

BW - _____ 4 _____

**ANNUAL
REPORTS**

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Friday, February 12, 2010 4:32 PM
To: 'gandy2@leaco.net'
Subject: BW-004 and 022 Annual Reports

Larry:

The OCD is in receipt of your annual reports and will get back with you soon.

Please contact me if you have questions.

Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
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Website: <http://www.emnrd.state.nm.us/ocd/index.htm>
(Pollution Prevention Guidance is under "Publications")

Wasserhund Inc.
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Lovington, New Mexico 88260

ANNUAL CLASS III WELL REPORT FOR 2015

Wasserhund Inc.

Buckeye Brine Station

OCD Permit BW-04

Expiration Date: November 08, 2018

API No. 30-025-26883 Eidson #1

Unit Letter M-Section 31-Ts 16s – R35e

April 30, 2016

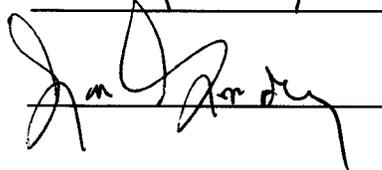
Submitted By: Price LLC on behalf of Wasserhund Inc Principals Mr. Larry and Jon Gandy.



Wayne Price-LLC _____



Larry Gandy _____



Jon Gandy _____

Bullet Point 2- Summary of Operations:

(Permit Condition 2.J.2 Annual Report: “Summary of Class III well operations for the year including a description and reason for any remedial or major work on the well with a copy of C-103.”) Permit Expires November 08, 2018.

During the 2015 year there was no major remedial work on the brine well. General housekeeping was routinely performed and on-site training and inspections were conducted for awareness of the BW-04 permit conditions. *(A copy of the most recent OCD approved Discharge Plan permit BW-04, Aerial photo, and inspection report is included for reference in **Appendix “A”**).*

In 2013, Wasserhund Inc. installed an automated brine dispensing system, which included remote automated billing and tracking. The equipment was supplied by Flowpoint systems and Price LLC provided start-up consulting services. **(Appendix “A” shows system filling station photos.)**

Inspections revealed that the loading area concrete sump was not tested in 2014 as planned. The sump was drained in 2015 and routine maintenance was performed, by adding another coat of epoxy. A third party consultant (Price LLC) scheduled and performed a hydrostatic test and the results showed no head loss during the 24 hours.

The OCD held a Brine Well Operator’s meeting, in Hobbs on September 05, 2012 to discuss permit changes. The most notable change by OCD was the removing of the annual pressure test requirement, and went to a 5-year requirement allowing the “Open-to-Formation” test, and a successful test was performed in September of 2013 (Copy attached in Appendix “D”). The next scheduled 5-year test will be due in 2018.

The brine well was drilled in 1980 and has been in operation for approximately 35 years and is sited on State Highway 08, approximately 12 miles southwest of Lovington, NM. The well is producing out of the Salado “Salt Formation” at a depth of approximately 1900-2460 feet below surface.

The brine well has been producing for a number of years and may possibly be considered approaching an “end of life” scenario due to its age. This scenario is not due to a safety aspect, i.e. collapse, since the well has produced only about one-half of normal volume compared to similar wells of age. Bullet point 10 (Brine Cavity/Subsidence Information) below discusses the safety aspects of this well in more detail.

As with most brine wells of this age, repeated required annual testing which flexes the cavern support, thus causing flexure stress cracking and the required reverse flow issue, has caused these older wells to have pre-mature down-hole problems, such as “sloughing” of the salt-anhydrite layers damaging the tubing and making re-entry virtually impossible and extremely expensive. This well had to be whip-stocked in 2008 in order to reenter after a severe down-hole problem.

A Pro-active well “Area of Review” has been conducted and will continue to ensure the safety of the well system, including cavern subsidence monitoring as required or directed by OCD. Currently, this well does not have subsidence devices installed.

A yearly cavity size calculation and evaluation of the last sonar test has been conducted to determine cavern stability and is discussed further in Bullet Point 10 below.

While this is an older well, it still has not reached its productive end of life and is deemed safe and is an extremely valuable asset for the oil and gas industry.

Bullet Point 3- Production Volumes:

(Permit condition 2.J.3 “Monthly fluid injection and brine production volume, including the cumulative total carried over each year”

Wasserhund Inc. installed a new sales metering system in 2014 and installed new flow meters to monitor both water injected and brine produced.

Monthly, Yearly and Lifetime Injection and Production Volumes:

The monthly, yearly and lifetime fresh water injection and brine production volumes are attached herein for review. The total 2015 brine production volume was 415,784 bbls and the lifetime production volume is 9,111,275 bbls.

Enclosed in **Appendix “B”** is the injection and production and a comparison chart of injected water to produced water with comments.

Bullet Point 4- “Injection Pressure Data.”

(Permit condition 2.J.4 “Injection Pressure Data”

Maximum and Average Injection Pressure:

The maximum operating injection pressure is approximately 340 psig, which is approximately 35 pounds below the recommended maximum surface pressure of 380 psig, utilizing a .70 psi/ft brine well gradient, measured from the top to the casing shoe.

The average injection pressure as noted by Wasserhund Inc.’s personnel is approximately 280 psig. This reading is taken from a pressure gauge mounted on the pump outlet.

Bullet Point 5- Chemical Analysis:

(Permit condition 2.J.5 “A copy of the quarterly chemical analysis shall be included with data summary and all QA/QC information.”)

Please find attached in **Appendix “C”** the latest chemical analysis and chain-of-custody of the brine and fresh water injection water samples collected during the 2015 year and analyzed by Trace Analysis in Lubbock, Texas. The sampling process and laboratory used common approved EPA methods to collect, analyze and reporting.

The injection water was collected from the fresh water tank load line that is connected directly to the fresh water storage tanks. The fresh water is supplied by a fresh-water well located just west of the site.

The brine water was collected from the brine water tank load line that is connected directly to the brine water storage tanks. This sample point is representative of the brine water at the station.

The analysis revealed the brine water is predominately sodium chloride with a high density of 1.194 specific gravity. This analysis is very representative of Salado “Salt” formation waters found in the area. During the year, it appeared the weight of the brine ranged from 1.124 SG to 1.194 SG, with a weighted averaged of 1.15 SG for the year, equating to 9.57 lbs/gal, which has been normally acceptable to Wasserhund customers.

Wasserhund routinely performs field-testing to ensure brine well quality. This testing generally shows close to 10 lb brine using the field method.

The Sodium-Chloride ratio for the year averaged .69, which is above the .648 ratio theoretical value of sodium chloride. It’s not unusual for salt caverns to produced super-saturated brine waters.

Bullet Point 6- Mechanical Integrity:

(Permit condition 2.J.6 “Copy of any mechanical integrity test chart, including the type of test, i.e., duration, gauge pressure, etc;”)

A Mechanical Integrity Test (MIT) was successfully ran and passed on September 09, 2013. The next scheduled MIT will occur in 2018 as approved by OCD.

Please find in **Appendix “D”** a copy of the test chart and meter calibration record.

Bullet Point 7- Deviations from Normal Production Methods:

(Permit condition 2.J.7 “Brief explanation describing deviations from normal operations.”)

In 2008 two OCD permitted brine wells collapsed. As a result of those incidents, the OCD issued a temporary moratorium on new brine well permits. During the moratorium OCD facilitated a work group to determine a proper path forward for current and new brine well operations.

As a result of those proceedings, OCD issued instructions to operators to change OCD’s previous requirement of injecting fresh water down the annuals and producing brine up the tubing (i.e reverse-flow); to injecting fresh water down the tubing and producing brine up the annuals, (i.e. conventional-flow).

Wasserhund Inc. has been successful in changing the flow pattern to conventional flow, and is making quality 10# brine, with occasional reverse flow for maintenance.

Bullet Point 8- Leak and Spill Reports:

(Permit condition 2.J.8 “Results of any leaks and spill reports;”)

There were no reportable leaks and spills in 2015.

The loading areas are concrete with an integral concrete sump with spill containers under the hose connections, which are designed to catch de-minimis drips from hose connections. Drivers routinely suck out the spill containers, for re-cycling.

The entire facility is bermed to prevent run-on or run-off and all reportable or non-reportable spills are cleaned up pursuant to OCD rules and guidance.

Bullet Point 9- Area of Review Update Summary:

(Permit condition 2.J.9 “An Area of Review (AOR) update summary;”)

An extensive AOR review was conducted for the Eidson #1 brine well, OCD permit # BW-04, located in UL M of Section 31-Ts16S-R35e. Wasserhund Inc. used OCD records and actual field verification (see **Appendix “E”**) to confirm wells in the AOR.

Using OCD on-line files, a well status list and AOR plot plan was constructed (see **Appendix “E”**) listing all wells within adjacent quarter sections of the BW-04 location. The list shows API#, Operator well name, UL, Section, Township and Range, footages, Wells within 660 ft (i.e. critical zone) and ¼ mile, casing program status, casing/cementing status, and corrective action required status.

This method was formulated to provide a baseline for future AOR studies. Since brine wells are limited in size, a critical AOR of 660 feet was initially established and all wells within that radius was researched in detail.

Using the current estimated diameter of the brine well @ 312 feet (R = 156 ft) up-dated for 2015, a 10:1 safety factor is applied that equates to about 1560 ft. As the brine well grows, this newly calculated critical AOR will be expanded and new wells will be added and all existing wells restudied.

The rationale behind this approach is the fact that brine wells are non-static in terms of size and configuration, and the fact that the brine well operator has only indirect control on wells drilled in close proximity.

Initially focusing on the current wells in the ¼ mile AOR, and assuming the status of these wells remain the same, may be a mistake. Therefore, a more dynamic approach is being undertaken, and each well in the critical Area of Review (AOR) will be looked at on an annual basis, or whenever any planned activity or new wells are noticed in the AOR.

In the 2015 review, there were no wells added to the list. **Appendix "E"** contains the check-off list showing the OCD wells in all adjacent quarter sections surrounding the BW-04 brine well.

There currently are three wells located within the critical 1560 ft, and ¼ miles radius of review. The critical zone wells were investigated by checking the OCD on-line well records.

The three wells located in the new critical zone, i.e. within 1560 feet, were reinvestigated by checking the OCD on-line well records. The last recorded file records for the three wells located in the critical AOR are identified as API# 30-025-25146, 30-025-35678 and 30-025-31621 and the following provides the most recent results found in the OCD public records.

The Findings are as follows:

API # 30-025-25146: In 2010, a C-103 was submitted to the OCD to P&A the well by setting plugs at the top, top of salt, bottom of salt, and place a cement plug in tubing at 5700 feet. This work was completed and C-103 filed with the OCD District I office in Hobbs and subsequently approved.

This well was properly plugged and abandoned in September of 2012 and approved by OCD. This well has been transferred to Lime Rock Resources.

Conclusions: The OCD records show that a subsequent P&A report was filed and approved by OCD.

Corrective Actions: Well has been P&A.

API # 30-025-35678: The Chesapeake St. VII #7, (Now Chevron USA) according to OCD records, is located 660 FNL & 660 FEL of UL A Section 1-Ts17s-R34e. It is shown to be located approximately 1600 ft to the SW of the BW-04 well.

In November of 2013, OCD sent Chevron USA Inc. a Letter of Violation and Shut-In Directive due to an observation of a Bradenhead issue, and required corrective actions and a Mechanical Integrity Test. In the 2014 year another Bradenhead test was conducted and witnessed by OCD.

This well has since been transferred to Lime Rock Resources and has been approved by OCD for recompletion, which would appear to have the salt zone "Salado" casing cemented. See Copy of proposed recompletion diagram in **Appendix "E"**.

Conclusions: OCD has approved the proposed re-completion.

Corrective Actions and Recommendation: If completed as proposed, this well appears to have adequate cemented casing coverage across the salt section and no corrective actions are required.

API # 30-025-31621: The BTA Oil Producers Vacuum 9205 JV-P Com was drilled and completed in 1992 as a gas well. The Casing strings are as follows: 13-3/8" surface casing set at 423 feet cemented with 480 sacks, circulated to the surface. 8 5/8" Intermediate casing set at 4795 cemented with 2500 sacks, circulated to the surface.

A 5-1/2" production string was set at 12,900 ft and cemented with 2100 sacks, circulated to the surface.

Conclusions: This well is properly cemented from top to bottom, and the salt section is adequately covered.

Corrective Actions: No Corrective actions required.

Bullet Point 10- Subsidence/Cavern Volumes/Geometric Measurements

(Permit condition 2.J.10. "A summary with interpretations of MIT's, surface subsidence surveys, cavern volume and geometric measurements with conclusion(s) and recommendation(s);")

Since the use of sonar tests in other wells has not provided adequate information, the continued use of sonar may be in question until the validity of using sonar test is resolved.

The last cavern survey (2008) for this well did not provide any useful information pertaining to the size and shape of this particular cavern. An alternate method has been discussed with Jim Griswold-OCD and it was mutually decided that an estimated worst-case diameter is to be determined in order to provide maximum protection and ensure the permit conditions are being met.

The Solution Mining Research Institute (SMRI), other state agencies, OCD work-group, along with various studies conducted during the permitting of the WIPP site, has concluded that failures, such as "catastrophic collapses", have a higher probability when

the roof diameter of the cavern exceeds a certain value compared to the actual depth of the cavern.

This number is typically called D/H where “D” is the diameter of the cavity and “H” is the depth from surface to the casing shoe. Various reports seem to conclude that when a ratio of D/H reaches or exceeds .66 then the probably of collapse increases to a point that the well may be considered un-safe, thus closing procedures such as proper plugging and abandonment, and possible long term subsidence monitoring should be instituted.

The alternate method mentioned above involves calculating the maximum diameter of the cavern by using a worst-case scenario of an “**upright cone**”. The volume of the cavern is calculated using the lifetime brine production volumes and using a “*rule of thumb*” conversion factor to determine the volumetric size of the cavern. The rule of thumb conversion factor was taken from the 1982 Wilson Report and equates that every barrel of brine produced will create approximately one cubic foot of cavity.

Please find attached in **Appendix “F”**, a wellbore sketch, and the calculations for the brine well, and the lifetime brine production tally of approximately 9.11 million barrels of brine produced as of December 2015. The maximum diameter was calculated to be approximately 312 feet with a corresponding D/H ratio of .148 updated for the 2015 year.

Comparing the current D/H ratio of .148 to the .66 value mentioned above, it can be concluded that the current brine well status meets and exceeds the recommended safety value by approximately five times.

Included in **Appendix “F”** is an aerial view showing the 156-foot radius superimposed around the brine well and station. The radius has increased by 2.0 feet from last year.

Permit Condition 2.B. SOLUTION CAVERN MONITORING PROGRAM:

1. Surface Subsidence Monitoring Plan: The Permittee shall submit a Surface Subsidence Monitoring Plan to OCD within 180 days of the effective date of this permit. The Surface Subsidence Monitoring Plan shall specify that the Permittee will install at least three survey monuments and shall include a proposal to monitor the elevation of the monuments at least semiannually.

The Permittee shall survey each benchmark at least semiannually to monitor for possible surface subsidence and shall tie each survey to the nearest USGS benchmark. The Permittee shall employ a licensed professional surveyor to conduct the subsidence monitoring program. The Permittee shall submit the results of all subsidence surveys to OCD within 15 days of the survey. If the monitored surface subsidence at any measuring point reaches 0.10 feet compared to its baseline elevation, then the Permittee shall suspend operation of the Class III well. If the Permittee cannot demonstrate the integrity of the cavern and well to the satisfaction of OCD, then it shall cease all brine production and submit a corrective action plan to mitigate the

subsidence.

Wasserhund Inc. hereby, submits a subsidence monitoring plan pursuant to Permit Condition 2.B. "Solution Cavern Monitoring Plan Program". A copy of the proposal is included in **Appendix "G"** for OCD review and approval.

Special Note: Wasserhund Inc. **request a Minor Modifications** that allows the results be supplied in the annual report, unless there is an exceedance as noted in the permit.

2. Solution Cavern Characterization Program: *The Permittee shall submit a Solution Cavern Characterization Plan to characterize the size and shape of the solution cavern using geophysical methods within 180 days of the effective date of this permit. The Permittee shall characterize the size and shape of the solution cavern using a geophysical methods approved by OCD at least once before November 8, 2018. The Permittee shall demonstrate that at least 90% of the calculated volume of salt removed based upon injection and production volumes has been accounted for by the approved geophysical method(s) for such testing to be considered truly representative.*

Solution Cavern Characterization Plan: Wasserhund Inc. hereby proposes to use a combination of calculated results as determined above, and will experiment with various geophysical methods, including actually performing an "Induced Current Method" and report these results in the next annual report.

The "Induced Current" Method has not been successful, primarily to bad connections and low voltage used. Wasserhund will continue trying this method and others as approved by OCD. The old fashion cavern calculation continues to be the best economic method available.

Bullet Point #11- Ratio of Injected/Produced Fluids

(Permit condition 2.J.11 "A summary of the ratio of the volume of injected fluids to the volume of produced brine;")

See Bullet Point #3 and Appendix "B" for comparison chart numbers.

Special Note: **Key requests a minor modification of the permit requirement 3.K** *"The Permittee shall suspend injection if the monthly injection volume is less than 110% or greater than 120% of associated brine production. If such an event occurs, the Permittee shall notify OCD within 24 hours."*

Dear Jim Giswold-NMOCD Environmental Bureau Chief: As you know, this topic has been discussed and kicked around for a long time. The current permit requirement does not take into account many factors that can cause the variance to be under or over the requirement of 110%-120%. Every year we report this number in the annual report and while the average monthly injection for the year is normally within range, the actual monthly numbers can and are sometimes under and over. There are many reasons for this

as we have discussed, and thus the requirement to suspend operations is not based on any real parameter or trend that may be an immediate threat to the well, groundwater or the environment. The current requirement put operators in a continuous violation and interruption of operations. Notwithstanding, if you have a well that takes water without producing, or starts to pressure up, then you know you may have lost circulation or communicated to a pressure zone, then immediate action should be taken and notification to the agency. Currently the permit reads as follows:

The Permittee shall immediately suspend injection and notify the agency within 72 hours, if the Fresh Water Injection does not cause a normal immediate return of Brine Water to the surface, or if the well flows excessively for an unusual amount of time without fresh water injection after the cavern pressure has been stabilized to its normal operating pressure, or if permittee has become aware of any out of zone injection or communication. The Permittee shall include in each annual report a summary showing the monthly variance, the average monthly variance for the year and the total accumulative variance over the life of the well. The operator shall certify and explain that any yearly variance that falls outside of the range of 20%, (Difference between the Fresh Water input and Brine Water output) will not cause harm to Fresh Water, Public Health or the Environment.

Bullet Point #12- Summary of Activities

(Permit condition 2.J.12 “A summary of all major Facility activities or events, which occurred during the year with any conclusions and recommendations;”)

See Bullet Point #2 for summary.

5.B. BONDING OR FINANCIAL ASSURANCE: *The Permittee shall submit an estimate of the minimum cost to properly close, plug and abandon its Class III well, conduct ground water restoration if applicable, and any post-operational monitoring as may be needed (see 20.6.2.5210B(17) NMAC) within 90 days of permit issuance (See 20.6.2.5210B(17) NMAC). The Permittee’s cost estimate shall be based on third person estimates. After review, OCD will require the Permittee to submit a single well plugging bond based on the third person cost estimate.*

Appendix “H” contains a third party closure estimate for the Wasserhund Inc. BW-04 brine well.

Bullet Point #13- Annual Certification

(Permit condition 2.J.13 “Annual Certification in accordance with Permit Condition 2.B.3. **“2.B.3. Annual Certification:** The Permittee shall certify annually that continued salt solution mining will not cause cavern collapse, surface subsidence, property damage, or otherwise threaten public health and the environment, based on geologic and engineering data.”)

Operator Response: Based on all current information and actual on-site

observance, the operator of record hereby certifies that the current operations pose no threat to public health and the environment at the submission of this report. If any substantial event that, has or may cause, this current certification to change, then the operator will notify OCD and take the necessary actions to protect the public and environment.

By signing the cover sheet of Bullet Point 1 of permit condition 2.J.1, the operator hereby certifies this condition of the permit.

Bullet Point 14- Groundwater Monitoring:

(Permit condition 2.J.14 “A summary of any new discoveries of ground water contamination with all leaks, spills and releases and corrective actions taken;”)

The BW-04 Wasserhund Inc. Buckeye facility, currently does not have groundwater monitoring at this site. There are no planned or intentional discharges of water contaminants that may move directly or indirectly into groundwater. Any unintentional discharge, leak, spill, or drip is handled pursuant to the permit conditions.

The closure of the “out-of-service” brine storage pit was started in December of 2013 and the Wasserhund has received OCD approved in install a down-gradient Monitoring Well. The results concerning groundwater will be listed in the 2016 annual report.

Bullet Point 15- Annual Reporting

(Permit condition 2.J.15 “The Permittee shall file its Annual Report in an electronic format with a hard copy submitted to OCD’s Environmental Bureau.”)

The operator hereby submits a PDF file on flash drive and one hard copy.

Appendix "A"

- Aerial View Plot Plan
- Site Photos-New Flowpoint Dispensing System
- 3rd Party Field Inspection Report
- Discharge Plan BW-04



FW Well

Brine water storage tanks with impermeable berm and secondary containment.

BW-4

Site Berms

Pit Soil Pile for Disposal

FW

Pumps

concrete drive with sump

Pit reclamation shows red bed liner back-fill

soil boring

238

© 2014 Google

©2009 Google

222 ft

Imagery Date: Feb 14, 2014

32° 52.373' N 103° 30.286' W elev. 4037 ft

Eye alt 4810 ft



Brine Well Inspection Sheet:

Permit # BW-04
 API# 30-025-26883 Eidson #1
 Operator: Wasserhund Inc.
 Location: Unit Letter M-Section 31-Ts 16s – R35e

	Yes	No
1 Any reportable leaks or spills noted at time of inspection?		X
2 Any observed radial cracks or any evidence of subsidence?		X
3 Load/unload pots in place?	X	
4 Any New Wells IN AOR?		X
5 Observed Injection Pressure on Well?	X	220 psig.
6 Is operator experiencing any downhole issues?		X None Noted at this time.
7 Do brine Tanks have secondary containment?	X	
8 Samples Collected?	X	Fresh + Brine
9 Brine well Operated Normal or Reverse Flow?	Normal	
10 Checked Sumps?	X	Holding Water no observed drop in 24 hours
11 Groundwater Monitor Wells on-site?		X
12 Subsidence Monitors on-site?		X
13 Equipment failures?		X
Photos Taken:		2 see attached

Date of Inspection:

2/17/16

Inspector: Wayne Price Jr. Price LLC

Inspector Signature:



Wasserhund Buckeye BW-04
Feb 17, 2016-Looking SW
BY: Price LLC

Wasserhund BW-04 Well Head Pressure Gage
Feb 17, 2016 Photo by Price LLC



BW-4

**Wasserhund/Buckeye
Eidson State #1**

**Permit Renewal
11/8/13**

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary

Brett F. Woods, Ph.D.
Deputy Cabinet Secretary

Jami Bailey
Division Director
Oil Conservation Division



November 8, 2013

Larry Gandy
Wasserhund, Inc.
PO Box 827
Tatum, New Mexico 88267

RE: Renewal of Discharge Permit BW-4 for the Eidson State #1 Brine Well in Unit M of Section 31, Township 16 South, Range 35 East NMPM; Lea County, New Mexico

Dear Mr. Gandy,

Pursuant to all applicable parts of the Water Quality Control Commission regulations 20.6.2 NMAC and more specifically 20.6.2.3104 thru.3999 discharge permit, and 20.6.2.5000 thru .5299 Underground Injection Control, the Oil Conservation Division hereby renews the discharge permit and authorizes operation and injection for the Wasserhund, Inc. (owner/operator) brine well BW-4 (API# 30-025-26883) at the location described above and under the conditions specified in the attached Discharge Permit Approval Conditions.

Be advised that approval of this permit does not relieve the owner/operator of responsibility should operations result in pollution of surface water, groundwater, or the environment. Nor does this permit relieve the owner/operator of any responsibility or consequences associated with subsidence or cavern failure. This permit does not relieve the owner/operator of its responsibility to comply with any other applicable governmental rules or regulations.

If you have any questions, please contact Jim Griswold of my staff at (505) 476-3465 or by email at jim.griswold@state.nm.us. On behalf of the Oil Conservation Division, I wish to thank you and your staff for your cooperation and patience during this renewal application review.

Respectfully,

A handwritten signature in blue ink that reads "Jami Bailey".

Jami Bailey
Director

JB/JG/jg
Attachment – Discharge Permit Approval Conditions

cc: Michael Mariano, State Land Office

DISCHARGE PERMIT BW-4

1. GENERAL PROVISIONS:

1.A. PERMITTEE AND PERMITTED FACILITY: The Director of the Oil Conservation Division (OCD) of the Energy, Minerals and Natural Resources Department renews Discharge Permit BW-4 (Discharge Permit) to Wasserhund, Inc. (Permittee) to operate its Underground Injection Control (UIC) Class III well for the in situ extraction of salt (Eidson State #1 Brine Well - API No. 30-025-26883) located 567 feet FSL and 162 feet FWL (SW/4 SW/4, Unit Letter M) in Section 31, Township 16 South, Range 35 East, NMPM, Lea County, New Mexico at its Brine Production Facility (Facility). The Facility is located approximately 5 miles north of Buckeye, New Mexico along the west side of NM 238.

The Permittee is permitted to inject water into the subsurface salt layers and produce brine for use in the oil and gas industry. Ground water that may be affected by a spill, leak, or accidental discharge occurs at a depth of approximately 75 feet below ground surface and has a total dissolved solids concentration of approximately 500 mg/L.

1.B. SCOPE OF PERMIT: OCD has been granted the authority by statute and by delegation from the Water Quality Control Commission (WQCC) to administer the Water Quality Act (Chapter 74, Article 6 NMSA 1978) as it applies to Class III wells associated with the oil and gas industry (See Section 74-6-4, 74-6-5 NMSA 1978).

The Water Quality Act and the rules promulgated pursuant to the Act protect ground water and surface water of the State of New Mexico by providing that, unless otherwise allowed by 20.6.2 NMAC, no person shall cause or allow effluent or leachate to discharge so that it may move directly or indirectly into ground water unless such discharge is pursuant to an approved discharge plan (See 20.6.2.3104 NMAC, 20.6.2.3106 NMAC, and 20.6.2.5000 through 20.6.2.5299 NMAC).

This Discharge Permit for a Class III well is issued pursuant to the Water Quality Act and WQCC rules, 20.6.2 NMAC. This Discharge Permit does not authorize any treatment of, or on-site disposal of, any materials, product, by-product, or oil-field waste.

Pursuant to 20.6.2.5004A NMAC, the following underground injection activities are prohibited:

1. The injection of fluids into a motor vehicle waste disposal well is prohibited.
2. The injection of fluids into a large capacity cesspool is prohibited.
3. The injection of any hazardous or radioactive waste into a well is prohibited except as provided by 20.6.2.5004A(3) NMAC.
4. Class IV wells are prohibited, except for wells re-injecting treated ground water into the same formation from which it was drawn as part of a removal or remedial action.

5. Barrier wells, drainage wells, recharge wells, return flow wells, and motor vehicle waste disposal wells are prohibited.

This Discharge Permit does not convey any property rights of any sort nor any exclusive privilege, and does not authorize any injury to persons or property, any invasion of other private rights, or any infringement of state, federal, or local laws, rules or regulations.

The Permittee shall operate in accordance with the terms and conditions specified in this Discharge Permit to comply with the Water Quality Act and the rules issued pursuant to that Act, so that neither a hazard to public health nor undue risk to property will result (see 20.6.2.3109C NMAC); so that no discharge will cause or may cause any stream standard to be violated (see 20.6.2.3109H(2) NMAC); so that no discharge of any water contaminant will result in a hazard to public health, (see 20.6.2.3109H(3) NMAC); so that the numerical standards specified of 20.6.2.3103 NMAC are not exceeded; and, so that the technical criteria and performance standards (see 20.6.2.5000 through 20.6.2.5299 NMAC) for Class III wells are met. Pursuant to 20.6.2.5003B NMAC, the Permittee shall comply with 20.6.2.1 through 20.6.2.5299 NMAC.

The Permittee shall not allow or cause water pollution, discharge, or release of any water contaminant that exceeds the Water Quality Control Commission (WQCC) standards specified at 20.6.2.3101 NMAC and 20.6.2.3103 NMAC or 20.6.4 NMAC (Water Quality Standards for Interstate and Intrastate Streams). Pursuant to 20.6.2.5101A NMAC, the Permittee shall not inject non-hazardous fluids into ground water having 10,000 mg/l or less total dissolved solids (TDS).

The issuance of this permit does not relieve the Permittee from the responsibility of complying with the provisions of the Water Quality Act, any applicable regulations or water quality standards of the WQCC, or any applicable federal laws, regulations or standards (See Section 74-6-5 NMSA 1978).

1.C. DISCHARGE PERMIT RENEWAL: This Discharge Permit is a permit renewal that replaces the permit being renewed. Replacement of a prior permit does not relieve the Permittee of its responsibility to comply with the terms of that prior permit while that permit was in effect.

1.D. DEFINITIONS: Terms not specifically defined in this Discharge Permit shall have the same meanings as those in the Water Quality Act or the rules adopted pursuant to the Act, as the context requires.

1.E. FILING FEES AND PERMIT FEES: Pursuant to 20.6.2.3114 NMAC, every facility that submits a Discharge Permit application for initial approval or renewal shall pay the permit fees specified in Table 1 and the filing fee specified in Table 2 of 20.6.2.3114 NMAC. OCD has already received the required \$100.00 filing fee. The Permittee is now required to submit the \$1,700.00 permit fee for a Class III well. Please remit payment made payable to the Water Quality Management Fund in care of OCD at 1220 South St. Francis Drive in Santa Fe, New Mexico 87505.

1.F. EFFECTIVE DATE, EXPIRATION, RENEWAL CONDITIONS, AND PENALTIES FOR OPERATING WITHOUT A DISCHARGE PERMIT: This Discharge Permit becomes effective 30 days from the date that the Permittee receives this discharge permit or until the permit is terminated or expires. This Discharge Permit will expire on **November 8, 2018**. The Permittee shall submit an application for renewal no later than 120 days before that expiration date, pursuant to 20.6.2.5101F NMAC. If a Permittee submits a renewal application at least 120 days before the Discharge Permit expires and is in compliance with the approved Discharge Permit, then the existing Discharge Permit will not expire until OCD has approved or disapproved the renewal application. A discharge permit continued under this provision remains fully effective and enforceable. Operating with an expired Discharge Permit may subject the Permittee to civil and/or criminal penalties (See Section 74-6-10.1 NMSA 1978 and Section 74-6-10.2 NMSA 1978).

1.G. MODIFICATIONS AND TERMINATIONS: The Permittee shall notify the OCD Director and OCD's Environmental Bureau of any Facility expansion or process modification (See 20.6.2.3107C NMAC). The OCD Director may require the Permittee to submit a Discharge Permit modification application pursuant to 20.6.2.3109E NMAC and may modify or terminate a Discharge Permit pursuant to Sections 74-6-5(M) through (N) NMSA 1978.

1. If data submitted pursuant to any monitoring requirements specified in this Discharge Permit or other information available to the OCD Director indicate that 20.6.2 NMAC is being or may be violated, then the OCD Director may require modification or, if it is determined by the OCD Director that the modification may not be adequate, may terminate this Discharge Permit for a Class III well that was approved pursuant to the requirements of 20.6.2.5000 through 20.6.2.5299 NMAC for the following causes:

a. Noncompliance by Permittee with any condition of this Discharge Permit;
or,

b. The Permittee's failure in the discharge permit application or during the discharge permit review process to disclose fully all relevant facts, or Permittee's misrepresentation of any relevant facts at any time; or,

c. A determination that the permitted activity may cause a hazard to public health or undue risk to property and can only be regulated to acceptable levels by discharge permit modification or termination (See Section 75-6-6 NMSA 1978; 20.6.2.5101I NMAC; and, 20.6.2.3109E NMAC).

2. This Discharge Permit may also be modified or terminated for any of the following causes:

a. Violation of any provisions of the Water Quality Act or any applicable regulations, standard of performance or water quality standards;

b. Violation of any applicable state or federal effluent regulations or limitations; or

c. Change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge (See Section 75-6-5M NMSA 1978).

1.H. TRANSFER OF CLASS III WELL DISCHARGE PERMIT:

1. The transfer provisions of 20.6.2.3111 NMAC do not apply to a discharge permit for a Class III well.

2. Pursuant to 20.6.2.5101H NMAC, the Permittee may request to transfer its Class III well discharge permit if:

a. The OCD Director receives written notice 30 days prior to the transfer date; and,

b. The OCD Director does not object prior to the proposed transfer date. OCD may require modifications to the discharge permit as a condition of transfer, and may require demonstration of adequate financial responsibility.

3. The written notice required in accordance with Permit Condition 1.H.2.a shall:

a. Have been signed by the Permittee and the succeeding Permittee, and shall include an acknowledgement that the succeeding Permittee shall be responsible for compliance with the Class III well discharge permit upon taking possession of the facility; and

b. Set a specific date for transfer of the discharge permit responsibility, coverage and liability; and

c. Include information relating to the succeeding Permittee's financial responsibility required by 20.6.2.5210B(17) NMAC.

1.I. COMPLIANCE AND ENFORCEMENT: If the Permittee violates or is violating a condition of this Discharge Permit, OCD may issue a compliance order that requires compliance immediately or within a specified time period, or assess a civil penalty, or both (See Section 74-6-10 NMSA 1978). The compliance order may also include a suspension or termination of this Discharge Permit. OCD may also commence a civil action in district court for appropriate relief, including injunctive relief (See Section 74-6-10(A)(2) NMSA 1978). The Permittee may be subject to criminal penalties for discharging a water contaminant without a discharge permit or in violation of a condition of a discharge permit; making any false material statement, representation, certification or omission of material fact in a renewal application, record, report, plan or other document filed, submitted or required to be maintained under the Water Quality Act; falsifying, tampering with or rendering inaccurate any monitoring device, method or record required to be maintained under the Water Quality Act; or failing to monitor, sample or report as required by a Discharge Permit issued pursuant to a state or federal law or regulation (See Section 74-6-10.2 NMSA 1978).

2. GENERAL FACILITY OPERATIONS:

2.A. QUARTERLY MONITORING REQUIREMENTS FOR CLASS III WELLS: The Permittee may use either or both fresh water or water from otherwise non-potable sources. Pursuant to 20.6.2.5207C, the Permittee shall provide analysis of the injected fluids at least quarterly to yield data representative of their characteristics. The Permittee shall analyze the injected fluids for the following characteristics:

- pH;
- density;
- concentration of total dissolved solids; and,
- chloride concentration.

The Permittee shall also provide analysis of the produced brine on a quarterly basis. The Permittee shall analyze the produced brine for the following characteristics:

- pH;
- density;
- concentration of total dissolved solids;
- chloride concentration; and,
- sodium concentration.

2.B. SOLUTION CAVERN MONITORING PROGRAM:

1. Surface Subsidence Monitoring Plan: The Permittee shall submit a Surface Subsidence Monitoring Plan to OCD within 180 days of the effective date of this permit. The Surface Subsidence Monitoring Plan shall specify that the Permittee will install at least three survey monuments and shall include a proposal to monitor the elevation of the monuments at least semiannually.

The Permittee shall survey each benchmark at least semiannually to monitor for possible surface subsidence and shall tie each survey to the nearest USGS benchmark. The Permittee shall employ a licensed professional surveyor to conduct the subsidence monitoring program. The Permittee shall submit the results of all subsidence surveys to OCD within 15 days of the survey. If the monitored surface subsidence at any measuring point reaches 0.10 feet compared to its baseline elevation, then the Permittee shall suspend operation of the Class III well. If the Permittee cannot demonstrate the integrity of the cavern and well to the satisfaction of OCD, then it shall cease all brine production and submit a corrective action plan to mitigate the subsidence.

2. Solution Cavern Characterization Program: The Permittee shall submit a Solution Cavern Characterization Plan to characterize the size and shape of the solution cavern using geophysical methods within 180 days of the effective date of this permit. The Permittee shall characterize the size and shape of the solution cavern using a geophysical method approved by OCD at least once before November 8, 2018. The Permittee shall demonstrate that at least 90% of the calculated volume of salt removed based upon injection and production volumes has been accounted for by the approved geophysical method(s) for such testing to be considered truly representative.

a. The Permittee shall provide an estimate of the size and shape of the solution cavern at least annually, based on fluid injection and brine production data.

b. The Permit shall compare the ratio of the volume of injected fluids to the volume of produced brine monthly. If the average ratio of injected fluid to produced brine varies is less than 90% or greater than 110%, the Permittee shall report this to OCD and cease injection and production operations of its Class III well within 24 hours. The Permittee shall begin an investigation to determine the cause of this abnormal ratio within 72 hours. The Permittee shall submit to OCD a report of its investigation within 15 days of cessation of injection and production operations of its Class III well.

3. Annual Certification: The Permittee shall certify annually that continued salt solution mining will not cause cavern collapse, surface subsidence, property damage, or otherwise threaten public health and the environment, based on geologic and engineering data.

If the solution cavern is determined by either OCD or the Permittee to be potentially unstable by either direct or indirect means, then the Permittee shall cease all fluid injection and brine production within 24 hours. If the Permittee ceases operations because it or OCD has determined that the solution cavern is unstable, then it shall submit a plan to stabilize the solution cavern within 30 days. OCD may require the Permittee to implement additional subsidence monitoring and to conduct additional corrective action.

2.C. CONTINGENCY PLANS: The Permittee shall implement its proposed contingency plan(s) included in its Permit Renewal Application to cope with failure of a system(s) in the Discharge Permit.

2.D. CLOSURE: Prior to closure of the facility, the Permittee shall submit for OCD's approval, a closure plan including a completed form C-103 for plugging and abandonment of the Class III well. The Permittee shall plug and abandon its well pursuant to 20.6.2.5209 NMAC and as specified in Permit Condition 2.D.

1. Pre-Closure Notification: Pursuant to 20.6.2.5005A NMAC, the Permittee shall submit a pre-closure notification to OCD's Environmental Bureau at least 30 days prior to the date that it proposes to close or to discontinue operation of its Class III well. Pursuant to 20.6.2.5005B NMAC, OCD's Environmental Bureau must approve all proposed well closure activities before Permittee may implement its proposed closure plan.

2. Required Information: The Permittee shall provide OCD's Environmental Bureau with the following information:

- Name of facility;
- Address of facility;
- Name of Permittee (and owner or operator, if appropriate);
- Address of Permittee (and owner or operator, if appropriate);
- Contact person;
- Phone number;
- Number and type of well(s);

- Year of well construction;
- Well construction details;
- Type of discharge;
- Average flow (gallons per day);
- Proposed well closure activities (*e.g.*, sample fluids/sediment, appropriate disposal of remaining fluids/sediments, remove well and any contaminated soil, clean out well, install permanent plug, conversion to other type of well, ground water and vadose zone investigation, other);
- Proposed date of well closure;
- Name of Preparer; and,
- Date.

2.E. PLUGGING AND ABANDONMENT PLAN: Pursuant to 20.6.2.5209A NMAC, when the Permittee proposes to plug and abandon its Class III well, it shall submit to OCD a plugging and abandonment plan that meets the requirements of 20.6.2.3109C NMAC, 20.6.2.5101C NMAC, and 20.6.2.5005 NMAC for protection of ground water. If requested by OCD, Permittee shall submit for approval prior to closure, a revised or updated plugging and abandonment plan. The obligation to implement the plugging and abandonment plan as well as the requirements of the plan survives the termination or expiration of this Discharge Permit. The Permittee shall comply with 20.6.2.5209 NMAC.

2.F RECORD KEEPING: The Permittee shall maintain records of all inspections, surveys, investigations, *etc.*, required by this Discharge Permit at its Facility office for a minimum of five years and shall make those records available for inspection by OCD.

2.G. RELEASE REPORTING: The Permittee shall comply with the following permit conditions, pursuant to 20.6.2.1203 NMAC, if it determines that a release of oil or other water contaminant, in such quantity as may with reasonable probability injure or be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property, has occurred. The Permittee shall report unauthorized releases of water contaminants in accordance with any additional commitments made in its approved Contingency Plan. If the Permittee determines that any constituent exceeds the standards specified at 20.6.2.3103 NMAC, then it shall report a release to OCD's Environmental Bureau.

1. Oral Notification: As soon as possible after learning of such a discharge, but in no event more than twenty-four (24) hours thereafter, the Permittee shall notify OCD's Environmental Bureau. The Permittee shall provide the following:

- The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility;
- The name and location of the facility;
- The date, time, location, and duration of the discharge;
- The source and cause of discharge;
- A description of the discharge, including its chemical composition;
- The estimated volume of the discharge; and,

- Any corrective or abatement actions taken to mitigate immediate damage from the discharge.

2. Written Notification: Within one week after the Permittee has discovered a discharge, the Permittee shall send written notification (may use form C-141 with attachments) to OCD's Environmental Bureau verifying the prior oral notification as to each of the foregoing items and providing any appropriate additions or corrections to the information contained in the prior oral notification.

The Permittee shall provide subsequent written reports as required by OCD's Environmental Bureau.

2.H. OTHER REQUIREMENTS:

1. Inspection and Entry: Pursuant to Section 74-6-9 NMSA 1978 and 20.6.2.3107A NMAC, the Permittee shall allow any authorized representative of the OCD Director, to:

- Upon the presentation of proper credentials, enter the premises at reasonable times;
- Inspect and copy records required by this Discharge Permit;
- Inspect any treatment works, monitoring, and analytical equipment;
- Sample any injection fluid or produced brine; and,
- Use the Permittee's monitoring systems and wells in order to collect samples.

2. Advance Notice: The Permittee shall provide OCD's Environmental Bureau and Hobbs District Office with at least five (5) working days advance notice of any environmental sampling to be performed pursuant to this Discharge Permit, or any well plugging, abandonment or decommissioning of any equipment associated with its Class III well.

3. Environmental Monitoring: The Permittee shall ensure that any environmental sampling and analytical laboratory data collected meets the standards specified in 20.6.2.3107B NMAC. The Permittee shall ensure that all environmental samples are analyzed by an accredited "National Environmental Laboratory Accreditation Conference" (NELAC) Laboratory. The Permittee shall submit data summary tables, all raw analytical data, and laboratory QA/QC.

2.I. BONDING OR FINANCIAL ASSURANCE: Pursuant to 20.6.2.5210B(17) NMAC, the Permittee shall maintain at a minimum, a single well plugging bond in the amount that it shall determine, in accordance with Permit Condition 5.B, to cover potential costs associated with plugging and abandonment of the Class III well, surface restoration, and post-operational monitoring, as may be needed. OCD may require additional financial assurance to ensure adequate funding is available to plug and abandon the well and/or for any required corrective actions.

Methods by which the Permittee shall demonstrate the ability to undertake these measures shall include submission of a surety bond or other adequate assurances, such as financial statements or other materials acceptable to the OCD Director, such as: (1) a surety bond; (2) a trust fund with a New Mexico bank in the name of the State of New Mexico, with the State as Beneficiary; (3) a

non-renewable letter of credit made out to the State of New Mexico; (4) liability insurance specifically covering the contingencies listed in this paragraph; or (5) a performance bond, generally in conjunction with another type of financial assurance. If an adequate bond is posted by the Permittee to a federal or another state agency, and this bond covers all of the measures specified above, the OCD Director shall consider this bond as satisfying the bonding requirements of Sections 20.6.2.5000 through 20.6.2.5299 NMAC wholly or in part, depending upon the extent to which such bond is adequate to ensure that the Permittee will fully perform the measures required hereinabove.

2.J. ANNUAL REPORT: The Permittee shall submit its annual report pursuant to 20.6.2.3107 NMAC to OCD's Environmental Bureau by **June 1st** of the following year. The annual report shall include the following:

- Cover sheet marked as "Annual Class III Well Report, Name of Permittee, Discharge Permit Number, API number of well(s), date of report, and person submitting report;
- Summary of Class III well operations for the year including a description and reason for any remedial or major work on the well with a copy of form C-103;
- Monthly fluid injection and brine production volume, including the cumulative total carried over each year;
- Injection pressure data;
- A copy of the quarterly chemical analyses shall be included with data summary and all QA/QC information;
- Copy of any mechanical integrity test chart, including the type of test, *i.e.*, duration, gauge pressure, etc.;
- Brief explanation describing deviations from the normal operations;
- Results of any leaks and spill reports;
- An Area of Review (AOR) update summary;
- A summary with interpretation of MITs, surface subsidence surveys, cavern volume and geometry measurements with conclusion(s) and recommendation(s);
- A summary of the ratio of the volume of injected fluids to the volume of produced brine;
- A summary of all major Facility activities or events, which occurred during the year with any conclusions and recommendations;
- Annual Certification in accordance with Permit Condition 2.B.3.
- A summary of any new discoveries of ground water contamination with all leaks, spills and releases and corrective actions taken; and,
- The Permittee shall file its Annual Report in an electronic format with a hard copy submittal to OCD's Environmental Bureau.

3. CLASS III WELL OPERATIONS:

3.A. OPERATING REQUIREMENTS: The Permittee shall comply with the operating requirements specified in 20.6.2.5206A NMAC and 20.6.2.5206A NMAC to ensure that:

1. Injection will occur through the innermost tubing string and brine production through the annulus between the casing and tubing string to promote cavern development at depth. Injection and production flow can be reversed as required to achieve optimal cavern shaping, mine salt most efficiently, and to periodically clean the tubing and annulus. Injection must only occur in the intended solution mining interval.

2. Injection between the outermost casing and the well bore is prohibited in a zone other than the authorized injection zone. If the Permittee determines that its Class III well is discharging or suspects that it is discharging fluids into a zone or zones other than the permitted injection zone specified in Permit Condition 3.B.1., then the Permittee shall within 24 hours notify OCD's Environmental Bureau and Hobbs District Office of the circumstances and action(s) taken. The Permittee shall cease operations until proper repairs are made and it has received approval from OCD to re-start injection operations.

3.B. INJECTION OPERATIONS:

1. **Well Injection Pressure Limit:** The Permittee shall ensure that the maximum wellhead or surface injection pressure on its Class III well shall not exceed the fracture pressure of the injection salt formation and will not cause new fractures or propagate any existing fractures of cause damage to the system.

2. **Pressure Limiting Device:** The Permittee shall equip and operate its Class III well or system with a pressure limiting device which shall, at all times, limit surface injection pressure to the maximum allowable pressure for its Class III well. The Permittee shall monitor the pressure-limiting device daily and shall report all pressure exceedances within 24 hours of detecting an exceedance to OCD's Environmental Bureau.

The Permittee shall take all steps necessary to ensure that the injected fluids enter only the proposed injection interval and is not permitted to escape to other formations or onto the ground surface. The Permittee shall report to OCD's Environmental Bureau within 24 hours of discovery any indication that new fractures or existing fractures have been propagated, or that damage to the well, the injection zone, or formation has occurred.

3.C. CONTINUOUS MONITORING DEVICES: The Permittee shall use continuous monitoring devices to provide a record of injection pressure, flow rate, flow volume, and pressure on the annulus between the tubing and the long string of casing.

3.D. MECHANICAL INTEGRITY FOR CLASS III WELLS:

1. Pursuant to 20.6.2.5204 NMAC, the Permittee shall demonstrate mechanical integrity for its Class III well at least once every five years or more frequently as the OCD

Director may require for good cause during the life of the well. The Permittee shall demonstrate mechanical integrity for its Class III well every time it performs a well workover, including when it pulls the tubing. A Class III well has mechanical integrity if there is no detectable leak in the casing or tubing which OCD considers to be significant at maximum operating temperature and pressure; and no detectable conduit for fluid movement out of the injection zone through the well bore or vertical channels adjacent to the well bore which the OCD Director considers to be significant. The Permittee shall conduct a casing Mechanical Integrity Test (MIT) from the surface to the approved injection depth to assess casing integrity. The MIT shall consist of a 30-minute test at a minimum pressure of 300 psig measured at the surface.

The Permittee shall notify OCD's Environmental Bureau 5 days prior to conducting any MIT to allow OCD the opportunity to witness the MIT.

2. The following criteria will determine if the Class III well has passed the MIT:

- a. Passes MIT if zero bleed-off during the test;
- b. Passes MIT if final test pressure is within $\pm 10\%$ of starting pressure, if approved by OCD;
- c. When the MIT is not witnessed by OCD and fails, the Permittee shall notify OCD within 24 hours of the failure of the MIT.

3. Pursuant to 20.6.2.5204C NMAC, the OCD Director may consider the use by the Permittee of equivalent alternative test methods to determine mechanical integrity. The Permittee shall submit information on the proposed test and all technical data supporting its use. The OCD Director may approve the Permittee's request if it will reliably demonstrate the mechanical integrity of the well for which its use is proposed.

4. Pursuant to 20.6.2.5204D NMAC, when conducting and evaluating the MIT(s), the Permittee shall apply methods and standards generally accepted in the oil and gas industry. When the Permittee reports the results of all MIT(s) to the OCD Director, it shall include a description of the test(s), the method(s) used, and the test results.

3.E. WELL WORKOVER OPERATIONS: Pursuant to 20.6.2.5205A(5) NMAC, the Permittee shall provide notice to and shall obtain approval from OCD's District Office in Hobbs and the Environmental Bureau in Santa Fe prior to commencement of any remedial work or any other workover operations to allow OCD the opportunity to witness the operation. The Permittee shall request approval using form C-103 (Sundry Notices and Reports on Wells) with copies sent to OCD's Environmental Bureau and Hobbs District Office. Properly completed Forms C-103 and/or C-105 must be filed with OCD upon completion of workover activities and copies included in that year's Annual Report.

3.K. FLUIDS INJECTION AND BRINE PRODUCTION VOLUMES AND PRESSURES: The Permittee shall continuously monitor the volumes of water injected and brine production. The Permittee shall submit monthly reports of its injection and production volumes on or before the 10th day of the following month. The Permittee shall suspend injection if the monthly injection volume is less than 110% or greater than 120% of associated brine production. If such an event occurs, the Permittee shall notify OCD within 24 hours.

3.L. AREA OF REVIEW (AOR): The Permittee shall report within 72 hours of discovery any new wells, conduits, or any other device that penetrates or may penetrate the injection zone within a 1-mile radius from its Class III well.

4. CLASS V WELLS: Pursuant to 20.6.2.5002B NMAC, leach fields and other waste fluids disposal systems that inject non-hazardous fluid into or above an underground source of drinking water are UIC Class V injection wells. This Discharge Permit does not authorize the use of a Class V injection well for the disposal of industrial waste. Pursuant to 20.6.2.5005 NMAC, the Permittee shall close any Class V industrial waste injection well that injects non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes (*e.g.*, septic systems, leach fields, dry wells, *etc.*) within 90 calendar days of the issuance of this Discharge Permit. The Permittee shall document the closure of any Class V wells used for the disposal of non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes other than contaminated ground water in its Annual Report. Other Class V wells, including wells used only for the injection of domestic wastes, shall be permitted by the New Mexico Environment Department.

5. SCHEDULE OF COMPLIANCE:

5.A. ANNUAL REPORT: The Permittee shall submit its annual report to OCD by June 1st of each year.

5.B. BONDING OR FINANCIAL ASSURANCE: The Permittee shall submit an estimate of the minimum cost to properly close, plug and abandon its Class III well, conduct ground water restoration if applicable, and any post-operational monitoring as may be needed (see 20.6.2.5210B(17) NMAC) within 90 days of permit issuance (See 20.6.2.5210B(17) NMAC). The Permittee's cost estimate shall be based on third person estimates. After review, OCD will require the Permittee to submit a single well plugging bond based on the third person cost estimate.

5.C. SURFACE SUBSIDENCE MONITORING PLAN: The Permittee shall submit the Surface Subsidence Monitoring Plan required in accordance with Permit Condition 2.B.1 within 180 days of permit issuance.

5.D. SOLUTION CAVERN CHARACTERIZATION PLAN: The Permittee shall submit the Solution Cavern Characterization Plan required in accordance with Permit Condition 2.B.2 within 180 days of permit issuance.

Appendix “B”

- Injection and Production Volumes/Comparison Charts

2015 Wasserhund Inc OCD BW-04 Annual Production Data						
						Plus numbers represent more fresh injected than brine produced. Neg numbers the opposite.
			Brine-BBLS	Fresh-BBLS	% diff	
Jan			64,531.00	64,647.00	0.18%	
Feb			43,305.00	43,439.00	0.31%	
Mar			38,845.00	38,974.00	0.33%	
Apr			28,060.00	28,175.00	0.41%	
May			24,125.00	24,275.00	0.62%	
Jun			36,901	37,005	0.28%	
Jul			30,752	30,567	-0.60%	
Aug			23,952	24,331	1.58%	
Sept			26,863	27,020	0.58%	
Oct			33,537	33,669	0.39%	
Nov			32,346	32,461	0.36%	
Dec			31,071	31,221	0.48%	
2014 Total			414,288	415,784	0.36%	
Total Brine Water Production Carry Over from Years Past BBLs			8,696,987			
Total Production year ending 2015			9,111,275	bbls		

Appendix "C"

- Chemical Analysis Fresh Water
- Chemical Analysis Brine Water

Summary Report

Lester Wayne Price Jr.
 Price LLC
 312 Encantado Ridge Ct. NE
 Rio Rancho, NM 87124

Report Date: February 17, 2015

Work Order: 15012306



Project Location: Buckeye, NM
 Project Name: Brine Well

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
385130	Fresh	water	2015-01-16	15:51	2015-01-21
385131	Brine	water	2015-01-16	14:10	2015-01-21

Sample: 385130 - Fresh

Param	Flag	Result	Units	RL
Chloride	H	338	mg/L	2.5
Dissolved Sodium	Qs	221	mg/L	1
pH		8.03	s.u.	2
Specific Gravity		0.9918	g/ml	
Total Dissolved Solids		806	mg/L	2.5

Sample: 385131 - Brine

Param	Flag	Result	Units	RL
Chloride	H	106000	mg/L	2.5
Dissolved Sodium	Qs	81300	mg/L	1
pH		7.12	s.u.	2
Specific Gravity		1.124	g/ml	
Total Dissolved Solids		186000	mg/L	2.5



6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800-378-1296 806-794-1296 FAX 806-794-1298
200 East Sunset Road, Suite E El Paso, Texas 79922 915-585-3443 FAX 915-585-4944
5002 Basin Street, Suite A1 Midland, Texas 79703 432-689-6301 FAX 432-689-6313
(BioAquatic) 2501 Mayes Rd., Suite 100 Carrollton, Texas 75006 972-242-7750
E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

Lester Wayne Price Jr.
Price LLC
312 Encantado Ridge Ct. NE
Rio Rancho, NM, 87124

Report Date: February 17, 2015

Work Order: 15012306



Project Location: Buckeye, NM
Project Name: Brine Well
Project Number: Brine Well-Buckeye

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
385130	Fresh	water	2015-01-16	15:51	2015-01-21
385131	Brine	water	2015-01-16	14:10	2015-01-21

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 16 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director
James Taylor, Assistant Director
Brian Pellam, Operations Manager

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Case Narrative

Samples for project Brine Well were received by TraceAnalysis, Inc. on 2015-01-21 and assigned to work order 15012306. Samples for work order 15012306 were received intact at a temperature of 0.3 C.

Samples were analyzed for the following tests using their respective methods.

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
Chloride (IC)	E 300.0	100982	2015-02-16 at 12:00	119410	2015-02-16 at 12:53
Na, Dissolved	S 6010C	100546	2015-01-27 at 17:40	119127	2015-02-06 at 09:23
pH	SM 4500-H+	100544	2015-01-27 at 04:00	118893	2015-01-27 at 16:44
Specific Gravity	ASTM D1429-95	100533	2015-01-27 at 13:00	118885	2015-01-27 at 13:10
TDS	SM 2540C	100553	2015-01-26 at 09:00	118905	2015-01-26 at 17:00

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 15012306 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Analytical Report

Sample: 385130 - Fresh

Laboratory: Lubbock
Analysis: Chloride (IC) Analytical Method: E 300.0 Prep Method: N/A
QC Batch: 119410 Date Analyzed: 2015-02-16 Analyzed By: RL
Prep Batch: 100982 Sample Preparation: Prepared By: RL

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	H	1,2,3,4,5	338	mg/L	10	2.50

Sample: 385130 - Fresh

Laboratory: Lubbock
Analysis: Na, Dissolved Analytical Method: S 6010C Prep Method: S 3005A
QC Batch: 119127 Date Analyzed: 2015-02-06 Analyzed By: RR
Prep Batch: 100546 Sample Preparation: 2015-01-27 Prepared By: RR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Dissolved Sodium	Qs	2,3,4,5	221	mg/L	1	1.00

Sample: 385130 - Fresh

Laboratory: Lubbock
Analysis: pH Analytical Method: SM 4500-H+ Prep Method: N/A
QC Batch: 118893 Date Analyzed: 2015-01-27 Analyzed By: AT
Prep Batch: 100544 Sample Preparation: 2015-01-27 Prepared By: AT

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
pH		1,2,4,5	8.03	s.u.	1	2.00

Sample: 385130 - Fresh

Laboratory: Lubbock
Analysis: Specific Gravity Analytical Method: ASTM D1429-95 Prep Method: N/A
QC Batch: 118885 Date Analyzed: 2015-01-27 Analyzed By: CF
Prep Batch: 100533 Sample Preparation: 2015-01-27 Prepared By: CF

Report Date: February 17, 2015
Brine Well-Buckeye

Work Order: 15012306
Brine Well

Page Number: 5 of 16
Buckeye, NM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Specific Gravity			0.9918	g/ml	1	0.000

Sample: 385130 - Fresh

Laboratory: Lubbock
Analysis: TDS Analytical Method: SM 2540C Prep Method: N/A
QC Batch: 118905 Date Analyzed: 2015-01-26 Analyzed By: RL
Prep Batch: 100553 Sample Preparation: Prepared By: RL

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Dissolved Solids		1,2,3,4,5	806	mg/L	20	2.50

Sample: 385131 - Brine

Laboratory: Lubbock
Analysis: Chloride (IC) Analytical Method: E 300.0 Prep Method: N/A
QC Batch: 119410 Date Analyzed: 2015-02-16 Analyzed By: RL
Prep Batch: 100982 Sample Preparation: Prepared By: RL

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	H	1,2,3,4,5	106000	mg/L	5000	2.50

Sample: 385131 - Brine

Laboratory: Lubbock
Analysis: Na, Dissolved Analytical Method: S 6010C Prep Method: S 3005A
QC Batch: 119127 Date Analyzed: 2015-02-06 Analyzed By: RR
Prep Batch: 100546 Sample Preparation: 2015-01-27 Prepared By: RR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Dissolved Sodium	Qs	2,3,4,5	81300	mg/L	1000	1.00

Sample: 385131 - Brine

Laboratory: Lubbock
Analysis: pH Analytical Method: SM 4500-H+ Prep Method: N/A
QC Batch: 118893 Date Analyzed: 2015-01-27 Analyzed By: AT
Prep Batch: 100544 Sample Preparation: 2015-01-27 Prepared By: AT

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
pH		1,2,4,5	7.12	s.u.	1	2.00

Sample: 385131 - Brine

Laboratory: Lubbock
Analysis: Specific Gravity Analytical Method: ASTM D1429-95 Prep Method: N/A
QC Batch: 118885 Date Analyzed: 2015-01-27 Analyzed By: CF
Prep Batch: 100533 Sample Preparation: 2015-01-27 Prepared By: CF

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Specific Gravity			1.124	g/ml	1	0.000

Sample: 385131 - Brine

Laboratory: Lubbock
Analysis: TDS Analytical Method: SM 2540C Prep Method: N/A
QC Batch: 118905 Date Analyzed: 2015-01-26 Analyzed By: RL
Prep Batch: 100553 Sample Preparation: Prepared By: RL

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Dissolved Solids		1,2,3,4,5	186000	mg/L	2000	2.50

Method Blanks

Method Blank (1) QC Batch: 118885

QC Batch: 118885 Date Analyzed: 2015-01-27 Analyzed By: CF
Prep Batch: 100533 QC Preparation: 2015-01-27 Prepared By: CF

Parameter	Flag	Cert	MDL Result	Units	RL
Specific Gravity			0.9916	g/ml	

Method Blank (1) QC Batch: 118905

QC Batch: 118905 Date Analyzed: 2015-01-26 Analyzed By: RL
Prep Batch: 100553 QC Preparation: 2015-01-26 Prepared By: RL

Parameter	Flag	Cert	MDL Result	Units	RL
Total Dissolved Solids		1,2,3,4,5	<25.0	mg/L	2.5

Method Blank (1) QC Batch: 119127

QC Batch: 119127 Date Analyzed: 2015-02-06 Analyzed By: RR
Prep Batch: 100546 QC Preparation: 2015-01-27 Prepared By: PM

Parameter	Flag	Cert	MDL Result	Units	RL
Dissolved Sodium		2,3,4,5	<0.0184	mg/L	1

Method Blank (1) QC Batch: 119410

QC Batch: 119410 Date Analyzed: 2015-02-16 Analyzed By: RL
Prep Batch: 100982 QC Preparation: 2015-02-16 Prepared By: RL

Report Date: February 17, 2015
Brine Well-Buckeye

Work Order: 15012306
Brine Well

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Buckeye, NM

Parameter	Flag	Cert	MDL Result	Units	RL
Chloride		1,2,3,4,5	0.767	mg/L	2.5

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride		1,2,3,4,5	24.0	mg/L	1	25.0	0.767	93	90 - 110

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride		1,2,3,4,5	23.5	mg/L	1	25.0	0.767	91	90 - 110	2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

Matrix Spike (xMS-1) Spiked Sample: 385041

QC Batch: 119127 Date Analyzed: 2015-02-06 Analyzed By: RR
 Prep Batch: 100546 QC Preparation: 2015-01-27 Prepared By: PM

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Sodium		2,3,4,5	1660	mg/L	1	525	1210	86	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit	
Dissolved Sodium	Qs	Qs	2,3,4,5	1580	mg/L	1	525	1210	70	75 - 125	5	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 386889

QC Batch: 119410 Date Analyzed: 2015-02-16 Analyzed By: RL
 Prep Batch: 100982 QC Preparation: 2015-02-16 Prepared By: RL

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride		1,2,3,4,5	3350	mg/L	100	2500	812	102	80 - 120

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride		1,2,3,4,5	3290	mg/L	100	2500	812	99	80 - 120	2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Calibration Standards

Standard (ICV-1)

QC Batch: 118893

Date Analyzed: 2015-01-27

Analyzed By: AT

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
pH		1,2,4,5	s.u.	7.00	7.01	100	98.6 - 101.4	2015-01-27

Standard (CCV-1)

QC Batch: 118893

Date Analyzed: 2015-01-27

Analyzed By: AT

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
pH		1,2,4,5	s.u.	7.00	7.01	100	98.6 - 101.4	2015-01-27

Standard (ICV-1)

QC Batch: 119127

Date Analyzed: 2015-02-06

Analyzed By: RR

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Sodium		2,3,4,5	mg/L	51.0	51.7	101	90 - 110	2015-02-06

Standard (CCV-1)

QC Batch: 119127

Date Analyzed: 2015-02-06

Analyzed By: RR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Sodium		2,3,4,5	mg/L	51.0	55.9	110	90 - 110	2015-02-06

Standard (CCV-1)

QC Batch: 119410

Date Analyzed: 2015-02-16

Analyzed By: RL

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		1,2,3,4,5	mg/L	25.0	23.8	95	90 - 110	2015-02-16

Standard (CCV-2)

QC Batch: 119410

Date Analyzed: 2015-02-16

Analyzed By: RL

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		1,2,3,4,5	mg/L	25.0	23.9	96	90 - 110	2015-02-16

Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
SQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

C	Certifying Authority	Certification Number	Laboratory Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	PJLA	L14-93	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	LELAP	LELAP-02003	Lubbock
4	NELAP	T104704219-14-10	Lubbock
5		2014-018	Lubbock

Standard Flags

F	Description
B	Analyte detected in the corresponding method blank above the method detection limit
H	Analyzed out of hold time
J	Estimated concentration
Jb	The analyte is positively identified and the value is approximated between the SDL and SQL. Sample contains less than ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
Je	Estimated concentration exceeding calibration range.
MI1	Split peak or shoulder peak
MI2	Instrument software did not integrate
MI3	Instrument software misidentified the peak
MI4	Instrument software integrated improperly
MI5	Baseline correction
Qc	Calibration check outside of laboratory limits.
Qr	RPD outside of laboratory limits
Qs	Spike recovery outside of laboratory limits.
Qsr	Surrogate recovery outside of laboratory limits.

F Description

U The analyte is not detected above the SDL

Attachments

The scanned attachments will follow this page.
Please note, each attachment may consist of more than one page.

Summary Report

Lester Wayne Price Jr.
Price LLC
312 Encantado Ridge Ct. NE
Rio Rancho, NM 87124

Report Date: June 5, 2015

Work Order: 15050505



Project Location: Buckeye, NM
Project Name: Buckeye Fresh & Brine Station

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
392447	Fresh	water	2015-04-27	16:30	2015-05-04
392448	Brine	water	2015-04-27	16:40	2015-05-04

Sample: 392447 - Fresh

Param	Flag	Result	Units	RL
Chloride		377	mg/L	2.5
pH		7.82	s.u.	2
Specific Gravity		0.9841	g/ml	
Total Dissolved Solids		884	mg/L	2.5

Sample: 392448 - Brine

Param	Flag	Result	Units	RL
Chloride		185000	mg/L	2.5
Dissolved Sodium		101000	mg/L	1
pH		6.79	s.u.	2
Specific Gravity		1.194	g/ml	
Total Dissolved Solids		269000	mg/L	2.5



6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800-378-1296 806-794-1296 FAX 806-794-1298
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5002 Basin Street, Suite A1 Midland, Texas 79703 432-689-6301 FAX 432-689-6313
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E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

Lester Wayne Price Jr.
Price LLC
312 Encantado Ridge Ct. NE
Rio Rancho, NM, 87124

Report Date: June 5, 2015

Work Order: 15050505



Project Location: Buckeye, NM
Project Name: Buckeye Fresh & Brine Station
Project Number: Buckeye Fresh & Brine Station

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
392447	Fresh	water	2015-04-27	16:30	2015-05-04
392448	Brine	water	2015-04-27	16:40	2015-05-04

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TraceAnalysis, Inc. uses the attached chain of custody (COC) as the laboratory check-in documentation which includes sample receipt, temperature, sample preservation method and condition, collection date and time, testing requested, company, sampler, contacts and any special remarks.

This report consists of a total of 17 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Blair Leftwich

Dr. Blair Leftwich, Director
James Taylor, Assistant Director
Brian Pellam, Operations Manager

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Case Narrative

Samples for project Buckeye Fresh & Brine Station were received by TraceAnalysis, Inc. on 2015-05-04 and assigned to work order 15050505. Samples for work order 15050505 were received intact at a temperature of 0.3 C.

Samples were analyzed for the following tests using their respective methods.

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
Chloride (IC)	E 300.0	102846	2015-05-14 at 09:30	121554	2015-05-14 at 10:32
Na, Dissolved	S 6010C	103232	2015-06-04 at 14:09	122047	2015-06-05 at 13:17
pH	SM 4500-H+	102649	2015-05-06 at 16:48	121318	2015-05-06 at 16:51
Specific Gravity	ASTM D1429-95	102660	2015-05-07 at 10:00	121329	2015-05-07 at 10:10
TDS	SM 2540C	102686	2015-05-07 at 17:44	121355	2015-05-07 at 17:46

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 15050505 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Analytical Report

Sample: 392447 - Fresh

Laboratory: Lubbock
Analysis: Chloride (IC) Analytical Method: E 300.0 Prep Method: N/A
QC Batch: 121554 Date Analyzed: 2015-05-14 Analyzed By: RL
Prep Batch: 102846 Sample Preparation: Prepared By: RL

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride		1,2,3,4,5	377	mg/L	10	2.50

Sample: 392447 - Fresh

Laboratory: Lubbock
Analysis: pH Analytical Method: SM 4500-H+ Prep Method: N/A
QC Batch: 121318 Date Analyzed: 2015-05-06 Analyzed By: HJ
Prep Batch: 102649 Sample Preparation: Prepared By: HJ

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
pH		1,2,4,5	7.82	s.u.	1	2.00

Sample: 392447 - Fresh

Laboratory: Lubbock
Analysis: Specific Gravity Analytical Method: ASTM D1429-95 Prep Method: N/A
QC Batch: 121329 Date Analyzed: 2015-05-07 Analyzed By: CF
Prep Batch: 102660 Sample Preparation: 2015-05-07 Prepared By: CF

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Specific Gravity			0.9841	g/ml	1	0.000

Sample: 392447 - Fresh

Laboratory: Lubbock
Analysis: TDS Analytical Method: SM 2540C Prep Method: N/A
QC Batch: 121355 Date Analyzed: 2015-05-07 Analyzed By: HJ
Prep Batch: 102686 Sample Preparation: Prepared By: HJ

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Dissolved Solids		1,2,3,4,5	884	mg/L	20	2.50

Sample: 392448 - Brine

Laboratory: Lubbock
 Analysis: Chloride (IC) Analytical Method: E 300.0 Prep Method: N/A
 QC Batch: 121554 Date Analyzed: 2015-05-14 Analyzed By: RL
 Prep Batch: 102846 Sample Preparation: Prepared By: RL

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride		1,2,3,4,5	185000	mg/L	5000	2.50

Sample: 392448 - Brine

Laboratory: Lubbock
 Analysis: Na, Dissolved Analytical Method: S 6010C Prep Method: S 3005A
 QC Batch: 122047 Date Analyzed: 2015-06-05 Analyzed By: RR
 Prep Batch: 103232 Sample Preparation: 2015-06-04 Prepared By: RR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Dissolved Sodium		2,3,4,5	101000	mg/L	1000	1.00

Sample: 392448 - Brine

Laboratory: Lubbock
 Analysis: pH Analytical Method: SM 4500-H+ Prep Method: N/A
 QC Batch: 121318 Date Analyzed: 2015-05-06 Analyzed By: HJ
 Prep Batch: 102649 Sample Preparation: Prepared By: HJ

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
pH		1,2,4,5	6.79	s.u.	1	2.00

Report Date: June 5, 2015
Buckeye Fresh & Brine Station

Work Order: 15050505
Buckeye Fresh & Brine Station

Page Number: 7 of 17
Buckeye, NM

Sample: 392448 - Brine

Laboratory: Lubbock
Analysis: Specific Gravity Analytical Method: ASTM D1429-95 Prep Method: N/A
QC Batch: 121329 Date Analyzed: 2015-05-07 Analyzed By: CF
Prep Batch: 102660 Sample Preparation: 2015-05-07 Prepared By: CF

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Specific Gravity			1.194	g/ml	1	0.000

Sample: 392448 - Brine

Laboratory: Lubbock
Analysis: TDS Analytical Method: SM 2540C Prep Method: N/A
QC Batch: 121355 Date Analyzed: 2015-05-07 Analyzed By: HJ
Prep Batch: 102686 Sample Preparation: Prepared By: HJ

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Dissolved Solids		1,2,3,4,5	269000	mg/L	2000	2.50

Method Blanks

Method Blank (1) QC Batch: 121329

QC Batch: 121329 Date Analyzed: 2015-05-07 Analyzed By: CF
Prep Batch: 102660 QC Preparation: 2015-05-07 Prepared By: CF

Parameter	Flag	Cert	MDL Result	Units	RL
Specific Gravity			0.9884	g/ml	

Method Blank (1) QC Batch: 121355

QC Batch: 121355 Date Analyzed: 2015-05-07 Analyzed By: HJ
Prep Batch: 102686 QC Preparation: 2015-05-07 Prepared By: HJ

Parameter	Flag	Cert	MDL Result	Units	RL
Total Dissolved Solids		1,2,3,4,5	<25.0	mg/L	2.5

Method Blank (1) QC Batch: 121554

QC Batch: 121554 Date Analyzed: 2015-05-14 Analyzed By: RL
Prep Batch: 102846 QC Preparation: 2015-05-14 Prepared By: RL

Parameter	Flag	Cert	MDL Result	Units	RL
Chloride		1,2,3,4,5	0.973	mg/L	2.5

Method Blank (1) QC Batch: 122047

QC Batch: 122047 Date Analyzed: 2015-06-05 Analyzed By: RR
Prep Batch: 103232 QC Preparation: 2015-06-04 Prepared By: PM

Report Date: June 5, 2015
Buckeye Fresh & Brine Station

Work Order: 15050505
Buckeye Fresh & Brine Station

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Buckeye, NM

Parameter	Flag	Cert	MDL Result	Units	RL
Dissolved Sodium		2,3,4,5	<0.0197	mg/L	1

Duplicates

Duplicates (1) Duplicated Sample: 392489

QC Batch: 121318 Date Analyzed: 2015-05-06 Analyzed By: HJ
Prep Batch: 102649 QC Preparation: 2015-05-06 Prepared By: HJ

Param		Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
pH	1,2,4,5	9.09	9.19	s.u.	1	1	20

Duplicates (1) Duplicated Sample: 392450

QC Batch: 121329 Date Analyzed: 2015-05-07 Analyzed By: CF
Prep Batch: 102660 QC Preparation: 2015-05-07 Prepared By: CF

Param		Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Specific Gravity		1.008	1.018	g/ml	1	1	200

Duplicates (1) Duplicated Sample: 392450

QC Batch: 121355 Date Analyzed: 2015-05-07 Analyzed By: HJ
Prep Batch: 102686 QC Preparation: 2015-05-07 Prepared By: HJ

Param		Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids	1,2,3,4,5	32400	34100	mg/L	1000	5	10

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Sodium		2,3,4,5	56.8	mg/L	1	52.5	<0.0197	108	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Sodium		2,3,4,5	54.4	mg/L	1	52.5	<0.0197	104	85 - 115	4	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

Matrix Spike (MS-1) Spiked Sample: 392448

QC Batch: 121554 Date Analyzed: 2015-05-14 Analyzed By: RL
 Prep Batch: 102846 QC Preparation: 2015-05-14 Prepared By: RL

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride		1,2,3,4,5	320000	mg/L	5000	125000	185000	108	80 - 120

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride		1,2,3,4,5	316000	mg/L	5000	125000	185000	105	80 - 120	1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 394405

QC Batch: 122047 Date Analyzed: 2015-06-05 Analyzed By: RR
 Prep Batch: 103232 QC Preparation: 2015-06-04 Prepared By: PM

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Sodium		2,3,4,5	703	mg/L	1	525	143	107	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Sodium		2,3,4,5	688	mg/L	1	525	143	104	75 - 125	2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

C	Certifying Authority	Certification Number	Laboratory Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	L-A-B	L2418	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	LELAP	LELAP-02003	Lubbock
4	NELAP	T104704219-15-11	Lubbock
5		2014-018	Lubbock

Standard Flags

F	Description
B	Analyte detected in the corresponding method blank above the method detection limit
H	Analyzed out of hold time
J	Estimated concentration
Jb	The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less than ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
Je	Estimated concentration exceeding calibration range.
MI1	Split peak or shoulder peak
MI2	Instrument software did not integrate
MI3	Instrument software misidentified the peak
MI4	Instrument software integrated improperly
MI5	Baseline correction
Qc	Calibration check outside of laboratory limits.
Qr	RPD outside of laboratory limits
Qs	Spike recovery outside of laboratory limits.
Qsr	Surrogate recovery outside of laboratory limits.

F Description

U The analyte is not detected above the SDL

Attachments

The scanned attachments will follow this page.
Please note, each attachment may consist of more than one page.

Summary Report

Wayne Price
 Price LLC
 312 Encantado Ridge Ct. NE
 Rio Rancho, NM 87124

Report Date: August 19, 2015

Work Order: 15081113



Project Location: Buckeye, NM
 Project Name: Buckeye Fresh & Brine Station

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
401720	Fresh	water	2015-07-08	16:20	2015-08-09
401721	Brine	water	2015-07-08	16:30	2015-08-09

Sample: 401720 - Fresh

Param	Flag	Result	Units	RL
Chloride	B,H	302	mg/L	2.5
Dissolved Sodium		156	mg/L	1
pH		7.77	s.u.	2
Specific Gravity		0.9842	g/ml	
Total Dissolved Solids		804	mg/L	2.5

Sample: 401721 - Brine

Param	Flag	Result	Units	RL
Dissolved Sodium		124000	mg/L	1



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 5002 Basin Street, Suite A1 Midland, Texas 79703 432-689-6301 FAX 432-689-6313
 (BioAquatic) 2501 Mayes Rd., Suite 100 Carrollton, Texas 75006 972-242-7750
 E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

Wayne Price
 Price LLC
 312 Encantado Ridge Ct. NE
 Rio Rancho, NM, 87124

Report Date: August 19, 2015

Work Order: 15081113



Project Location: Buckeye, NM
 Project Name: Buckeye Fresh & Brine Station
 Project Number: Buckeye Fresh & Brine Station

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
401720	Fresh	water	2015-07-08	16:20	2015-08-09
401721	Brine	water	2015-07-08	16:30	2015-08-09

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TraceAnalysis, Inc. uses the attached chain of custody (COC) as the laboratory check-in documentation which includes sample receipt, temperature, sample preservation method and condition, collection date and time, testing requested, company, sampler, contacts and any special remarks.

This report consists of a total of 16 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Blair Leftwich

Dr. Blair Leftwich, Director
James Taylor, Assistant Director
Brian Pellam, Operations Manager

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Case Narrative

Samples for project Buckeye Fresh & Brine Station were received by TraceAnalysis, Inc. on 2015-08-09 and assigned to work order 15081113. Samples for work order 15081113 were received intact at a temperature of 31.0 C.

Samples were analyzed for the following tests using their respective methods.

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
Chloride (IC)	E 300.0	104957	2015-08-17 at 11:00	124129	2015-08-17 at 12:10
Na, Dissolved	S 6010C	104805	2015-08-12 at 14:05	124020	2015-08-13 at 16:07
pH	SM 4500-H+	104784	2015-08-11 at 17:18	123931	2015-08-11 at 17:19
Specific Gravity	ASTM D1429-95	104834	2015-08-13 at 10:45	123992	2015-08-13 at 10:50
TDS	SM 2540C	104944	2015-08-17 at 16:36	124118	2015-08-17 at 16:37

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 15081113 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Analytical Report

Sample: 401720 - Fresh

Laboratory: Lubbock
Analysis: Chloride (IC) Analytical Method: E 300.0 Prep Method: N/A
QC Batch: 124129 Date Analyzed: 2015-08-17 Analyzed By: RL
Prep Batch: 104957 Sample Preparation: Prepared By: RL

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	B,H	1,2,3,4,5	302	mg/L	10	2.50

Sample: 401720 - Fresh

Laboratory: Lubbock
Analysis: Na, Dissolved Analytical Method: S 6010C Prep Method: S 3005A
QC Batch: 124020 Date Analyzed: 2015-08-13 Analyzed By: RR
Prep Batch: 104805 Sample Preparation: 2015-08-12 Prepared By: RR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Dissolved Sodium		2,3,4,5	156	mg/L	10	1.00

Sample: 401720 - Fresh

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
pH		1,2,4,5	7.77	s.u.	1	2.00

Sample: 401720 - Fresh

Laboratory: Lubbock
Analysis: Specific Gravity Analytical Method: ASTM D1429-95 Prep Method: N/A
QC Batch: 123992 Date Analyzed: 2015-08-13 Analyzed By: CF
Prep Batch: 104834 Sample Preparation: Prepared By: CF

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Specific Gravity			0.9842	g/ml	1	0.000

Report Date: August 19, 2015
Buckeye Fresh & Brine Station

Work Order: 15081113
Buckeye Fresh & Brine Station

Page Number: 6 of 16
Buckeye, NM

Sample: 401720 - Fresh

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Dissolved Solids		1,2,3,4,5	804	mg/L	20	2.50

Sample: 401721 - Brine

Laboratory: Lubbock
Analysis: Na, Dissolved
QC Batch: 124020
Prep Batch: 104805

Analytical Method: S 6010C
Date Analyzed: 2015-08-13
Sample Preparation: 2015-08-12

Prep Method: S 3005A
Analyzed By: RR
Prepared By: RR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Dissolved Sodium		2,3,4,5	124000	mg/L	1000	1.00

Method Blanks

Method Blank (1) QC Batch: 123992

QC Batch: 123992 Date Analyzed: 2015-08-13 Analyzed By: CF
Prep Batch: 104834 QC Preparation: 2015-08-13 Prepared By: CF

Parameter	Flag	Cert	MDL Result	Units	RL
Specific Gravity			0.9856	g/ml	

Method Blank (1) QC Batch: 124020

QC Batch: 124020 Date Analyzed: 2015-08-13 Analyzed By: RR
Prep Batch: 104805 QC Preparation: 2015-08-12 Prepared By: PM

Parameter	Flag	Cert	MDL Result	Units	RL
Dissolved Sodium		2,3,4,5	<0.0197	mg/L	1

Method Blank (1) QC Batch: 124118

QC Batch: 124118 Date Analyzed: Analyzed By:
Prep Batch: QC Preparation: Prepared By:

Parameter	Flag	Cert	MDL Result	Units	RL
Total Dissolved Solids		1,2,3,4,5	<25.0	mg/L	2.5

Method Blank (1) QC Batch: 124129

QC Batch: 124129 Date Analyzed: 2015-08-17 Analyzed By: RL
Prep Batch: 104957 QC Preparation: 2015-08-17 Prepared By: RL

Report Date: August 19, 2015
Buckeye Fresh & Brine Station

Work Order: 15081113
Buckeye Fresh & Brine Station

Page Number: 8 of 16
Buckeye, NM

Parameter		Flag	Cert	MDL Result	Units	RL
Chloride	B	B	1,2,3,4,5	0.971	mg/L	2.5

Duplicates

Duplicates (1) Duplicated Sample: 401722

QC Batch: 123931
Prep Batch:

Date Analyzed:
QC Preparation:

Analyzed By:
Prepared By:

Param		Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
pH	1,2,4,5	8.05	8.04	s.u.	1	0	20

Duplicates (1) Duplicated Sample: 401722

QC Batch: 123992
Prep Batch: 104834

Date Analyzed: 2015-08-13
QC Preparation: 2015-08-13

Analyzed By: CF
Prepared By: CF

Param		Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Specific Gravity		0.9743	1.000	g/ml	1	3	200

Duplicates (1) Duplicated Sample: 401720

QC Batch: 124118
Prep Batch:

Date Analyzed:
QC Preparation:

Analyzed By:
Prepared By:

Param		Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids	1,2,3,4,5	804	804	mg/L	20	0	10

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 124020
 Prep Batch: 104805

Date Analyzed: 2015-08-13
 QC Preparation: 2015-08-12

Analyzed By: RR
 Prepared By: PM

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Sodium		2,3,4,5	51.4	mg/L	1	50.0	<0.0197	103	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Sodium		2,3,4,5	51.0	mg/L	1	50.0	<0.0197	102	85 - 115	1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 124118
 Prep Batch:

Date Analyzed:
 QC Preparation:

Analyzed By:
 Prepared By:

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Dissolved Solids		1,2,3,4,5	999	mg/L	10	1000	<25.0	100	90 - 110

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Total Dissolved Solids		1,2,3,4,5	987	mg/L	10	1000	<25.0	99	90 - 110	1	10

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 124129
 Prep Batch: 104957

Date Analyzed: 2015-08-17
 QC Preparation: 2015-08-17

Analyzed By: RL
 Prepared By: RL

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride		1,2,3,4,5	24.9	mg/L	1	25.0	0.971	96	90 - 110

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride		1,2,3,4,5	25.1	mg/L	1	25.0	0.971	96	90 - 110	1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Calibration Standards

Standard (CCV-1)

QC Batch: 123931				Date Analyzed:			Analyzed By:		
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	
pH		1,2,4,5	s.u.	7.00	7.06	101	98.6 - 101.4	2015-08-11	

Standard (ICV-1)

QC Batch: 124020				Date Analyzed: 2015-08-13			Analyzed By: RR		
Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed	
Dissolved Sodium		2,3,4,5	mg/L	25.5	26.1	102	90 - 110	2015-08-13	

Standard (CCV-1)

QC Batch: 124020				Date Analyzed: 2015-08-13			Analyzed By: RR		
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	
Dissolved Sodium		2,3,4,5	mg/L	25.0	23.5	94	90 - 110	2015-08-13	

Standard (CCV-1)

QC Batch: 124129				Date Analyzed: 2015-08-17			Analyzed By: RL		
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	
Chloride		1,2,3,4,5	mg/L	25.0	24.5	98	90 - 110	2015-08-17	

Report Date: August 19, 2015
Buckeye Fresh & Brine Station

Work Order: 15081113
Buckeye Fresh & Brine Station

Page Number: 14 of 16
Buckeye, NM

Standard (CCV-2)

QC Batch: 124129

Date Analyzed: 2015-08-17

Analyzed By: RL

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		1,2,3,4,5	mg/L	25.0	25.1	100	90 - 110	2015-08-17

Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

C	Certifying Authority	Certification Number	Laboratory Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	L-A-B	L2418	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	LELAP	LELAP-02003	Lubbock
4	NELAP	T104704219-15-11	Lubbock
5		2014-018	Lubbock

Standard Flags

F	Description
B	Analyte detected in the corresponding method blank above the method detection limit
H	Analyzed out of hold time
J	Estimated concentration
Jb	The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less than ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
Je	Estimated concentration exceeding calibration range.
MI1	Split peak or shoulder peak
MI2	Instrument software did not integrate
MI3	Instrument software misidentified the peak
MI4	Instrument software integrated improperly
MI5	Baseline correction
Qc	Calibration check outside of laboratory limits.
Qr	RPD outside of laboratory limits
Qs	Spike recovery outside of laboratory limits.
Qsr	Surrogate recovery outside of laboratory limits.

F Description

U The analyte is not detected above the SDL

Attachments

The scanned attachments will follow this page.
Please note, each attachment may consist of more than one page.

TraceAnalysis, Inc.

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BioAquatic Testing
2501 Mayes Rd., Ste 100
Carrollton, Texas 75006
Tel (972) 242-7750

Company Name: PRICE LLC		Phone #: 505 892 6643					
Address: (Street, City, Zip) 312 ENCANTADO RIDGE COURT NE 87104		Fax #: 505 892 6643					
Contact Person: LESTER WAYNE PRICE JR		E-mail: WAPRICE23@HOTMAIL.COM					
Invoice to: (If different from above) NA		Project Name: BRINE WELL					
Project #: BUCKEYE NM		Sampler Signature: LUPPER					
Project Location (including state):							
LAB #	FIELD CODE	# CONTAINERS	VOLUME / AMOUNT	MATRIX	PRESERVATIVE METHOD	SAMPLING DATE	SAMPLING TIME
85130	FRESH	1	1 LITER X	WATER	HCl	1/16/15	3:51 PM
131	BRINE	1	1 LITER X	SLUDGE	H ₂ SO ₄	1/16/15	4:10 PM
				AIR	NaOH		
				SOIL	ICE		
				SLUDGE	NONE		

Relinquished by: LESTER WAYNE PRICE JR PRICE LLC	Company: PRICE OR PRICE LLC	Date: 1/21/15	Time: 4:50 AM
Received by: Billy Bender	Company: Brandon + Clark	Date: 1-21-15	Time: 4:52 PM
Relinquished by: Owen	Company: Wapack	Date: 1/21/15	Time: 8:30
Received by: Owen	Company: Wapack	Date: 1/21/15	Time: 8:30

INST: _____	OBS: _____	COR: _____
INST: _____	OBS: _____	COR: _____
INST: _____	OBS: _____	COR: _____

TPH 418.1 / TX1005 / TX1005 EX(C35)	TPH 8015 GRO / DRO / TVHC	PAH 8270 / 625	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260 / 624	GC/MS Semi. Vol. 8270 / 625	PCB's 8082 / 608	Pesticides 8081 / 608	BOD, TSS, PH	Moisture Content	Cl, F, SO ₄ , NO ₃ -N, NO ₂ -N, PO ₄ -P, Alkalinity	Na, Ca, Mg, K, TDS, EC	X CHLORIDES, PH, SR, TDS	X DISSOLVED SODIUM
-------------------------------------	---------------------------	----------------	---	-------------------------------------	----------------	---------------------	-----------------	-----	-----------------------	-----------------------------	------------------	-----------------------	--------------	------------------	---	------------------------	--------------------------	--------------------

LAB USE ONLY	LAB USE ONLY	REMARKS: N/A
Intact Y / N	Headspace Y / N / NA	
Log-In-Review		

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C. O. C. -30

Carrier # 25 ZSD/HB344

ORIGINAL COPY

Summary Report

Wayne Price
 Price LLC
 312 Encantado Ridge Ct. NE
 Rio Rancho, NM 87124

Report Date: November 12, 2015

Work Order: 15102712



Project Location: Buckeye & Tatum NM
 Project Name: Brine Well 3rd QT. Sample
 Project Number: BW-4 & BW-22

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
407093	BW-22 Tatum Fresh	water	2015-10-23	13:15	2015-10-26
407094	BW-22 Tatum Brine	water	2015-10-23	13:20	2015-10-26
407095	BW-4 Buckeye Fresh	water	2015-10-23	17:55	2015-10-26
407096	BW-4 Buckeye Brine	water	2015-10-23	18:00	2015-10-26

Sample: 407093 - BW-22 Tatum Fresh

Param	Flag	Result	Units	RL
Chloride		76.6	mg/L	2.5
Density		0.978	g/ml	
pH		7.79	s.u.	2
Total Dissolved Solids		659	mg/L	2.5

Sample: 407094 - BW-22 Tatum Brine

Param	Flag	Result	Units	RL
Chloride		18000	mg/L	2.5
Density		1.02	g/ml	
Dissolved Sodium		12500	mg/L	1
pH		6.99	s.u.	2
Total Dissolved Solids		37000	mg/L	2.5

Sample: 407095 - BW-4 Buckeye Fresh

Param	Flag	Result	Units	RL
Chloride		280	mg/L	2.5
Density		0.997	g/ml	
pH		7.61	s.u.	2
Total Dissolved Solids		868	mg/L	2.5

Sample: 407096 - BW-4 Buckeye Brine

Param	Flag	Result	Units	RL
Chloride		176000	mg/L	2.5
Density		1.18	g/ml	
Dissolved Sodium		108000	mg/L	1
pH		6.76	s.u.	2
Total Dissolved Solids		310000	mg/L	2.5



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 (BioAquatic) 2501 Mayes Rd., Suite 100 Carrollton, Texas 75006 972-242-7750
 E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

Wayne Price
 Price LLC
 312 Encantado Ridge Ct. NE
 Rio Rancho, NM, 87124

Report Date: November 12, 2015

Work Order: 15102712



Project Location: Buckeye & Tatum NM
 Project Name: Brine Well 3rd QT. Sample
 Project Number: BW-4 & BW-22

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
407093	BW-22 Tatum Fresh	water	2015-10-23	13:15	2015-10-26
407094	BW-22 Tatum Brine	water	2015-10-23	13:20	2015-10-26
407095	BW-4 Buckeye Fresh	water	2015-10-23	17:55	2015-10-26
407096	BW-4 Buckeye Brine	water	2015-10-23	18:00	2015-10-26

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TraceAnalysis, Inc. uses the attached chain of custody (COC) as the laboratory check-in documentation which includes sample receipt, temperature, sample preservation method and condition, collection date and time, testing requested, company, sampler, contacts and any special remarks.

This report consists of a total of 20 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Blair Leftwich

Dr. Blair Leftwich, Director
James Taylor, Assistant Director
Brian Pellam, Operations Manager

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Case Narrative

Samples for project Brine Well 3rd QT. Sample were received by TraceAnalysis, Inc. on 2015-10-26 and assigned to work order 15102712. Samples for work order 15102712 were received intact at a temperature of 3.0 C.

Samples were analyzed for the following tests using their respective methods.

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
Chloride (IC)	E 300.0	106703	2015-11-04 at 13:00	126115	2015-11-04 at 13:45
Density	ASTM D854-92	106620	2015-11-02 at 13:10	126018	2015-11-02 at 13:15
Na, Dissolved	S 6010C	106726	2015-11-06 at 12:43	126288	2015-11-12 at 10:10
pH	SM 4500-H+	106519	2015-10-27 at 17:30	125907	2015-10-27 at 17:31
TDS	SM 2540C	106564	2015-10-29 at 12:04	126012	2015-10-29 at 12:00
TDS	SM 2540C	106671	2015-11-03 at 16:30	126079	2015-11-03 at 16:31

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 15102712 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Analytical Report

Sample: 407093 - BW-22 Tatum Fresh

Laboratory: Lubbock
Analysis: Chloride (IC) Analytical Method: E 300.0 Prep Method: N/A
QC Batch: 126115 Date Analyzed: 2015-11-04 Analyzed By: RL
Prep Batch: 106703 Sample Preparation: Prepared By: RL

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride		1,2,3,4,6	76.6	mg/L	5	2.50

Sample: 407093 - BW-22 Tatum Fresh

Laboratory: Lubbock
Analysis: Density Analytical Method: ASTM D854-92 Prep Method: N/A
QC Batch: 126018 Date Analyzed: 2015-11-02 Analyzed By: CF
Prep Batch: 106620 Sample Preparation: Prepared By: CF

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Density			0.978	g/ml	1	0.00

Sample: 407093 - BW-22 Tatum Fresh

Laboratory: Lubbock
Analysis: pH Analytical Method: SM 4500-H+ Prep Method: N/A
QC Batch: 125907 Date Analyzed: 2015-10-27 Analyzed By: LQ
Prep Batch: 106519 Sample Preparation: Prepared By: LQ

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
pH		1,2,4,6	7.79	s.u.	1	2.00

Sample: 407093 - BW-22 Tatum Fresh

Laboratory: Lubbock
Analysis: TDS Analytical Method: SM 2540C Prep Method: N/A
QC Batch: 126012 Date Analyzed: 2015-10-29 Analyzed By: LQ
Prep Batch: 106564 Sample Preparation: Prepared By: LQ

Report Date: November 12, 2015
BW-4 & BW-22

Work Order: 15102712
Brine Well 3rd QT. Sample

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Buckeye & Tatum NM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Dissolved Solids		1,2,3,4,6	659	mg/L	10	2.50

Sample: 407094 - BW-22 Tatum Brine

Laboratory: Lubbock
Analysis: Chloride (IC) Analytical Method: E 300.0 Prep Method: N/A
QC Batch: 126115 Date Analyzed: 2015-11-04 Analyzed By: RL
Prep Batch: 106703 Sample Preparation: Prepared By: RL

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride		1,2,3,4,6	18000	mg/L	500	2.50

Sample: 407094 - BW-22 Tatum Brine

Laboratory: Lubbock
Analysis: Density Analytical Method: ASTM D854-92 Prep Method: N/A
QC Batch: 126018 Date Analyzed: 2015-11-02 Analyzed By: CF
Prep Batch: 106620 Sample Preparation: Prepared By: CF

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Density			1.02	g/ml	1	0.00

Sample: 407094 - BW-22 Tatum Brine

Laboratory: Lubbock
Analysis: Na, Dissolved Analytical Method: S 6010C Prep Method: S 3005A
QC Batch: 126288 Date Analyzed: 2015-11-12 Analyzed By: RR
Prep Batch: 106726 Sample Preparation: 2015-11-06 Prepared By: RR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Dissolved Sodium		2,3,4,6	12500	mg/L	100	1.00

Sample: 407094 - BW-22 Tatum Brine

Laboratory: Lubbock
Analysis: pH Analytical Method: SM 4500-H+ Prep Method: N/A
QC Batch: 125907 Date Analyzed: 2015-10-27 Analyzed By: LQ
Prep Batch: 106519 Sample Preparation: Prepared By: LQ

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
pH		1,2,4,6	6.99	s.u.	1	2.00

Sample: 407094 - BW-22 Tatum Brine

Laboratory: Lubbock
Analysis: TDS Analytical Method: SM 2540C Prep Method: N/A
QC Batch: 126012 Date Analyzed: 2015-10-29 Analyzed By: LQ
Prep Batch: 106564 Sample Preparation: Prepared By: LQ

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Dissolved Solids		1,2,3,4,6	37000	mg/L	1000	2.50

Sample: 407095 - BW-4 Buckeye Fresh

Laboratory: Lubbock
Analysis: Chloride (IC) Analytical Method: E 300.0 Prep Method: N/A
QC Batch: 126115 Date Analyzed: 2015-11-04 Analyzed By: RL
Prep Batch: 106703 Sample Preparation: Prepared By: RL

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride		1,2,3,4,6	280	mg/L	10	2.50

Sample: 407095 - BW-4 Buckeye Fresh

Laboratory: Lubbock
Analysis: Density Analytical Method: ASTM D854-92 Prep Method: N/A
QC Batch: 126018 Date Analyzed: 2015-11-02 Analyzed By: CF
Prep Batch: 106620 Sample Preparation: Prepared By: CF

continued . . .

sample 407095 continued ...

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Density			0.997	g/ml	1	0.00

Sample: 407095 - BW-4 Buckeye Fresh

Laboratory: Lubbock
 Analysis: pH Analytical Method: SM 4500-H+ Prep Method: N/A
 QC Batch: 125907 Date Analyzed: 2015-10-27 Analyzed By: LQ
 Prep Batch: 106519 Sample Preparation: Prepared By: LQ

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
pH		1,2,4,6	7.61	s.u.	1	2.00

Sample: 407095 - BW-4 Buckeye Fresh

Laboratory: Lubbock
 Analysis: TDS Analytical Method: SM 2540C Prep Method: N/A
 QC Batch: 126012 Date Analyzed: 2015-10-29 Analyzed By: LQ
 Prep Batch: 106564 Sample Preparation: Prepared By: LQ

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Dissolved Solids		1,2,3,4,6	868	mg/L	20	2.50

Sample: 407096 - BW-4 Buckeye Brine

Laboratory: Lubbock
 Analysis: Chloride (IC) Analytical Method: E 300.0 Prep Method: N/A
 QC Batch: 126115 Date Analyzed: 2015-11-04 Analyzed By: RL
 Prep Batch: 106703 Sample Preparation: Prepared By: RL

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride		1,2,3,4,6	176000	mg/L	5000	2.50

Report Date: November 12, 2015
BW-4 & BW-22

Work Order: 15102712
Brine Well 3rd QT. Sample

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Sample: 407096 - BW-4 Buckeye Brine

Laboratory: Lubbock
Analysis: Density Analytical Method: ASTM D854-92 Prep Method: N/A
QC Batch: 126018 Date Analyzed: 2015-11-02 Analyzed By: CF
Prep Batch: 106620 Sample Preparation: Prepared By: CF

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Density			1.18	g/ml	1	0.00

Sample: 407096 - BW-4 Buckeye Brine

Laboratory: Lubbock
Analysis: Na, Dissolved Analytical Method: S 6010C Prep Method: S 3005A
QC Batch: 126288 Date Analyzed: 2015-11-12 Analyzed By: RR
Prep Batch: 106726 Sample Preparation: 2015-11-06 Prepared By: RR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Dissolved Sodium		2,3,4,6	108000	mg/L	1000	1.00

Sample: 407096 - BW-4 Buckeye Brine

Laboratory: Lubbock
Analysis: pH Analytical Method: SM 4500-H+ Prep Method: N/A
QC Batch: 125907 Date Analyzed: 2015-10-27 Analyzed By: LQ
Prep Batch: 106519 Sample Preparation: Prepared By: LQ

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
pH		1,2,4,6	6.76	s.u.	1	2.00

Sample: 407096 - BW-4 Buckeye Brine

Laboratory: Lubbock
Analysis: TDS Analytical Method: SM 2540C Prep Method: N/A
QC Batch: 126079 Date Analyzed: 2015-11-03 Analyzed By: LQ
Prep Batch: 106671 Sample Preparation: Prepared By: LQ

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Dissolved Solids		1,2,3,4,6	310000	mg/L	2000	2.50

Method Blanks

Method Blank (1) QC Batch: 126012

QC Batch: 126012 Date Analyzed: 2015-10-29 Analyzed By: LQ
Prep Batch: 106564 QC Preparation: 2015-10-29 Prepared By: LQ

Parameter	Flag	Cert	MDL Result	Units	RL
Total Dissolved Solids		1,2,3,4,6	<25.0	mg/L	2.5

Method Blank (1) QC Batch: 126018

QC Batch: 126018 Date Analyzed: 2015-11-02 Analyzed By: CF
Prep Batch: 106620 QC Preparation: 2015-11-02 Prepared By: CF

Parameter	Flag	Cert	MDL Result	Units	RL
Density			0.988	g/ml	

Method Blank (1) QC Batch: 126079

QC Batch: 126079 Date Analyzed: 2015-11-03 Analyzed By: LQ
Prep Batch: 106671 QC Preparation: 2015-11-03 Prepared By: LQ

Parameter	Flag	Cert	MDL Result	Units	RL
Total Dissolved Solids		1,2,3,4,6	<25.0	mg/L	2.5

Method Blank (1) QC Batch: 126115

QC Batch: 126115 Date Analyzed: 2015-11-04 Analyzed By: RL
Prep Batch: 106703 QC Preparation: 2015-11-04 Prepared By: RL

Report Date: November 12, 2015
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Work Order: 15102712
Brine Well 3rd QT. Sample

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Parameter	Flag	Cert	MDL Result	Units	RL
Chloride		1,2,3,4,6	<0.323	mg/L	2.5

Method Blank (1) QC Batch: 126288

QC Batch: 126288
Prep Batch: 106726

Date Analyzed: 2015-11-12
QC Preparation: 2015-11-06

Analyzed By: RR
Prepared By: PM

Parameter	Flag	Cert	MDL Result	Units	RL
Dissolved Sodium		2,3,4,6	<0.0197	mg/L	1

Duplicates

Duplicates (1) Duplicated Sample: 406966

QC Batch: 125907 Date Analyzed: 2015-10-27 Analyzed By: LQ
Prep Batch: 106519 QC Preparation: 2015-10-27 Prepared By: LQ

Param		Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
pH	1,2,4,6	6.95	6.79	s.u.	1	2	20

Duplicates (1) Duplicated Sample: 407191

QC Batch: 126012 Date Analyzed: 2015-10-29 Analyzed By: LQ
Prep Batch: 106564 QC Preparation: 2015-10-29 Prepared By: LQ

Param		Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids	1,2,3,4,6	3320	3180	mg/L	50	4	10

Duplicates (1) Duplicated Sample: 407096

QC Batch: 126018 Date Analyzed: 2015-11-02 Analyzed By: CF
Prep Batch: 106620 QC Preparation: 2015-11-02 Prepared By: CF

Param		Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Density		1.19	1.18	g/ml	1	1	20

Duplicates (1) Duplicated Sample: 407287

QC Batch: 126079 Date Analyzed: 2015-11-03 Analyzed By: LQ
Prep Batch: 106671 QC Preparation: 2015-11-03 Prepared By: LQ

Report Date: November 12, 2015
BW-4 & BW-22

Work Order: 15102712
Brine Well 3rd QT. Sample

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Param		Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids	1,2,3,4,6	1190	1180	mg/L	20	1	10

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride		1,2,3,4,6	24.7	mg/L	1	25.0	<0.323	99	90 - 110

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride		1,2,3,4,6	24.9	mg/L	1	25.0	<0.323	100	90 - 110	1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 126288
 Prep Batch: 106726

Date Analyzed: 2015-11-12
 QC Preparation: 2015-11-06

Analyzed By: RR
 Prepared By: PM

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Sodium		2,3,4,6	53.0	mg/L	1	52.5	<0.0197	101	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Sodium		2,3,4,6	53.2	mg/L	1	52.5	<0.0197	101	85 - 115	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

Matrix Spike (MS-1) Spiked Sample: 407240

QC Batch: 126115 Date Analyzed: 2015-11-04 Analyzed By: RL
 Prep Batch: 106703 QC Preparation: 2015-11-04 Prepared By: RL

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride		1,2,3,4,6	153	mg/L	5	125	26.2	101	80 - 120

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride		1,2,3,4,6	153	mg/L	5	125	26.2	101	80 - 120	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 407349

QC Batch: 126288 Date Analyzed: 2015-11-12 Analyzed By: RR
 Prep Batch: 106726 QC Preparation: 2015-11-06 Prepared By: PM

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Sodium		2,3,4,6	874	mg/L	1	525	377	95	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Sodium		2,3,4,6	852	mg/L	1	525	377	90	75 - 125	2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Report Date: November 12, 2015
BW-4 & BW-22

Work Order: 15102712
Brine Well 3rd QT. Sample

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Buckeye & Tatum NM

Standard (CCV-1)

QC Batch: 126288

Date Analyzed: 2015-11-12

Analyzed By: RR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Sodium		2,3,4,6	mg/L	27.5	27.8	101	90 - 110	2015-11-12

Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

C	Certifying Authority	Certification Number	Laboratory Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	L-A-B	L2418	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	LELAP	LELAP-02003	Lubbock
4	NELAP	T104704219-15-11	Lubbock
5	NELAP	T104704392-14-8	Midland
6		2015-066	Lubbock

Standard Flags

F	Description
B	Analyte detected in the corresponding method blank above the method detection limit
H	Analyzed out of hold time
J	Estimated concentration
Jb	The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less than ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
Je	Estimated concentration exceeding calibration range.
MI1	Split peak or shoulder peak
MI2	Instrument software did not integrate
MI3	Instrument software misidentified the peak
MI4	Instrument software integrated improperly
MI5	Baseline correction
Qc	Calibration check outside of laboratory limits.
Qr	RPD outside of laboratory limits
Qs	Spike recovery outside of laboratory limits.

F Description

Qsr Surrogate recovery outside of laboratory limits.

U The analyte is not detected above the SDL

Attachments

The scanned attachments will follow this page.
Please note, each attachment may consist of more than one page.

TraceAnalysis, Inc.
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 Carrollton, Texas 75006
 Tel (972) 242-7750
 Fax (575) 392-7561
 Brandon & Clark
 3403 Industrial Blvd.
 Hobbs, NM 88240
 Tel (575) 392-7561
 Fax (575) 392-4508

Company Name: **WASSERHUND c/o GANPY CORP** Phone #: **575-398-9860**
 Address: **PO 2140 LOUINGTON NM 88260** Fax #:
 Contact Person: **WAYNE PRICE - PRICE LLC 505-715-2809** E-mail: **WAYNE PRICE@EARTHLINK.NET**
 Invoice to: **BRINE WELL 3 RGT SAMPLE**
 Project #: **BW-4 + BW-22** Project Name:
 Project Location (including state): **BUCKEYE + TATUM NM** Sampler Signature:

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume / Amount	MATRIX			PRESERVATIVE METHOD					SAMPLING		Turn Around Time if different from standard	
				WATER	AIR	SLUDGE	HCl	HNO ₃	H ₂ SO ₄	NaOH	ICE	NONE	DATE		TIME
097013	BW-22 TATUM	1	1000 mL	X						X			10-23-15	1:15A	Hold
0944	" - BRINE	1	"	X						X			"	1:30P	Hold
0945	BW-4 BUCKEYE	1	"	X						X			"	5:55P	Hold
095096	BUCKEYE - FRESH	1	"	X						X			"	6:00P	Hold
0946	" - BRINE	1	"	X						X			"		Hold

ANALYSIS REQUEST
 (Circle or Specify Method No.)

MTBE 8021 / 602 / 8260 / 624	TPH 418.1 / TX1005 / TX1005 EX(C35)	TPH 8015 GRO / DRO / TVHC	PAH 8270 / 625	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260 / 624	GC/MS Semi. Vol. 8270 / 625	PCBs 8082 / 608	Pesticides 8081 / 608	BOD, TSS, pH	Moisture Content	Cl, F, SO ₄ , NO ₃ -N, NO ₂ -N, PO ₄ -P, Alkalinity	(Na) Ca, Mg, K, TDS, EC	CHLORIDE	DENSITY	PH	TDS
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LAB USE ONLY

INST ⁰⁴ Time: INST ⁰⁴ Time: INST ⁰⁴ Time:
 OBS ⁰⁴ Time: OBS ⁰⁴ Time: OBS ⁰⁴ Time:
 COR ⁰⁴ Time: COR ⁰⁴ Time: COR ⁰⁴ Time:

Received by: **GLS BTC** Date: **10-26-15** Company: **GLS BTC**
 Received by: _____ Date: _____ Company: _____

Received by: **GLS BTC** Date: **10-26-15** Company: **GLS BTC**
 Received by: _____ Date: _____ Company: _____

Received by: **GLS BTC** Date: **10-26-15** Company: **GLS BTC**
 Received by: _____ Date: _____ Company: _____

Impact: Y / N
 Headspace: Y / N / NA
 Log-in-Review:

Dry Weight Basis Required
 TRRP Report Required
 Check if Special Reporting Limits Are Needed

Carrier # **SZS853803**

Summary Report

(Corrected Report)

Lester Waynce Price Jr.
Price LLC
312 Encantado Ridge Ct. NE
Rio Rancho, NM 87124

Report Date: March 24, 2016

Work Order: 16022210



Project Location: Buckeye New Mexico
Project Name: Brine Well

Report Corrections (Work Order 16022210)

- 3/24/16: Added Chloride, pH, TDS and Density to sample 414779.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
414778	Fresh Water	water	2016-02-17	14:25	2016-02-18
414779	Brine Water	water	2016-02-17	14:30	2016-02-18

Sample: 414778 - Fresh Water

Param	Flag	Result	Units	RL
Chloride		1820	mg/L	2.5
Density		0.980	g/ml	
pH		7.81	s.u.	2
Total Dissolved Solids		3240	mg/L	2.5

Sample: 414779 - Brine Water

Param	Flag	Result	Units	RL
Chloride	H	149000	mg/L	2.5
Density	1	1.16	g/ml	
Dissolved Sodium		106000	mg/L	1
pH		6.91	s.u.	2

continued ...

¹Analyzed out of hold time.

sample 414779 continued ...

Param	Flag	Result	Units	RL
Total Dissolved Solids		263000	mg/L	2.5



6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800-378-1296 806-794-1296 FAX 806-794-1298
 200 East Sunset Road, Suite E El Paso, Texas 79922 915-585-3443 FAX 915-585-4944
 5002 Basin Street, Suite A1 Midland, Texas 79703 432-689-6301 FAX 432-689-6313
 (BioAquatic) 2501 Mayes Rd., Suite 100 Carrollton, Texas 75006 972-242-7750
 E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

(Corrected Report)

Lester Wayne Price Jr.
 Price LLC
 312 Encantado Ridge Ct. NE
 Rio Rancho, NM, 87124

Report Date: March 24, 2016

Work Order: 16022210



Project Location: Buckeye New Mexico
 Project Name: Brine Well
 Project Number: Brine Well

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
414778	Fresh Water	water	2016-02-17	14:25	2016-02-18
414779	Brine Water	water	2016-02-17	14:30	2016-02-18

Report Corrections (Work Order 16022210)

- 3/24/16: Added Chloride, pH, TDS and Density to sample 414779.

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TraceAnalysis, Inc. uses the attached chain of custody (COC) as the laboratory check-in documentation which includes sample receipt, temperature, sample preservation method and condition, collection date and time, testing requested, company, sampler, contacts and any special remarks.

This report consists of a total of 20 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Blair Leftwich

Dr. Blair Leftwich, Director
James Taylor, Assistant Director
Johnny Grindstaff, Operations Manager

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Case Narrative

Samples for project Brine Well were received by TraceAnalysis, Inc. on 2016-02-18 and assigned to work order 16022210. Samples for work order 16022210 were received intact at a temperature of -0.1 C.

Samples were analyzed for the following tests using their respective methods.

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
Chloride (IC)	E 300.0	108743	2016-02-23 at 10:00	128419	2016-02-23 at 10:08
Chloride (IC)	E 300.0	109290	2016-03-23 at 14:00	129049	2016-03-23 at 15:09
Density	ASTM D854-92	108721	2016-02-23 at 13:10	128394	2016-02-23 at 13:15
Density	ASTM D854-92	109263	2016-03-23 at 11:10	129013	2016-03-23 at 11:15
Na, Dissolved	S 6010C	108686	2016-02-22 at 12:23	128362	2016-02-22 at 15:23
pH	SM 4500-H+	108694	2016-02-22 at 15:00	128366	2016-02-22 at 15:00
pH	SM 4500-H+	109282	2016-03-23 at 12:30	129028	2016-03-23 at 12:30
TDS	SM 2540C	108734	2016-02-23 at 15:30	128463	2016-02-23 at 15:30
TDS	SM 2540C	109281	2016-03-23 at 16:30	129044	2016-03-23 at 16:30

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 16022210 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Analytical Report

Sample: 414778 - Fresh Water

Laboratory: Lubbock
Analysis: Chloride (IC) Analytical Method: E 300.0 Prep Method: N/A
QC Batch: 128419 Date Analyzed: 2016-02-23 Analyzed By: RL
Prep Batch: 108743 Sample Preparation: Prepared By: RL

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride		1,2,3,4,5	1820	mg/L	100	2.50

Sample: 414778 - Fresh Water

Laboratory: Lubbock
Analysis: Density Analytical Method: ASTM D854-92 Prep Method: N/A
QC Batch: 128394 Date Analyzed: 2016-02-23 Analyzed By: CF
Prep Batch: 108721 Sample Preparation: Prepared By: CF

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Density			0.980	g/ml	1	0.00

Sample: 414778 - Fresh Water

Laboratory: Lubbock
Analysis: pH Analytical Method: SM 4500-H+ Prep Method: N/A
QC Batch: 128366 Date Analyzed: 2016-02-22 Analyzed By: LQ
Prep Batch: 108694 Sample Preparation: Prepared By: LQ

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
pH		1,2,4,5	7.81	s.u.	1	2.00

Sample: 414778 - Fresh Water

Laboratory: Lubbock
Analysis: TDS Analytical Method: SM 2540C Prep Method: N/A
QC Batch: 128463 Date Analyzed: 2016-02-23 Analyzed By: LQ
Prep Batch: 108734 Sample Preparation: Prepared By: LQ

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Dissolved Solids		1,2,3,4,5	3240	mg/L	50	2.50

Sample: 414779 - Brine Water

Laboratory: Lubbock
Analysis: Chloride (IC) Analytical Method: E 300.0 Prep Method: N/A
QC Batch: 129049 Date Analyzed: 2016-03-23 Analyzed By: RL
Prep Batch: 109290 Sample Preparation: 2016-03-23 Prepared By: RL

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	H	1,2,3,4,5	149000	mg/L	5000	2.50

Sample: 414779 - Brine Water

Laboratory: Lubbock
Analysis: Density Analytical Method: ASTM D854-92 Prep Method: N/A
QC Batch: 129013 Date Analyzed: 2016-03-23 Analyzed By: CF
Prep Batch: 109263 Sample Preparation: Prepared By: CF

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Density		1	1.16	g/ml	1	0.00

Sample: 414779 - Brine Water

Laboratory: Lubbock
Analysis: Na, Dissolved Analytical Method: S 6010C Prep Method: S 3005A
QC Batch: 128362 Date Analyzed: 2016-02-22 Analyzed By: RR
Prep Batch: 108686 Sample Preparation: 2016-02-22 Prepared By: RR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Dissolved Sodium		2,3,4,5	106000	mg/L	1000	1.00

Report Date: March 24, 2016
Brine Well

Work Order: 16022210
Brine Well

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Buckeye New Mexico

Sample: 414779 - Brine Water

Laboratory: Lubbock
Analysis: pH Analytical Method: SM 4500-H+ Prep Method: N/A
QC Batch: 129028 Date Analyzed: 2016-03-23 Analyzed By: LQ
Prep Batch: 109282 Sample Preparation: 2016-03-23 Prepared By: LQ

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
pH		1,2,4,5	6.91	s.u.	1	2.00

Sample: 414779 - Brine Water

Laboratory: Lubbock
Analysis: TDS Analytical Method: SM 2540C Prep Method: N/A
QC Batch: 129044 Date Analyzed: 2016-03-23 Analyzed By: LQ
Prep Batch: 109281 Sample Preparation: 2016-03-23 Prepared By: LQ

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Dissolved Solids		1,2,3,4,5	263000	mg/L	2000	2.50

Method Blanks

Method Blank (1) QC Batch: 128362

QC Batch: 128362 Date Analyzed: 2016-02-22 Analyzed By: RR
Prep Batch: 108686 QC Preparation: 2016-02-22 Prepared By: PM

Parameter	Flag	Cert	MDL Result	Units	RL
Dissolved Sodium		2,3,4,5	<0.0197	mg/L	1

Method Blank (1) QC Batch: 128394

QC Batch: 128394 Date Analyzed: 2016-02-23 Analyzed By: CF
Prep Batch: 108721 QC Preparation: 2016-02-23 Prepared By: CF

Parameter	Flag	Cert	MDL Result	Units	RL
Density			0.988	g/ml	

Method Blank (1) QC Batch: 128419

QC Batch: 128419 Date Analyzed: 2016-02-23 Analyzed By: RL
Prep Batch: 108743 QC Preparation: 2016-02-23 Prepared By: RL

Parameter	Flag	Cert	MDL Result	Units	RL
Chloride		1,2,3,4,5	<0.323	mg/L	2.5

Method Blank (1) QC Batch: 128463

QC Batch: 128463 Date Analyzed: 2016-02-23 Analyzed By: LQ
Prep Batch: 108734 QC Preparation: 2016-02-23 Prepared By: LQ

Report Date: March 24, 2016
Brine Well

Work Order: 16022210
Brine Well

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Buckeye New Mexico

Parameter	Flag	Cert	MDL Result	Units	RL
Total Dissolved Solids		1,2,3,4,5	<25.0	mg/L	2.5

Method Blank (1) QC Batch: 129013

QC Batch: 129013 Date Analyzed: 2016-03-23 Analyzed By: CF
Prep Batch: 109263 QC Preparation: 2016-03-23 Prepared By: CF

Parameter	Flag	Cert	MDL Result	Units	RL
Density			0.979	g/ml	

Method Blank (1) QC Batch: 129044

QC Batch: 129044 Date Analyzed: 2016-03-23 Analyzed By: LQ
Prep Batch: 109281 QC Preparation: 2016-03-23 Prepared By: LQ

Parameter	Flag	Cert	MDL Result	Units	RL
Total Dissolved Solids		1,2,3,4,5	<25.0	mg/L	2.5

Method Blank (1) QC Batch: 129049

QC Batch: 129049 Date Analyzed: 2016-03-23 Analyzed By: RL
Prep Batch: 109290 QC Preparation: 2016-03-23 Prepared By: RL

Parameter	Flag	Cert	MDL Result	Units	RL
Chloride		1,2,3,4,5	<0.323	mg/L	2.5

Duplicates

Duplicates (1) Duplicated Sample: 414780

QC Batch: 128366 Date Analyzed: 2016-02-22 Analyzed By: LQ
Prep Batch: 108694 QC Preparation: 2016-02-22 Prepared By: LQ

Param		Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
pH	1,2,4,5	7.91	7.93	s.u.	1	0	20

Duplicates (1) Duplicated Sample: 414780

QC Batch: 128394 Date Analyzed: 2016-02-23 Analyzed By: CF
Prep Batch: 108721 QC Preparation: 2016-02-23 Prepared By: CF

Param		Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Density		0.968	0.985	g/ml	1	2	20

Duplicates (1) Duplicated Sample: 414786

QC Batch: 128463 Date Analyzed: 2016-02-23 Analyzed By: LQ
Prep Batch: 108734 QC Preparation: 2016-02-23 Prepared By: LQ

Param		Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids	1,2,3,4,5	1090	1120	mg/L	20	3	10

Duplicates (1) Duplicated Sample: 414781

QC Batch: 129013 Date Analyzed: 2016-03-23 Analyzed By: CF
Prep Batch: 109263 QC Preparation: 2016-03-23 Prepared By: CF

Report Date: March 24, 2016
Brine Well

Work Order: 16022210
Brine Well

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Buckeye New Mexico

Param		Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Density	2	0.978	0.996	g/ml	1	2	20

Duplicates (1) Duplicated Sample: 416191

QC Batch: 129028
Prep Batch: 109282

Date Analyzed: 2016-03-23
QC Preparation: 2016-03-23

Analyzed By: LQ
Prepared By: LQ

Param		Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
pH	1,2,4,5	7.18	7.18	s.u.	1	4	20

Duplicates (1) Duplicated Sample: 416188

QC Batch: 129044
Prep Batch: 109281

Date Analyzed: 2016-03-23
QC Preparation: 2016-03-23

Analyzed By: LQ
Prepared By: LQ

Param		Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids	1,2,3,4,5	4630	4670	mg/L	50	1	10

Report Date: March 24, 2016
 Brine Well

Work Order: 16022210
 Brine Well

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 Buckeye New Mexico

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Dissolved Solids		1,2,3,4,5	1010	mg/L	10	1000	<25.0	101	90 - 110

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec. Limit	RPD	RPD Limit
Total Dissolved Solids		1,2,3,4,5	1010	mg/L	10	1000	<25.0	101	90 - 110	0

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 129044
 Prep Batch: 109281

Date Analyzed: 2016-03-23
 QC Preparation: 2016-03-23

Analyzed By: LQ
 Prepared By: LQ

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Dissolved Solids		1,2,3,4,5	995	mg/L	10	1000	<25.0	100	90 - 110

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec. Limit	RPD	RPD Limit
Total Dissolved Solids		1,2,3,4,5	1020	mg/L	10	1000	<25.0	102	90 - 110	2

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 129049
 Prep Batch: 109290

Date Analyzed: 2016-03-23
 QC Preparation: 2016-03-23

Analyzed By: RL
 Prepared By: RL

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride		1,2,3,4,5	24.3	mg/L	1	25.0	<0.323	97	90 - 110

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec. Limit	RPD	RPD Limit
Chloride		1,2,3,4,5	24.2	mg/L	1	25.0	<0.323	97	90 - 110	0

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Report Date: March 24, 2016
Brine Well

Work Order: 16022210
Brine Well

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Buckeye New Mexico

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride		1,2,3,4,5	3570	mg/L	100	2500	1100	99	80 - 120

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride		1,2,3,4,5	3540	mg/L	100	2500	1100	98	80 - 120	1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Standard (CCV-2)

QC Batch: 128419

Date Analyzed: 2016-02-23

Analyzed By: RL

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		1,2,3,4,5	mg/L	25.0	25.9	104	90 - 110	2016-02-23

Standard (CCV-1)

QC Batch: 129028

Date Analyzed: 2016-03-23

Analyzed By: LQ

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
pH		1,2,4,5	s.u.	7.00	7.03	100	98.6 - 101.4	2016-03-23

Standard (CCV-1)

QC Batch: 129049

Date Analyzed: 2016-03-23

Analyzed By: RL

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		1,2,3,4,5	mg/L	25.0	24.4	98	90 - 110	2016-03-23

Standard (CCV-2)

QC Batch: 129049

Date Analyzed: 2016-03-23

Analyzed By: RL

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		1,2,3,4,5	mg/L	25.0	24.4	98	90 - 110	2016-03-23

Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

C	Certifying Authority	Certification Number	Laboratory Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	L-A-B	L2418	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	LELAP	LELAP-02003	Lubbock
4	NELAP	T104704219-15-11	Lubbock
5		2015-066	Lubbock

Standard Flags

F	Description
B	Analyte detected in the corresponding method blank above the method detection limit
H	Analyzed out of hold time
J	Estimated concentration
Jb	The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less than ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
Je	Estimated concentration exceeding calibration range.
MI1	Split peak or shoulder peak
MI2	Instrument software did not integrate
MI3	Instrument software misidentified the peak
MI4	Instrument software integrated improperly
MI5	Baseline correction
Qc	Calibration check outside of laboratory limits.
Qr	RPD outside of laboratory limits
Qs	Spike recovery outside of laboratory limits.
Qsr	Surrogate recovery outside of laboratory limits.

F Description

U The analyte is not detected above the SDL

Result Comments

- 1 Analyzed out of hold time.
- 2 Analyzed out of hold time.

Attachments

The scanned attachments will follow this page.
Please note, each attachment may consist of more than one page.

LAB Order ID # 16022210

TraceAnalysis, Inc.

email: lab@traceanalysis.com

6701 Aberdeen Avenue, Suite 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

5002 Basin Street, Suite A1
Midland, Texas 79703
Tel (432) 689-6301
Fax (432) 689-6313

200 East Sunset Rd., Suite E
El Paso, Texas 79922
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

BioAquatic Testing
2501 Mayes Rd., Ste 100
Carrollton, Texas 75006
Tel (972) 242-7750
Fax (972) 242-7750

Branch:
3403 Industrial
Hobbs, NM 88240
Tel (575) 392-7500
Fax (575) 392-4500

Company Name: PRICE LLC Phone #: 832 657 4873

Address: (Street, City, Zip) 310 ENCANTADO RIDGE CT NE 87104 FAX #: 505 892 6643

Contact Person: LESTER WAYNE PRICE JR E-mail: wprice@3shotmail.com

Invoice to: (If different from above) NA

Project #: NA Project Name: BRINE WELL

Project Location (including state): BOCKEYE NM Sampler Signature: LWPak

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume / Amount	MATRIX			PRESERVATIVE METHOD						SAMPLING		
				WATER	SOIL	AIR	SLUDGE	HCl	HNO ₃	H ₂ SO ₄	NaOH	ICE	NONE	DATE	TIME
44778	FRESH WATER	1	1 PLASTIC	X										2/17/16	2:30PM
779	BRINE WATER	1	1 PLASTIC	X										2/17/16	2:30PM

Relinquished by: Lester Wayne Price, Jr Company: PRICE LLC Date: 2/17/16 12:30 PM INST 177 OBS 177 COR 177

Received by: Murrell Company: TA 2-20-16 10:00 INST 177 OBS 177 COR 177

Relinquished by: Company: Date: Time: INST OBS COR

ANALYSIS REQUEST (Circle or Specify Method No.)

MTBE 8021 / 602 / 8260 / 624	BTEX 8021 / 602 / 8260 / 624	TPH 418.1 / TX1005 / TX1005 Ext(C35)	TPH 8015 GRO / DRO / TVHC	PAH 8270 / 625	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260 / 624	GC/MS Semi. Vol. 8270 / 625	PCB's 8082 / 608	Pesticides 8081 / 608	BOD, TSS, pH	Moisture Content	Cl, F, SO ₄ , NO ₃ -N, NO ₂ -N, PO ₄ -P, Alkalinity	Na, Ca, Mg, K, TDS, EC	X Chloride, Density, Pl, TDS	X Dissolved Sodium	Turn Around Time if different from standard	Hold
------------------------------	------------------------------	--------------------------------------	---------------------------	----------------	---	-------------------------------------	----------------	---------------------	-----------------	-----	-----------------------	-----------------------------	------------------	-----------------------	--------------	------------------	---	------------------------	---	-------------------------------	---	------

REMARKS: COC # 1

LAB USE ONLY

Inject Y/N Y N

Headspace Y/N/A Y N NA

Log-in-Review

Dry Weight Basis Required

TRRP Report Required

Check If Special Reporting Limits Are Needed

REPORT # 16022210

INV. & COC # 1

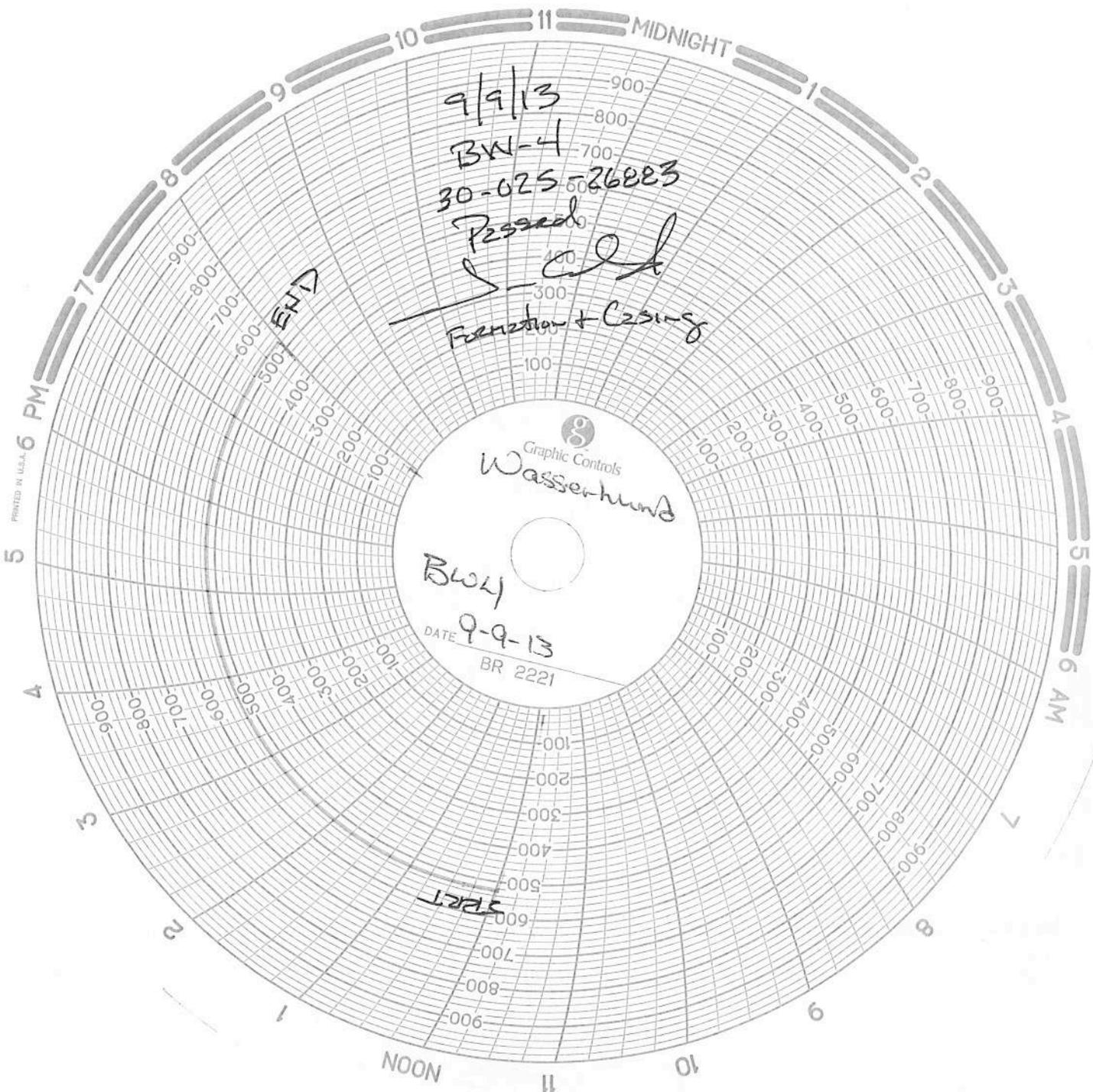
FAX: 2-25-16 AM

2-25-16 AM

Appendix “D”

- 2013 MIT Chart

PRINTED IN U.S.A.



9/9/13
 BW-4
 30-025-26223

Passed
[Signature]
 Friction + Casing

Graphic Controls
 Wasserhund

BW4
 DATE 9-9-13
 BR 2221

START

END

D & L Meters & Instrument Service, Inc.

Lovington, NM 88260
P.O. Box 1621
Office: (575) 396-3715
Fax: (575) 396-5812



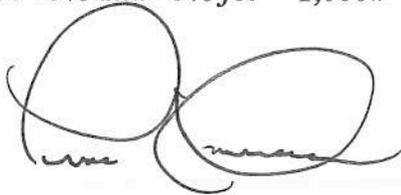
Friday, September 06, 2013

Invoice # 100177

Certification of Pressure Recorder Test:

Company: Gandy
Unit: 2
Model: 8" Chartrecorder
Pressure Rating: 1,000#
Serial #:

This Pressure Recorder was tested at midrange for accuracy and verified within +5% and -5% for 1,000# pressure element.



Issac Luna

Appendix “E”

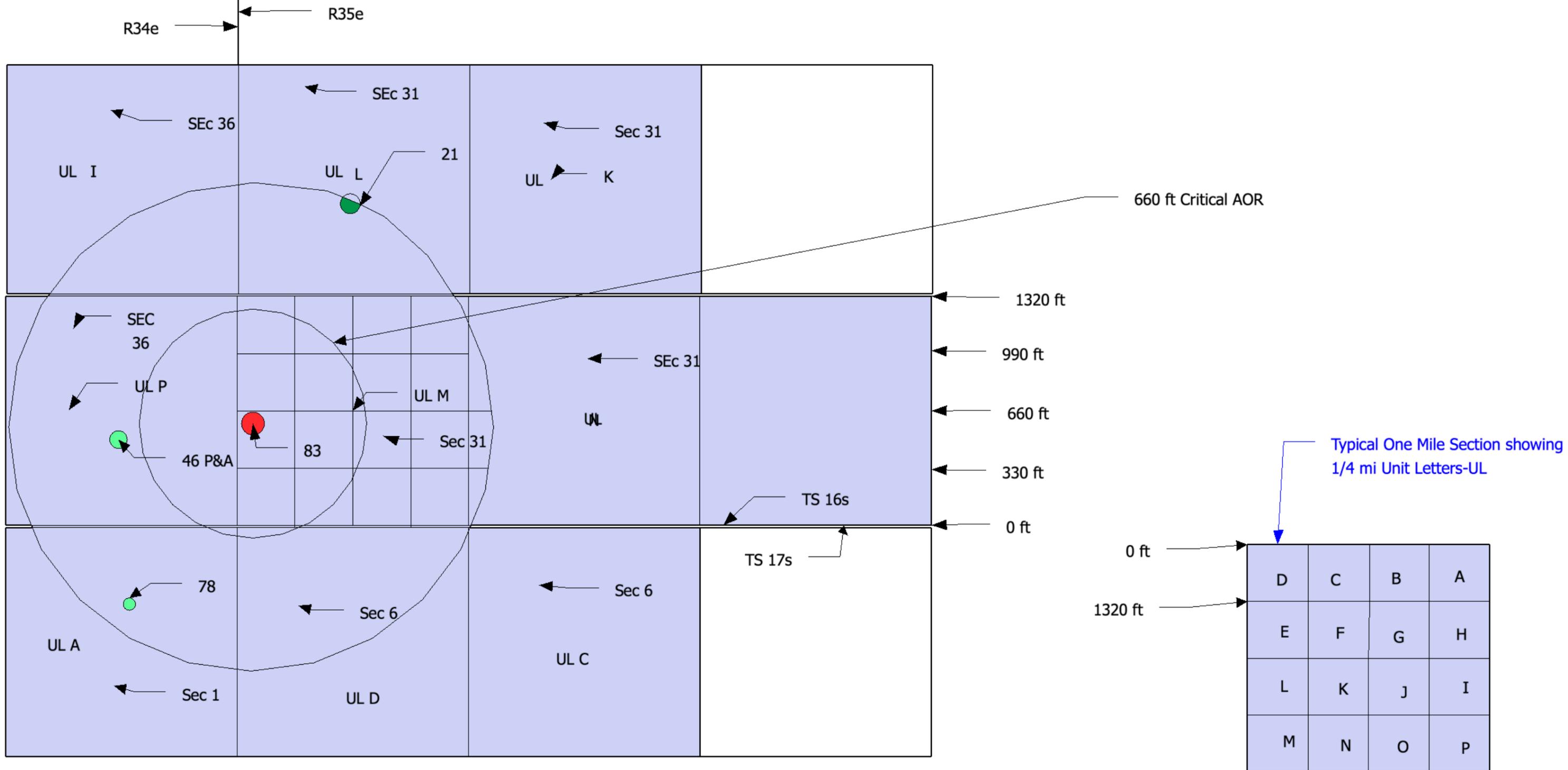
- AOR Well Status List
- AOR Plot Plan

2015 BW-04 AOR Review- Well Status List
 up-dated Apr 03, 2016

API#	Well Name	UL	Sector	Ts	Rg	Footage	Within 1/4 mi AOR * within 660 ft or Critical AOR	Casing Program Checked	Cased/Cemented across salt section	Corrective Action Required	
0	30-025-26883	Wasserhund Eidson #1	M	31	16s	35e	567 FSL & 162 FWL	NA	NA	NA	NA
1	30-025-25146	LimeRock-N Vacumm ABO #1	P	36	16s	34e	460 FSL & 660 FEL	yes*	yes	yes	NO-P&A
1	30-025-35678	LimeRock St.VII #7	A	1	17s	34e	660 FNL & 660 FEL	yes*	yes	no	Re-Completion OCD Approved No Action Required
1	30-025-31621	BTA Oil Producers	L	31	16s	35e	1980 FSL & 660 FWL	Yes*	yes	yes	no

3 Total # of wells in adjacent quarter-sections
 3 Total # of wells in 1/4 mile AOR
 3 Total # of wells that are within 660 ft or have become within the Critical AOR of the outside radius of the brine well and casing program will be checked Annually.

Notes:
 * Means the well is within 660 ft or Critical AOR (1500-1600 ft) of the outside radius of the brine well and casing program will be checked annually.



Brine Well Area of Review (AOR) UL Plot Plan	Well API#: 30-025-26883	Note: Wells are identified by the last 2 digits of the well's API#. API #'s are listed in the well status list.
Operator Name: Wasserhund INC	Permit # BW-04	
AOR Year: 2015	Location: UL M-Sec 31-Ts16s-R35e	

Submit 1 Copy To Appropriate District Office
 District I - (575) 393-6161
 1625 N. French Dr., Hobbs, NM 88240
 District II - (575) 748-1283
 811 S. First St., Artesia, NM 88210
 District III - (505) 334-6178
 1000 Rio Brazos Rd., Aztec, NM 87410
 District IV - (505) 476-3460
 1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
 Energy, Minerals and Natural Resources

Form C-103
 Revised July 18, 2013

OIL CONSERVATION DIVISION
 1220 South St. Francis Dr.
 Santa Fe, NM 87505

WELL API NO. 30-025-35678
5. Indicate Type of Lease STATE <input checked="" type="checkbox"/> FEE <input type="checkbox"/>
6. State Oil & Gas Lease No. 28798
7. Lease Name or Unit Agreement Name North Vacuum Abo North Unit (form. State VII, 7)
8. Well Number 62
9. OGRID Number
10. Pool name or Wildcat North Vacuum (Abo) (61760)
11. Elevation (Show whether DR, RKB, RT, GR, etc.) 4051' KB 4033' GL

SUNDRY NOTICES AND REPORTS ON WELLS
 (DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

1. Type of Well: Oil Well Gas Well Other **HOBBS OCD**

2. Name of Operator
Lime Rock Resources II-A, LP **MAR 18 2016**

3. Address of Operator
1111 Bagby St., Ste. 4600; Houston, TX 77002 **RECEIVED**

4. Well Location
 Unit Letter A : 660 feet from the N line and 660 feet from the E line
 Section 1 Township 17S Range 34E NMPM County Lea

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK <input type="checkbox"/>	PLUG AND ABANDON <input type="checkbox"/>	REMEDIAL WORK <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
TEMPORARILY ABANDON <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	COMMENCE DRILLING OPNS. <input type="checkbox"/>	P AND A <input type="checkbox"/>
PULL OR ALTER CASING <input type="checkbox"/>	MULTIPLE COMPL <input type="checkbox"/>	CASING/CEMENT JOB <input type="checkbox"/>	
DOWNHOLE COMMINGLE <input type="checkbox"/>			
CLOSED-LOOP SYSTEM <input type="checkbox"/>			
OTHER: Recompletion <input checked="" type="checkbox"/>		OTHER: <input type="checkbox"/>	

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 19.15.7.14 NMAC. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

Our plan is to recomplete the well, into the North Vacuum (Abo) formation, utilizing the following procedure:

- 1) Dump bail 35' cmt on pkr @ 12406'
- 2) Set CIBP @ +12000'
- 3) Spot 20' cmt on top of CIBP
- 4) Shoot sqz perfs @ 9600' & sqz across Abo formation up to +/-8700'
- 5) Perforate Abo formation from +8820'-8950'
- 6) Return well to production

Spud Date:

Rig Release Date:

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Carla Martin TITLE Carla Martin/Regulatory Tech DATE 3/17/16

Type or print name _____ E-mail address: _____ PHONE: _____

For State Use Only

APPROVED BY: [Signature] TITLE Petroleum Engineer DATE 03/22/16

Conditions of Approval (if any):

MAR 22 2016

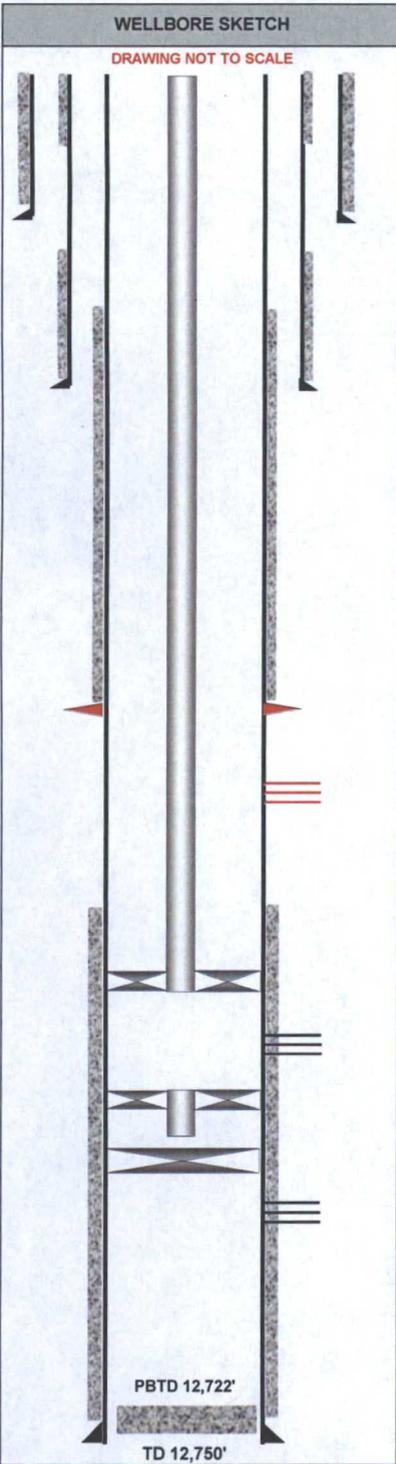
OPERATOR: LRR II-A, LP	LEASE / WELL: State VII, 7 (became NVANU 62)	SURVEY: Sec 1, T17S, R34E	Property No.
COMPLETION RIG:	COUNTY / STATE: Lea County, NM	SURFACE LOCATION: 660' FNL & 660' FEL	FIELD: North Vacuum

DIRECTIONAL DATA		
KOP:	STRAIGHT HOLE	
MAX DEV:	deg @	MD
DEV @ PERFS:	deg @	MD
DEV @ PERFS:	deg @	MD
DEV @ PERFS:	deg @	MD

TUBULAR DATA							
Tubulars	Size	Weight	Grade	Thread	Top	MD	SKS
DRIVE PIPE							
CONDUCTOR	20"				0'	92'	
SURFACE	11-3/4"	42#	H-40	STC	0'	1610'	790
INTERMEDIATE	8-5/8"	32#	K-55	LTC	0'	5020'	1,190
PRODUCTION	4-1/2"	11.6#	P-110	LTC	0'	12,732'	1,380
PROD TIEBACK							
PROD LINER							
PROD LINER							
TUBING	2-3/8"	4.7#	N-80	8rd	0'	12400'	
COILED TUBING							

WELLHEAD DATA	
TYPE	
WP	
T	FLANGE:
R	
E	
E	THREAD:
TUBING HANGER:	
BTM FLANGE:	
BPV PROFILE:	
ELEVATIONS:	GROUND ELEVATION
RKB-DF:	4033'
RKB-ELEV:	

DRILLING / COMPLETION FLUID	
DRILLING FLUID:	ppg -
DRILLING FLUID:	ppg -
DRILLING FLUID:	ppg -
COMPLETION FLUID:	ppg -
PACKER FLUID:	ppg -



EQUIPMENT DESCRIPTION	ID	OD	DEPTH TVD	DEPTH MD
TA'd Well				
<i>hole in 8-5/8" csg @ 700' - pumped 300 sxs down 4-1/2" x 8-5/8" annulus , circ to surface</i>				
11-3/4" surface csg @ 1610' - cmt'd w/790 sxs to surface				
TOC @ 1740' (TS)				
TOC @ 2000'				
8-5/8" intermediate csg @ 5020' - cmt'd w/1190 sxs				
Tubing Detail (Sept-02):				
386 jts 2-3/8" 4.7# N-80 8rd tubing				
PX plug				
4-1/2" AS1-X retrievable packer @ 12,185' w/1.875" profile nipple w/ PX plug				
6' 2-3/8" sub				
1.875" SN				
4' 2-3/8" sub				
<i>DV tool @ 8498'</i>				
<i>Proposed perfs ~8820'-8950'</i>				
TOC @ 11,475'				
Atoka perfs @ 12,280'-98'				
Permanent packer @ 12,406' w/1 jt 2-3/8" tubing, & 4' sub				
CIBP @ 12,469'				
Morrow perfs @ 12,551'-57', 12,604'-08', 12,612'-18', & 12,621'-27' (6 spf)				
<i>20 bbis 15% HCl, 10 bbis Morrow blend 10% HCl, 70/30 Methanol, 3600 gal</i>				
<i>50Q CO2 Morrow blend</i>				
4-1/2" production csg @ 12,732' - cmt'd w/1380 sxs				
COMMENTS:	Working Interest:	PLUG BACK DEPTH:		
API # 30-025-35678	Net Revenue Interest:	TOTAL WELL DEPTH:		
Property#		PREPARED OR	DATE:	
Spud Date:		REVISED BY:	9/2/2015	
Completed in		cml		

CURRENT

DIRECTIONS TO LOCATION: Directions to well needed.

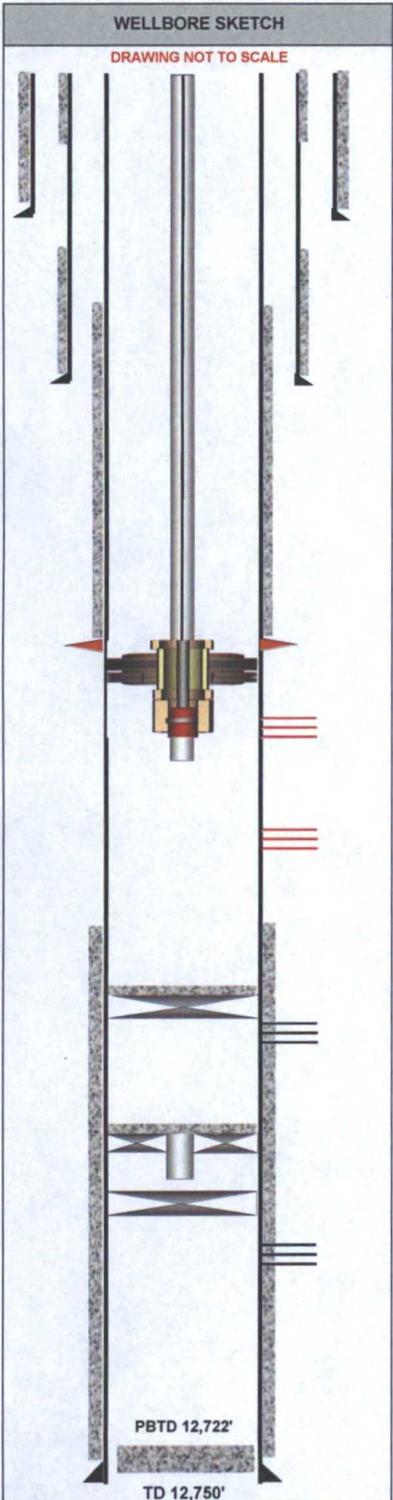
OPERATOR: LRR II-A, LP	LEASE / WELL: NVANU 62 (was State VII, 7)	SURVEY: Sec 1, T17S, R34E	Property No.
COMPLETION RIG:	COUNTY / STATE: Lea County, NM	SURFACE LOCATION: 660' FNL & 660' FEL	FIELD: North Vacuum

DIRECTIONAL DATA		
KOP:	STRAIGHT HOLE	
MAX DEV:	deg @	MD
DEV @ PERFS:	deg @	MD
DEV @ PERFS:	deg @	MD
DEV @ PERFS:	deg @	MD

DRILLING / COMPLETION FLUID	
DRILLING FLUID:	ppg -
DRILLING FLUID:	ppg -
DRILLING FLUID:	ppg -
COMPLETION FLUID:	ppg -
PACKER FLUID:	ppg -

TUBULAR DATA							
Tubulars	Size	Weight	Grade	Thread	Top	MD	SKS
DRIVE PIPE							
CONDUCTOR	20"				0'	92'	
SURFACE	11-3/4"	42#	H-40	STC	0'	1610'	790
INTERMEDIATE	8-5/8"	32#	K-55	LTC	0'	5020'	1,190
PRODUCTION	4-1/2"	11.6#	P-110	LTC	0'	12,732'	1,380
PROD TIEBACK							
PROD LINER							
PROD LINER							
TUBING	2-3/8"	4.7#	N-80	8rd	0'	12400'	
COILED TUBING							

WELLHEAD DATA	
TYPE	
WP	
T R C A P E	FLANGE:
	THREAD:
TUBING HANGER:	
BTM FLANGE:	
BPV PROFILE:	
ELEVATIONS:	
RKB-DF:	
RKB-ELEV:	GROUND ELEVATION 4033'



EQUIPMENT DESCRIPTION	ID	OD	DEPTH TVD	DEPTH MD
PROPOSED WELL				
<i>hole in 8-5/8" csg @ 700' - pumped 300 sxs down 4-1/2" x 8-5/8" annulus, circ to surface</i>				
11-3/4" surface csg @ 1610' - cmt'd w/790 sxs to surface				
TOC @ 1740' (TS)				
TOC @ 2000'				
8-5/8" intermediate csg @ 5020' - cmt'd w/1190 sxs				
<i>Proposed Tubular installation:</i>				
<i>Rod pump, TA @ ~8450', SN@ ~8975', & EOT @ ~9150'</i>				
DV tool @ 8498'				
<i>Proposed perfs ~8820'-8950'</i>				
<i>sqz perfs @ 9600' - circ cmt to above Abo</i>				
TOC @ 11,475'				
<i>Proposed CIBP @ 12,230' + 20' cmt</i>				
Atoka perfs @ 12,280'-98'				
<i>dump ball 35' cmt on pkr</i>				
Permanent packer @ 12,406' w/1 jt 2-3/8" tubing, & 4' sub				
CIBP @ 12,469'				
Morrow perfs @ 12,551'-57', 12,604'-08', 12,612'-18', & 12,621'-27' (6 spf)				
<i>20 bbls 15% HCl, 10 bbls Morrow blend 10% HCl, 70/30 Methanol, 3600 gal</i>				
<i>50Q CO2 Morrow blend</i>				
4-1/2" production csg @ 12,732' - cmt'd w/1380 sxs				
COMMENTS:	Working Interest:	PLUG BACK DEPTH:		
API # 30-025-35678	Net Revenue Interest:	TOTAL WELL DEPTH:		
Property#		PREPARED OR REVISED BY:	DATE:	
Spud Date:		cml	3/17/2016	
Completed in				

PROPOSED

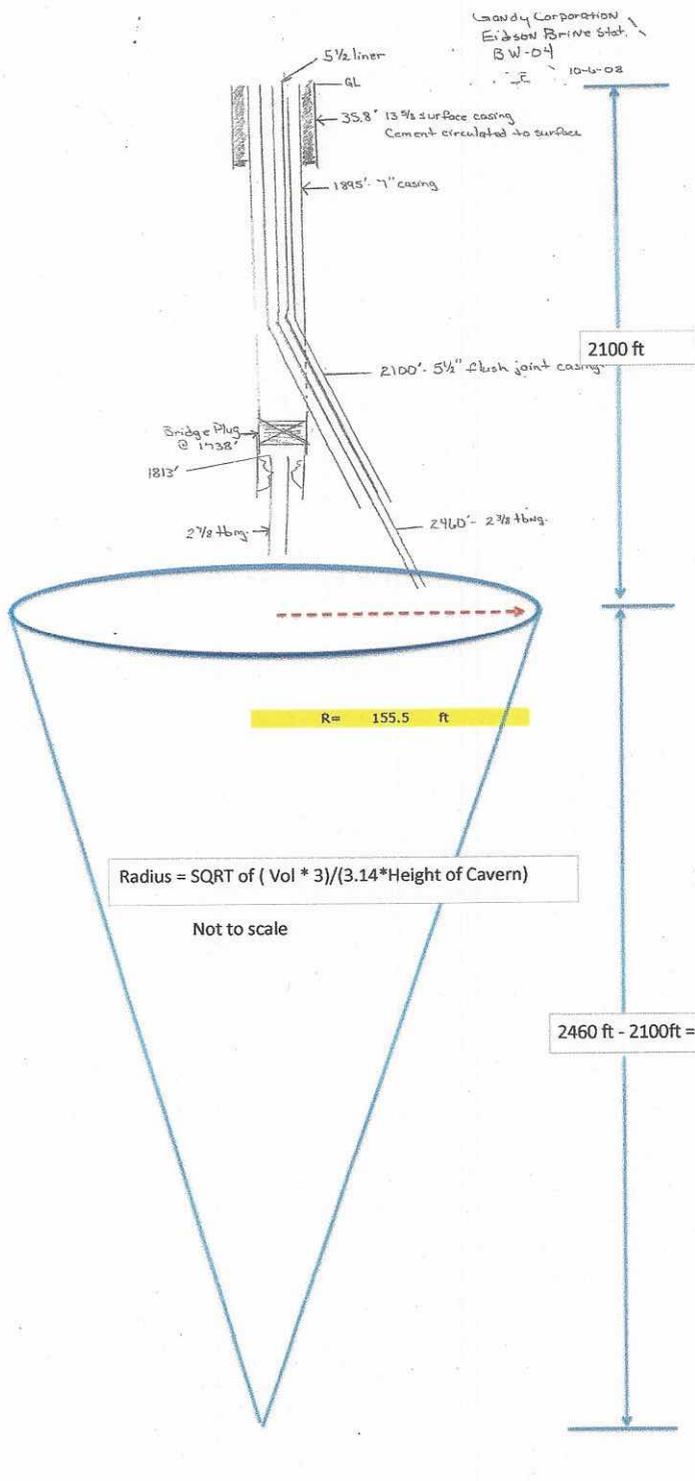
DIRECTIONS TO LOCATION: Directions to well needed.

Appendix “E”

- AOR Well Status List
- AOR Plot Plan
- Lime Rock API # 30-025-35678 Proposed Re-Completion

Appendix "F"

- Wellbore Sketch, Brine Cavity Calculations with new 2015 Radius and D/H calculations.
- Aerial View showing Cavern Radius



2015 Calculations

$$r = \sqrt[3]{\frac{V}{\pi * D}}$$

V	Volume	=	9,111,275 bbls
D	Depth	=	360 ft
H	Height	=	2100 ft
Kf	ft3 salt/bbl	155.5	1 est

r	=	155.5 ft
Diameter	=	311.00 ft

D/H	=	0.148
-----	---	-------



Radius of Cavern = 156 ft
As of Dec 2015.

BW-04

© 2015 Google

©2009 Google

238

Acq. Date: Feb 14, 2014

32°52'23.29" N 103°30'17.92" W elev. 4037 ft

Eye alt. 4879 ft

Appendix “G”

- Solution Cavern Monitoring Plan Program

“Solution Cavern Monitoring Plan Program”

Wasserhund Inc.
Buckeye Brine Station
OCD Permit BW-04
API No. 30-025-26883 Eidson #1
Unit Letter M-Section 31-Ts 16s – R35e

Wasserhund Inc. hereby proposes to install a minimum of three National Geodetic Survey (NGS) survey control stations, i.e. survey monuments, around the brine well in a manner that will adequately provide vertical geodetic data to determine if any subsidence is occurring at the aforementioned well site.

A Berntsen Monument Installation Detail is included for reference. An approved Surveying/Contracting company will install the complete system.

A certified surveyed plat will be provided showing the location of the monuments and all significant features of the site.

The monuments will be laid out in a triangulation configuration around the wellhead, and located so as to pick-up any movement related to up-lift or subsidence of the anticipated areas of greatest concern.

The wellhead will also be included in the measurements, along with a known geodetic reference point outside of the possible influence of the well. While the system will focus on vertical movements, lateral movements will be visually noted and will actually impact the vertical readings.

The surveys will be performed semi-annually, evaluated and reported to the agency. All survey readings will be adjusted for and conform to the New Mexico Coordinate System.

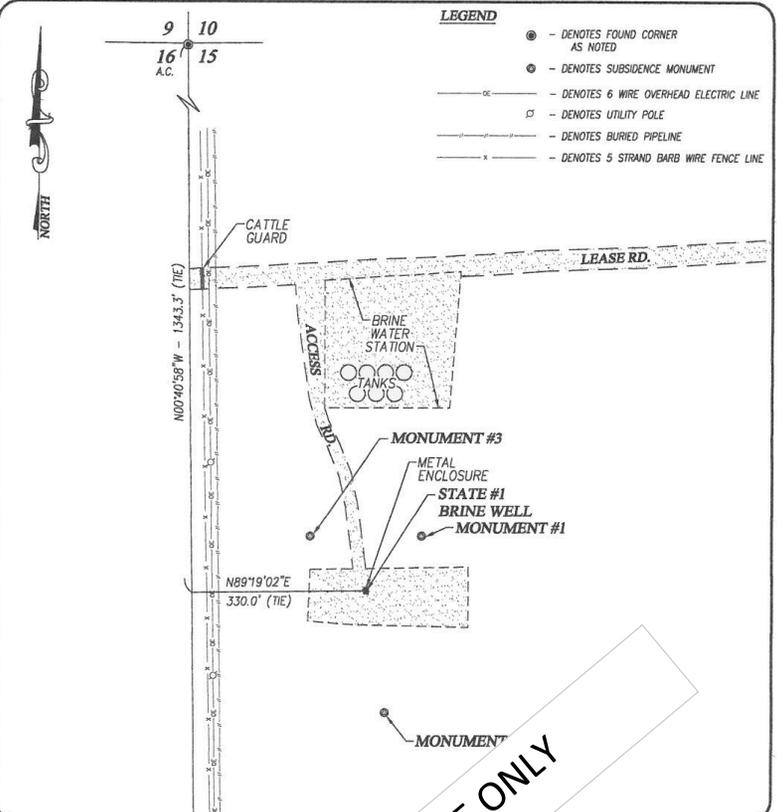
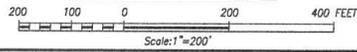
Price LLC will conduct surveys in-house using approved level measuring instruments with a set number of readings collected by a licensed surveyor for quality control.

The data will be tabulated and a graph be maintained for each point over the life of the system.

Attached: Examples Only:
Topographic Map-
Vicinity Map shows Local Benchmarks-Example only
USGS Map-Example only
Susidence Monument Location Map- Example only.
Berntsen Monument Installation Detail-Actual
Data Sheets-Example Only
Graphs-Example Only

TOPOGRAPHIC MAP

Figure 4



- LEGEND**
- - DENOTES FOUND CORNER AS NOTED
 - - DENOTES SUBSIDENCE MONUMENT
 - o— - DENOTES 6 WIRE OVERHEAD ELECTRIC LINE
 - - DENOTES UTILITY POLE
 - x— - DENOTES BURIED PIPELINE
 - x— - DENOTES 5 STRAND BARB WIRE FENCE LINE

NOTE
 BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALU...

EXAMPLE ONLY

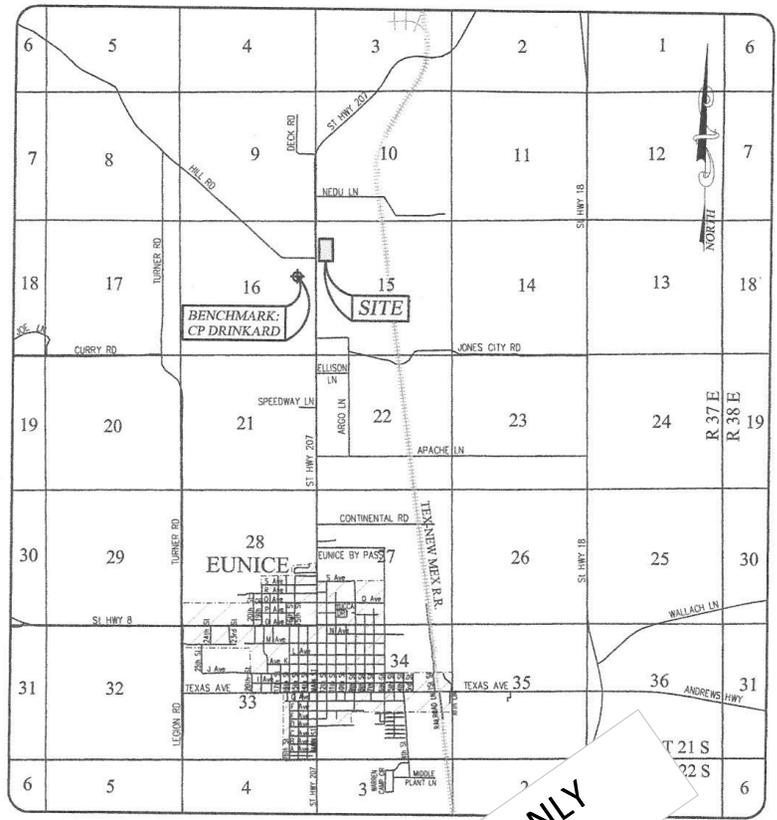
PROVIDING SURVEYING SERVICES
 SINCE 1946
JOHN WEST SURVEYING COMPANY
 412 N. DAL PASO
 HOBBS, N.M. 88240
 (575) 393-3117

ENERGY SERVICES, LLC
 SUBSIDENCE MONITORING FOR THE
 ENERGY STATE #1 BRINE WELL IN SECTION 15,
 TOWNSHIP 24 SOUTH, RANGE 37 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO

D:\maps\Projects\Subsidence Monitoring\Key Energy Services, LLC\State #1 Brine Well Enclosure Lea County NM\12111724

VICINITY MAP
NOT TO SCALE

Figure 1



EUNICE, NEW MEXICO AND SURROUNDING AREAS

EXAMPLE ONLY

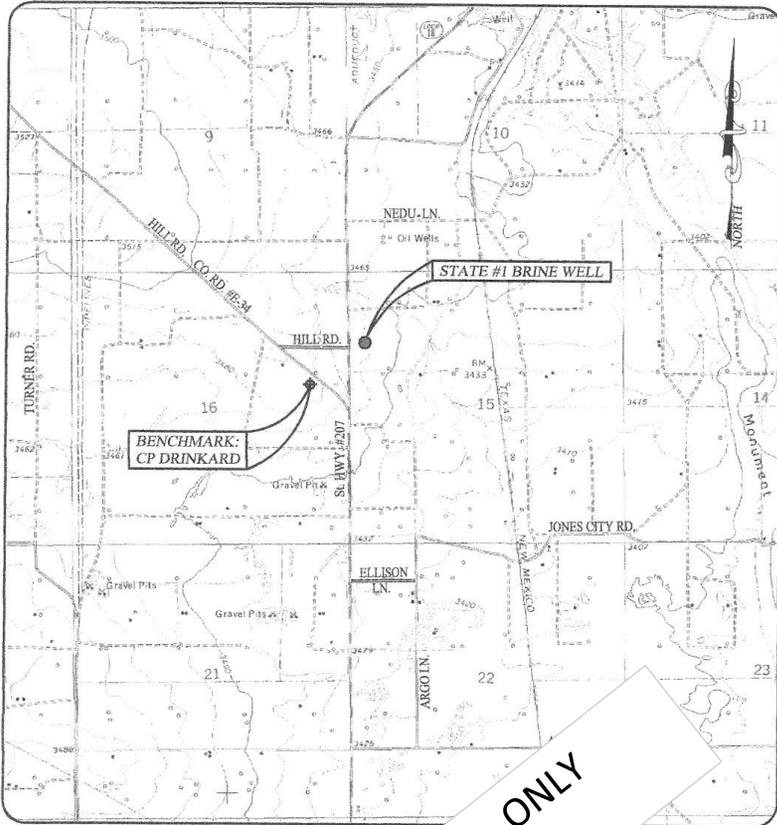
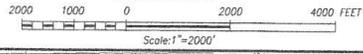
PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WESI SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(575) 393-3117

... SERVICES, LLC
... MONITORING FOR THE
... #1 BRINE WELL IN SECTION 15,
... 37 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO

D:\msc\projects\Substance Monitoring\Key Energy Services, LLC\10110622 State #1\10110622.dwg 01/09/11

U.S.G.S. MAP

Figure 2



U.S.G.S. 7.5' SERIES TOPOGRAPHIC MAPS FOR:
EUNICE, NEW MEXICO



PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(575) 393-3117

Example ONLY

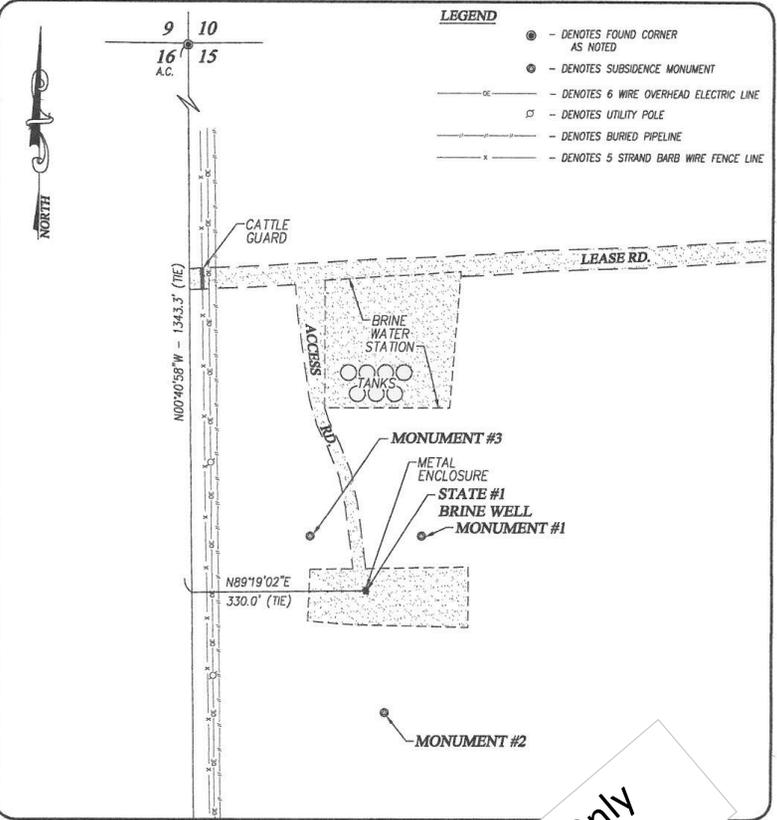
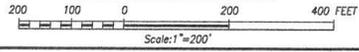
MONITORING FOR THE
STATE #1 BRINE WELL IN SECTION 15,
TOWNSHIP 21 SOUTH, RANGE 37 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO

SERVICES, LLC

MONITORING FOR THE
STATE #1 BRINE WELL IN SECTION 15,
TOWNSHIP 21 SOUTH, RANGE 37 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO

TOPOGRAPHIC MAP

Figure 4



NOTE
 BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

PROVIDING SURVEYING SERVICES SINCE 1946
JOHN WEST SURVEYING COMPANY
 412 N. DAL PASO
 HOBBS, N.M. 88240
 (575) 393-3117

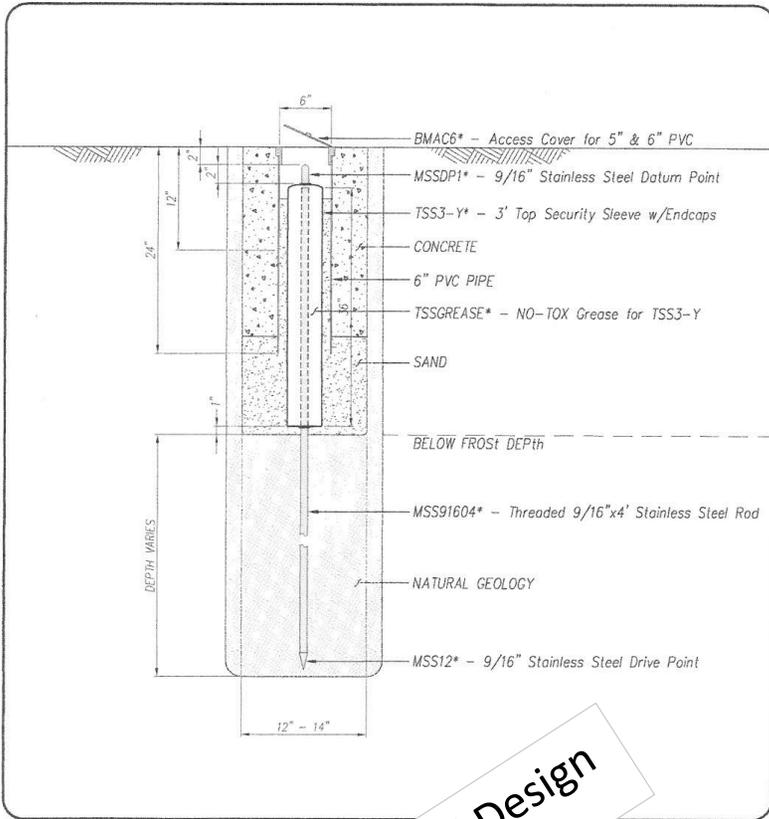
KEY ENERGY SERVICES, LLC
 FOR THE
 KEY ENERGY SERVICES, LLC
 TOWNSHIP 21 SOUTH, RANGE 10 EAST, SECTION 15, LEA COUNTY, NEW MEXICO

D:\maps\Projects\Subsidence Monitoring\Key Energy Services, LLC\State #1 Brine Well Lease Lea County NM\12111724

Example Only

BERNTSEN MONUMENT INSTALLATION DETAIL
NOT TO SCALE

Figure 6



Actual Design

*REFERENCE:
www.berntsen.com
9/16" STAINLESS STEEL TOP SECURITY SLEEVE MONUMENT

PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WESI SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(575) 393-3117

ENERGY SERVICES, LLC
ASSISTANCE MONITORING FOR THE
ENERGY STATE #1 BRINE WELL IN SECTION 15,
TOWNSHIP 21 SOUTH, RANGE 37 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO

11	14	-1.5010	427.9000
11	15	-2.6820	222.6000
11	16	-6.0820	384.5400
16	17	-4.3450	464.4600
17	18	-5.5910	384.1600
18	19	-2.5440	424.7600
19	20	-2.6950	398.0200
20	21	-2.8570	385.9600
21	22	-2.1030	267.9000

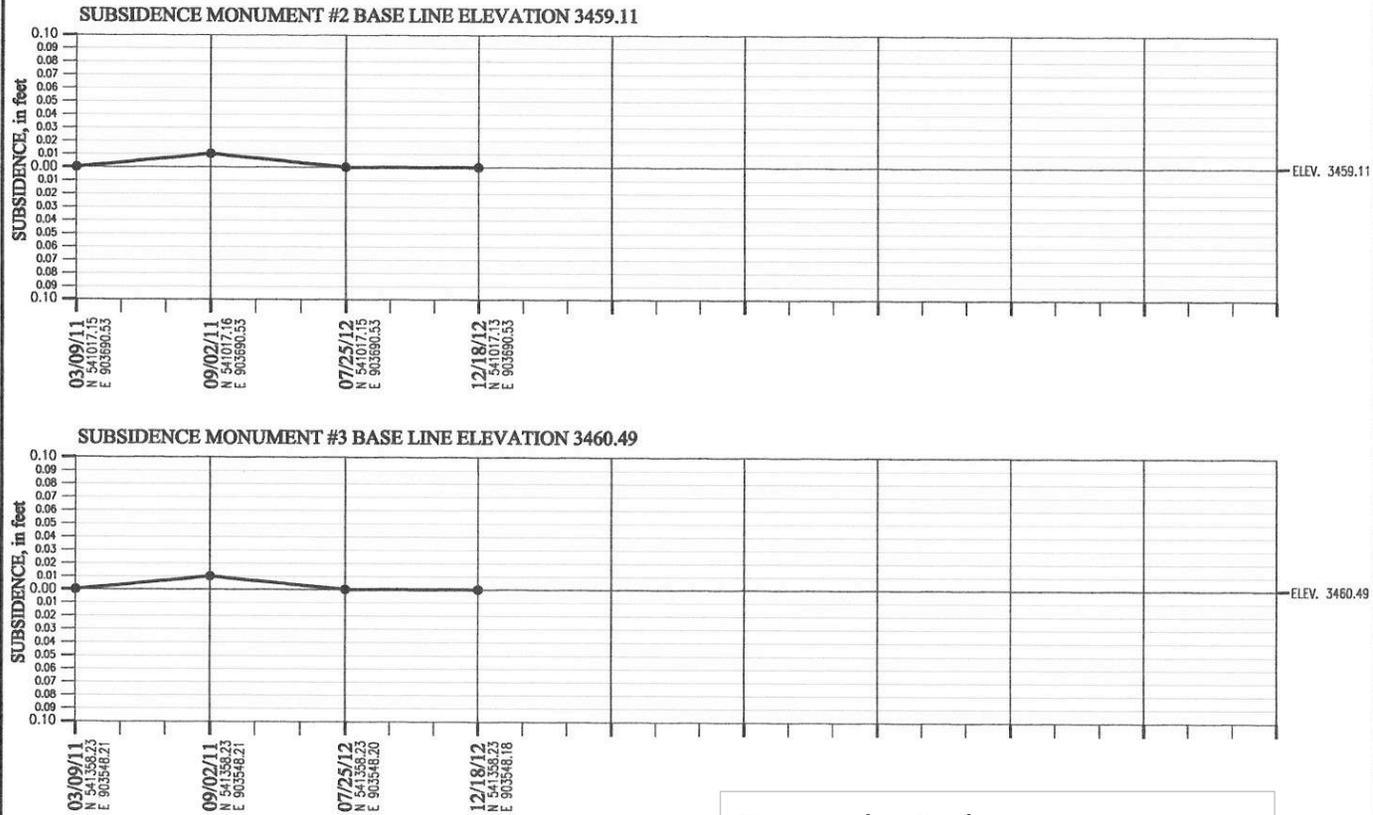
ADJUSTED ELEVATIONS

Station	Adjusted Elev	Standard Dev.	
L98	3434.3700	0.00000	NGS MONUMENT L98
22	3434.3700	0.00000	
1	3436.9801	0.01150	
2	3439.3987	0.01639	
3	3442.4091	0.01964	
4	3444.7482	0.02205	
5	3450.5778	0.02338	
6	3455.7212	0.02422	
7	3457.9332	0.02724	MONUMENT #1
8	3459.1092	0.02888	MONUMENT #2
9	3460.4962	0.02863	MONUMENT #3
10	3461.9212	0.02775	STATE #1 WELL
11	3460.6115	0.02450	(AVERAGE)
12	3461.9215	0.02694	STATE #1 WELL 3461.921
13	3460.4925	0.02785	MONUMENT #3 3460.494
14	3459.1105	0.02810	MONUMENT #2 3459.110
15	3457.9295	0.02643	MONUMENT #1 3457.931
16	3454.5260	0.02425	
17	3450.1768	0.02326	
18	3444.5823	0.02181	
19	3442.0345	0.01937	
20	3439.3359	0.01595	
21	3436.4754	0.01061	

From	To	ROUTE SUMMARY Elev. Diff. (adjusted)	Residuals
L98	1	2.6101	-0.0029
1	2	2.4186	-0.0034
2	3	3.0104	-0.0036
3	4	2.3390	-0.0040
4	5	5.8297	-0.0033
5	6	5.1434	-0.0036
6	7	2.2120	-0.0000
6	8	3.3880	-0.0000
6	9	4.7750	-0.0000
6	10	6.2000	-0.0000
6	11	4.8903	-0.0037
11	12	1.3100	-0.0000
11	13	-0.1190	-0.0000
11	14	-1.5010	-0.0000
11	15	-2.6820	0.0000

Example
Only

VERTICAL SUBSIDENCE TABLE



Example Only

Figure 7B



PROVIDING SURVEYING SERVICES
 SINCE 1946
JOHN WEST SURVEYING COMPANY
 412 N. DAL PASO
 HOBBS, N.M. 88240
 (575) 393-3117

NOTE:
 HORIZONTAL ACCURACY OF EQUIPMENT PER
 MANUFACTURER ±0.02 FT.
 VERTICAL ACCURACY OF EQUIPMENT PER
 MANUFACTURER ±0.01 FT.

SUBSIDENCE MONITORING FOR THE
**KEY ENERGY BW-19 CARLSBAD No. 1 WELL IN SECTION 36,
 TOWNSHIP 22 SOUTH, RANGE 26 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO**

Appendix “H”

BW-04 Wasserhund Inc. Closure Cost Estimate.

2015 Annual Report
BW-04 Wasserhund Inc. Closure Cost

		CPI	
Pulling Unit Rig	\$25,000	1.03	\$25,750
Halliburton Cement Job	\$8,000.00	1.03	\$8,240
Post Subsidence Monitoring 5 years	\$15,000.00	1.03	\$15,450
Tank Removal, Pad Clean-Up	\$30,000.00	1.03	\$30,900
Consulting fees	\$10,000.00	1.03	\$10,300
Total Estimate	\$88,000	1.03	\$90,640

RECEIVED 003

2010 FEB 12 P 1:01

Annual Brine Well Report
Gandy Corporation
Eidson Brine Station
BW Permit #B4-04
API #30-025-26883
January 31, 2010
Larry Gandy

2. Summary:
Fresh water injected down tubing producing brine water through casing into storage tanks.

Remedial:
See attached C-103.

3. Production Volumes:
- | | |
|-------------------|-------------------------|
| Beginning balance | 5,523,594 |
| 2009 total | <u>331,079</u> |
| Ending balance | <u><u>5,854,673</u></u> |

Maximum pressure	340#
Average pressure	280#

4. Chemical Analysis:
See attached.

5. MIT, Casing Test:
Chart attached.

6. Deviation:
None

7. Leaks or Spills:
See attached C-141.

8. Groundwater Monitoring:
None required.

9. Cavity Information:
See attached.

10. AOR Summary:
See attached.

11. Sign-Off Requirements:
See attached.

(4)

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

WHOLE EARTH ENVIRONMENTAL
ATTN: MR. MIKE GRIFFIN
19606 SAN GABRIEL
HOUSTON, TEXAS 77084
FAX: 281-646-8996

Sample Type: Water
Sample Condition: Intact/ 4 deg. C
Project #: None Given
Project Name: Eidson Station
Project Location: None Given

Sampling Date: 12/04/00
Receiving Date: 12/09/00
Analysis Date: See Below

ELT#	FIELD CODE	Sulfate mg/L	Chloride mg/L	Carbonate mg/L	Bicarbonate mg/L	TDS mg/L	Conductivity uS/cm
35143	Salt Water	3113	221563	<2	78	332232	164200
35144	Fresh Water	60.2	35	<2	146	318	590

QUALITY CONTROL	50.5	5318	*	*	*	1432
TRUE VALUE	50.0	5000	*	*	*	1413
% PRECISION	101	106	*	*	*	101
BLANK	<0.5	<10	<2	<2	<5	*

ANALYSIS DATE	12/13/00	12/12/00	12/12/00	12/12/00	12/11/00	12/12/00
---------------	----------	----------	----------	----------	----------	----------

METHODS: EPA 375.4, 325.3, 310, 160.1, 120.1

Roland K. Tuttle
Roland K. Tuttle

12-27-00
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

WHOLE EARTH ENVIRONMENTAL
ATTN: MR. MIKE GRIFFIN
19606 SAN GABRIEL
HOUSTON, TEXAS 77084
FAX: 281-646-8996

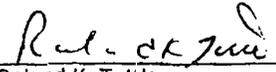
Sample Type: Water
Sample Condition: Intact/ 4 deg. C
Project #: None Given
Project Name: Eidson Station
Project Location: None Given

Sampling Date: 12/04/00
Receiving Date: 12/09/00
Analysis Date: 12/12/00

ELT#	FIELD CODE	pH s.u.	Hardness mg/L	Specific Gravity @ 60 deg F
35143	Salt Water	6.88	42000	1.185
35144	Fresh Water	8.42	650	1.000

QUALITY CONTROL	7.02	*	*
TRUE VALUE	7.00	*	*
% PRECISION	100	*	*
BLANK	*	<10	*

METHODS: EPA 150.1, 130.2


Ralnd K. Tuttle

12-27-00
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

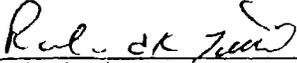
WHOLE EARTH ENVIRONMENTAL
ATTN: MR. MIKE GRIFFIN
19606 SAN GABRIEL
HOUSTON, TEXAS 77084
FAX: 281-646-8996

Sample Type: Water
Sample Condition: Intact/ 4 deg. C
Project #: None Given
Project Name: Eidson Station
Project Location: None Given

Sampling Date: 12/04/00
Receiving Date: 12/09/00
Analysis Date: 12/12, 12/14,
12/20/00

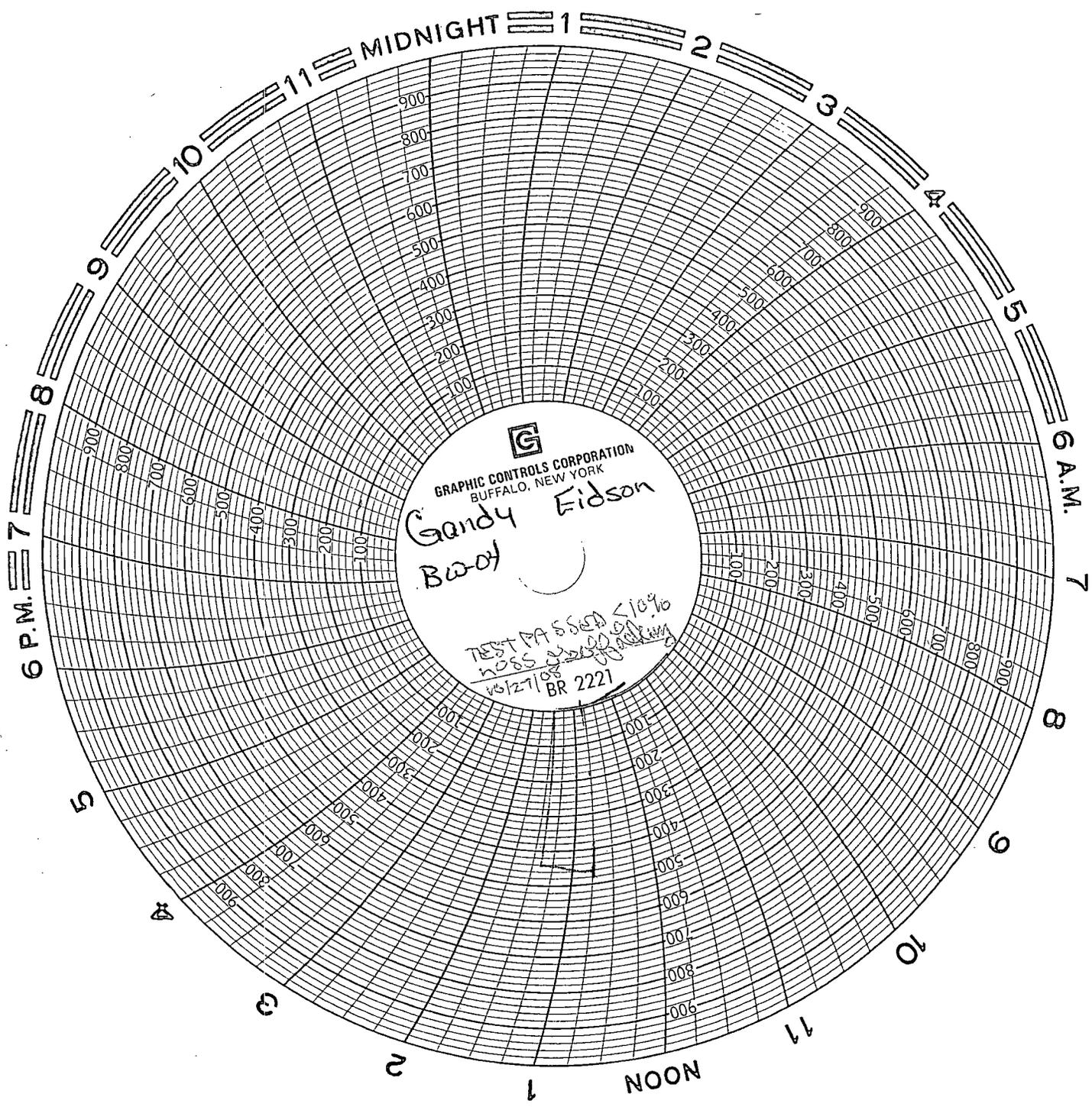
ELT#	FIELD CODE	Ca mg/L	Mg mg/L	Fe mg/L	Ba mg/L
35143	Salt Water	2328	7885	1.44	<0.10
35144	Fresh Water	34.2	9.52	0.18	<0.10
	QUALITY CONTROL	10.29	4.91	0.99	2.01
	TRUE VALUE	10.00	5.00	1.00	2.00
	% PRECISION	103	93	99	100
	BLANK	<0.10	<0.10	<0.03	<0.10

METHODS: SM 7000 series


Roland K. Tuttle

12-27-00
Date

(5)





District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, 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
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised October 10, 2003
Submit 2 Copies to appropriate
District Office in accordance
with Rule 116 on back
side of form

Release Notification and Corrective Action

OPERATOR Initial Report Final Report

Name of Company	Gandy Corporation	Contact	Larry Gandy
Address	P.O. Box 2140, Lovington, NM 88260	Telephone No.	575-396-0522
Facility Name	Eidson State	Facility Type	Brine and Fresh Water Station
Surface Owner	Eidson Ranch	Mineral Owner	NM
		Lease No.	25-26883

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
M	31	16s	35e	567	South	162	West	Lea

Latitude 32° 52' 23" Longitude 103° 30' 16"

NATURE OF RELEASE

Type of Release	Brine water	Volume of Release	1800 bbl	Volume Recovered	750 bbl
Source of Release	Open valve	Date and Hour of Occurrence		Date and Hour of Discovery	05/03/09
Was Immediate Notice Given?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom?	Mark		9:00 am
By Whom?	Cecil Guillory	Date and Hour	05/03/09 10:00 am		
Was a Watercourse Reached?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.			

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*
Vandals removed lock and opened valve on brine tank running water down bar ditch. Vacuum trucks picked up fluids and hauled to SWD.

Describe Area Affected and Cleanup Action Taken.*
Bar ditches north of battery. One call made, Remediation Plan will be submitted.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD 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 NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD 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.

Signature:	<i>Larry Gandy</i>	OIL CONSERVATION DIVISION	
Printed Name:	Larry Gandy	Approved by:	<i>Jeffrey Selinger</i> District Supervisor
Title:	Secretary/Treasurer	Approval Date:	05/05/09
E-mail Address:		Expiration Date:	07/03/09
Date:	05/04/09	Conditions of Approval:	SUBMIT FINAC C-141 BY <i>[initials]</i>
Phone:	575-396-0522	Attached	<input type="checkbox"/>
			IRP-09-5-2172

* Attach Additional Sheets If Necessary

API	WELL NAME	OPERATOR	FTG NS	NS CD	FTG EW	EW CD	NI	3116S	35E	Pfc	Dst	3,003,536,883	2555	84364	26949 S	NI					
								Sec	Sp				TVD DEPTH	OGRID	SDIV	UL	PROPERTY	LAND TYPE	WELL TYPE	NBR	COMPL
3002525146	NORTH VACUUSAGE ENERGY CO		460 S		660 E		P	36 16S	34E		829		8980	20054 P	9867 S	O				1	
3002525678	STATE VII 007 CHESAPEAKE OPERATING I		660 N		660 E		A	1 17S	34E		1477		12750	147179 I	300069 P	G				1	
3002531621	VACUUM 9205 BTA OIL PRODUCERS		1980 S		660 W		L	31 16S	35E		1498		12900	30023	2354 S	O				2	
3002537018	NORTH VACUUSAGE ENERGY CO		608 S		1777 E		O	36 16S	34E		1939		8883	20054 O	9867 S	O				1	
3002537993	ENCORE 36 ST/2 ENCORE OPERATING LP		1330 S		1750 E		J	36 16S	34E		2059		0	189951 J	35822 S	G				1	
3002525170	NORTH VACUUSAGE ENERGY CO		460 S		1980 E		O	36 16S	34E		1145		8950	20054 O	9867 S	O				1	



SOCON Sonar Well Services, Inc.

ECHO – LOG

Gandy Corporation

Brine Well No: 04

Eidson Brine Station, New Mexico

First SOCON Sonar Well Services Survey

10/21/2008

083069



SOCON Sonar Well Services, Inc.

11133 I-45 South, Ste. E
Phone (936) 441-5801

Conroe, Texas 77302
Fax (936) 539-6847

e-mail: soconusa@socon.com



SOCON Sonar Well Services, Inc.

Brine Well No: 04

083069

10/21/2008

Results of the Cavern Survey

By means of Echo-Sounding

In the cavern

Brine Well No: 04

Date: 10/21/2008

083069

Customer:

Gandy Corporation

Lovington, New Mexico

Responsible for the survey:

Surveyor:	HL Van Metre
Leadership:	Mr. Dale Gandy
Interpreter:	HL Van Metre
Control:	Mr. Richard Lawrence



Contents

Summary of results

Legend

Enclosures:

Volume (diagrams and lists)

Diameter and radii (diagrams and lists)

Perspective views

Maximum plots (top view)

Horizontal sections

Maximum plot (side view)

Vertical sections



Summary of results

Well details

All depths are given as:	MD
Datum level for all depths:	BHF
Shoe of the 4-1/2" - tubing:	1909.0 ft
Reference depth for ECHO-LOG:	1909.0 ft
Depth correction:	0.0 ft

Details of survey equipment

Measuring vehicle used:	Grey WireLine
Tools used:	XN02 – R185

General details

Number of runs:	1
Measured horizontal sections:	13
Measured tilted sections:	0
Lowest survey depth:	1944.0 ft



Maximum and minimum dimensions with ref. to the measuring axis

Reference direction: magnetic north

Determination out of 12 vertical sections derived from horizontally and tilted measured data at 1 5 degree intervals:

Minimum radius:	0.0 ft
Depth:	1945.1 ft
Direction:	0°

Maximum radius:	1.8 ft
Depth:	1911.0 ft
Direction:	180°

Highest point of cavern:	1910.0 ft
Horizontal distance:	1.1 ft
Direction:	0°

Lowest point of cavern:	1945.1 ft
Horizontal distance:	0.0 ft
Direction:	0°

Lowest point in the measuring axis: 1945.1 ft

Determination out of 13 horizontal sections in the depths between 1910 feet and 1944 feet at 5 degree intervals:

Maximum radius:	1.8 ft
Depth:	1911.0 ft
Direction:	100°

Maximum diameter:	3.3 ft
Depth:	1911.0 ft
Direction:	295 - 115°

Volume

Volume: 10.7 Bbls

Depth range: 1910.0 ft <--> 1945.0 ft



Interpretation

Supposing a rectilinear propagation of ultrasonic waves all recorded echo travel times were converted into distances by using the subsequent speeds of sound:

5902 feet/second in brine (measured)

In the case of recording several echoes along one trace of echo signals, the representative echo signal was selected according to the level of amplitude, transmission time, and density of measured points and the shape of the cavern.

Horizontal sections

13 horizontal sections at following measured depths are included as graphical plots in this report:

1910.0 ft	1911.0 ft	1912.0 ft	1914.0 ft	1916.0 ft	1918.0 ft	1920.0 ft
1925.0 ft	1930.0 ft	1935.0 ft	1940.0 ft	1942.0 ft	1944.0 ft	

The following 1 sections are constructed:

1945.0 ft

Tilted sections

0 sections recorded with tilted echo-transducer at following measured depths are presented in the vertical sections:

Vertical sections

The shape of the cavern was determined by interpretation of all horizontally and tilted measured data and is presented by 36 vertical sections in this report.



Maximum plots (top view)

The maximum plot presents the largest extension of the cavern in a top view. The first picture shows the areas of all horizontal sections and the area resulting out of the vertical sections (hatched). The resulting total area is shown in the second picture (cross hatching) together with the largest single area.

In both pictures the total centre of gravity of the cavern is shown with its distance and its direction referring to the measuring axis.

The total centre of gravity is derived out of the envelope, which is the connection line of the largest cavern extension in every direction

Perspective views

Several perspective drawings are included in this report to give a quick review of detailed relations.



LEGEND

- Measured point recorded with horizontal adjusted ultrasonic transducer
- Measured point recorded with tilted or vertical orientated ultrasonic transducer
- △ Interpolated point derived from the vertical sections

- Connection line between two measured points in order to calculate the volume
- Assumed connection line (in areas which are not sufficiently covered by measured points)

- N** Magnetic north determined with compass inside the tool
(Magnetic compass in areas without tubing)
(Fibre gyro compass in areas with tubing)

- (N)** Assumed north direction (for sections in magnetic disturbed surroundings without fibre gyro compass)

- a** Longest extension in section
(Without considering of hidden leached pockets)

- b** Longest extension in section perpendicular to a
(Without considering of hidden leached pockets)

- a/b** Ratio of longest extensions in section which are perpendicular to each other

- (xx m²)** Area in actual section resulting from hidden leached pockets

- r~** Average radius

- ☐ 021835 29.04.2002 Job number and survey date



SOCON Sonar Well Services, Inc.

Brine Well No: 04

083069

10/21/2008



Brine Well No: 04 --> 0° <--

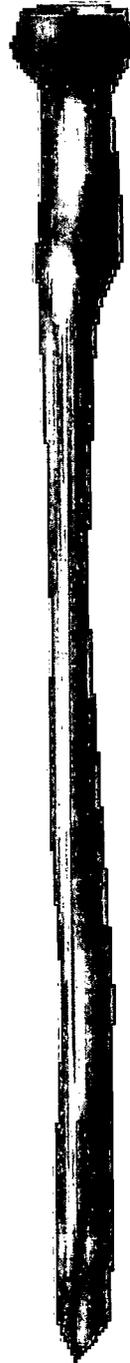


SOCON Sonar Well Services, Inc.

Brine Well No: 04

083069

10/21/2008



Brine Well No: 04 --> 60° <--



SOCON Sonar Well Services, Inc.

Brine Well No: 04

083069

10/21/2008



Brine Well No: 04 --> 120° <--



SOCON Sonar Well Services, Inc.

Brine Well No: 04

083069

10/21/2008



Brine Well No: 04 --> 180° <--



SOCON Sonar Well Services, Inc.

Brine Well No: 04

083069

10/21/2008



Brine Well No: 04 --> 240° <--



SOCON Sonar Well Services, Inc.

Brine Well No: 04

083069

10/21/2008



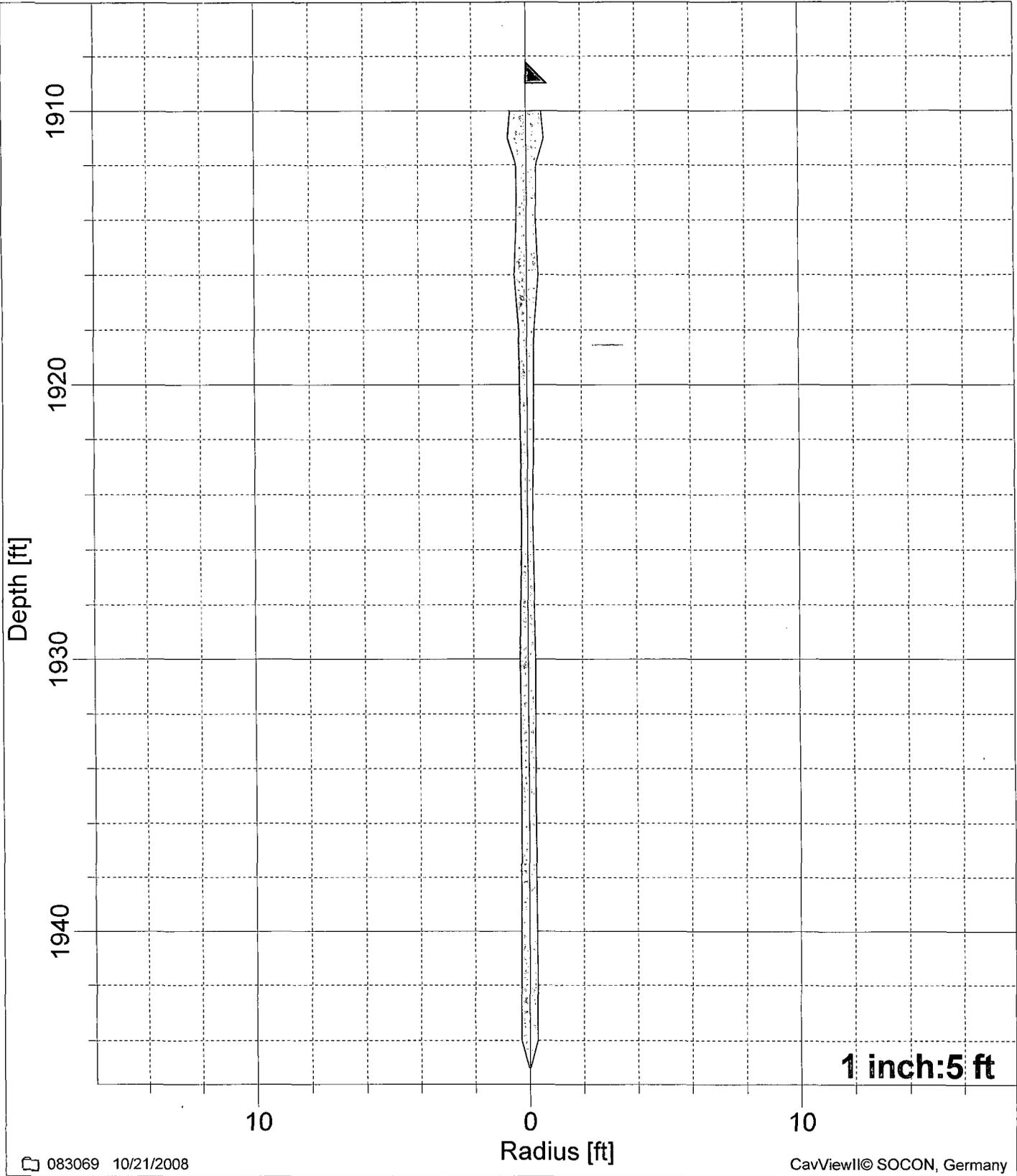
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Brine Well No: 04

AVERAGE RADIUS

10/21/2008



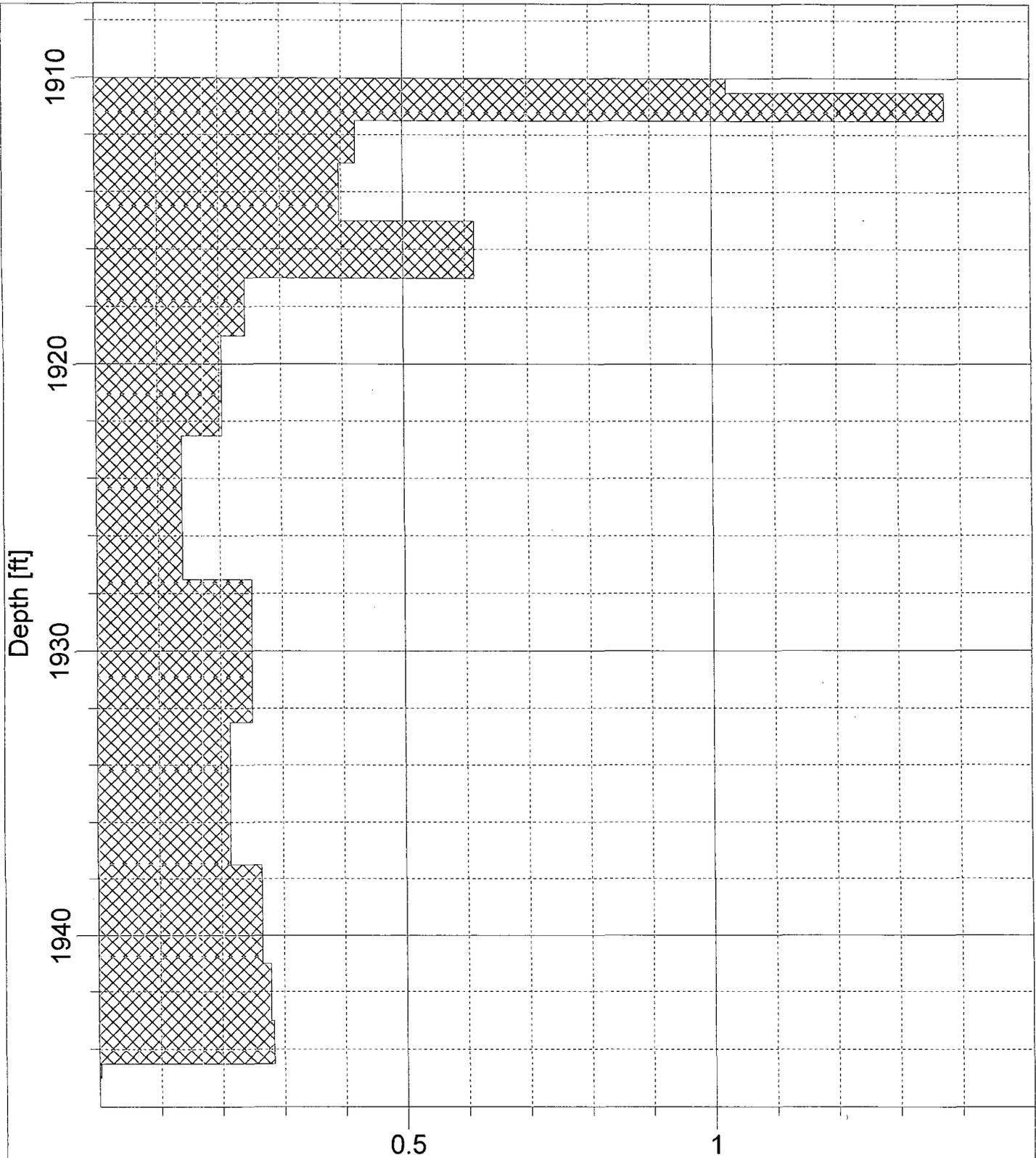
4-1/2" : 1909.0 ft

Average radius (10/21/2008)

Brine Well No: 04

PARTIAL VOLUME

10/21/2008



Partial volume



SOCON Sonar Well Services, Inc.

Volume list

Brine Well No: 04

083069

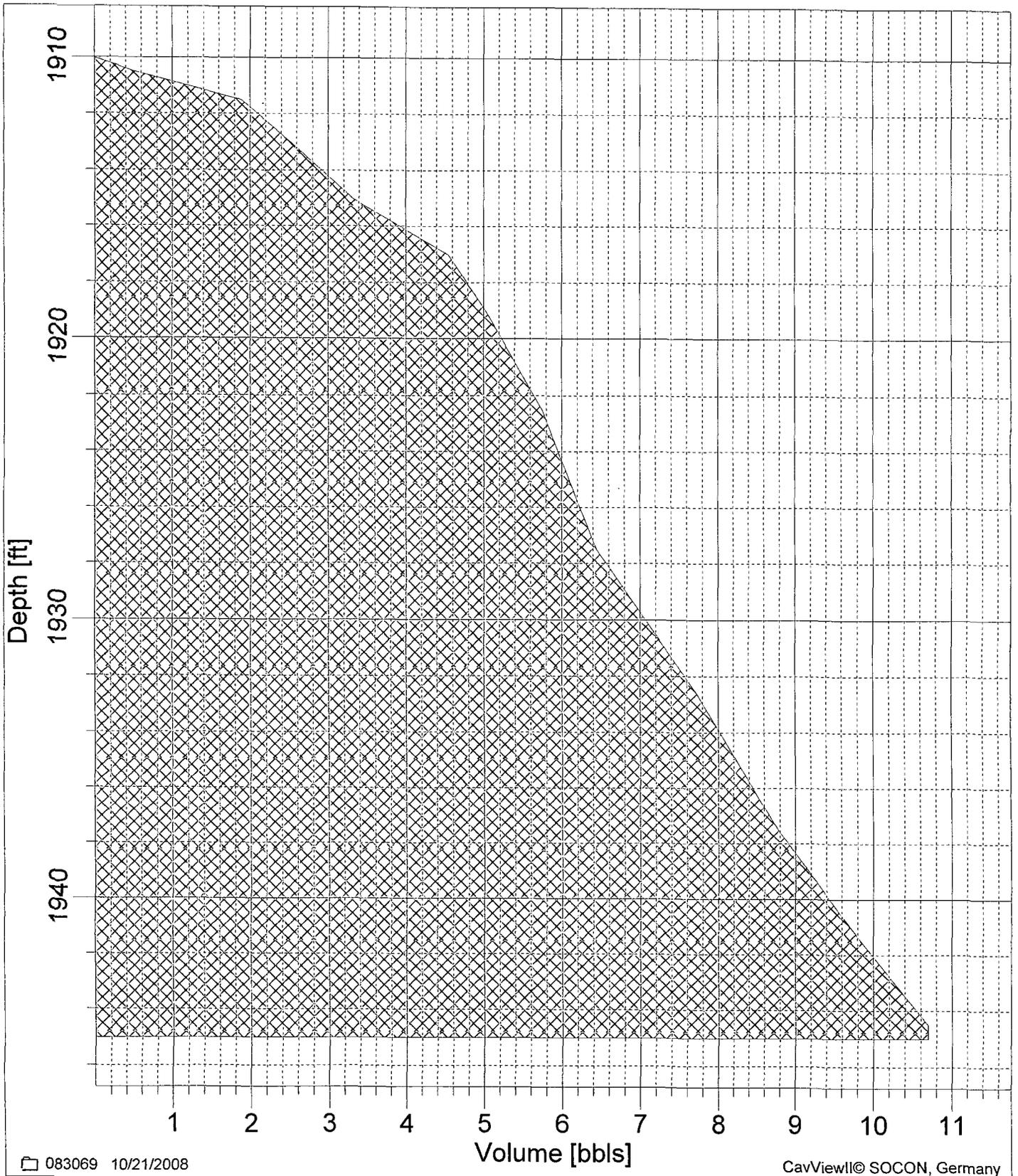
10/21/2008

Depth [ft]	Radius [ft]	Area [ft ²]	Depth range [ft]		Volume [bbls]	
			from	to	partial	total
1910.0	1.4	6	1910.0	1910.5	1	1
1911.0	1.6	8	1910.5	1911.5	1	2
1912.0	0.9	2	1911.5	1913.0	1	3
1914.0	0.8	2	1913.0	1915.0	1	3
1916.0	1.0	3	1915.0	1917.0	1	5
1918.0	0.7	1	1917.0	1919.0	0	5
1920.0	0.6	1	1919.0	1922.5	1	6
1925.0	0.5	1	1922.5	1927.5	1	6
1930.0	0.7	1	1927.5	1932.5	1	8
1935.0	0.6	1	1932.5	1937.5	1	9
1940.0	0.7	1	1937.5	1941.0	1	10
1942.0	0.7	2	1941.0	1943.0	1	10
1944.0	0.7	2	1943.0	1944.5	0	11
1945.0	0.1	0	1944.5	1945.0	0	11

Brine Well No: 04

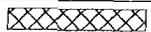
TOTAL VOLUME

10/21/2008



083069 10/21/2008

CarViewII© SOCON, Germany



Total volume = 10.7 bbls



Table of volumes (foot by foot)

Job-No.: 083069, Name: Brine Well No: 04, Date: 10/21/2008

depth [ft]	volume [bbls]								
1910	0	1911	1	1912	2	1913	3	1914	3
1915	3	1916	4	1917	5	1918	5	1919	5
1920	5	1921	5	1922	6	1923	6	1924	6
1925	6	1926	6	1927	6	1928	7	1929	7
1930	7	1931	7	1932	8	1933	8	1934	8
1935	8	1936	8	1937	9	1938	9	1939	9
1940	9	1941	10	1942	10	1943	10	1944	11
1945	11								

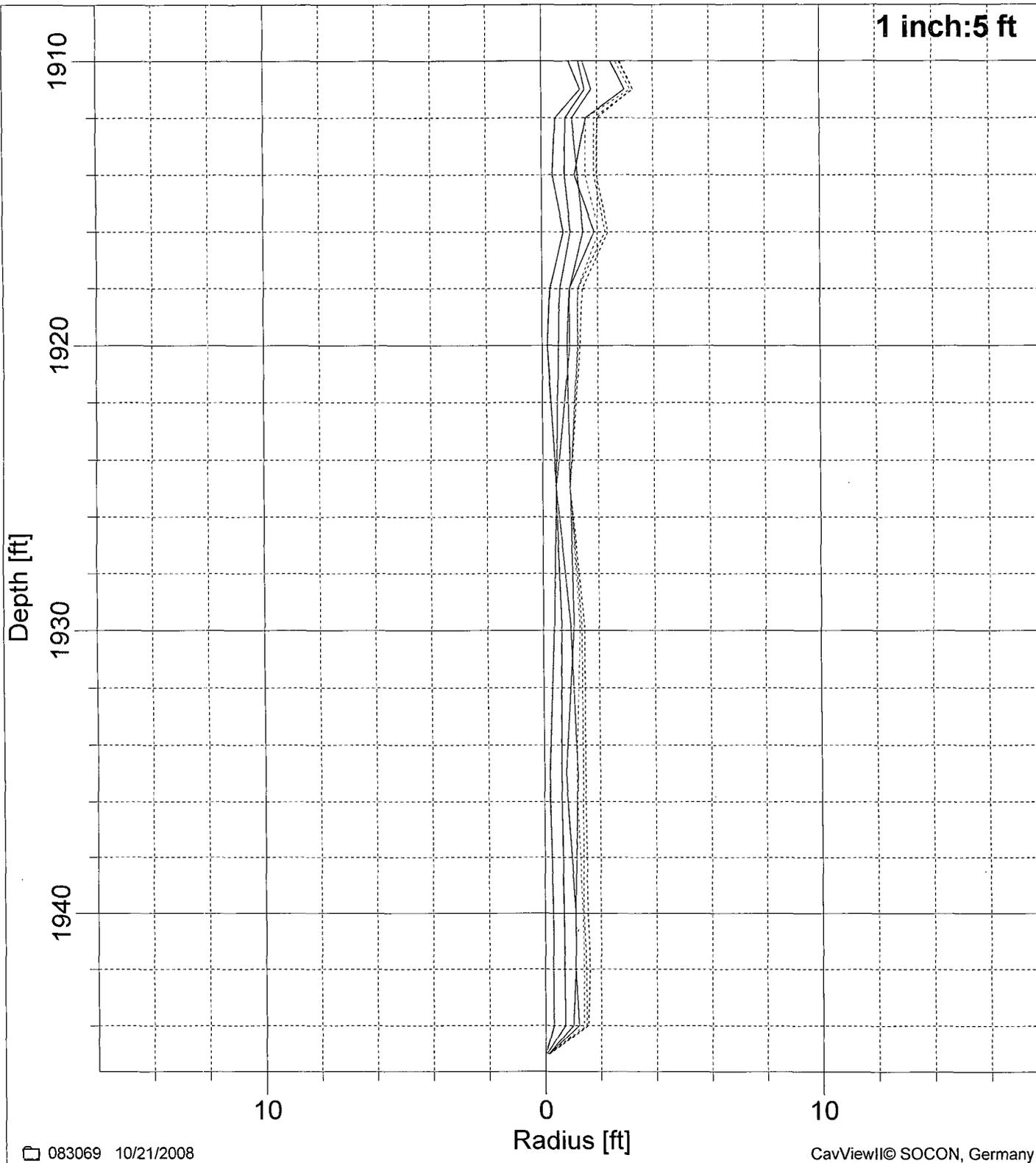


Brine Well No: 04

RADII / DIAMETERS

10/21/2008

1 inch:5 ft



083069 10/21/2008

CavViewII© SOCON, Germany

- | | | |
|-----------------------------------|--------------------|---------------------|
| — Average radius | — Minimum radius | — Maximum radius |
| — Minimum diameter | — Maximum diameter | — Largest extension |
| — Largest perpendicular extension | | |



SOCON Sonar Well Services, Inc.

Table of radii and diameters

Brine Well No: 04

083069

10/21/2008

10/21/2008

Depth [ft]	Radius [MIN]		Radius [MAX]		Diameter [MIN]		Diameter [MAX]	
	[ft]	[°]	[ft]	[°]	[ft]	[°]	[ft]	[°]
1910.0	1.0	332	1.5	85	2.5	152 <-> 332	2.8	60 <-> 240
1911.0	1.4	2	1.8	100	3.0	37 <-> 217	3.3	115 <-> 295
1912.0	0.5	261	1.1	75	1.6	69 <-> 249	1.9	10 <-> 190
1914.0	0.4	236	1.3	110	1.2	57 <-> 237	1.9	165 <-> 345
1916.0	0.8	242	1.5	155	1.9	17 <-> 197	2.3	160 <-> 340
1918.0	0.3	166	1.0	25	1.0	143 <-> 323	1.3	25 <-> 205
1920.0	0.2	221	1.0	35	0.9	131 <-> 311	1.3	35 <-> 215
1925.0	0.5	1	0.5	0	1.0	1 <-> 181	1.0	0 <-> 180
1930.0	0.4	196	1.0	80	1.1	17 <-> 197	1.4	130 <-> 310
1935.0	0.2	251	1.2	140	0.8	38 <-> 218	1.4	140 <-> 320
1940.0	0.3	236	1.1	120	1.1	15 <-> 195	1.4	120 <-> 300
1942.0	0.3	246	1.1	130	1.1	30 <-> 210	1.5	130 <-> 310
1944.0	0.3	251	1.0	65	1.2	5 <-> 185	1.5	140 <-> 320
1945.0	0.0	250	0.1	75	0.1	68 <-> 248	0.1	150 <-> 330



SOCON Sonar Well Services, Inc.

Table of radii in N-E-S-W-NE-SE-SW-NW presentation

Brine Well No: 04

083069

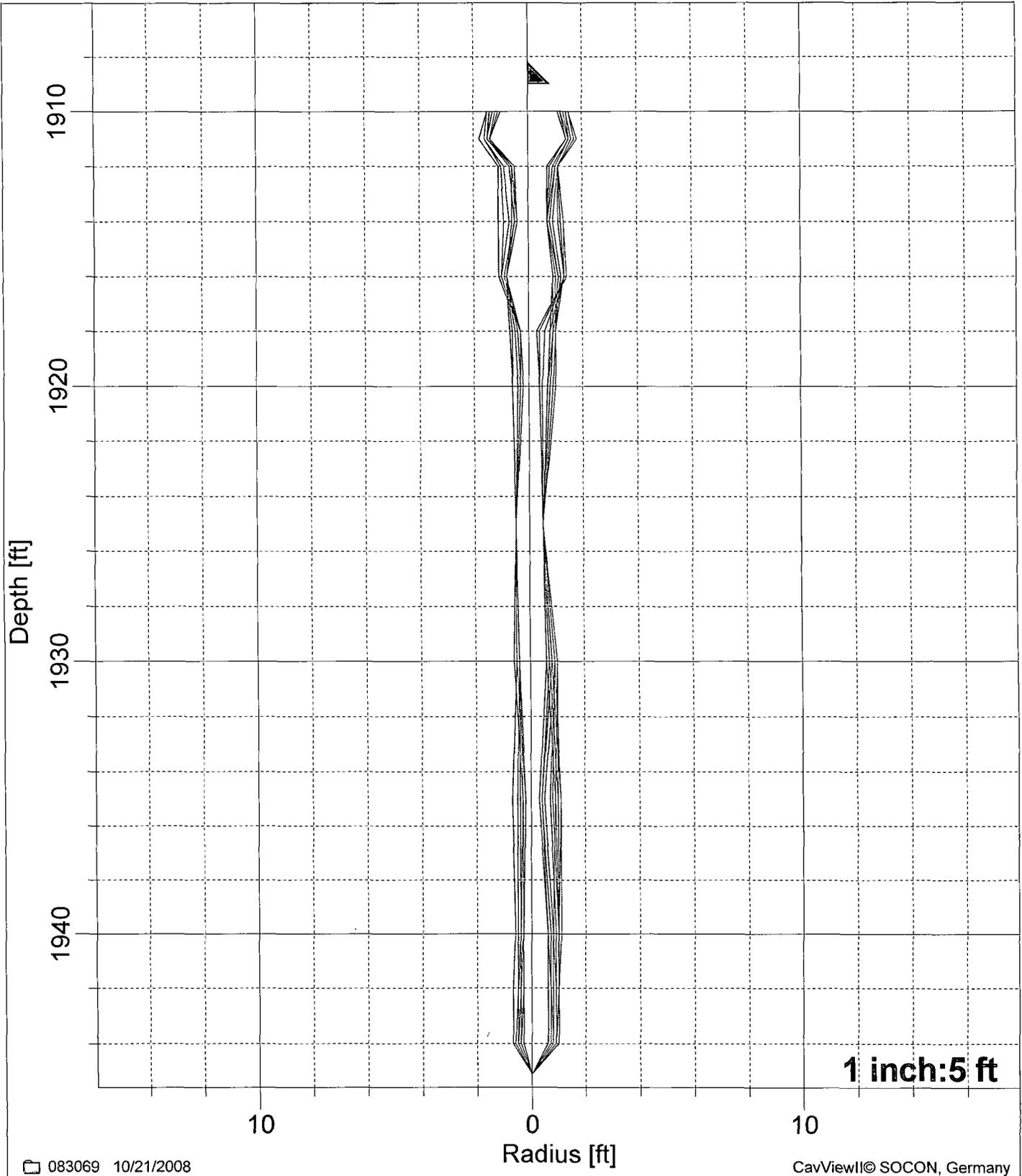
10/21/2008

Depth [ft]	<R> [ft]	N [ft]	E [ft]	S [ft]	W [ft]	NE [ft]	SE [ft]	SW [ft]	NW [ft]
1910.0	1.4	1.1	1.5	1.5	1.3	1.3	1.5	1.4	1.1
1911.0	1.6	1.4	1.7	1.8	1.5	1.5	1.8	1.5	1.4
1912.0	0.9	0.7	1.1	1.1	0.5	1.0	1.1	0.7	0.5
1914.0	0.8	0.7	1.1	1.1	0.4	0.7	1.3	0.5	0.4
1916.0	1.0	0.9	1.3	1.1	0.8	1.1	1.3	0.9	0.8
1918.0	0.7	0.8	1.0	0.3	0.3	1.0	0.6	0.3	0.5
1920.0	0.6	0.7	0.9	0.3	0.2	1.0	0.5	0.2	0.4
1925.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1930.0	0.7	0.6	1.0	0.5	0.4	0.9	0.8	0.4	0.5
1935.0	0.6	0.3	0.9	0.7	0.2	0.5	1.1	0.3	0.2
1940.0	0.7	0.6	1.0	0.6	0.3	0.8	1.0	0.4	0.3
1942.0	0.7	0.6	1.0	0.7	0.3	0.9	1.0	0.4	0.4
1944.0	0.7	0.6	1.0	0.7	0.4	0.9	1.0	0.4	0.4
1945.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0

Brine Well No: 04

MAXPLOT

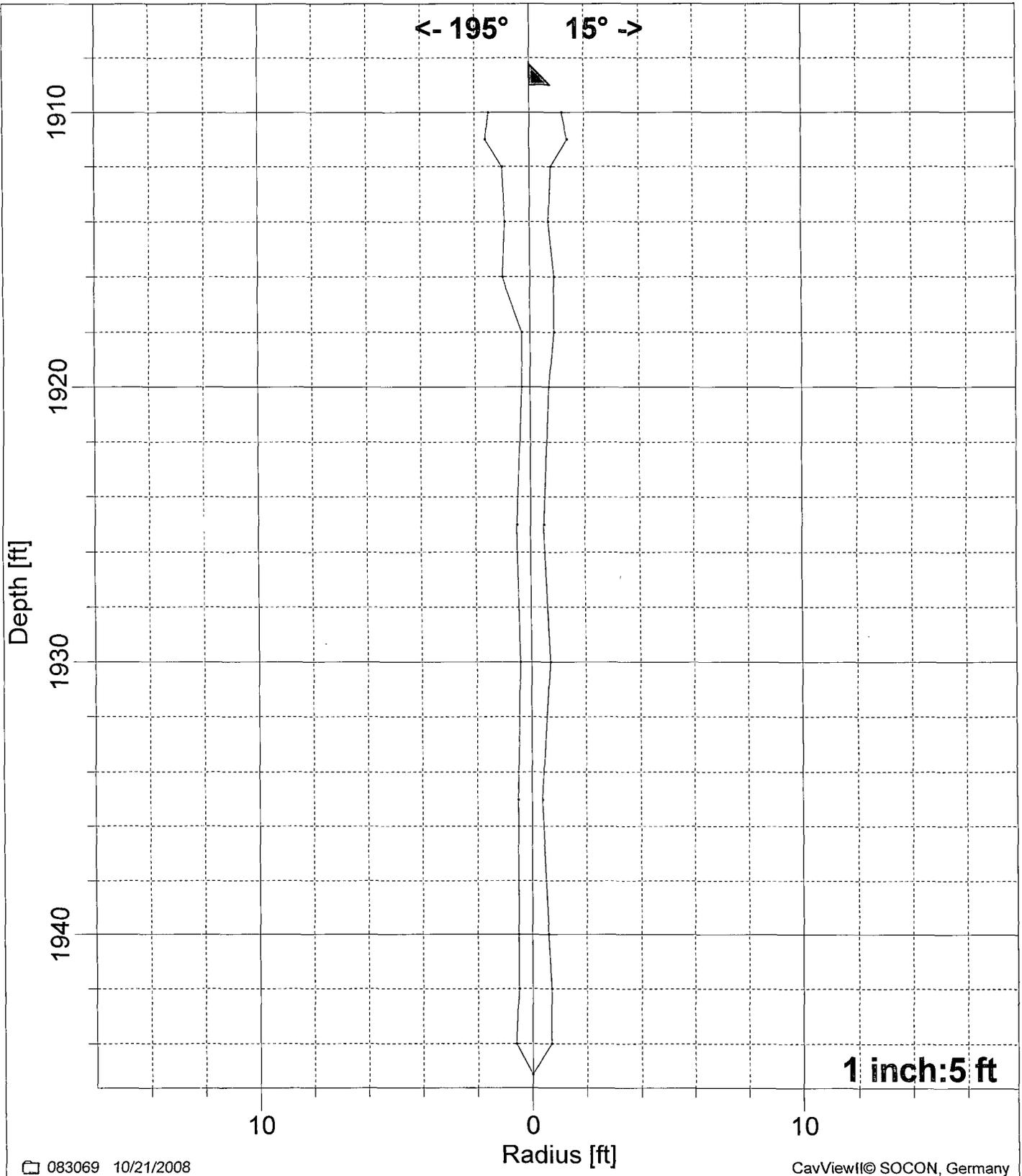
10/21/2008



4-1/2" : 1909.0 ft

Brine Well No: 04

10/21/2008

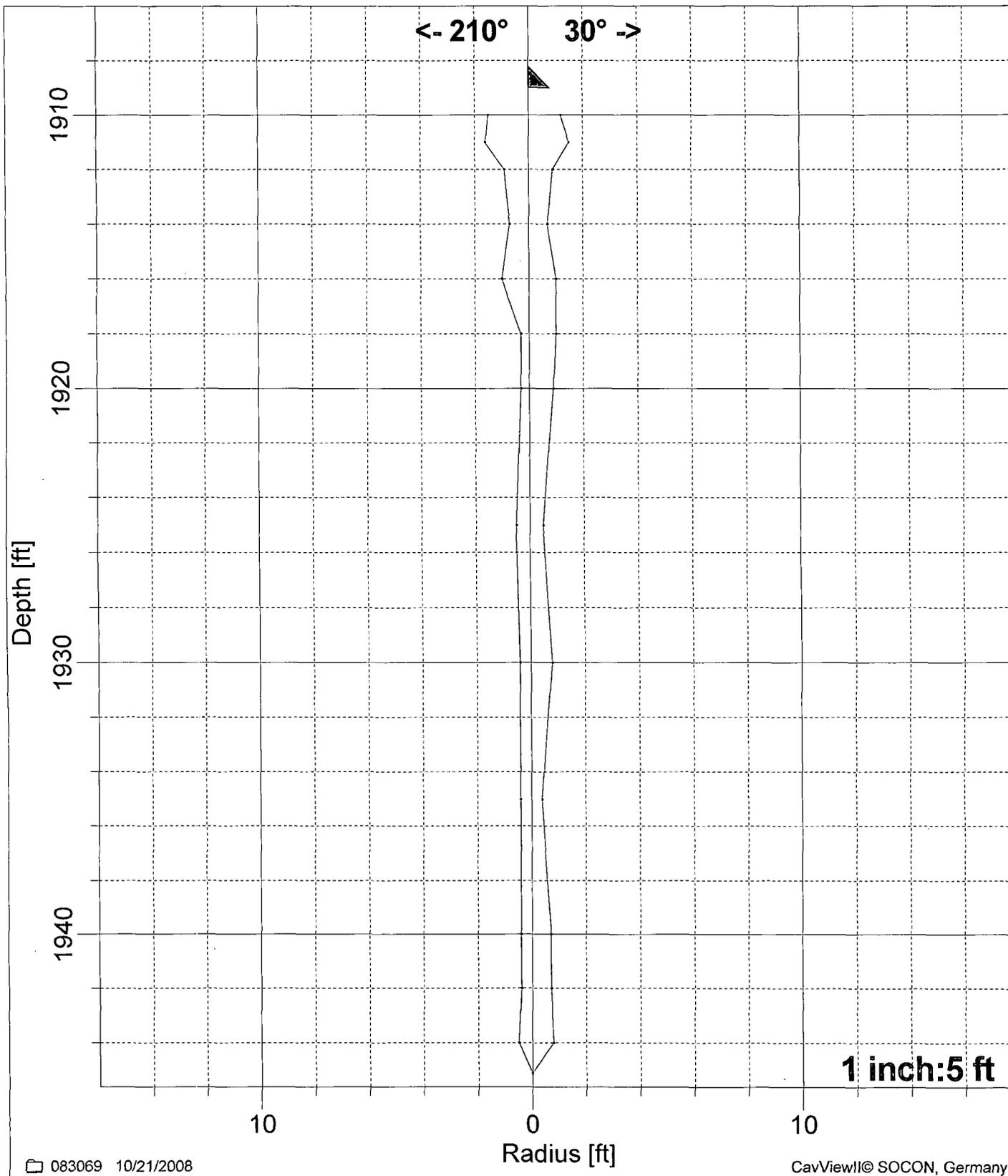


(10/21/2008)

4-1/2" : 1909.0 ft

Brine Well No: 04

10/21/2008

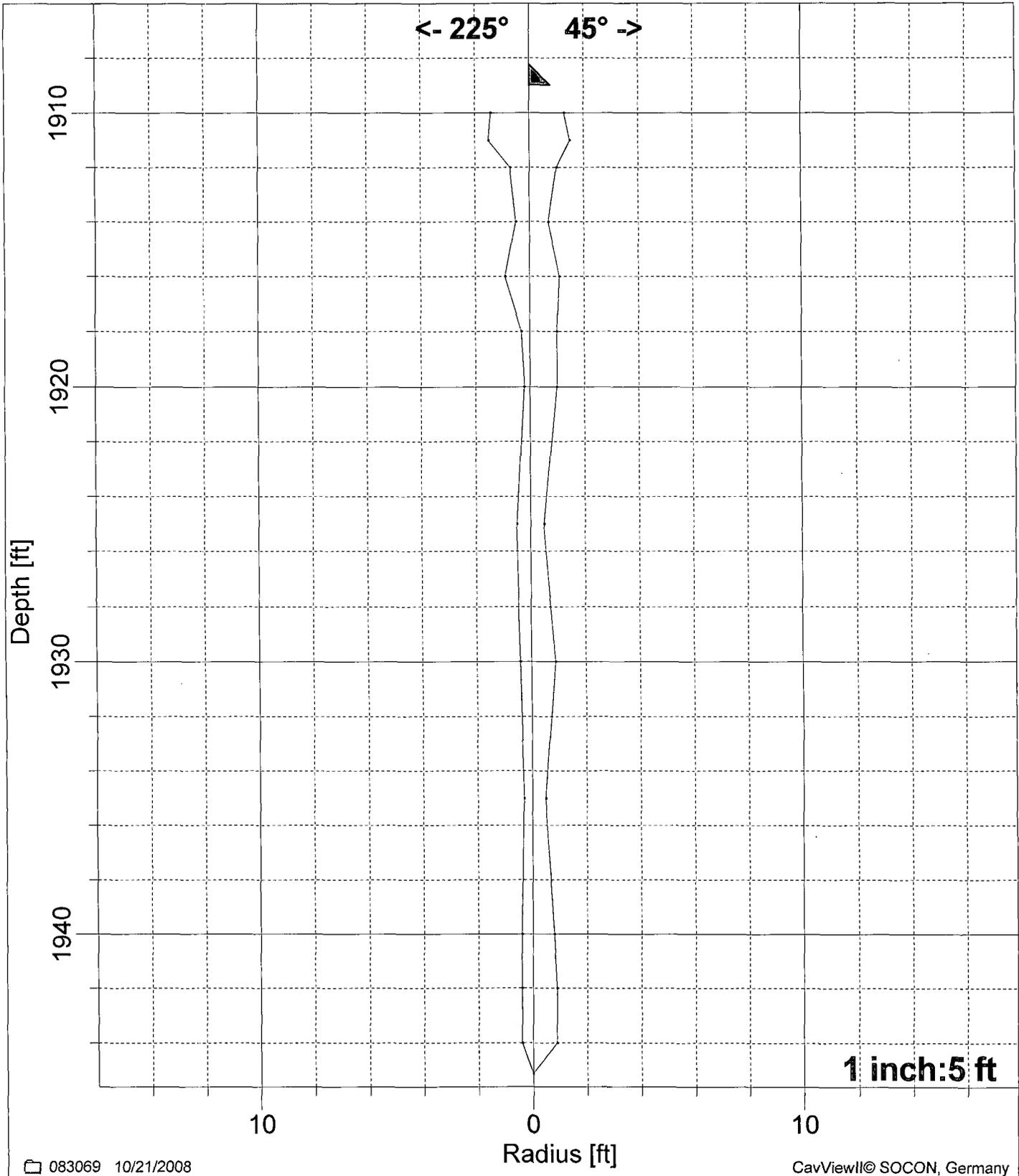


(10/21/2008)

4-1/2" : 1909.0 ft

Brine Well No: 04

10/21/2008

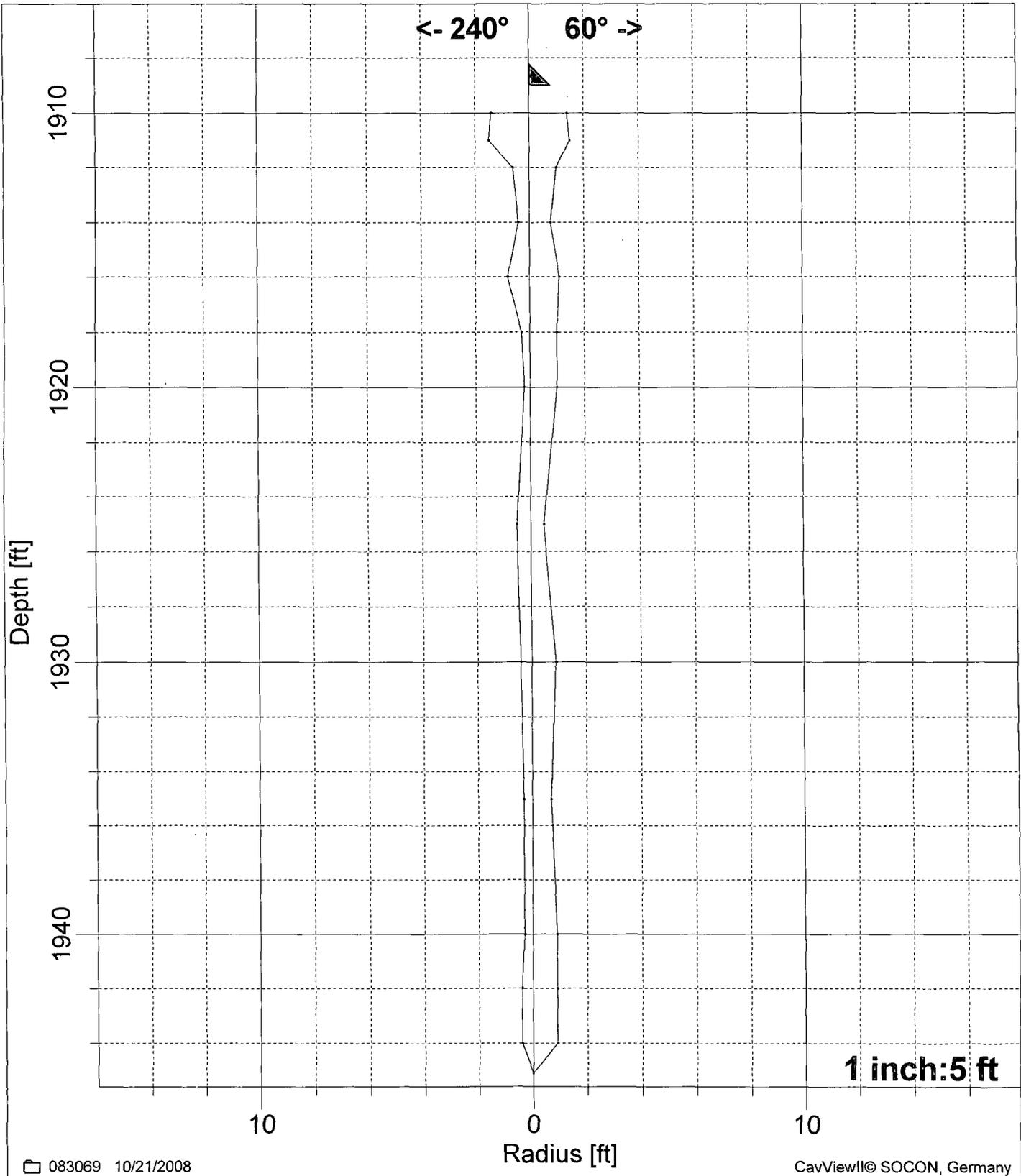


< - 225° 45° - >



Brine Well No: 04

10/21/2008

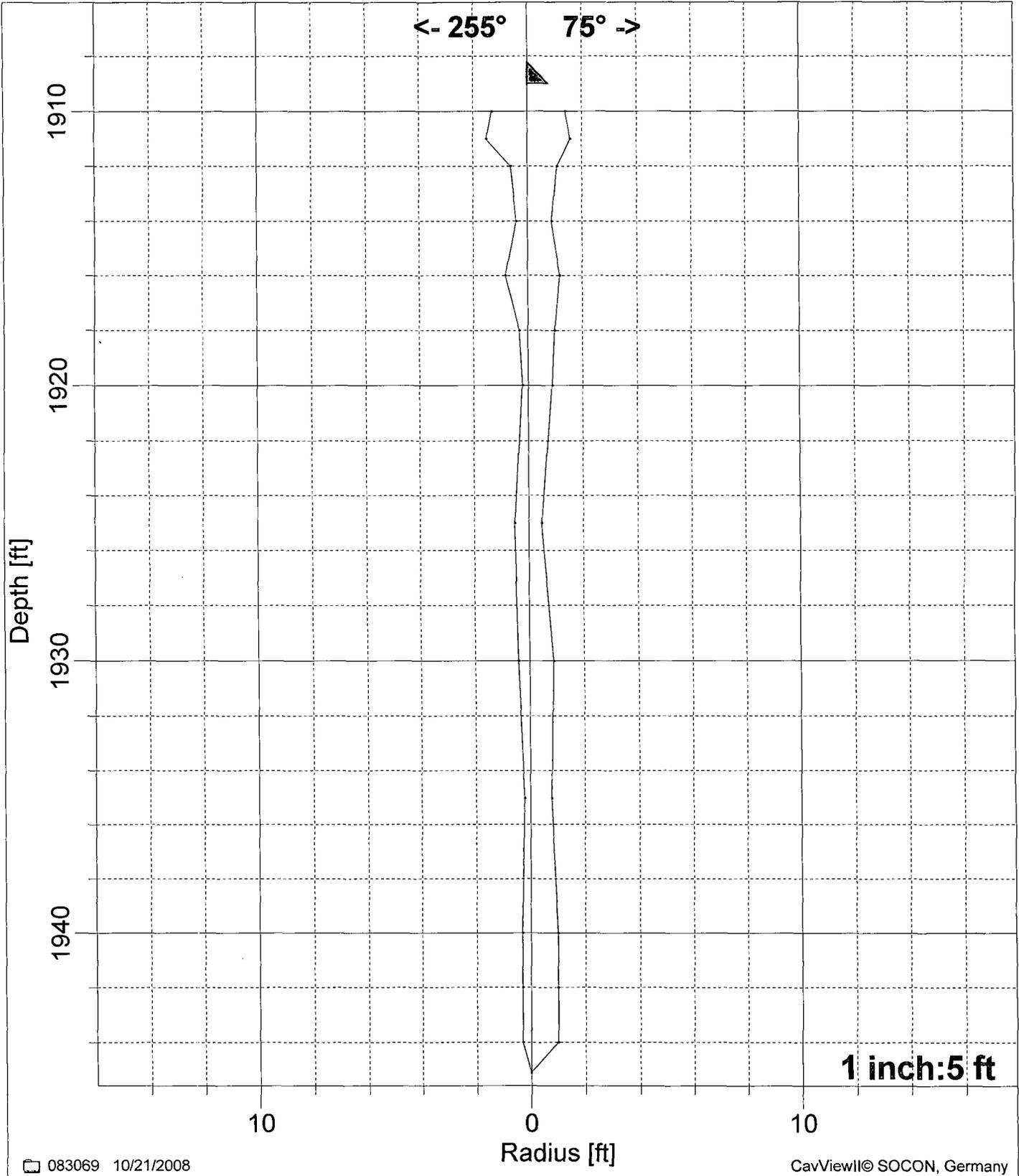


(10/21/2008)

4-1/2" : 1909.0 ft

Brine Well No: 04

10/21/2008



<- 255° 75° ->

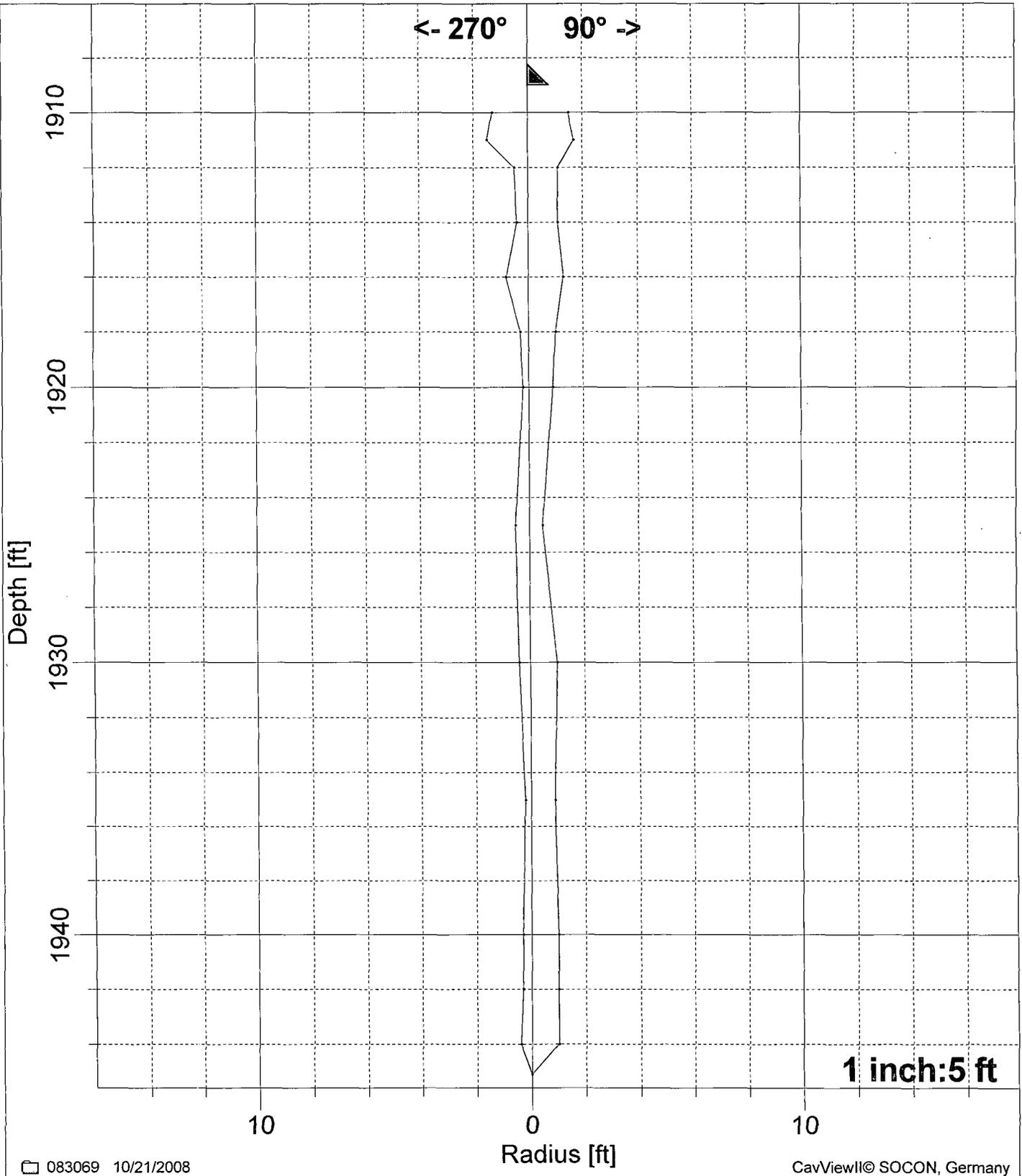
4-1/2" : 1909.0 ft

(10/21/2008)



Brine Well No: 04

10/21/2008

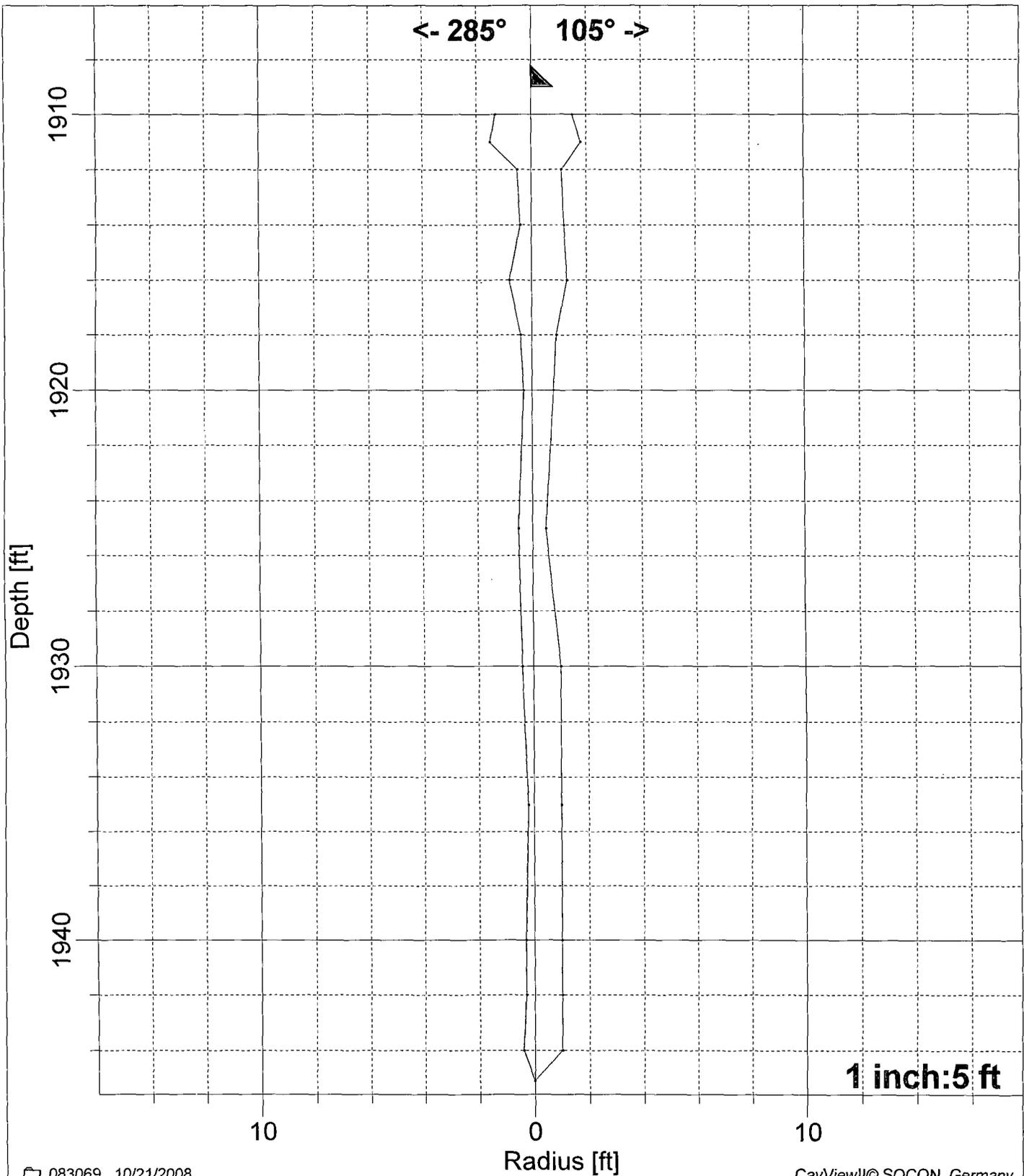


(10/21/2008)

4-1/2" : 1909.0 ft

Brine Well No: 04

10/21/2008



083069 10/21/2008

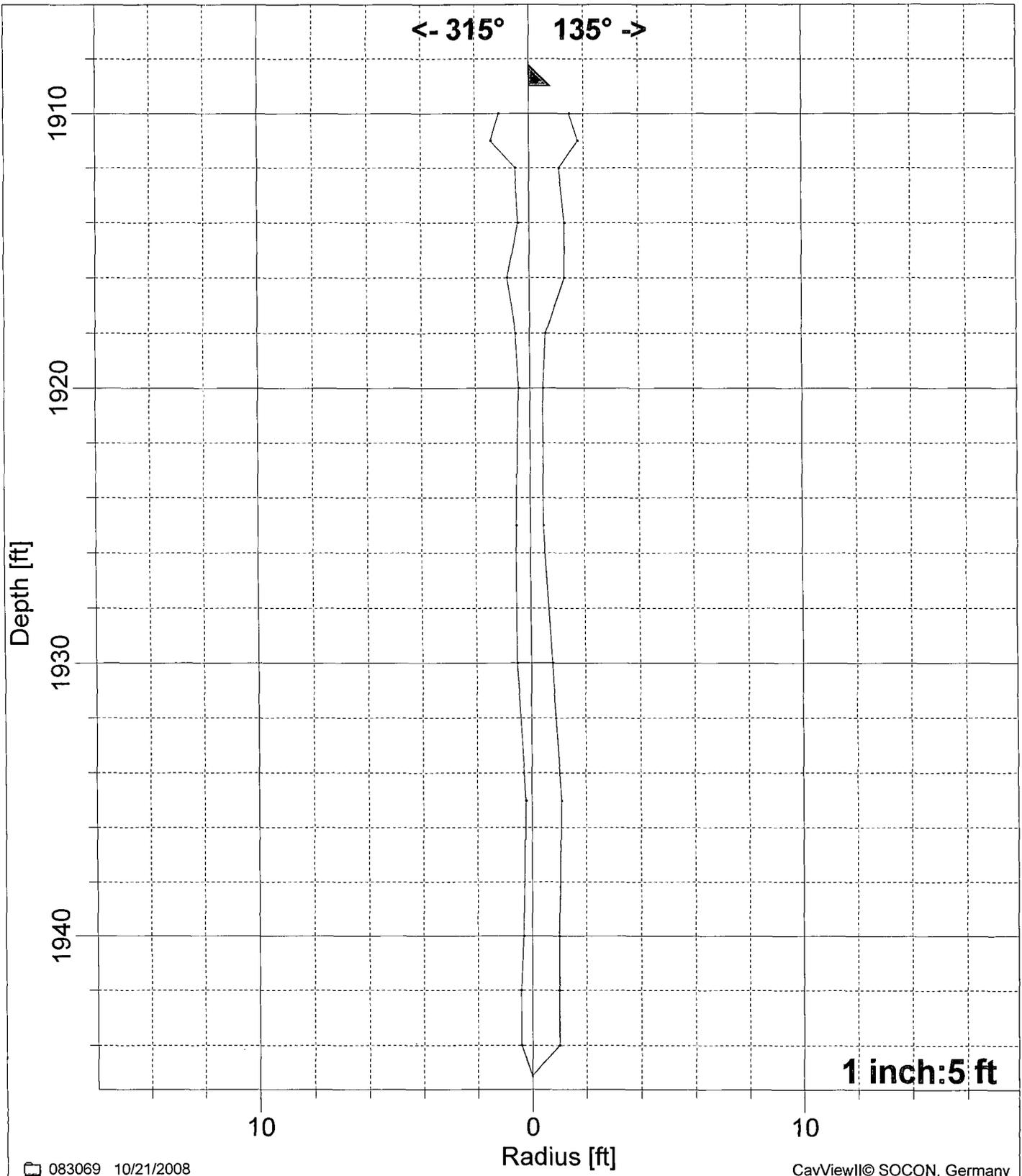
CavViewII© SOCON, Germany

(10/21/2008)

4-1/2" : 1909.0 ft

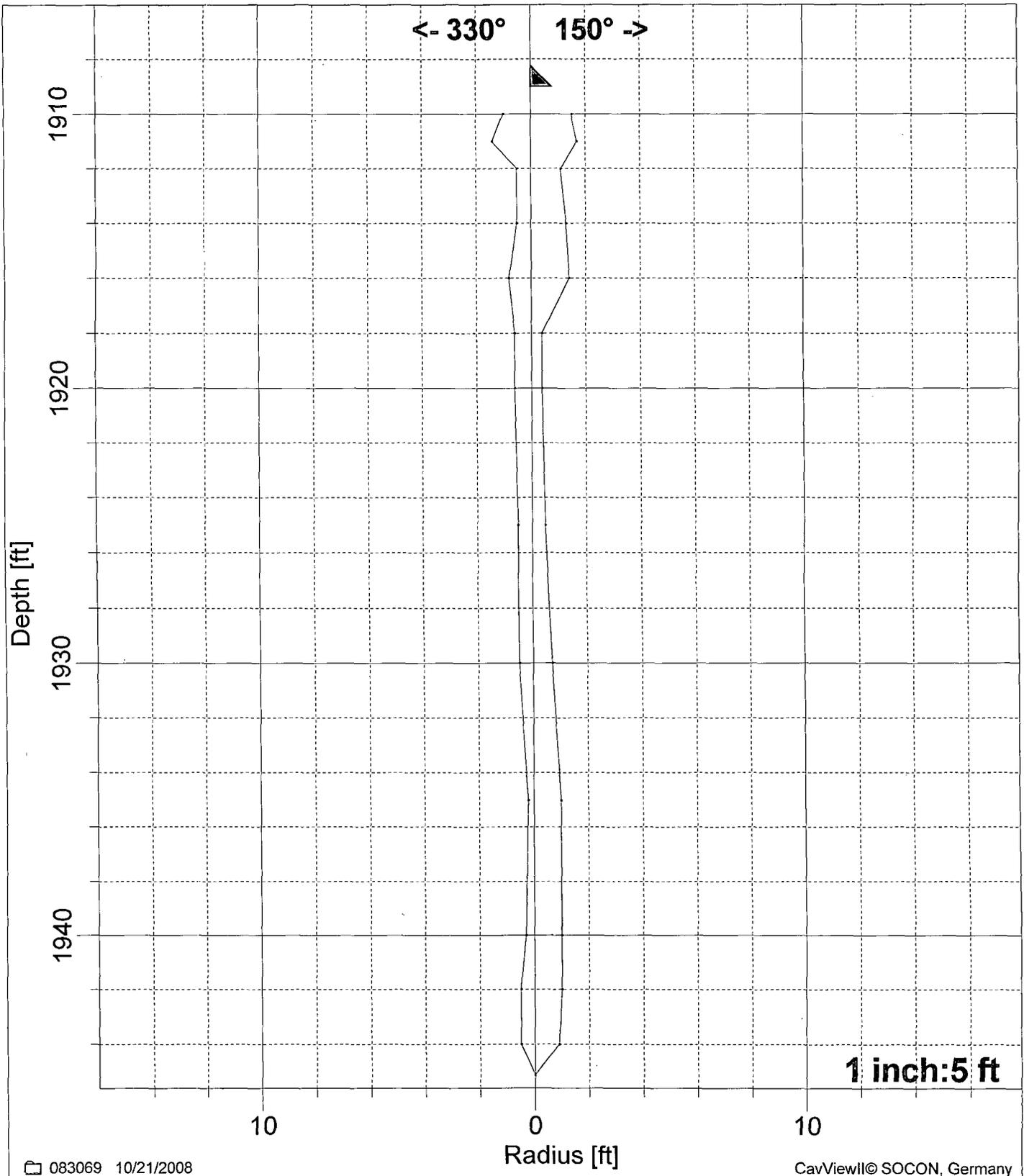
Brine Well No: 04

10/21/2008



Brine Well No: 04

10/21/2008



083069 10/21/2008

CavViewII© SOCON, Germany

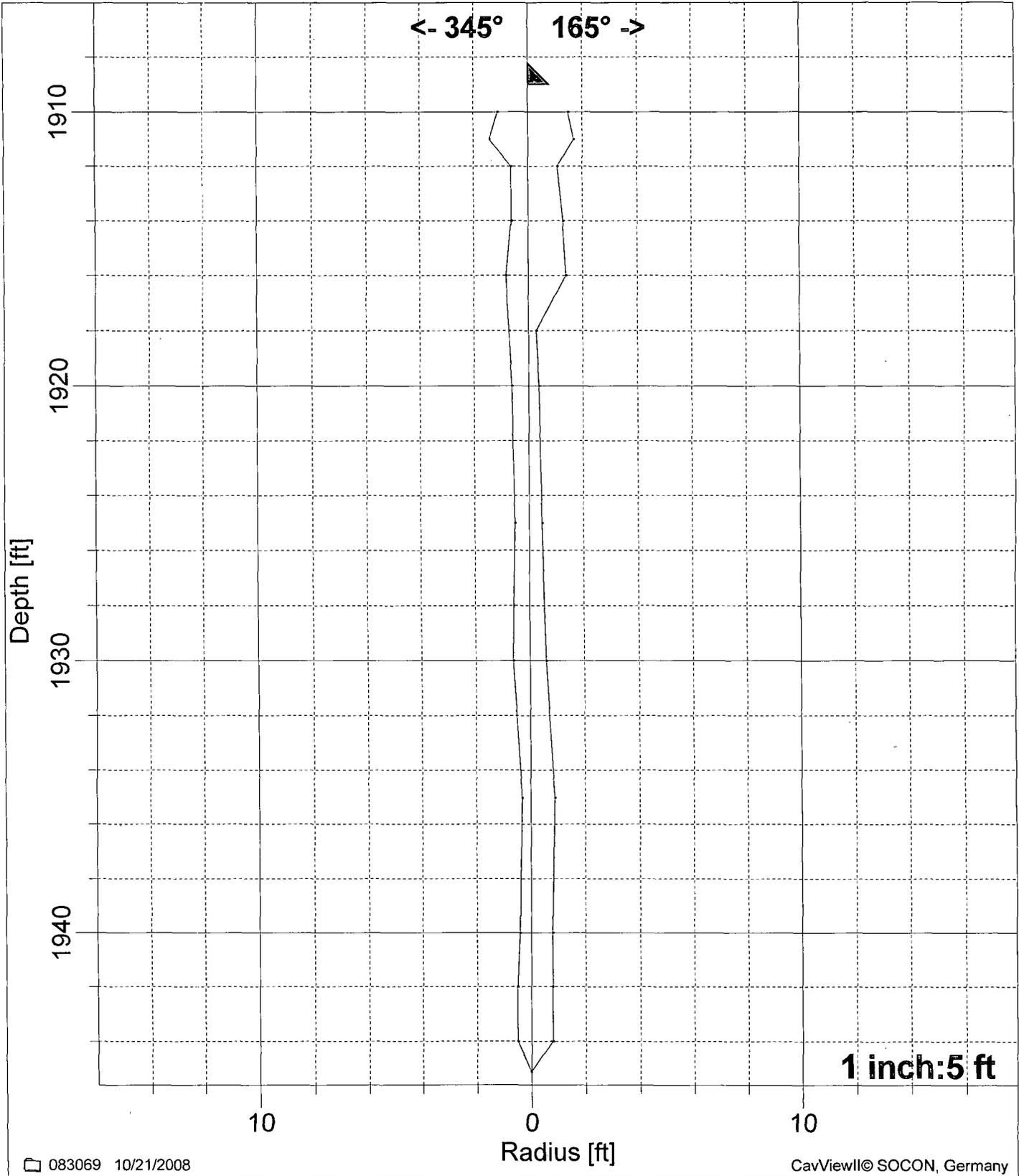
(10/21/2008)

4-1/2" : 1909.0 ft



Brine Well No: 04

10/21/2008



(10/21/2008)

4-1/2" : 1909.0 ft



SOCON Sonar Well Services, Inc.

Brine Well No: 04

083069

10/21/2008

HORIZONTAL SECTIONS

Brine Well No: 04

Report No.: 083069

Utilized speed of sound: 5902 feet/second

Measuring date: 10/21/2008

Scale: 1: 50

Horizontal sections measured at following depths:

1910.0 ft	1911.0 ft	1912.0 ft	1914.0 ft	1916.0 ft	1918.0 ft	1920.0 ft
1925.0 ft	1930.0 ft	1935.0 ft	1940.0 ft	1942.0 ft	1944.0 ft	

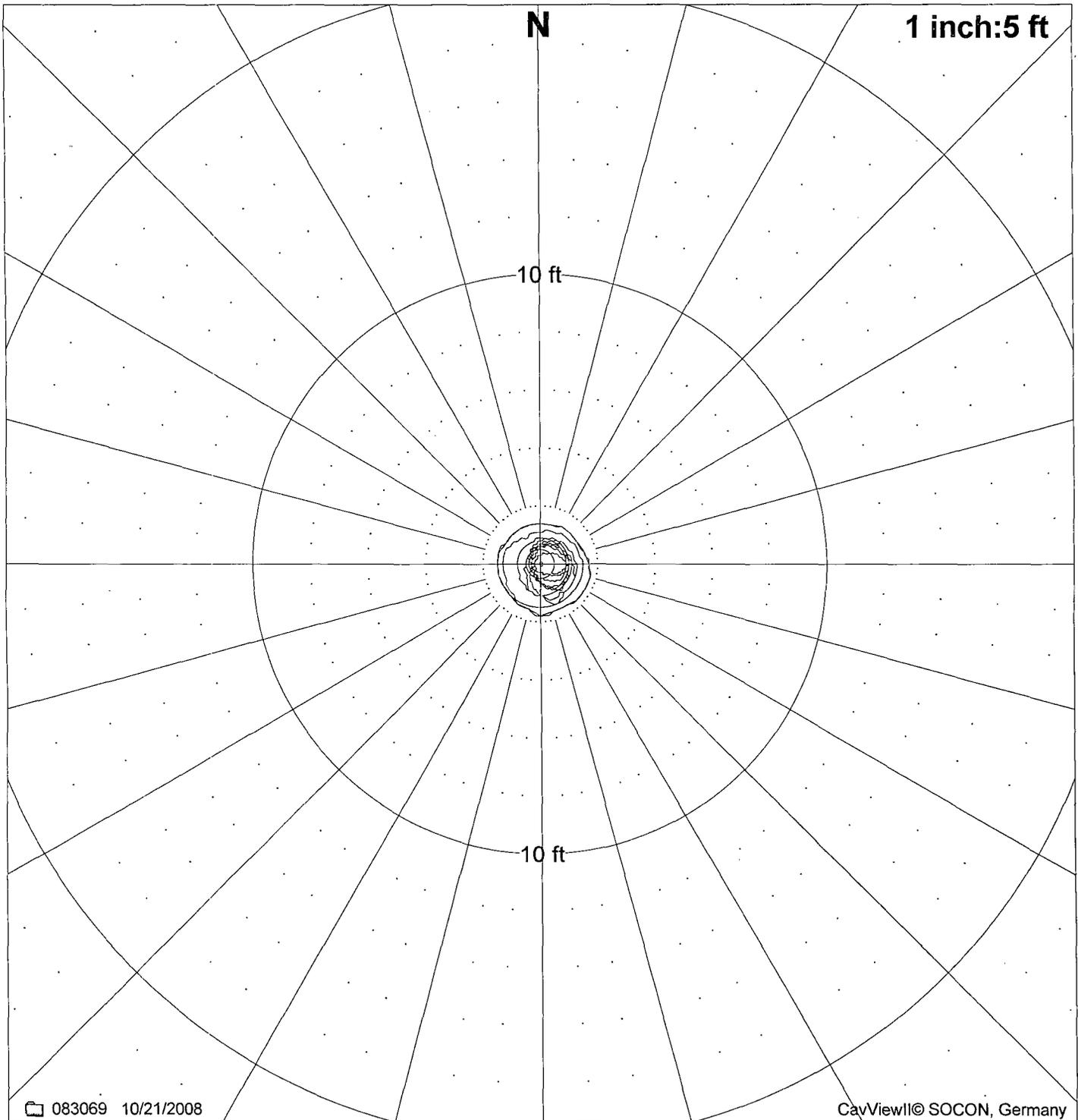
The following 1 section is constructed:

1945.0 ft

Brine Well No: 04

MAXPLOT

10/21/2008



083069 10/21/2008

CavViewII© SOCON, Germany

— Vertical maximum plot

— Horizontal sections

a/b

d_{max} : 3.3 ft $295^\circ \leftrightarrow 115^\circ$ r_{min} : 1.4 ft $\rightarrow 2^\circ$ r_{\sim} : 1.6 ft r_{max} : 1.8 ft $\rightarrow 100^\circ$

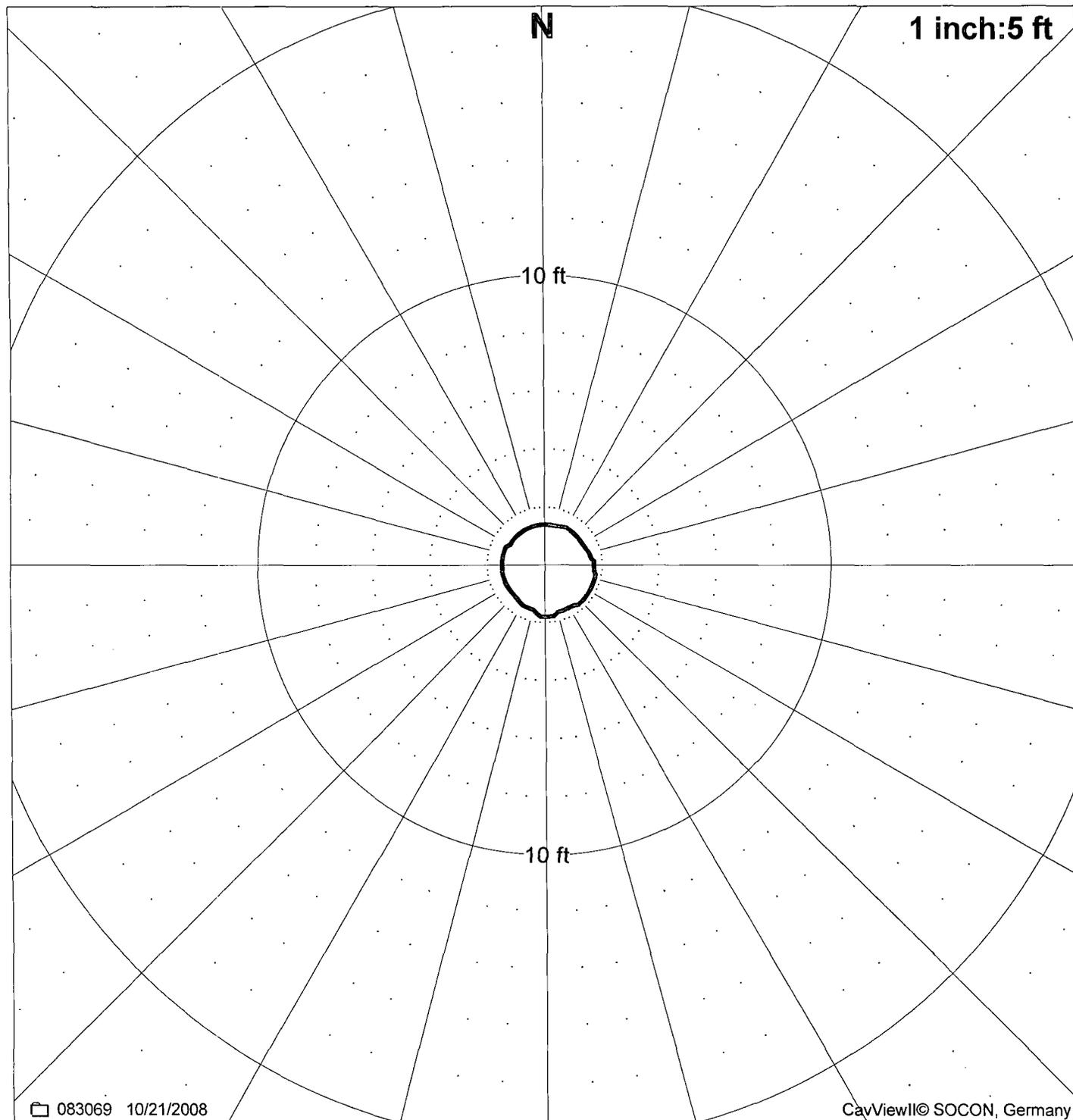
$a/b = 1.044$ $a = 3.3$ ft ($109^\circ-290^\circ$) $b = 3.2$ ft ($38^\circ-185^\circ$)

Area from vertical sections: 8 ft², Area from horizontal and vertical sections: 8 ft²

Brine Well No: 04

MAXPLOT

10/21/2008



a/b

— Horizontal/vertical maximum plot

□ Largest single area

d_{max} : 3.3 ft 295° \leftrightarrow 115° r_{min} : 1.4 ft \rightarrow 2° r_{\sim} : 1.6 ft r_{max} : 1.8 ft \rightarrow 100°

a/b = 1.044 a = 3.3 ft (109°-290°) b = 3.2 ft (38°-185°)

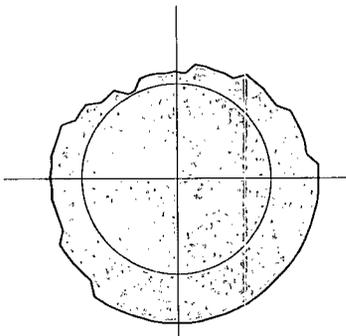
Largest single area: 8 ft² in depth: 1911.0 ft, Area from horizontal and vertical sections: 8 ft²



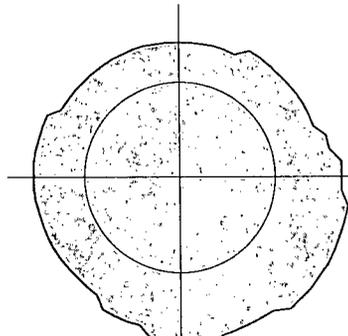
SOCON Sonar Well Services, Inc.

Horizontal slices 1 - 12

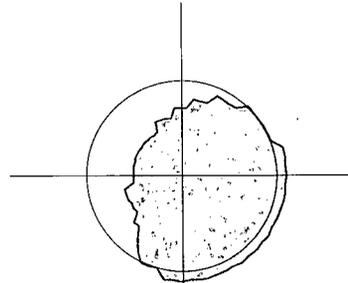
□ Cavity: Brine Well No: 04 Report number: 083069 Date: 10/21/2008



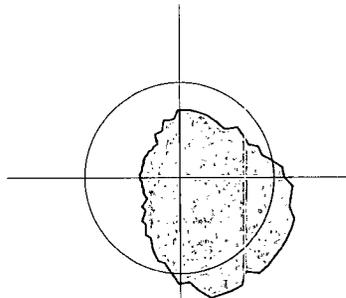
1910.0 ft / 6 ft²



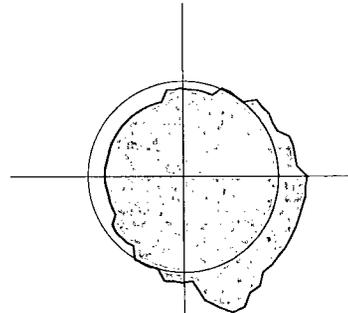
1911.0 ft / 8 ft² (max)



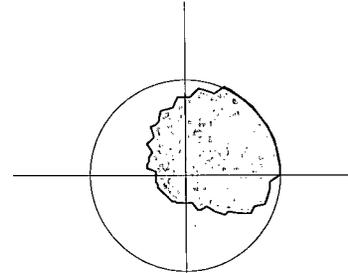
1912.0 ft / 2 ft²



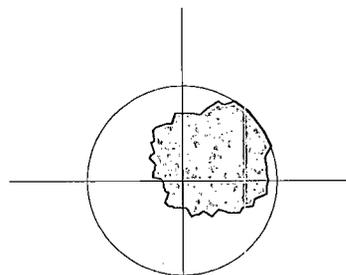
1914.0 ft / 2 ft²



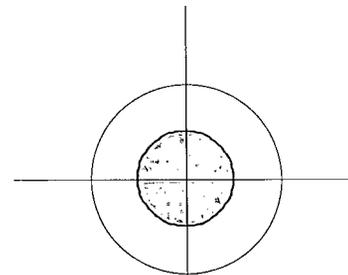
1916.0 ft / 3 ft²



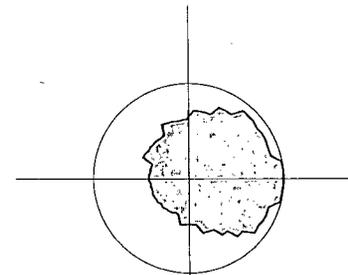
1918.0 ft / 1 ft²



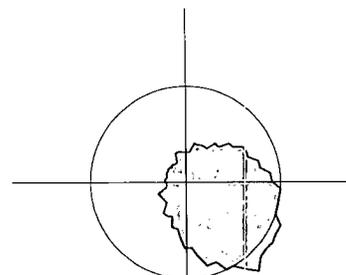
1920.0 ft / 1 ft²



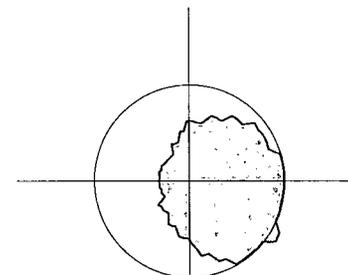
1925.0 ft / 1 ft²



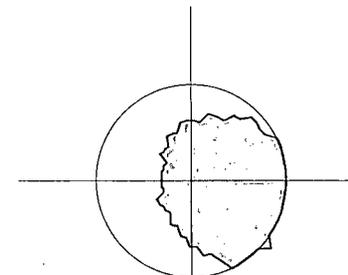
1930.0 ft / 1 ft²



1935.0 ft / 1 ft²



1940.0 ft / 1 ft²



1942.0 ft / 2 ft²

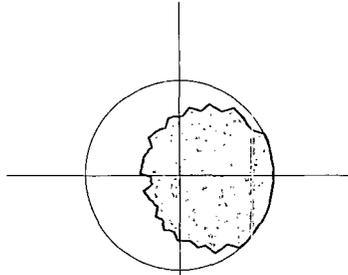
The distance between 2 circles equals 1 ft



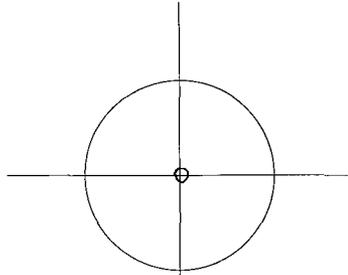
SOCON Sonar Well Services, Inc.

Horizontal slices 13 - 14

 Cavity: Brine Well No: 04 Report number: 083069 Date: 10/21/2008



1944.0 ft / 2 ft²



1945.0 ft / 0 ft²

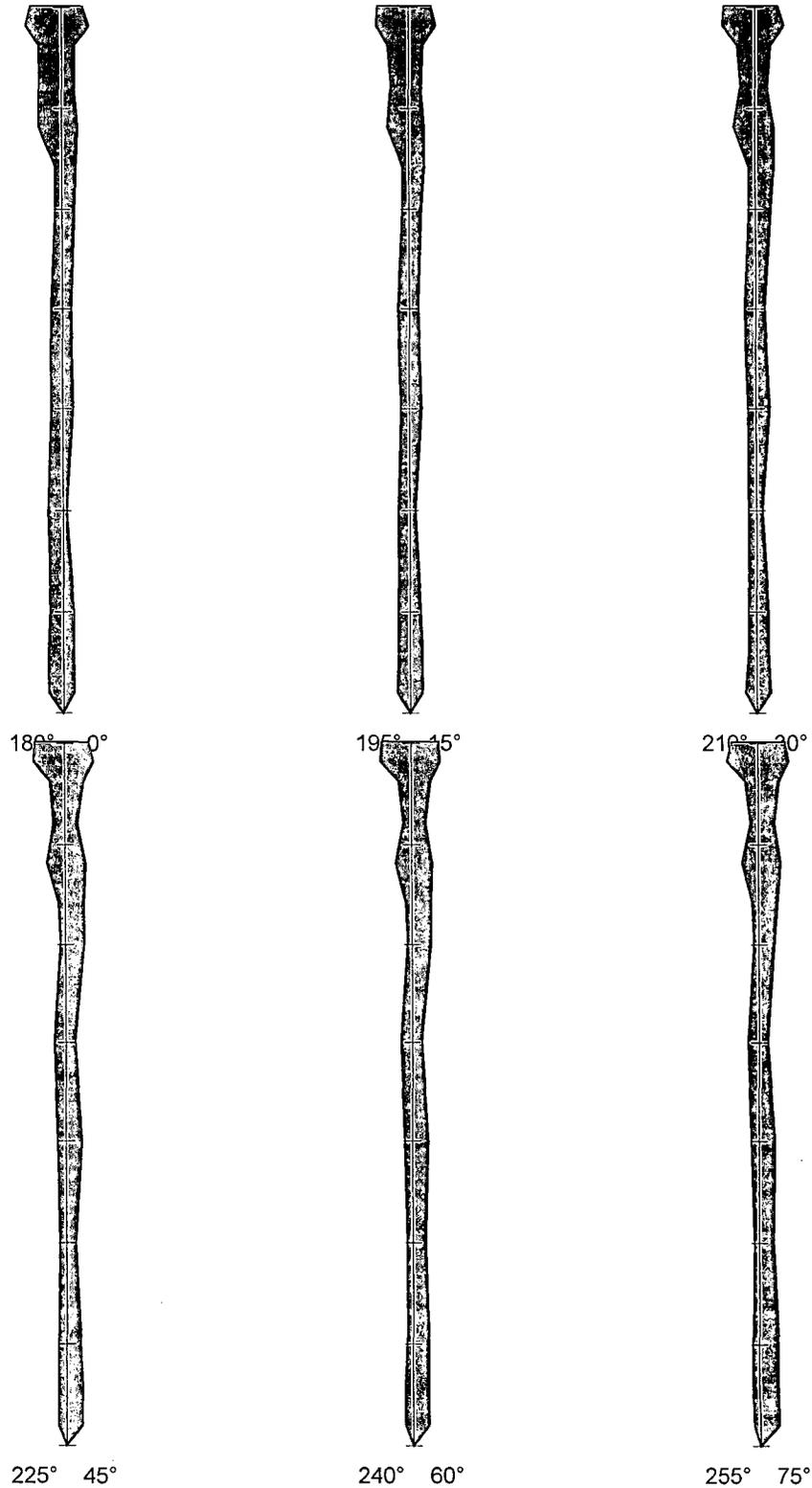


SOCON Sonar Well Services, Inc.

Vertical slices 1 - 6



Cavity: Brine Well No: 04 Report number: 083069 Date: 10/21/2008



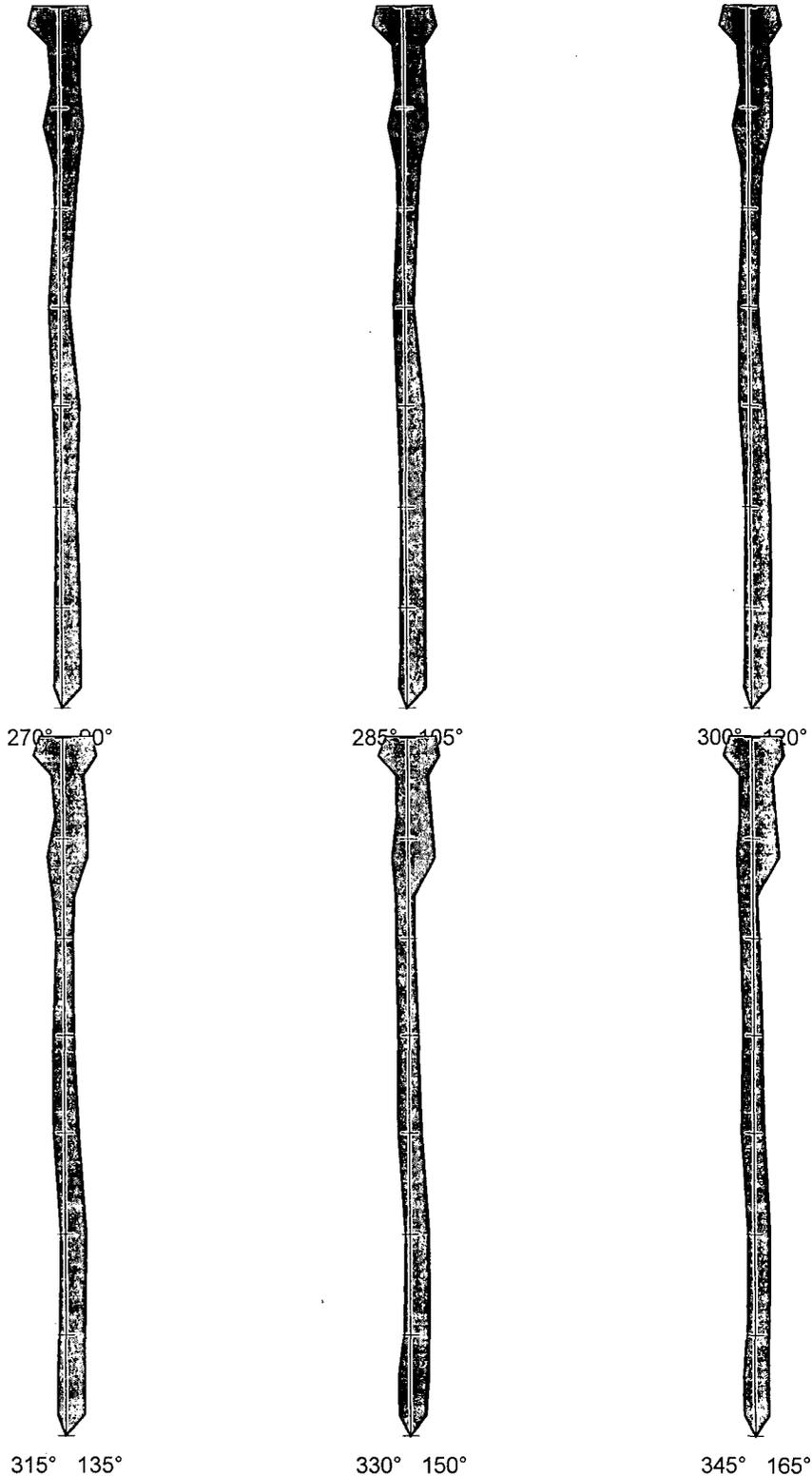
Range from 1910 ft to 1945 ft, step 5 ft



SOCON Sonar Well Services, Inc.

Vertical slices 7 - 12

 Cavity: Brine Well No: 04 Report number: 083069 Date: 10/21/2008



Range from 1910 ft to 1945 ft, step 5 ft

Conditions accepted by: "I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment."

Gandy Corporation
Company Name

Larry Gandy
Company Representative-Printed

Larry Gandy
Company Representative-Signed

Secretary/Treasurer
Title

02/11/10
Date

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Wednesday, November 18, 2009 7:02 AM
To: 'Prather, Steve'; 'gandy2@leaco.net'; 'James Millett'; 'Clay Wilson'; 'Bob Patterson'; 'David Pyeatt'; 'garymschubert@aol.com'; 'Gary Schubert'
Cc: Griswold, Jim, EMNRD; VonGonten, Glenn, EMNRD; Sanchez, Daniel J., EMNRD
Subject: UIC Class III Well Annual Report Schedule for Submittal & Content REMINDER- 2010
Attachments: Annual Reports 2010.xls

Gentlemen:

Good morning. You may recall an e-mail message from me this past Summer alerting you to the reporting provision of your current discharge permit (permit) and how the New Mexico Oil Conservation Division (OCD) is stepping up its efforts to track reporting under issued permits.

Please find attached a spreadsheet listing the dates that OCD expects to receive your Annual Reports and/or any reporting requirements from your permit. If you are an operator with limited reporting requirements based on your permit, you are welcome to follow the format and content required from more recent permit renewals issued by the OCD, which are more comprehensive and constitute a report. Any renewed permits will likely require similar content anyway.

Please plan on meeting the Annual Report submittal dates in January of 2010 as failure to submit the report will constitute a violation under the Federal Underground Injection Control (UIC) Program and reporting to the United States Environmental Protection Agency, which could result in the shut-in and/or plug and abandonment of your brine production well.

Please contact me if you have questions. Thank you in advance for your cooperation in this matter.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: <http://www.emnrd.state.nm.us/ocd/index.htm>
(Pollution Prevention Guidance is under "Publications")

CC: Brine Well File "Annual Reporting"

NMOCD UIC Annual Reports

11/18/09

Permit ID **Operator** **Annual Rpt. Due Date** **Submitted**

Annual Report Contents

BW-2 Basic Energy

01/31/10

L. Annual Report: All operators shall submit an annual report due on January 31 of each

year. The report shall include the following information:

1. Cover sheet marked as "Annual Brine Well Report, name of operator, BW permit #, API# of well(s), date of report, and person submitting report.
2. Brief summary of brine wells operations including description and reason for any remedial or major work on the well. Copy of C- 103.
3. Production volumes as required above in 21 .G. including a running total should be carried over to each year. The maximum and average injection pressure.
4. A copy of the chemical analysis as required above in 21 .1-1.
5. A copy of any mechanical integrity test chart, including the type of test, i.e. open to formation or easing test.
6. Brief explanation describing deviations from normal production methods.
7. A copy of any leaks and spills reports.
8. If applicable, results of any groundwater monitoring.
9. Information required from cavity/subsidence 21 .F. above.
10. An Area of Review (AOR) summary.
11. Sign-off requirements pursuant to WQCC Subsection G 20.6.2.5101.

BW-4

Gandy Corp.

01/31/10

L. Annual Report: All operators shall submit an annual report due on January 31 of each year. The report shall include the following information:

1. Cover sheet marked as "Annual Brine Well Report, name of operator, BW permit #, API# of well(s), date of report, and person submitting report.
2. Brief summary of brine wells operations including description and reason for any remedial or major work on the well. Copy of C- 103.
3. Production volumes as required above in 21 .G. including a running total should be carried over to each year. The maximum and average injection pressure.
4. A copy of the chemical analysis as required above in 21 .1-1.
5. A copy of any mechanical integrity test chart, including the type of test, i.e. open to formation or easing test.
6. Brief explanation describing deviations from normal production methods.
7. A copy of any leaks and spills reports.
8. If applicable, results of any groundwater monitoring.
9. Information required from cavity/subsidence 21 .F. above.
10. An Area of Review (AOR) summary.
11. Sign-off requirements pursuant to WQCC Subsection G 20.6.2.5101.

BW-8

PAB- Salty Dog

Mo. w/ Qity Rpts.

BW-22 Gandy Corp. 01/31/10

L. Annual Report: All operators shall submit an annual report due on January 31 of each year. The report shall include the following information:

1. Cover sheet marked as "Annual Brine Well Report, name of operator, BW permit #, API# of well(s), date of report, and person submitting report.
 2. Brief summary of brine wells operations including description and reason for any remedial or major work on the well. Copy of C-103.
 3. Production volumes as required above in 21 .G. including a running total should be carried over to each year. The maximum and average injection pressure.
 4. A copy of the chemical analysis as required above in 21.H.
 5. A copy of any mechanical integrity test chart, including the type of test, i.e. open to formation or casing test.
 6. Brief explanation describing deviations from normal production methods.
 7. A copy of any leaks and spills reports.
 8. If applicable, results of any groundwater monitoring.
 9. Information required from cavity/subsidence 21 .F. above.
 10. An Area of Review (AOR) summary.
 11. Sign-off requirements pursuant to WQCC Subsection G 20.6.2.5101.
6. Production/Injection Volumes/Annual Report: The volumes of fluids injected (fresh water) and produced (brine) will be recorded monthly and submitted to the OCD Santa Fe Office in an annual report due on the thirty-first (31) day of January of each year.

BW-25 Basic Energy 01/31/10

BW-27 Mesquite 01/01/10

7. Production/Injection Volumes: The volumes of fluids injected (fresh water) and produced (brine) will be recorded monthly and submitted to the OCD Sanla Fe Office in an annual report due on the first day of January of each year.

BW-28 Emy Energy Services LL 01/31/10

L. Annual Report: All operators shall submit an annual report due on January 31 of each year. The report shall include the following information:

1. Cover sheet marked as "Annual Brine Well Report, name of operator, BW permit #, API# of well(s), date of report, and person submitting report.
2. Brief summary of brine wells operations including description and reason for any remedial or major work on the well. Copy of C-103.
3. Production volumes as required above in 21 .G. including a running total should be carried over to each year. The maximum and average injection pressure.
4. A copy of the chemical analysis as required above in 21 .H.
5. A copy of any mechanical integrity test chart, including the type of test, i.e. open to formation or casing test.
6. Brief explanation describing deviations from normal production methods.
7. A copy of any leaks and spills reports.
8. If applicable, results of any groundwater monitoring.
9. Information required from cavity/subsidence 21 .F. above.
10. An Area of Review (AOR) summary.
11. Sign-off requirements pursuant to WQCC Subsection G 20.6.2.5101.

- BW-30 Liquid Resources 01/31/10
- L. Annual Report: All operators shall submit an annual report due on January 31 of each year. The report shall include the following information:
1. Cover sheet marked as "Annual Brine Well Report, name of operator, permit ~, API~ of well(s), date of report, and person submitting report.
 2. Brief summary of brine wells operations including description and reason for any remedial or major work on the well. Copy of C-103.
 3. Production volumes as required above in 21 .G. including a running total should be carried over to each year. The maximum and average injection pressure.
 4. A copy of the chemical analysis as required above in 21 .H.
 5. A copy of any mechanical integrity test chart, including the type of test, i.e. open to formation or casing test.
 6. Brief explanation describing deviations from normal production methods.
 7. A copy of any leaks and spills reports.
 8. If applicable, results of any groundwater monitoring.
 9. Information required from cavity/subsidence 21 .F. above.
 10. An Area of Review (AOR) summary.
 11. Sign-off requirements pursuant to WQCC Subsection G 20.6.2.5 101.
- BW-31 HRC- Schubert 01/31/10
6. Production/Injection Volumes/Annual Report: The volumes of fluids injected (fresh water) and produced (brine) will be recorded monthly and submitted to the OCD Santa Fe Office in an annual report due on the thirty-first (31) day of January of each year.

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Friday, September 25, 2009 1:48 PM
To: 'Prather, Steve'; 'gandy2@leaco.net'; 'James Millett'; 'Clay Wilson'; 'Bob Patterson'; 'Blevins, Sam'; 'David Pyeatt'; 'garymschubert@aol.com'
Cc: Sanchez, Daniel J., EMNRD; VonGonten, Glenn, EMNRD; Griswold, Jim, EMNRD; Jones, William V., EMNRD
Subject: New Mexico Oil Conservation Division Class III Solution Mining Well Operator Notice-- ANNUAL REPORTS

Gentlemen:

Re: Annual Reporting

You are receiving this message because you are currently operating a Underground Injection Control (UIC) Class III Solution Mining Well in New Mexico under an Oil Conservation Division (OCD) Discharge Permit. You may be aware of the most recent events related to OCD Class III Wells in New Mexico and can find out more by visiting the OCD's Website at <http://www.emnrd.state.nm.us/OCD/brinewells.htm> and OCD Brine Well Work Group Website at <http://ocdimage.emnrd.state.nm.us/imaging/AEOrderFileView.aspx?appNo=pCJC0906359521>.

The OCD is writing to inform you that it will be monitoring the receipt of your "Annual Reports" under the applicable section of your OCD discharge permit. The OCD has been deficient in tracking reporting obligations in the past; however, the OCD has recently upgraded our online system to track operators who are not meeting the reporting requirements specified in OCD Discharge Permits. Please plan on submitting the report with the required information by the date required in your discharge permit.

To access your OCD Discharge Permit Online for the date of submittal and contents of the report, please go to OCD Online at <http://ocdimage.emnrd.state.nm.us/imaging/AEOrderCriteria.aspx> (enter "Order Type" as BW and your "Order Number"). If you have not submitted an Annual Report (report) for your well, a historical review of your injection and production records will be required in order to provide cumulative injection and production information in this year's report.

Please contact me if you have questions or need assistance.

Thank you in advance for your cooperation in this matter.

Copy: Brine Well Files BWs 2, 4, 8, 22, 25, 27, 28, 30 & 31

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: <http://www.emnrd.state.nm.us/ocd/index.htm>
(Pollution Prevention Guidance is under "Publications")