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date: January 28, 2025

to: Records Center

from: Orlando Reyna and Tricia Johnson, SNL Contractors
Orlando Reyna
Digitally signed by Orlando Reyna
Date: 2025.01.29 09:49:48 -07'00'

subject: 2024 Calculated Densities

The groundwater densities for the WIPP Culebra monitoring wells were calculated for 2024 as described in the Activity/Project Specific Procedure (SP) 9-11 *Calculation of Densities for Groundwater in WIPP Wells, Revision 4*. The derivation of the data is explained in the following sections and supporting data are attached.

1. Calculation Process:

As stated in SP 9-11, for each calculation the observed water pressure is divided by the height of the water column. Specifically, the measured pressure value minus the closest corresponding barometric pressure value was divided by the pressure gauge install depth minus the closest corresponding depth to water (from or adjusted to the same measurement point elevation), and that result was then divided by 0.4335 (psi to feet of water conversion at 4°C, at which temperature the density of pure water is 1.000 g/cm^3). The individual calculated density results for each well were then averaged for a final density value.

The density data are included in the *2024 Calculated Densities.xlsx* workbook file created in Excel. Within that workbook, the worksheet *2024 Calc Dens* summarizes the resulting density values and supporting information for the calculated densities, and the worksheet *2024 Calc Dens Formulas* provides the formulas in the worksheet. In addition, the Excel file contains individual well worksheets that include the data used for the calculations and plots of the pressure gauge pressure data. The columns in the worksheets and their contents are described below:

- A – Monitor Well – Well name
- B – 2024 Avg Calc Dens (g/cm^3) – Average calculated density value for 2024
- C – 2024 Specific Gravity (Reference: Freshwater at 70°F) – Average calculated density value for 2024 divided by 0.998 g/cm^3 to represent density of freshwater at 70°F (as requested by the M&O contractor, LATA, to better represent an average and uniform temperature of monitored Culebra water for their reporting)
- D – 2023 Avg Calc Dens (g/cm^3) – Average calculated density value for 2023
- E – 2024 - 2022 Difference (g/cm^3) – Difference between 2024 and 2023 calculated densities (Column B - Column D)

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- F – # of Dens Averaged – number of density values averaged to get the final value
- G – 2024 Timeframe of Data – Time period for pressure data used in calculations
- H – Pressure Gauge File Name (Gauge SN) – File name for pressure data and INW or In-Situ gauge serial number
- I – Pressure Gauge Install Depth (ft BTOC/BTEC/BTOT) – Depth below primary measuring point at which the pressure gauge was installed
- J – Pressure Gauge Ideal Install Depth (ft BTOC/BTEC/BTOT) – Mid-Culebra depth below top of referenced casing
- K – Length Off Ideal Depth (ft) – Depth in feet that the pressure gauge is installed below or above the ideal (Column I - Column J)
- L – Date of Install – Date(s) the pressure gauge(s) was/were installed
- M – Installation Logbook Page – Reference to scientific notebook(s) and page(s) where the pressure gauge installation(s) is/are documented
- N – Comments/Explanations – Comments and/or explanations regarding data, as needed

The spreadsheet entries were verified by Justin Kirkes (8882) and Shelly Nielsen (8883).

2. Identification/Listing of Input, Input sources, and Output:

- Excel workbook including the data – 2024 Calculated Densities.xlsx
  - Worksheet 1 – 2024 Calc Dens
  - Worksheet 2 – 2024 Calc Dens Formulas
  - Worksheet 3 – Baro Data
  - Worksheet 4 – AEC-7R
  - Worksheet 5 – C-2737
  - Worksheet 6 – H-4bR
  - Worksheet 7 – H-5bR
  - Worksheet 8 – H-6bR
  - Worksheet 9 – H-9bR
  - Worksheet 10 – H-10cR
  - Worksheet 11 – H-11b4R
  - Worksheet 12 – H-12R
  - Worksheet 13 – H-15R
  - Worksheet 14 – H-16
  - Worksheet 15 – H-19b0
  - Worksheet 16 – IMC-461
  - Worksheet 17 – SNL-1
  - Worksheet 18 – SNL-2
  - Worksheet 19 – SNL-3
  - Worksheet 20 – SNL-5
  - Worksheet 21 – SNL-6
  - Worksheet 22 – SNL-8
  - Worksheet 23 – SNL-9
  - Worksheet 24 – SNL-10
  - Worksheet 25 – SNL-12
  - Worksheet 26 – SNL-13
  - Worksheet 27 – SNL-14
  - Worksheet 28 – SNL-15
  - Worksheet 29 – SNL-16
  - Worksheet 30 – SNL-17a
  - Worksheet 31 – SNL-18
  - Worksheet 32 – SNL-19
  - Worksheet 33 – WIPP-11R
  - Worksheet 34 – WQSP-1
  - Worksheet 35 – WQSP-2
  - Worksheet 36 – WQSP-3
  - Worksheet 37 – WQSP-4
  - Worksheet 38 – WQSP-5
  - Worksheet 39 – WQSP-6

3. Data Qualification for Compliance Decision Analysis:
Data sources are documented in Column H (Pressure Gauge File Name (Gauge SN)), Column M (Installation Logbook Page), and in the References Section of this memorandum.

4. Software Used:
Dell Precision 3460, Intel® vPRO i7, Windows 11 Enterprise, Microsoft Excel for Microsoft 365 Apps

5. Reviews:
Technical: Justin Kirkes, 8882
QA: Shelly Nielsen, 8883

6. References:

- Pressure gauge installation data and SNL water level data from the following scientific notebooks (package ERMS 543277):
  Long-Term Monitoring Notebook (LTM)-38
  Long-Term Monitoring Notebook (LTM)-39
  Long-Term Monitoring Notebook (LTM)-40
  Long-Term Monitoring Notebook (LTM)-41
- LATA (M&O Contractor) Water Level Data submitted to SNL in monthly memoranda (package ERMS 525178)
- Johnson, Patricia B., Culebra Center Depths for Use in Calculating Equivalent Freshwater Heads of the Culebra Dolomite Member of the Rustler Formation near the WIPP Site, Revision 3, June 10, 2010 (ERMS 553781)
- Pressure Transducer Calibration Certificates (INW Certificates package ERMS 558531, Troll Certificates package ERMS 506685)

7. List of Attachments:

1. Printout of Excel file worksheet 2024 Calc Dens.xls
2. Printout of Excel file worksheet 2024 Calc Dens Formulas.xls
3. Electronic files are archived at /data/cvs/CVSLIB/WIPP_EXTERNAL/SP911_2024

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2024 Calculated Densities

A	B	C	D	E	F	G	H	I	J	K	L	M	N
Monitor Well	2024 Avg Calc Dens (g/cm^3)	2024 Specific Gravity (Reference: Freshwater at 70°F)	2023 Avg Calc Dens (g/cm^3)	2024 - 2023 Difference (g/cm^3)	# of Dens Averaged	2024 Timeframe of Data	Pressure Gauge File Name (Gauge SN)	Pressure Gauge Install Depth (ft BTOC/BTEC/ BTOT)	Pressure Gauge Ideal Install Depth (ft BTOC/BTEC/ BTOT)	Length Off Ideal Depth (ft)	Date of Install(s)	Installation Logbook Page	Comments/Explanations
AEC-7R	1.071	1.073	1.070	0.001	8	Aug - Nov	AEC-7R C33 071824 (06221759), AEC-7R C34 082124 (06221759)	868.98	868.98	0.00	7/18/2024, 8/21/2024	LTM-40 pg. 117, LTM-40 pg. 146	
C-2737	1.028	1.030	1.027	0.001	8	Aug - Nov	C-2737 C44 111723_Append_2024-09-11_10-19-30-942 (1054365), C-2737 C45 091124_Append_2024-11-14_10-46-22-887 (810453)	688.85	689.78	-0.93	11/17/2023, 9/11/2024	LTM-39 pg. 90, LTM-41 pg. 17	
H-4bR	1.020	1.022	1.021	-0.001	8	Aug - Nov	H-4bR C31 072424 (21830020), H-4BR C32 092524 (21830020)	507.90	507.72	0.18	7/24/2024, 9/25/2024	LTM-40 pg. 121, LTM-41 pg. 26	
H-5bR	1.091	1.093	1.090	0.001	8	Aug - Nov	H-5bR C15 051624_Append_2024-11-12_10-22-48-979 (994017)	910.15	910.15	0.00	5/16/2024	LTM-40 pg. 64	
H-6bR	1.037	1.039	1.037	0.000	8	Aug - Nov	H-6BR C33 052224_Append_2024-09-09_11-06-29-250 (1054354), H-6BR C34 090924_Append_2024-11-11_10-43-18-182 (810458)	616.60	616.58	0.02	5/22/2024, 9/9/2024	LTM-40 pg. 76, LTM-41 pg. 7	
H-9bR	1.004	1.006	1.002	0.002	8	Aug - Nov	H-9BR C28 073024 (06221763)	660.54	660.47	0.07	7/30/2024	LTM-40 pg. 124	
H-10cR	1.092	1.094	1.092	0.000	8	Aug - Nov	H-10CR C22 061824_Append_2024-11-12_12-28-15-489 (995692)	1374.10	1368.38	5.72	6/18/2024	LTM-40 pg. 85	
H-11b4R	1.074	1.076	1.074	0.000	8	Aug - Nov	H-11B4R C28 110123 (01221919), H-11B4R C29 092524 (03220066)	735.85	736.72	-0.87	11/01/2023, 9/25/2024	LTM-39 pg. 73, LTM-41 pg. 27	
H-12R	1.104	1.106	1.104	0.000	8	July - Nov	H-12R C24 051424_2024-07-18_08-11-35-566 (1054369), H-12R C25 073024_Append_2024-09-10_10-31-56-912 (1054369), H-12R C26 092524_Append_2024-11-12_11-56-34-666 (1054369)	835.80	834.69	1.11	5/14/2024, 7/30/2024, 9/25/2024	LTM-40 pg. 59, LTM-40 pg. 124, LTM-41 pg. 27	Due to a missing 2024 September DTW measurement, July was added to accommodate a more representative data timeframe. NOTE: The 2023 calculated density was found to be incorrect due to error in a DTW entry from 8/7/2023. The correction resulted in a 2023 density of 1.104 compared to 1.094 as was originally reported.
H-15R	1.123	1.125	1.125	-0.002	8	Aug - Nov	H-15R C34 062124_Append_2024-11-14_11-47-29-785 (993993)	872.50	872.57	-0.07	6/12/2024	LTM-40 pg. 92	
H-16	1.033	1.035	1.033	0.000	8	Aug - Nov	H-16 C21 050724 (21741069)	715.10	714.50	0.60	5/7/2024	LTM-40 pg. 52	
H-19b0	1.057	1.059	1.062	-0.005	8	Aug - Nov	H-19BO C38 073024 (06221760)	753.49	753.49	0.00	7/30/2024	LTM-40 pg. 125	
IMC-461	1.010	1.012	1.010	0.000	8	Aug - Nov	IMC-461 C45 111423_Append_2024-10-31_10-15-14-774 (1054351), IMC-461 C46 103124 (06202194)	376.50	376.10	0.40	11/14/2023, 10/31/2024	LTM-39 pg. 76, LTM-41 pg. 47	
SNL-1	1.021	1.023	1.033	-0.012	8	Aug - Nov	SNL-1 C49 052124 (06221762)	611.11	612.23	-1.12	5/21/2024	LTM-40 pg. 75	Shift in density between 2023 and 2024 due to cable replacement that eliminated a significant amount of stretch that was increasingly influencing density calculations over time.
SNL-2	1.011	1.013	1.011	0.000	8	Aug - Nov	SNL-2 C52 062624 (01221918)	470.70	470.69	0.01	6/26/2024	LTM-40 pg. 99	
SNL-3	1.030	1.032	1.026	0.004	8	Aug - Nov	SNL-3 C40 071824_Append_2024-11-13_11-25-48-502 (810456)	766.19	766.19	0.00	7/18/2024	LTM-40 pg. 118	
SNL-5	1.003	1.005	1.005	-0.002	8	Aug - Nov	SNL-5 C51 070124_Append_2024-08-19_10-45-08-516 (1054367), SNL-5 C52 082124_Append_2024-11-13_09-37-20-981 (1054367)	649.00	648.84	0.16	7/1/2024, 8/21/2024	LTM-40 pg. 100, LTM-40 pg. 147	
SNL-6	1.262	1.265	1.260	0.002	8	Aug - Nov	SNL-6 C37 070124_Append_2024-11-12_09-26-49-811 (1055922)	1278.02	1338.03	-60.01	7/1/2024	LTM-40 pg. 101	Cable was raised 10' from 1288.02' BTOC to 1278.02' BTOC on 2/20/2024 due to increasing psi approaching max range on PT.
SNL-8	1.094	1.096	1.096	-0.002	8	Aug - Nov	SNL-8 C65 041624_Append_2024-11-12_10-40-38-345 (994004)	969.70	968.56	1.14	4/16/2024	LTM-40 pg. 46	
SNL-9	1.017	1.019	1.016	0.001	8	Aug - Nov	SNL-9 C53 062624 (10210603), SNL-9 C54 101424 (06221755)	567.20	566.07	1.13	6/26/2024, 10/14/2024	LTM-40 pg. 99, LTM-41 pg. 29	
SNL-10	1.010	1.012	1.006	0.004	8	Aug - Nov	SNL-10 C42 073024 (08200116), SNL-10 C43 082124 (03220064)	613.50	612.53	0.97	7/30/2024, 8/21/2024	LTM-40 pg. 125, LTM-40 pg. 147	
SNL-12	1.007	1.009	1.011	-0.004	8	Aug - Nov	SNL-12 C40 071624_Append_2024-08-19_10-06-36-749 (1054364), SNL-12 C41 082024_Append_2024-11-12_13-52-19-044 (1054364)	570.90	570.68	0.22	7/16/2024, 8/20/2024	LTM-40 pg. 108, LTM-40 pg. 146	
SNL-13	1.025	1.027	1.025	0.000	8	Aug - Nov	SNL-13 C42 031224 (06221757), SNL-13 C43 092524 (06221757)	401.00	400.62	0.38	3/12/2024, 9/25/2024	LTM-40 pg. 13, LTM-41 pg. 26	
SNL-14	1.049	1.051	1.046	0.003	8	Aug - Nov	SNL-14 C55 052224 (06202175)	668.95	668.95	0.00	5/22/2024	LTM-40 pg. 76	
SNL-15	1.232	1.234	1.232	0.000	8	Jul - Oct	SNL-15 C44 051524 (21225020)	922.18	922.18	0.00	5/15/2024	LTM-40 pg. 62	Due to equipment failure during targeted timeframe, a more representative data timeframe was used.
SNL-16	1.004	1.006	1.009	-0.005	8	Aug - Nov	SNL-16 C45 052224 (21830021), SNL-16 C46 101524 (21830021)	207.86	207.86	0.00	5/22/2024, 10/15/2024	LTM-40 pg. 76, LTM-41 pg. 36	
SNL-17a	1.001	1.003	1.002	-0.001	8	Aug - Nov	SNL-17A C45 061824 (06202193), SNL-17A C46 092524 (06202193)	349.93	349.93	0.00	6/18/2024, 9/25/2024	LTM-40 pg. 83, LTM-41 pg. 26	
SNL-18	1.000	1.002	0.999	0.001	8	Aug - Nov	SNL-18 C49 062624_Append_2024-11-13_10-06-45-040 (1054374)	549.30	549.30	0.00	6/26/2024	LTM-40 pg. 98	
SNL-19	1.004	1.006	1.004	0.000	8	Aug - Nov	SNL-19 C38 062624 (21741046)	355.10	354.19	0.91	6/26/2024	LTM-40 pg. 99	
WIPP-11R	1.026	1.028	1.026	0.000	8	Aug - Nov	WIPP-11R C11 110123 (06221753), WIPP-11R C12 082124 (06202178)	853.14	849.50	3.64	11/1/2023, 8/21/2024	LTM-39 pg. 74, LTM-40 pg. 147	
WQSP-1	1.039	1.041	1.040	-0.001	8	Apr - Nov	WQSP-1 C10 032024_Append_2024-11-11_11-52-04-186 (1045597)	707.00	710.68	-3.68	3/20/2024	LTM-40 pg. 27	
WQSP-2	1.033	1.035	1.032	0.001	8	Apr - Nov	WQSP-2 C8 080923 (06221756), WQSP-2 C9 080824 (06221754)	814.00	822.20	-8.20	8/9/2023, 8/8/2024	LTM-38 pg. 131, LTM-40 pg. 126	
WQSP-3	1.140	1.142	1.140	0.000	8	Apr - Nov	WQSP-3 C8 080923 (06221761), WQSP-3 C9 080824 (03220063)	849.00	857.39	-8.39	8/9/2023, 8/8/2024	LTM-38 pg. 132, LTM-40 pg. 127	

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WQSP-4	1.069	1.071	1.067	0.002	2	Nov - Dec	WQSP-4 C3 103124 (06221761)	746.00	780.81	-34.81	10/31/2024	LTM-41 pg. 46	Due to ongoing maintenance throughout 2024, including during the targeted timeframe, a limited data timeframe was used. Post-maintenance, a new install depth was utilized due to an obstruction in drop-tube used for PT and cable.
WQSP-5	1.019	1.021	1.026	-0.007	8	Apr - Nov	WQSP-5 C6 020124_Append_2024-11-13_13-21-25-265 (1054370)	653.99	658.73	-4.74	2/1/2024	LTM-39 pg. 136	
WQSP-6	1.005	1.007	1.003	0.002	8	Apr - Nov	WQSP-6 C4 020124_Append_2024-11-13_13-35-39-571 (1053215)	589.09	597.09	-8.00	2/1/2024	LTM-39 pg. 137	

Notes:

INW brand pressure gauges used at AEC-7R, H-4bR, H-9bR, H-11b4R, H-16, H-19b0, SNL-1, SNL-2, SNL-9, SNL-10, SNL-13, SNL-14, SNL-15, SNL-16, SNL-17a, SNL-19, WIPP-11R, WQSP-2, WQSP-3, & WQSP-4

In-Situ brand pressure gauges used at C-2737, H-5bR, H-6bR, H-10cR, H-12R, H-15R, SNL-3, SNL-5, SNL-6, SNL-8, SNL-12, SNL-18, WQSP-1, WQSP-5, & WQSP-6

Pressure data utilizes both In-Situ and INW brand pressure gauges at IMC-461

All cables are In-Situ brand and non-vented

Barometric data are from INW gauges - SN 21237000 and SN 21237002

ft BTOC = feet below top of casing

ft BTEC = feet below top of environmental casing

ft BTOT = feet below top of tubing

LTM = Long-Term Monitoring

PT = Pressure Transducer

NA = Not available

Mid Depths are from ERMS 553781, except for AEC-7R, H-9bR, H-11b4R, H-5bR, WIPP-11R, and H-12R, which are from M&O Contractor (currently LATA) BDRs and/or construction diagrams, and WQSP wells which are from DOE-WIPP-95-2154

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2024 Calculated Densities - Formulas

A	B	C	D	E	F	G	H	I	J	K	L	M	N
Monitor Well	2024 Avg Calc Dens (g/cm^3)	2024 Specific Gravity (Reference: Freshwater at 70°F)	2023 Avg Calc Dens (g/cm^3)	2024 - 2023 Difference (g/cm^3)	# of Dens Averaged	2024 Timeframe of Data	Pressure Gauge File Name (Gauge SN)	Pressure Gauge Install Depth (ft BTOC/BTEC/ BTOT)	Pressure Gauge Ideal Install Depth (ft BTOC/BTEC/ BTOT)	Length Off Ideal Depth (ft)	Date of Install(s)	Installation Logbook Page	Comments/Explanations
AEC-7R	1.071	=B4/0.998	1.07	=B4-D4	8	Aug - Nov	AEC-7R C33 071824 (06221759), AEC-7R C34 082124 (06221759)	868.98	868.98	=I4-J4	7/18/2024, 8/21/2024	LTM-40 pg. 117, LTM-40 pg. 146	
C-2737	1.028	=B5/0.998	1.027	=B5-D5	8	Aug - Nov	C-2737 C44 111723_Append_2024-09-11_10-19-30-942 (1054365), C-2737 C45 091124_Append_2024-11-14_10-46-22-887 (810453)	688.85	689.78	=I5-J5	11/17/2023, 9/11/2024	LTM-39 pg. 90, LTM-41 pg. 17	
H-4bR	1.02	=B6/0.998	1.021	=B6-D6	8	Aug - Nov	H-4bR C31 072424 (21830020), H-4BR C32 092524 (21830020)	507.9	507.72	=I6-J6	7/24/2024, 9/25/2024	LTM-40 pg. 121, LTM-41 pg. 26	
H-5bR	1.091	=B7/0.998	1.09	=B7-D7	8	Aug - Nov	H-5bR C15 051624_Append_2024-11-12_10-22-48-979 (994017)	910.15	910.15	=I7-J7	45428	LTM-40 pg. 64	
H-6bR	1.037	=B8/0.998	1.037	=B8-D8	8	Aug - Nov	H-6BR C33 052224_Append_2024-09-09_11-06-29-250 (1054354), H-6BR C34 090924_Append_2024-11-11_10-43-18-182 (810458)	616.6	616.58	=I8-J8	5/22/2024, 9/9/2024	LTM-40 pg. 76, LTM-41 pg. 7	
H-9bR	1.004	=B9/0.998	1.002	=B9-D9	8	Aug - Nov	H-9BR C28 073024 (06221763)	660.54	660.47	=I9-J9	45503	LTM-40 pg. 124	
H-10cR	1.092	=B10/0.998	1.092	=B10-D10	8	Aug - Nov	H-10CR C22 061824_Append_2024-11-12_12-28-15-489 (995692)	1374.1	1368.38	=I10-J10	45461	LTM-40 pg. 85	
H-11b4R	1.074	=B11/0.998	1.074	=B11-D11	8	Aug - Nov	H-11B4R C28 110123 (01221919), H-11B4R C29 092524 (03220066)	735.85	736.72	=I11-J11	11/01/2023, 9/25/2024	LTM-39 pg. 73, LTM-41 pg. 27	
H-12R	1.104	=B12/0.998	1.104	=B12-D12	8	July - Nov	H-12R C24 051424_2024-07-18_08-11-35-566 (1054369), H-12R C25 073024_Append_2024-09-10_10-31-56-912 (1054369), H-12R C26 092524_Append_2024-11-12_11-56-34-666 (1054369)	835.8	834.69	=I12-J12	5/14/2024, 7/30/2024, 9/25/2024	LTM-40 pg. 59, LTM-40 pg. 124, LTM-41 pg. 27	Due to a missing 2024 September DTW measurement, July was added to accommodate a more representative data timeframe. NOTE: The 2023 calculated density was found to be incorrect due to error in a DTW entry from 8/7/2023. The correction resulted in a 2023 density of 1.104 compared to 1.094 as was originally reported.
H-15R	1.123	=B13/0.998	1.125	=B13-D13	8	Aug - Nov	H-15R C34 062124_Append_2024-11-14_11-47-29-785 (993993)	872.5	872.57	=I13-J13	45455	LTM-40 pg. 92	
H-16	1.033	=B14/0.998	1.033	=B14-D14	8	Aug - Nov	H-16 C21 050724 (21741069)	715.1	714.5	=I14-J14	45419	LTM-40 pg. 52	
H-19b0	1.057	=B15/0.998	1.062	=B15-D15	8	Aug - Nov	H-19BO C38 073024 (06221760)	753.49	753.49	=I15-J15	45503	LTM-40 pg. 125	
IMC-461	1.01	=B16/0.998	1.01	=B16-D16	8	Aug - Nov	IMC-461 C45 111423_Append_2024-10-31_10-15-14-774 (1054351), IMC-461 C46 103124 (06202194)	376.5	376.1	=I16-J16	11/14/2023, 10/31/2024	LTM-39 pg. 76, LTM-41 pg. 47	
SNL-1	1.021	=B17/0.998	1.033	=B17-D17	8	Aug - Nov	SNL-1 C49 052124 (06221762)	611.11	612.23	=I17-J17	45433	LTM-40 pg. 75	Shift in density between 2023 and 2024 due to cable replacement that eliminated a significant amount of stretch that was increasingly influencing density calculations over time.
SNL-2	1.011	=B18/0.998	1.011	=B18-D18	8	Aug - Nov	SNL-2 C52 062624 (01221918)	470.7	470.69	=I18-J18	45469	LTM-40 pg. 99	
SNL-3	1.03	=B19/0.998	1.026	=B19-D19	8	Aug - Nov	SNL-3 C40 071824_Append_2024-11-13_11-25-48-502 (810456)	766.19	766.19	=I19-J19	45491	LTM-40 pg. 118	
SNL-5	1.003	=B20/0.998	1.005	=B20-D20	8	Aug - Nov	SNL-5 C51 070124_Append_2024-08-19_10-45-08-516 (1054367), SNL-5 C52 082124_Append_2024-11-13_09-37-20-981 (1054367)	649	648.84	=I20-J20	7/1/2024, 8/21/2024	LTM-40 pg. 100, LTM-40 pg. 147	
SNL-6	1.262	=B21/0.998	1.26	=B21-D21	8	Aug - Nov	SNL-6 C37 070124_Append_2024-11-12_09-26-49-811 (1055922)	1278.02	1338.03	=I21-J21	45474	LTM-40 pg. 101	Cable was raised 10' from 1288.02' BTOC to 1278.02' BTOC on 2/20/2024 due to increasing psi approaching max range on PT.
SNL-8	1.094	=B22/0.998	1.096	=B22-D22	8	Aug - Nov	SNL-8 C65 041624_Append_2024-11-12_10-40-38-345 (994004)	969.7	968.56	=I22-J22	45398	LTM-40 pg. 46	
SNL-9	1.017	=B23/0.998	1.016	=B23-D23	8	Aug - Nov	SNL-9 C53 062624 (10210603), SNL-9 C54 101424 (06221755)	567.2	566.07	=I23-J23	6/26/2024, 10/14/2024	LTM-40 pg. 99, LTM-41 pg. 29	
SNL-10	1.01	=B24/0.998	1.006	=B24-D24	8	Aug - Nov	SNL-10 C42 073024 (08200116), SNL-10 C43 082124 (03220064)	613.5	612.53	=I24-J24	7/30/2024, 8/21/2024	LTM-40 pg. 125, LTM-40 pg. 147	
SNL-12	1.007	=B25/0.998	1.011	=B25-D25	8	Aug - Nov	SNL-12 C40 071624_Append_2024-08-19_10-06-36-749 (1054364), SNL-12 C41 082024_Append_2024-11-12_13-52-19-044 (1054364)	570.9	570.68	=I25-J25	7/16/2024, 8/20/2024	LTM-40 pg. 108, LTM-40 pg. 146	
SNL-13	1.025	=B26/0.998	1.025	=B26-D26	8	Aug - Nov	SNL-13 C42 031224 (06221757), SNL-13 C43 092524 (06221757)	401	400.62	=I26-J26	3/12/2024, 9/25/2024	LTM-40 pg. 13, LTM-41 pg. 26	
SNL-14	1.049	=B27/0.998	1.046	=B27-D27	8	Aug - Nov	SNL-14 C55 052224 (06202175)	668.95	668.95	=I27-J27	45434	LTM-40 pg. 76	
SNL-15	1.232	=B28/0.998	1.232	=B28-D28	8	Jul - Oct	SNL-15 C44 051524 (21225020)	922.18	922.18	=I28-J28	45427	LTM-40 pg. 62	Due to equipment failure during targeted timeframe, a more representative data timeframe was used.
SNL-16	1.004	=B29/0.998	1.009	=B29-D29	8	Aug - Nov	SNL-16 C45 052224 (21830021), SNL-16 C46 101524 (21830021)	207.86	207.86	=I29-J29	5/22/2024, 10/15/2024	LTM-40 pg. 76, LTM-41 pg. 36	
SNL-17a	1.001	=B30/0.998	1.002	=B30-D30	8	Aug - Nov	SNL-17A C45 061824 (06202193), SNL-17A C46 092524 (06202193)	349.93	349.93	=I30-J30	6/18/2024, 9/25/2024	LTM-40 pg. 83, LTM-41 pg. 26	
SNL-18	1	=B31/0.998	0.999	=B31-D31	8	Aug - Nov	SNL-18 C49 062624_Append_2024-11-13_10-06-45-040 (1054374)	549.3	549.3	=I31-J31	45469	LTM-40 pg. 98	
SNL-19	1.004	=B32/0.998	1.004	=B32-D32	8	Aug - Nov	SNL-19 C38 062624 (21741046)	355.1	354.19	=I32-J32	45469	LTM-40 pg. 99	
WIPP-11R	1.026	=B33/0.998	1.026	=B33-D33	8	Aug - Nov	WIPP-11R C11 110123 (06221753), WIPP-11R C12 082124 (06202178)	853.14	849.5	=I33-J33	11/1/2023, 8/21/2024	LTM-39 pg. 74, LTM-40 pg. 147	
WQSP-1	1.039	=B34/0.998	1.04	=B34-D34	8	Apr - Nov	WQSP-1 C10 032024_Append_2024-11-11_11-52-04-186 (1045597)	707	710.68	=I34-J34	45371	LTM-40 pg. 27	
WQSP-2	1.033	=B35/0.998	1.032	=B35-D35	8	Apr - Nov	WQSP-2 C8 080923 (06221756), WQSP-2 C9 080824 (06221754)	814	822.2	=I35-J35	8/9/2023, 8/8/2024	LTM-38 pg. 131, LTM-40 pg. 126	
WQSP-3	1.14	=B36/0.998	1.14	=B36-D36	8	Apr - Nov	WQSP-3 C8 080923 (06221761), WQSP-3 C9 080824 (03220063)	849	857.39	=I36-J36	8/9/2023, 8/8/2024	LTM-38 pg. 132, LTM-40 pg. 127	
WQSP-4	1.069	=B37/0.998	1.067	=B37-D37	2	Nov - Dec	WQSP-4 C3 103124 (06221761)	746	780.81	=I37-J37	45596	LTM-41 pg. 46	Due to ongoing maintenance throughout 2024, including during the targeted timeframe, a limited data timeframe was used. Post-maintenance, a new install depth was utilized due to an obstruction in drop-tube used for PT and cable.
WQSP-5	1.019	=B38/0.998	1.026	=B38-D38	8	Apr - Nov	WQSP-5 C6 020124_Append_2024-11-13_13-21-25-265 (1054370)	653.99	658.73	=I38-J38	45323	LTM-39 pg. 136	
WQSP-6	1.005	=B39/0.998	1.003	=B39-D39	8	Apr - Nov	WQSP-6 C4 020124_Append_2024-11-13_13-35-39-571 (1053215)	589.09	597.09	=I39-J39	45323	LTM-39 pg. 137	

Notes:
INW brand pressure gauges used at AEC-7R, H-4bR, H-9bR, H-11b4R, H-16, H-19b0, SNL-1, SNL-2, SNL-9, SNL-10, SNL-13, SNL-14, SNL-15, SNL-16, SNL-17a, SNL-19, WIPP-11R, WQSP-2, WQSP-3, & WQSP-4
In-Situ brand pressure gauges used at C-2737, H-5bR, H-6bR, H-10cR, H-12R, H-15R, SNL-3, SNL-5, SNL-6, SNL-8, SNL-12, SNL-18, WQSP-1, WQSP-5, & WQSP-6
Pressure data utilizes both In-Situ and INW brand pressure gauges at IMC-461
All cables are In-Situ brand and non-vented
Barometric data are from INW gauges - SN 21237000 and SN 21237002
ft BTOC = feet below top of casing
ft BTEC = feet below top of environmental casing
ft BTOT = feet below top of tubing
LTM = Long-Term Monitoring
PT = Pressure Transducer
NA = Not available
Mid Depths are from ERI

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