November 2020

C-141 Release Characterization Report and Remediation Plan

DeSoto Springs Recycling Containment Release

Incident Number NRM2025449421
Section 5, T26S R36E, Lea County

Google Earth satellite image of DeSoto Springs recycling facility from 2/21/2019

Prepared for:
Ameredev Operating, LLC
Austin, Texas

Prepared by:
R.T. Hicks Consultants, Ltd.
901 Rio Grande NW F-142
Albuquerque, New Mexico

R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Since 1996
Artesia ▲ Carlsbad ▲ Midland

November 23, 2020

New Mexico Oil & Gas Conservation Division, District I
1625 N. French Drive
Hobbs, New Mexico 88240
Emailed to OCD.Enviro@state.nm.us and submitted via NMOCD E-permitting portal

RE: Ameredev Operating LLC – DeSoto Springs Release (8/4/2020)
Characterization Report and Remediation Plan
Incident Number NRM2025449421

To Whom It May Concern:

In accordance with 19.15.29 NMAC (Rule), R.T. Hicks Consultants submits this Site Assessment/Characterization Report and Remediation Plan on behalf of Ameredev Operating LLC (Ameredev). The updated C-141 form is attached.

Characterization Report Checklist: ***Each of the following items must be included in the report.***

☒ Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells. (See Plate 1)
☒ Field data (See site photographs, Plate 1, Table 1)
☒ Data table of soil contaminant concentration data (Tables 1 and 2)
☒ Depth to water determination
(See Figures 1 and 2 and Appendix A from the August 2018 C-147 registration of the De Soto Containment and Appendix C provides drillers' logs in the area)
☒ Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release (Figure 3, Appendix A)
☐ Boring or excavation logs (Not applicable)
☒ Photographs including date and GIS information (Site photographs follow Plate 1)
☒ Topographic/Aerial maps (Figures 3, 4, 6 and 7 provide the best images)
☒ Laboratory data including chain of custody
Table 1 shows delineation data including chloride field tests, electrical conductivity (EC) readings, and laboratory analyses of soils within the footprint of the release. Table 2 displays the correlation between the field EC readings and laboratory chloride concentrations. Appendix B includes the Laboratory Certificate of Analyses.

Description of Site Assessment/Characterization Methods

All delineation samples were collected in accordance with 19.15.29.11, following the NRCS Field Guide[1]. An extension was granted by the District for this delineation report and is enclosed herein.

The release consisted of a spray of produced water on the location and a narrow flow off location. Shallow pooling was noted by Ameredev in two small areas, one on the pad and one off the east side of the location fence (see Plate 1). Ameredev immediately responded to the release by flagging the perimeter of the affected area. Hicks Consultants initially collected near-surface samples by hand to determine if further actions were required and added the seven sample points and the perimeter to our GIS database.

On September 10, 2020, we directed a backhoe to collect sub-surface samples while field-screening for EC to determine the vertical extent of impact at the representative sample points. Plate 1 displays the locations of the sample points within the release area and demonstrates the majority of impacted surface is within the facility pad. A narrow channel exited the pad near the gate, following the slope of the entrance ramp, and pooled in a sandy area of approximately 3,200 square feet between the facility and a buried pipeline. We asked the laboratory to analyze soil samples for chloride at all sample points and TPH, BTEX, and Benzene on the samples from the pooling areas. Table 1 summarizes the soil analyses.

Summary of Laboratory Findings

- Four samples analyzed for petroleum hydrocarbon constituents listed in Table 1 of the Rule demonstrate the absence of these constituents within the laboratory's detection limits.
- Chloride concentrations beneath the release footprint on the pad ("in-use")
    - All samples meet the remediation criteria of Table 1 (20,000 mg/kg)
    - All samples except point H exceed the reclamation criteria for the upper 4-feet of soil (600 mg/kg chloride).
    - By EC readings and laboratory analyses, all 4.1-feet samples meet closure criteria of 20,000 mg/kg chloride.
- Chloride concentrations beneath the release area footprint off the pad (not "in-use")
    - These sample points exceed the reclamation target value of 600 mg/kg in the upper 4 feet
    - All samples meet the closure criteria below 4 feet.

Proposed Remediation

Off-Site Remediation

For areas not "in-use" and for depths from 0 to 4 feet BGS, the 600 mg/kg chloride Closure Criteria will be used to determine excavation extent and depth. Sample points A and B exhibit chloride concentrations in exceedance of the limits found in Table 1 of the Rule for 0-4 feet.

[1] https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052523.pdf

Chloride concentrations and EC readings at 4.1 feet indicate Table 1 limits are met at these locations in soils deeper than 4 feet BGS. Ameredev proposes the removal of affected soils from the surface to 4 feet BGS from the shaded area drawn on the satellite image of Plate 1. The excavation area is approximately 2,500 square feet and the proposed volume of soil removed will be approximately 370 cubic yards.

Five-point composite soil samples will be collected from the each wall of the excavation from 0 to 4 feet BGS. If soil sample results exceed 600 mg/kg chloride at the excavation walls, the wall will be extended horizontally, if active facilities permit, and resampled. Horizontal excavation will continue until subsequent sampling shows chloride below 600 mg/kg in the upper 4-feet. Excavation depth will be determined by the collection of a five-point (or more, depending on final excavation size) composite sample of the floor of the excavation of this area. Each component of the composite sample will be spaced no more than 200 square feet apart. Based on the previous chloride delineation concentrations, the floor or base of the excavation is anticipated to be approximately 4 feet deep, but will be extended as needed in order to meet Table 1 Closure Criteria of the Rule.

NMOCD will be notified of the collection of composite samples at least two business days prior. All composite samples of the final excavation will be analyzed for the constituents listed in Table 1 of the Rule. If parameters of Table 1 area met, clean material will be imported and backfilled into the excavation and contoured to match the surrounding terrain with regard to erosion control, stability, and surface runoff flow patterns. The excavated soils will be removed to a permitted disposal facility. Surface restoration/re-vegetation efforts will be addressed in the subsequent closure report.

Reclamation of In-Use Area

Aside from the areas discussed above, the remainder of the impacted area is confined to the active recycling location. The sample points on the in-use portion of the release meet Table 1 criteria, so remediation is not required on this portion of the release. In accordance with paragraph B of 19.15.29.13 NMAC, Ameredev has restored the surface of the location pad and ramp to prevent ponding and erosion.

Proposed Timeline

Within two weeks after approval is received, excavation will begin at the area of impact outside the facility as described above. NMOCD will be notified prior to closure sampling as prescribed by the Rule.

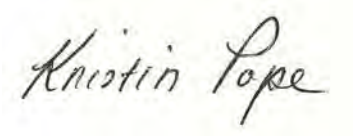
Within one week of confirmation that the final composite samples meet Table 1 closure criteria, the excavation will be backfilled and contoured in accordance with the Rule.

Within 90 days after approval of this remediation plan, a closure report and final C-141 form will be submitted to the District.

The backfilled excavation area will be contoured to blend with the surrounding terrain and to minimize erosion in accordance with the Rule. The disturbed area not "in-use" will be seeded in the first favorable growing season following closure and in coordination with a forecasted rainfall. NMOCD will be notified when re-vegetation criteria described in the Rule are met.

Thank you for your consideration of this Characterization Report and Remediation Plan. Please contact me with any questions regarding this submission.

Sincerely,



R.T. Hicks Consultants, Ltd.
Kristin Pope
Sr. Project Geologist

Cc: Ameredev

Updated form C-141

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources Department

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 24, 2018
Submit to appropriate OCD District office

Incident ID	NRM2025449421
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party Ameredev Operating, LLC	OGRID 372224
Contact Name Shane McNeely	Contact Telephone 737-300-4729
Contact email smcneely@ameredev.com	Incident # *(assigned by OCD)*
Contact mailing address 2901 Via Fortuna Suite 600,Austin, Texas 78746	

Location of Release Source

Latitude 32.075571° Longitude -103.281182° (approx.)
(NAD 83 in decimal degrees to 5 decimal places)

Site Name DeSoto Sprints Recycling Containment	Site Type Recycling Containment
Date Release Discovered 8/4/2020 7 am	API# *(if applicable)*

Unit Letter	Section	Township	Range	County
D	5	26S	36E	Lea

Surface Owner: ☐ State ☐ Federal ☐ Tribal ☒ Private *(Name: EOG Resources)*

Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

☐ Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
☒ Produced Water	Volume Released (bbls) Unknown	Volume Recovered (bbls) 0
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	☒ Yes ☐ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release: Gasket on a water transport pump failed and created a spray of produced water with a few small pooling areas.

Form C-141
Page 2

State of New Mexico
Oil Conservation Division

Incident ID	NRM2025449421
District RP	
Facility ID	
Application ID	

Was this a major release as defined by 19.15.29.7(A) NMAC? ☐ Yes ☐ No	If YES, for what reason(s) does the responsible party consider this a major release? There are no reasonable data at this time to determine if this release less than 25 bbls. Therefore, we are reporting the release within the 24-hour window and will provide an estimate of the volume of the release after site characterization.
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)? This form was transmitted to ocd.enviro@state.nm.us with return/read receipt.	

Initial Response

The responsible party must undertake the following actions immediately unless they could create a safety hazard that would result in injury

☒ The source of the release has been stopped.

☒ The impacted area has been secured to protect human health and the environment.

☐ Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.

☐ All free liquids and recoverable materials have been removed and managed appropriately.

If all the actions described above have not been undertaken, explain why:
A relatively small volume of produced water soaked into the soil while much of the release fell as a spray. Ameredev will

1. Outline the spill footprint on the ground on with a GPS
2. Make a 1-call as necessary
3. Cause excavation of impacted material in any pooling areas before August 11
4. Place the excavated material within the spill footprint where pooling did not occur and
5. Secure a 12-mil (minimum) synthetic liner over the stockpile to minimize the potential of downward seepage after precipitation
6. Notify NMOCD 48 hours prior to site characterization sampling.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: ___Randall Hicks_____ Title: __Consultant for Ameredev Operating LLC_____

Signature: _____ _____ Date: __8/4/2020_____

email: r@rthicksconsult.com AND smcneely@ameredev.com _Telephone: Hicks: 505 238 9515_AND McNeely : (737) 300-4729

Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.

OCD Only

Received by: Ramona Marcus Date: 9/10/2020

NOT ACCEPTED

Incident ID	NRM2025449421
District RP	
Facility ID	
Application ID	

Site Assessment/Characterization

This information must be provided to the appropriate district office no later than 90 days after the release discovery date.

What is the shallowest depth to groundwater beneath the area affected by the release?	222 (ft bgs)
Did this release impact groundwater or surface water? SEE FIGURE 1 AND 2	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse? SEE FIGURE 3	☐ Yes ☒ No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)? SEE FIGURE 3	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church? SEE FIGURE 4	☐ Yes ☒ No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes? SEE FIGURES 1 AND 3	☐ Yes ☒ No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring? SEE FIGURES 1 AND 3	☐ Yes ☒ No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field? SEE FIGURE 5	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a wetland? SEE FIGURE 6	☐ Yes ☒ No
Are the lateral extents of the release overlying a subsurface mine? SEE FIGURE 7	☐ Yes ☒ No
Are the lateral extents of the release overlying an unstable area such as karst geology? SEE FIGURE 8	☐ Yes ☒ No
Are the lateral extents of the release within a 100-year floodplain? SEE FIGURE 9	☐ Yes ☒ No
Did the release impact areas **not** on an exploration, development, production, or storage site?	☒ Yes ☐ No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

Characterization Report Checklist: ***Each of the following items must be included in the report.***

- ☒ Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- ☒ Field data
- ☒ Data table of soil contaminant concentration data
- ☒ Depth to water determination
- ☒ Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release
- ☒ Boring or excavation logs
- ☒ Photographs including date and GIS information
- ☒ Topographic/Aerial maps
- ☒ Laboratory data including chain of custody

If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

Form C-141
Page 4

State of New Mexico
Oil Conservation Division

Incident ID	NRM2025449421
District RP	
Facility ID	
Application ID	

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: _Kristin Pope_____ Title: _Consultant for Ameredev Operating LLC_____

Signature:__ Kristin Pope _____ Date: _11/23/2020_____

email: kristin@rthicksconsult.com **AND** smcneely@ameredev.com Telephone: __575-302-6755, 737-300-4729_____

OCD Only

Received by: Cristina Eads Date: 11/24/2020

State of New Mexico
Oil Conservation Division

Incident ID	NRM2025449421
District RP	
Facility ID	
Application ID	

Remediation Plan

Remediation Plan Checklist: ***Each of the following items must be included in the plan.***

☒ Detailed description of proposed remediation technique
☒ Scaled sitemap with GPS coordinates showing delineation points
☒ Estimated volume of material to be remediated
☒ Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC
☒ Proposed schedule for remediation (note if remediation plan timeline is more than 90 days OCD approval is required)

Deferral Requests Only: ***Each of the following items must be confirmed as part of any request for deferral of remediation.***

☐ Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.

☐ Extents of contamination must be fully delineated.

☐ Contamination does not cause an imminent risk to human health, the environment, or groundwater.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: _Kristin Pope_____ Title: _Consultant for Ameredev Operating LLC_____

Signature: Kristin Pope Date: __11/23/2020_____

email: kristin@rthicksconsult.com **AND** smcneely@ameredev.com Telephone: _575-302-6755, 737-300-4729_____

OCD Only

Received by: Cristina Eads Date: 11/24/2020

☑ Approved ☐ Approved with Attached Conditions of Approval ☐ Denied ☐ Deferral Approved

Signature: Date: 02/03/2021

Incident ID	
District RP	
Facility ID	
Application ID	

Closure

The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (electronic submittals in .pdf format are preferred) including a scaled site map, sampling diagrams, relevant field notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents of final sampling, and a narrative of the remedial activities. Refer to 19.15.29.12 NMAC.

Closure Report Attachment Checklist: ***Each of the following items must be included in the closure report.***

☐ A scaled site and sampling diagram as described in 19.15.29.11 NMAC

☐ Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)

☐ Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)

☐ Description of remediation activities

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: _____ Title: _____

Signature: _____ Date: _____

email: _____ Telephone: _____

OCD Only

Received by: _____ Date**:** _____

Closure approval by the OCD does not relieve the responsible party of liability should their operations have failed to adequately investigate and remediate contamination that poses a threat to groundwater, surface water, human health, or the environment nor does not relieve the responsible party of compliance with any other federal, state, or local laws and/or regulations.

Closure Approved by: _____ Date**:** _____

Printed Name: _____ Title: _____

From: Hamlet, Robert, EMNRD
To: Kristin Pope; EMNRD-OCD-District1spills
Cc: "Shane McNeely"; "Randall Hicks"
Subject: (Extension Approval) Ameredev-DeSoto Release #NRM2025449421
Date: Friday, October 30, 2020 10:17:05 AM

RE: Incident **#NRM2025449421**

Kristin,

Your request for an extension to **November 9th, 2020** is approved. Ameredev Operating, R.T. Hicks Consultants requests an extension of 7-days' time for #NRM2025449421 from the 90-day timeline for a characterization report which is due on November 2, 2020. Characterization is complete but lab analysis took longer than expected. Ameredev asks for a 7-day extension to complete the proposed remediation plan for NMOCD approval to submit along with the characterization report. A 7-day extension will allow enough time to complete the characterization report/correction action plan and for peer review before submission to NMOCD.

Thank you,

Robert J Hamlet
State of New Mexico
Energy, Minerals, and Natural Resources
Oil Conservation Division
811 S. First St., Artesia NM 88210
(575) 748-1283
Robert.Hamlet@state.nm.us

From: Kristin Pope <kristin@rthicksconsult.com>
Sent: Thursday, October 29, 2020 10:50 PM
To: EMNRD-OCD-District1spills <EMNRD-OCD-District1spills@state.nm.us>; Enviro, OCD, EMNRD <OCD.Enviro@state.nm.us>
Cc: 'Shane McNeely' <smcneely@ameredev.com>; 'Randall Hicks' <r@rthicksconsult.com>
Subject: [EXT] RE: Ameredev-DeSoto Release #NRM2025449421

NMOCD, District I:

On the behalf of Ameredev Operating, R.T. Hicks Consultants respectfully requests for an extension of 7-days' time for #NRM2025449421 from the 90-day timeline for a characterization report which is due on November 2, 2020. Characterization is complete but lab analysis took longer than expected. We ask for a 7-day extension to complete the proposed remediation plan for NMOCD approval to submit along with the characterization report.

A 7-day extension will allow enough time to complete the characterization report/correction action

plan and for peer review before submission to NMOCD.

> 19.15.29.11 **SITE ASSESSMENT/CHARACTERIZATION:** After the responsible party has removed all free liquids and recoverable materials, the responsible party must assess soils both vertically and horizontally for potential environmental impacts from any major or minor release containing liquids.
>
> **A. Characterization requirements.** The responsible party must submit information characterizing the release to the appropriate division district office within 90 days of discovery of the release or characterize the release by submitting a final closure report within 90 days of discovery of the release in accordance with Subsection E of 19.15.29.12 NMAC. The responsible party may seek an extension of time to submit characterization information for good cause as determined by the division. The responsible party must submit the following information to the division.

Please contact me with any questions regarding this request to submit the report/plan by November 9, 2020.
Thank you.

Kristin Pope, Sr. Project Geologist
R.T. Hicks Consultants
Carlsbad Field Office
(575) 302-6755
www.RTHicksConsult.com

From: Kristin Pope [mailto:kristin@rthicksconsult.com]
Sent: Tuesday, August 11, 2020 9:20 AM
To: 'r@rthicksconsult.com' <r@rthicksconsult.com>; 'EMNRD-OCD-District1spills@state.nm.us' <EMNRD-OCD-District1spills@state.nm.us>; 'Enviro, OCD, EMNRD' <OCD.Enviro@state.nm.us>
Cc: 'Shane McNeely' <smcneely@ameredev.com>
Subject: RE: Ameredev DeSoto Release Notification

Please accept this notification of characterization sampling at the release on **Thursday, August 13**, 2020, beginning at approximately 9:00 am MST. Please contact me at the number below if you have any questions. Thank you.

Kristin Pope, Sr. Project Geologist
R.T. Hicks Consultants
Carlsbad Field Office
(575) 302-6755
www.RTHicksConsult.com

From: r@rthicksconsult.com [mailto:r@rthicksconsult.com]
Sent: Tuesday, August 4, 2020 4:12 PM
To: EMNRD-OCD-District1spills@state.nm.us; 'Enviro, OCD, EMNRD' <OCD.Enviro@state.nm.us>
Cc: 'Shane McNeely' <smcneely@ameredev.com>; kristin@rthicksconsult.com
Subject: Ameredev DeSoto Release Notification

Sir or Madam

Please accept this as notification of a release at the DeSoto Springs Containment site of Ameredev Operating LLC. At this time we cannot determine if the release exceeded 25 bbls, thus we are notifying OCD within the 24 hour window.

Thanks you for your attention to this matter.

Randall Hicks, PG
505-238-9515 (cell)
505-266-5004
901 Rio Grande Blvd. NW
Suite F-142
Albuquerque, NM 87104

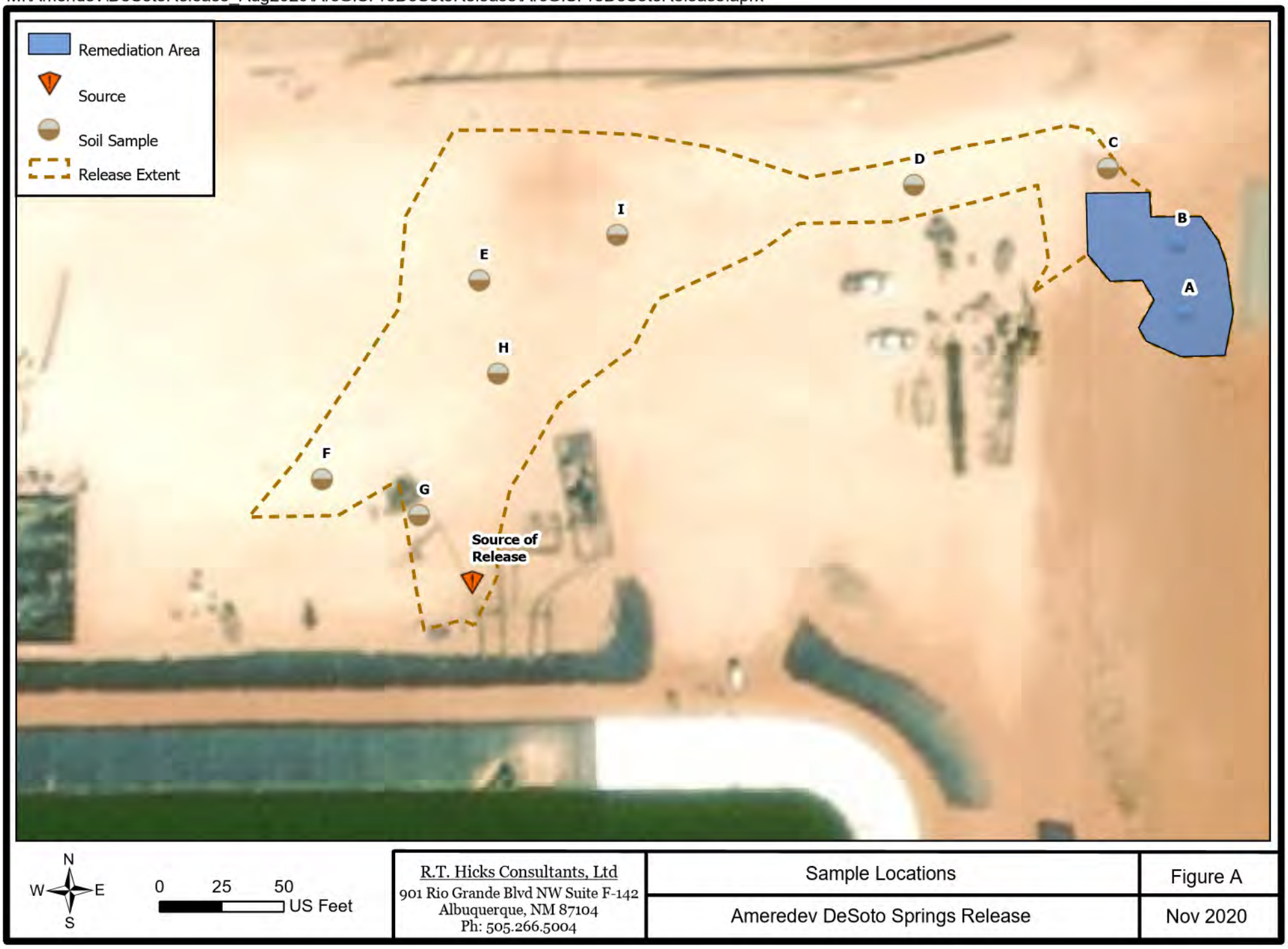
Plate 1

(Release area, sample points)

&

Delineation Photographs

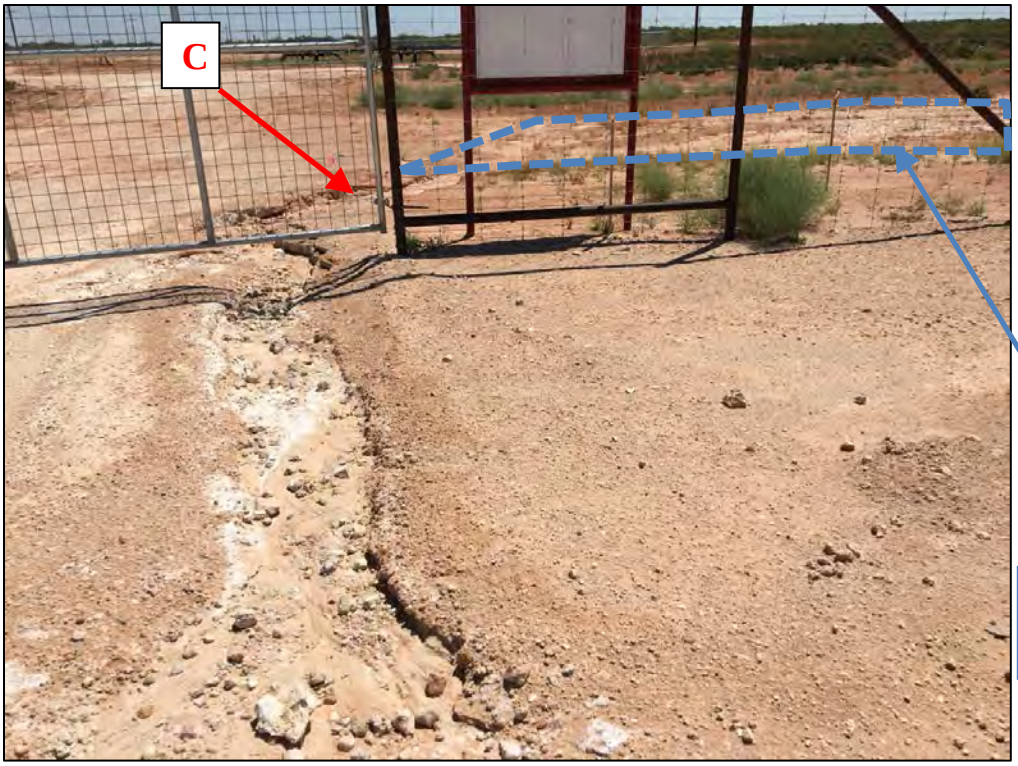
M:\Ameridev\DeSotoRelease_Aug2020\ArcGISProDeSotoRelease\ArcGISProDeSotoRelease.aprx



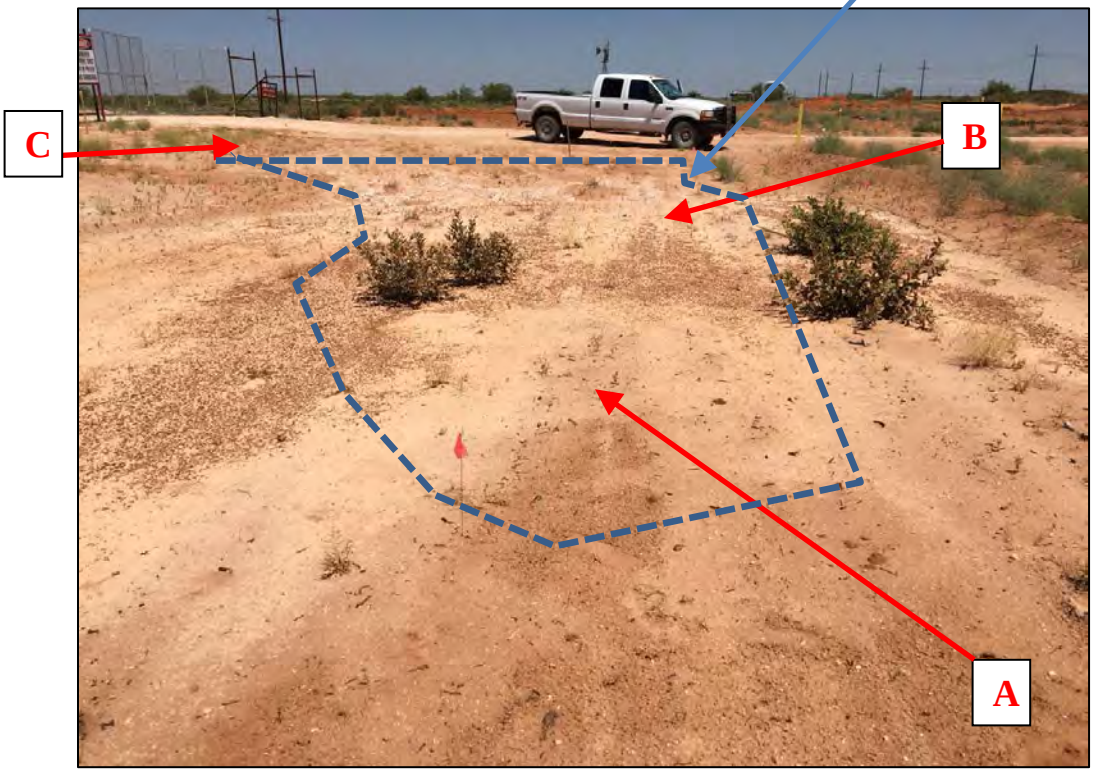
R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Sample Locations	Figure A
	Ameredev DeSoto Springs Release	Nov 2020

8/13/2020 Close-up of release origin 32.075769°, -103.281887°

8/13/2020 Northern extent of release area; view south toward release origin 32.076332°, -103.281954°



8/13/2020 Exit channel of release from location; view east toward Sample Point 'C'
32.076250°, -103.281106°



8/13/2020 Terminus of release and pooling area near Sample Point 'A'; view north
32.076044°, -103.280807°

9/10/2020 Collection of samples at Sample Point 'I'; view southwest
32.076199°, -103.281752°

9/10/2020 Backhoe delineation trenches at off-site release area; view southeast from facility gate.
32.076244°, -103.281034°

Tables 1 & 2

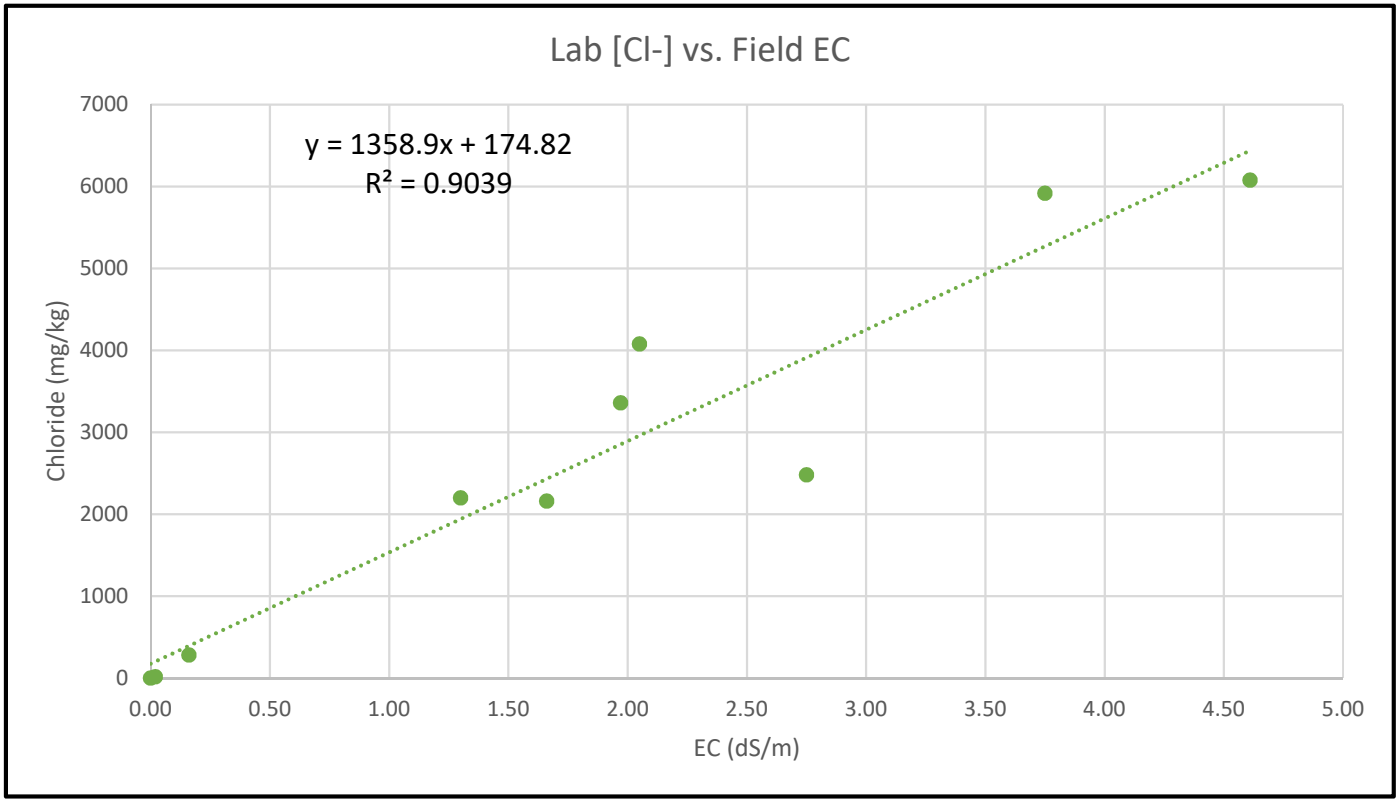
Chloride delineation data

DeSoto Springs Release (8/4/2020)

Sample ID	Date	Discrete Depth (Feet)	Top Depth (Feet)	Bottom Depth (Feet)	EC (Hanna) (dS/m)	Chloride (mg/kg)	In Use?	Comments
NMOCD Limits					Field	Lab		
0 - 4 feet & "not in-use"						600		
> 4 ft or "in-use"						20,000		
A @ 0-2 ft	8/13/2020		0.0	2.0	1.30	2200	No	pooling area
A @ 0-4 ft	9/10/2020		0.0	4.0		2200		
A @ 4.1 ft	9/10/2020	4.1			0.16	280		
A @ 5.0 ft	9/10/2020	5.0				190		
B @ 0-2 ft	8/13/2020		0.0	2.0	2.75	2480	No	narrow area of flow
B @ 0-4 ft	9/10/2020		0.0	4.0		1700		
B @ 4.1 ft	9/10/2020	4.1			0.00			
C @ 0-2 ft	8/13/2020		0.0	2.0	4.61	6080	Yes	narrow area of flow, adjacent to ramp onto location
C @ 0-4 ft	9/10/2020		0.0	4.0		860		
C @ 4.1 ft	9/10/2020	4.1			0.01			
D @ 1.5 ft	8/13/2020		0.0	1.5	2.05	4080	Yes	Location pad
D @ 0-4 ft	9/10/2020		0.0	4.0		1800		
D @ 4.1 ft	9/10/2020	4.1			0.00			
E @ 1.5 ft	8/13/2020		0.0	1.5	1.97	3360	Yes	pooling area
E @ 0-4 ft	9/10/2020		0.0	4.0		470		
E @ 4.1 ft	9/10/2020	4.1			0.00	<60		
F @ 1.0 ft	8/13/2020		0.0	1.0	1.66	2160	Yes	Location pad
F @ 0-4 ft	9/10/2020		0.0	4.0		190		
F @ 4.1 ft	9/10/2020	4.1			0.01			
G @ 1.5 ft	8/13/2020		0.0	1.5	3.75	5920	Yes	Location pad
G @ 0-4 ft	9/10/2020		0.0	4.0		680		
G @ 4.1 ft	9/10/2020	4.1			0.00			
H @ 0-4 ft	9/10/2020		0.0	4.0		580	Yes	Location pad
H @ 4.1 ft	9/10/2020	4.1			0.01			
I @ 0-4 ft	9/10/2020		0.0	4.0		680	Yes	Location pad
I @ 4.1 ft	9/10/2020	4.1			0.00			
Background	8/13/2020		0.0	2.0	0.02	16	n/a	NE of site; healthy vegetation

R.T. Hicks Consultants, Ltd. 901 Rio Grande Blvd. NW, Suite F-142 Albuquerque, New Mexico 87104	Soil Samples & Analyses	**Table 1**
	Ameredev Operating LLC	**November 2020**

Laboratory analyses of BTEX, Benzene, TPHext were also performed on samples A and E at 0-4 ft, and C and G at 0-2 ft; All concentrations are below detection limits.



Sample ID	Date	EC (Hanna) dS/m	Chloride (mg/kg)	Laboratory ID*
E @ 4.1 ft	9/10/2020	0.00	0	1
Background @ 0-2 ft	8/13/2020	0.02	16	2
A @ 4.1 ft	9/10/2020	0.16	280	1
A @ 0-2 ft	8/13/2020	1.30	2200	2
F @ 1.0 ft	8/13/2020	1.66	2160	2
E @ 1.5 ft	8/13/2020	1.97	3360	2
D @ 1.5 ft	8/13/2020	2.05	4080	2
B @ 0-2 ft	8/13/2020	2.75	2480	2
G @ 1.5 ft	8/13/2020	3.75	5920	2
C @ 0-2 ft	8/13/2020	4.61	6080	2

*Results from two laboratories are presented; Names are not included

DeSoto Springs Release

(8/4/2020)

R.T. Hicks Consultants, Ltd. 901 Rio Grande Blvd. NW, Suite F-142 Albuquerque, New Mexico 87104	Variation of EC Readings (field) vs. Chloride Concentrations (lab)	Table 2
	Ameredev Operating LLC	November 2020

Figures 1-9

Supporting site-specific description (Appendix A)

M:\Ameridev\Desoto Containment\ap_nmGIS\Figures\figure1_GeolDTW.mxd

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Depth To Water and Geology	Figure 1
	Ameredev Operating Desoto Springs Frac Pond #3	May 2018

M:\Ameridev\Desoto Containment\ap_nmGIS\Figures\figure1_LEGEND.mxd

Legend

Desoto Containment

- Area of Disturbance
- MWFM Containment

Containment Buffer

- 200 ft
- 300 ft
- 500 ft
- 1000 ft

USGS Gauging Station (DTW, Date)

Aquifer Code, Well Status

- Alluvium/Bolsom
- Alluvium/Bolsom, Site had been pumped recently.
- Chinle
- Not Defined

Misc. Water Wells (Well ID, DTW)

Well Depth (ft)

- No Data

OSE Water Wells (DTW, Date)

Well Depth (ft)

- <= 150
- 351 - 500
- 501 - 1000
- > 1000

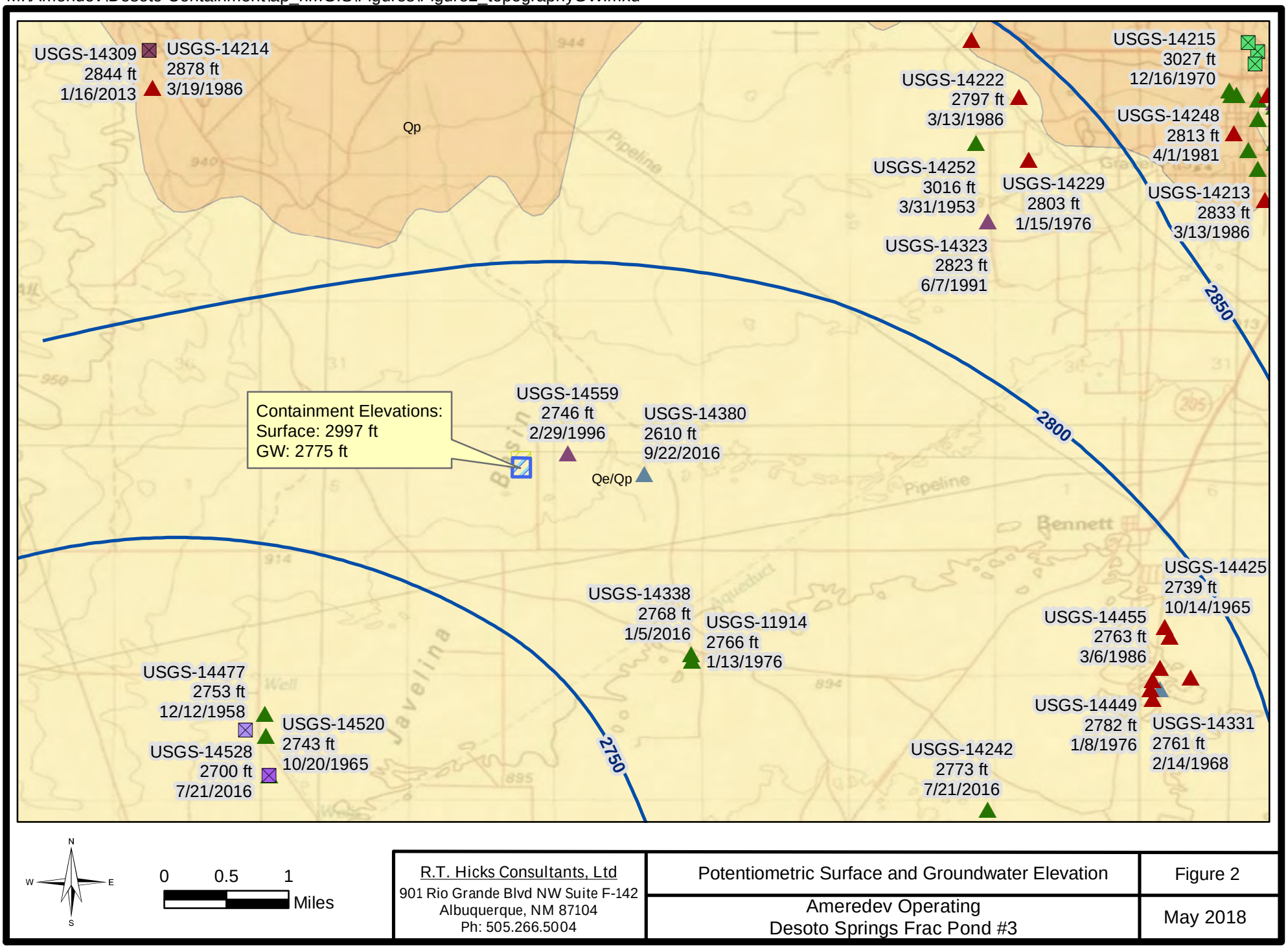
NM Geology

Map Unit, Description

- Qe/Qp, Quaternary-Eolian Piedmont Deposits
- Qp, Quaternary-Piedmont Alluvial Deposits

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Depth To Water and Geology	Figure 1 LEGEND
	Ameredev Operating Desoto Springs Frac Pond #3	May 2018

M:\Ameridev\Desoto Containment\ap_nmGIS\Figures\Figure2_topographyGW.mxd



R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Potentiometric Surface and Groundwater Elevation	Figure 2
	Ameredev Operating Desoto Springs Frac Pond #3	May 2018

M:\Ameridev\Desoto Containment\ap_nmGIS\Figures\Figure2_LEGEND.mxd

Legend

Desoto Containment

- Area of Disturbance
- MWFM Containment

Potentiometric Surface (ft msl)

Isocontours

- Isocontour

USGS Gauging Station (GW Elev, Date)

Aquifer Code, Well Status

- Alluvium/Bolsom
- 110AVMB, Nearby site that taps the same aquifer had been pumped recently.
- 110AVMB, Nearby site that taps the same aquifer was being pumped.
- Alluvium/Bolsom, Site had been pumped recently.
- Chinle
- Chinle, Site was being pumped.
- Santa Rosa
- Not Defined

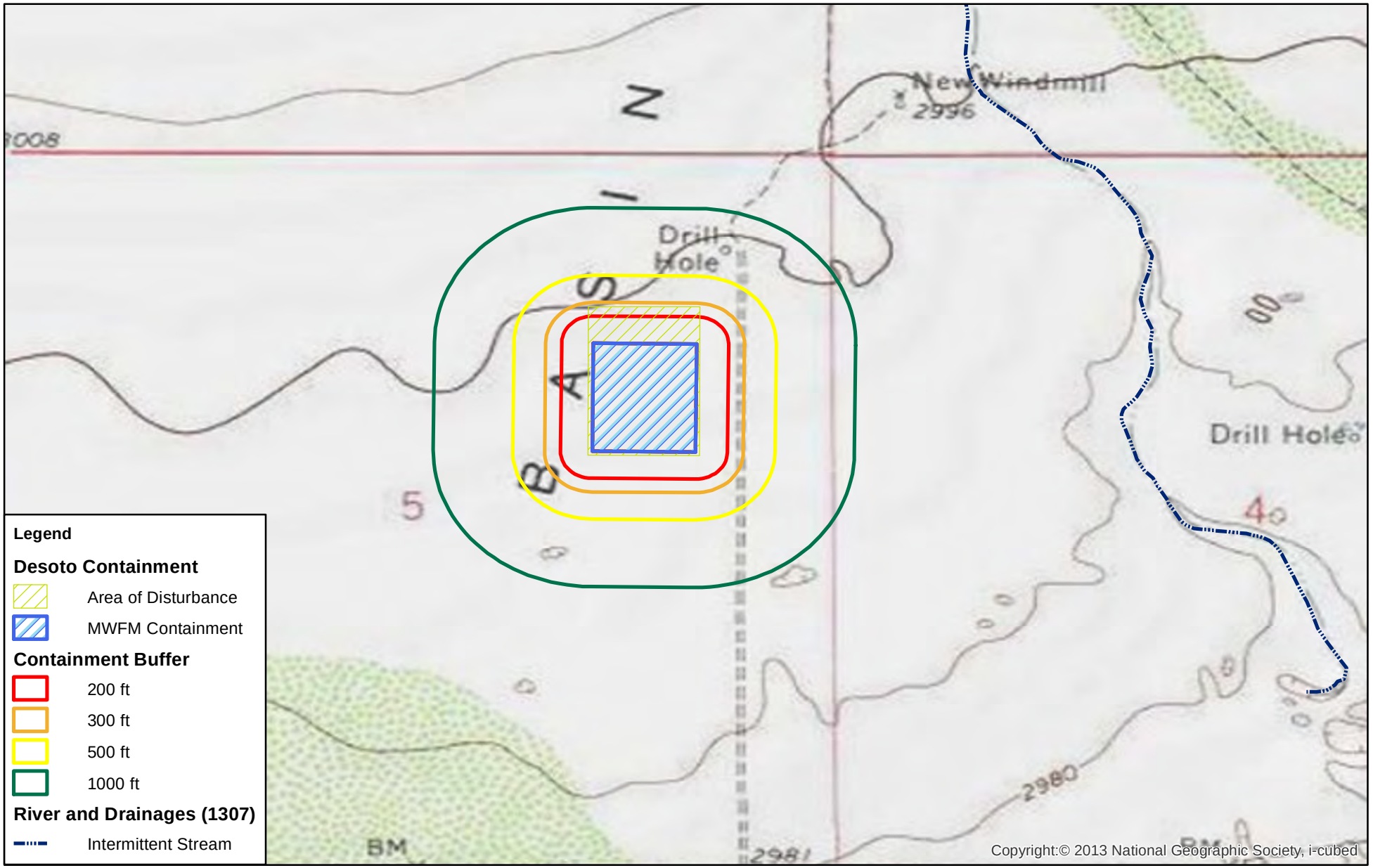
NM Geology

Map Unit, Description

- Qe/Qp, Quaternary-Eolian Piedmont Deposits
- Qp, Quaternary-Piedmont Alluvial Deposits

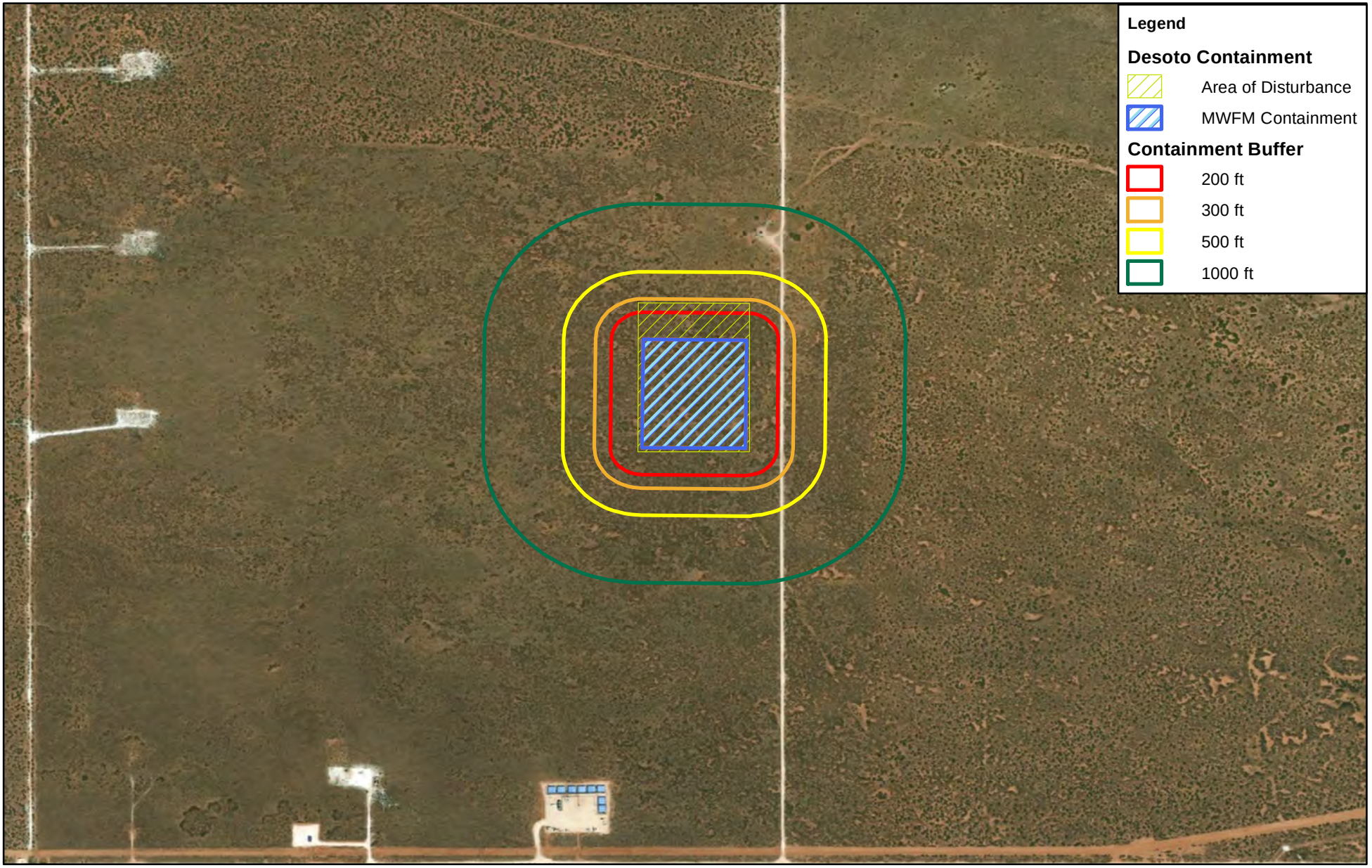
R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Potentiometric Surface and Groundwater Elevation	Figure 2 LEGEND
	Ameredev Operating Desoto Springs Frac Pond #3	May 2018

M:\Ameridev\Desoto Containment\ap_nmGIS\Figures\figure3_SurfaceWater.mxd



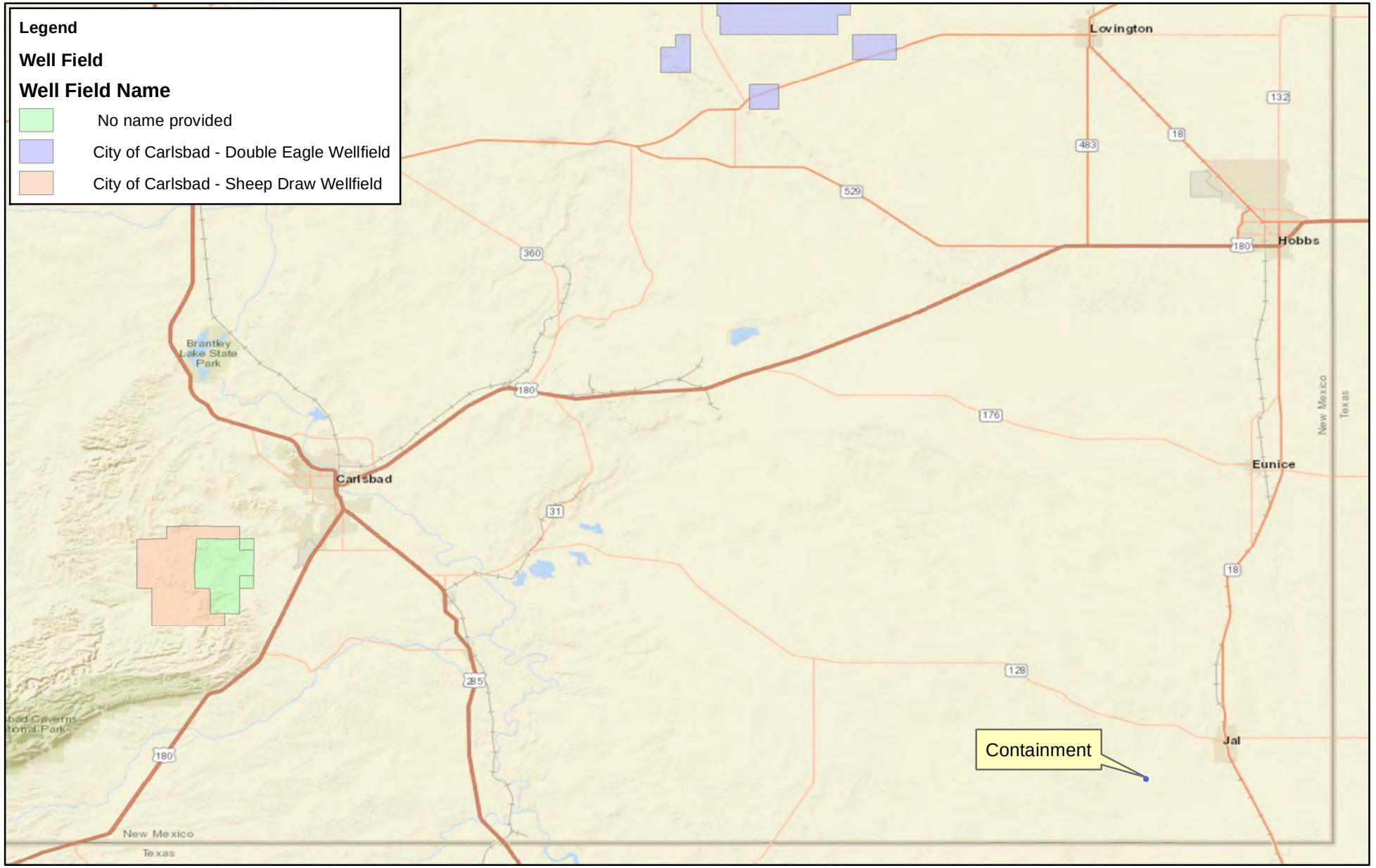
R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Surface Water and Topography	Figure 3
	Ameredev Operating Desoto Springs Frac Pond #3	May 2018

M:\Ameridev\Desoto Containment\ap_nmGIS\Figures\figure4_NearbyStructures.mxd



R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Nearby Structures	Figure 4
	Ameredev Operating Desoto Springs Frac Pond #3	May 2018

M:\Ameridev\Desoto Containment\ap_nmGIS\Figures\figure5_wellFields.mxd



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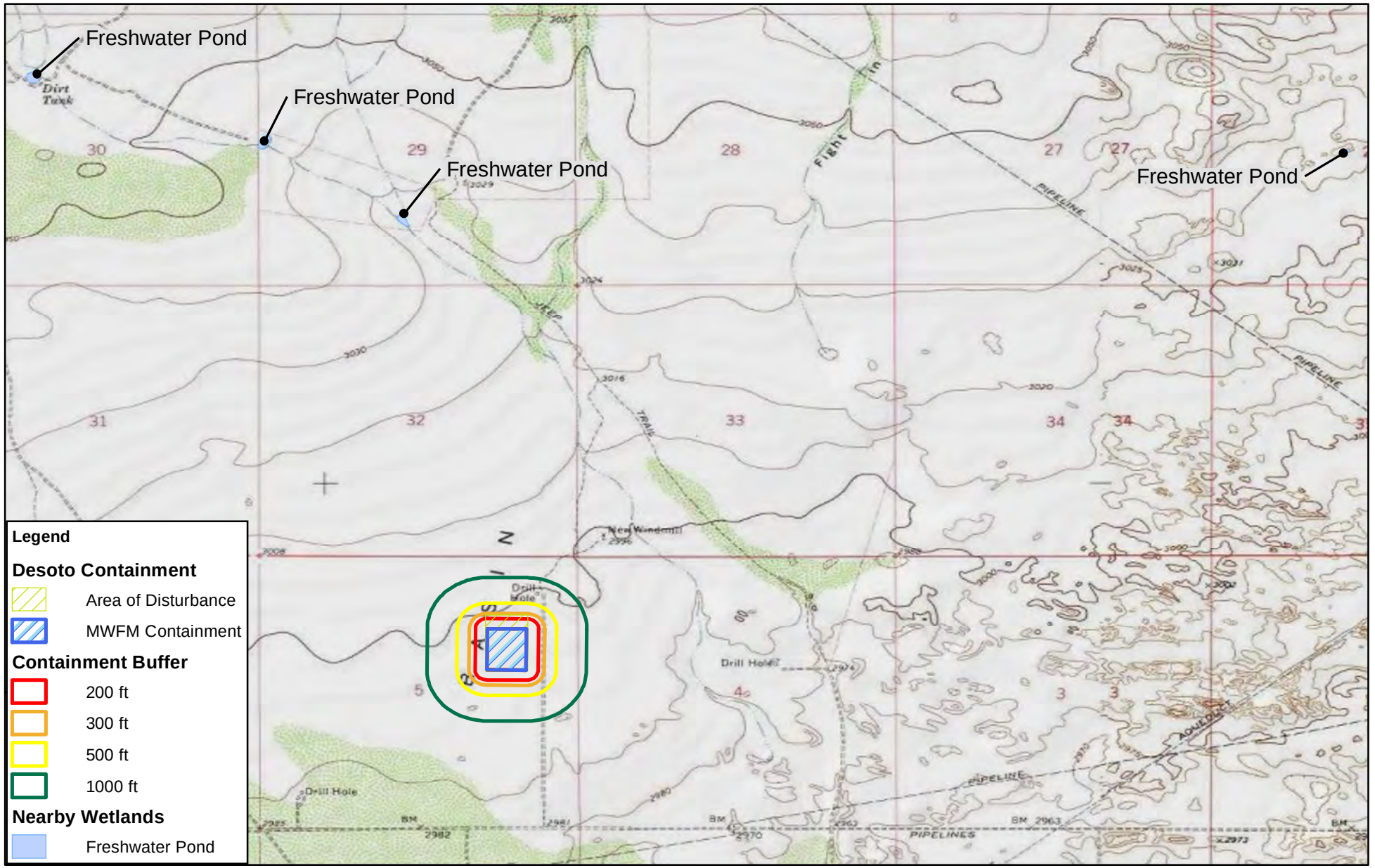
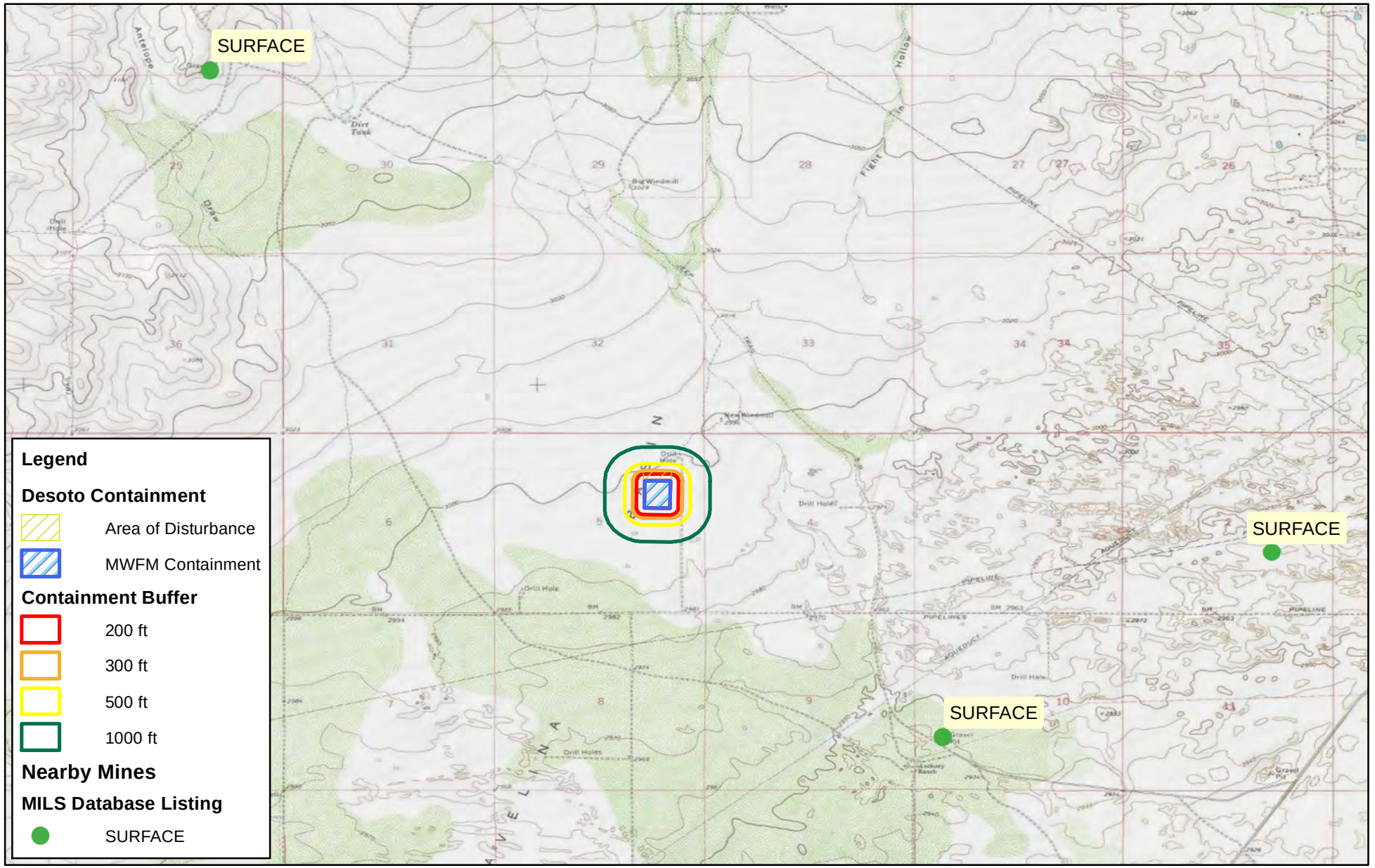
R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Nearby Municipalities and Well Fields	Figure 5
	Ameredev Operating Desoto Springs Frac Pond #3	May 2018

M:\Ameridev\Desoto Containment\ap_nmGIS\Figures\figure6_wetlands.mxd



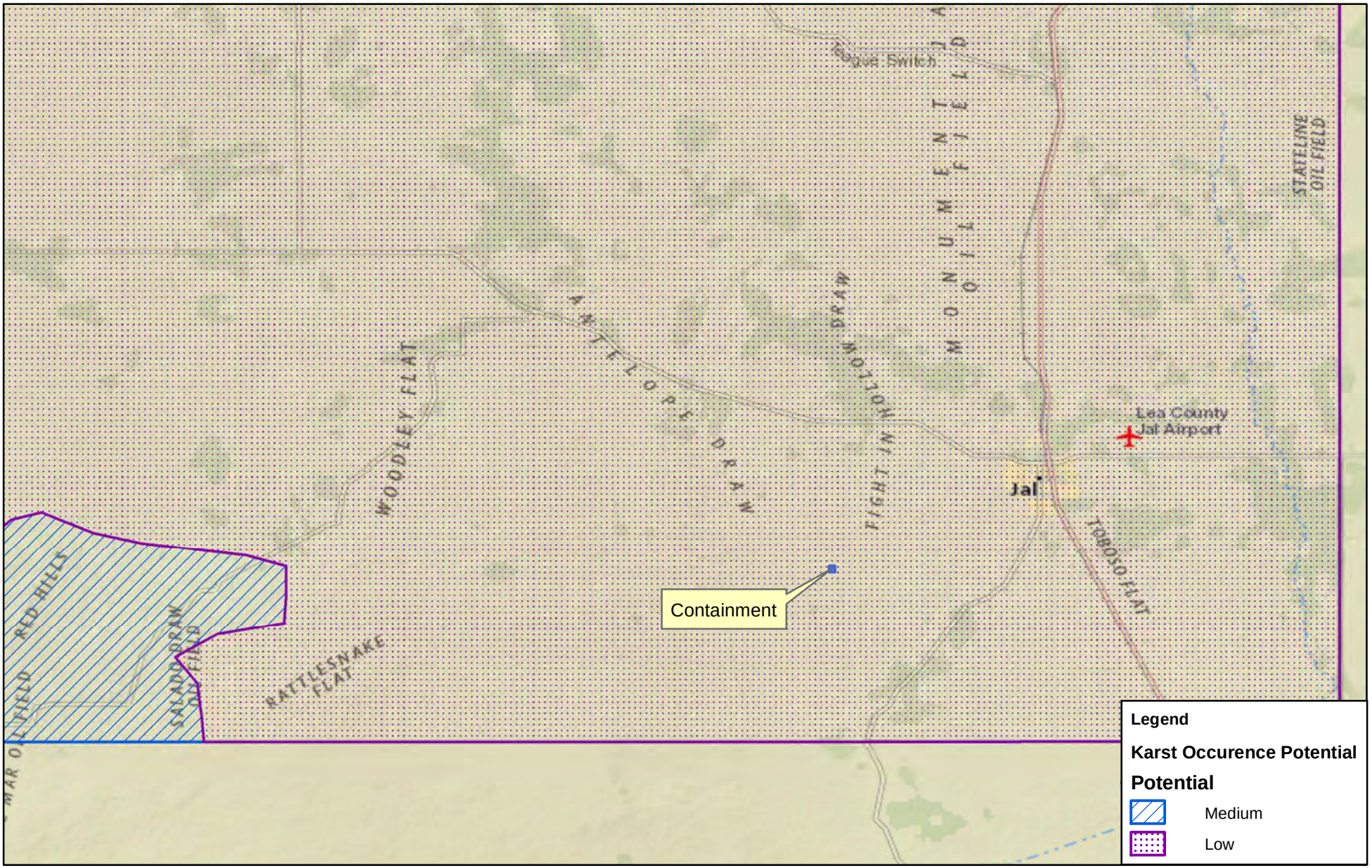
R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Nearby Wetlands	Figure 6
	Ameredev Operating Desoto Springs Frac Pond #3	May 2018

M:\Ameridev\Desoto Containment\ap_nmGIS\Figures\figure7_minesMinerals.mxd



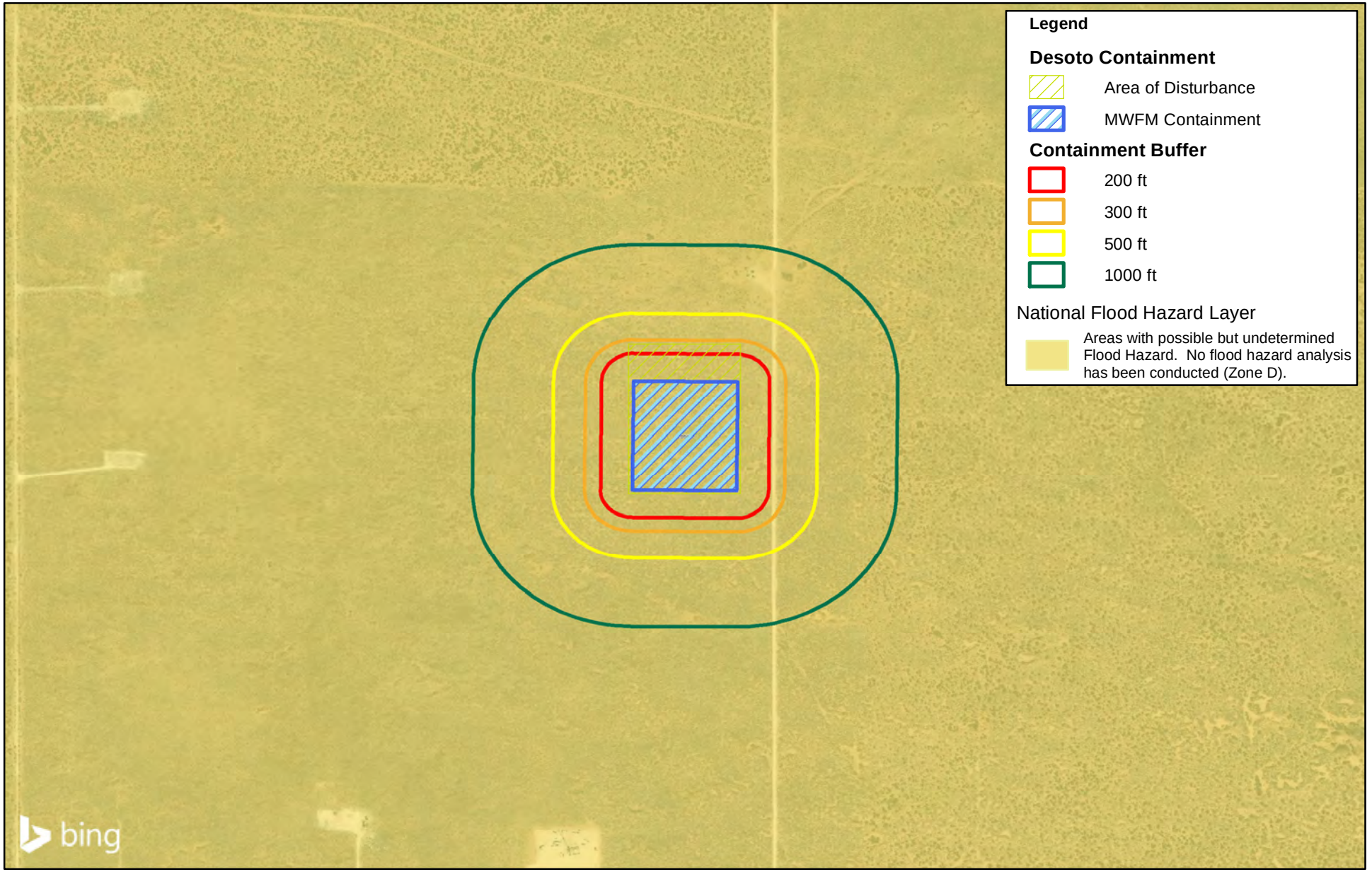
R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Nearby Mines and Minerals	Figure 7
	Ameredev Operating Desoto Springs Frac Pond #3	May 2018

M:\Ameridev\Desoto Containment\ap_nmGIS\Figures\figure8_karstPotential.mxd



R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Karst Potential	Figure 8
	Ameredev Operating Desoto Springs Frac Pond #3	May 2018

M:\Ameridev\Desoto Containment\ap_nmGIS\Figures\figure9_femaFlood.mxd



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Feet

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	FEMA Flood Map	Figure 9
	Ameredev Operating Desoto Springs Frac Pond #3	May 2018

Appendix A

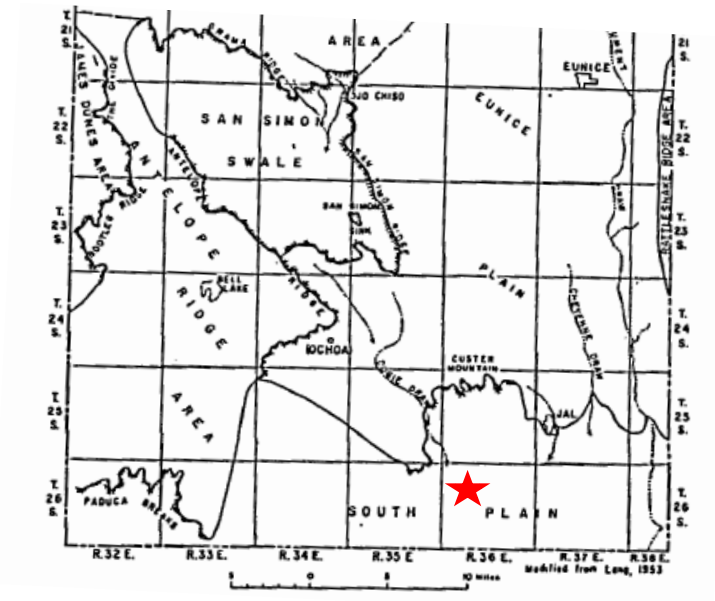
Site-Specific Description of Siting Assessment Criteria

Geologic Setting of the Regional Fresh-Water Bearing Formations

The Ogallala and associated alluvial aquifers are the primary groundwater source in the area of the DeSoto Containment. All of water wells within the area of the containment that were measured by the USGS are considered "Alluvium" by the agency (see Figures 1 and 2). . Drillers and other experts, however, may consider the producing strata equivalent to the Ogallala. Driller's logs of several of these wells suggest the water-bearing zone of the deeper wells (500-600 feet) tap the basal conglomerate of the Ogallala.

Groundwater in the area within the area is also found in in Mesozoic and Cenozoic Era rocks. The oldest of these are the Triassic age Dockum Group. They consist of conglomerates, cross-bedded sandstones, claystones, and siltstones that were deposited in a continental fluvial environment over the evaporites of the late Permian Ochoan Series, which had filled the Delaware Basin by that time. In much of the South Plain area, the Dockum Group (aka Chinle) is a secondary groundwater zone relative to the Ogallala.

Any Jurassic or Cretaceous age rocks that were deposited above the Triassic have subsequently been removed by erosion leaving an irregular surface on the Triassic rocks. Cenozoic Era rocks in the area consist of the Tertiary age Ogallala Formation and Quaternary age eolian and piedmont deposits. The Ogallala Formation consists of terrestrial sediments (sand with some clay, silt and gravel) that were deposited on the Triassic age rocks. The Quaternary deposits are generally thin veneers over the Ogallala in this area, except in larger drainages, such as Monument Draw.



Distance to Groundwater

Figure 1, Figure 2, and the discussion presented below demonstrates that the depth to the groundwater surface at the location is approximately 222 feet.

Figure 1 is an area geologic base map that depicts regional topography and includes the water wells located nearest to the containment site for which information is available, regardless of how comprehensive or useful. It also shows:

1. The location of the containment in the northeast quarter of Section 5 within an area mapped as Quaternary eolian/piedmont deposits.
2. Water wells from the USGS database as color-coded triangles that indicate the producing aquifer (see Legend).
3. Water wells from the New Mexico Office of the State Engineer (OSE) database as a small blue triangle inside a colored circle that indicates the well depth (see Legend). Please note, OSE wells are often miss-located in the WATERS database as older wells are plotted in the center of the quarter, quarter, quarter, of the Section Township and Range. Topographic maps and/or aerial photographs verified many of the OSE well locations included on this map.
4. Water wells, which are not documented in the public databases but were identified by field inspection or other published reports are shown as a dot inside a color-coded (depth) square.
5. Depth to water and gauging dates from the most recent and reliable measurement for each well is provided adjacent to the well symbol. It should be noted that in most cases the depth to water provided by the OSE database are from drillers log notes estimated at the time of completion, rather than actual field measurements.
6. Based upon the information discussed below, the 80-foot depth to water measurement associated with CP-00938, located about 1 mile northeast of the containment, is erroneous and is probably the depth to drilling mud in the boring at completion of the well. Evidence suggests that the USGS measured a depth to water of 379 feet at this well in 2016 (USGS well 14380), which is about 0.75 miles east of the containment. This active windmill is not shown on the 2005 Google Earth image but is obvious in the 2008 image and therefore corresponds to the drilling date provided on the driller's log in Appendix F. There is no evidence of a well on Google Earth at the location shown on the OSE database for CP-00938.
7. The driller's log for Well CP-01446, about 1 mile east of the containment, shows a total depth of 5,000 feet and contains a detailed mud log. This well is an open hole completion in dolomite from 3632 to 4975 feet below surface. This well appears to be a Capitan Reef test well.

Figure 2 is a regional geologic base map that depicts the potentiometric surface contours of the shallow-most aquifer surrounding the site. The potentiometric contours are labeled in feet above sea level (ASL). The water wells plotted include only the USGS database and published report water wells from Figure 1 for which a reliable depth to water measurement has been recorded. Figure 2 also shows:

1. The location of the containment as a blue rectangle
2. Groundwater elevations and gauging dates from the most recent available static water level measurement for each well.
3. USGS well 14559 shown east of the containment is mis-located. This USGS well could be well CP-00857, which is located 504 feet north of the northeast corner of the recycling

facility and containment or an abandoned windmill located 1500 feet northeast of CP-00857 that is shown on Google Earth.

4. USGS well 14380 also appears slightly mis-located. As mentioned above, we believe this USGS well is the active windmill about 1-mile east of CP-0057 on Google Earth.

Site Geology

The containment is located on what is mapped as Quaternary Age eolian and piedmont deposits (Qe/Qp on Figure 1). Aeolian deposits are fine-grained sands in vegetated low dunes that cover most of Section 5. Regional evidence suggests that these dunes are 5-10 feet thick and underlain by caliche.

Water Table Elevation and Depth to Groundwater

A large number of depth to groundwater measurements are presented in Figure 2. These data provide a very good estimate of the groundwater elevation in the area (see Figure 2). Figure 2 uses only data from the USGS.

Based on the potentiometric surface contours created using the available measurements from surrounding wells (Figure 2), we conclude that the groundwater elevation at the containment site is approximately 2,775 feet ASL. With a surface elevation of 2,997 feet ASL, the depth to groundwater below the containment floor should be approximately 222 feet.

Distance to Surface Water

Figure 3 and the site visit demonstrates that the location is not within 300 feet of a continuously flowing watercourse, or within 200 feet of any other significant watercourse, lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).
No continuously flowing watercourses exist within 300 feet of the location. The nearest surface feature is an intermittent stream located about ½ mile to the east (Figure 3). Note that Figure 3 shows the "New Windmill" northeast of the containment, which is the abandoned windmill discussed in the previous section of this submittal.

Stabilized dune fields, like that which characterizes the location and much of the surrounding area, are seldom characterized by well-defined drainage patterns and that is the case in the area shown in Figure 3.

Distance to Permanent Residence or Structures

Figure 4 and the site visit demonstrates that the location is not within 300 feet from a permanent residence, school, hospital, institution, church, or other structure in existence at the time of initial application.

Distance to Non-Public Water Supply

Figures 1 and 2, and 3 demonstrate that the location is not within 500 feet of a spring or fresh water well used for domestic or stock watering purposes in existence at the time of the initial registration;.

- Figure 1 shows that the closest fresh water well is about 700 feet north of the containment

- Figure 3 shows that no springs are identified within the mapping area and the field survey identified no evidence of springs.

Distance to Municipal Boundaries and Fresh Water Fields

Figure 5 demonstrates that the location is not within incorporated municipal boundaries or defined municipal fresh water well fields covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended.

- The closest municipality is Jal, NM approximately 7 miles to the northeast.
- The closest public well field is located west of Carlsbad or north of Maljamar

Distance to Wetlands

Figure 6 and the site visit demonstrates the location is not within 500 feet of wetlands.

- The nearest designated wetlands are about 1.5 miles north of the site and are considered freshwater ponds
- The site inspection identified no evidence of wetlands in the general area

Distance to Subsurface Mines

Figure 7 and our general reconnaissance of the area demonstrate that the nearest mine is caliche pit.

- Figure 7 show the nearest caliche pit about 2 miles southeast of the containment

Distance to High or Critical Karst Areas

Figure 8 shows the location of the temporary pit with respect BLM Karst areas

- The release area is located within a “low” potential karst area.
- The nearest moderate potential karst area is located approximately 12 miles west of the site.
- We saw no evidence of unstable ground near the containment location during the site inspection.

Distance to 100-Year Floodplain

Figure 9 demonstrates that the location is within an area that has not yet been mapped by the Federal Emergency Management Agency with respect to the Flood Insurance Rate 100-Year Floodplain.

- Areas that are not mapped are designated as “Undetermined Flood Hazard” and are generally considered minimal flood risk.
- Our field inspection and examination of the topography permit a conclusion that the location is not within any floodplain.

Appendix B
Laboratory Reports

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: clients.hallenvironmental.com

October 01, 2020

Kristin Pope

R.T. Hicks Consultants, LTD
901 Rio Grande Blvd. NW
Suite F-142
Albuquerque, NM 87104
TEL: (505) 266-5004
FAX: (505) 266-0745

RE: Ameredev- DeSoto Release OrderNo.: 2009B90

Dear Kristin Pope:

Hall Environmental Analysis Laboratory received 12 sample(s) on 9/19/2020 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **2009B90**
Date Reported: **10/1/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: R.T. Hicks Consultants, LTD
Client Sample ID: A @ 0-4 ft
Project: Ameredev- DeSoto Release
Collection Date: 9/10/2020 9:59:00 AM
Lab ID: 2009B90-001 **Matrix:** SOIL **Received Date:** 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	2200	60		mg/Kg	20	9/28/2020 9:34:42 PM	55496
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/23/2020 5:29:00 AM	55331
Surr: BFB	102	70-130		%Rec	1	9/23/2020 5:29:00 AM	55331
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	9/23/2020 4:13:27 PM	55347
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	9/23/2020 4:13:27 PM	55347
Surr: DNOP	81.0	30.4-154		%Rec	1	9/23/2020 4:13:27 PM	55347
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**	
Benzene	ND	0.024		mg/Kg	1	9/23/2020 5:29:00 AM	55331
Toluene	ND	0.049		mg/Kg	1	9/23/2020 5:29:00 AM	55331
Ethylbenzene	ND	0.049		mg/Kg	1	9/23/2020 5:29:00 AM	55331
Xylenes, Total	ND	0.098		mg/Kg	1	9/23/2020 5:29:00 AM	55331
Surr: 1,2-Dichloroethane-d4	88.6	70-130		%Rec	1	9/23/2020 5:29:00 AM	55331
Surr: 4-Bromofluorobenzene	99.2	70-130		%Rec	1	9/23/2020 5:29:00 AM	55331
Surr: Dibromofluoromethane	104	70-130		%Rec	1	9/23/2020 5:29:00 AM	55331
Surr: Toluene-d8	98.0	70-130		%Rec	1	9/23/2020 5:29:00 AM	55331

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B90**
Date Reported: **10/1/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: R.T. Hicks Consultants, LTD
Client Sample ID: B @ 0-4 ft
Project: Ameredev- DeSoto Release
Collection Date: 9/10/2020 9:55:00 AM
Lab ID: 2009B90-002 **Matrix:** SOIL **Received Date:** 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	1700	59		mg/Kg	20	9/28/2020 9:47:06 PM	55496

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B90**
Date Reported: **10/1/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: R.T. Hicks Consultants, LTD
Client Sample ID: C @ 0-4 ft
Project: Ameredev- DeSoto Release
Collection Date: 9/10/2020 9:50:00 AM
Lab ID: 2009B90-003 **Matrix:** SOIL **Received Date:** 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	860	59		mg/Kg	20	9/28/2020 9:59:31 PM	55496

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B90**
Date Reported: **10/1/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: R.T. Hicks Consultants, LTD
Client Sample ID: D @ 0-4 ft
Project: Ameredev- DeSoto Release
Collection Date: 9/10/2020 10:05:00 AM
Lab ID: 2009B90-004 **Matrix:** SOIL **Received Date:** 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	1800	60		mg/Kg	20	9/28/2020 10:11:56 PM	55496

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B90**
Date Reported: **10/1/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: R.T. Hicks Consultants, LTD
Client Sample ID: E @ 0-4 ft
Project: Ameredev- DeSoto Release
Collection Date: 9/10/2020 10:10:00 AM
Lab ID: 2009B90-005 **Matrix:** SOIL **Received Date:** 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	470	60		mg/Kg	20	9/28/2020 10:49:10 PM	55496
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/23/2020 5:57:53 AM	55331
Surr: BFB	103	70-130		%Rec	1	9/23/2020 5:57:53 AM	55331
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	9/23/2020 4:23:15 PM	55347
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/23/2020 4:23:15 PM	55347
Surr: DNOP	82.8	30.4-154		%Rec	1	9/23/2020 4:23:15 PM	55347
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**	
Benzene	ND	0.025		mg/Kg	1	9/23/2020 5:57:53 AM	55331
Toluene	ND	0.049		mg/Kg	1	9/23/2020 5:57:53 AM	55331
Ethylbenzene	ND	0.049		mg/Kg	1	9/23/2020 5:57:53 AM	55331
Xylenes, Total	ND	0.098		mg/Kg	1	9/23/2020 5:57:53 AM	55331
Surr: 1,2-Dichloroethane-d4	87.9	70-130		%Rec	1	9/23/2020 5:57:53 AM	55331
Surr: 4-Bromofluorobenzene	99.8	70-130		%Rec	1	9/23/2020 5:57:53 AM	55331
Surr: Dibromofluoromethane	104	70-130		%Rec	1	9/23/2020 5:57:53 AM	55331
Surr: Toluene-d8	100	70-130		%Rec	1	9/23/2020 5:57:53 AM	55331

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B90**
Date Reported: **10/1/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: R.T. Hicks Consultants, LTD
Client Sample ID: F @ 0-4 ft
Project: Ameredev- DeSoto Release
Collection Date: 9/10/2020 10:14:00 AM
Lab ID: 2009B90-006 **Matrix:** SOIL **Received Date:** 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	190	60		mg/Kg	20	9/28/2020 11:01:35 PM	55496

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B90**
Date Reported: **10/1/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: R.T. Hicks Consultants, LTD
Client Sample ID: G @ 0-4 ft
Project: Ameredev- DeSoto Release
Collection Date: 9/10/2020 10:17:00 AM
Lab ID: 2009B90-007 **Matrix:** SOIL **Received Date:** 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	680	60		mg/Kg	20	9/28/2020 11:13:59 PM	55496

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B90**
Date Reported: **10/1/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: R.T. Hicks Consultants, LTD
Client Sample ID: H @ 0-4 ft
Project: Ameredev- DeSoto Release
Collection Date: 9/10/2020 10:25:00 AM
Lab ID: 2009B90-008 **Matrix:** SOIL **Received Date:** 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	580	60		mg/Kg	20	9/28/2020 11:26:24 PM	55496

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B90**
Date Reported: **10/1/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: R.T. Hicks Consultants, LTD
Client Sample ID: I @ 0-4 ft
Project: Ameredev- DeSoto Release
Collection Date: 9/10/2020 10:34:00 AM
Lab ID: 2009B90-009 **Matrix:** SOIL **Received Date:** 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	680	60		mg/Kg	20	9/28/2020 11:38:48 PM	55496

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B90**
Date Reported: **10/1/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: R.T. Hicks Consultants, LTD
Client Sample ID: E @ 4.1 ft
Project: Ameredev- DeSoto Release
Collection Date: 9/10/2020 10:10:00 AM
Lab ID: 2009B90-010 **Matrix:** SOIL
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	ND	60		mg/Kg	20	9/28/2020 11:51:13 PM	55496

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B90**
Date Reported: **10/1/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: R.T. Hicks Consultants, LTD
Client Sample ID: A @ 4.1 ft
Project: Ameredev- DeSoto Release
Collection Date: 9/10/2020 9:59:00 AM
Lab ID: 2009B90-011 **Matrix:** SOIL **Received Date:** 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	280	60		mg/Kg	20	9/29/2020 1:32:26 PM	55518

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B90**
Date Reported: **10/1/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: R.T. Hicks Consultants, LTD
Client Sample ID: A @ 5.0 ft
Project: Ameredev- DeSoto Release
Collection Date: 9/10/2020 10:40:00 AM
Lab ID: 2009B90-012 **Matrix:** SOIL **Received Date:** 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	190	60		mg/Kg	20	9/29/2020 2:09:39 PM	55518

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2009B90**
01-Oct-20

Client: R.T. Hicks Consultants, LTD
Project: Ameredev- DeSoto Release

Sample ID: **MB-55496** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **55496** RunNo: **72226**
Prep Date: **9/28/2020** Analysis Date: **9/28/2020** SeqNo: **2532664** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-55496** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **55496** RunNo: **72226**
Prep Date: **9/28/2020** Analysis Date: **9/28/2020** SeqNo: **2532665** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	95.6	90	110			

Sample ID: **MB-55518** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **55518** RunNo: **72231**
Prep Date: **9/29/2020** Analysis Date: **9/29/2020** SeqNo: **2534523** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-55518** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **55518** RunNo: **72231**
Prep Date: **9/29/2020** Analysis Date: **9/29/2020** SeqNo: **2534524** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	96.3	90	110			

Sample ID: **MB-55518** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **55518** RunNo: **72232**
Prep Date: **9/29/2020** Analysis Date: **9/29/2020** SeqNo: **2534647** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-55518** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **55518** RunNo: **72232**
Prep Date: **9/29/2020** Analysis Date: **9/29/2020** SeqNo: **2534648** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	96.0	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2009B90**

01-Oct-20

Client: R.T. Hicks Consultants, LTD

Project: Ameredev- DeSoto Release

Sample ID: **LCS-55347**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **55347**	RunNo: **72066**
Prep Date: **9/22/2020**	Analysis Date: **9/23/2020**	SeqNo: **2527106** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	53	10	50.00	0	106	70	130			
Surr: DNOP	5.3		5.000		106	30.4	154			

Sample ID: **MB-55347**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **55347**	RunNo: **72066**
Prep Date: **9/22/2020**	Analysis Date: **9/23/2020**	SeqNo: **2527109** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	11		10.00		113	30.4	154			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2009B90**
01-Oct-20

Client: R.T. Hicks Consultants, LTD
Project: Ameredev- DeSoto Release

Sample ID: **lcs-55331** SampType: **LCS4** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **BatchQC** Batch ID: **55331** RunNo: **72064**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2524709** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.97	0.025	1.000	0	96.9	80	120			
Toluene	1.0	0.050	1.000	0	102	80	120			
Ethylbenzene	1.0	0.050	1.000	0	101	80	120			
Xylenes, Total	3.1	0.10	3.000	0	104	80	120			
Surr: 1,2-Dichloroethane-d4	0.42		0.5000		85.0	70	130			
Surr: 4-Bromofluorobenzene	0.50		0.5000		99.5	70	130			
Surr: Dibromofluoromethane	0.50		0.5000		101	70	130			
Surr: Toluene-d8	0.48		0.5000		96.3	70	130			

Sample ID: **mb-55331** SampType: **MBLK** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **PBS** Batch ID: **55331** RunNo: **72064**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2524710** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 1,2-Dichloroethane-d4	0.43		0.5000		86.1	70	130			
Surr: 4-Bromofluorobenzene	0.50		0.5000		99.7	70	130			
Surr: Dibromofluoromethane	0.53		0.5000		106	70	130			
Surr: Toluene-d8	0.50		0.5000		99.6	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2009B90**

01-Oct-20

Client: R.T. Hicks Consultants, LTD

Project: Ameredev- DeSoto Release

Sample ID: **lcs-55331** SampType: **LCS** TestCode: **EPA Method 8015D Mod: Gasoline Range**

Client ID: **LCSS** Batch ID: **55331** RunNo: **72064**

Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2524727** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	20	5.0	25.00	0	79.6	70	130			
Surr: BFB	510		500.0		102	70	130			

Sample ID: **mb-55331** SampType: **MBLK** TestCode: **EPA Method 8015D Mod: Gasoline Range**

Client ID: **PBS** Batch ID: **55331** RunNo: **72064**

Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2524728** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	520		500.0		105	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: clients.hallenvironmental.com

Sample Log-In Check List

Client Name: R.T. Hicks Consultants, LTD Work Order Number: 2009B90 RcptNo: 1

Received By: **Emily Mocho** 9/19/2020 7:30:00 AM

Completed By: **Juan Rojas** 9/21/2020 10:09:22 AM

Reviewed By: EM 9/21/20

Chain of Custody

1. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2. How was the sample delivered?	Courier		

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. Received at least 1 vial with headspace <1/4" for AQ VOA?	Yes ☐	No ☐	NA ☑
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: SPA 9.21.20

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.7	Good				

Chain-of-Custody Record

Client: R.T. Hicks Consultants

901 Rio Grande Blvd NW, Suite F-142
Mailing Address:

Albuquerque, NM 87104

Phone #: 505-266-5004

email or Fax#: R@rthicksconsult.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush

Project Name:
Ameredev - DeSoto Release

Project #:

Project Manager:
Kristin Pope

Sampler: Kristin Pope
On Ice: ☒ Yes ☐ No
# of Coolers: 1
Cooler Temp(including CF): 0.8-0.1=0.7

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time (KP)	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2009390	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	(Cl, F, Br, NO_3, NO_2, PO_4, SO_4)	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
0959	9/10/20	soil	A @ 0-4 ft	1 glass	ice	-001	X	X					X			
0955			B @ 0-4 ft			-002							X			
0950			C @ 0-4 ft			-003							X			
1005			D @ 0-4 ft			-004							X			
1010			E @ 0-4 ft			-005	X	X					X			
1014			F @ 0-4 ft			-006							X			
1017			G @ 0-4 ft			-007							X			
1025			H @ 0-4 ft			-008							X			
1034			I @ 0-4 ft			-009							X			
1010			E @ 4.1 ft			-010	KP						X			
0959			A @ 4.1 ft			-011							X			
1040			A @ 5.0 ft			-012							X			

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
9/18/20	1430	Kristin Pope			9/18/20	1430
9/18/20	1900		EM	courier	9/19/20	7:30

Remarks: email to kristin@rthicksconsult.com

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

August 26, 2020

KRISTIN POPE

R T HICKS CONSULTANTS

901 RIO GRANDE BLVD SUITE F-142

ALBUQUERQUE, NM 87104

RE: DE SOTO RELEASE

Enclosed are the results of analyses for samples received by the laboratory on 08/20/20 11:35.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-20-13. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

R T HICKS CONSULTANTS
KRISTIN POPE
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104
Fax To: NONE

Received:	08/20/2020	Sampling Date:	08/13/2020
Reported:	08/26/2020	Sampling Type:	Soil
Project Name:	DE SOTO RELEASE	Sampling Condition:	Cool & Intact
Project Number:	RECYCLING FACILITY	Sample Received By:	Tamara Oldaker
Project Location:	AMEREDEV		

Sample ID: A @ 0-2' (H002190-01)

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2200**	16.0	08/21/2020	ND	416	104	400	0.00	

Sample ID: B @ 0-2' (H002190-02)

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2480**	16.0	08/21/2020	ND	416	104	400	0.00	

Sample ID: C @ 0-2' (H002190-03)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	08/21/2020	ND	2.09	105	2.00	1.71	
Toluene*	<0.050	0.050	08/21/2020	ND	2.07	104	2.00	1.77	
Ethylbenzene*	<0.050	0.050	08/21/2020	ND	2.06	103	2.00	1.48	
Total Xylenes*	<0.150	0.150	08/21/2020	ND	5.97	99.5	6.00	1.61	
Total BTEX	<0.300	0.300	08/21/2020	ND					

Surrogate: 4-Bromofluorobenzene (PID *98.2 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**6080**	16.0	08/21/2020	ND	416	104	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

R T HICKS CONSULTANTS
KRISTIN POPE
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104
Fax To: NONE

Received:	08/20/2020	Sampling Date:	08/13/2020
Reported:	08/26/2020	Sampling Type:	Soil
Project Name:	DE SOTO RELEASE	Sampling Condition:	Cool & Intact
Project Number:	RECYCLING FACILITY	Sample Received By:	Tamara Oldaker
Project Location:	AMEREDEV		

Sample ID: C @ 0-2' (H002190-03)

TPH 8015M **mg/kg** **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	08/24/2020	ND	183	91.6	200	6.67	
DRO >C10-C28*	<10.0	10.0	08/24/2020	ND	182	91.0	200	5.19	
EXT DRO >C28-C36	<10.0	10.0	08/24/2020	ND					

Surrogate: 1-Chlorooctane	*90.0 %*	*44.3-144*
Surrogate: 1-Chlorooctadecane	*94.4 %*	*42.2-156*

Sample ID: BACKGROUND @ 0-2' (H002190-04)

Chloride, SM4500Cl-B **mg/kg** **Analyzed By: AC**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**16.0**	16.0	08/21/2020	ND	416	104	400	0.00	

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

Company Name: RT Hicks Consultants		**BILL TO**	
Project Manager: Kristin Pope		P.O. #:	
Address: 901 Rio Grande Blvd NW, F-142		Company: RT Hicks	
City: Albuquerque	State: NM Zip: 87104	Attn: Randy Hicks	
Phone #: 505-266-5004	Fax #:	Address:	
Project #:	Project Owner: Ameredev	City:	
Project Name: DeSoto Release.		State: Zip:	
Project Location: Recycling Facility		Phone #:	
Sampler Name: Kristin Pope		Fax #:	

FOR LAB USE ONLY				MATRIX						PRESERV.			SAMPLING		ANALYSIS REQUEST											
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID/BASE:	ICE / COOL	OTHER :	DATE	TIME	Chloride	BTEX	DRO/GRO/MRO 8015M	BTEX + added 8260	TPH							
H002190																										
1	A @ 0-2 ft	C	1			X					X		8-13-20	1010	X	SEE BELOW		X	X							
2	B @ 0-2 ft	C	1			X					X		"	1045	X											
3	C @ 0-2 ft	C	1			X					X		"	1100	X											
4	background @ 0-2 ft	C	1			X					X		"	1510	X											

Relinquished By: Kristin Pope	Date: 8-20-20 Time: 1135	Received By: Tamara Oldaker	Phone Result: ☐ Yes ☐ No Add'l Phone #:
Relinquished By:	Date: Time:	Received By:	Fax Result: ☐ Yes ☐ No Add'l Fax #:
Delivered By: (Circle One) Sampler - UPS - Bus - Other: 5.3c #113	Sample Condition Cool: ☑ Yes ☐ No Intact: ☑ Yes ☐ No	CHECKED BY: (Initials) TO	REMARKS: Run BTEX, DRO, GRO, MRO only on sample with highest [Cl-]. Email to kristin@rthicksconsult.com

+ Cardinal cannot accept verbal changes. Please fax written changes to (575) 393-2326

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

August 26, 2020

KRISTIN POPE

R T HICKS CONSULTANTS

901 RIO GRANDE BLVD SUITE F-142

ALBUQUERQUE, NM 87104

RE: DE SOTO RELEASE

Enclosed are the results of analyses for samples received by the laboratory on 08/20/20 11:35.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-20-13. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

R T HICKS CONSULTANTS
KRISTIN POPE
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104
Fax To: NONE

Received:	08/20/2020	Sampling Date:	08/13/2020
Reported:	08/26/2020	Sampling Type:	Soil
Project Name:	DE SOTO RELEASE	Sampling Condition:	Cool & Intact
Project Number:	RECYCLING FACILITY	Sample Received By:	Tamara Oldaker
Project Location:	AMEREDEV		

Sample ID: D @ 0-1.5' (H002191-01)

Chloride, SM4500Cl-B **mg/kg** **Analyzed By: AC**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**4080**	16.0	08/21/2020	ND	416	104	400	0.00	

Sample ID: E @ 0-1.5' (H002191-02)

Chloride, SM4500Cl-B **mg/kg** **Analyzed By: AC**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**3360**	16.0	08/21/2020	ND	416	104	400	0.00	QM-07

Sample ID: F @ 0-1.0' (H002191-03)

Chloride, SM4500Cl-B **mg/kg** **Analyzed By: AC**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2160**	16.0	08/21/2020	ND	416	104	400	0.00	

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

R T HICKS CONSULTANTS
KRISTIN POPE
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104
Fax To: NONE

Received:	08/20/2020	Sampling Date:	08/13/2020
Reported:	08/26/2020	Sampling Type:	Soil
Project Name:	DE SOTO RELEASE	Sampling Condition:	Cool & Intact
Project Number:	RECYCLING FACILITY	Sample Received By:	Tamara Oldaker
Project Location:	AMEREDEV		

Sample ID: G @ 0-1.5' (H002191-04)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	08/21/2020	ND	2.09	105	2.00	1.71	
Toluene*	<0.050	0.050	08/21/2020	ND	2.07	104	2.00	1.77	
Ethylbenzene*	<0.050	0.050	08/21/2020	ND	2.06	103	2.00	1.48	
Total Xylenes*	<0.150	0.150	08/21/2020	ND	5.97	99.5	6.00	1.61	
Total BTEX	<0.300	0.300	08/21/2020	ND					

Surrogate: 4-Bromofluorobenzene (PID *100 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**5920**	16.0	08/21/2020	ND	416	104	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	08/24/2020	ND	183	91.6	200	6.67	
DRO >C10-C28*	<10.0	10.0	08/24/2020	ND	182	91.0	200	5.19	
EXT DRO >C28-C36	<10.0	10.0	08/24/2020	ND					

Surrogate: 1-Chlorooctane *100 %* *44.3-144*

Surrogate: 1-Chlorooctadecane *104 %* *42.2-156*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Notes and Definitions

QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

Company Name:	R.T. Hicks Consultants	**BILL TO** P.O. #:	
Project Manager:	Kristin Pope	Company:	RT Hicks
Address:	901 Rio Grande Blvd NW, F-142	Attn:	Randy Hicks
City:	Albuquerque State: NM Zip: 87104	Address:	
Phone #:	505-266-5004 Fax #:	City:	
Project #:	Project Owner: Amerada Hess	State: Zip:	
Project Name:	De Soto Release	Phone #:	
Project Location:	Recycling Facility	Fax #:	
Sampler Name:	K. Pope		

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	PRESERV.: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING DATE	TIME	Chloride	BTEX	GRO/DRO/mro 8015M	BTEX + added 8021B	TPH
H002191																			
1	D @ 0-1.5 ft	C	1			X					X		8-13-20	1130	X				
2	E @ 0-1.5 ft	C	1			X					X		"	1150	X	SEE	BELOW		
3	F @ 0-1.0 ft	C	1			X					X		"	1230	X				
4	G @ 0-1.5 ft	C	1			X					X		"	1300	X			X	X

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequental damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By: Kristin Pope	Date: 8-20-20 Time: 1135	Received By: Tamara Oldaker	Phone Result: ☐ Yes ☐ No Add'l Phone #:
Relinquished By:	Date: Time:	Received By:	Fax Result: ☐ Yes ☐ No Add'l Fax #:

REMARKS: Run BTEX, DRO, GRO, MRO only on sample with highest Cl- value. Email to kristin@rthicksconsult.com

Delivered By: (Circle One) Sampler - UPS - Bus - Other: 5.3°C #113

Sample Condition: Cool ☑ Yes ☐ No; Intact ☐ Yes ☐ No

CHECKED BY: (Initials) TO.

* Cardinal cannot accept verbal changes. Please fax written changes to (575) 393-2326

Appendix C

Drillers' Logs of Nearby Water Wells

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Jay Anthony Owner's Well No. _____
Street or Post Office Address P.O. Box 398
City and State Jal New Mexico 88252

Well was drilled under Permit No. CP-938 and is located in the:

a. _____ ¼ _____ ¼ SE ¼ SE ¼ of Section 33 Township ~~26~~ 25S Range 36E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Duran Drilling License No. WD-1607
Address P.O. Box 1561 Seminole Tx. 79360

Drilling Began 5-10-06 Completed 5-12-06 Type tools Rotary Size of hole 8 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 360 ft.

Completed well is ☐ shallow ☑ artesian. Depth to water upon completion of well 80 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
250	285	35	layers of rocks + Sand	20
300	360	60	layers of rocks + Sand	25

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
5 in			0	360	361		260	360

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
0	10	8 3/4	7		

STATE ENGINEER ROSWELL, NEW MEX. 2006 MAY 30 A 11:30

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by:
_____ State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received 05/30/06 ~~#358498~~ 477042

Quad _____ FWL _____ FSL _____

File No. CP-938 Use Stk Location No. 25.36.33.44

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	5	5	Topsoil
5	75	70	Caliche + Sand
75	85	10	layers of Rocks + Sand
85	250	165	Red Clay + White Sand
250	285	35	layers of Rock + White Sand
285	300	15	Clay + White Sand
300	360	60	layers of Rocks + White Sand

Section 7. REMARKS AND ADDITIONAL INFORMATION

STATE ENGINEER OFFICE
ROSWELL, NEW MEXICO
2016 AUG 16 PM 3:11

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Luis R. Duran
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

STR

~~358498~~

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

COPY

1. GENERAL AND WELL LOCATION

OSE POD NUMBER (WELL NUMBER)	OSE FILE NUMBER(S): CP-1285
WELL OWNER NAME(S): DINWIDDIE CATTLE COMPANY, LLC & ATKINS ENGINEERING A	PHONE (OPTIONAL): 575-354-2489
WELL OWNER MAILING ADDRESS: P.O. BOX 3156	CITY: ROSWELL STATE: NM ZIP: 88202

WELL LOCATION (FROM GPS)	DEGREES	MINUTES	SECONDS	
LATITUDE	32	03	55	N
LONGITUDE	103	17	37	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND
* DATUM REQUIRED: WGS 84

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

SE 1/4, SW 1/4, SW 1/4, SECTION 05, TOWNSHIP 26 SOUTH, RANGE 36 EAST N.M.P.M

2. DRILLING & CASING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD-1607	LUIS A. (TONY) DURAN	DURAN DRILLING

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
7/01/15	7/6/15	511	510	250

STATIC WATER LEVEL IN COMPLETED WELL (FT):

COMPLETED WELL IS: ○ ARTESIAN ○ DRY HOLE ◉ SHALLOW (UNCONFINED)

DRILLING FLUID: ○ AIR ○ MUD ADDITIVES – SPECIFY: DRILLING MUD

DRILLING METHOD: ◉ ROTARY ○ HAMMER ○ CABLE TOOL ○ OTHER – SPECIFY:

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	190	16	STEEL	STEEL PERF	10	1/4	-
190	510	16	STEEL PERF	STEEL	10	1/4	1/8

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
0	20	16	20 BGS 80 LBS CEMENT		MIXER
20	510	16	36 YARDS 1/4 GRAVEL PACK		

FOR OSE INTERNAL USE

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

FILE NUMBER	CP-1285	POD NUMBER		TRN NUMBER	664512
LOCATION	26S.36E.5.3.3.3				PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
0	1	1	TOPSOIL	O Y ◉ N	
1	16	15	CALICHE	O Y ◉ N	
16	230	214	CLAY	O Y ◉ N	
230	285	55	ROCK	O Y ◉ N	
285	290	5	SAND	◉ Y O N	20
290	315	25	ROCK	◉ Y O N	40
315	507	192	SAND	◉ Y O N	30
507	510	3	RED BED	O Y ◉ N	
				O Y O N	
				O Y O N	
				O Y O N	
				O Y O N	
				O Y O N	
				O Y O N	
				O Y O N	
				O Y O N	
				O Y O N	
				O Y O N	
				O Y O N	
				O Y O N	

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

TOTAL ESTIMATED WELL YIELD (gpm): 90

5. TEST; RIG SUPERVISION

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

MISCELLANEOUS INFORMATION:

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

6. SIGNATURE

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

Luis A Duran / LUIS A. DURAN — SIGNATURE OF DRILLER / PRINT SIGNEE NAME

7-6-15 — DATE

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

FILE NUMBER	CP-1285	POD NUMBER	TRN NUMBER	PAGE 2 OF 2
LOCATION	26S.36E.5.3.3.3		comm.	

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NUMBER (WELL NUMBER): 3	OSE FILE NUMBER(S): CP-1263
WELL OWNER NAME(S): BECKHAM RANCH, INC. / MSTAPLETON, LLC	PHONE (OPTIONAL): 575-441-3045
WELL OWNER MAILING ADDRESS: P.O. BOX 823	CITY: JAL STATE: NM ZIP: 88252

WELL LOCATION (FROM GPS)

	DEGREES	MINUTES	SECONDS	
LATITUDE	32	03	55	N
LONGITUDE	103	18	15	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND

* DATUM REQUIRED: WGS 84

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

SE 1/4, NW 1/4, SW 1/4, SECTION 06, TOWNSHIP 26S, RANGE 36E

2. DRILLING & CASING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD-1607	LUIS A. (TONY) DURAN	DURAN DRILLING

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
6/24/15	6/28/15	516	515	240

STATIC WATER LEVEL IN COMPLETED WELL (FT)

COMPLETED WELL IS: ○ ARTESIAN ○ DRY HOLE ◉ SHALLOW (UNCONFINED)

DRILLING FLUID: ○ AIR ○ MUD ADDITIVES – SPECIFY: DRILLING MUD

DRILLING METHOD: ◉ ROTARY ○ HAMMER ○ CABLE TOOL ○ OTHER – SPECIFY:

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	215	16	STEEL	STEEL PERF	10	1/4	-
215	515	16	STEEL PERF	STEEL	10	1/4	1/8

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
0	20	16	43 BGS 80 LBS CEMENT		MIXER
20	515	16	36 YARDS 3/8 GRAVEL		

FOR OSE INTERNAL USE

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

FILE NUMBER	CP-1263	POD NUMBER	3	TRN NUMBER	
LOCATION	26S.36E.6.4.3.3				PAGE 1 OF 2

Ind.

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
0	1	1	TOPSOIL	○ Y ◉ N	
1	15	14	CALICHE	○ Y ◉ N	
15	35	20	SAND	○ Y ◉ N	
35	85	50	SAND STONE	○ Y ◉ N	
85	160	75	SANDY CLAY	○ Y ◉ N	
160	195	35	BROWN CLAY	○ Y ◉ N	
195	254	59	SAND	◉ Y ○ N	25
254	350	96	SANDY CLAY	○ Y ◉ N	
350	384	34	SAND	◉ Y ○ N	100
384	512	128	SANDY CLAY	○ Y ◉ N	
512	515	3	RED CLAY	○ Y ◉ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	
				○ Y ○ N	

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

TOTAL ESTIMATED WELL YIELD (gpm): 125

5. TEST; RIG SUPERVISION

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

MISCELLANEOUS INFORMATION:

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

6. SIGNATURE

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

Luis A Duran. / LUIS A. DURAN — SIGNATURE OF DRILLER / PRINT SIGNEE NAME

6-28-15 — DATE

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

FILE NUMBER	CP-1263	POD NUMBER		TRN NUMBER	
LOCATION	26S.36E.6.4.3.3			Ind.	PAGE 2 OF 2

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NUMBER (WELL NUMBER): CP-1446 Pod 1	OSE FILE NUMBER(S): CP-1446 POD 1
WELL OWNER NAME(S): EOG Resources Inc.	PHONE (OPTIONAL): 432-686-3600
WELL OWNER MAILING ADDRESS: 5509 Champions Drive	CITY: Midland STATE: TX ZIP: 79706

WELL LOCATION (FROM GPS) NAD 1927	DEGREES	MINUTES	SECONDS	
LATITUDE	32	03	57.82	N
LONGITUDE	103	17	02.84	W

* ACCURACY REQUIRED ONE TENTH OF A SECOND
* DATUM REQUIRED WGS 84

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

409' From South Line and 1849' from East Line Section 5 Township 26S Range 36E Lea County NM

2. DRILLING & CASING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD-331	Joel Stewart	Stewart Brothers Drilling Co.

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
8/12/2015	8/24/2015	4,975'	4,975'	Unknown

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

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

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

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	115	30"	24" H-40 Steel	welded	23.50	0.250	NA
115	2055	20"	16" J-55 75 lbs./foot	buttress	15.124	0.438	NA
2055	3632	14.75"	9 5/8" J-55	LTC	8.835	0.395	NA
3632	4975	8.75"	open hole				

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
0	115	30"	Class C Cement + 1.5% CaCl2 + 6.35 GPS FW	482	Pressure Grout
0	2055	20"	Lead-Class C Cement + 4% Bentonite + 2% CaCl2		
			+ 9.2 GPS FW	4375	Pressure Grout
			Tail-Class C + 1.5% CaCl2 + 6.34 GPS FW	623	Pressure Grout
			Top Out - Same as Lead	1040	Tremie
0	3632	14.75"	Lead-Class C+10% Salt + additives+11.88 GPS FW	3330	Pressure Grout
			Tail-Class C + 2% Salt + additives + 6.37 GPS FW	540	Pressure Grout

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

FILE NUMBER	CP-1446	POD NUMBER	1	TRN NUMBER	598413
LOCATION	N01	34.5.26S.36E			PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

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

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: ○ PUMP ○ AIR LIFT ○ BAILER ○ OTHER – SPECIFY: Well not tested yet

TOTAL ESTIMATED WELL YIELD (gpm):

5. TEST; RIG SUPERVISION

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

MISCELLANEOUS INFORMATION:

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

6. SIGNATURE

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

Joel H. Stewart — SIGNATURE OF DRILLER / PRINT SIGNEE NAME

September 3, 2015 — DATE

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

FILE NUMBER	CP-1446	POD NUMBER	1	TRN NUMBER	
LOCATION	NO1	434.5.26S.36E			PAGE 2 OF 2

QUALITY LOGGING, INC

P.O. Box 2463
MIDLAND, TX 79702
(432)682-7168

COMPANY: EOG Resources, Inc.
WELL: Capitan WSW No. 4
FIELD: Red Hills COUNTY: Lea STATE: New Mexico
LOCATION:

Interval Logged: 140 To: 5000 G.L.: 2984 K.B: 0
Date Logged: 8-12-15 To: 8-22-15 Spud Date: 8-12-15
Rig: H & P Rig 415 Unit No.:
Loggers: Gary Gavitt; Dave Pittman
Api No.:
Filename: capitanwswno4.mlw
Geologist: PALKO/ WASHULESKI

Created By MainLog

Abbreviations:

NB...New Bit
CO...Circ Out
NR...No Returns
TG...Trip Gas
WOB...Wt on Bit
RPM...Rev/Min
SG...Survey Gas
DST...Drill Stem Test
DS...Directional Survey
CG...Connection gas
LAT...Logged After Trip
PP...Pump Pressure
SPM...Strokes/Min
DTG...Down Time Gas

Mud Data

WT..Weight
PH..Acidity
CHL..Chlorides
V..Viscosity
F..Filtrate
SC..Solids Content

Lithology Symbols:

Anhydrite, Salt, Granite
Siltstone, Chert, Sandstone
Dolomite, Conglomerate, Limestone
Coal, Shale, Bentonite
Carb Shale, Granite Wash, Quartz Wash
Red Sh, Org Sh, Green Sh
Cust Sh1, Cust Sh2, Cust Sh3
Cust Sh4, Cust Sh5, Cust Sh6

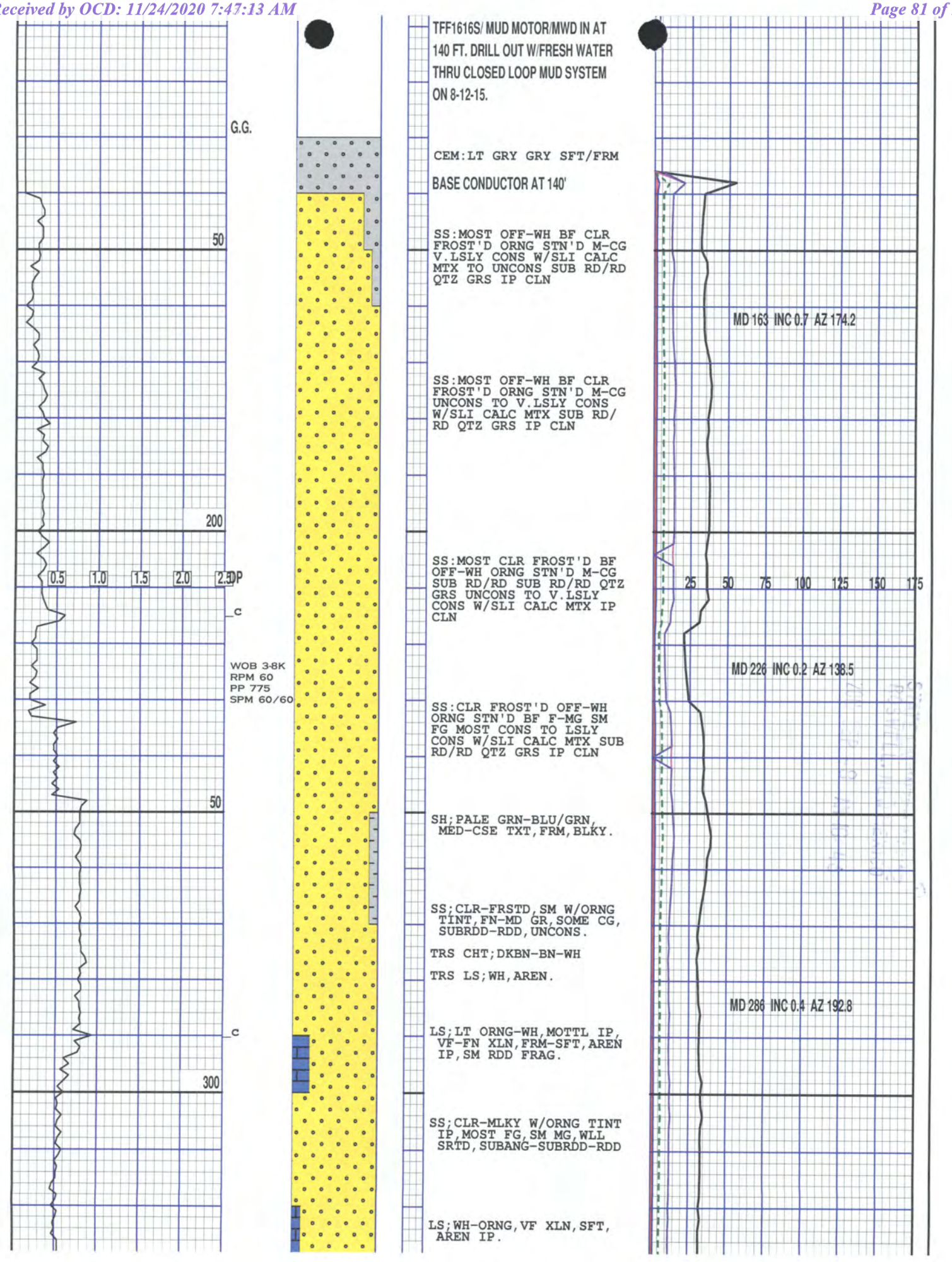
Accessories

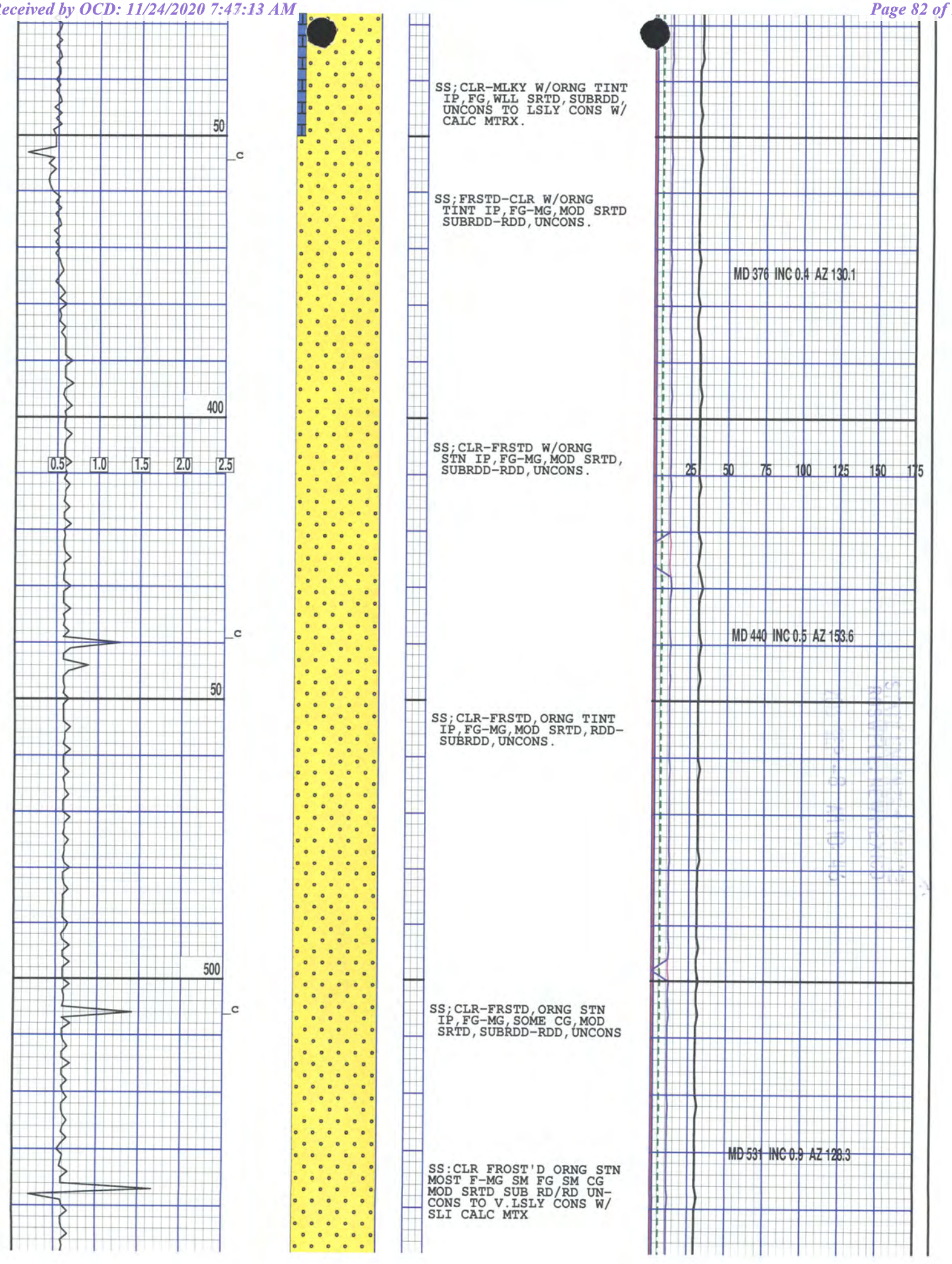
Glauconite, Pyrite, Fossils, Oolites
Fractures, Cement

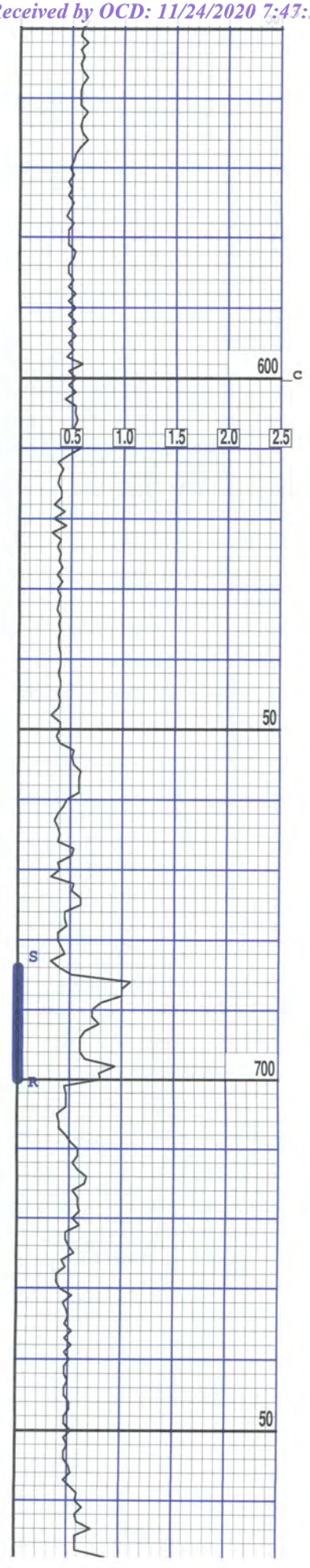
Gas Chromatograph Analysis:

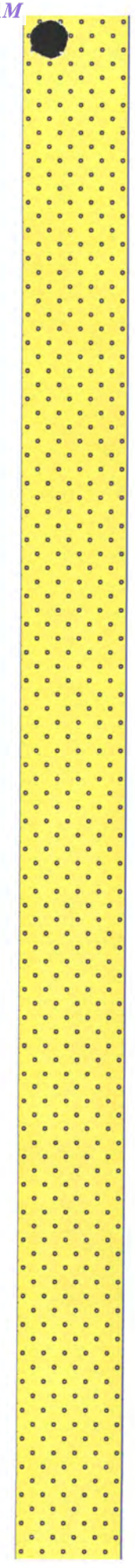
HW
C1
C2
C3
IC4
NC4
IC5

Drilling Rate MIN/FT	Vis Por Tr / p f g	Lithology	% Oil Flu Tr / p f g	Cut Tr / pfg	Descriptions/Remarks	Total Gas/Chromatograph
0.5 1.0 1.5 2.0 2.5 100					RIG UP 2-MAN LOGGING UNIT ON 8-11-15. CONDUCTOR PIPE SET AT 140 FT. SPUD IN W/NB # 1 20" BAKER	25 50 75 100 125 150 175


G.G.
50
200
0.5
1.0
1.5
2.0
2.3
DP
C
WOB 3-8K
RPM 60
PP 775
SPM 60/60
50
C
300
TFF1616S/ MUD MOTOR/MWD IN AT 140 FT. DRILL OUT W/FRESH WATER THRU CLOSED LOOP MUD SYSTEM ON 8-12-15.
CEM:LT GRY GRY SFT/FRM
BASE CONDUCTOR AT 140'
SS:MOST OFF-WH BF CLR FROST'D ORNG STN'D M-CG V.LSLY CONS W/SLI CALC MTX TO UNCONS SUB RD/RD QTZ GRS IP CLN
SS:MOST OFF-WH BF CLR FROST'D ORNG STN'D M-CG UNCONS TO V.LSLY CONS W/SLI CALC MTX SUB RD/ RD QTZ GRS IP CLN
SS:MOST CLR FROST'D BF OFF-WH ORNG STN'D M-CG SUB RD/RD SUB RD/RD QTZ GRS UNCONS TO V.LSLY CONS W/SLI CALC MTX IP CLN
SS:CLR FROST'D OFF-WH ORNG STN'D BF F-MG SM FG MOST CONS TO LSLY CONS W/SLI CALC MTX SUB RD/RD QTZ GRS IP CLN
SH;PALE GRN-BLU/GRN, MED-CSE TXT,FRM,BLKY.
SS;CLR-FRSTD,SM W/ORNG TINT,FN-MD GR,SOME CG, SUBRDD-RDD,UNCONS.
TRS CHT;DKBN-BN-WH
TRS LS;WH,AREN.
LS;LT ORNG-WH,MOTTL IP, VF-FN XLN,FRM-SFT,AREN IP,SM RDD FRAG.
SS;CLR-MLKY W/ORNG TINT IP,MOST FG,SM MG,WLL SRTD,SUBANG-SUBRDD-RDD
LS;WH-ORNG,VF XLN,SFT, AREN IP.
MD 163 INC 0.7 AZ 174.2
MD 226 INC 0.2 AZ 138.5
MD 286 INC 0.4 AZ 192.8
25
50
75
100
125
150
175


50
c
400
0.5
1.0
1.5
2.0
2.5
c
50
500
c
SS;CLR-MLKY W/ORNG TINT IP,FG,WLL SRTD,SUBRDD, UNCONS TO LSLY CONS W/ CALC MTRX.
SS;FRSTD-CLR W/ORNG TINT IP,FG-MG,MOD SRTD SUBRDD-RDD,UNCONS.
SS;CLR-FRSTD W/ORNG STN IP,FG-MG,MOD SRTD, SUBRDD-RDD,UNCONS.
SS;CLR-FRSTD,ORNG TINT IP,FG-MG,MOD SRTD,RDD- SUBRDD,UNCONS.
SS;CLR-FRSTD,ORNG STN IP,FG-MG,SOME CG,MOD SRTD,SUBRDD-RDD,UNCONS
SS:CLR FROST'D ORNG STN MOST F-MG SM FG SM CG MOD SRTD SUB RD/RD UN- CONS TO V.LSLY CONS W/ SLI CALC MTX
MD 376 INC 0.4 AZ 130.1
25
50
75
100
125
150
175
MD 440 INC 0.5 AZ 153.6
MD 531 INC 0.9 AZ 128.3





SS:CLR FROST'D ORNG STN MOST F-MG SM FG SM CG MOST SUB RD/RD SM SUB ANG MOST UNCONS TO V. LSLY CONS W/SLI CALC MTX

SS:CLR FROST'D ORNG STN BF MOST F-MG SM FG SM CG MOST UNCONS TO V. LSLY CONS W/SLI CALC MTX MOST SUB RD/RD SM SUB ANG

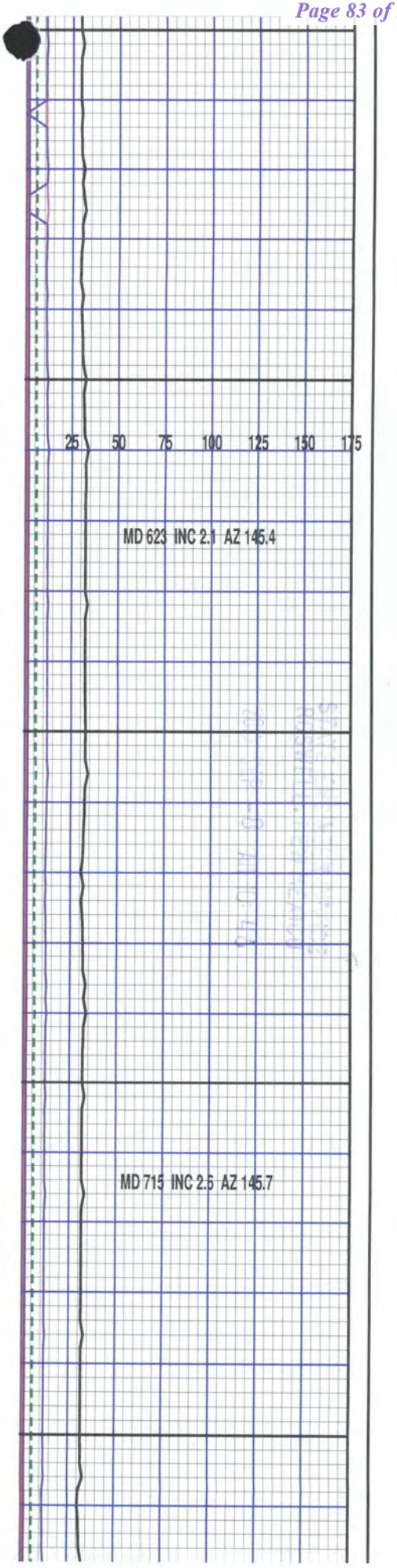
SS:CLR FROST'D ORNG STN BF MOST FG SM M-CG MOST UNCONS TO LSLY CONS W/ SLI CALC MTX FRIA MOST SUB RD/SUB ANG SM RD

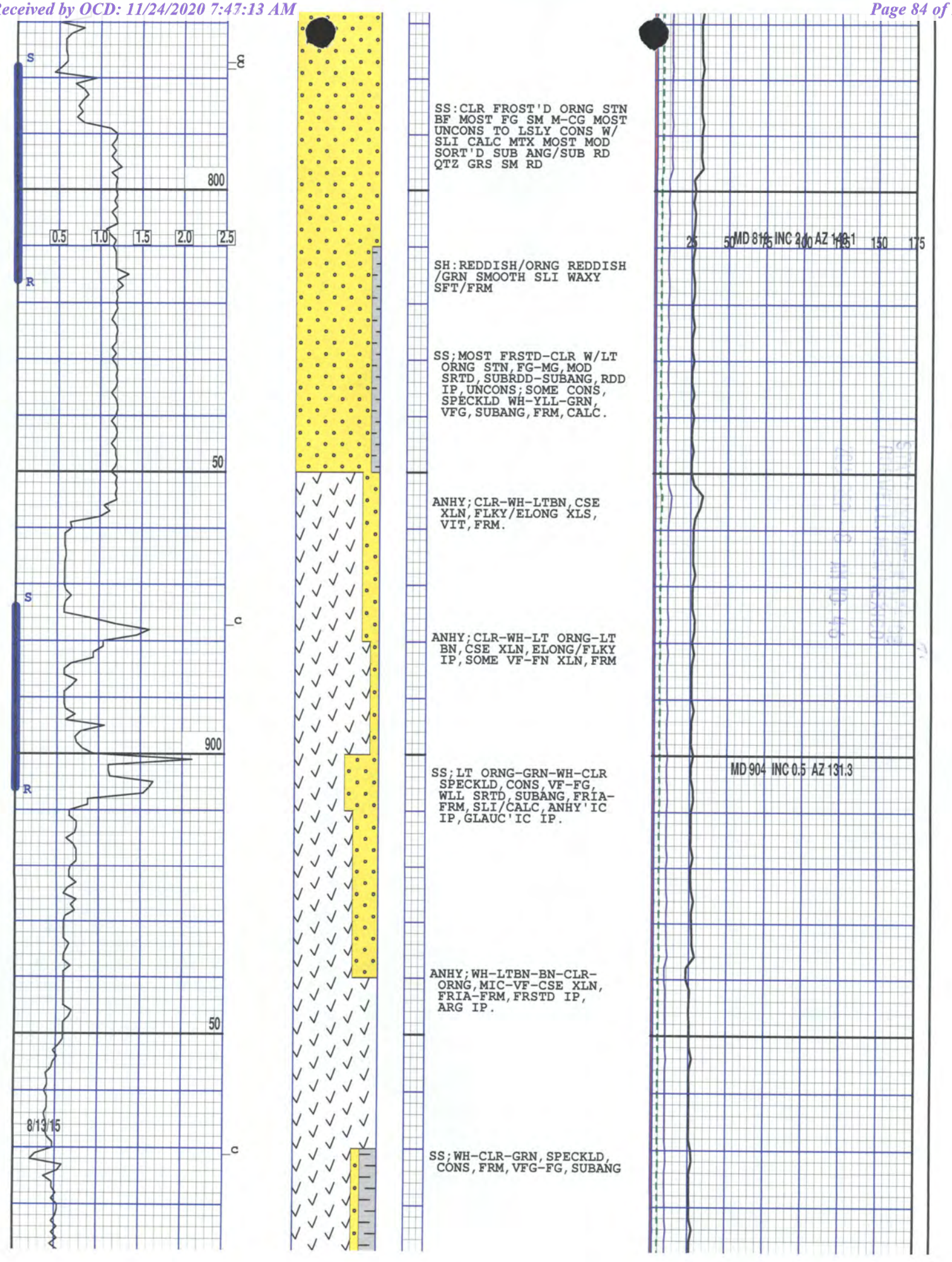
SS:CLR FROST'D BF OFF-WH MOST FG SM F-MG MOST SUB ANG/SUB RD QTZ GRS UNCONS TO LSLY CONS W/ SLI CALC MTX

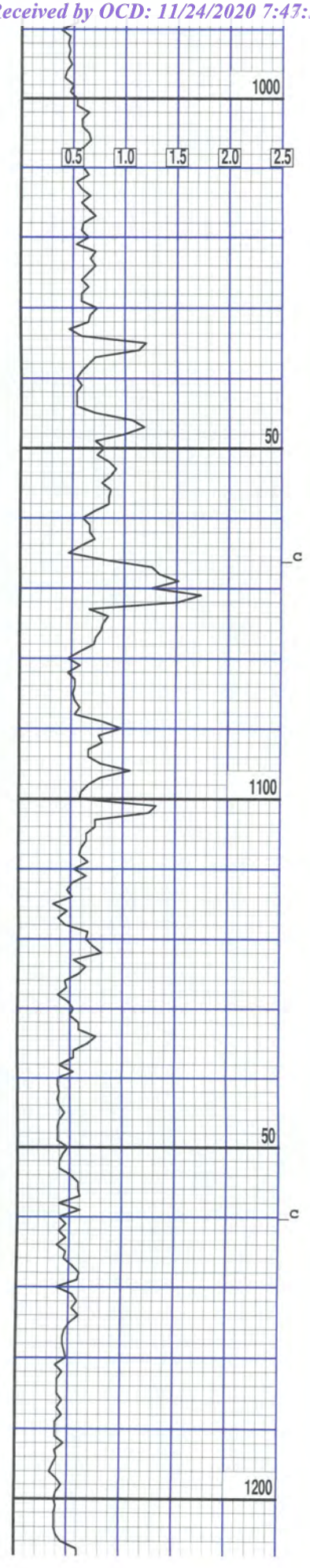
SS:CLR FROST'D BF OFF-WH MOST FG SM F-MG MOST SUB ANG/SUB RD SM RD QTZ GRS LSLY CONS W/SLI CALC MTX TO UNCONS

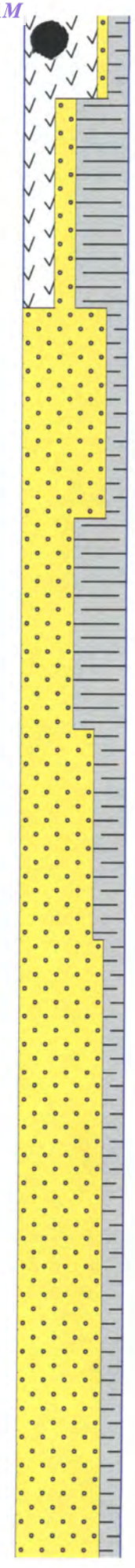
SS:CLR FROST'D ORNG STN BF OFF-WH MOST FG SM F-MG MOST UNCONS TO V. LSLY CONS W/SLI CALC MTX MOST SUB ANG/SUB RD MOD WELL SORT'D

SS:CLR FROST'D ORNG STN BF OFF-WH MOST FG SM F-MG MOST UNCONS TO V. LSLY CONS W/SLI CALC MTX MOST SUB ANG/SUB RD MOD WELL SORT'D




S
R
800
0.5
1.0
1.5
2.0
2.5
50
S
R
900
50
8/13/15
SS:CLR FROST'D ORNG STN BF MOST FG SM M-CG MOST UNCONS TO LSLY CONS W/ SLI CALC MTX MOST MOD SORT'D SUB ANG/SUB RD QTZ GRS SM RD
SH:REDDISH/ORNG REDDISH /GRN SMOOTH SLI WAXY SFT/FRM
SS;MOST FRSTD-CLR W/LT ORNG STN,FG-MG,MOD SRTD,SUBRDD-SUBANG,RDD IP,UNCONS;SOME CONS, SPECKLD WH-YLL-GRN, VFG,SUBANG,FRM,CALC.
ANHY;CLR-WH-LTBN,CSE XLN,FLKY/ELONG XLS, VIT,FRM.
ANHY;CLR-WH-LT ORNG-LT BN,CSE XLN,ELONG/FLKY IP,SOME VF-FN XLN,FRM
SS;LT ORNG-GRN-WH-CLR SPECKLD,CONS,VF-FG, WLL SRTD,SUBANG,FRIA-FRM,SLI/CALC,ANHY'IC IP,GLAUC'IC IP.
ANHY;WH-LTBN-BN-CLR-ORNG,MIC-VF-CSE XLN, FRIA-FRM,FRSTD IP, ARG IP.
SS;WH-CLR-GRN,SPECKLD, CONS,FRM,VFG-FG,SUBANG
25
50
MD 816 INC 2.00 AZ 149.1
150
175
MD 904 INC 0.5 AZ 131.3





SH;RUST-ORNG,FN TXT, SFT-FRM,BLKY,SLTY.

SS;CLR-FRSTD W/ORNG STN,FG-MG,WLL-MOD SRTD SUBRDD-RDD,UNCONS.

SH;ORNG-RUST-LTGRN,VF-F TXT,FRM-SFT,BLKY,SLTY IP.

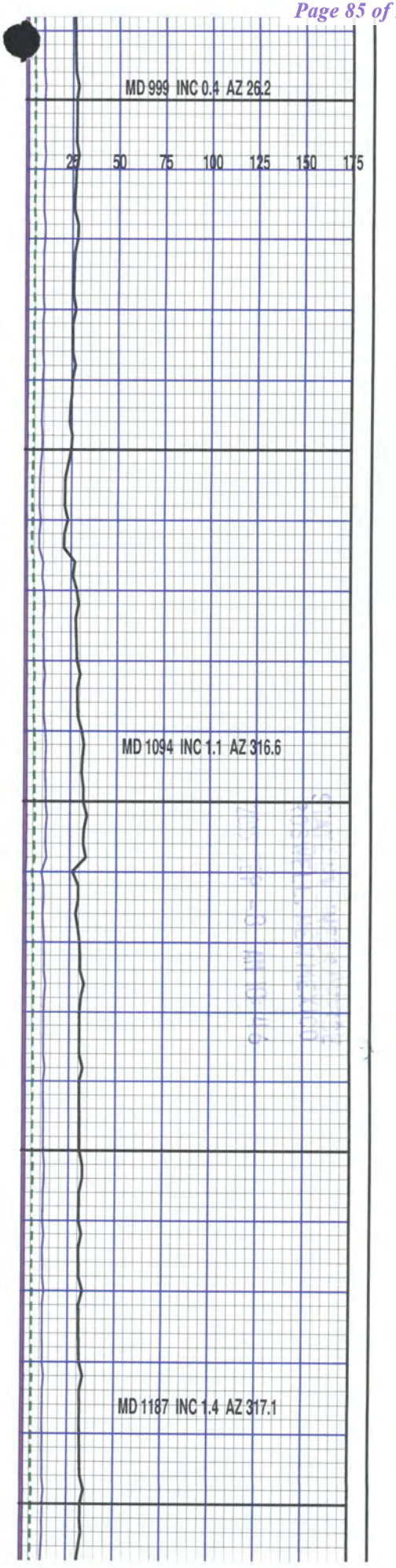
SS;CLR-FRSTD W/ORNG TINT IP,FG-MG,MOD SRTD SUBRDD-RDD,UNCONS;SOME WH-LTGRN,CONS,FG,WLL SRTD,FRIA,ANHY'IC.

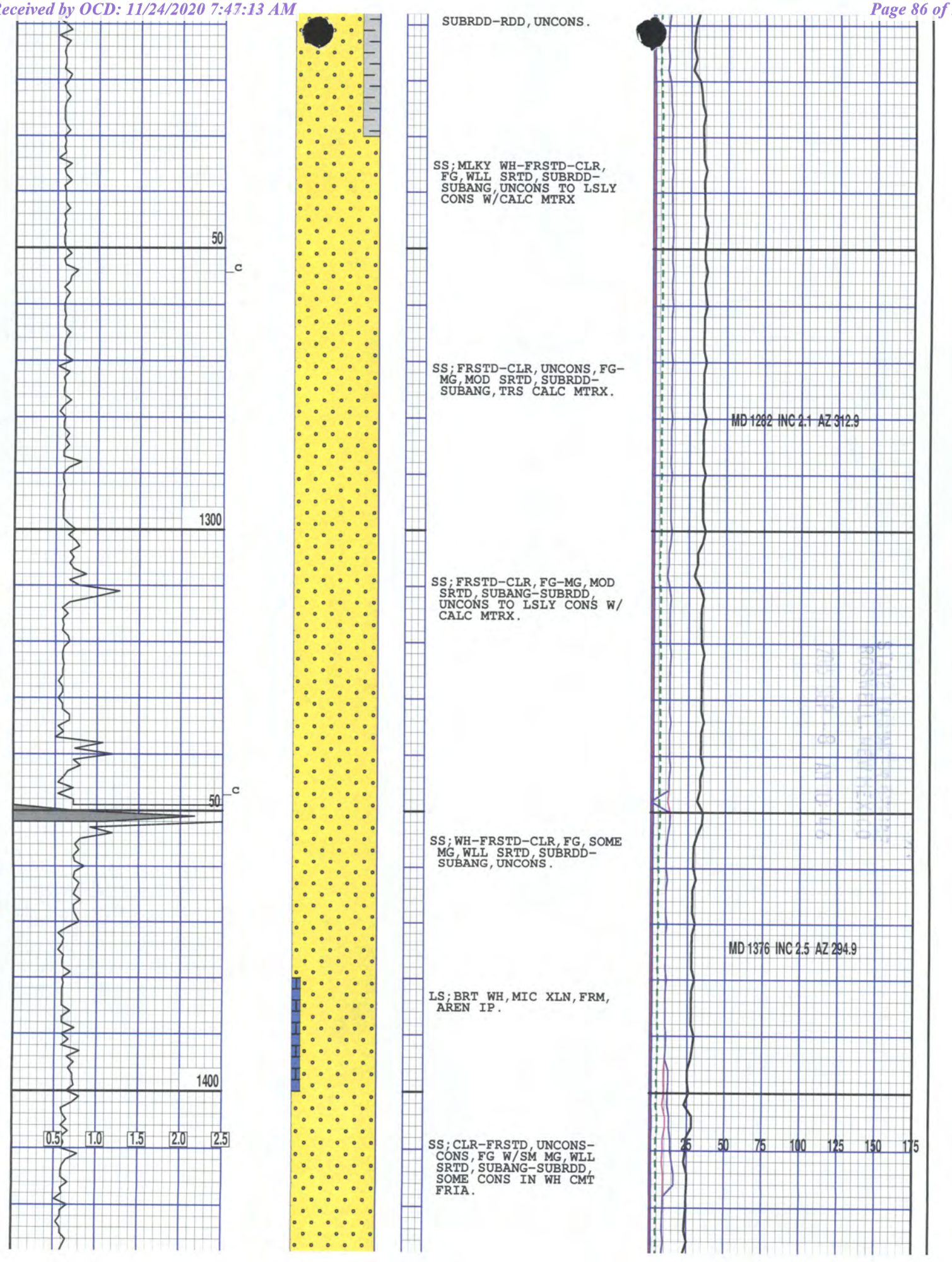
SH;RUST-ORNG,CSE TXT, SFT-FRM,BLKY,SLTY.

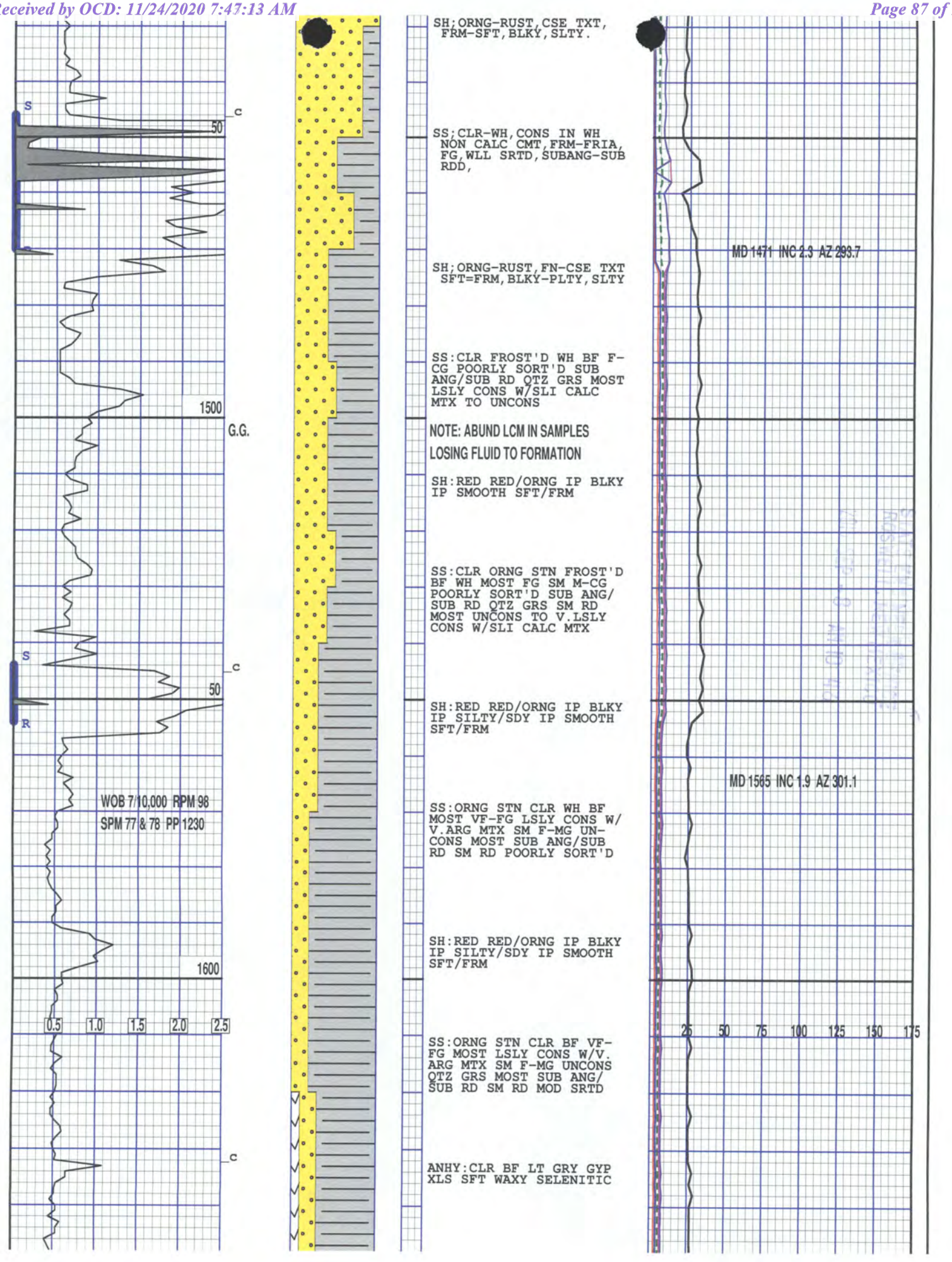
SS;CLR-FRSTD W/ORNG STN FG-MG,MOD SRTD,UNCONS, SUBRDD-RDD.

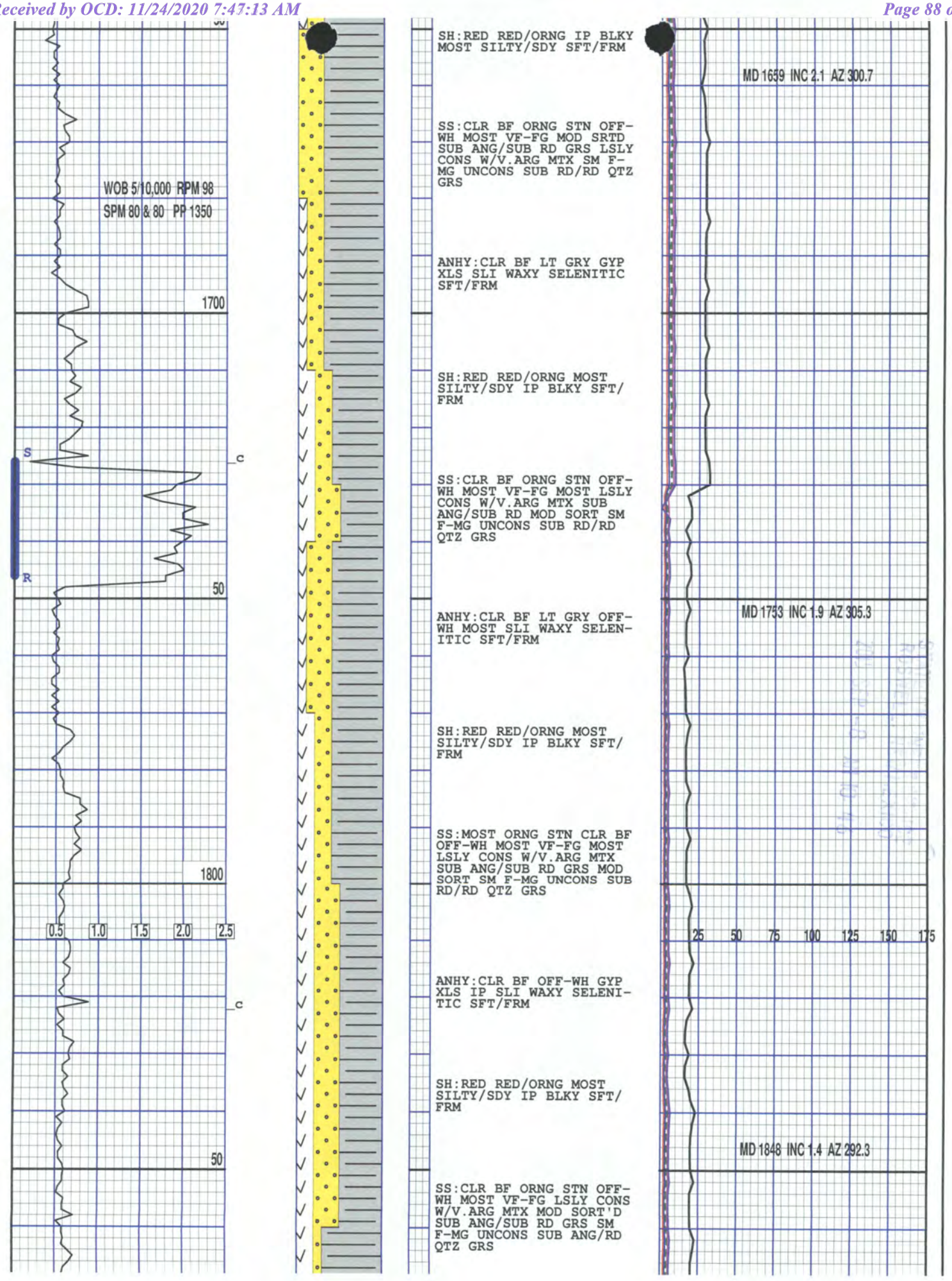
ABUND LCM

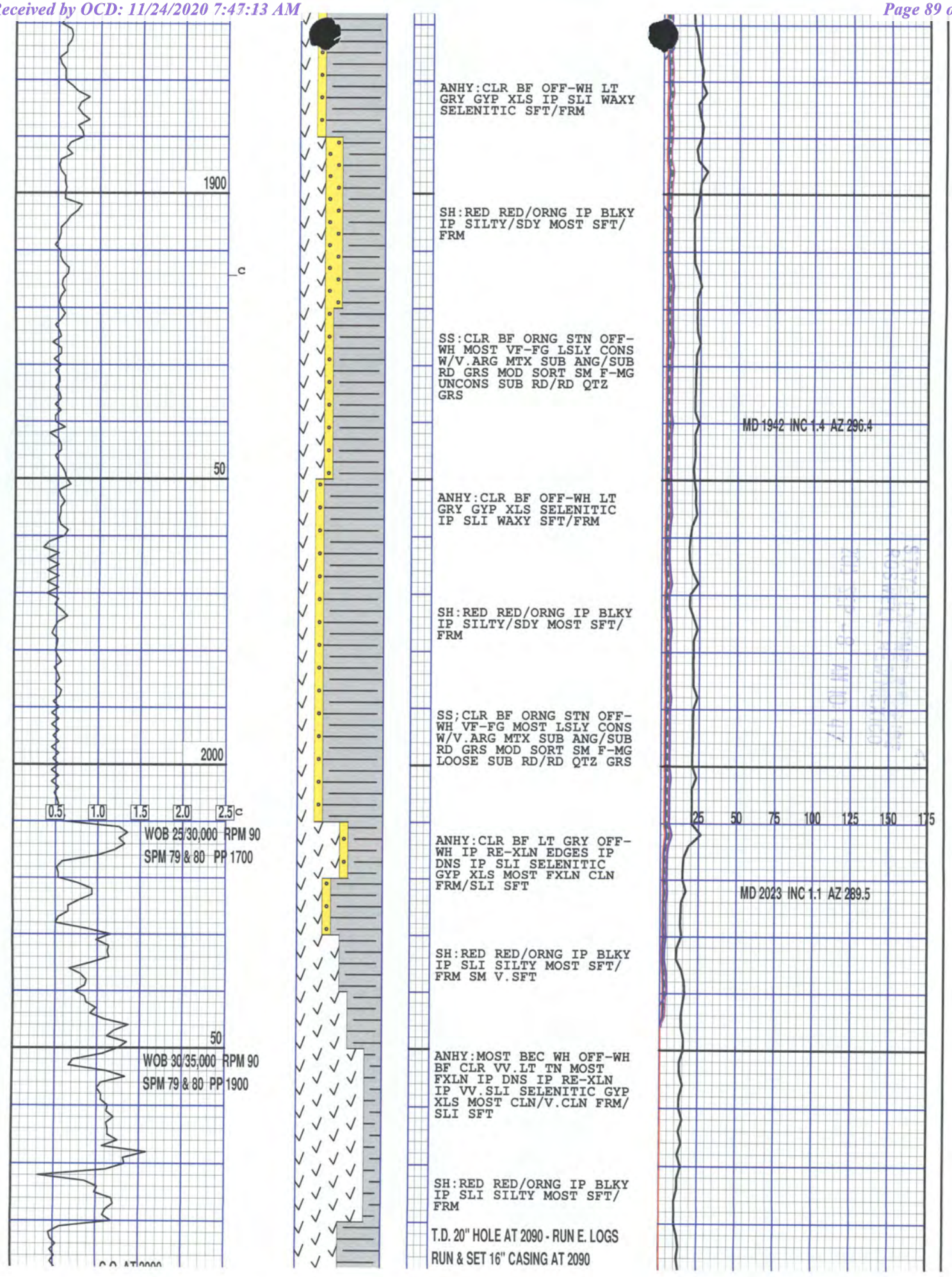
SS;CLR-MLKY W/ORNG TINT IP,FG,SOME MG,WLL SRTD

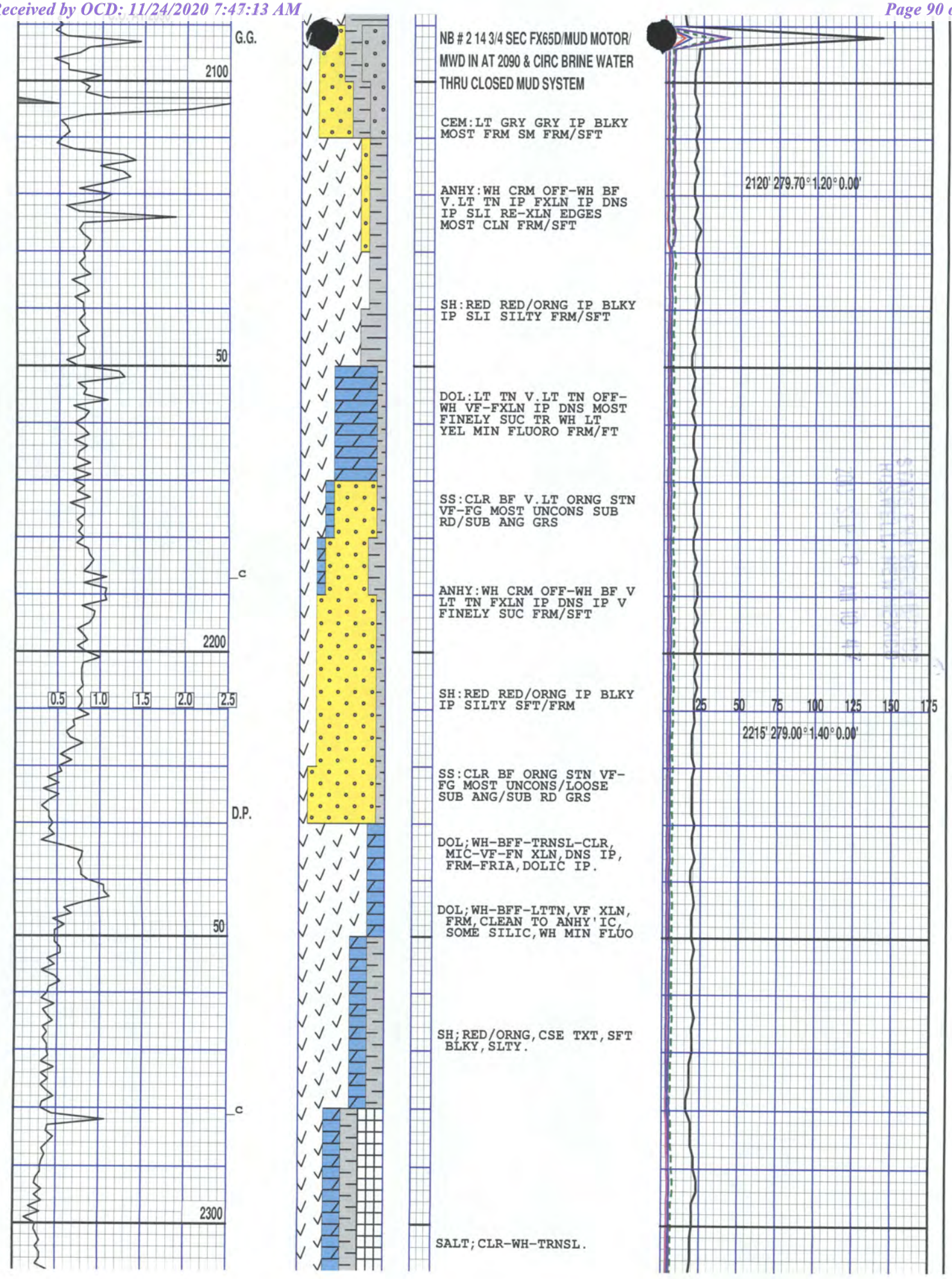


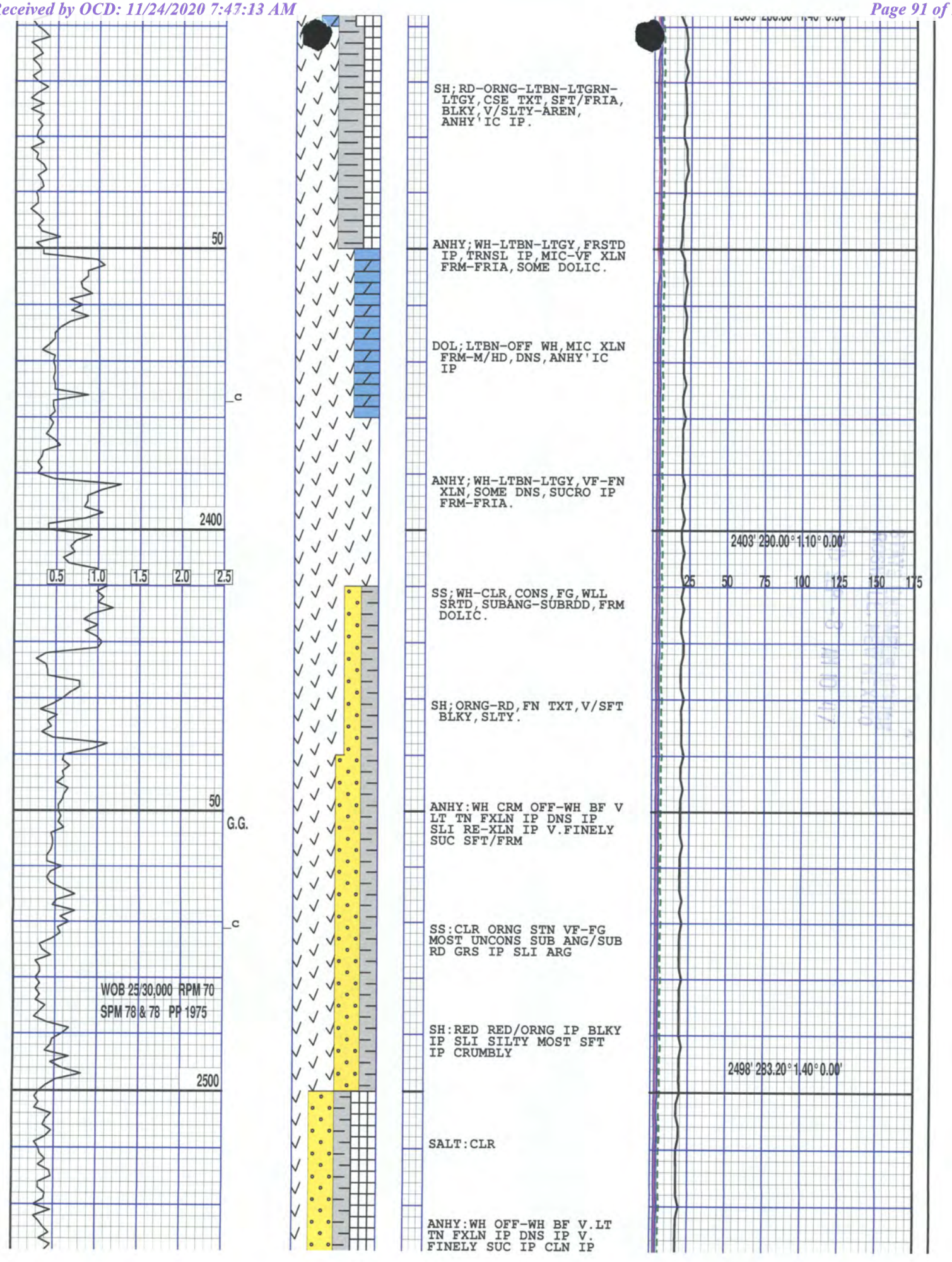

50
C
1300
50
C
1400
0.5
1.0
1.5
2.0
2.5
SUBRDD-RDD, UNCONS.
SS; MLKY WH-FRSTD-CLR, FG, WLL SRTD, SUBRDD-SUBANG, UNCONS TO LSLY CONS W/CALC MTRX
SS; FRSTD-CLR, UNCONS, FG-MG, MOD SRTD, SUBRDD-SUBANG, TRS CALC MTRX.
SS; FRSTD-CLR, FG-MG, MOD SRTD, SUBANG-SUBRDD, UNCONS TO LSLY CONS W/ CALC MTRX.
SS; WH-FRSTD-CLR, FG, SOME MG, WLL SRTD, SUBRDD-SUBANG, UNCONS.
LS; BRT WH, MIC XLN, FRM, AREN IP.
SS; CLR-FRSTD, UNCONS-CONS, FG W/SM MG, WLL SRTD, SUBANG-SUBRDD, SOME CONS IN WH CMT FRIA.
MD 1282 INC 2.1 AZ 312.9
MD 1376 INC 2.5 AZ 294.9
25
50
75
100
125
150
175

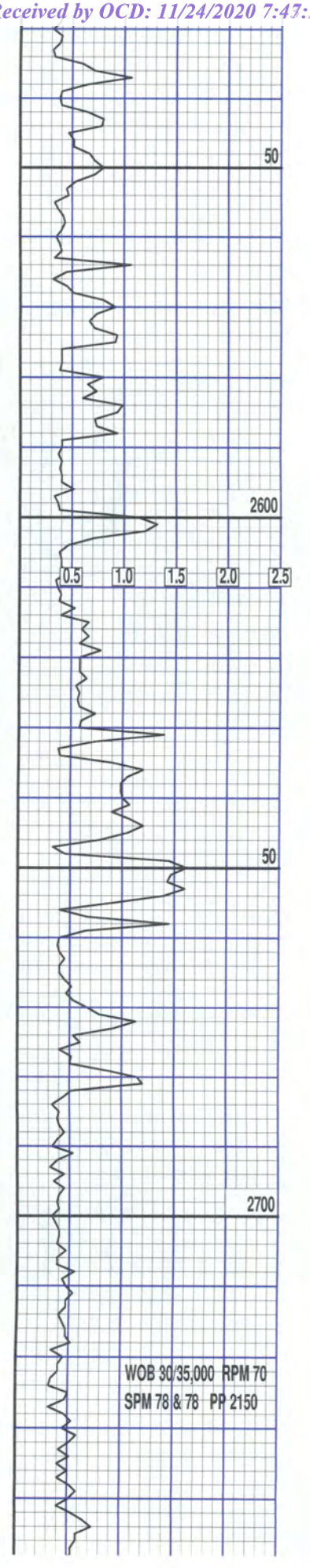

S
C
50
1500
G.G.
S
C
50
R
WOB 7/10,000 RPM 98
SPM 77 & 78 PP 1230
1600
0.5
1.0
1.5
2.0
2.5
C
SH;ORNG-RUST,CSE TXT, FRM-SFT,BLKY,SLTY.
SS;CLR-WH,CONS IN WH NON CALC CMT,FRM-FRIA, FG,WLL SRTD,SUBANG-SUB RDD,
SH;ORNG-RUST,FN-CSE TXT SFT=FRM,BLKY-PLTY,SLTY
SS:CLR FROST'D WH BF F-CG POORLY SORT'D SUB ANG/SUB RD QTZ GRS MOST LSLY CONS W/SLI CALC MTX TO UNCONS
NOTE: ABUND LCM IN SAMPLES
LOSING FLUID TO FORMATION
SH:RED RED/ORNG IP BLKY IP SMOOTH SFT/FRM
SS:CLR ORNG STN FROST'D BF WH MOST FG SM M-CG POORLY SORT'D SUB ANG/ SUB RD QTZ GRS SM RD MOST UNCONS TO V.LSLY CONS W/SLI CALC MTX
SH:RED RED/ORNG IP BLKY IP SILTY/SDY IP SMOOTH SFT/FRM
SS:ORNG STN CLR WH BF MOST VF-FG LSLY CONS W/ V.ARG MTX SM F-MG UN-CONS MOST SUB ANG/SUB RD SM RD POORLY SORT'D
SH:RED RED/ORNG IP BLKY IP SILTY/SDY IP SMOOTH SFT/FRM
SS:ORNG STN CLR BF VF-FG MOST LSLY CONS W/V. ARG MTX SM F-MG UNCONS QTZ GRS MOST SUB ANG/ SUB RD SM RD MOD SRTD
ANHY:CLR BF LT GRY GYP XLS SFT WAXY SELENITIC
MD 1471 INC 2.3 AZ 293.7
MD 1565 INC 1.9 AZ 301.1
25
50
75
100
125
150
175

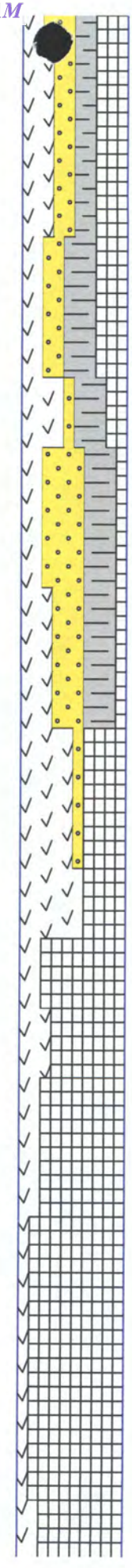

WOB 5/10,000 RPM 98
SPM 80 & 80 PP 1350
1700
S
C
R
50
1800
0.5
1.0
1.5
2.0
2.5
C
50
SH:RED RED/ORNG IP BLKY MOST SILTY/SDY SFT/FRM
SS:CLR BF ORNG STN OFF-WH MOST VF-FG MOD SRTD SUB ANG/SUB RD GRS LSLY CONS W/V.ARG MTX SM F-MG UNCONS SUB RD/RD QTZ GRS
ANHY:CLR BF LT GRY GYP XLS SLI WAXY SELENITIC SFT/FRM
SH:RED RED/ORNG MOST SILTY/SDY IP BLKY SFT/FRM
SS:CLR BF ORNG STN OFF-WH MOST VF-FG MOST LSLY CONS W/V.ARG MTX SUB ANG/SUB RD MOD SORT SM F-MG UNCONS SUB RD/RD QTZ GRS
ANHY:CLR BF LT GRY OFF-WH MOST SLI WAXY SELEN-ITIC SFT/FRM
SH:RED RED/ORNG MOST SILTY/SDY IP BLKY SFT/FRM
SS:MOST ORNG STN CLR BF OFF-WH MOST VF-FG MOST LSLY CONS W/V.ARG MTX SUB ANG/SUB RD GRS MOD SORT SM F-MG UNCONS SUB RD/RD QTZ GRS
ANHY:CLR BF OFF-WH GYP XLS IP SLI WAXY SELENI-TIC SFT/FRM
SH:RED RED/ORNG MOST SILTY/SDY IP BLKY SFT/FRM
SS:CLR BF ORNG STN OFF-WH MOST VF-FG LSLY CONS W/V.ARG MTX MOD SORT'D SUB ANG/SUB RD GRS SM F-MG UNCONS SUB ANG/RD QTZ GRS
MD 1659 INC 2.1 AZ 300.7
MD 1753 INC 1.9 AZ 305.3
MD 1848 INC 1.4 AZ 292.3
25
50
75
100
125
150
175


1900
50
2000
0.5
1.0
1.5
2.0
2.5
WOB 25/30,000 RPM 90
SPM 79 & 80 PP 1700
50
WOB 30/35,000 RPM 90
SPM 79 & 80 PP 1900
ANHY:CLR BF OFF-WH LT GRY GYP XLS IP SLI WAXY SELENITIC SFT/FRM
SH:RED RED/ORNG IP BLKY IP SILTY/SDY MOST SFT/ FRM
SS:CLR BF ORNG STN OFF-WH MOST VF-FG LSLY CONS W/V.ARG MTX SUB ANG/SUB RD GRS MOD SORT SM F-MG UNCONS SUB RD/RD QTZ GRS
ANHY:CLR BF OFF-WH LT GRY GYP XLS SELENITIC IP SLI WAXY SFT/FRM
SH:RED RED/ORNG IP BLKY IP SILTY/SDY MOST SFT/ FRM
SS;CLR BF ORNG STN OFF-WH VF-FG MOST LSLY CONS W/V.ARG MTX SUB ANG/SUB RD GRS MOD SORT SM F-MG LOOSE SUB RD/RD QTZ GRS
ANHY:CLR BF LT GRY OFF-WH IP RE-XLN EDGES IP DNS IP SLI SELENITIC GYP XLS MOST FXLN CLN FRM/SLI SFT
SH:RED RED/ORNG IP BLKY IP SLI SILTY MOST SFT/ FRM SM V.SFT
ANHY:MOST BEC WH OFF-WH BF CLR VV.LT TN MOST FXLN IP DNS IP RE-XLN IP VV.SLI SELENITIC GYP XLS MOST CLN/V.CLN FRM/ SLI SFT
SH:RED RED/ORNG IP BLKY IP SLI SILTY MOST SFT/ FRM
T.D. 20" HOLE AT 2090 - RUN E. LOGS
RUN & SET 16" CASING AT 2090
MD 1942 INC 1.4 AZ 296.4
MD 2023 INC 1.1 AZ 289.5
25
50
75
100
125
150
175


G.G.
2100
50
c
2200
0.5
1.0
1.5
2.0
2.5
D.P.
50
c
2300
NB # 2 14 3/4 SEC FX65D/MUD MOTOR/ MWD IN AT 2090 & CIRC BRINE WATER THRU CLOSED MUD SYSTEM
CEM:LT GRY GRY IP BLKY MOST FRM SM FRM/SFT
ANHY:WH CRM OFF-WH BF V.LT TN IP FXLN IP DNS IP SLI RE-XLN EDGES MOST CLN FRM/SFT
SH:RED RED/ORNG IP BLKY IP SLI SILTY FRM/SFT
DOL:LT TN V.LT TN OFF-WH VF-FXLN IP DNS MOST FINELY SUC TR WH LT YEL MIN FLUORO FRM/FT
SS:CLR BF V.LT ORNG STN VF-FG MOST UNCONS SUB RD/SUB ANG GRS
ANHY:WH CRM OFF-WH BF V LT TN FXLN IP DNS IP V FINELY SUC FRM/SFT
SH:RED RED/ORNG IP BLKY IP SILTY SFT/FRM
SS:CLR BF ORNG STN VF-FG MOST UNCONS/LOOSE SUB ANG/SUB RD GRS
DOL;WH-BFF-TRNSL-CLR, MIC-VF-FN XLN,DNS IP, FRM-FRIA,DOLIC IP.
DOL;WH-BFF-LTTN,VF XLN, FRM,CLEAN TO ANHY'IC, SOME SILIC,WH MIN FLUO
SH;RED/ORNG,CSE TXT,SFT BLKY,SLTY.
SALT;CLR-WH-TRNSL.
2120' 279.70° 1.20° 0.00'
25
50
75
100
125
150
175
2215' 279.00° 1.40° 0.00'


50
2400
0.5
1.0
1.5
2.0
2.5
50
G.G.
WOB 25/30,000 RPM 70
SPM 78 & 78 PP 1975
2500
SH;RD-ORNG-LTBN-LTGRN-LTGY,CSE TXT,SFT/FRIA, BLKY,V/SLTY-AREN, ANHY'IC IP.
ANHY;WH-LTBN-LTGY,FRSTD IP,TRNSL IP,MIC-VF XLN FRM-FRIA,SOME DOLIC.
DOL;LTBN-OFF WH,MIC XLN FRM-M/HD,DNS,ANHY'IC IP
ANHY;WH-LTBN-LTGY,VF-FN XLN,SOME DNS,SUCRO IP FRM-FRIA.
SS;WH-CLR,CONS,FG,WLL SRTD,SUBANG-SUBRDD,FRM DOLIC.
SH;ORNG-RD,FN TXT,V/SFT BLKY,SLTY.
ANHY:WH CRM OFF-WH BF V LT TN FXLN IP DNS IP SLI RE-XLN IP V.FINELY SUC SFT/FRM
SS:CLR ORNG STN VF-FG MOST UNCONS SUB ANG/SUB RD GRS IP SLI ARG
SH:RED RED/ORNG IP BLKY IP SLI SILTY MOST SFT IP CRUMBLY
SALT:CLR
ANHY:WH OFF-WH BF V.LT TN FXLN IP DNS IP V. FINELY SUC IP CLN IP
2403' 290.00° 1.10° 0.00'
25 50 75 100 125 150 175
2498' 283.20° 1.40° 0.00'





SLI ARG FRM/SFT

SS:CLR ORNG STN BF VF-FG UNCONS SUB ANG/SUB RD GRS IP CLN IP SLI ARG

SALT:CLR

SH:RED RED/ORNG IP BLKY IP SILTY MOST SFT IP SLI CRUMBLY

MW 10.0 VIS 28

ANHY:WH OFF-WH BF LT GRY V.LT TN VF-FXLN IP DNS IP SLI RE-XLN EDGES IP VV.FINELY SUC SFT/ FRM

SS:CLR ORNG STN VF-FG MOST UNCONS SUB ANG/SUB RD GRS IP CLN MOST SLI ARG

SALT:CLR

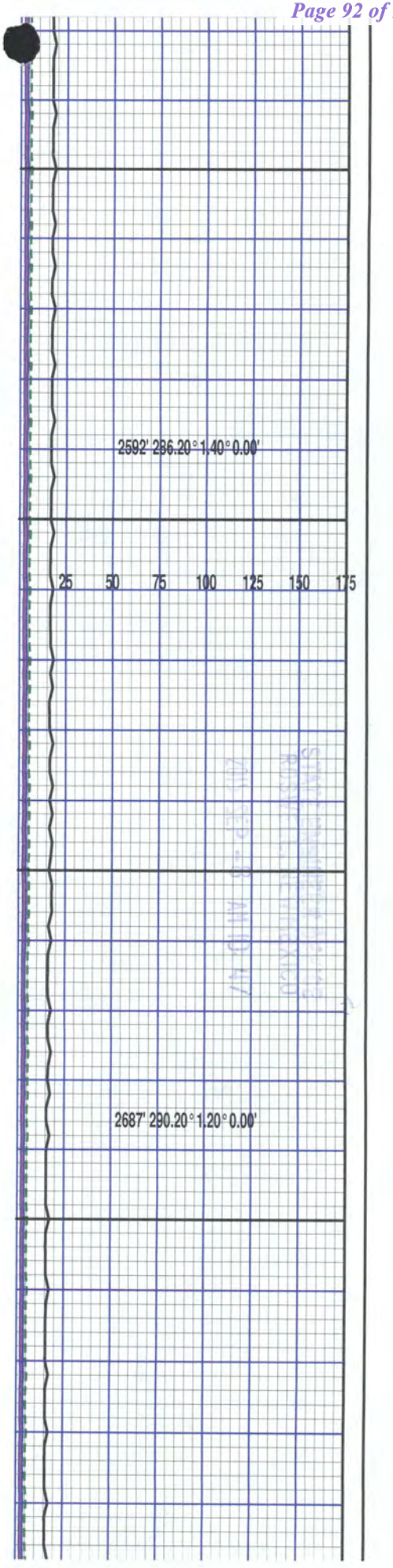
ANHY:WH CRM OFF-WH BF VF-FXLN IP DNS IP V. FINELY SUC SFT/FRM

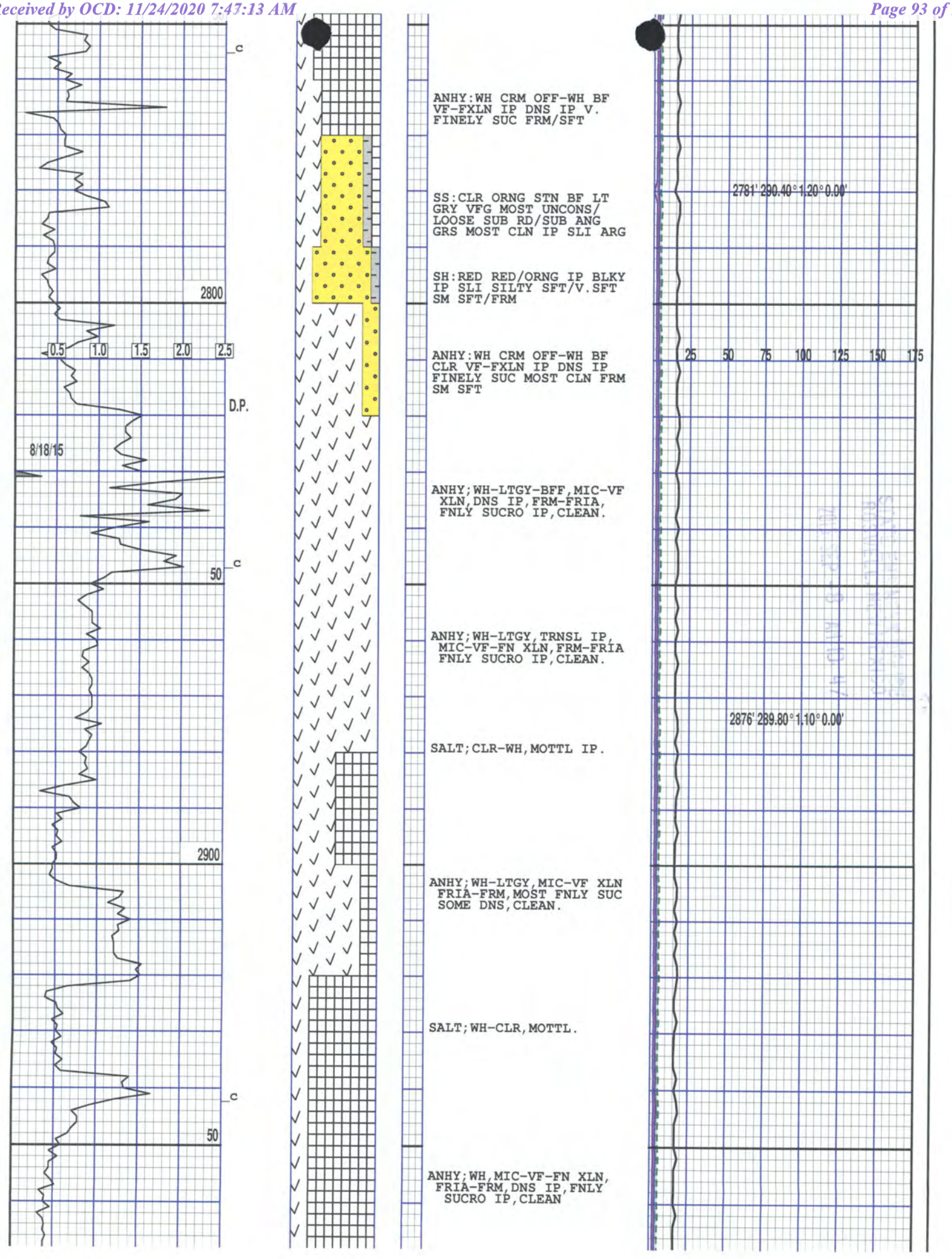
SALT:CLR

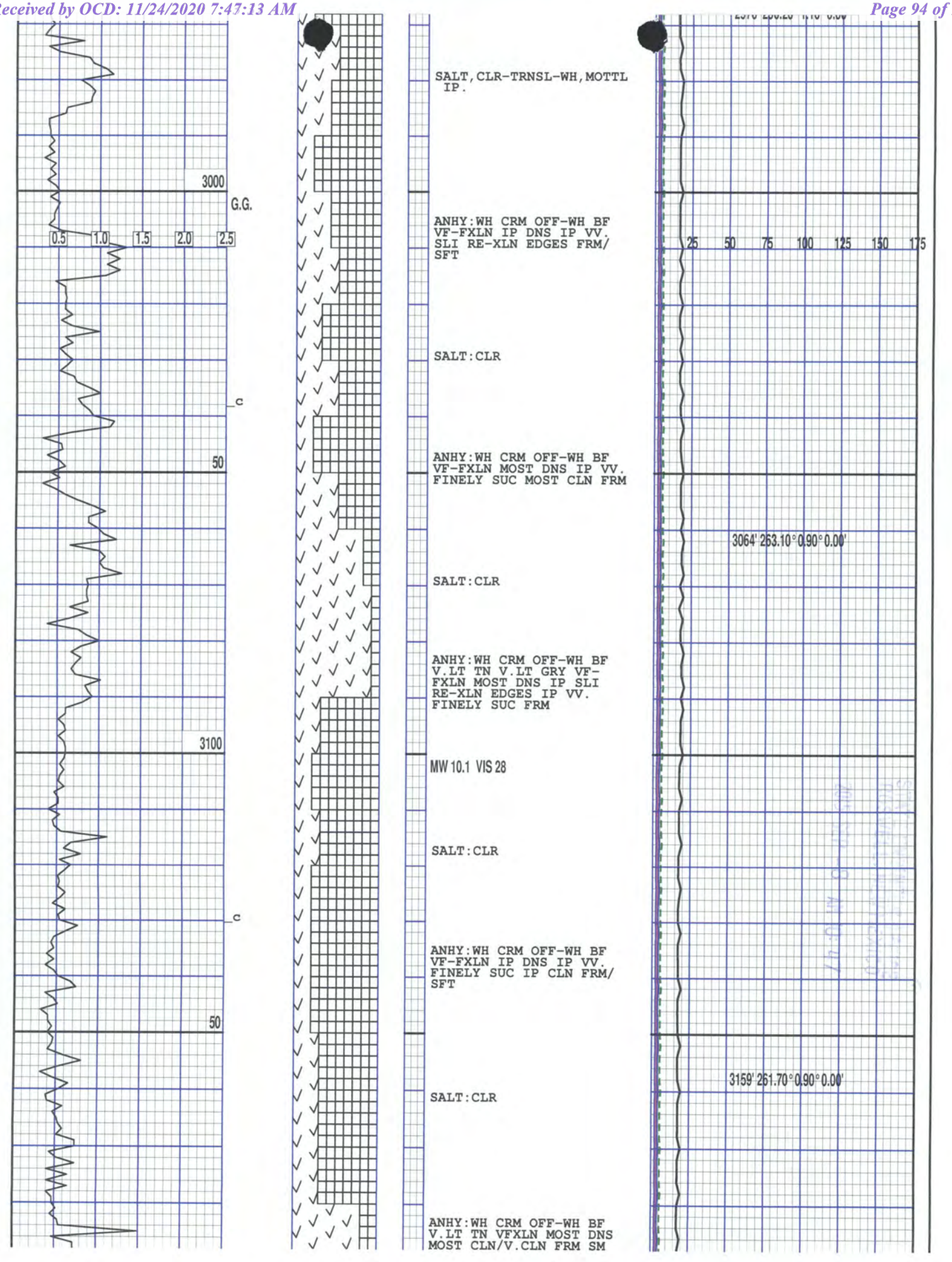
ANHY:WH CRM OFF-WH BF VF-FXLN IP DNS IP V. FINELY SUC SFT/FRM

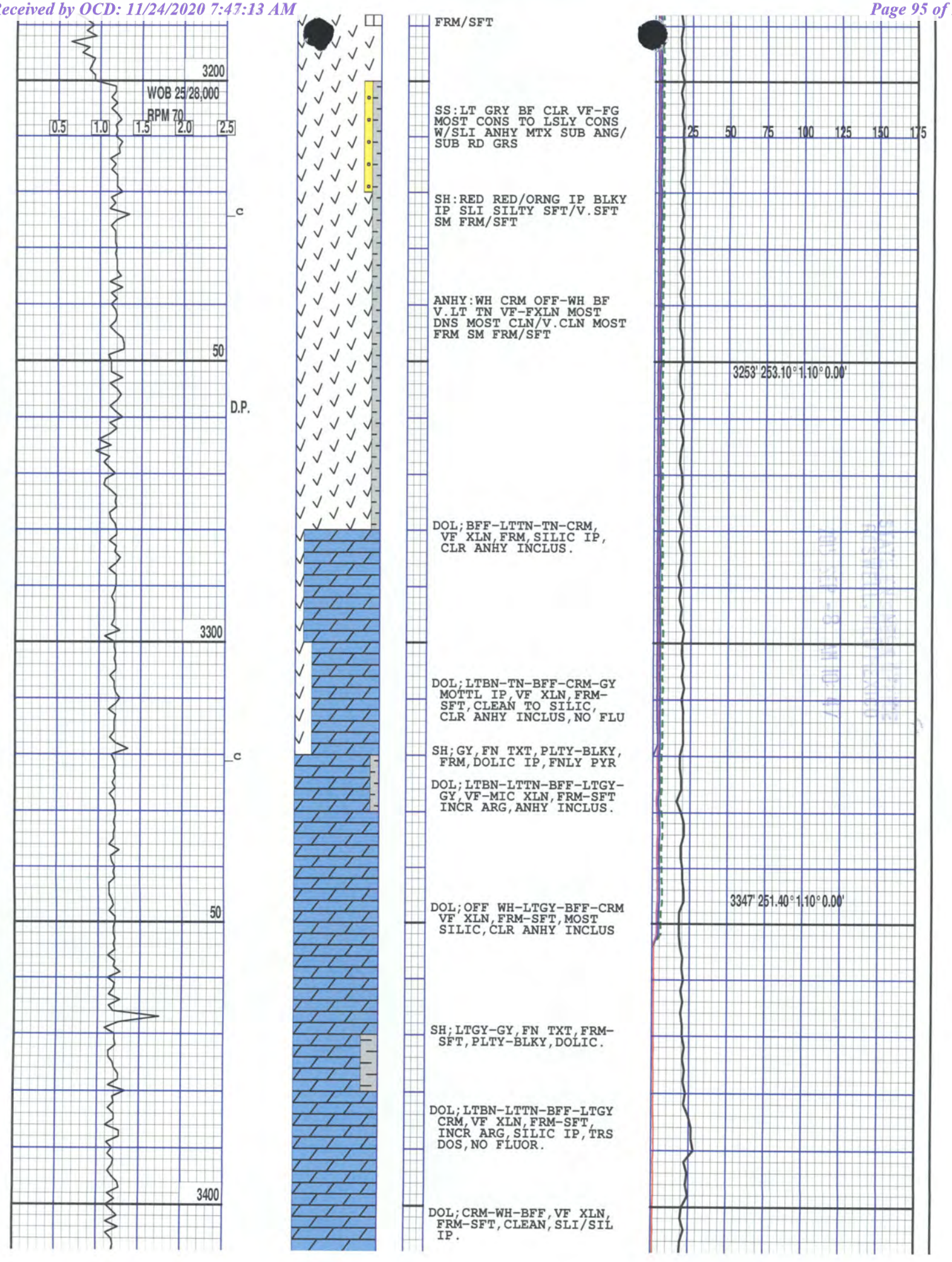
SALT:CLR

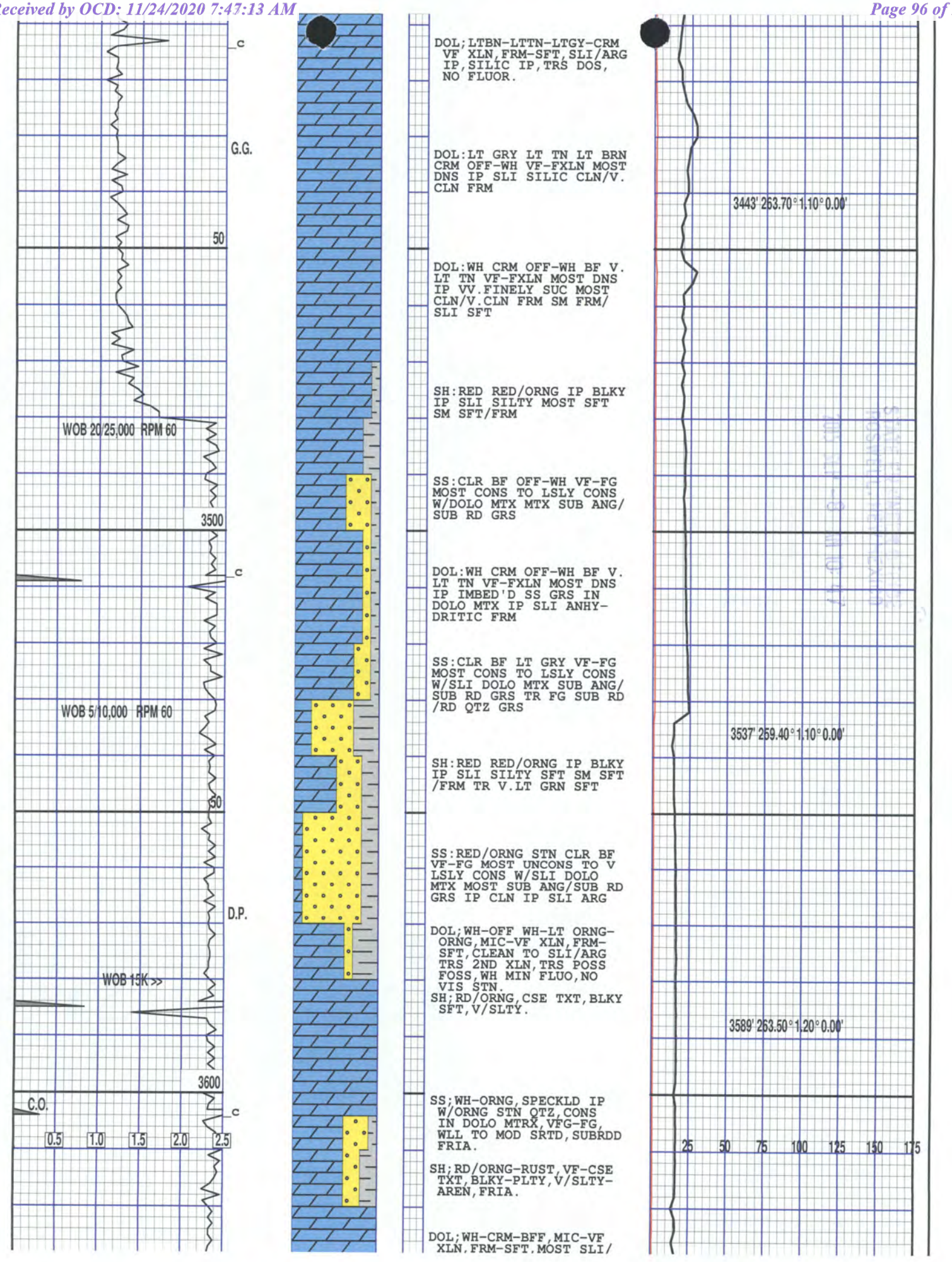
TR RED RED/ORNG SFT/V. SFT SH

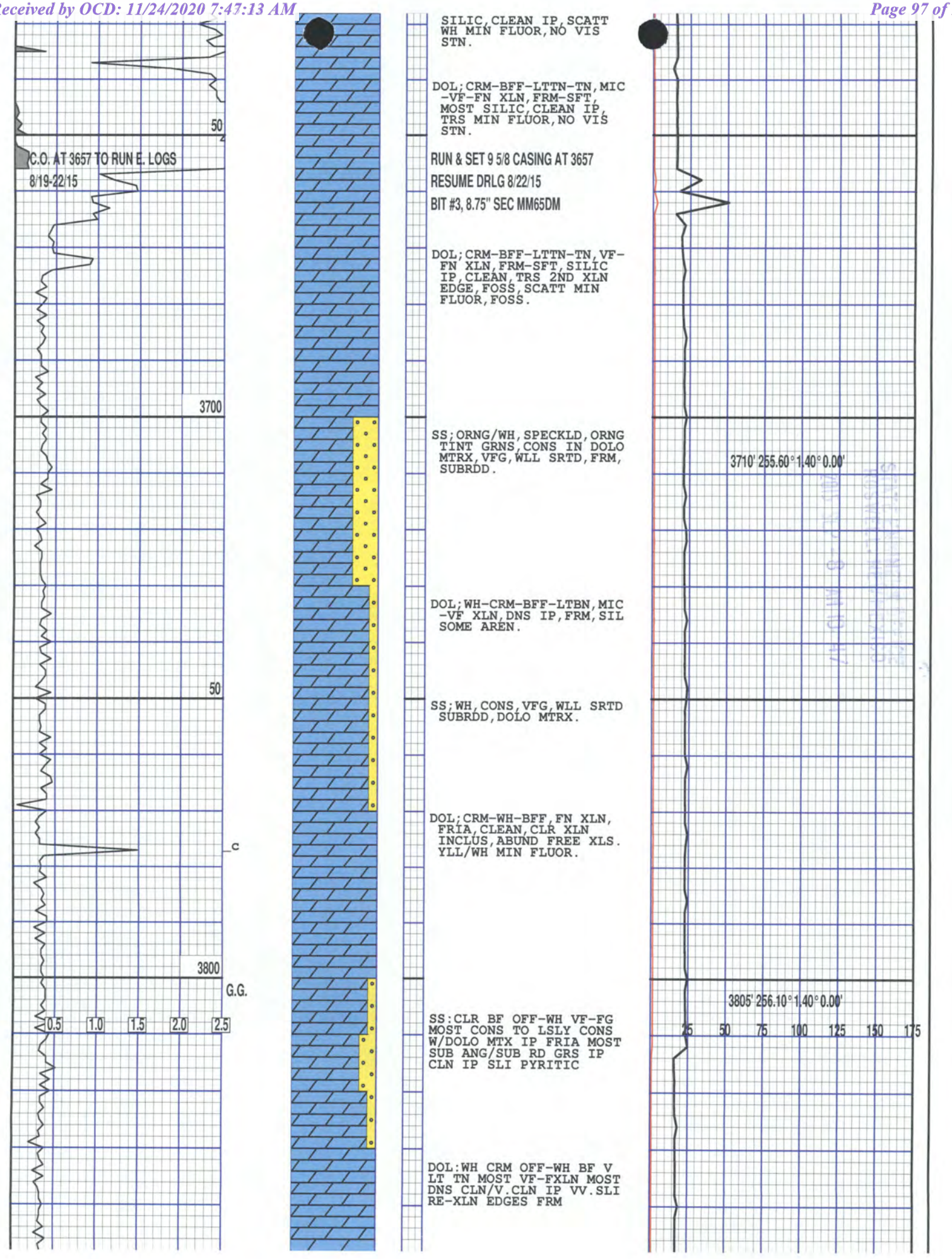


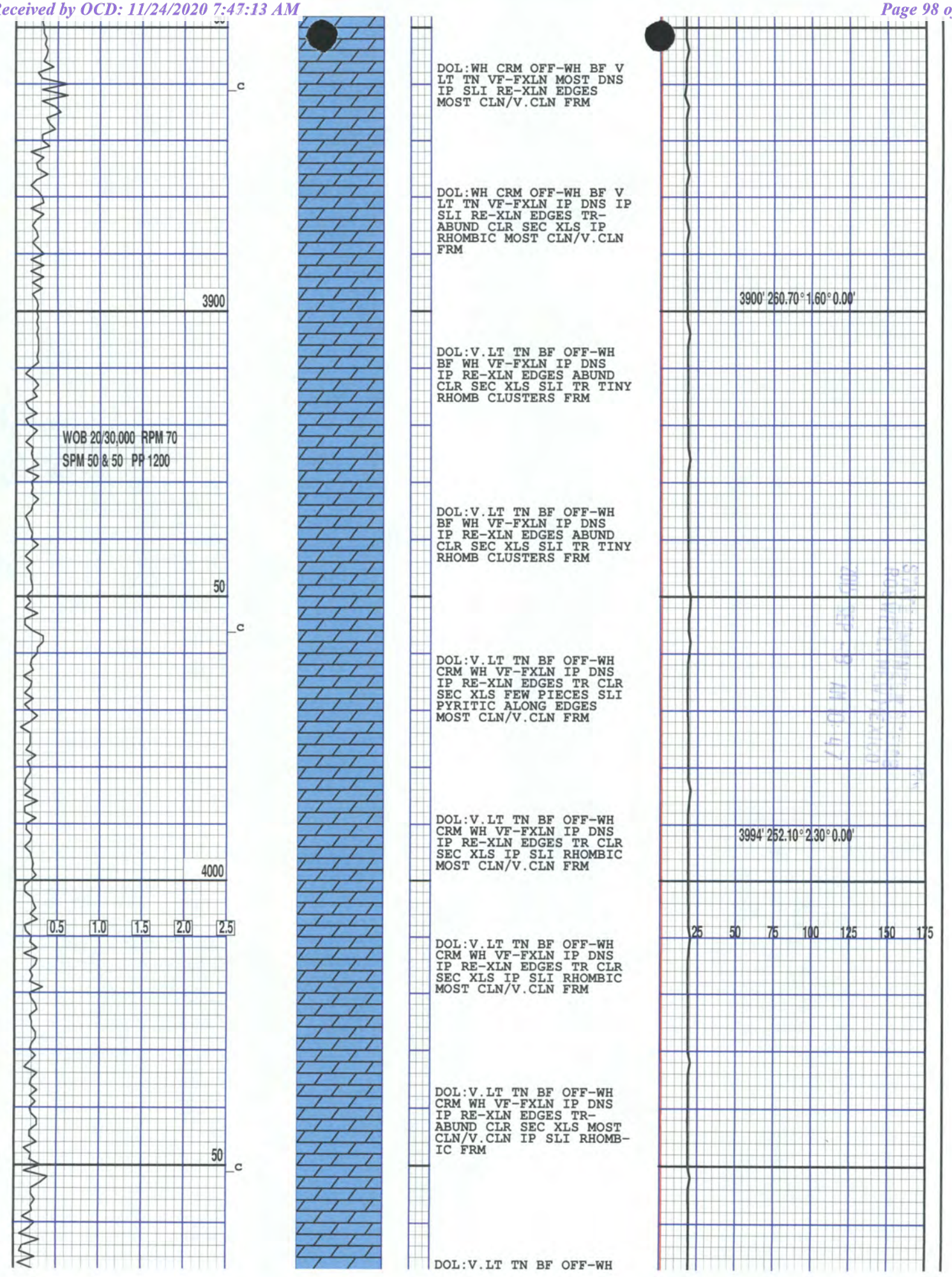

c
2800
0.5
1.0
1.5
2.0
2.5
D.P.
8/18/15
50
c
2900
c
50
ANHY:WH CRM OFF-WH BF VF-FXLN IP DNS IP V. FINELY SUC FRM/SFT
SS:CLR ORNG STN BF LT GRY VFG MOST UNCONS/ LOOSE SUB RD/SUB ANG GRS MOST CLN IP SLI ARG
SH:RED RED/ORNG IP BLKY IP SLI SILTY SFT/V.SFT SM SFT/FRM
ANHY:WH CRM OFF-WH BF CLR VF-FXLN IP DNS IP FINELY SUC MOST CLN FRM SM SFT
ANHY;WH-LTGY-BFF,MIC-VF XLN,DNS IP,FRM-FRIA, FNLY SUCRO IP,CLEAN.
ANHY;WH-LTGY,TRNSL IP, MIC-VF-FN XLN,FRM-FRIA FNLY SUCRO IP,CLEAN.
SALT;CLR-WH,MOTTL IP.
ANHY;WH-LTGY,MIC-VF XLN FRIA-FRM,MOST FNLY SUC SOME DNS,CLEAN.
SALT;WH-CLR,MOTTL.
ANHY;WH,MIC-VF-FN XLN, FRIA-FRM,DNS IP,FNLY SUCRO IP,CLEAN
2781' 290.40° 1.20° 0.00'
25
50
75
100
125
150
175
2876' 289.80° 1.10° 0.00'

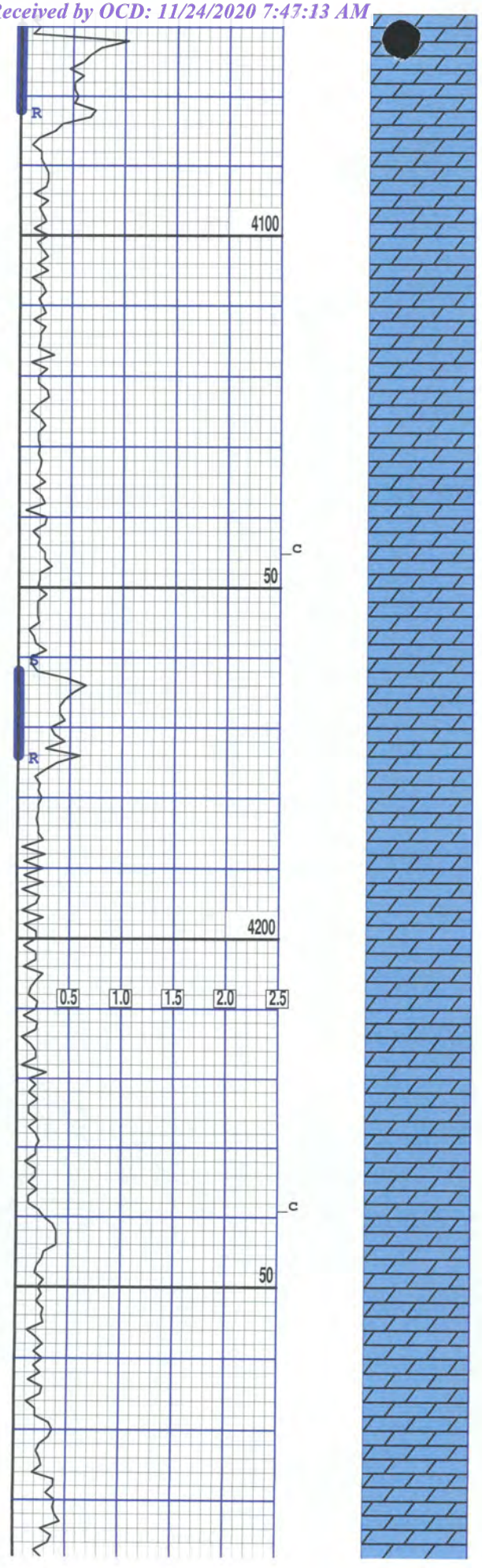

3000
G.G.
0.5
1.0
1.5
2.0
2.5
c
50
3100
c
50
SALT, CLR-TRNSL-WH, MOTTL IP.
ANHY:WH CRM OFF-WH BF VF-FXLN IP DNS IP VV. SLI RE-XLN EDGES FRM/ SFT
SALT:CLR
ANHY:WH CRM OFF-WH BF VF-FXLN MOST DNS IP VV. FINELY SUC MOST CLN FRM
SALT:CLR
ANHY:WH CRM OFF-WH BF V.LT TN V.LT GRY VF-FXLN MOST DNS IP SLI RE-XLN EDGES IP VV. FINELY SUC FRM
MW 10.1 VIS 28
SALT:CLR
ANHY:WH CRM OFF-WH BF VF-FXLN IP DNS IP VV. FINELY SUC IP CLN FRM/ SFT
SALT:CLR
ANHY:WH CRM OFF-WH BF V.LT TN VFXLN MOST DNS MOST CLN/V.CLN FRM SM
25
50
75
100
125
150
175
3064' 263.10° 0.90° 0.00'
3159' 261.70° 0.90° 0.00'


3200
WOB 25/28,000
RPM 70
0.5
1.0
1.5
2.0
2.5
c
50
D.P.
3300
c
50
3400
FRM/SFT
SS:LT GRY BF CLR VF-FG MOST CONS TO LSLY CONS W/SLI ANHY MTX SUB ANG/ SUB RD GRS
SH:RED RED/ORNG IP BLKY IP SLI SILTY SFT/V.SFT SM FRM/SFT
ANHY:WH CRM OFF-WH BF V.LT TN VF-FXLN MOST DNS MOST CLN/V.CLN MOST FRM SM FRM/SFT
DOL;BFF-LTTN-TN-CRM, VF XLN,FRM,SILIC IP, CLR ANHY INCLUS.
DOL;LTBN-TN-BFF-CRM-GY MOTTL IP,VF XLN,FRM-SFT,CLEAN TO SILIC, CLR ANHY INCLUS,NO FLU
SH;GY,FN TXT,PLTY-BLKY, FRM,DOLIC IP,FNLY PYR
DOL;LTBN-LTTN-BFF-LTGY-GY,VF-MIC XLN,FRM-SFT INCR ARG,ANHY INCLUS.
DOL;OFF WH-LTGY-BFF-CRM VF XLN,FRM-SFT,MOST SILIC,CLR ANHY INCLUS
SH;LTGY-GY,FN TXT,FRM-SFT,PLTY-BLKY,DOLIC.
DOL;LTBN-LTTN-BFF-LTGY CRM,VF XLN,FRM-SFT, INCR ARG,SILIC IP,TRS DOS,NO FLUOR.
DOL;CRM-WH-BFF,VF XLN, FRM-SFT,CLEAN,SLI/SIL IP.
25
50
75
100
125
150
175
3253' 253.10° 1.10° 0.00'
3347' 251.40° 1.10° 0.00'


c
G.G.
50
WOB 20/25,000 RPM 60
3500
c
WOB 5/10,000 RPM 60
50
D.P.
WOB 15K >>
3600
C.O.
c
0.5
1.0
1.5
2.0
2.5
DOL;LTBN-LTTN-LTGY-CRM VF XLN,FRM-SFT,SLI/ARG IP,SILIC IP,TRS DOS, NO FLUOR.
DOL:LT GRY LT TN LT BRN CRM OFF-WH VF-FXLN MOST DNS IP SLI SILIC CLN/V. CLN FRM
DOL:WH CRM OFF-WH BF V. LT TN VF-FXLN MOST DNS IP VV.FINELY SUC MOST CLN/V.CLN FRM SM FRM/ SLI SFT
SH:RED RED/ORNG IP BLKY IP SLI SILTY MOST SFT SM SFT/FRM
SS:CLR BF OFF-WH VF-FG MOST CONS TO LSLY CONS W/DOLO MTX MTX SUB ANG/ SUB RD GRS
DOL:WH CRM OFF-WH BF V. LT TN VF-FXLN MOST DNS IP IMBED'D SS GRS IN DOLO MTX IP SLI ANHY-DRITIC FRM
SS:CLR BF LT GRY VF-FG MOST CONS TO LSLY CONS W/SLI DOLO MTX SUB ANG/ SUB RD GRS TR FG SUB RD /RD QTZ GRS
SH:RED RED/ORNG IP BLKY IP SLI SILTY SFT SM SFT /FRM TR V.LT GRN SFT
SS:RED/ORNG STN CLR BF VF-FG MOST UNCONS TO V LSLY CONS W/SLI DOLO MTX MOST SUB ANG/SUB RD GRS IP CLN IP SLI ARG
DOL;WH-OFF WH-LT ORNG-ORNG,MIC-VF XLN,FRM-SFT,CLEAN TO SLI/ARG TRS 2ND XLN,TRS POSS FOSS,WH MIN FLUO,NO VIS STN.
SH;RD/ORNG,CSE TXT,BLKY SFT,V/SLTY.
SS;WH-ORNG,SPECKLD IP W/ORNG STN QTZ,CONS IN DOLO MTRX,VFG-FG, WLL TO MOD SRTD,SUBRDD FRIA.
SH;RD/ORNG-RUST,VF-CSE TXT,BLKY-PLTY,V/SLTY-AREN,FRIA.
DOL;WH-CRM-BFF,MIC-VF XLN.FRM-SFT.MOST SLI/
3443' 263.70° 1.10° 0.00'
3537' 259.40° 1.10° 0.00'
3589' 263.50° 1.20° 0.00'
25
50
75
100
125
150
175


50
C.O. AT 3657 TO RUN E. LOGS
8/19-22/15
3700
50
3800
G.G.
0.5
1.0
1.5
2.0
2.5
SILIC, CLEAN IP, SCATT WH MIN FLUOR, NO VIS STN.
DOL; CRM-BFF-LTTN-TN, MIC -VF-FN XLN, FRM-SFT, MOST SILIC, CLEAN IP, TRS MIN FLUOR, NO VIS STN.
RUN & SET 9 5/8 CASING AT 3657
RESUME DRLG 8/22/15
BIT #3, 8.75" SEC MM65DM
DOL; CRM-BFF-LTTN-TN, VF-FN XLN, FRM-SFT, SILIC IP, CLEAN, TRS 2ND XLN EDGE, FOSS, SCATT MIN FLUOR, FOSS.
SS; ORNG/WH, SPECKLD, ORNG TINT GRNS, CONS IN DOLO MTRX, VFG, WLL SRTD, FRM, SUBRDD.
DOL; WH-CRM-BFF-LTBN, MIC -VF XLN, DNS IP, FRM, SIL SOME AREN.
SS; WH, CONS, VFG, WLL SRTD SUBRDD, DOLO MTRX.
DOL; CRM-WH-BFF, FN XLN, FRIA, CLEAN, CLR XLN INCLUS, ABUND FREE XLS. YLL/WH MIN FLUOR.
SS: CLR BF OFF-WH VF-FG MOST CONS TO LSLY CONS W/DOLO MTX IP FRIA MOST SUB ANG/SUB RD GRS IP CLN IP SLI PYRITIC
DOL: WH CRM OFF-WH BF V LT TN MOST VF-FXLN MOST DNS CLN/V. CLN IP VV. SLI RE-XLN EDGES FRM
3710' 255.60° 1.40° 0.00'
3805' 256.10° 1.40° 0.00'
25
50
75
100
125
150
175


C
3900
WOB 20/30,000 RPM 70
SPM 50 & 50 PP 1200
50
C
4000
0.5
1.0
1.5
2.0
2.5
50
C
DOL:WH CRM OFF-WH BF V LT TN VF-FXLN MOST DNS IP SLI RE-XLN EDGES MOST CLN/V.CLN FRM
DOL:WH CRM OFF-WH BF V LT TN VF-FXLN IP DNS IP SLI RE-XLN EDGES TR-ABUND CLR SEC XLS IP RHOMBIC MOST CLN/V.CLN FRM
3900' 260.70° 1.60° 0.00'
DOL:V.LT TN BF OFF-WH BF WH VF-FXLN IP DNS IP RE-XLN EDGES ABUND CLR SEC XLS SLI TR TINY RHOMB CLUSTERS FRM
DOL:V.LT TN BF OFF-WH BF WH VF-FXLN IP DNS IP RE-XLN EDGES ABUND CLR SEC XLS SLI TR TINY RHOMB CLUSTERS FRM
DOL:V.LT TN BF OFF-WH CRM WH VF-FXLN IP DNS IP RE-XLN EDGES TR CLR SEC XLS FEW PIECES SLI PYRITIC ALONG EDGES MOST CLN/V.CLN FRM
DOL:V.LT TN BF OFF-WH CRM WH VF-FXLN IP DNS IP RE-XLN EDGES TR CLR SEC XLS IP SLI RHOMBIC MOST CLN/V.CLN FRM
3994' 252.10° 2.30° 0.00'
25
50
75
100
125
150
175
DOL:V.LT TN BF OFF-WH CRM WH VF-FXLN IP DNS IP RE-XLN EDGES TR CLR SEC XLS IP SLI RHOMBIC MOST CLN/V.CLN FRM
DOL:V.LT TN BF OFF-WH CRM WH VF-FXLN IP DNS IP RE-XLN EDGES TR-ABUND CLR SEC XLS MOST CLN/V.CLN IP SLI RHOMB-IC FRM
DOL:V.LT TN BF OFF-WH



CRM WH VF-FG IP DNS IP RE-XLN EDGES TR-ABUND CLR SEC XLS IP RHOMBIC MOST CLN/V.CLN FRM

DOL:V.LT TN BF OFF-WH CRM WH VF-FG IP DNS IP RE-XLN EDGES TR-ABUND CLR SEC XLS IP RHOMBIC MOST CLN/V.CLN FRM

DOL:V.LT TN BF OFF-WH CRM WH VF-FG IP DNS IP RE-XLN EDGES TR CLR SEC XLS MOST CLN/V.CLN FRM

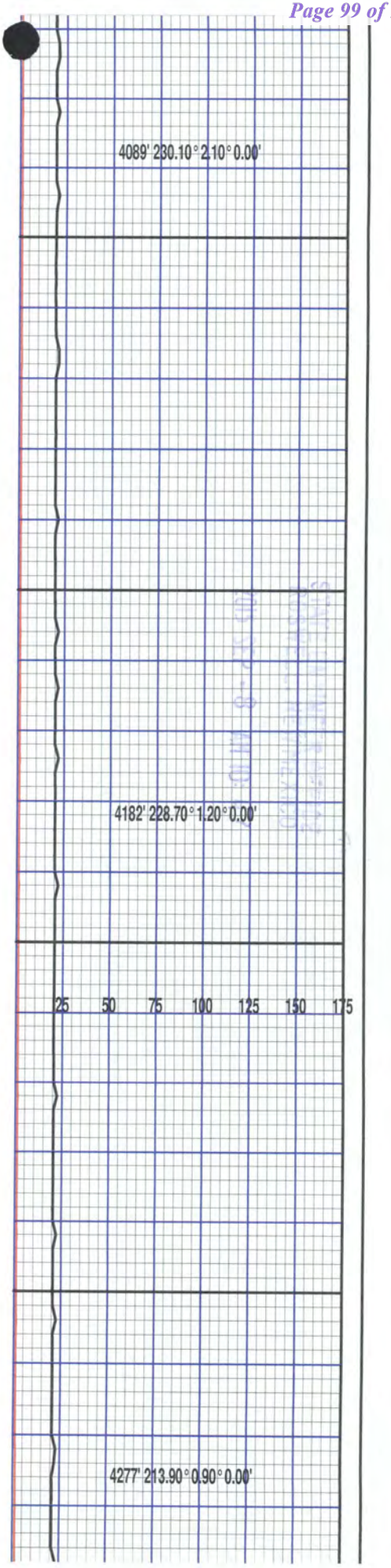
DOL:V.LT TN BF OFF-WH CRM WH VF-FXLN IP DNS IP RE-XLN EDGES TR CLR SEC XLS MOST CLN/V.CLN FRM

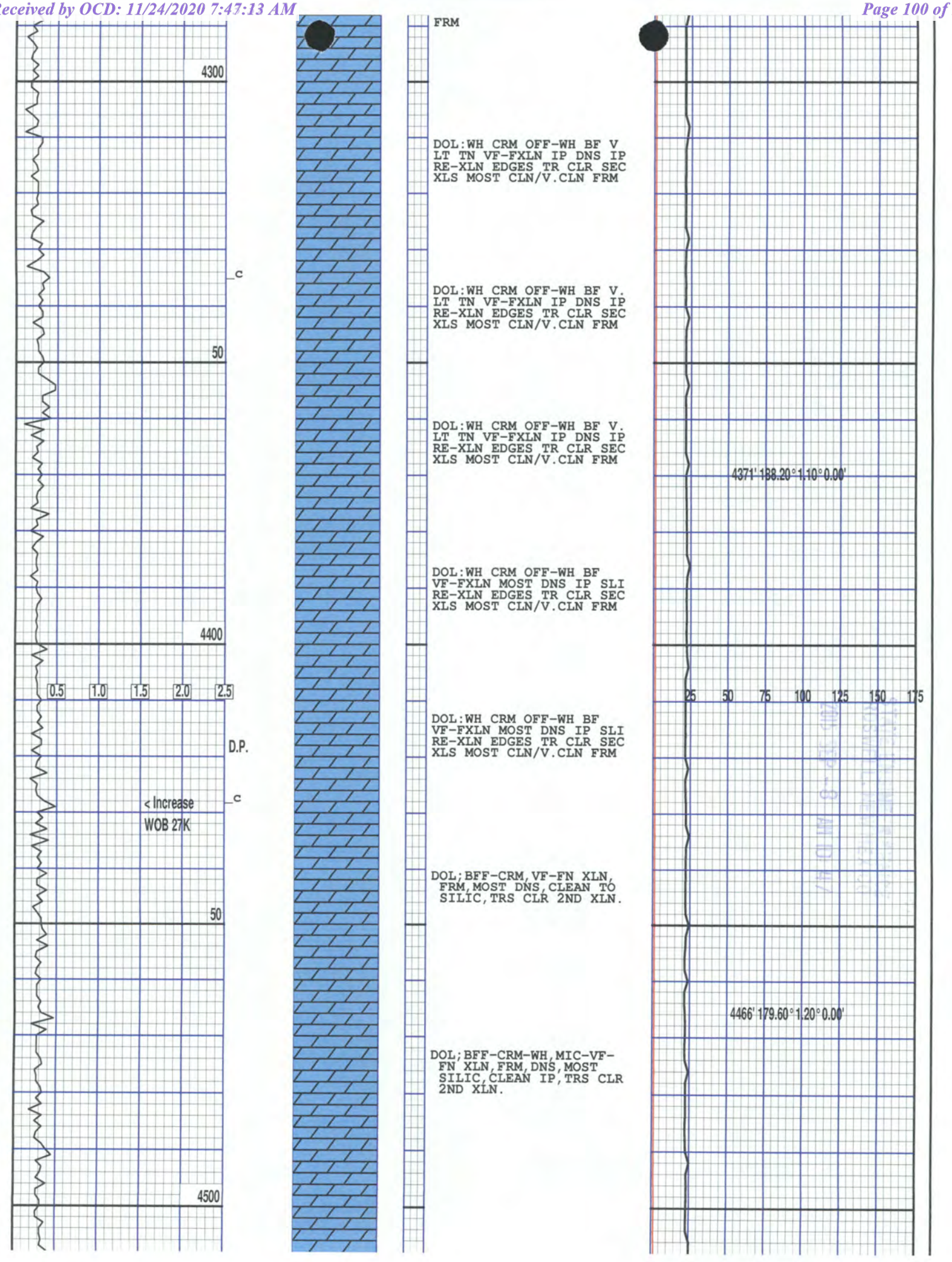
DOL:V.LT TN BF OFF-WH CRM WH VF-FXLN IP DNS TR-ABUND CLR SEC XLS IP RE-XLN EDGES IP SLI RHOMBIC MOST CLN/V.CLN FRM

DOL:V.LT TN BF OFF-WH CRM WH VF-FXLN IP DNS IP RE-XLN EDGES TR-ABUND CLR SEC XLS IP SLI RHOMBIC MOST CLN/V.CLN FRM

DOL:V.LT TN BF OFF-WH CRM WH VF-FXLN IP DNS IP RE-XLN EDGES TR CLR SEC XLS MOST CLN/V.CLN FRM

DOL:V.LT TN BF OFF-WH CRM WH VF-FXLN IP DNS IP RE-XLN EDGES TR CLR SEC XLS MOST CLN/V.CLN




4300
c
50
4400
0.5
1.0
1.5
2.0
2.5
D.P.
< Increase
WOB 27K
c
50
4500
FRM
DOL:WH CRM OFF-WH BF V LT TN VF-FXLN IP DNS IP RE-XLN EDGES TR CLR SEC XLS MOST CLN/V.CLN FRM
DOL:WH CRM OFF-WH BF V. LT TN VF-FXLN IP DNS IP RE-XLN EDGES TR CLR SEC XLS MOST CLN/V.CLN FRM
DOL:WH CRM OFF-WH BF V. LT TN VF-FXLN IP DNS IP RE-XLN EDGES TR CLR SEC XLS MOST CLN/V.CLN FRM
DOL:WH CRM OFF-WH BF VF-FXLN MOST DNS IP SLI RE-XLN EDGES TR CLR SEC XLS MOST CLN/V.CLN FRM
DOL:WH CRM OFF-WH BF VF-FXLN MOST DNS IP SLI RE-XLN EDGES TR CLR SEC XLS MOST CLN/V.CLN FRM
DOL;BFF-CRM,VF-FN XLN, FRM,MOST DNS,CLEAN TO SILIC,TRS CLR 2ND XLN.
DOL;BFF-CRM-WH,MIC-VF-FN XLN,FRM,DNS,MOST SILIC,CLEAN IP,TRS CLR 2ND XLN.
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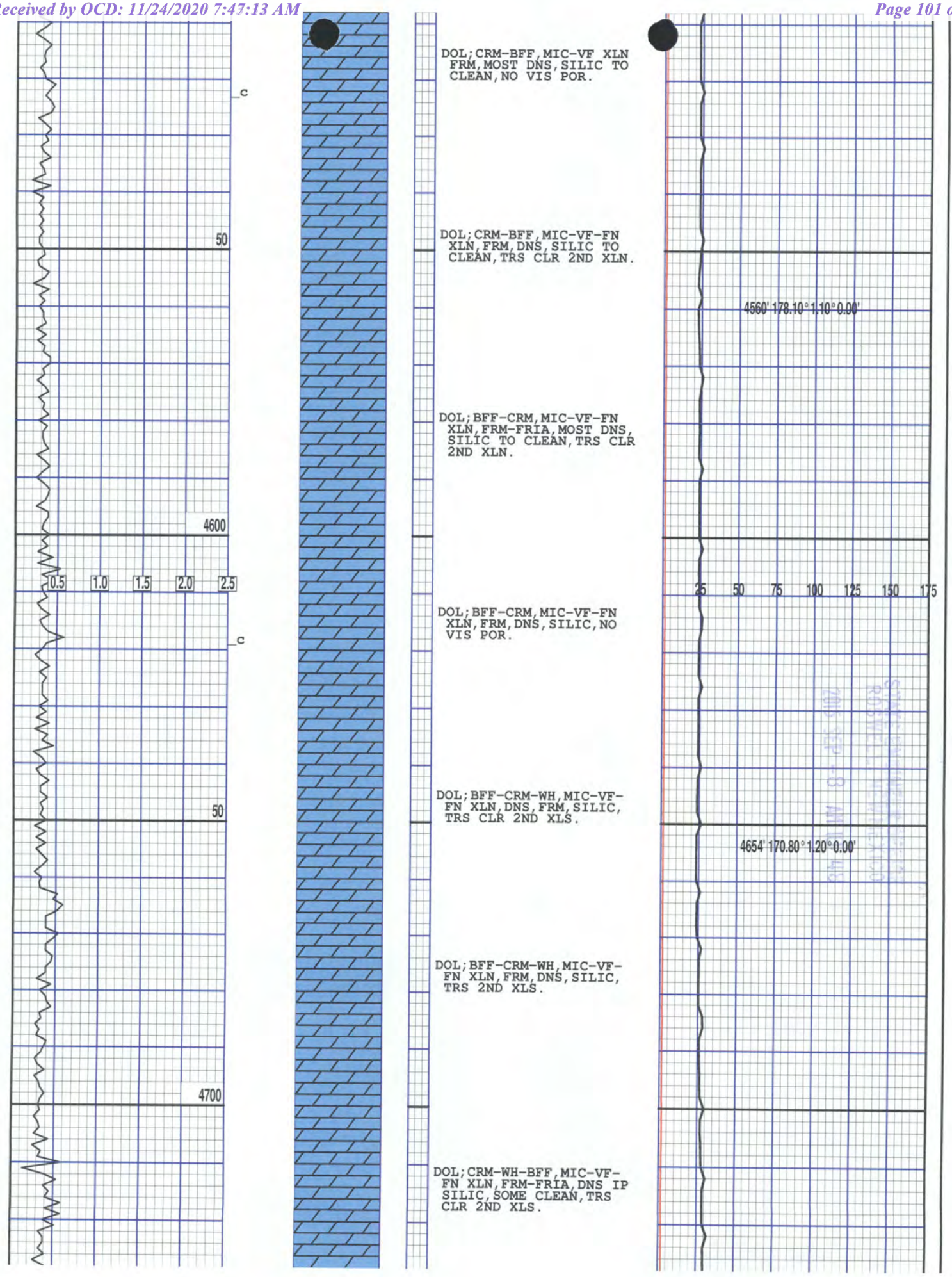
50
75
100
125
150
175
4466' 179.60° 1.20° 0.00'


c
50
4600
0.5
1.0
1.5
2.0
2.5
c
50
4700
DOL;CRM-BFF,MIC-VF XLN FRM,MOST DNS,SILIC TO CLEAN,NO VIS POR.
DOL;CRM-BFF,MIC-VF-FN XLN,FRM,DNS,SILIC TO CLEAN,TRS CLR 2ND XLN.
DOL;BFF-CRM,MIC-VF-FN XLN,FRM-FRIA,MOST DNS, SILIC TO CLEAN,TRS CLR 2ND XLN.
DOL;BFF-CRM,MIC-VF-FN XLN,FRM,DNS,SILIC,NO VIS POR.
DOL;BFF-CRM-WH,MIC-VF-FN XLN,DNS,FRM,SILIC, TRS CLR 2ND XLS.
DOL;BFF-CRM-WH,MIC-VF-FN XLN,FRM,DNS,SILIC, TRS 2ND XLS.
DOL;CRM-WH-BFF,MIC-VF-FN XLN,FRM-FRIA,DNS IP SILIC,SOME CLEAN,TRS CLR 2ND XLS.
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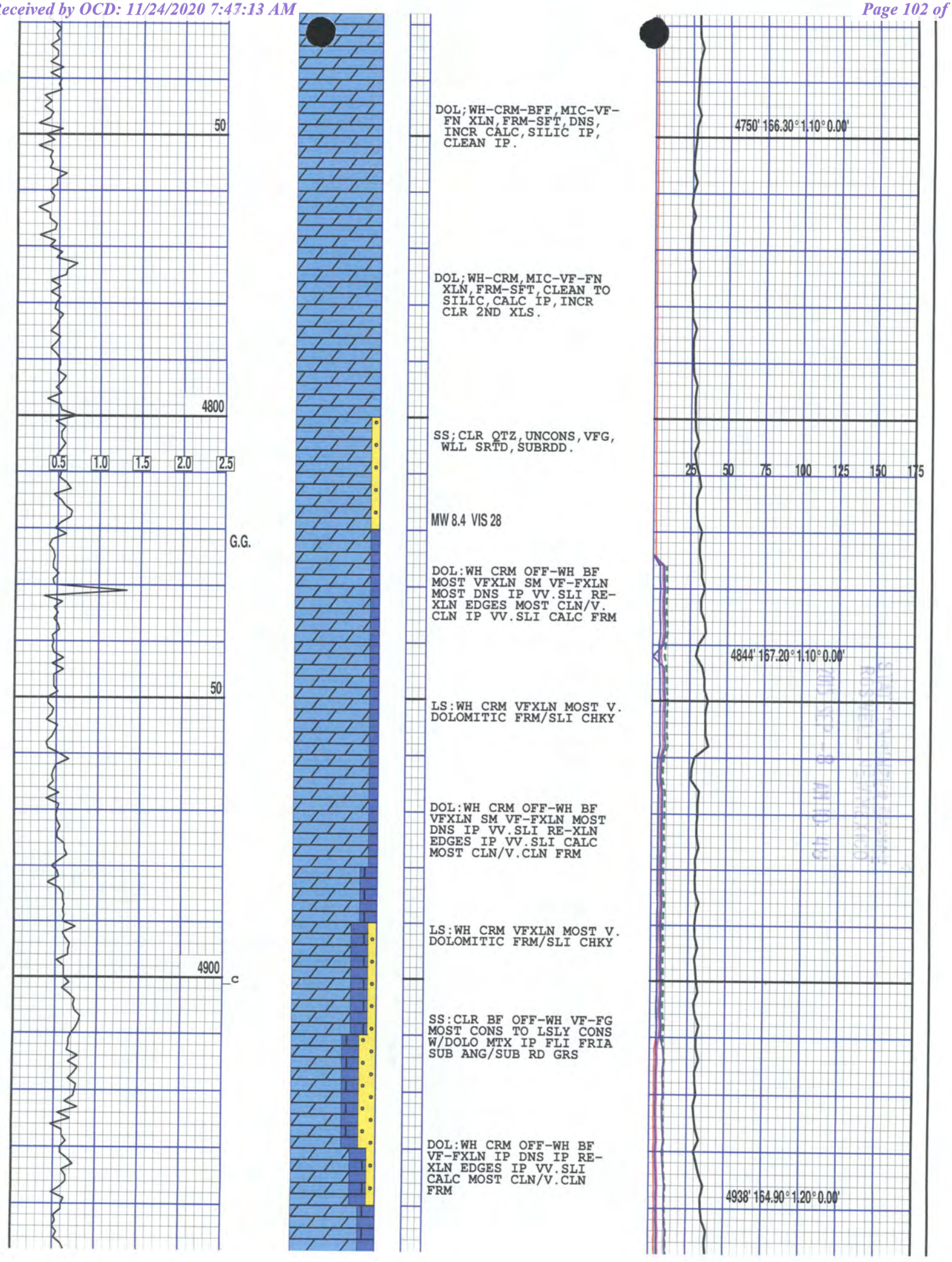
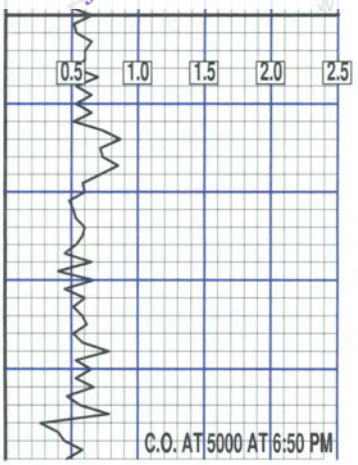
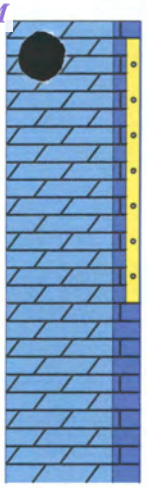
100
125
150
175
4654' 170.80° 1.20° 0.00'


50
4800
0.5
1.0
1.5
2.0
2.5
G.G.
50
4900
c
DOL;WH-CRM-BFF,MIC-VF-FN XLN,FRM-SFT,DNS, INCR CALC,SILIC IP, CLEAN IP.
DOL;WH-CRM,MIC-VF-FN XLN,FRM-SFT,CLEAN TO SILIC,CALC IP,INCR CLR 2ND XLS.
SS;CLR QTZ,UNCONS,VFG, WLL SRTD,SUBRDD.
MW 8.4 VIS 28
DOL:WH CRM OFF-WH BF MOST VFXLN SM VF-FXLN MOST DNS IP VV.SLI RE-XLN EDGES MOST CLN/V. CLN IP VV.SLI CALC FRM
LS:WH CRM VFXLN MOST V. DOLOMITIC FRM/SLI CHKY
DOL:WH CRM OFF-WH BF VFXLN SM VF-FXLN MOST DNS IP VV.SLI RE-XLN EDGES IP VV.SLI CALC MOST CLN/V.CLN FRM
LS:WH CRM VFXLN MOST V. DOLOMITIC FRM/SLI CHKY
SS:CLR BF OFF-WH VF-FG MOST CONS TO LSLY CONS W/DOLO MTX IP FLI FRIA SUB ANG/SUB RD GRS
DOL:WH CRM OFF-WH BF VF-FXLN IP DNS IP RE-XLN EDGES IP VV.SLI CALC MOST CLN/V.CLN FRM
4750' 166.30° 1.10° 0.00'
25
50
75
100
125
150
175
4844' 167.20° 1.10° 0.00'
4938' 164.90° 1.20° 0.00'



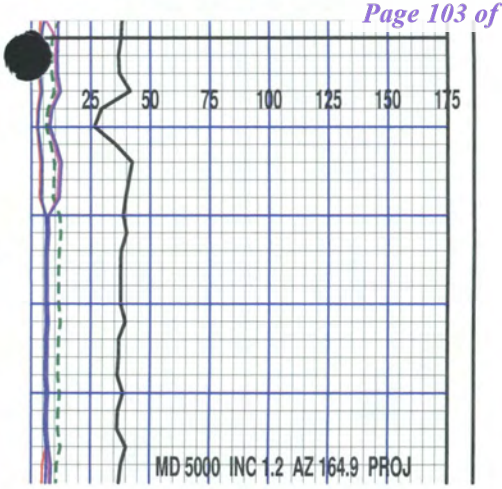


LS:WH CRM OFF-WH VFXLN IP DNS MOST DOLOMITIC CLN FRM/SLI CHKY

SS:CLR BF OFF-WH VF-FG MOST CONS TO LSLY CONS W/DOLOMITIC MTX IP FRIA SUB ANG/SUB RD GRS

DOL:WH CRM OFF-WH BF V. LT TN VFXLN SM VF-FXLN MOST DNS IP V.SLI RE-XLN CLN FRM

T.D. 8 3/4" HOLE AT 5000'- E.LOGS



Cement Blend Calculations

CONDUCTOR

DESIRED CEMENT DENSITY	WATER DENSITY FRESH - 8.34 SEA - 8.55	YIELD CU.FT./SK	MIX WATER GPS	TOTAL MIX FLUID - GPS	% WATER - BWOC
14.80	8.34	1.34	6.35	6.35	56.30%

CEMENTS	% CU.FT.	LBS/SK	ABS VOL	GALS		
Class C	100	94.00	0.0382	3.5908	674.76	GRAMS
		0.00	0.0000	0.0000	0.00	GRAMS
		0.00	0.0000	0.0000	0.00	GRAMS
		0.00	0.0000	0.0000	0.00	GRAMS
TOTAL BASE	100	94.00		3.5908		

Dry adds.	%	LBS	ABS VOL	GALS/SK		
CaCl2	1.50	1.410	0.0612	0.0863	10.12	GRAMS
		0.000	0.0000	0.0000	0.00	GRAMS
		0.000	0.0000	0.0000	0.00	GRAMS
		0.000	0.0000	0.0000	0.00	GRAMS
		0.000	0.0000	0.0000	0.00	GRAMS
		0.000	0.0000	0.0000	0.00	GRAMS
		0.000	0.0000	0.0000	0.00	GRAMS
		0.000	0.0000	0.0000	0.00	GRAMS
TOTAL DRY		1.410		0.0863		

Liquid Adds	gps	LBS	ABS VOL	GALS/SK				
		0.000	0.0000	0.0000	0.00	GRAMS	0.00	MLS
		0.000	0.0000	0.0000	0.00	GRAMS	0.00	MLS
		0.000	0.0000	0.0000	0.00	GRAMS	0.00	MLS
		0.000	0.0000	0.0000	0.00	GRAMS	0.00	MLS
		0.000	0.0000	0.0000	0.00	GRAMS	0.00	MLS
		0.000	0.0000	0.0000	0.00	GRAMS	0.00	MLS
TOTAL LIQUIDS		0.000		0.0000				

SALTS	% BWOW	LBS/SK	ABS VOL	GALS/SK		
SALT	0	0.000	0.0000	0.0000	0.00	GRAMS
KCL	0	0.000	0.0000	0.0000	0.00	GRAMS
TOTAL SALT		0.000		0.0000		

684.89	GRAMS TOTAL DRY ADDS

WATER TYPE	WEIGHT	SP.GR.
FRESH	8.34	1.000

379.86	GRAMS	WATER TYPE	
379.86	MLS	FRESH	

6.35	GPS
1.34	YIELD

POUNDS DRY	95.41
GALLONS DRY	3.677092
POUNDS LIQUID	0
GALLONS LIQUID	0
TOTAL POUNDS	148.3277369

LAB TOTAL WT	1064.748201

EOG Capitan WSW #4 Surface Casing Lead Cement

ABSOLUTE VOLUME CALCULATOR

DESIRED SLURRY WEIGHT	13.5	WATER	9.16	YIELD	1.75

MATERIAL	WEIGHT	FACTOR	GALLONS
CEMENT	94	0.0382	3.5908
Coletta C Pozmix		0.0487	0
TXI Light Weight		0.0429	0
MC-500		0.0414	0

	% BWOC	Lbs/Sk	ABS Volume	Gals/Sk
Gel	4	3.76	0.0453	0.170328
Calcium Chloride	2	1.88	0.0612	0.1151481
CFL 100		0	0.1009	0
C-35		0	0.0649	0
C 37		0	0.0923	0
C 51		0	0.0857	0
C-47A		0	0.0747	0
SSA-1		0	0.0453	0
C-45		0	0.055	0
Citric Acid		0	0.072	0
C-49		0	0.0462	0
C-20		0	0.078	0
C-24		0	0.078	0
C 41P		0	0.0444	0
CCR-550		0	0.09306	0
Mag Ox		0	0.0353	0
C-19		0	0.0875	0
C-14A		0	0.081	0
CSA-1000		0	0.1	0
C-16A		0	0.0903	0
Statfree	0.01	0.0094	0.1275	0.0011985
C-43P		0	0.0517	0
		#/SK		
GypSeal			0.0445	0
Gilsonite			0.1122	0
KCL			0.0443	0
Salt			0.03645	0
SFA			0.0521	0
Silica Fume			0.0538	0
STE			0.0393	0
KolSeal			0.09234	0
Polyflake	0.25		0.0844	0.0211
Phenoseal			0.0923	0
100 mesh Sand			0.0453	0
Hematite			0.02265	0
Barite			0.0284	0
Calcium Carbinate			0.0443	0
		99.8994		3.8985746

EOG Capitan WSW #4 Surface Casing Tail Cement

ABSOLUTE VOLUME CALCULATOR

DESIRED SLURRY WEIGHT	14.8	WATER	6.34	YIELD	1.34

MATERIAL	WEIGHT	FACTOR	GALLONS
CEMENT	94	0.0382	3.5908
Coletta C Pozmix		0.0487	0
TXI Light Weight		0.0429	0
MC-500		0.0414	0

	% BWOC	Lbs/Sk	ABS Volume	Gals/Sk
Gel		0	0.0453	0
Calcium Chloride	1.5	1.41	0.0612	0.086361075
CFL 100		0	0.1009	0
C-35		0	0.0649	0
C 37		0	0.0923	0
C 51		0	0.0857	0
C-47A		0	0.0747	0
SSA-1		0	0.0453	0
C-45		0	0.055	0
Citric Acid		0	0.072	0
C-49		0	0.0462	0
C-20		0	0.078	0
C-24		0	0.078	0
C 41P		0	0.0444	0
CCR-550		0	0.09306	0
Mag Ox		0	0.0353	0
C-19		0	0.0875	0
C-14A		0	0.081	0
CSA-1000		0	0.1	0
C-16A		0	0.0903	0
Statfree	0.01	0.0094	0.1275	0.0011985
C-43P		0	0.0517	0
		#/SK		
GypSeal			0.0445	0
Gilsonite			0.1122	0
KCL			0.0443	0
Salt			0.03645	0
SFA			0.0521	0
Silica Fume			0.0538	0
STE			0.0393	0
KolSeal			0.09234	0
Polyflake			0.0844	0
Phenoseal			0.0923	0
100 mesh Sand			0.0453	0
Hematite			0.02265	0
Barite			0.0284	0
Calcium Carbinate			0.0443	0
		95.4194		3.678359575

EOG Capitan WSW #4 Production Casing Lead Cement

ABSOLUTE VOLUME CALCULATOR

DESIRED SLURRY WEIGHT	12.7	WATER	11.88	YIELD	2.22

MATERIAL	WEIGHT	FACTOR	GALLONS
CEMENT	94	0.0382	3.5908
Coletta C Pozmix		0.0487	0
TXI Light Weight		0.0429	0
MC-500		0.0414	0

	% BWOC	Lbs/Sk	ABS Volume	Gals/Sk
Gel		0	0.0453	0
Calcium Chloride		0	0.0612	0
CFL 100		0	0.1009	0
C-35		0	0.0649	0
C 37		0	0.0923	0
C 51		0	0.0857	0
C-47A		0	0.0747	0
SSA-1		0	0.0453	0
C-45	2	1.88	0.055	0.1034
Citric Acid		0	0.072	0
C-49		0	0.0462	0
C-20	0.7	0.658	0.078	0.051324
C-24		0	0.078	0
C 41P		0	0.0444	0
CCR-550		0	0.09306	0
Mag Ox		0	0.0353	0
C-19		0	0.0875	0
C-14A		0	0.081	0
CSA-1000		0	0.1	0
C-16A		0	0.0903	0
Statfree	0.01	0.0094	0.1275	0.0011985
C-43P		0	0.0517	0

	#/SK		
GypSeal		0.0445	0
Gilsonite	5	0.1122	0.561
KCL		0.0443	0
Salt	9.9	0.0391	0.38709
SFA		0.0521	0
Silica Fume		0.0538	0
STE		0.0393	0
KolSeal		0.09234	0
Polyflake	0.25	0.0844	0.0211
Phenoseal		0.0923	0
100 mesh Sand		0.0453	0
Hematite		0.02265	0
Barite		0.0284	0
Calcium Carbinate		0.0443	0
	111.6974		4.7159125

EOG Capitan WSW #4 Production Casing Tail Cement

ABSOLUTE VOLUME CALCULATOR

DESIRED SLURRY WEIGHT: 14.8 WATER: 6.37 YIELD: 1.35

MATERIAL	WEIGHT	FACTOR	GALLONS
CEMENT	94	0.0382	3.5908
Coletta C Pozmix		0.0487	0
TXI Light Weight		0.0429	0
MC-500		0.0414	0

	% BWOC	Lbs/Sk	ABS Volume	Gals/Sk
Gel	[redacted]	0	0.0453	0
Calcium Chloride		0	0.0612	0
CFL 100		0	0.1009	0
C-35	[redacted]	0.47	0.0649	0.030503
C 37		0	0.0923	0
C 51		0	0.0857	0
C-47A		0	0.0747	0
SSA-1		0	0.0453	0
C-45		0	0.055	0
Citric Acid		0	0.072	0
C-49		0	0.0462	0
C-20	[redacted]	0.141	0.078	0.010998
C-24		0	0.078	0
C 41P		0	0.0444	0
CCR-550		0	0.09306	0
Mag Ox		0	0.0353	0
C-19		0	0.0875	0
C-14A		0	0.081	0
CSA-1000		0	0.1	0
C-16A	[redacted]	0.564	0.0903	0.0509292
Statfree	[redacted]	0.0094	0.1275	0.0011985
C-43P		0	0.0517	0

	#/SK		
GypSeal	[redacted]	0.0445	0
Gilsonite		0.1122	0
KCL		0.0443	0
Salt	[redacted]	0.03645	0.03867345
SFA		0.0521	0
Silica Fume		0.0538	0
STE		0.0393	0
KolSeal		0.09234	0
Polyflake		0.0844	0
Phenoseal		0.0923	0
100 mesh Sand		0.0453	0
Hematite		0.02265	0
Barite		0.0284	0
Calcium Carbinate		0.0443	0
	96.2454		3.72310215

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 11305

CONDITIONS OF APPROVAL

Operator:	OGRID:	Action Number:	Action Type:
AMEREDEV OPERATING, LLC 2901 Via Fortuna Suite 600 Austin, TX78746	372224	11305	C-141

OCD Reviewer	Condition
ceads	None