BW-004

SUBSIDENCE MONUMENT INSTALL REPORT

2024

April 21, 2024

Reference: Wasserhund Inc Brine Well BW-04
Ul M-sec 31-Ts 16s-R 35e

Title: Subsidence Monitor(s) Report

This document contains the following elements:

1. BW-04 Subsidence install report.pdf
2. A Bertsen survey monitors Install instructions.pdf
3. BW-04 Sub MW Plat as built.pdf
4. Wasserhund BW-004 Vertical Subsidence Table (4-10-24).pdf
5. Photos-

Price LLC Subsidence Monitor Installation Report-

Annotated April 20, 2024

Glenn's Water Well Service, Inc.

8 South NM 206
PO Box 692
Tatum, NM 88267

Phone: 575-398-2424
Cell: 575-369-5145
Email: travis.glenn@outlook.com

12/18/23

Note: Price LLC was on-site as third party Witness and Acted as Quality Control Engineering Services.

3/4/24

Arrived on site at 9:00 AM and discussed the procedure to set the subsidence monuments with Wayne Price Jr. Using a Cat 299D3 Compact Track Loader equipped with a 12" rock tooth auger, we started drilling the holes for the monuments. We drilled through 3" of soil then 12" of loose caliche rock then we hit the hard pan (cap) of the caliche layer. It was extremely hard down to 36" then it soften and we drilled another 12". We elected to drill through the hard pan because the 9/16" stainless steel rod would not have been able to be driven through it. After cleaning out the bore hole, we mechanically drove 8.5' (including bottom point and datum) of SS rod using a tee post driver, finishing with the datum 2-3" below the surface. Monuments #1, #3 and #4 were similar in geology. Monument #2 had 12" of caliche on top of the soil that was put down during the cattle guard installation, below that it was similar to the other holes. After drilling the 4 holes and driving the stainless steel rods, we cleaned up the area and left. Wayne Jr. preferred not to purge and sample the monitor well until we finished with the monuments.

3/5/24

Arrived on site at 10:30 AM after going to Hobbs to get 56 – 50# bags of play sand from Home Depot. In each hole, we filled with clean play sand to 39" below the datum. Then we glued the yellow caps in the ends of the pink security sleeves and pumped ½ tube of grease in each sleeve. We then slid the sleeve over the SS rod and pushed it down to 3" below the datum. After that, we filled the hole with more sand stopping at 22" below ground level. The monument access covers would not fit inside the 6" schedule 40 PVC until I machined the aluminum insert off .065". We then attached the cover to the 6" X 24" PVC by drilling a hole through both and installing a #8 X 1" machine screw and nut. Following that, we set the PVC in the hole with the sleeve and rod inside of it leaving the top of the cap 1-2" above ground level to avoid rainwater running into the monument. We then mixed "Quikrete" cement and filled the annulus. After doming and finishing the cement we filled the inside of the PVC with clean play sand to within 2" of the top of the sleeve. Monuments #1, #3

and #4 used 6-50# bags of sand along with 5-80# bags of Quikrete. Monument #2 used 6-50# bags of sand and 8-80# bags of Quikrete. After discussing with Wayne Jr., we agreed to return on Thursday at 10:00 AM, cleaned the area and left at 4:30 PM.

3/7/24 Dressed up area:

Note for Clarification: There was some question concerning the depth of each rod, Price LLC made on-site recommendations to increase depth to a minimum of 8 ft.

Price LLC Photos of installation:

Berntsen International, Inc.
Marking the Boundaries of the Nations since 1972

NGS Three Dimensional Rod Monument Installation Instructions

GEOMETRIC GEODETIC ACCURACY STANDARDS
AND
SPECIFICATIONS FOR USING GPS RELATIVE POSITIONING TECHNIQUES
FEDERAL GEODETIC CONTROL COMMITTEE
VERSION 5.0: May 11, 1988

APPENDIX H. - SPECIFICATIONS AND SETTING PROCEDURES FOR THREE DIMENSIONAL MONUMENTATION

A. MATERIALS REQUIRED FOR SETTING MONUMENT:
1. Rod, stainless steel, 4-foot (1220 mm) sections [SS91604]
2. Rod, stainless steel, one 4 inch (100 mm) [M1DPA]
3. Studs (threads), stainless steel [M13 thread]
4. Datum point, stainless steel [SSDP1]
5. Spiral (fluted) rod entry point, standard [SS-12 Point]
6. NGS logo caps, standard, aluminum [BMAC-1, -5, -6]
7. Pipe, schedule 40 PVC, 5 (or 6) inches (127 mm or 152 mm) inside diameter, 2-foot (610 mm) length [5PVC24] [6PVC24]
8. Pipe, schedule 40 PVC, 1 inch (25 mm) inside diameter, 3-foot (915 mm) length [TSS3]
9. Caps, schedule 50 PVC, (Slip-on caps centered and drilled to 0.567 inch [14 mm] ±0.002 [.05mm]) [TSSEC-Y]
10. Cement, for making concrete
11. Cement, PVC solvent [Eclectic® UV-6800]
12. Loctite (2 oz. bottle)
13. Grease-MIL SPEC G-10924D (B15395A, Grade 7) [Bel-Ray NO TOX AA-1-1]
14. Fine-grained washed or play sand
15. Grease Gun
16. * (Vise grips or pipe wrench (2) to tighten each rod section together)

B. SETTING PROCEDURES:
1. The time required to set an average mark using the following procedures is 1 to 2 hours.

2. Using the solvent cement [Eclectic UV-6800] formulated specifically for PVC, glue the aluminum logo cap [BMAC] to a 2-foot (610 mm) section of PVC pipe [5PVC24]. This will allow the glue to set while continuing with the following setting procedures.

3. Glue the PVC cap with a drill hole [TSSEC-Y] on one end of the 3-foot (915 mm) section of schedule 40 PVC pipe 1-inch (25 mm) inside diameter [TSS3]. Pump the PVC pipe full of grease. Thoroughly clean the open end of the pipe with a solvent which will remove grease. Then glue another cap with drill hole on the remaining open end. Set aside while continuing with the next step. *(*NOTE: This step can also be done in advance, prior to going into the field.)*

4. ***IMPORTANT:*** **Use proper eye and ear protection!** Using a power auger or post hole digger, drill or dig a hole in the ground 12 - 14 inches (300 mm - 350 mm) in diameter and 3-1/2 feet (1100 mm) deep.
5. Attach the standard spiral (fluted) rod entry point [SS-12 point] to one end of the 4-foot (1220 mm) section of stainless steel rod [SS-916-04] with the standard 3/8 inch (10 mm) stud [M-13 thread]. On the opposite end screw on a short 4 inch (100 mm) piece of rod [M-1 DPA] which will be used as the impact point for driving the rod. Drive this section of rod with a reciprocating driver such as a *Pionjar 120, Cobra 148, Wacker BHB 25* or another machine with an equivalent driving force.

6. Remove the short piece of rod used for driving [M-1-DPA] and screw in a new stud [M-13 thread]. Attach another 4-foot (1220 mm) section of rod [SS-916-04]. Tighten securely *(*using vise grips or pipe wrenches)*. Reattach the short piece of rod [M-1-DPA]and drive the new section into the ground.

7. Repeat step 6 until the rod refuses to drive further or until a driving rate of 60 seconds per foot (300 mm) is achieved. The top of the rod should terminate about 3 inches (75 mm) below ground surface.
8. When the desired depth of rod is reached, cut off the top removing the tapped and threaded portion of the rod leaving the top about 3 inches (75 mm) below ground surface. The top of the rod must be shaped to a smooth rounded (hemispherical) top, using a portable grinding machine to produce a datum point. The datum point must then be center punched to provide a plumbing (centering) point. NOTE: For personnel that may not have the proper cutting or grinding equipment to produce the datum point, the following alternative procedure should be used if absolutely necessary. When the desired depth of the rod is obtained (an even 4-foot [1220 mm] section), thoroughly clean the thread with a solvent to remove any possible remains of grease or oil that may have been used when the rod was tapped. Coat the threads of the datum point with Loctite and screw the datum point into the rod. Tighten the point firmly with vise grips to make sure it is secure. The datum point is a stainless steel 3/8 inch (10 mm) bolt [SSDP-1] with the head precisely machined to 9/16 inch (14 mm).

9. Insert the grease filled 3-foot (915 mm) section of 1-inch (25 mm) PVC pipe sleeve [TSS3] over the rod. The rod and datum point should protrude through the sleeve about 3 inches (75 mm).

10. Backfill and pack with fine-grained washed or play sand around the sleeve [TSS3] to about 20 inches (500 mm) below surface. Place the 5-inch (127 mm) PVC [5PVC24] and logo cap [BMAC] over and around the 1-inch (25 mm) sleeve [TSS3] and rod. The datum point [SSDP-1] should be about 3 inches (75 mm) below the cover of the logo cap.

11. Place concrete around the outside of the 5-inch (127 mm) PVC [5PVC24] and logo cap [BMAC], up to the top of logo cover. Trowel the concrete until a smooth neat finish is produced.

12. Continue to backfill and pack with sand inside the 5-inch (127 mm) PVC [5PVC24] and around the outside of the 1-inch (25 mm) sleeve [TSS3] and rod to about 1 inch (25 mm) below the top of the sleeve.

13. Remove all debris and excess dirt to leave area in original condition. Make sure all excess grease is removed and the datum point [SSDP-1] is clean.
[SS-916-04] = Berntsen model number of material specified.
These instructions have been taken from ***GEOMETRIC GEODETIC ACCURACY STANDARDS AND SPECIFICATIONS FOR USING GPS RELATIVE POSITIONING TECHNIQUES (pages 46-48) -- Federal Geodetic Control Committee (Rear Admiral Wesley V. Hull, Chairman) -- Version 5.0: May 11, 1988; Reprinted with corrections: January 5, 2000.***

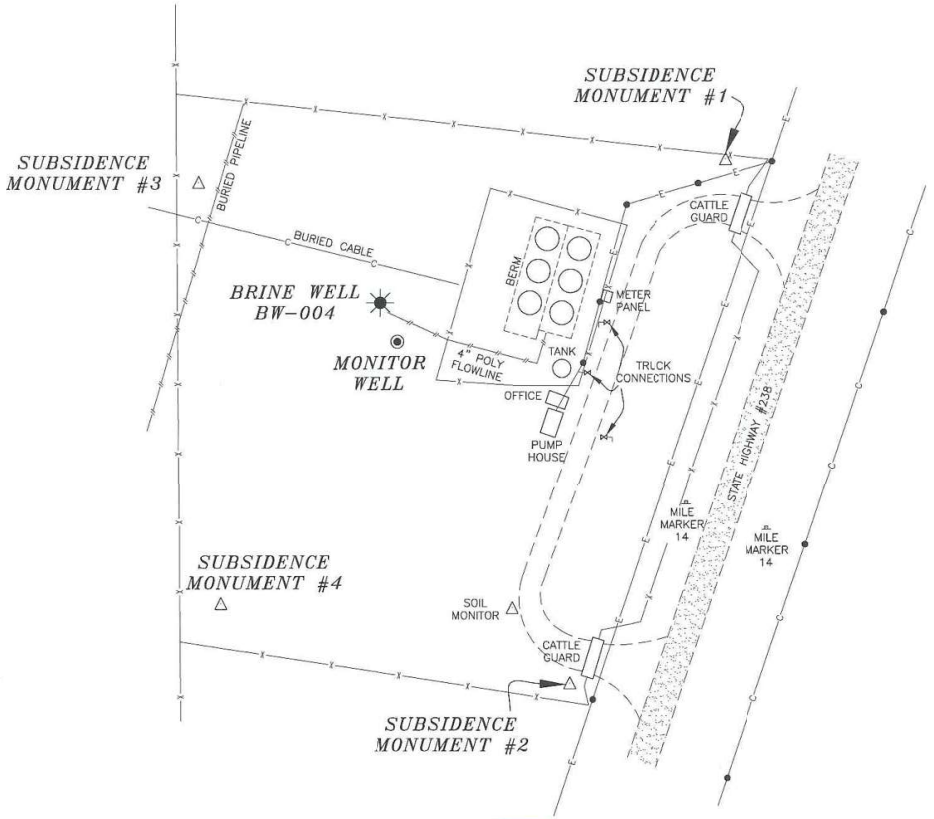
Note: These are to be used only as a guideline for geodetic surveys using GPS relative positioning techniques. **items in italics are added procedures recommended by Berntsen International.*

REMEMBER: "Any Monument Is Only As Stable As Its Backfill".

QUESTIONS? PLEASE CONTACT US FOR ASSISTANCE:
Email: surveymark@berntsen.com
Toll-Free Telephone: 1-800-356-7388 (USA, Canada and Caribbean Islands)
Toll-Free Fax: 1-800-249-9794 (USA, Canada and Caribbean Islands)
Telephone: +1 608.249.8549 (all other countries)
Fax: +1 608.249.9794 (all other countries)

WASSERHUND INC.

SURVEY OF FOUR SUBSIDENCE MONUMENTS AROUND THE WASSERHUND INC. BW-004 BRINE WELL (API#30-025-26883) INSIDE THE EIDSON BRINE STATION LOCATED IN THE SW/4 (UNIT M) OF SECTION 31, TOWNSHIP 16 SOUTH, RANGE 35 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO



NEW MEXICO EAST ZONE – NAD 83

NAME	NORTHING (Y)	EASTING (X)	ELEVATION
BW-004 (SEE NOTE 1)	682359.21	795629.18	4034.33
MONITOR WELL (SEE NOTE 2)	682327.89	795643.10	4033.73
SUBSIDENCE MONUMENT #1	682475.35	795906.68	4030.31'
SUBSIDENCE MONUMENT #2	682052.52	795783.22	4032.22'
SUBSIDENCE MONUMENT #3	682455.79	795483.24	4033.66
SUBSIDENCE MONUMENT #4	682116.77	795501.87	4033.54

Data Aquired from GPS Geodetic Measurements
NM East Zone (83) North American Datum of 1983

NOTES:
1) ELEVATION IS ON TOP OF BOTTOM FLANGE OF WELL HEAD.
2) ELEVATION IS ON TOP OF PVC PIPE. NORTH EDGE.
3) HORIZONTAL POSITIONS ARE BASED OFF U.S.C. & G.S. TRIANGULATION STATION "RYCADE" (CV0874). VALUES ARE U.S. SURVEY FEET.
4) ELEVATIONS ARE BASED OFF U.S.C. & G.S. BENCHMARK "K151" (CV0443). VALUES ARE NAVD 88.
5) ALL POINTS WERE OBSERVED USING TOPCON HIPER PLUS GPS SYSTEM UTILIZING REAL TIME KINEMATIC METHODS.

100' 0 100' 200 FEET
SCALE: 1"= 100'

TERRY J ASEL NEW MEXICO 15079 REGISTERED PROFESSIONAL LAND SURVEYOR

SURVEYORS CERTIFICATE

I, TERRY J. ASEL, NEW MEXICO PROFESSIONAL SURVEYOR NO. 15079, DO HEREBY CERTIFY THAT I CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND MEETS THE "MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO" AS ADOPTED BY THE NEW MEXICO STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND SURVEYORS.

Terry J. Asel 4/16/2024
Terry J. Asel N.M. R.P.L.S. No. 15079

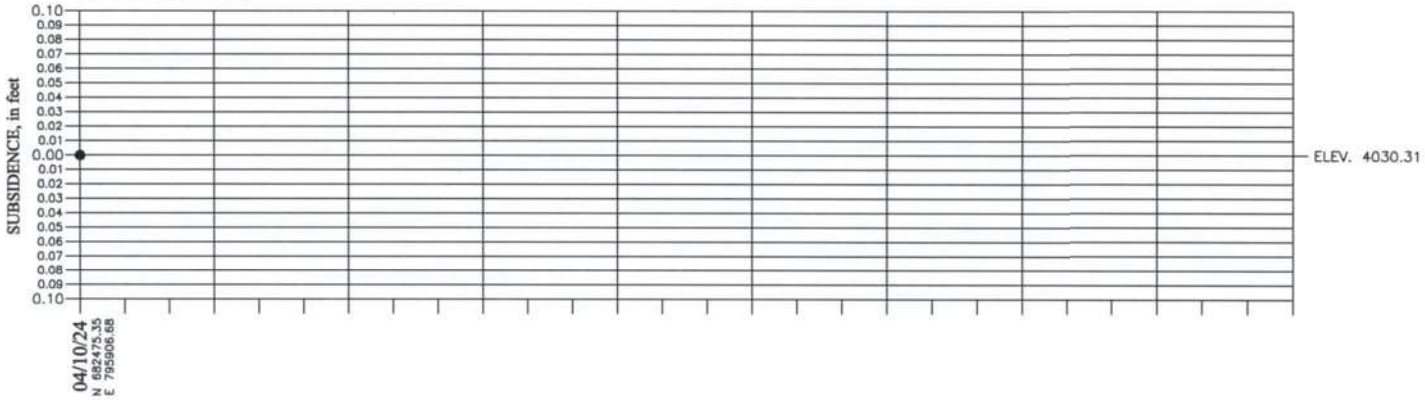
Asel Surveying, LLC
P.O. BOX 393 – 310 W. TAYLOR
HOBBS, NEW MEXICO – 575-393-9146

WASSERHUND INC.		
SURVEY OF FOUR SUBSIDENCE MONUMENTS AROUND THE WASSERHUND INC. BW-004 BRINE WELL (API#30-025-26883) INSIDE THE EIDSON BRINE STATION LOCATED IN THE SW/4 (UNIT M) OF SECTION 31, TOWNSHIP 16 SOUTH, RANGE 35 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO		
Survey Date: 04/10/24	Sheet 1 of 1 Sheets	
W.O. Number: 240410WL	Drawn By: KA	
Date: 04/11/24	240410WL.DWG	Scale:1"=100'

VERTICAL SUBSIDENCE TABLE
WASSERHUND INC. – BW–004

NEW MEXICO EAST NAD 83

MONUMENT #1



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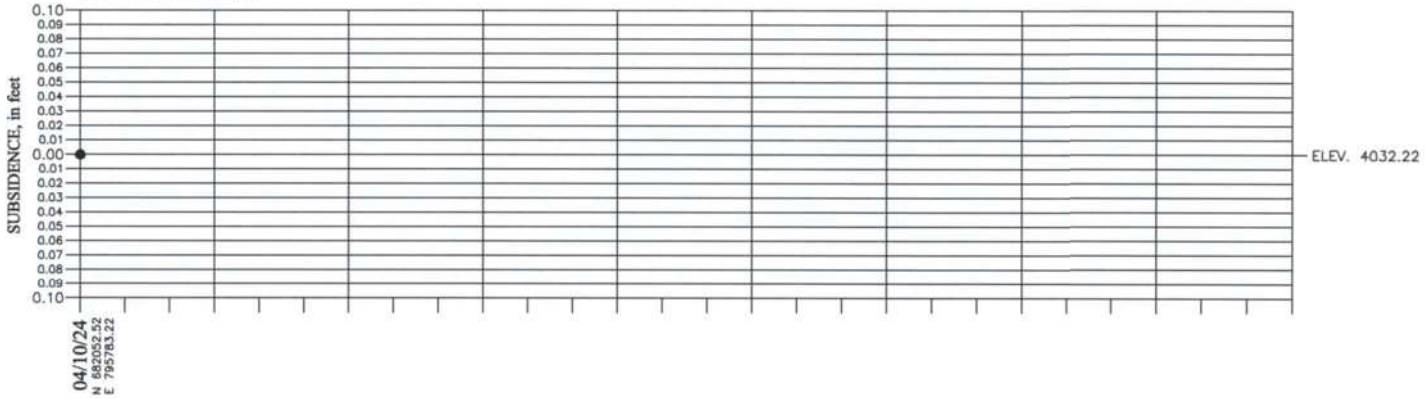

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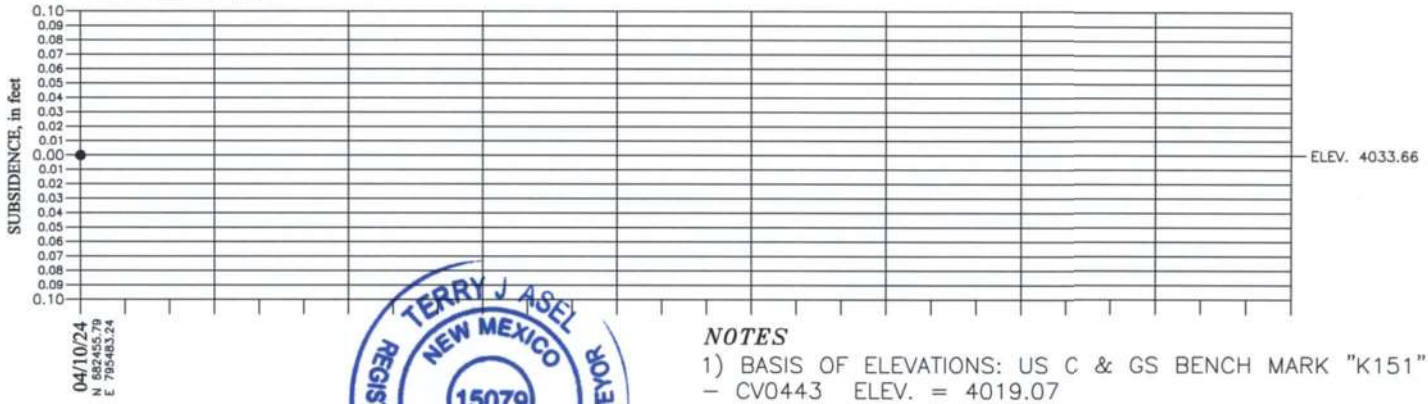

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Terry J. Asel 4/18/2024

Terry J. Asel N.M. R.P.L.S. No. 15079

Asel Surveying, LLC
P.O. BOX 393 – 310 W. TAYLOR
HOBBS, NEW MEXICO – 575–393–9146

NOTES

1) BASIS OF ELEVATIONS: US C & GS BENCH MARK "K151" – CV0443 ELEV. = 4019.07

2) OBSERVATIONS WERE MADE USING TOPCON–HIPER PLUS GPS SYSTEM UTILIZING REAL TIME KINEMATIC METHODS FROM A BASE POINT LOCATED AT N–681878.43 E–796655.34 ELEV.=4025.64

WASSERHUND INC.

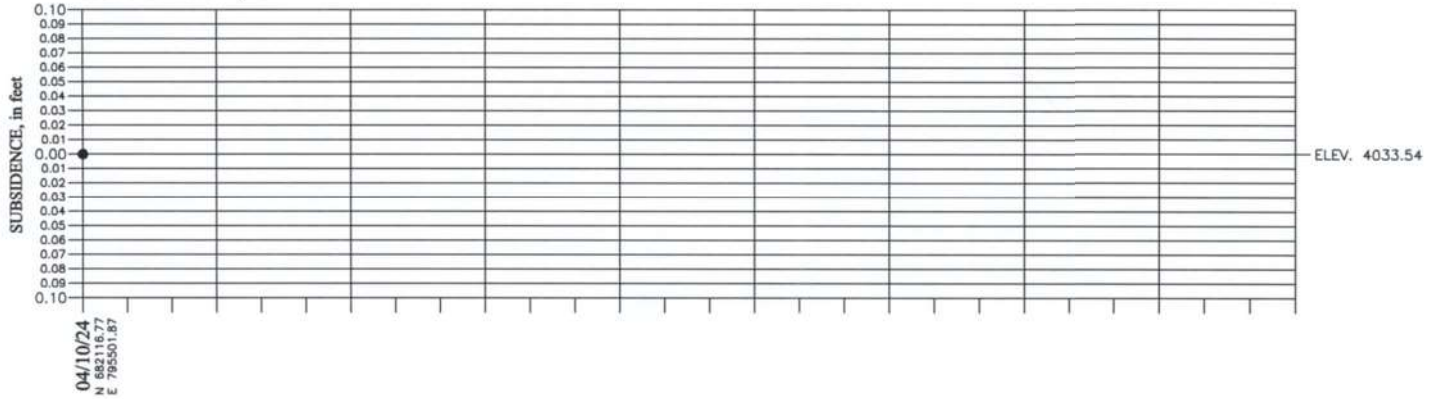
SUBSIDENCE MONITORING FOR THE WASSERHUND INC. – BRINE WELL BW–004 IN SECTION 31, TOWNSHIP 16 SOUTH, RANGE 35 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO

Survey Date: 04/10/24	Sheet 1 of 2 Sheets	
W.O. Number: 240410MS	Drawn By: KA	Rev:
Date: 04/17/24	240410MS	Scale: 1"=1000'

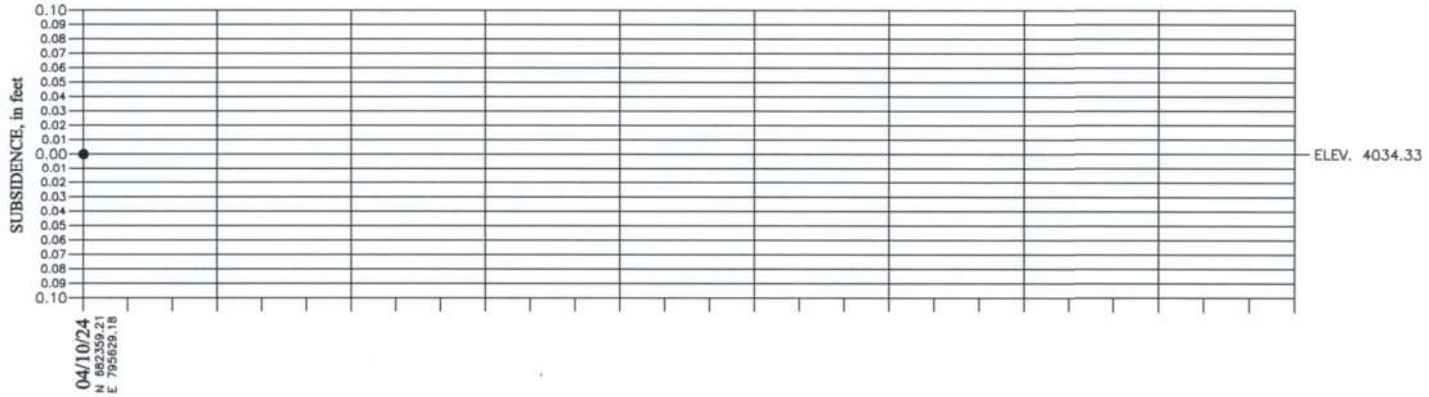
VERTICAL ELEVATION TABLE
WASSERHUND INC. – BW–004

NEW MEXICO EAST NAD 83

MONUMENT #4



BOTTOM FLANGE OF WELLHEAD



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Terry J. Asel 4/18/2024

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P.O. BOX 393 – 310 W. TAYLOR
HOBBS, NEW MEXICO – 575–393–9146

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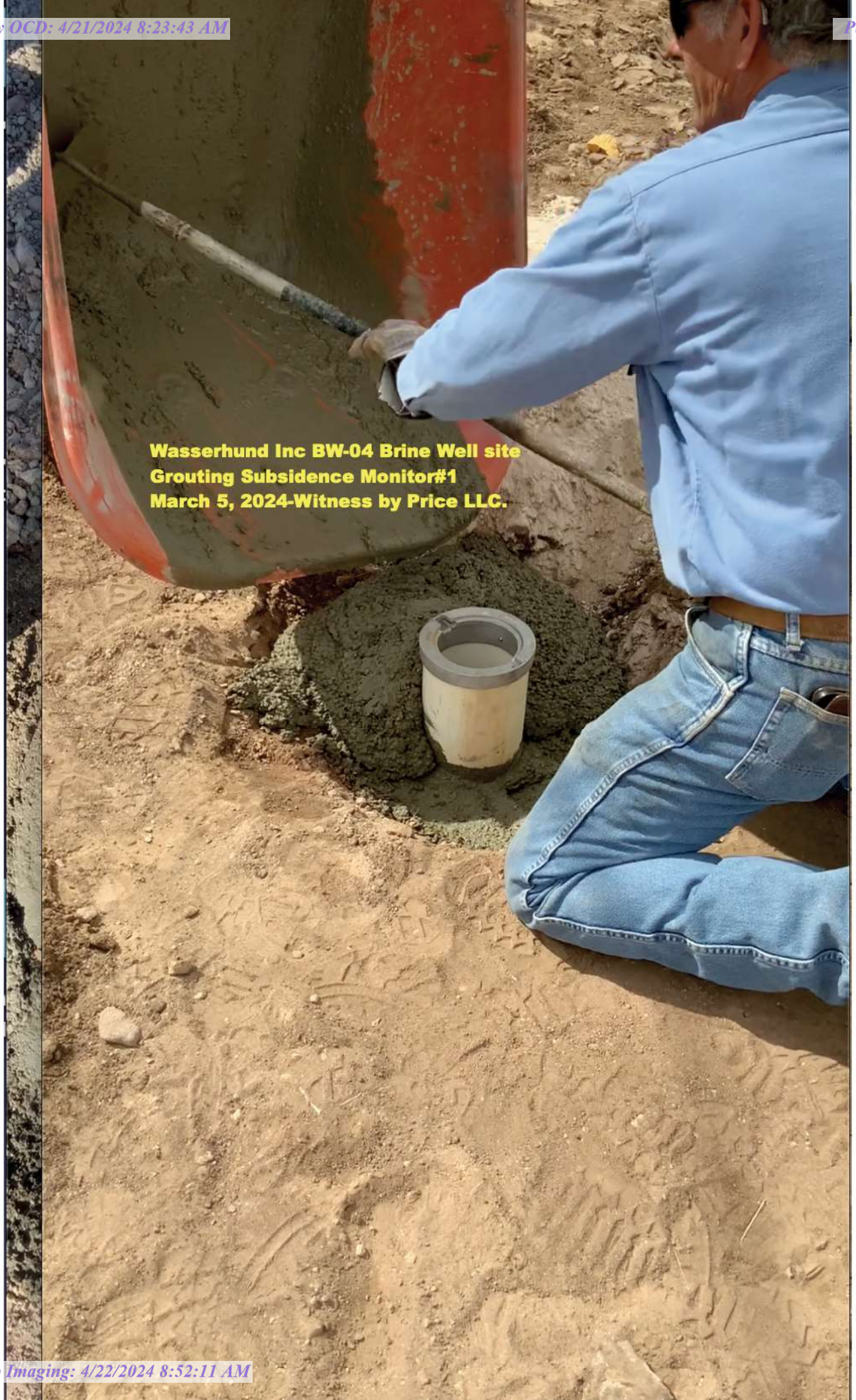
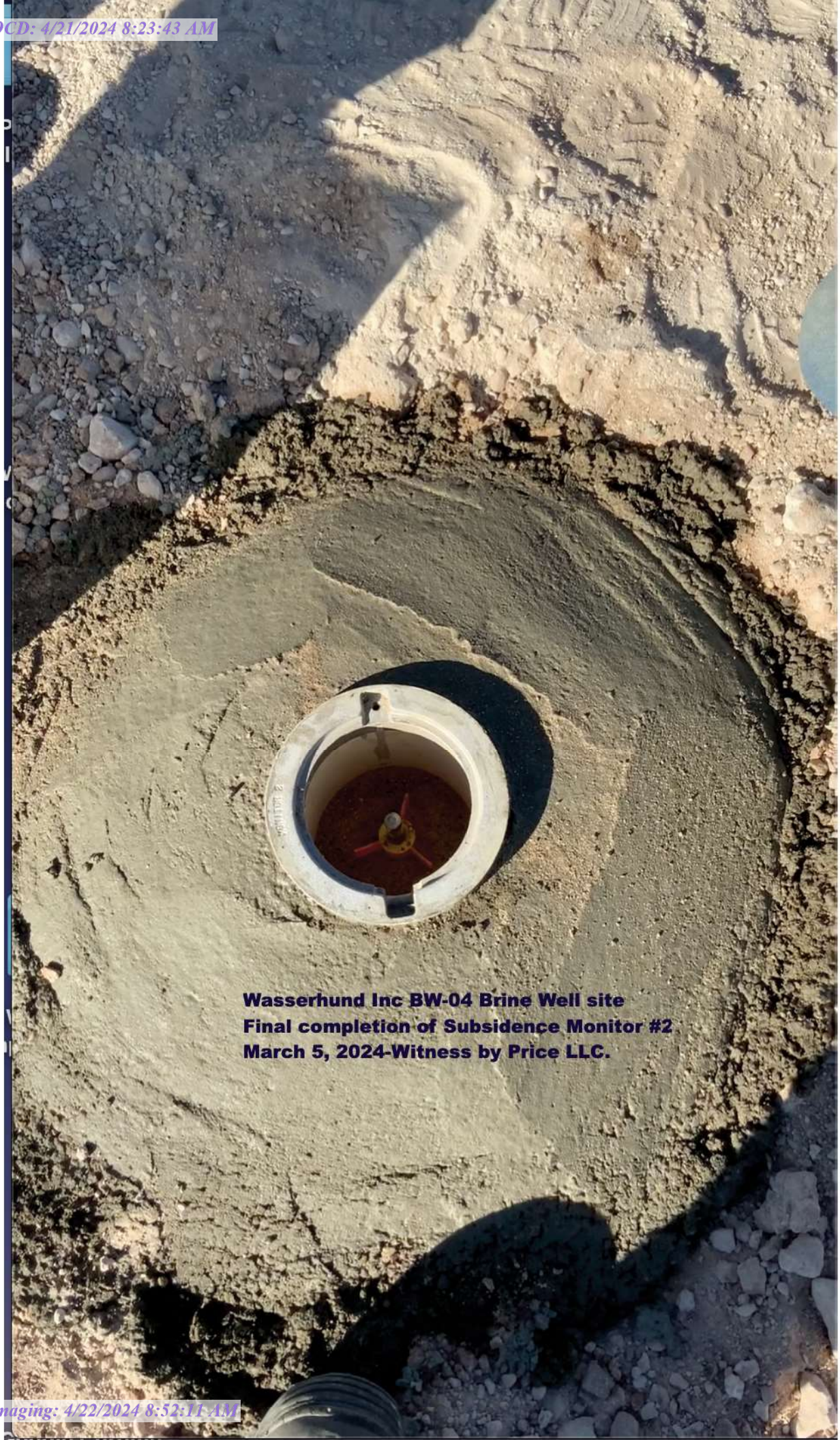
WASSERHUND INC.

SUBSIDENCE MONITORING FOR THE WASSERHUND INC. – BRINE WELL BW–004 IN SECTION 31, TOWNSHIP 16 SOUTH, RANGE 35 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO

Survey Date: 04/10/24	Sheet 2 of 2 Sheets	
W.O. Number: 240410MS	Drawn By: KA	Rev:
Date: 04/17/24	240410MS	Scale:1"=1000'


Wasserhund Inc BW-04 Brine Well site
Grouting Subsidence Monitor#1
March 5, 2024-Witness by Price LLC.



Wasserhund Inc BW-04 Brine Well site
Final completion of Subsidence Monitor #2
March 5, 2024-Witness by Price LLC.


Wasserhund Inc BW-04 Brine Well site
Final completion of Subsidence Monitor #3
March 5, 2024-Witness by Price LLC.


Wasserhund Inc BW-04 Brine Well site
Final completion of Subsidence Monitor #4
March 5, 2024-Witness by Price LLC.

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

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

COMMENTS

Action 335629

COMMENTS

Operator: WASSERHUND INC P.O. Box 2140 Lovington, NM 88260	OGRID: 130851
	Action Number: 335629
	Action Type: [UF-DP] Brine Facility Discharge Plan (DISCHARGE PLAN BRINE EXTRACTION)

COMMENTS

Created By	Comment	Comment Date
cchavez	Subsidence Monument Installation Report 4-21-2024	4/22/2024

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

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

CONDITIONS

Action 335629

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CONDITIONS

Created By	Condition	Condition Date
cchavez	None	4/22/2024