741.25</p> <p>Elevation (Brass Cap): 4861.1 ft amsl</p> <p>Elevation (Top of Casing): 4863.6 ft amsl</p> <p>Drilling Contractor: Layne Christensen Environmental Services</p> <p>Driller: Martin Quiñones</p> <p>Drilling Method: Dual Wall Percussion Air Rotary</p> <p>Total Depth of Borehole (bgs): 250 ft</p> <p>Borehole Diameter: 7-in. to 250 ft</p> <p>Depth to Bedrock (bgs): 80 ft (Limestone)</p> <p>Depth to Groundwater: 164 ft (5/24/00)</p> <p>Total Depth Surface Casing (bgs): N/A</p> <p>Diameter and Type Surface Casing: N/A</p>	<p>Dates of Drilling: 11/25 - 12/3/97</p> <p>Dates Well Installed: 12/1 - 12/3/97</p> <p>Dates Well Developed: 3/22 - 3/28/00</p> <p>Field Representative(s): Mary Canavan, Geoff Giles, Molly Russell</p> <p>Total Depth Well Casing (bgs): 170.3 ft</p> <p>Type of Casing: Schedule 40 PVC Casing</p> <p>Diameter Well Casing: Nominal 2-in.</p> <p>Soil Vapor Port (ft bgs): 30, 60, 90, 120, and 154 ft</p> <p>Groundwater Screened Zone (ft bgs): 155-170 ft</p> <p>Comments:</p> <p style="color: red;">*Reconfigured 1/20/2023, Groundwater portion plugged</p>
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<p>Completion Casing</p> <p> Nominal 2-in. Schedule 40 PVC Casing</p> <p> Well Screen Nominal 2-in. PVC Screen with 0.010" Slots</p> <p> 2-in. Schedule 40 PVC End Cap</p>	<p>Materials Explanation:</p> <p> Water Level</p> <p> 1/4" Stainless Steel Tubing</p> <p> Soil Vapor Port</p> <p> 3/8-in. Steel Guide Wire</p> <p> Cable Weight</p>	<p> Neat Cement</p> <p> Bentonite Chip Seal</p> <p> Slough</p>	<p> 10/20 Sand Bentonite Mix</p> <p> 12/20 Filter Pack Sand</p>
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Elevation (ft amsl) / Depth (ft bgs)	Borehole/Well Description All depths listed are bgs	Annular Materials Description All depths listed are bgs
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WELL COMPLETION DIAGRAM

MULTI-PORT SOIL VAPOR MONITORING WELL














Well ID: **200-SG-3**

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 551908.428 / E 1531741.25**
 Elevation (Brass Cap): **4861.1 ft amsl**
 Elevation (Top of Casing): **4863.6 ft amsl**
 Drilling Contractor: **Layne Christensen Environmental Services**
 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**

Dates of Drilling: **11/25 - 12/3/97**
 Dates Well Installed: **12/1 - 12/3/97**
 Dates Well Developed: **3/22 - 8/28/00**
 Field Representative(s): **Mary Canavan, Geoff Giles, Molly Russell**
 Total Depth Well Casing (bgs): **170.3 ft**
 Type of Casing: **Schedule 40 PVC Casing**
 Diameter Well Casing: **Nominal 2-in.**
 Soil Vapor Port (ft bgs): **30, 60, 90, 120, and 154 ft**
 Groundwater Screened Zone (ft bgs): **155-170 ft**
 Comments:

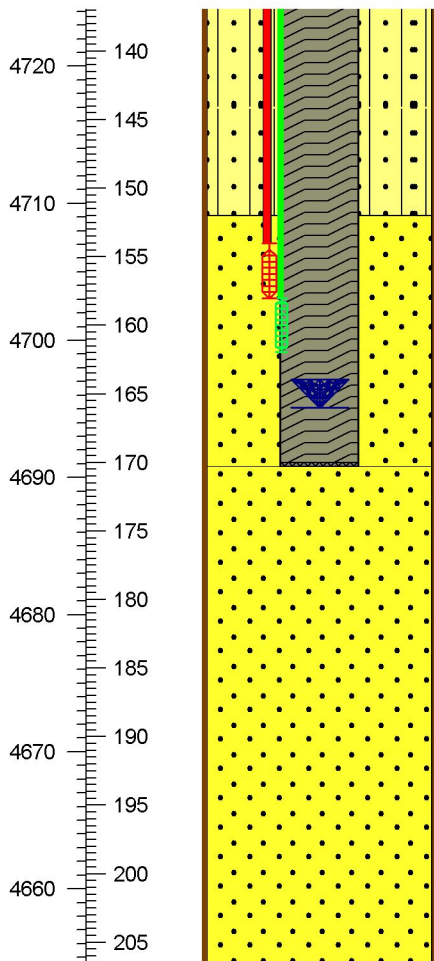
***Reconfigured 1/20/2023, Groundwater portion plugged**

Completion Casing		Materials Explanation:			
	Nominal 2-in. Schedule 40 PVC Casing		Water Level		3/8-in. Steel Guide Wire
	Well Screen Nominal 2-in. PVC Screen with 0.010" Slots		1/4" Stainless Steel Tubing		Cable Weight
	2-in. Schedule 40 PVC End Cap		Soil Vapor Port		Neat Cement
					Bentonite Chip Seal
					Slough
					10/20 Sand Bentonite Mix
					12/20 Filter Pack Sand

Elevation (ft amsl)
/ Depth (ft bgs)

Borehole/Well Description
All depths listed are bgs

Annular Materials Description
All depths listed are bgs



Depth of Soil Gas Sampling Port = 154 ft
 Top of Nominal 2" Schedule 40 PVC 0.010"-Slot Screen = 155 ft

Water Level = 164 ft (5/24/00)

Bottom of Nominal 2" Schedule 40 PVC 0.010"-Slot Screen = 170 ft

Nominal 2" Schedule 40 PVC Casing TD = 170.3 ft














Top of 10/20 Sand (to cover lower soil gas port and groundwater screen) = 152 ft

WELL COMPLETION DIAGRAM

MULTI-PORT SOIL VAPOR MONITORING WELL

Well ID: **200-SG-3** Site ID: **NASA-WSTF, Doña Ana County, NM**

<p>Township and Range: SE 1/4, NW 1/4, NE 1/4, Sec 2, T21S, R3E</p> <p>Site Coordinates (NAD 83) (ft): N 551908.428 / E 1531741.25</p> <p>Elevation (Brass Cap): 4861.1 ft amsl</p> <p>Elevation (Top of Casing): 4863.6 ft amsl</p> <p>Drilling Contractor: Layne Christensen Environmental Services</p> <p>Driller: Martin Quiñones</p> <p>Drilling Method: Dual Wall Percussion Air Rotary</p> <p>Total Depth of Borehole (bgs): 250 ft</p> <p>Borehole Diameter: 7-in. to 250 ft</p> <p>Depth to Bedrock (bgs): 80 ft (Limestone)</p> <p>Depth to Groundwater: 164 ft (5/24/00)</p> <p>Total Depth Surface Casing (bgs): N/A</p> <p>Diameter and Type Surface Casing: N/A</p>	<p>Dates of Drilling: 11/25 - 12/3/97</p> <p>Dates Well Installed: 12/1 - 12/3/97</p> <p>Dates Well Developed: 3/22 - 3/28/00</p> <p>Field Representative(s): Mary Canavan, Geoff Giles, Molly Russell</p> <p>Total Depth Well Casing (bgs): 170.3 ft</p> <p>Type of Casing: Schedule 40 PVC Casing</p> <p>Diameter Well Casing: Nominal 2-in.</p> <p>Soil Vapor Port (ft bgs): 30, 60, 90, 120, and 154 ft</p> <p>Groundwater Screened Zone (ft bgs): 155-170 ft</p> <p>Comments:</p> <p style="color: red;">*Reconfigured 1/20/2023, Groundwater portion plugged</p>
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Materials Explanation:			
 Completion Casing Nominal 2-in. Schedule 40 PVC Casing	 Water Level	 3/8-in. Steel Guide Wire	 Neat Cement
 Well Screen Nominal 2-in. PVC Screen with 0.010" Slots	 1/4" Stainless Steel Tubing	 Cable Weight	 Bentonite Chip Seal
 2-in. Schedule 40 PVC End Cap	 Soil Vapor Port		 10/20 Sand Bentonite Mix
			 12/20 Filter Pack Sand
			 Slough

Elevation (ft amsl) / Depth (ft bgs)	Borehole/Well Description All depths listed are bgs	Annular Materials Description All depths listed are bgs
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