APPENDIX D

Water Well Records and Well Logs

Table D1. MECP Online Well Database Summary (500 m).

ID	Township	Completion Date (yyyy-mm-dd)	Water Use	Well Depth (m)	Bedrock Depth (m)	Minimum Casing Depth (m)	Static Water Levels (m)	Water Types and Bearing Zone Depths (ft)	Stratigraphic Layers (ft)
7166124	WEST GARAFRAXA TOWNS CON 04 011								
6702896	WEST GARAFRAXA TOWNS CON 02 009	3/10/1959	DO	53.9	23.5	25.9	10.7	FR 0177	CLAY MSND 0015 CLAY STNS 0040 BLUE CLAY 0077 GREY LMSN 0177
6702928	WEST GARAFRAXA TOWNS CON 04 010	11/20/1965	DO	10.7		10.7	7.6	FR 0025	LOAM 0002 LOAM MSND 0010 CLAY STNS 0033 CLAY GRVL 0035
6702935	WEST GARAFRAXA TOWNS CON 04 010	11/23/1966	DO	9.1		9.1	1.5	FR 0017	LOAM 0001 BRWN CLAY 0003 MSND 0005 BLUE HPAN 0017 MSND 0020 HPAN STNS 0030
6702937	WEST GARAFRAXA TOWNS CON 04 010	7/20/1967	DO	29.9	26.5	26.5	5.5	FR 0088	LOAM 0001 GREY CLAY STNS 0087 SHLE 0098
6705285	WEST GARAFRAXA TOWNS CON 04 009	9/20/1974	DO	51.8	21.3	27.4	8.8	FR 0170	LOAM 0001 BRWN CLAY STNS 0023 GREY CLAY 0070 BRWN ROCK FCRD 0082 GREY ROCK 0155 BRWN ROCK 0170
6705605	WEST GARAFRAXA TOWNS CON 04 010	7/28/1975	DO	79.2	73.4	74.7	11.9	FR 0260	LOAM 0001 BRWN CLAY SAND 0015 GREY CLAY STNS 0145 GREY SAND 0152 GREY CLAY 0208 BRWN SAND 0241 BRWN ROCK 0260
6705693	WEST GARAFRAXA TOWNS CON 04 010	8/9/1975	DO	7.6		4.9	1.8	FR 0006	BRWN SAND 0006 GREY SAND 0010 GREY CLAY 0025
6705695	WEST GARAFRAXA TOWNS CON 04 010	9/4/1975	DO	7.6		7.6	1.8	FR 0006	BRWN SAND 0006 GREY SAND 0010 GREY CLAY 0025
6705694	WEST GARAFRAXA TOWNS CON 04 010	9/4/1975	DO	7.6		7.6	1.8	FR 0006	BRWN SAND 0006 GREY SAND 0010 GREY CLAY 0025
6705698	WEST GARAFRAXA TOWNS CON 04 010	9/8/1975	DO	7.6		4.9	3.0	FR 0013	BRWN SAND 0015 GREY CLAY 0025
6705700	WEST GARAFRAXA TOWNS CON 03 008	9/10/1975	DO	63.1	21.9	33.5	10.4	FR 0207	BRWN CLAY BLDR 0036 GREY CLAY BLDR 0072 LMSN CLAY 0104 GREY LMSN HARD 0155 BRWN DLMT 0207
6706075	WEST GARAFRAXA TOWNS CON 04 010	6/22/1976	DO	61.3	29.6	32.3	10.7	FR 0190	BRWN SAND 0012 GREY CLAY GRVL 0097 GREY ROCK 0127 BRWN ROCK 0201

AC = Cooling and A/C
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Table D1. MECP Online Well Database Summary (500 m). (2 of 6)

ID	Township	Completion Date (yyyy-mm-dd)	Water Use	Well Depth (m)	Bedrock Depth (m)	Minimum Casing Depth (m)	Static Water Levels (m)	Water Types and Bearing Zone Depths (ft)	Stratigraphic Layers (ft)
6706242	WEST GARAFRAXA TOWNS CON 04 010	10/14/1976	DO	7.3		4.9	1.8	FR 0006	BRWN SAND 0014 GREY CLAY 0024
6706243	WEST GARAFRAXA TOWNS CON 04 010	10/15/1976	DO	6.4		4.6	1.2	FR 0004	BRWN SAND 0014 GREY CLAY 0021
6706396	WEST GARAFRAXA TOWNS CON 04 010	5/28/1977	DO	6.7		5.5	3.4	FR 0012	BLCK LOAM 0001 BRWN CLAY BLDR 0012 BRWN SAND 0013 BRWN CLAY BLDR 0022
6706640	WEST GARAFRAXA TOWNS CON 03 009	6/9/1977	DO	65.5	22.6	24.7	10.1	FR 0195	BRWN CSND 0015 GREY CLAY STNS 0074 GREY ROCK 0215
6706452	WEST GARAFRAXA TOWNS CON 04 009	7/14/1977	DO	36.6	26.5	27.7	15.8	FR 0100	BRWN LOAM 0001 GREY CLAY SAND STNS 0087 BRWN ROCK 0120
6706753	WEST GARAFRAXA TOWNS CON 04 010	8/1/1978	DO	9.1		9.1	3.0	FR 0007	BRWN SAND 0010 GREY CLAY 0030
6706784	WEST GARAFRAXA TOWNS CON 04 010	8/29/1978	DO	12.2		12.2	2.7	FR 0009 FR 0026	LOAM 0001 BRWN CLAY SNDY 0009 GREY CLAY STNS 0026 BRWN SAND 0028 GREY CLAY STNS 0040
6707006	WEST GARAFRAXA TOWNS CON 04 009	6/20/1979	DO	36.0			9.8	FR 0117	BRWN LOAM 0001 BRWN CLAY STNS 0015 GREY CLAY STNS GRVL 0080 GREY STNS CLAY FCRD 0083 GREY STNS 0115 BRWN STNS 0118
6707096	WEST GARAFRAXA TOWNS CON 04 010	9/13/1979	DO	12.2	3.0	12.2	1.2	FR 0004 FR 0010 FR 0016 FR 0033	BRWN SAND GRVL 0004 GREY CLAY 0010 GREY MARL SAND 0012 GREY CLAY 0016 GRVL 0017 GREY CLAY 0030 GREY MARL SAND 0033 GREY CLAY 0040
6707227	WEST GARAFRAXA TOWNS CON 02 010	1/23/1980	DO	9.1		9.1	1.8	FR 0006	BRWN LOAM 0001 BRWN CLAY 0010 BRWN SAND 0012 BRWN CLAY 0030
1702651	EAST GARAFRAXA TOWNS CON 03 009	4/5/1980	DO	43.3	21.9	9.8	11.9	FR 0140	BRWN CLAY 0016 GRVL 0028 STNS GRVL 0041 BRWN CLAY STNS 0072 BLUE LMSN HARD 0117 WHIT SNDS 0126 WHIT LMSN 0134 GREY LMSN 0142
6707302	WEST GARAFRAXA TOWNS CON 04 010	7/9/1980	DO	36.0	27.1	28.0	13.1	FR 0114	BRWN FSND 0012 GREY CLAY GRVL 0089 GREY ROCK 0118
6707789	WEST GARAFRAXA TOWNS CON 04 010	6/25/1982	DO	53.9		53.9	4.9	FR 0176	CLAY GRVL 0006 CLAY STNS 0055 GREY CLAY 0070 CLAY STNS 0105 CLAY SOFT SNDY 0172 STNS 0176 UNKN 0177

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ID	Township	Completion Date (yyyy-mm-dd)	Water Use	Well Depth (m)	Bedrock Depth (m)	Minimum Casing Depth (m)	Static Water Levels (m)	Water Types and Bearing Zone Depths (ft)	Stratigraphic Layers (ft)
6708187	WEST GARAFRAXA TOWNS CON 04 010	6/6/1984	DO	42.7	28.6	29.9	7.0	FR 0125	CLAY STNS 0094 LMSN 0140
6708208	WEST GARAFRAXA TOWNS CON 04 009	5/8/1985	DO	64.9	27.4	27.7	7.9	SA 0195 SA 0213	BLCK LOAM 0001 BRWN CLAY 0008 GREY CLAY STNS 0090 GREY LMSN 0152 BRWN LMSN 0213
6708405	WEST GARAFRAXA TOWNS CON 04 012	3/19/1986	DO	51.5	29.0	30.5	12.8	FR 0157 FR 0165	BLCK LOAM 0001 BRWN CLAY SAND 0012 GREY CLAY STNS 0095 GREY LMSN SHLE 0169
6708706	WEST GARAFRAXA TOWNS CON 03 012	5/15/1986	DO	50.3	33.5	34.1	2.1	FR 0150 FR 0165	GRVL 0010 CLAY 0100 SAND 0110 LMSN 0165
6708435	WEST GARAFRAXA TOWNS CON 04 010	6/17/1986	DO	61.0	27.4	29.3	7.3	FR 0185	BRWN CLAY SAND 0011 GREY CLAY STNS 0090 GREY LMSN 0200
6708770	WEST GARAFRAXA TOWNS CON 04 011	2/5/1987	DO	38.7	34.4	34.4	15.2	FR 0125	BLCK LOAM 0001 BRWN SAND 0011 BLUE CLAY 0113 GREY LMSN 0127
6708835	WEST GARAFRAXA TOWNS CON 04 010	6/23/1987	DO	53.0	29.9	31.7	11.6	FR 0140 FR 0160	BRWN CLAY STNS 0005 SAND 0008 GREY CLAY STNS 0073 GREY CLAY STKY 0078 GREY CLAY STNS 0096 GREY CLAY STKY 0098 ROCK 0100 GREY LMSN 0128 BRWN LMSN 0174
6708836	WEST GARAFRAXA TOWNS CON 04 010	6/24/1987	DO	44.2	40.2	41.1	9.1	FR 0138	BRWN CLAY STNS 0010 GREY CLAY STNS 0062 GREY CLAY STKY 0085 GREY CLAY STNS 0132 GREY LMSN 0145
6708893	WEST GARAFRAXA TOWNS CON 04 010	8/6/1987	DO	79.2	61.3	63.1	12.8	FR 0260	BRWN FILL 0003 BRWN CLAY 0012 GREY CLAY STNS 0165 GREY SAND 0195 GREY CLAY STNS 0201 BRWN SNDS SHLE 0207 BRWN LMSN 0260
6708933	WEST GARAFRAXA TOWNS CON 04 012	9/1/1987	DO	41.1	36.9	40.2	4.6	FR 0135	BRWN CLAY GRVL STNS 0018 GREY CLAY 0121 GREY ROCK 0135
6709528	WEST GARAFRAXA TOWNS CON 03 009	6/8/1988	DO	51.8	23.2	23.2	13.7	FR 0170	BLCK LOAM SOFT 0002 GREY CLAY STNS HARD 0076 BRWN ROCK LMSN HARD 0170
6709396	WEST GARAFRAXA TOWNS CON 03 012	7/7/1988	DO	56.4	36.0	6.4	5.2	FR 0184	BRWN CLAY STNS 0118 BLUE ROCK 0123 GREY ROCK 0140 LMSN 0185
6709484	WEST GARAFRAXA TOWNS CON 04 010	9/27/1988	DO	39.3	30.5	31.7	15.8	FR 0129	BLCK LOAM 0001 BRWN SAND CLAY 0012 BRWN CLAY STNS 0034 GREY CLAY STNS 0100 GREY LMSN 0129

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Table D1. MECP Online Well Database Summary (500 m). (4 of 6)

ID	Township	Completion Date (yyyy-mm-dd)	Water Use	Well Depth (m)	Bedrock Depth (m)	Minimum Casing Depth (m)	Static Water Levels (m)	Water Types and Bearing Zone Depths (ft)	Stratigraphic Layers (ft)
6709642	WEST GARAFRAXA TOWNS CON 04 009	1/23/1989	DO	36.6	25.6	25.9	13.7	FR 0119	BRWN CLAY STNS 0015 BRWN CLAY GRVL 0084 GREY ROCK 0110 BRWN ROCK 0120
6710559	WEST GARAFRAXA TOWNS CON 04 010	6/11/1990	DO	43.9	29.0	30.5	4.9	FR 0135	BRWN CLAY STNS 0010 GREY CLAY STNS 0095 GREY LMSN 0144
6711036	WEST GARAFRAXA TOWNS CON 04 010	9/17/1992	DO	50.9	29.6	30.2	12.2	FR 0167	BRWN SAND FILL 0002 BRWN CLAY SAND 0011 GREY CLAY STNS 0097 GREY LMSN 0167
6711152	WEST GARAFRAXA TOWNS CON 04 011	4/12/1993	DO	50.3	33.2	34.1	23.8	FR 0115 FR 0120 FR 0145 FR 0165	LOAM 0001 BRWN SAND CLAY 0018 BRWN CLAY SAND HPAN 0026 BRWN CLAY SAND GRVL 0109 GREY LMSN 0165
6711170	WEST GARAFRAXA TOWNS CON 04 009	5/18/1993	DO	42.1	25.9	26.8	7.6	FR 0138	BLCK LOAM 0001 BRWN CLAY STNS 0027 GREY CLAY STNS 0085 GREY LMSN 0138
6711924	WEST GARAFRAXA TOWNS CON 04 009	1/26/1996	DO	33.5	23.2	23.5	13.7	FR 0086 FR 0094	BRWN CLAY 0018 GREY CLAY SAND 0025 GREY CLAY SOFT 0055 GREY CLAY HARD 0076 GREY ROCK 0079 GREY ROCK LOOS 0085 GREY ROCK 0110
6711958	WEST GARAFRAXA TOWNS CON 04 010	4/9/1996	DO	70.1	51.2	51.8	12.5	FR 0215	LOAM 0001 BRWN SAND 0011 BRWN GRVL SAND 0016 GREY CLAY STNS 0083 GREY CLAY GRVL 0117 GREY CLAY SILT STNS 0168 GREY LMSN 0230
6712869	WEST GARAFRAXA TOWNS CON 04 010	7/13/1998	DO	56.1	29.3	30.5	11.3	FR 0175	LOAM 0001 BRWN CLAY STNS 0016 GREY CLAY STNS 0090 SAND CLAY 0096 BRWN LMSN 0184
6712754	WEST GARAFRAXA TOWNS CON 02 010	11/24/1998	DO	36.6	23.8	24.4	18.3	FR 0115	BRWN CLAY SAND 0025 GREY CLAY STNS 0078 BRWN ROCK 0110 GREY ROCK 0120
6713066	WEST GARAFRAXA TOWNS CON 04 010	5/12/1999	DO	76.2	70.1	71.0	9.1	FR 0246 FR 0250	LOAM 0001 BRWN SAND GRVL CLAY 0004 BRWN CLAY STNS 0009 GREY CLAY GRVL 0027 GREY CLAY STNS 0157 GREY CLAY GRVL 0171 GREY GRVL SAND SILT 0230 GREY LMSN 0250
6713242	WEST GARAFRAXA TOWNS CON 04 010	8/17/1999	DO	61.6	30.2	31.4	13.7	FR 0172 FR 0198	BRWN LOAM 0001 BRWN CLAY STNS SNDY 0012 GREN CLAY STNS 0099 GREN LMSN 0202
6714970	WEST GARAFRAXA TOWNS CON 04 006	12/6/2003	DO	37.4	28.3		8.5	0123	BRWN LOAM 0002 BRWN CLAY SAND GRVL 0093 GREY LMSN 0123
6715076	WEST GARAFRAXA TOWNS CON 04 010	8/25/2004	DO AC	62.8	29.3	30.8	12.7	0203	BRWN SAND CLAY 0012 GREY CLAY STNS 0069 GREY CLAY 0096 BRWN LMSN 0105 GREY LMSN 0145 BRWN LMSN 0206

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ID	Township	Completion Date (yyyy-mm-dd)	Water Use	Well Depth (m)	Bedrock Depth (m)	Minimum Casing Depth (m)	Static Water Levels (m)	Water Types and Bearing Zone Depths (ft)	Stratigraphic Layers (ft)
6715584	WEST GARAFRAXA TOWNS 011	11/15/2005	AB						
7170379	WEST GARAFRAXA TOWNS CON 04 010	10/13/2011	DO	63.4	59.7	60.4	12.8	FR 0205	BRWN CLAY 0037 GREY CLAY 0112 GREY CLAY STNS 0143 GREY CLAY SLTY 0196 GREY LMSN 0208
7172623	WEST GARAFRAXA TOWNS CON 03 009	10/26/2011	DO ST	41.2	28.3	29.9	16.3	FR 0135	BRWN CLAY SLTY 0005 BRWN CLAY SAND 0012 GREY CLAY STNS 0093 GREY LMSN 0135
7179341	WEST GARAFRAXA TOWNS CON 03 009	3/1/2012	DO			35.1			
7185591	WEST GARAFRAXA TOWNS CON 04 009	7/16/2012	DO	75.6	74.7	75.0	15.2	FR 0248	BRWN SAND 0016 BRWN CLAY STNS 0102 GREY CLAY 0189 GREY CLAY STNS 0245 GREY LMSN 0248
7249014	WEST GARAFRAXA TOWNS CON 04 009	9/24/2015	DO	61.6	28.6	29.9	13.7	FR 0192	BRWN CLAY STNS 0039 GREY CLAY STNS 0094 GREY LMSN 0202
7273582	WEST GARAFRAXA TOWNS CON 04 009	5/20/2016	DO	42.7	26.2	26.2	5.5	FR 0102 FR 0137	BRWN LOAM SOFT 0002 BRWN CLAY STNS HARD 0037 GREY CLAY GRVL SOFT 0086 BRWN LMSN SHLE HARD 0140
7281023	WEST GARAFRAXA TOWNS	1/15/2017	DO	84.7	73.3	74.7	16.6	UT 0262	BRWN LOAM 0001 BRWN CLAY SNDY 0004 BRWN SAND 0011 BRWN CLAY SAND GRVL 0240 BRWN LMSN 0261 GREY LMSN 0278
7281021	WEST GARAFRAXA TOWNS CON 03 011	1/21/2017	DO	57.3	31.3	33.8	11.9	UT 0187	BRWN LOAM 0002 BRWN CLAY HARD 0010 BRWN CLAY SNDY 0015 BRWN SAND GRVL 0042 GREY TILL CLAY SILT 0103 GREY LMSN 0188
7281022	WEST GARAFRAXA TOWNS CON 03 011	1/21/2017	AB						
7294234	WEST GARAFRAXA TOWNS	8/30/2017	PS	25.6		25.6	9.6	UT 0084	BRWN CLAY GRVL 0030 GREY CLAY GRVL 0080 GREY GRVL 0084
7310362	WEST GARAFRAXA TOWNS	3/16/2018	AB						
7317288	WEST GARAFRAXA TOWNS CON 04 010	7/25/2018	AB				2.1		

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Table D1. MECP Online Well Database Summary (500 m).

ID	Township	Completion Date (yyyy-mm-dd)	Water Use	Well Depth (m)	Bedrock Depth (m)	Minimum Casing Depth (m)	Static Water Levels (m)	Water Types and Bearing Zone Depths (ft)	Stratigraphic Layers (ft)
7319355	WEST GARAFRAXA TOWNS CON 04 009	8/7/2018	DO	54.3	27.1	28.7	13.7	FR 0174	BRWN CLAY STNS 0035 GREY CLAY STNS 0089 GREY LMSN 0178
7377087	WEST GARAFRAXA TOWNS CON 02 010	6/15/2020	DO	61.0	23.8	24.7	18.3		
7377090	WEST GARAFRAXA TOWNS CON 02 010	9/20/2020	AB				2.4		
7377089	WEST GARAFRAXA TOWNS CON 02 010	9/20/2020	AB				3.0		
7379634	WEST GARAFRAXA TOWNS CON 04 010	12/4/2020	DO	43.2	28.3	29.7	10.9		
7395149	WEST GARAFRAXA TOWNS CON 02 009	7/1/2021	DO	92.0	22.6	23.8	18.3		
7406108	WEST GARAFRAXA TOWNS CON 04 010	9/10/2021							

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General Instructions and Explanations for completing a Well Record

A completed electronic Well Record Form must be delivered to the well purchaser and the owner of the land on which the well is situated within 14 days after the date on which the well's structural stage is complete. The electronic Well Record must also be forwarded within 30 days after the date on which the well's structural stage is complete to the ministry through email to the following email address: WellRecordSubmission@ontario.ca

False and Misleading Information

Subsection 98(2) of the *Ontario Water Resources Act*, R.S.O. 1990 c. O. 40, states that:

"No person shall orally, in writing or electronically, give or submit false or misleading information in any statement, document or data, to any provincial officer, the Minister, the Ministry or the Agency, any employee in or agent of the Ministry or the Agency, or any person involved in carrying out a program of the Ministry or the Agency in respect of any matter related to this Act or the regulations."

Further, subsection 98(3) of the Act states that:

"No person shall include false or misleading information in any document or data required to be created, stored or submitted under this Act."

Measurements

All measurements must be recorded in the specified unit, metric or imperial by checking off the applicable box on the top of the form. You must use the checked unit consistently throughout the well record. Measurements must be reported to 1/10th of a metre if the unit is a metre. All measurements of depth must be referenced to ground surface.

Well Owner's Information

A "well owner" means the owner of land upon which a well is situated and includes a tenant or lessee of the land and a well purchaser. If the "well owner" is an individual, record the owner's last name and first name or if the "well owner" is a business, government or other organization, record the name in the "organization" area.

Well Location

Street Number/Name and City/town/Village must be provided, if available.

Geographic Township, Concession and Lot must be reported if the well is located in an area where such information exists.

UTM Coordinates must be recorded each time a Well Record is completed. Click the button [Test UTM in Map] to use the UTM Coordinates to plot the location to Google map. This allows verification of the UTM Coordinates. This will also automatically populate the County/District.

Municipal Plan and Sublet Number may be provided, if available.

Overburden and Bedrock Materials

For each formation encountered during construction, choose words from the lists that best describe the formation on the basis of general colour, most common material, other materials, and general description of the formation.

General Colours are White, Yellow, Grey, Brown, Blue, Red, Green and Black.

Examples of Materials are: Fill, Silt, Top Soil, Coarse Sand, Slate, Muck, Gravel, Limestone, Dolomite, Quartzite, Peat, Stones, Fine Sand, Shale, Granite, Clay, Boulders, Medium Sand, Sandstone, and Greenstone.

Some definitions are as follows:

- Clay: Composed of very fine particles. Forms dense hard lumps or clods when dry and a very elastic putty-like mass when wet. It can be rolled between fingers to form a long, flexible ribbon.
- Silt: Grain size, midway between sand and clay. It may form clods which, when broken, feel soft and floury. When moist, it will form a cast that can be handled freely without breaking. Rolled between thumb and finger, it will not "ribbon" but will give a broken appearance.

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- Sand: Grains are loose and granular and may be seen and felt readily. Squeezed in the hand when dry, it falls apart when the pressure is released. Squeezed when moist, it will form a cast that will crumble when touched. Should be listed as fine sand, medium sand or coarse sand.
- Gravel: Rock fragments greater than 0.3 cm in diameter.

Examples of General Descriptions are Loose, Cemented, Previously Dug or Bored, Porous, Layered, Previously Drilled, Dense, Soft, Wood Fragments, Packed, Hard.

Abandonment

To report abandonment of a well, check off the applicable box in Type on the top of the form. Details of abandonment must be recorded in the Abandonment and Sealing Section. Additional comments may be entered in the comments box under the Information section.

Annular Space

Record all material placed in the annular space around the single casing or around the permanent outer casing. If the well is a telescoped well [i.e., a well with an outer casing and inner casing(s)] or if the well is a multi-level nested test hole, report the depth from, depth to, material and volume placed for the annular space between two different sized casings or between the inner casing(s) and the side of the well in the "Comments" area of this electronic well record form.

Method of Construction

If the equipment used to construct the well is not on the list, check "Other (specify)" and record the type of equipment, check each equipment that applies.

Well Use

If the well's use is not provided on the list, check "Other (specify)" and record the use of the well. If the well has multiple uses, check each use that applies.

Status of Well

If the well's status is not provided on the list, check "Other (specify)" and record the use of the well. If the well has multiple statuses, check each use that applies.

Construction Record – Casing and Open Hole

Use negative values to report the top of casing above ground surface. For example, if the top of the casing is 0.4 metres above the ground surface and the bottom of the casing 6.0 metres below the ground surface, record the casing "Depth From" as -0.4.

If the top of casing is located below the ground surface (e.g., if a test hole is constructed and the top of casing is located below the ground surface in a flush mounted well vault), report the top of the casing from below ground surface. For example, if the top of the casing is 0.1 metres below the ground surface and the bottom of the casing is 6 metres below the ground surface, record the casing "Depth From" as 0.1.

Note: If a drive shoe is used, the shoe is considered casing and it must be reported if the shoe has a different inside diameter thickness.

If a portion of the well was created an open hole, record the location of the open hole on a separate row, including the diameter and the depth (top and bottom of open hole) from the ground surface.

Construction Record – Well Screen

A "well screen" means perforated pipe or tubing, unsealed concrete tiles or other material installed in a well to filter out particulate matter and form the water intake zone. Therefore, the length of a well screen includes any slotted or perforated area and unsealed area of pipe or tiles.

Water Details

- if groundwater was located, record the depth from the ground surface to the location of the groundwater resource, and
- record if the groundwater quality is "Untested," "Fresh" (i.e., not salty), or "Other (specify)." If "Other (specify)" is recorded, use the "Other (specify)" dropdown list toselect the type of groundwater (e.g., salty, blackish water, yellowish water, mineralized, etc.).

Check off "Gas" if natural gas was encountered during well construction.

Note: Natural gas encounters need to be immediately reported to the ministry at 1-800-268-6060, well purchaser and the owner of the land.

Results of Well Yield Testing

Check off "Pumping Discontinued" if pumping was discontinued before 1 hour of continuous pumping. Explain the reason why pumping was discontinued or in some cases not performed (e.g., the well went dry, impossible to install pump in small diameter well, static water level from test hole or dewatering well was obtained and is reported instead of completing a yield test etc.).

Note: Equipment breakdown is not an acceptable reason for checking off "Pumping Discontinued" on the well record form. If groundwater in the well is flowing out of the well, provide the rate of flow, and check off "Flowing Well" (i.e., static water level above the ground surface).

In the "Results of Well Yield Testing" section of the well record form, record:

- the depth to the intake of the pump,
- the rate of pumping and duration of pumping period during the yield test,
- the final water level when pumping stops,
- water level measurements made during pumping (drawdown) and recovery. All water level measurements must be referenced from below the ground surface for each time interval specified in the drawdown and recovery boxes.

If the water level measurements remain the same over a period of time, continue to measure and report the same water level measurement for the remaining pumping or recovery time intervals.

If pumping continuously for at least 1 hour, but the design of the well does not allow for water level measurements (e.g., driven point well), the person constructing the well is not required to report drawdown or recovery water level measurements.

Map of Well Location

In the "Map of Well Location" section of the well record form, click the map area to attach a map of the well location. The map must show sufficient information to locate the well, including:

- a mark on the map showing the well,
- a scale on the map, and
- where available, the name of the structure, street or surface water body nearest to the well.

Note: More than one map can be added to the well record form by clicking on "Add Map (+)" to add an additional map.

Information

Record any additional information (e.g., observations, tests, additional licensed well technicians who worked on the well, additional annular space details for a telescoped well or a multi-level nested test hole, reasons for not providing a well owner information package) in the comments area.

Declaration

Check the declaration statement to confirm that the person constructing the well agrees with the following statement: "I hereby confirm that I am the person who constructed the well and I hereby confirm that the information on the form is correct and accurate".

Validate

Click the validate button. If there is no missing information, you will be asked to enter the well tag again to make sure the well tag is entered correctly (only enter the numeric portion of the tag number). The audit number will then be changed from "**incomplete**" to an assigned audit number. The signature field will then be available. Click on "signature" to enter the well technician's electronic signature. For instructions on how to create an electronic signature, please visit the Adobe Digital IDs website using the following link: https://helpx.adobe.com/acrobat/using/digital-ids.html

Ontario

Ministry of the Environment, Conservation and Parks

Well Record - Regulation 903

Ontario Water Resources Act

Notice of Collection of Personal Information

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Fields marked with an asterisk (*) are mandatory.

Well Tag Number *
A423956

Type *

☑ Construction ☐ Abandonment

TW25-3

Measurement recorded in: *

☐ Metric ☑ Imperial

1. Well Owner's Information

Last Name and First Name, or Organization is mandatory. *

Last Name	First Name
Organization	**Email Address**
Fergus Developments Inc.	

Current Address

Unit Number	Street Number *	Street Name *	City/Town/Village
300	3190	Steeles Avenue East	Markham

Country	Province	Postal Code	Telephone Number
Canada	Ontario	L3R 1G9	905-477-1177

2. Well Location

Address of Well Location

Unit Number	Street Number *	Street Name *	Township
	8282	Wellington 19	

Lot	Concession	County/District/Municipality
		Wellington

City/Town	Province	Postal Code
Fergus - Township of Centre Wellington	Ontario	N1M 2R3

UTM Coordinates	Zone *	Easting *	Northing *		Municipal Plan and Sublot Number
NAD 83	17	550904	4844592	Test UTM in Map	

Other
PW25-3; Test Well.

3. Overburden and Bedrock Material *

Well Depth * 260 (ft)

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To

				(ft)	(ft)
	Topsoil			0	2
Brown	Clay			2	7
	Clay	Gravel		7	15
	Gravel	Clay		15	85
	Gravel			85	87
Grey	Limestone		Dark-Coloured	87	90
Brown	Limestone		Light-Coloured	90	93
Grey	Limestone		Dark-Coloured	93	96
Brown	Limestone		Light-Coloured	96	97
Grey	Limestone			97	100
Brown	Limestone		Light-Coloured	100	118
Grey	Limestone		Dark-Coloured	118	137
Brown	Limestone		Dark-Coloured	137	150
Grey	Limestone		Light-Coloured	150	226
Grey	Limestone		Dark-Coloured	226	234
Grey	Limestone		Light-Coloured	234	254
Grey	Limestone		Dark-Coloured	254	260

4. Annular Space *

Depth From (ft)	Depth To (ft)	Type of Sealant Used (Material and Type)	Volume Placed (cubic feet)
0	97.5	Cement	33.93

5. Method of Construction *

☐ Cable Tool ☐ Rotary (Conventional) ☐ Rotary (Reverse) ☐ Boring ☐ Air percussion ☐ Diamond
☐ Jetting ☐ Driving ☐ Digging ☐ Rotary (Air) ☐ Augering ☐ Direct Push
☑ Other (specify) DR

6. Well Use *

☐ Public ☐ Industrial ☐ Cooling & Air Conditioning
☐ Domestic ☑ Commercial ☐ Not Used
☐ Livestock ☐ Municipal ☐ Monitoring
☐ Irrigation ☑ Test Hole ☐ Dewatering
☐ Other (specify)

7. Status of Well *

☐ Water Supply ☐ Replacement Well ☑ Test Hole

☐ Recharge Well ☐ Dewatering Well ☐ Observation and/or Monitoring Hole

☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality

☐ Abandoned, other (specify) _____

☐ Other (specify) _____

8. Construction Record - Casing (use negative number(s) to indicate depth above ground surface)

Inside Diameter (in)	Open Hole or Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness	Depth From (ft)	Depth To (ft)
6	Stainless Steel	0.25	-2.5	97
6	Open Hole		97	260

9. Construction Record - Screen

Outside Diameter (in)	Material (Plastic, Galvanized, Steel)	Slot Number	Depth From (ft)	Depth To (ft)

10. Water Details

Water found at Depth 18.3 (ft) ☐ Gas Kind of water ☐ Fresh ☑ Untested ☐ Other

11. Hole Diameter

Depth From (ft)	Depth To (ft)	Diameter (in)
0	97.5	10
97.5	260	6

12. Results of Well Yield Testing

☐ Pumping Discontinued

Explain _____

If flowing give rate

☐ Flowing _____ (GPM)

Draw down

Time (min)	Static Level	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)	18.3	29.0	28.6	28.3	28.3	28.4	28.6	28.9	29.0	29.1	29.2	29.3	40.8	41.4

Recovery

Time (min)	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)	33.0	26.0	24.4	23.7	23.2	21.9	21.3	20.9	20.6	20.3			

After test of well yield, water was

☑ Clear and sand free ☐ Other (specify)

Pump intake set at	Pumping rate	Duration of pumping	Final water level end of pumping	Disinfected? *
106.6 (ft)	(GPM)	2 hrs + 30 min	99.5 (ft)	☑ Yes ☐ No

Recommended pump depth	Recommended pump rate	Well production
(ft)	(GPM)	(GPM)

13. Map of Well Location *

Map 1. Please Click the map area below to import an image file to use as the map. ☑ Make map area bigger



14. Information

Well owner's information package delivered	Date Package Delivered (yyyy/mm/dd)	Date Work Completed (yyyy/mm/dd) *
☑ Yes ☐ No	2026/02/17	2026/02/17

Comments

Section 3, Overburden and Bedrock Materials further details:
Fractures noted at 116', 188' below grade.

Section 12, Results of Well Yield Testing further details:
Variable Rate Performance Test performed by Lotowater Technical Services. Three 45-minute pumping intervals performed at rates of 2 L/s, 4 L/s and 6 L/s (31.7 gpm, 63.4 gpm and 95.1 gpm), followed by a 15-minute pumping interval preformed at 7.5-8 L/s (118.9-126.8 gpm). 30-minute recovery measurements taken starting 1 minute after final pumping measurement recorded . Water levels from first hour of pumping at 31.7- 63.4 gpm shown in Section 12.

15. Well Contractor and Well Technician Information

Business Name of Well Contractor *	Well Contractor's License Number *
Aardvark Drilling Inc.	7675

Business Address

Unit Number	Street Number	Street Name *
C	25	Lewis Road

City/Town/Village *	Province	Postal Code *
Guelph	ON	N1H 1E9

Business Telephone Number	Business Email Address
519-826-9340	info@aardvarkdrillinginc.com

Last Name of Well Technician *	First Name of Well Technician *	Well Technician's License Number *
Gerrits	David	3864

16. Declaration *

☑ I hereby confirm that I am the person who constructed the well and I hereby confirm that the information on the form is correct and accurate.

Last Name	First Name	Email Address
England	Matthew	mengland@aardvarkdrillinginc.com

Signature	Date Submitted (yyyy/mm/dd)
Matt England Digitally signed by Matt England Date: 2026.02.25 10:10:40 -05'00'	2026/02/25

17. Ministry Use Only

Audit Number

62LM PVMJ

Ontario

Ministry of the Environment, Conservation and Parks

Well Record - Regulation 903

Ontario Water Resources Act

Notice of Collection of Personal Information

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Fields marked with an asterisk (*) are mandatory.

Well Tag Number *
A424007

TW25-2

Type *

☑ Construction ☐ Abandonment

Measurement recorded in: *

☐ Metric ☑ Imperial

1. Well Owner's Information

Last Name and First Name, or Organization is mandatory. *

Last Name	First Name
Organization	**Email Address**
Fergus Developments Inc.	

Current Address

Unit Number	Street Number *	Street Name *	City/Town/Village
300	3190	Steeles Avenue East	Markham

Country	Province	Postal Code	Telephone Number
Canada	Ontario	L3R 1G9	905-477-1177

2. Well Location

Address of Well Location

Unit Number	Street Number *	Street Name *	Township
	8282	Wellington 19	

Lot	Concession	County/District/Municipality
		Wellington

City/Town	Province	Postal Code
Fergus - Township of Centre Wellington	Ontario	N1M 2R3

UTM Coordinates	Zone *	Easting *	Northing *		Municipal Plan and Sublot Number
NAD 83	17	550898	4844445	Test UTM in Map	

Other

3. Overburden and Bedrock Material *

Well Depth * 267.5 (ft)

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To

				(ft)	(ft)
	Topsoil			0	1
	Clay	Sand		1	8
	Gravel	Clay		8	97
	Gravel	Limestone	Other	97	99.5
Grey	Limestone			99.5	106
Brown	Limestone			106	108
Grey	Limestone			108	137
Brown	Limestone			137	143
Grey	Limestone			143	152
Brown	Limestone			152	154
Grey	Limestone			154	156
Brown	Limestone			156	159
Grey	Limestone			159	161
Brown	Limestone			161	166
Brown	Limestone		Light-Coloured	166	167
Grey	Limestone		Light-Coloured	167	174
Grey	Limestone			174	189
Grey	Limestone		Dark-Coloured	189	197
Brown	Limestone		Light-Coloured	197	242
Grey	Limestone		Dark-Coloured	242	254
Brown	Limestone		Light-Coloured	254	263
Brown	Limestone			263	266
Brown	Limestone		Dark-Coloured	266	267.5

4. Annular Space *

Depth From (ft)	Depth To (ft)	Type of Sealant Used (Material and Type)	Volume Placed (cubic feet)
0	115	Portland Cement	50.26
245.75	250.5	Cement	1.66
250.5	267.5	Pellet Plug	5.93

5. Method of Construction *

☐ Cable Tool ☐ Rotary (Conventional) ☐ Rotary (Reverse) ☐ Boring ☐ Air percussion ☐ Diamond

☐ Jetting ☐ Driving ☐ Digging ☐ Rotary (Air) ☐ Augering ☐ Direct Push

☑ Other (specify) DR

6. Well Use *

☐ Public	☐ Industrial	☐ Cooling & Air Conditioning
☑ Domestic	☐ Commercial	☐ Not Used
☐ Livestock	☐ Municipal	☐ Monitoring
☐ Irrigation	☐ Test Hole	☐ Dewatering

☐ Other (specify)

7. Status of Well *

☑ Water Supply	☐ Replacement Well	☐ Test Hole
☐ Recharge Well	☐ Dewatering Well	☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)	☐ Abandoned, Insufficient Supply	☐ Abandoned, Poor Water Quality

☐ Abandoned, other (specify)

☐ Other (specify)

8. Construction Record - Casing * (use negative number(s) to indicate depth above ground surface)

Inside Diameter (in)	Open Hole or Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness	Depth From (ft)	Depth To (ft)
12	Steel	0.25	0	99.5
8	Stainless Steel	0.322	-2.9	115
8	Open Hole		115	245.75

9. Construction Record - Screen

Outside Diameter (in)	Material (Plastic, Galvanized, Steel)	Slot Number	Depth From (ft)	Depth To (ft)

10. Water Details

Water found at Depth (ft) ☐ Gas Kind of water ☐ Fresh ☐ Untested ☐ Other

11. Hole Diameter

Depth From (ft)	Depth To (ft)	Diameter (in)
0	115	12
115	267.5	8

12. Results of Well Yield Testing

☐ Pumping Discontinued

Explain

If flowing give rate

☐ Flowing _____ (GPM)

Draw down

Time (min)	Static Level	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)	23.0	29.2	34.1	38.5	42.5	46.0	59.1	67.8	73.7	77.6	80.4	84.0	85.9	87.1

Recovery

Time (min)	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)	82.5	78.3	74.5	70.4	67.2	52.3	41.5	34.3	29.5	26.7	24.3	23.6	23.1

After test of well yield, water was

☑ Clear and sand free ☐ Other (specify)

Pump intake set at	Pumping rate	Duration of pumping	Final water level end of pumping	Disinfected? *
245 (ft)	25 (GPM)	1 hrs + min	87.1 (ft)	☑ Yes ☐ No

Recommended pump depth	Recommended pump rate	Well production
235 (ft)	40 (GPM)	50 (GPM)

13. Map of Well Location *

Map 1. Please Click the map area below to import an image file to use as the map. ☑ Make map area bigger



14. Information

Well owner's information package delivered	Date Package Delivered (yyyy/mm/dd)	Date Work Completed (yyyy/mm/dd) *
☑ Yes ☐ No	2025/06/06	2025/06/06

Comments

Section 3, Overburden and Bedrock Materials further details:
Borehole drilled to a depth of 267.5 feet below grade, backfilled to a depth of 245.75' below grade for final construction.
(1-8') Other Materials: sand, gravel.
(97-99.6') Other Materials: broken limestone.
(104') Void at 104', water-bearing.
(105') Hard, consistent limestone.
Fractures noted at the following depths/depth intervals below grade: 123', 137', 159', 166', 171', 174', 178', 181', 185', 189-191', 193-194', 206', 213', 216', 251', 253-253.5' and 257'.

Section 8, Construction Record - Casing further details:
12" diameter steel casing removed after addition of annular space materials.

Section 12, Results of Well Yield Testing further details:
Well Production 50+ gpm.

15. Well Contractor and Well Technician Information

Business Name of Well Contractor *	Well Contractor's License Number *
Aardvark Drilling Inc.	7675

Business Address

Unit Number	Street Number	Street Name *
C	25	Lewis Road

City/Town/Village *	Province	Postal Code *
Guelph	ON	N1H 1E9

Business Telephone Number	Business Email Address
519-826-9340	info@aardvarkdrillinginc.com

Last Name of Well Technician *	First Name of Well Technician *	Well Technician's License Number *
Gerrits	David	3864

16. Declaration *

☑ I hereby confirm that I am the person who constructed the well and I hereby confirm that the information on the form is correct and accurate.

Last Name	First Name	Email Address
England	Matthew	mengland@aardvarkdrillinginc.com

Signature		Date Submitted (yyyy/mm/dd)
Matt England	Digitally signed by Matt England Date: 2025.06.24 08:07:06 -05'00'	2025/06/24

17. Ministry Use Only

Audit Number

N2NE B3L6

Ontario — Ministry of the Environment, Conservation and Parks

Well Record - Regulation 903

Ontario Water Resources Act

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Fields marked with an asterisk (*) are mandatory.

Well Tag Number *
A423995

Type *

☑ Construction ☐ Abandonment

MW25-01 (1st one)

Measurement recorded in: *

☐ Metric ☑ Imperial

1. Well Owner's Information

Last Name and First Name, or Organization is mandatory. *

Last Name	First Name

Organization	Email Address
Fergus Developments Inc.	

Current Address

Unit Number	Street Number *	Street Name *	City/Town/Village
300	3190	Steeles Avenue East	Markham

Country	Province	Postal Code	Telephone Number
Canada	Ontario	L3R 1G9	905-477-1177

2. Well Location

Address of Well Location

Unit Number	Street Number *	Street Name *	Township
	0	2 Line	

Lot	Concession	County/District/Municipality
		Wellington

City/Town	Province	Postal Code
Township of Centre Wellington	Ontario	

UTM Coordinates	Zone *	Easting *	Northing *		Municipal Plan and Sublot Number
NAD 83	17	550262	4843972	Test UTM in Map	

Other
Well located on west edge of road allowance of 2 Line, approximately 1.2 km north of Wellington 19.

3. Overburden and Bedrock Material *

Well Depth * 20 (ft)

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To

				(ft)	(ft)
Brown	Gravel	Boulders		0	7
Grey	Till	Boulders		7	20

4. Annular Space *

Depth From (ft)	Depth To (ft)	Type of Sealant Used (Material and Type)	Volume Placed (cubic feet)
0	8	Bentonite Holeplug	2.54
8	20	Sand	3.82

5. Method of Construction *

☐ Cable Tool ☐ Rotary (Conventional) ☐ Rotary (Reverse) ☐ Boring ☐ Air percussion ☐ Diamond
☐ Jetting ☐ Driving ☐ Digging ☐ Rotary (Air) ☑ Augering ☐ Direct Push
☐ Other (specify)

6. Well Use *

☐ Public ☐ Industrial ☐ Cooling & Air Conditioning
☐ Domestic ☐ Commercial ☐ Not Used
☐ Livestock ☐ Municipal ☑ Monitoring
☐ Irrigation ☑ Test Hole ☐ Dewatering
☐ Other (specify)

7. Status of Well *

☐ Water Supply ☐ Replacement Well ☑ Test Hole
☐ Recharge Well ☐ Dewatering Well ☑ Observation and/or Monitoring Hole
☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality
☐ Abandoned, other (specify)
☐ Other (specify)

8. Construction Record - Casing * (use negative number(s) to indicate depth above ground surface)

Inside Diameter (in)	Open Hole **or** Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness	Depth From (ft)	Depth To (ft)
2	Plastic	0.154	0	10

9. Construction Record - Screen

Outside Diameter (in)	Material (Plastic, Galvanized, Steel)	Slot Number	Depth From (ft)	Depth To (ft)
2.38	Plastic	10	10	20

10. Water Details

Water found at Depth (ft)	☐ Gas	Kind of water ☐ Fresh	☑ Untested	☐ Other

11. Hole Diameter

Depth From (ft)	Depth To (ft)	Diameter (in)
0	20	8

12. Results of Well Yield Testing

☐ Pumping Discontinued

Explain

If flowing give rate

☐ Flowing (GPM)

Draw down

Time (min)	Static Level	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)														

Recovery

Time (min)	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)													

After test of well yield, water was

☐ Clear and sand free ☐ Other (specify)

Pump intake set at (ft)	Pumping rate (GPM)	Duration of pumping hrs + min	Final water level end of pumping (ft)	Disinfected? * ☐ Yes ☑ No

Recommended pump depth (ft)	Recommended pump rate (GPM)	Well production (GPM)

13. Map of Well Location *

Map 1. Please Click the map area below to import an image file to use as the map. ☑ Make map area bigger



14. Information

Well owner's information package delivered	Date Package Delivered (yyyy/mm/dd)	Date Work Completed (yyyy/mm/dd) *
☐ Yes ☑ No		2025/12/02

Comments

Section 3, Overburden and Bedrock Materials further details:
(0-7') Other Materials: boulders, silt.

Section 8, Construction Record - Casing further details:
Monitoring well installed in 1 ft deep, 6" diameter protective flushmount casing.

15. Well Contractor and Well Technician Information

Business Name of Well Contractor *	Well Contractor's License Number *
Aardvark Drilling Inc.	7675

Business Address

Unit Number	Street Number	Street Name *
C	25	Lewis Road

City/Town/Village *	Province	Postal Code *
Guelph	ON	N1H 1E9

Business Telephone Number	Business Email Address
519-826-9340	info@aardvarkdrillinginc.com

Last Name of Well Technician *	First Name of Well Technician *	Well Technician's License Number *
Juneau	Isaac	4340

16. Declaration *

☑ I hereby confirm that I am the person who constructed the well and I hereby confirm that the information on the form is correct and accurate.

Last Name	First Name	Email Address
England	Matthew	mengland@aardvarkdrillinginc.com

Signature		Date Submitted (yyyy/mm/dd)
Matt England	Digitally signed by Matt England Date: 2025.12.10 11:57:11 -05'00'	2025/12/10

17. Ministry Use Only

Audit Number

NJAZ V6EC

Ontario | Ministry of the Environment, Conservation and Parks

Well Record - Regulation 903

Ontario Water Resources Act

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Fields marked with an asterisk (*) are mandatory.

Well Tag Number *
A423955

MW25-01 (Abandonment)

Type *

☐ Construction ☑ Abandonment

Measurement recorded in: *

☐ Metric ☑ Imperial

1. Well Owner's Information

Last Name and First Name, or Organization is mandatory. *

Last Name	First Name

Organization	Email Address
Fergus Developments Inc.	

Current Address

Unit Number	Street Number *	Street Name *	City/Town/Village
300	3190	Steeles Avenue East	Markham

Country	Province	Postal Code	Telephone Number
Canada	Ontario	L3R 1G9	905-477-1177

2. Well Location

Address of Well Location

Unit Number	Street Number *	Street Name *	Township
	N/A	2 Line	

Lot	Concession	County/District/Municipality
		Wellington

City/Town	Province	Postal Code
Township of Centre Wellington	Ontario	

UTM Coordinates	Zone *	Easting *	Northing *		Municipal Plan and Sublot Number
NAD 83	17	550262	4843972	Test UTM in Map	

Other
MW25-1; Well located on west edge of road allowance of 2 Line, approximately 1.2 km north of Wellington 19.

3. Abandonment and Sealing

Well Depth 20 (ft)

Provide information of well (e.g. construction date, original contractor). **Do not** enter private information
Original construction date: December 2, 2025. Original contractor: Aardvark Drilling Inc., License #7675.

Original Owner

Original Owner: Fergus Developments Inc.

General Description	Depth From (ft)	Depth To (ft)
Bentonite Holeplug	0	20

4. Annular Space

Depth From (ft)	Depth To (ft)	Type of Sealant Used (Material and Type)	Volume Placed (cubic feet)

5. Method of Construction

☐ Cable Tool ☐ Rotary (Conventional) ☐ Rotary (Reverse) ☐ Boring ☐ Air percussion ☐ Diamond

☐ Jetting ☐ Driving ☐ Digging ☐ Rotary (Air) ☐ Augering ☐ Direct Push

☑ Other (specify) Abandonment equipment.

6. Well Use

☐ Public ☐ Industrial ☐ Cooling & Air Conditioning

☐ Domestic ☐ Commercial ☐ Not Used

☐ Livestock ☐ Municipal ☐ Monitoring

☐ Irrigation ☐ Test Hole ☐ Dewatering

☑ Other (specify) Abandoned.

7. Status of Well

☐ Water Supply ☐ Replacement Well ☐ Test Hole

☐ Recharge Well ☐ Dewatering Well ☐ Observation and/or Monitoring Hole

☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality

☑ Abandoned, other (specify) Abandoned and replaced.

☐ Other (specify)

8. Construction Record - Casing (use negative number(s) to indicate depth above ground surface)

Inside Diameter (in)	Open Hole **or** Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness	Depth From (ft)	Depth To (ft)

9. Construction Record - Screen

Outside Diameter (in)	Material (Plastic, Galvanized, Steel)	Slot Number	Depth From (ft)	Depth To (ft)

10. Water Details

Water found at Depth (ft)	☐ Gas	Kind of water ☐ Fresh	☐ Untested	☐ Other

11. Hole Diameter

Depth From (ft)	Depth To (ft)	Diameter (in)
0		

12. Results of Well Yield Testing

☐ Pumping Discontinued

Explain

If flowing give rate

☐ Flowing _____ (GPM)

Draw down

Time (min)	Static Level	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)														

Recovery

Time (min)	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)													

After test of well yield, water was

☐ Clear and sand free ☐ Other (specify)

Pump intake set at (ft)	Pumping rate (GPM)	Duration of pumping hrs + min	Final water level end of pumping (ft)	Disinfected? ☐ Yes ☐ No

Recommended pump depth (ft)	Recommended pump rate (GPM)	Well production (GPM)

13. Map of Well Location *

Map 1. Please Click the map area below to import an image file to use as the map. ☑ Make map area bigger



14. Information

Well owner's information package delivered	Date Package Delivered (yyyy/mm/dd)	Date Work Completed (yyyy/mm/dd) *
☐ Yes ☑ No		2026/04/02

Comments
Abandonment of well measured to a depth of 20 feet below grade. Protective steel flushmount casing and all 2" diameter PVC pipe removed, void of well backfilled with bentonite holeplug.

15. Well Contractor and Well Technician Information

Business Name of Well Contractor *	Well Contractor's License Number *
Aardvark Drilling Inc.	7675

Business Address

Unit Number	Street Number	Street Name *
C	25	Lewis Road

City/Town/Village *	Province	Postal Code *
Guelph	ON	N1H 1E9

Business Telephone Number	Business Email Address
519-826-9340	info@aardvarkdrillinginc.com

Last Name of Well Technician *	First Name of Well Technician *	Well Technician's License Number *
Juneau	Isaac	4340

16. Declaration *

☑ I hereby confirm that I am the person who constructed the well and I hereby confirm that the information on the form is correct and accurate.

Last Name	First Name	Email Address
England	Matthew	mengland@aardvarkdrillinginc.com

Signature		Date Submitted (yyyy/mm/dd)
Matt England	Digitally signed by Matt England Date: 2026.04.15 09:12:49 -04'00'	2026/04/15

17. Ministry Use Only

Audit Number

TR23 LZF9

Ontario

Ministry of the Environment, Conservation and Parks

Well Record - Regulation 903

Ontario Water Resources Act

Notice of Collection of Personal Information

Personal information contained on this form is collected pursuant to sections 35-50 and 75(2) of the *Ontario Water Resources Act* and section 16.3 of the Wells Regulation. This information will be used for the purpose of maintaining a public record of wells in Ontario. This form and the information contained on the form will be stored in the Ministry's well record database and made publicly available. Questions about this collection should be directed to the Water Well Customer Service Representative at the Wells Help Desk, 125 Resources Road, Toronto Ontario M9P 3V6, at 1-888-396-9355 or wellshelpdesk@ontario.ca.

Fields marked with an asterisk (*) are mandatory.

Well Tag Number *
A447784

MW25-01 (final)

Type *

☑ Construction ☐ Abandonment

Measurement recorded in: *

☐ Metric ☑ Imperial

1. Well Owner's Information

Last Name and First Name, or Organization is mandatory. *

Last Name	First Name

Organization	Email Address
Fergus Developments Inc.	

Current Address

Unit Number	Street Number *	Street Name *	City/Town/Village
300	3190	Steeles Avenue East	Markham

Country	Province	Postal Code	Telephone Number
Canada	Ontario	L3R 1G9	

2. Well Location

Address of Well Location

Unit Number	Street Number *	Street Name *	Township
	N/A	2 Line	

Lot	Concession	County/District/Municipality
		Wellington

City/Town	Province	Postal Code
Township of Centre Wellington	Ontario	

UTM Coordinates	Zone *	Easting *	Northing *		Municipal Plan and Sublot Number
NAD 83	17	550262	4843972	Test UTM in Map	

Other
MW25-1-R; replacement, located on west edge road allowance of 2 Line, approximately 1.2 km n of Wellington 19.

3. Overburden and Bedrock Material *

Well Depth * 20 (ft)

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To

				(ft)	(ft)
Brown	Silt	Gravel		0	10
Grey	Silt	Clay		10	20

4. Annular Space *

Depth From (ft)	Depth To (ft)	Type of Sealant Used (Material and Type)	Volume Placed (cubic feet)
0	8	Bentonite Holeplug	2.54
8	20	Sand	3.82

5. Method of Construction *

☐ Cable Tool ☐ Rotary (Conventional) ☐ Rotary (Reverse) ☐ Boring ☐ Air percussion ☐ Diamond
☐ Jetting ☐ Driving ☐ Digging ☐ Rotary (Air) ☑ Augering ☐ Direct Push
☐ Other (specify)

6. Well Use *

☐ Public ☐ Industrial ☐ Cooling & Air Conditioning
☐ Domestic ☐ Commercial ☐ Not Used
☐ Livestock ☐ Municipal ☑ Monitoring
☐ Irrigation ☑ Test Hole ☐ Dewatering
☐ Other (specify)

7. Status of Well *

☐ Water Supply ☑ Replacement Well ☑ Test Hole
☐ Recharge Well ☐ Dewatering Well ☑ Observation and/or Monitoring Hole
☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality
☐ Abandoned, other (specify)
☐ Other (specify)

8. Construction Record - Casing * (use negative number(s) to indicate depth above ground surface)

Inside Diameter (in)	Open Hole **or** Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness	Depth From (ft)	Depth To (ft)
2	Plastic	0.154	0	10

9. Construction Record - Screen

Outside Diameter (in)	Material (Plastic, Galvanized, Steel)	Slot Number	Depth From (ft)	Depth To (ft)
2.38	Plastic	10	10	20

10. Water Details

Water found at Depth 10 (ft) ☐ Gas Kind of water ☐ Fresh ☑ Untested ☐ Other

11. Hole Diameter

Depth From (ft)	Depth To (ft)	Diameter (in)
0	20	8

12. Results of Well Yield Testing

☐ Pumping Discontinued

Explain _____

If flowing give rate

☐ Flowing _____ (GPM)

Draw down

Time (min)	Static Level	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)														

Recovery

Time (min)	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)													

After test of well yield, water was

☐ Clear and sand free ☐ Other (specify)

Pump intake set at (ft)	Pumping rate (GPM)	Duration of pumping hrs + min	Final water level end of pumping (ft)	Disinfected? *
				☐ Yes ☑ No

Recommended pump depth (ft)	Recommended pump rate (GPM)	Well production (GPM)

13. Map of Well Location *

Map 1. Please Click the map area below to import an image file to use as the map. ☑ Make map area bigger



14. Information

Well owner's information package delivered	Date Package Delivered (yyyy/mm/dd)	Date Work Completed (yyyy/mm/dd) *
☐ Yes ☑ No		2026/04/02

Comments

15. Well Contractor and Well Technician Information

Business Name of Well Contractor *	Well Contractor's License Number *
Aardvark Drilling Inc.	7675

Business Address

Unit Number	Street Number	Street Name *
C	25	Lewis Road

City/Town/Village *	Province	Postal Code *
Guelph	ON	N1H 1E9

Business Telephone Number	Business Email Address
519-826-9340	info@aardvarkdrillinginc.com

Last Name of Well Technician *	First Name of Well Technician *	Well Technician's License Number *
Juneau	Isaac	4340

16. Declaration *

☑ I hereby confirm that I am the person who constructed the well and I hereby confirm that the information on the form is correct and accurate.

Last Name	First Name	Email Address
England	Matthew	mengland@aardvarkdrillinginc.com

Signature		Date Submitted (yyyy/mm/dd)
Matt England	Digitally signed by Matt England Date: 2026.04.15 09:13:41 -04'00'	2026/04/15

17. Ministry Use Only

Audit Number

9VI6 EONW

PW-1

Ministry of Environment and Energy
Ontario

N. I. W.

The Ontario Water Resources Act
WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 — 6712549 — Municipality 67004 — Con. GOR 03

County or District: WELLINGTON | Township/Borough/City/Town/Village: WEST GARAFRAXA | Con | Block | Tract | Survey, etc. | Lot: 11

Owner's surname: FAIRVIEW GOLF & COUNTRY CLUB | First name | Address: R.R.#3 FERGUS ONT. N1M 2W4 | Date completed: 05 06 98

21 — Zone | Easting | Northing | RC | Elevation | RC | Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
BROWN	CLAY	SAND + GRAVEL		0	25
GREY	CLAY	SAND + GRAVEL		25	95
GREY	CLAY	GRAVEL + LIMESTONE BROKEN		95	105
LIGHT BROWN	LIMESTONE			105	125
MED BROWN	LIMESTONE			125	155
LIGHT BROWN	LIMESTONE			155	235
LIGHT GREY	LIMESTONE			235	250
MED GREY	LIMESTONE			250	260
LIGHT GREY & BROWN	LIMESTONE			260	282
			TOTAL = 282 FT.		
6" CASING	DRIVE SHOE				

31

32

41 WATER RECORD

Water found at – feet	Kind of water
145	1 ☒ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
260	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
282	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
6"	1 ☒ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	+2	105
6"	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☒ Open hole 5 ☐ Plastic		105	282
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Size of opening (Slot No.) | Diameter inches | Length feet | Material and type | Depth at top of screen feet

61 PLUGGING & SEALING RECORD

☒ Annular space ☐ Abandonment

Depth set at – feet From	To	Material and type (Cement grout, bentonite, etc.)
0	20	BENSEAL

71 PUMPING TEST

Pumping test method: 1 ☒ Pump 2 ☐ Bailer | Pumping rate: 30 GPM | Duration of pumping: 1 Hours Mins | 1 ☒ Pumping 2 ☐ Recovery

Static level	Water level end of pumping	Water levels during pumping: 15 minutes	30 minutes	45 minutes	60 minutes
26' 6" feet	88' 6" feet	87 feet	88' feet	88' 6" feet	88' 6" feet

If flowing give rate: GPM | Pump intake set at: feet | Water at end of test: ☒ Clear ☐ Cloudy

Recommended pump type: ☐ Shallow ☐ Deep | Recommended pump setting: 100 feet | Recommended pump rate: 30 GPM

FINAL STATUS OF WELL

1 ☒ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

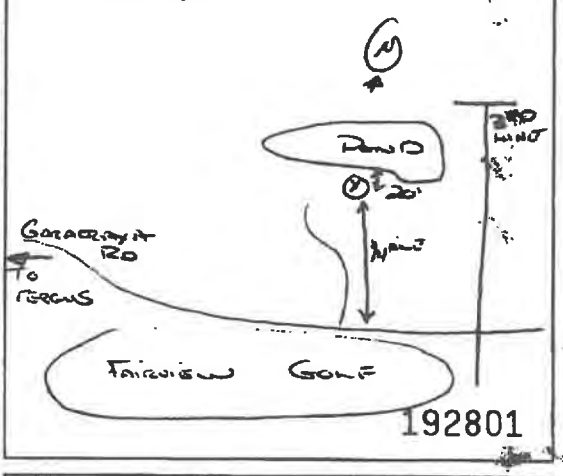
1 ☒ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not used 10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☐ Boring (air) 5 ☐ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



Name of Well Contractor: HANDLEY WELL DRILLING LTD | Well Contractor's Licence No: 2663

Address: R.R.#5 GUELPH ONT. N1H 6J2

Name of Well Technician: DENNIS R. HANDLEY | Well Technician's Licence No: T-0570

Signature of Technician/Contractor | Submission date: 98 06 09

MINISTRY USE ONLY: Data source | Contractor: 2663 | Date received: JUN 18 1998 | Date of inspection | Inspector | Remarks: CSS. SG

2 - MINISTER OF ENVIRONMENT & ENERGY COPY

0506 (07/94) Front Form 9

Water Well Stratigraphy and Completion Log

Well Ident	Name
192801	Irrigation Well PW-1, Fairview Golf and Club, Lot 11, Conc 3, W. Garafraxa

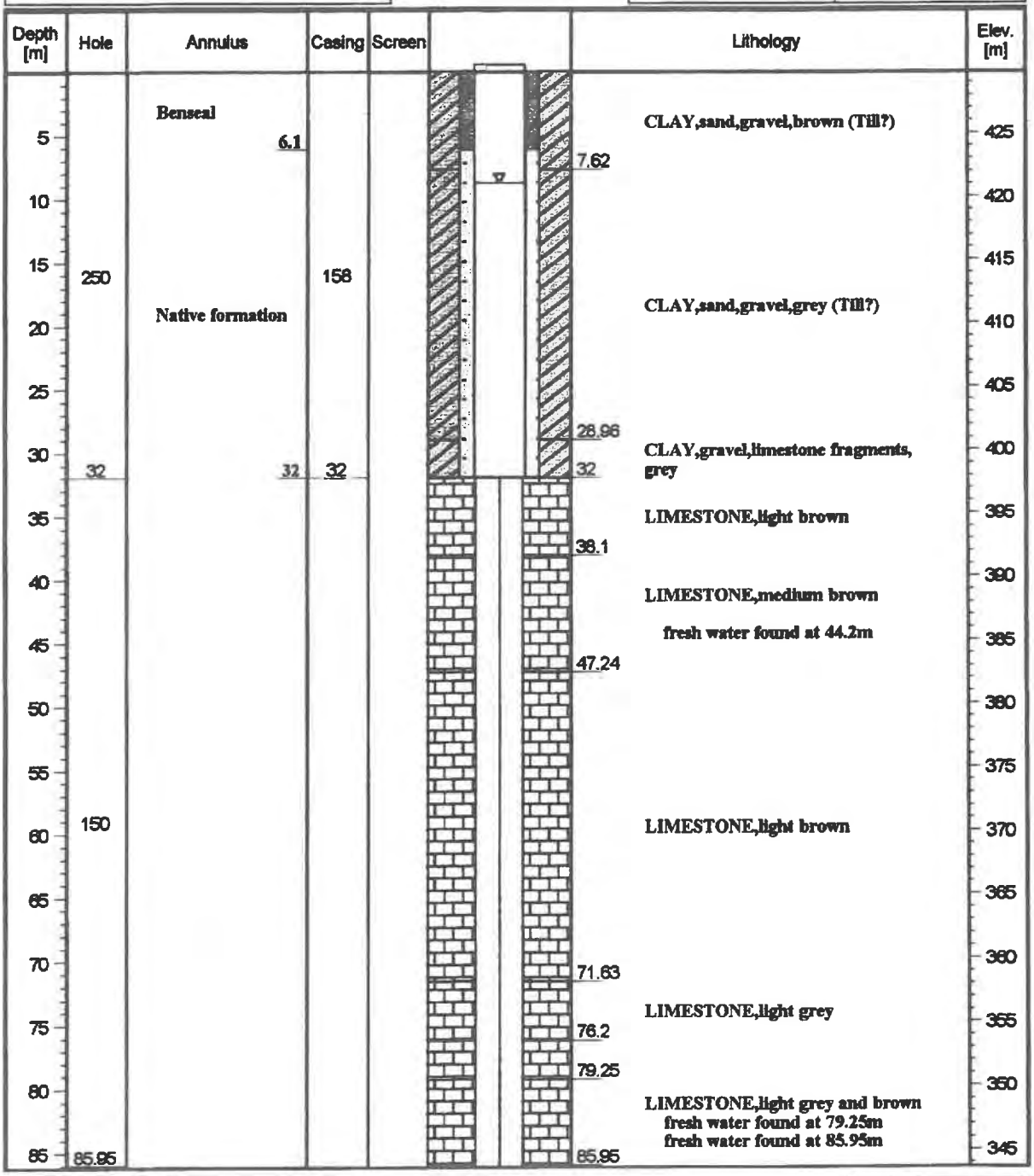
Drill. Method	Drill. Dates
Air Rotary	June 5, 1998

X	Y	Z	Meas. Pt. Elev.
5511175	4944590	429.77	430.37

Depths and elevations are in metres with diameters in millimetres.

Scales (1: xxx)

Water Level (AMSL)	Vertical	Horizontal
421.05	485.0	20.0



Morrison Environmental Limited
Mississauga, Ontario

Figure 4

TABLE X

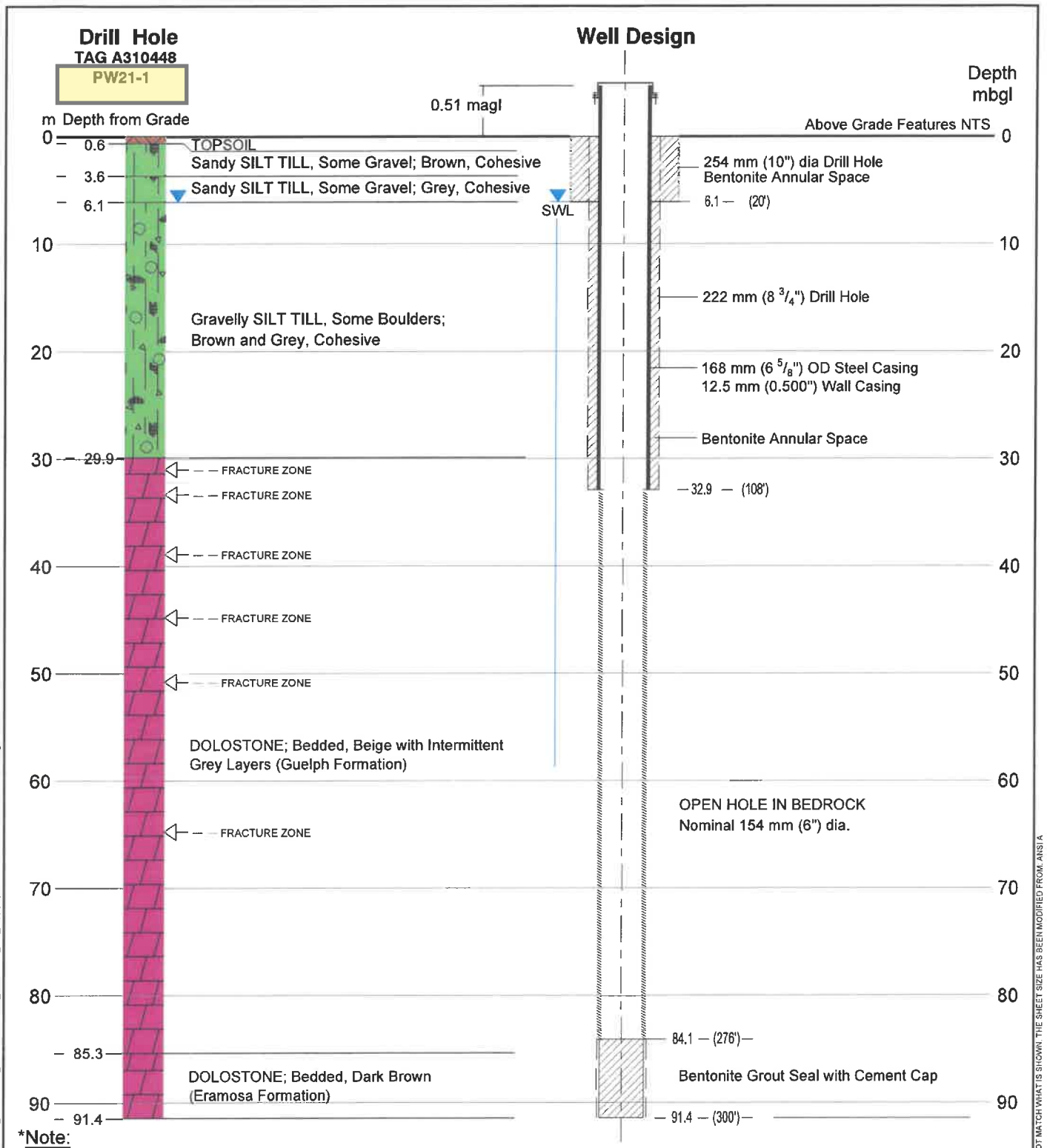
Township of Center Wellington

North Irrigation Well - Belwood Golf Course
Investigation Video Summary
2026/05/21

Elapsed Time (h:min)	Depth (ft below MP)	Depth (m below MP)	Comments
0:00	0.00	0.00	At top of concrete lid
0:00	3.28	1.00	In temporary extension
0:00	5.31	1.62	Below grade top of casing
0:02	23.42	7.14	Casing joint
0:02	24.02	7.32	Static water level (turbid)
0:04	32.81	10.00	Pause to set 10SQ pump to clear image
0:06	49.21	15.00	Breaking suction, run down camera and pump
0:08	66.14	20.16	Casing joint
0:11	86.32	26.31	Casing joint
0:13	106.66	32.51	Base of casing/top of open rock
0:14	111.81	34.08	Vuggy, water production zone
0:14	113.52	34.60	More fouling, more turbid
0:16	128.28	39.10	No flow visible
0:17	139.43	42.50	Fouling, turbid
0:19	159.05	48.48	Vuggy, fouling
0:22	186.35	56.80	Camera knocking off fouling, very turbid
0:24	203.41	62.00	Fouling, turbid
0:34	285.36	86.98	Bottom of well, fouling sediment fill

Video survey conducted by Rayne Hettinga

Note: Measuring point (MP) is top of well lid which is 0.19 m above ground level



*Note:

Converted depths to feet nominal 1 foot integrals
Drilled by Well Initiatives Limited
Constructed 6th-12th May 2021
Constructed by Rotary Drill Methods

CLIENT
883890 ONTARIO LIMITED
C/O FERGUS DEVELOPMENT INC.

PROJECT
FERGUS GOLF CLUB
WATER SUPPLY INVESTIGATION

CONSULTANT
GOLDER

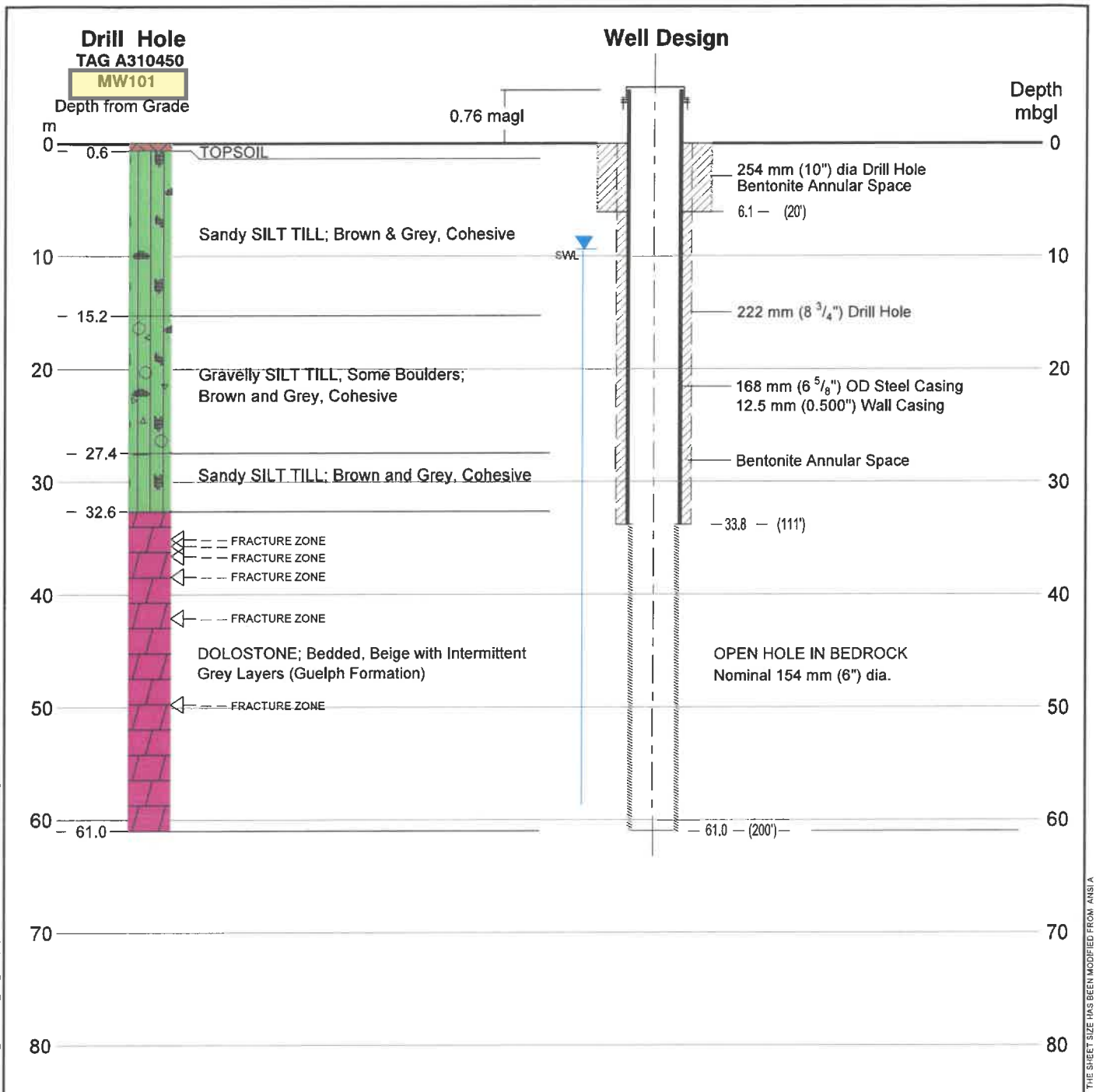
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DESIGNED	
PREPARED	JPR
REVIEWED	GP
APPROVED	JAP

TITLE
PW21-1 AS-BUILT

PROJECT NO.	CONTROL	REV.	FIGURE
21456909	0010	---	A1

25 mm IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A

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*Note:

Converted depths to feet nominal 1 foot integrals
Drilled by Well Initiatives Limited
Constructed 17th-18th May 2021
Constructed by Rotary Drill Methods

CLIENT
883890 ONTARIO LIMITED
C/O FERGUS DEVELOPMENT INC.

PROJECT
FERGUS GOLF CLUB
WATER SUPPLY INVESTIGATION

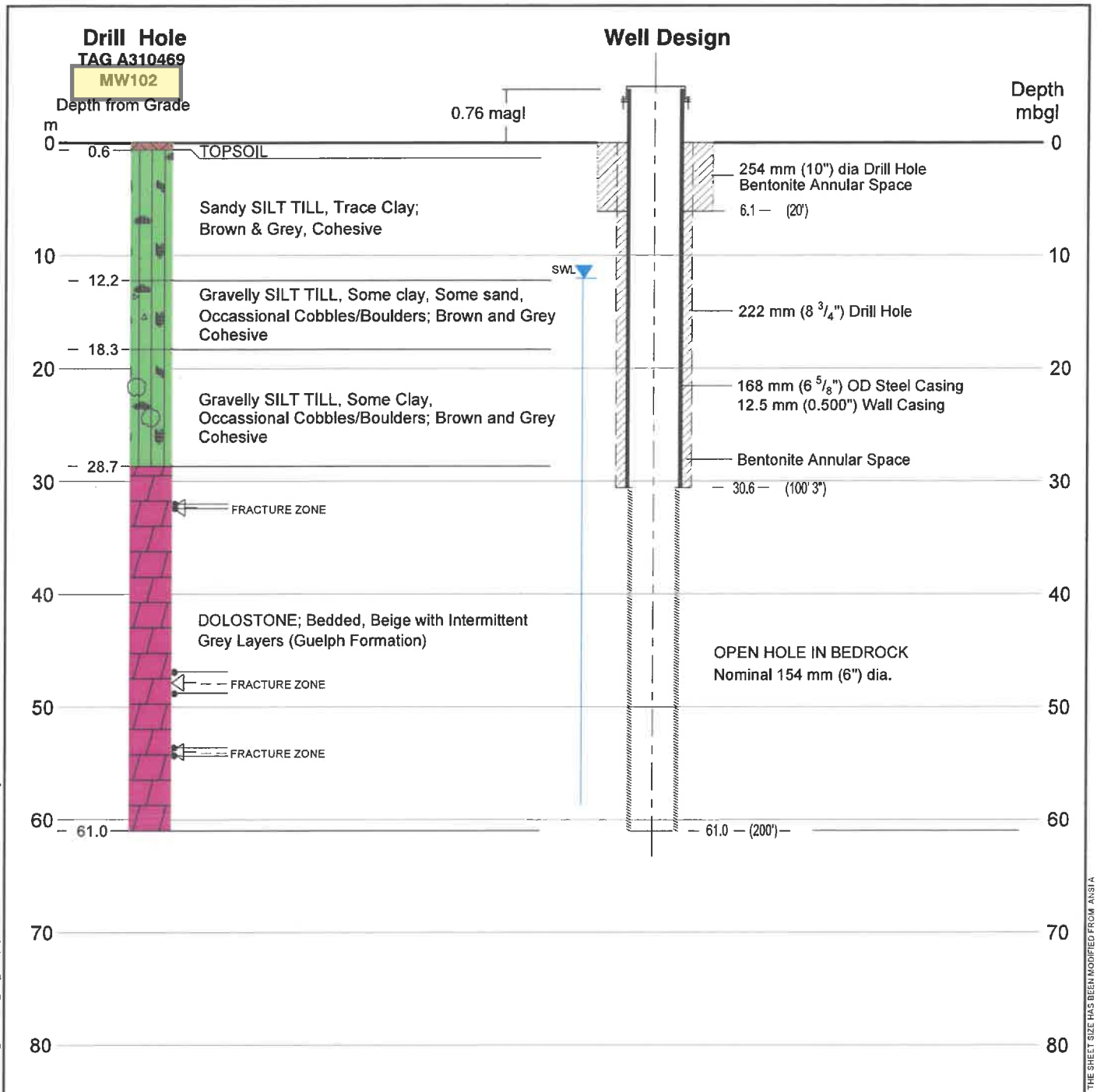
CONSULTANT
GOLDER

YYYY-MM-DD	2022-01-13
DESIGNED	
PREPARED	JPR
REVIEWED	GP
APPROVED	JAP

TITLE
MW101 AS-BUILT

PROJECT NO.	CONTROL	REV.	FIGURE
21456909	0010	—	A2

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25 mm IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
0



*Note:

Converted depths to feet nominal 1 foot integrals
Drilled by Well Initiatives Limited
Constructed 25th-26th May 2021
Constructed by Rotary Drill Methods

CLIENT
883890 ONTARIO LIMITED
C/O FERGUS DEVELOPMENT INC.

PROJECT
FERGUS GOLF CLUB
WATER SUPPLY INVESTIGATION

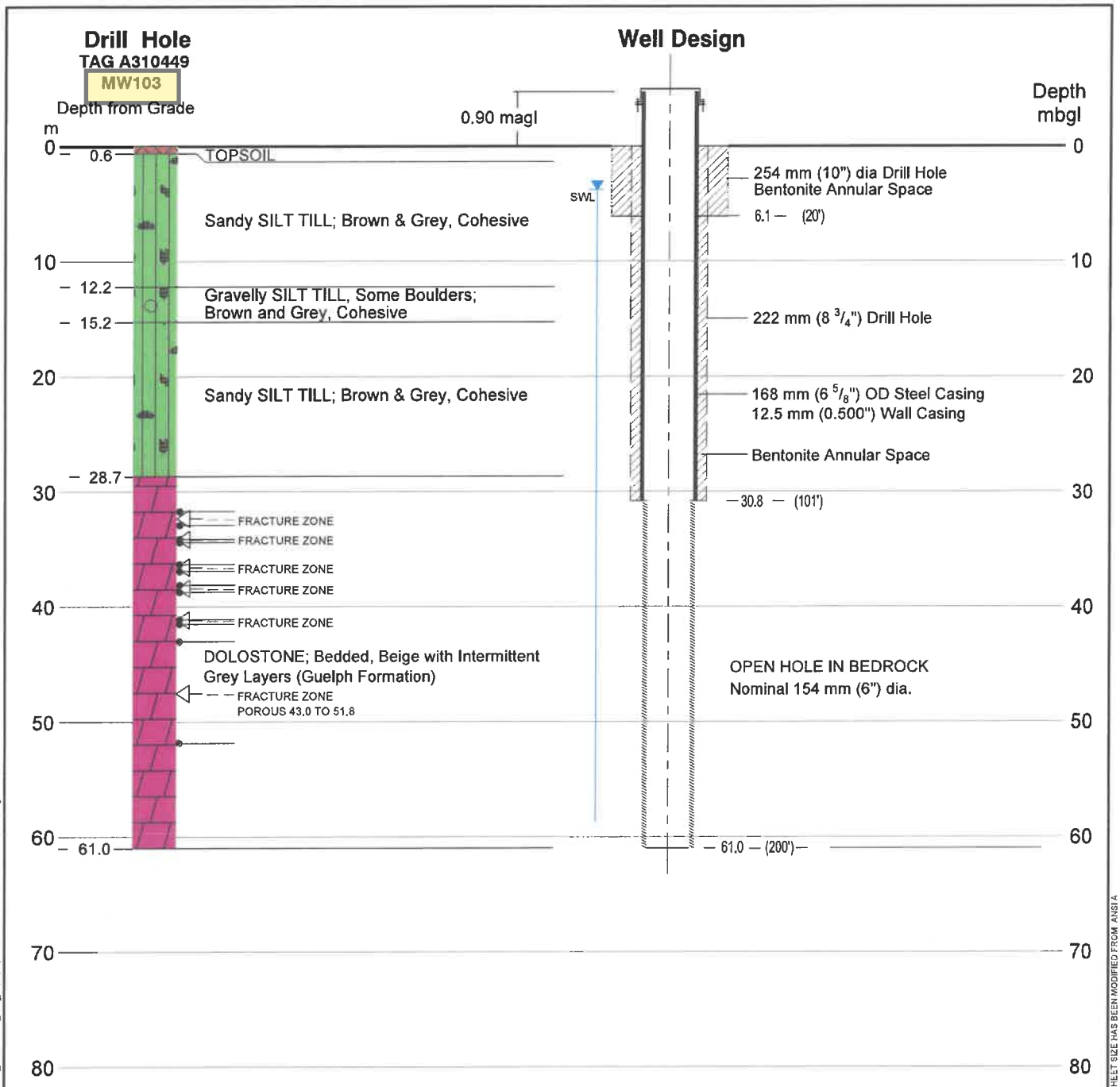
CONSULTANT
GOLDER

YYYY-MM-DD	2022-01-13
DESIGNED	
PREPARED	JPR
REVIEWED	GP
APPROVED	JAP

TITLE
MW102 AS-BUILT

PROJECT NO.	CONTROL	REV.	FIGURE
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25 mm IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



*Note:

Converted depths to feet nominal 1 foot integrals
Drilled by Well Initiatives Limited
Constructed 12th - 15th May 2021
Constructed by Rotary Drill Methods

CLIENT
883890 ONTARIO LIMITED
C/O FERGUS DEVELOPMENT INC.

PROJECT
FERGUS GOLF CLUB
WATER SUPPLY INVESTIGATION

CONSULTANT
GOLDER

YYYY-MM-DD	2022-01-13
DESIGNED	
PREPARED	JPR
REVIEWED	GP
APPROVED	JAP

TITLE
MW103 AS-BUILT

PROJECT NO.	CONTROL	REV.	FIGURE
21456909	0010	—	A4

25 mm IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

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21-19

PWI

Ontario — Ministry of the Environment, Conservation and Parks

Well Tag No. (Place Sticker and/or Print Below) A310448 Tag#:A310448

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☒ Metric ☐ Imperial

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	☐ Well Constructed by Well Owner
	Geranium		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
3190 Steeles Ave East Suite 300	Markham	ON	L3R1G9	9054777117

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
8282 Wellington Rd 19	Garafraxa	11	3

County/District/Municipality	City/Town/Village	Province	Postal Code
Wellington	Fergus	Ontario	N1M2R3

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	550791	4844517		

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Top Soil			0	0.6
Brown	Clay	Sand Stones		0.6	3.6
Grey	Clay	Sand, Stones		3.6	6.1
Grey	Clay	Gravel		6.1	23.1
Brown	Clay	Gravel	23.1		29.9
Brown	Limestone		Weathered	29.9	32.6
Grey	Limestone			32.6	37.2
Brown	Limestone			37.2	37.7
Grey	Limestone			37.7	39.3

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	6.1	Bentonite Hole plug	0.3

Method of Construction

☐ Cable Tool ☐ Diamond
☒ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☐ Other, specify

Well Use

☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☒ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
15.6	Steel	0.5	+0.6	32.9
15.6	Open Hole		32.9	91.5

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To

Status of Well

☐ Water Supply
☐ Replacement Well
☒ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, specify
☐ Other, specify

Water Details

Water found at Depth (m/ft)	Gas	Kind of Water	Other, specify
32.9-91.5	☐	☐ Fresh ☒ Untested	
	☐	☐ Fresh ☐ Untested	
	☐	☐ Fresh ☐ Untested	

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	6.1	25.5
6.1	32.9	22.2
32.9	91.5	15.6

Results of Well Yield Testing

After test of well yield, water was:
☒ Clear and sand free
☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft): 30

Pumping rate (l/min / GPM): 95

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 8.89

If flowing give rate (l/min/GPM)

Recommended pump depth (m/ft): 30

Recommended pump rate (l/min/GPM): 95

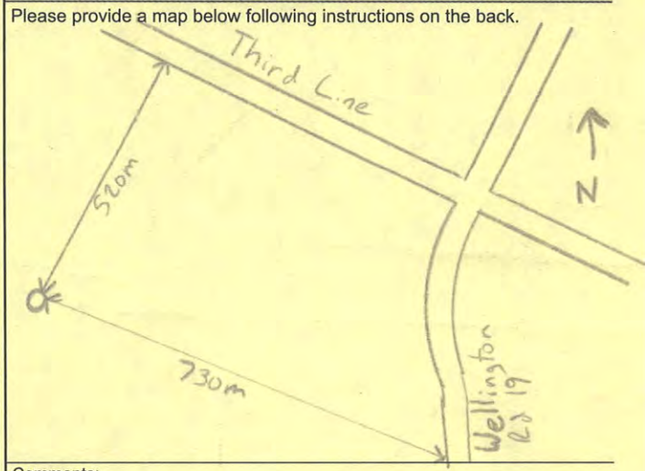
Well production (l/min/GPM)

Disinfected? ☒ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level		8.41		8.89
1	1	8.80	1	8.41
2	2	8.89	2	8.41
3	3	8.89	3	8.41
4	4	8.89	4	8.41
5	5	8.89	5	8.41
10	10	8.89	10	8.41
15	15	8.89	15	8.41
20	20	8.89	20	8.41
25	25	8.89	25	8.41
30	30	8.89	30	8.41
40	40	8.89	40	8.41
50	50	8.89	50	8.41
60	60	8.89	60	8.41

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Well Initiatives Limited	7121

Business Address (Street Number/Name)	Municipality
9 Townline Rd	Orangeville

Province	Postal Code	Business E-mail Address
Ontario	L9W3R4	info@wellinitiatives.com

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
5198146829	Bilek, Philip

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3922		2021/06/02

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☒ No		

Ministry Use Only

Audit No. Z352722

Received

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Contractor's Copy

21-19

PWL TW1

Ontario

Ministry of the Environment, Conservation and Parks

Well Tag No. (Place Sticker and/or Print Below) A310448

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☒ Metric ☐ Imperial

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	☐ Well Constructed by Well Owner
	Geranium		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
3190 Steeles Ave East Suite 300	Markham	ON	L3R 1G9	905 477 1177

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
8282 Wellington Rd 19	Garafraxa	11	3

County/District/Municipality	City/Town/Village	Province	Postal Code
Wellington	Fergus	Ontario	N1M 2R3

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	550791	4844517		

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Limestone			39.3	40.2
Grey	Limestone			40.2	43.6
Brown	Limestone			43.6	45.4
Grey	Limestone			45.4	47.2
Brown	Limestone.			47.2	51.5
Grey	Limestone			51.5	67.0
Brown	Limestone.			67.0	91.5

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☐ Other, specify

Well Use

☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To

Status of Well

☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, specify
☐ Other, specify

Water Details

Water found at Depth (m/ft)	Kind of Water	Hole Diameter Depth (m/ft) From	Hole Diameter Depth (m/ft) To	Hole Diameter (cm/in)
☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify			
☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify			
☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify			

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping ____ hrs + ____ min

Final water level end of pumping (m/ft)

If flowing give rate (l/min/GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min/GPM)

Well production (l/min/GPM)

Disinfected? ☐ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.

Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Well Initiatives Limited	7221

Business Address (Street Number/Name)	Municipality
9 Townline Rd	Orangeville

Province	Postal Code	Business E-mail Address
Ontario	L9W 3R4	info@wellinitiatives.com

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
519 941 6829	Bilek, Philip

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3922		

Well owner's information package delivered: ☐ Yes ☒ No

Date Package Delivered: Y Y Y Y M M D D

Date Work Completed: Y Y Y Y M M D D

Ministry Use Only

Audit No. Z352721

Received

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Contractor's Copy

Ministry of Environment and Energy
Ontario

S. I. W.

6713016

The Ontario Water Resources Act
WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11

Municipality 67004 Con. CON 03

County or District: WELLINGTON
Township/Borough/City/Town/Village: WEST GARAFRAXA
Con: 3
Block/tract/survey, etc.:
Lot: 11
Owner's surname: FAIRVIEW GOLF CLUB
First name:
Address: RR#3 FERGUS N1M 2W4
Date completed: 24 06 99 (day month year)

21 — UTM Zone / Easting / Northing / RC / Elevation / RC / Basin Code / ii / iii / iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see Instructions)

General colour	Most common material	Other materials	General description	Depth – From	Depth – To
	TOP SOIL			0	1
BROWN	CLAY	SAND, STONES		1	25
BROWN	CLAY	GRAVEL		25	90
GREY	SAND	GRAVEL		90	125
BROWN	CLAY	SAND		125	170
BROWN	CLAY	SAND GRAVEL		170	188
LIGHT BROWN	LIMESTONE		BROKEN	188	192
LIGHT BROWN	LIMESTONE			192	265
MED GREY	LIMESTONE			265	285
MED GREY-BROWN	LIMESTONE			285	310
	6" CASING W/ DRIVE SHOE			TOTAL = 310'	

31
32

41 WATER RECORD

Water found at – feet	Kind of water
210	1 ☑ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
260	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
300	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
310	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – From	Depth – To
6"	1 ☑ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	+2	92
6"	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☑ Open hole 5 ☐ Plastic		92	310
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Sizes of opening (Slot No.) | Diameter (inches) | Length (feet)
Material and type | Depth at top of screen (feet)

61 PLUGGING & SEALING RECORD

☐ Annular space ☐ Abandonment

Depth set at – From	Depth set at – To	Material and type (Cement grout, bentonite, etc.)
5	20	BENTSEAL

71 PUMPING TEST

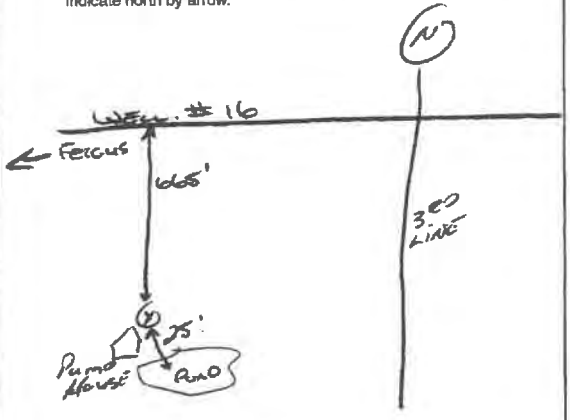
Pumping test method: 1 ☐ Pump 2 ☐ Bailer
Pumping rate: 30 GPM
Duration of pumping: 2 Hours 0 Mins
Static level: 45 feet
Water level end of pumping: 110 feet
Water levels during: 1 ☑ Pumping 2 ☐ Recovery

15 minutes	30 minutes	45 minutes	60 minutes
65 feet	85 feet	110 feet	110 feet

If flowing give rate: GPM
Pump intake set at: feet
Water at end of test: ☐ Clear ☐ Cloudy
Recommended pump type: ☐ Shallow ☐ Deep
Recommended pump setting: 180 feet
Recommended pump rate: 30 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line.
Indicate north by arrow.



198880

FINAL STATUS OF WELL

1 ☑ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

1 ☐ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not used 10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☐ Rotary (air) 5 ☐ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

Name of Well Contractor: HAMILTON WELL DRILLING LTD
Well Contractor's Licence No.: 2663
Address: RR#5 GUELPH N1H 6J2
Name of Well Technician: HENRY MCHAMILTON
Well Technician's Licence No.: T-6590
Signature of Technician/Contractor:
Submission date: 07 07 99 (day mo yr)

MINISTRY USE ONLY

Data source | Contractor: 2663 | Date received: JUL 06 1999
Date of inspection | Inspector
Remarks

0506 (07/94) Front Form 9

2 - MINISTER OF ENVIRONMENT & ENERGY COPY

Old Clubhouse

Ontario

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act

CORRESPONDENCE TO 409/19 W C/LWRAITH 490 TOWER SES FERGUS ONT

WATER WELL RECORD

C.P.N.

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

(18) 6706408 MUNICIP. 67004 CON. CON 103

COUNTY OR DISTRICT: WELLINGTON
TOWNSHIP, BOROUGH CITY, TOWN, VILLAGE: WEST GARAFRAXA
CON., BLOCK, TRACT, SURVEY, ETC: THREE
LOT: 9 & 10
OWNER (SURNAME): FERVIEN COUNTRY CLUB (Fervien Country Club Ltd)
ADDRESS: R.R.3 FERGUS
DATE COMPLETED: DAY 18 MO 05 YR 77

(21) UTM ZONE 17 EASTING 551500 NORTHING 4843600 SC 5 ELEVATION 1410 SC 5 BASIN CODE 23

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH FEET FROM	DEPTH FEET TO
Brown		Loose stones		0	259
Gray		rock		259	356

(31) 0259 605 12 | 0356 212

(32)

(41) WATER RECORD

WATER FOUND AT FEET	KIND OF WATER
0356	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

(51) CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH FEET FROM	DEPTH FEET TO
5	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	260'
05			260	356
05				0356

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET	

(61) PLUGGING & SEALING RECORD

DEPTH SET AT FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)

(71) PUMPING TEST

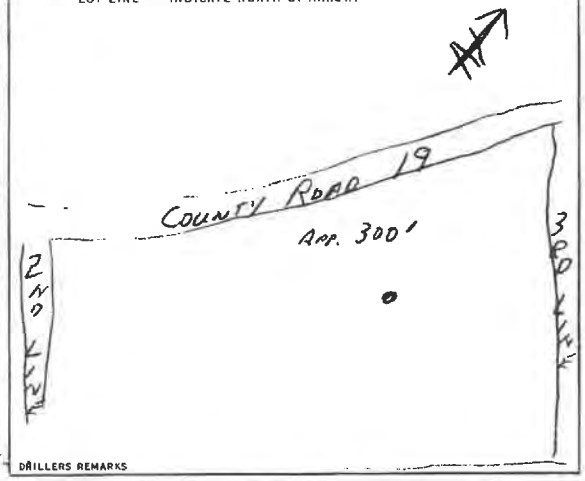
PUMPING TEST METHOD: 1 ☐ PUMP 2 ☐ BAILER
PUMPING RATE: 0015 GPM
DURATION OF PUMPING: 05 HOURS 00 MINS
WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
065 FEET	085 FEET	085 FEET	085 FEET	085 FEET	085 FEET

IF FLOWING GIVE RATE: GPM
PUMP INTAKE SET AT: 150 FEET
WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SET: 100 FEET
RECOMMENDED PUMPING RATE: 0015 GPM
GPM/FT. SPECIFIC CAPACITY

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS

FINAL STATUS OF WELL (54): 1 ☒ WATER SUPPLY; 2 ☐ OBSERVATION WELL; 3 ☐ TEST HOLE; 4 ☐ RECHARGE WELL; 5 ☐ ABANDONED INSUFFICIENT SUPPLY; 6 ☐ ABANDONED POOR QUALITY; 7 ☐ UNFINISHED

WATER USE (55-56) 01: 1 ☒ DOMESTIC; 2 ☐ STOCK; 3 ☐ IRRIGATION; 4 ☐ INDUSTRIAL; ☐ OTHER; 5 ☐ COMMERCIAL; 6 ☐ MUNICIPAL; 7 ☐ PUBLIC SUPPLY; 8 ☐ COOLING OR AIR CONDITIONING; 9 ☐ NOT USED

METHOD OF DRILLING (57) 2: 1 ☐ CABLE TOOL; 2 ☒ ROTARY (CONVENTIONAL); 3 ☐ ROTARY (REVERSE); 4 ☐ ROTARY (AIR); 5 ☐ AIR PERCUSSION; 6 ☐ BORING; 7 ☐ DIAMOND; 8 ☐ JETTING; 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Albert Earley — LICENCE NUMBER: 1906
ADDRESS: 202 Meeve St Guelph
NAME OF DRILLER OR BORER: Albert Earley — LICENCE NUMBER: 1906
SIGNATURE OF CONTRACTOR: Albert Earley — SUBMISSION DATE: DAY 18 MO May YR 77

OFFICE USE ONLY

DATA SOURCE (58): 1 — CONTRACTOR (59-62): 1906 — DATE RECEIVED (63-66): 2 10677
DATE OF INSPECTION: Oct 1979 — INSPECTOR: EJ
REMARKS: CSS.S8
P
WI

FORM 7 MOE 07-091

MINISTRY OF THE ENVIRONMENT COPY

Ontario Ministry of the Environment

Clubhouse Well

The Ontario Water Resources Act

WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 — 6714026 — Municipality 67004 — Con. CON 03

County or District: HENNINGTON — Township/Borough/City/Town/Village: WEST GRANTHAM — Con block tract survey, etc. 3 — Lot 11

Owner's surname: GULF NORTH — First Name — Address: 1171 KOSSUTH RD. CHRISTELINE N3H 4R7 — Date completed: 03 15 02 (day month year)

21 — UTM Zone — Easting — Northing — RC — Elevation — RC — Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
BLACK	TOP SOIL			0	3
BROWN	CLAY	STONES		3	35
BROWN	CLAY		HARD PAN	35	85
BROWN	CLAY	GRAVEL		85	104
GREY	LIMESTONE		BROKEN	104	108
GREY	LIMESTONE			108	165
GREY	LIMESTONE			115	245
			TOTAL = 245 FT		
		6 1/4" CASING	DRIVE SHOE		

31

32

41 WATER RECORD

Water found at - feet	Kind of water
245	1 ☑ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
6"	1 ☑ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	188	+1	108
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic		108	245
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Size of opening (Slot No.) — Diameter (inches) — Length (feet)

Material and type — Depth at top of screen (feet)

61 PLUGGING & SEALING RECORD

☐ Annular space ☐ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
0	2	BENTONITE

71 PUMPING TEST

Pumping test method: 1 ☐ Pump 2 ☐ Bailer — Pumping rate: 15 GPM — Duration of pumping: 1 Hours ___ Mins

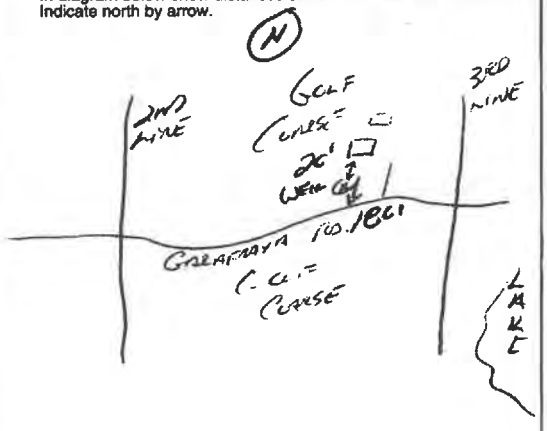
Static level	Water level end of pumping	Water levels during: 1 ☑ Pumping 2 ☐ Recovery	15 minutes	30 minutes	45 minutes	60 minutes
3 feet	119 feet		101 feet	112 feet	118 feet	119 feet

If flowing give rate: ___ GPM — Pump intake set at: ___ feet — Water at end of test: ☑ Clear ☐ Cloudy

Recommended pump type: ☐ Shallow ☑ Deep — Recommended pump setting: 150 feet — Recommended pump rate: ___ GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line.
Indicate north by arrow.



235147

FINAL STATUS OF WELL

1 ☑ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

1 ☑ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not use 10 ☐ Other ___

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☑ Rotary (air) 5 ☐ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other ___

Name of Well Contractor: [illegible] — Well Contractor's Licence No. 2663

Address: RR #5 GUELPH ONT. N1H 6J2

Name of Well Technician: JOHN [illegible] — Well Technician's Licence No. T-2790

Signature of Technician/Contractor: [signature] — Submission date: 04 07 (day mo yr)

MINISTRY USE ONLY — Data source — Contractor 2663 — Date received APR 15 2002

Date of inspection — Inspector

Remarks

OSS.ESC

0506 (07/00) Front Form 9

2 - MINISTRY OF THE ENVIRONMENT COPY

PROJECT: 21456909

RECORD OF BOREHOLE: BH21-1

SHEET 1 OF 1

LOCATION: N 4843275.90; E 551475.50

BORING DATE: March 25, 2021

DATUM:

DRILL RIG: Geoprobe

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		426.33							GR SA SI CL
0	Power Auger 102 mm O.D. Solid Stem	TOPSOIL (200 mm)		0.00 / 426.13	1A	SS	5				
		(OH) ORGANIC SILT; brown; non-cohesive, moist, loose		0.20 / 425.65	1B						
1		(SP) SAND, some gravel to gravelly; black to brown; non-cohesive wet, compact to very dense		0.68	2	SS	16				
					3	SS	12		○	MH	April 14, 2021
2											Bentonite
					4	SS	12				
3				422.95	5A				○		
		(CL) SILTY CLAY, some gravel with silty sand seams; grey (TILL); cohesive, w<PL, hard - Auger grinding at 3.7 m		3.38	5B	SS	43		○		
4					6	SS	57				Sand
					7	SS	50/ 0.10		○		
5											Screen
6				419.80	8	SS	81/ 0.28				
		END OF BOREHOLE		6.53							
7		NOTES: 1. Groundwater measured at 1.5 m below ground surface upon completion of drilling. 2. Groundwater measured at 1.56 m below ground surface on April 14, 2021.									
8											
9											
10											

DEPTH SCALE

1 : 50

GOLDER
MEMBER OF WSP

LOGGED: SM

CHECKED: EN

GTA-BHS 005 S:\CLIENTS\GERANIUM\FERGUS_GOLFNORTH_PROPERTIES\02_DATA\GINT\FERGUS_GOLFNORTH_PROPERTIES.GPJ GAL-MIS.GDT 11/29/21

PROJECT: 21456909

LOCATION: N 4843696.30; E 551427.00

RECORD OF BOREHOLE: BH21-3

SHEET 1 OF 1

BORING DATE: March 29, 2021

DATUM:

DRILL RIG: Geoprobe

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp W Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		434.96							GR SA SI CL
0	Power Auger 102 mm O.D. Solid Stem	TOPSOIL (250 mm)		0.00 / 434.71	1A						
		(OH) Sandy ORGANIC SILT, some gravel; non-cohesive, moist, loose		0.25	1B	SS	1				April 14, 2021 Bentonite
				434.05	2A	SS	7				
1		(CL-ML) SILTY CLAY-CLAYEY SILT, trace sand to sandy, some gravel; brown; cohesive, w<PL, firm		0.91	2B						Sand
					3	SS	5		O—I	MH	
2		- Auger grinding between 2.1 m and 3.4 m		432.75							
		(CL) SILTY CLAY, trace sand to sandy, some gravel; brown to grey (TILL); cohesive, w~PL to w<PL, very stiff to hard		2.21	4	SS	29				
3					5	SS	50/ 0.03				Screen
4					6	SS	50/ 0.13		O		
5					7	SS	50/ 0.15				
6					8	SS	30		O		
				428.25							
7		END OF BOREHOLE		6.71							
		NOTES:									
8		1. Groundwater measured at 2.13 m below ground surface upon completion of drilling.									
		2. Groundwater measured at 0.4 m below ground surface on April 14, 2021.									
9											
10											

DEPTH SCALE

1 : 50

GOLDER
MEMBER OF WSP

LOGGED: SM

CHECKED: EN

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PROJECT: 21456909

LOCATION: N 4844077.10; E 551875.60

RECORD OF BOREHOLE: BH21-5

SHEET 1 OF 1

BORING DATE: March 30, 2021

DATUM:

DRILL RIG: Geoprobe

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕; Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		428.71							GR SA SI CL
0	Power Auger 102 mm O.D. Solid Stem	TOPSOIL (150 mm)		0.00	1A						
		(SM) SILTY SAND, trace gravel, trace organics; brown; non-cohesive, moist, very loose to loose		0.15	1B	SS	2		W		Bentonite
				427.80	2A	SS	7				April 14, 2021 Sand
1		(SM/ML) SILT and SAND, trace gravel; brown; non-cohesive, wet, loose to compact		0.91	2B						
					3	SS	7		W	MH	
2					4	SS	10				Screen
3		- gravel seam at 3.45 m			5A				W		
				425.21	5B	SS	10				
		(CL) CLAYEY SILT, trace sand, trace gravel; brown to grey (TILL); cohesive, w~PL to w<PL, stiff to very stiff		3.50							
4					6	SS	20				Sand
					7	SS	16		W		
5				423.53							
		END OF BOREHOLE		5.18							
6		NOTES: 1. Groundwater measured at 0.6 m below ground surface upon completion of drilling. 2. Groundwater measured at 0.76 m below ground surface on April 14, 2021.									
7											
8											
9											
10											

DEPTH SCALE

1 : 50

GOLDER
MEMBER OF WSP

LOGGED: EN

CHECKED: MWK

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PROJECT: 21456909

RECORD OF BOREHOLE: BH21-6

SHEET 1 OF 1

LOCATION: N 4844124.90; E 551636.50

BORING DATE: March 30, 2021

DATUM:

DRILL RIG: Geoprobe

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (20 40 60 80) nat V. + Q - ● rem V. ⊕ U - ○	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp W Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		427.33							GR SA SI CL
0	Power Auger 102 mm O.D. Solid Stem	TOPSOIL (150 mm)		0.00	1A						
		(SP) SAND, some silt; brown; non-cohesive, moist to wet, loose to compact		0.15	1B	SS	4		O		April 14, 2021
1					2	SS	13				Bentonite
2					3	SS	15		O	MH	
				424.89	4A	SS	20				
		(SM) SILTY SAND; brown; non-cohesive, wet, compact		2.44	4B						
3				424.36							
		(CL) Sandy SILTY CLAY, some gravel with sand seams; grey (TILL); cohesive, w<PL, firm to stiff		2.97	5A	SS	9				
					5B				O		Screen
4					6A						
					6B	SS	7		IO	MH	
5				422.15	7	SS	7				
		END OF BOREHOLE		5.18							
6		NOTES: 1. Groundwater measured at 0.9 m below ground surface upon completion of drilling. 2. Groundwater measured at 0.41 m below ground surface on April 14, 2021.									
7											
8											
9											
10											

DEPTH SCALE

1 : 50

GOLDER
MEMBER OF WSP

LOGGED: SM

CHECKED: MWK

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PROJECT: 21456909

RECORD OF BOREHOLE: BH21-7

SHEET 1 OF 2

LOCATION: N 4844015.70; E 551439.30

BORING DATE: March 30, 2021

DATUM:

DRILL RIG: Geoprobe

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕; Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		428.99							GR SA SI CL
0		TOPSOIL (75 mm)		0.00 / 0.07							
		(CL-ML) SILTY CLAY-CLAYEY SILT with SAND, some gravel; brown; cohesive, w<PL, firm to stiff			1B	SS	4				Bentonite
											April 14, 2021 (D)
											April 14, 2021 (S)
1					2	SS	6			MH	Sand
					3	SS	9				
2											Screen
					4A	SS					
				426.39		SS	37				
		(CL-ML) Sandy SILTY CLAY-CLAYEY SILT, some gravel; brown to grey (TILL); cohesive, w<PL, hard		2.60	4B						
3					5	SS	64			MH	
4					6	SS	67				
					7	SS	100/ 0.25				
5	Power Auger 102 mm O.D. Solid Stem										Bentonite
6					8	SS	78				
7											Sand
					9	SS	80/ 0.18				
8											Screen
9											Sand
					10	SS	67				
		END OF BOREHOLE		419.39 / 9.60							
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE
1 : 50

GOLDER
MEMBER OF WSP

LOGGED: SM
CHECKED: EN

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PROJECT: 21456909

LOCATION: N 4844015.70; E 551439.30

RECORD OF BOREHOLE: BH21-7

SHEET 2 OF 2

BORING DATE: March 30, 2021

DATUM:

DRILL RIG: Geoprobe

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (20 40 60 80) nat V. + Q - ● rem V. ⊕ U - ○	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp W Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
10		*— CONTINUED FROM PREVIOUS PAGE —*									
		NOTES: 1. Groundwater measured at 3.0 m below ground surface upon completion of drilling. 2. Groundwater measured at 0.74 m below ground surface in shallow well and at 0.53 m below ground surface in deep well on April 14, 2021.									
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

DEPTH SCALE

1 : 50

GOLDER
MEMBER OF WSP

LOGGED: SM

CHECKED: EN

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PROJECT: 21456909

RECORD OF BOREHOLE: BH21-8

SHEET 1 OF 1

LOCATION: N 4844379.70; E 551552.80

BORING DATE: March 30, 2021

DATUM:

DRILL RIG: Geoprobe

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (20 40 60 80) nat V. + Q - ● rem V. ⊕ U - ○	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp W Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		427.75							GR SA SI CL
0	Power Auger 102 mm O.D. Solid Stem	TOPSOIL (200 mm)		0.00 / 427.55	1	SS	WH				April 14, 2021
		(CL) CLAYEY SILT, trace sand, trace gravel; brown (TILL); cohesive, w<PL, stiff to very stiff		0.20							Bentonite
1					2	SS	14		O		
					3A						Sand
2		(SM) SILTY SAND, trace gravel; brown; non-cohesive, wet, compact to dense		425.77 / 1.98	3B	SS	19				
					4	SS	30		O		
3					5A						Screen
				424.40		SS	15				
		(CL) CLAYEY SILT, trace sand, trace gravel; grey (TILL); cohesive, w<PL, very stiff		3.35	5B						
				423.94							
4		(SM) SILTY SAND, some gravel: grey; non-cohesive, wet, compact		3.81	6	SS	29		O	MH	
					7	SS	22				
5				422.72							
		END OF BOREHOLE		5.03							
6		NOTES: 1. Groundwater measured at 0.2 m below ground surface upon completion of drilling. 2. Groundwater measured at -0.02 m below ground surface on April 14, 2021.									
7											
8											
9											
10											

DEPTH SCALE

1 : 50

GOLDER
MEMBER OF WSP

LOGGED: EN

CHECKED: MWK

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PROJECT: 21456909

LOCATION: N 4844084.50; E 551266.00

RECORD OF BOREHOLE: BH21-9

SHEET 1 OF 1

BORING DATE: March 22, 2021

DATUM:

DRILL RIG: Geoprobe

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		432.43							GR SA SI CL
0		TOPSOIL (150 mm)- (SM) SILTY SAND		0.00	1A						
		(CL) Sandy SILTY CLAY, some gravel, occasional cobbles; brown; cohesive, w<PL, firm		0.15	1B	SS	6				
1					2	SS	9				
					3	SS	7		O		April 14, 2021 ▽
2				429.99							
		- Auger grinding between 2.4 m and 4.5 m		2.44	4	SS	46		O ⊢	MH	
		(CL-ML) Sandy SILTY CLAY-CLAYEY SILT, some gravel; brown (TILL); cohesive, w<PL, hard									
3					5	SS	50/ 0.05				Bentonite
4	Power Auger 102 mm O.D. Solid Stem				6	SS	50/ 0.07		O		
				427.93							
		(SM-GM) SILTY SAND and GRAVEL; brown; non-cohesive, dry, very dense - Auger grinding between 4.5 m and 5.6 m		4.50	7	SS	50/ 0.07		O		
5											
				426.83							
		(CL) Sandy SILTY CLAY, some gravel; grey (TILL); cohesive, w<PL, hard - Auger grinding between 5.6 m and 6.1 m		5.60							
6					8	SS	50/ 0.07				Sand
7											Screen
					9	SS	50/ 0.07		O		
8				424.15	10	SS	50/ 0.05				
		END OF BOREHOLE		8.28							
9		NOTES: 1. Groundwater measured at 7.3 m below ground surface upon completion of drilling. 2. Groundwater measured at 1.57 m below ground surface on April 14, 2021.									
10											

DEPTH SCALE

1 : 50

GOLDER

MEMBER OF WSP

LOGGED: SM

CHECKED: MWK

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PROJECT: 21456909

LOCATION: N 4844290.00; E 551238.50

RECORD OF BOREHOLE: BH21-10

SHEET 1 OF 1

BORING DATE: March 24, 2021

DATUM:

DRILL RIG: Geoprobe

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (20 40 60 80) nat V. + Q - ● rem V. ⊕ U - ○	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp W Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		433.20							GR SA SI CL
0	Power Auger 102 mm O.D. Solid Stem	TOPSOIL (300 mm) - Sandy ORGANIC SILT		0.00	1A	SS	3				
				432.90							
		(CL) Sandy SILTY CLAY, some gravel with occasional cobbles; brown to grey at 4.57 m (TILL); cohesive, w<PL, soft to hard		0.30	1B						April 14, 2021
1					2	SS	12				Bentonite
2					3	SS	11		O		
					4	SS	35				Sand
3					5	SS	28				
4											
											Screen
5					6	SS	10		O		
6											
					7	SS	40		O⊢⊣	MH	
7											Bentonite
				425.35	8	SS	50/ 0.07		O		
8		END OF BOREHOLE		7.85							
		NOTES:									
9		1. Groundwater in monitoring well measured at 3.0 m below ground level on March 26, 2021.									
		2. Groundwater measured at 0.62 m below ground surface on April 14, 2021.									
10											

DEPTH SCALE

1 : 50

GOLDER
MEMBER OF WSP

LOGGED: SM

CHECKED: EN

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PROJECT: 21456909

LOCATION: N 4844264.70; E 551602.20

RECORD OF BOREHOLE: BH21-11

SHEET 1 OF 1

BORING DATE: March 31, 2021

DATUM:

DRILL RIG: Geoprobe

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕; Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		428.46							GR SA SI CL
0		TOPSOIL (250 mm)		0.00 / 428.21	1	SS	3				
		(SP) SAND, some silt; brown; non-cohesive, moist, loose to compact		0.25							
1					2	SS	7				April 14, 2021
2					3	SS	11		○		
				426.02	4A	SS	8				Hole Plug
		(CL) SILTY CLAY, some sand to SANDY, some gravel; grey (TILL); cohesive, w<PL, firm		2.44	4B				○		
3	Power Auger 102 mm O.D. Solid Stem				5	SS	14				
4					6	SS	12				
5					7	SS	11		⊢○⊣	MH	Sand
											Screen
6					8	SS	11				
				421.75							
		END OF BOREHOLE		6.71							
7		NOTES:									
		1. Groundwater in open borehole at 1.5 m below ground surface upon completion of drilling.									
		2. Groundwater measured at 1.07 m below ground surface on April 14, 2021.									
8											
9											
10											

DEPTH SCALE

1 : 50

GOLDER
MEMBER OF WSP

LOGGED: SM

CHECKED: EN

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PROJECT: 21456909

RECORD OF BOREHOLE: BH21-12

SHEET 1 OF 1

LOCATION: N 4844086.60; E 551092.60

BORING DATE: March 23, 2021

DATUM:

DRILL RIG: Geoprobe

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕; Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		431.95									GR SA SI CL
0	Power Auger 102 mm O.D. Solid Stem	TOPSOIL (200 mm)-SILTY SAND		0.00 / 431.75	1A								
		(CL) SILTY CLAY, some sand, some gravel; brown; cohesive, w<PL, soft to stiff		0.20	1B	SS	8				○		▽ April 14, 2021
1					2	SS	7						Hole Plug
				430.12	3	SS	9						
2		(SM-GM) SILTY SAND and GRAVEL; brown; non-cohesive, moist, compact		1.83 / 429.74									
		(CL-ML) Gravelly SILTY CLAY-CLAYEY SILT with SAND; brown (TILL); cohesive, w<PL, very stiff to hard		2.21	4	SS	28				○		Sand
3					5	SS	28						
4													Screen
					6	SS	50/ 0.13				○ ⊢	MH	
				427.10									
5		END OF BOREHOLE		4.85									
		NOTES:											
		1. Groundwater measured at 3.7 m below ground surface upon completion of drilling.											
6		2. Groundwater measured at 0.52 m below ground surface on April 14, 2021.											
7													
8													
9													
10													

DEPTH SCALE
1 : 50

GOLDER
MEMBER OF WSP

LOGGED: SM
CHECKED: MWK

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PROJECT: 21456909

LOCATION: N 4844451.50; E 551049.00

RECORD OF BOREHOLE: BH21-13

SHEET 1 OF 1

BORING DATE: March 23, 2021

DATUM:

DRILL RIG: Geoprobe

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa; nat V. +, rem V. ⊕; Q - ●, U - ○ (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-5} 10^{-6} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp W Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		429.07							GR SA SI CL
0		TOPSOIL (300 mm)- (OH) CLAYEY ORGANIC SILT		0.00 428.77	1A	SS	5				
		(CL) SILTY CLAY, some sand, some gravel, some organics to 0.61 m; brown; non-cohesive, w<PL, firm		0.30	1B						
1					2	SS	5				
				427.62							April 14, 2021
		(CL) SILTY CLAY, some sand, some gravel, occasional cobbles; brown to grey (TILL); cohesive, w<PL, stiff to hard		1.45	3	SS	10			MH	
2					4	SS	30				Hole Plug
3	Power Auger 102 mm O.D. Solid Stem				5	SS	50/ 0.13				
4		- Auger grinding between 4.6 m and 6.9 m			6	SS	91				Sand
5											
6					7	SS	93/ 0.25				Screen
				422.14							
7		(SM-GM) SILTY SAND and GRAVEL; grey; non-cohesive, wet, very dense		6.93 421.70		SS	50/ 0.05				
		END OF BOREHOLE		7.37							
8		NOTE: 1. Groundwater measured at 1.31 m below ground surface on April 14, 2021.									
9											
10											

DEPTH SCALE

1 : 50

GOLDER
MEMBER OF WSP

LOGGED: SM

CHECKED: MWK

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PROJECT: 21456909

LOCATION: N 4844278.70; E 550895.00

RECORD OF BOREHOLE: BH21-14

SHEET 1 OF 1

BORING DATE: March 23, 2021

DATUM:

DRILL RIG: Geoprobe

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (20 40 60 80) nat V. + Q - ● rem V. ⊕ U - ○	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT Wp W Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		431.06									GR SA SI CL
0		TOPSOIL (300 mm)		0.00	1A	SS	1						April 14, 2021
				430.76									Hole Plug
		(CL) Sandy SILTY CLAY, some gravel, cobbles present; brown; cohesive, w<PL, very soft to very stiff		0.30	1B								
1	Power Auger 102 mm O.D. Solid Stem				2	SS	6						Sand
2					3	SS	17					MH	
		- Auger grinding between 2.1 m and 6.9 m			4	SS	50/ 0.15						Screen
3				427.94	5	SS	50/ 0.00						
		END OF BOREHOLE		3.12									
4		NOTES:											
		1. Groundwater measured at 1.7 m below ground surface upon completion of drilling.											
		2. Groundwater measured at 0.2 m below ground surface on April 14, 2021.											
5													
6													
7													
8													
9													
10													

DEPTH SCALE

1 : 50

GOLDER
MEMBER OF WSP

LOGGED: SM

CHECKED: MWK

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PROJECT: 21456909

LOCATION: N 4844267.20; E 551086.40

RECORD OF BOREHOLE: BH21-15

SHEET 1 OF 1

BORING DATE: March 24, 2021

DATUM:

DRILL RIG: Geoprobe

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		432.46							GR SA SI CL
0	Power Auger 102 mm O.D. Solid Stem	TOPSOIL (300 mm) - ORGANIC SILT and SAND		0.00	1A	SS	1				
		(SM) SILTY SAND, some gravel		0.30 / 431.85	1B						April 14, 2021
1		(CL) SILTY CLAY, some gravel with occasional cobbles; brown; cohesive, w<PL, firm to stiff		0.61	2	SS	4				Hole Plug
2					3	SS	11		O		
				430.25							
		(CL) Sandy SILTY CLAY, some gravel; brown to grey (TILL); cohesive, w<PL, hard - Auger grinding at 2.3 m		2.21	4	SS	30				Sand
3					5	SS	33		O—I	MH	
4											Screen
5					6	SS	50				
				427.30							
		END OF BOREHOLE		5.16							
6		NOTES: 1. Groundwater measured at 3.8 m below ground surface upon completion of drilling. 2. Groundwater measured at 0.34 m below ground surface on April 14, 2021.									
7											
8											
9											
10											

DEPTH SCALE

1 : 50

GOLDER
MEMBER OF WSP

LOGGED: SM

CHECKED: EN

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PROJECT: 21456909

LOCATION: N 4844256.07; E 551424.87

RECORD OF BOREHOLE: BH21-16

SHEET 1 OF 1

BORING DATE: March 31, 2021

DATUM:

DRILL RIG: Geoprobe

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕; 20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		429.46							GR SA SI CL
0	Power Auger 102 mm O.D. Solid Stem	TOPSOIL (50 mm)		429.41 0.05							April 14, 2021
		(SM/ML) Gravelly SILT with slight plasticity and SAND, cobbles; brown; cohesive, w<PL, firm to very stiff			1	SS	4				
1					2	SS	17				
											Hole Plug
2					3	SS	13			MH	
				427.25							
		(CL-ML) SILTY CLAY-CLAYEY SILT, some sand, some gravel, some cobbles; brown to grey (TILL); cohesive, w<PL, hard		2.21							
					4	SS	61				
3											Sand
					5	SS	64				
4					6	SS	66				Screen
5					7	SS	88				
6					8	SS	50/ 0.13				
				423.08							
		END OF BOREHOLE		6.38							
7		NOTES:									
		1. Groundwater at 0.6 m below ground surface upon completion of drilling.									
		2. Groundwater measured at 0.13 m below ground surface on April 14, 2021.									
8											
9											
10											

DEPTH SCALE

1 : 50

GOLDER
MEMBER OF WSP

LOGGED: SM

CHECKED: EN

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PROJECT: 21456909

LOCATION: N 4843491.90; E 551511.50

RECORD OF BOREHOLE: BH21-17

SHEET 1 OF 1

BORING DATE: March 26, 2021

DATUM:

DRILL RIG: Geoprobe

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕; Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		428.92							GR SA SI CL
0		TOPSOIL (50 mm)		0.05							
		(SP) SAND, some gravel, trace organics; brown; non-cohesive, wet			1	SS	2				April 14, 2021
				428.24							
1		(CL-ML) Sandy SILTY CLAY-CLAYEY SILT, some gravel; brown to grey (TILL); cohesive, w>PL to w<PL, soft to hard at 3.05 m		0.68	2	SS	3		O		Hole Plug
2	Power Auger 102 mm O.D. Solid Stem				3	SS	10				
		- Auger grinding at 2.3 m			4	SS	31		⊖	MH	Sand
3					5	SS	41				
4					6	SS	58		O		Screen
					7	SS	50/ 0.13				
5				423.89							
		END OF BOREHOLE		5.03							
6		NOTES:									
		1. Groundwater measured at 2.13 m below ground surface on completion of drilling.									
		2. Groundwater measured at 0.46 m below ground surface on April 14, 2021.									
7											
8											
9											
10											

DEPTH SCALE

1 : 50

GOLDER
MEMBER OF WSP

LOGGED: SM

CHECKED: EN

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PROJECT: 21456909

LOCATION: N 4843775.60; E 551588.20

RECORD OF BOREHOLE: BH21-18

SHEET 1 OF 2

BORING DATE: March 29, 2021

DATUM:

DRILL RIG: Geoprobe

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		427.24							GR SA SI CL
0		TOPSOIL (50 mm)		0.05							
		(SP-GP) SAND and GRAVEL, some silt; brown; non-cohesive, moist, compact			1	SS	10				Bentonite
				426.56							
1		(CL) CLAYEY SILT, some gravel, some sand, trace organics; cohesive, w<PL, very stiff		0.68	2A						Sand
				426.17		SS	5				April 14, 2021
		(ML) Sandy SILT, some gravel; brown (TILL); non-cohesive, moist, loose		1.07	2B						
				425.79							
		(SM-GM) SILTY SAND and GRAVEL; brown; non-cohesive, moist, compact		1.45							
2					3		16				Screen
					4A						
				424.64							
		(CL) SILTY CLAY, some gravel, trace sand; brown (TILL); cohesive, w~PL, stiff		2.60	4B		11				
3					5		33				
				423.51							
		(SM/ML) SILT with slight plasticity and SAND, some gravel, trace clay; grey (TILL); cohesive, w<PL, hard		3.73	6		68				
4											
					7		66			MH	
5											
6					8		85/ 0.28				
7				420.08							
		(SM) SILTY SAND, some gravel; grey; non-cohesive, wet, dense		7.16							
					9		32				
8											
9				418.10							
		END OF BOREHOLE		9.14							
		NOTES:									
		1. Groundwater measured at 1.2 m below ground surface upon completion of drilling.									
10											
		CONTINUED NEXT PAGE									

Power Auger

102 mm O.D. Solid Stem

DEPTH SCALE

1 : 50

GOLDER
MEMBER OF WSP

LOGGED: EN

CHECKED: MWK

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PROJECT: 21456909

LOCATION: N 4843775.60; E 551588.20

RECORD OF BOREHOLE: BH21-18

SHEET 2 OF 2

BORING DATE: March 29, 2021

DATUM:

DRILL RIG: Geoprobe

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (20 40 60 80) nat V. + rem V. ⊕ Q - ● U - ○	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp W Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
10		— CONTINUED FROM PREVIOUS PAGE —									GR SA SI CL
		2. Groundwater measured at 1.05 m below ground surface on April 14, 2021.									
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

DEPTH SCALE

1 : 50

GOLDER

MEMBER OF WSP

LOGGED: EN

CHECKED: MWK

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PROJECT: 21456909

LOCATION: N ; E

RECORD OF BOREHOLE: BH22-01

BORING DATE: November 21, 2022

SHEET 1 OF 1

DATUM:

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [PPM] ⊕ ND = Not Detected (100 200 300 400) / HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] □ ND = Not Detected (100 200 300 400)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp — W — Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
-1				-1.10							Stickup
0		GROUND SURFACE									
	Direct Push	TOPSOIL - SILTY SAND, trace roots; dark brown; non-cohesive, moist			1						
		(SM) SILTY SAND, trace clay; brown; non-cohesive, moist to wet		0.25	2	DO	-	ND			Bentonite Seal
1											Silica Sand
		(CL) SILTY CLAY, trace sand; brown to grey; cohesive, w>PL		1.52	3			ND			
2						DO	-				
		(CL) SILTY CLAY, trace gravel; brown (TILL); cohesive, very stiff, w~PL		2.29	4			ND			
3					5			ND			PVC #10 Slot Screen
						DO	-				
4					6			ND			
	Power Auger	(SW) SAND; brown; non-cohesive, wet		4.57	7	SS	86				
5		(SM) SILTY SAND, trace sand; brown; non-cohesive, moist		5.18	8	SS	>50	ND			
		End of Borehole		5.64							
6		Note(s):									
		1. Water level measured at a depth of 2.3 m.									
7											
8											

DRAFT

DEPTH SCALE

1 : 50

GOLDER

LOGGED: SA

CHECKED: RN

GTA-BHS 001 S:\CLIENTS\GERANIUM\FERGUS_GOLFNORTH_PROPERTIES\02_DATA\GINT\FERGUS_GOLFNORTH_PROPERTIES.GPJ GAL-MIS.GDT 12/23/22

PROJECT: 21456909

LOCATION: N ; E

RECORD OF BOREHOLE: BH22-27

BORING DATE: November 30, 2022

SHEET 1 OF 1

DATUM:

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [PPM] ⊕ ND = Not Detected (20 40 60 80) / HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] □ ND = Not Detected (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp W Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		-1.00							Stickup
0	Power Auger 102 mm Hollow Stem	TOPSOIL - (SM) SILTY SAND; dark brown; non-cohesive; moist			1	DO	24/48				
		(SM) SILTY SAND, trace clay; brown; non-cohesive; moist		0.25	2	DO	24/48				
1		(SM) SILTY SAND, trace to some clay; trace gravel/stone		1.22	3	DO	48/48	ND			Bentonite Seal
2		(CL) SILTY CLAY, trace sand, gravel; brown; cohesive; w~PL		1.83	4	DO	48/48	ND			
		(CL) SILTY CLAY, trace to some gravel/stone, trace sand; brown; very hard; w~PL		2.44	5	DO	48/48	ND			
3		(CL) SILTY CLAY, trace sand; brown; very hard; w~PL		3.05	6	DO		ND			Silica Sand
		(CL) SILTY CLAY, trace gravel/stone, trace sand; very hard		3.66	7	DO	48/48	ND			
4		(CL) SILTY CLAY, trace gravel/stone, trace sand; very hard - Rock layers from 4.57 m to 4.70 m		4.27	8	DO	48/48	ND			
5		(CL) SILTY CLAY, trace sand, gravel/stone		4.88	9	DO	48/48	ND			Screen
		(SM) SILTY SAND, trace clay, trace to some gravel/stone; brown to grey; non-cohesive; moist		5.49	10	DO	48/48	ND			
6		(SM) SILTY SAND, trace clay, trace gravel/rock; grey; non-cohesive; moist		6.10	11	DO	48/48	ND			
		End of Borehole Note(s): 1. Water level encountered at a depth of 5.48 m.		6.71							
7											
8											
9											

DEPTH SCALE

1 : 50

LOGGED: SA

CHECKED: RN

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PROJECT: 21456909
LOCATION: N ; E

RECORD OF BOREHOLE: BH22-28

BORING DATE: December 1, 2022

SHEET 1 OF 1
DATUM:

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [PPM] ⊕ ND = Not Detected (20 40 60 80) / HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] □ ND = Not Detected (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp W Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
-1				-1.20							Stickup
0		GROUND SURFACE									
		TOPSOIL - (SM) SILTY SAND; dark brown; non-cohesive; moist			1	DO	28	ND			
		(SM) SILTY SAND, trace gravel; dark brown; non-cohesive; moist		0.20	2	DO	48	ND			
1		(CL) SILTY CLAY, trace sand, gravel; cohesive; w~PL		1.22	3	DO	32	ND			Bentonite Seal
		- Organic layer at a depth of 1.78 m									
2		(CL) SILTY CLAY, trace sand, gravel; brown		1.83	4	DO	48	ND			
		(CL) SILTY CLAY, trace sand, gravel; brown; moist to wet		2.44	5	DO	48	ND			Silica Sand
3	Power Auger 102 mm Hollow Stem	(CL) SILTY CLAY, trace sand, gravel; brown; firm; cohesive; moist to wet		3.05	6	DO	48	ND			
		(CL) SILTY CLAY, trace gravel, sand; firm; w~PL		3.66	7	DO	48	ND			
4		(CL) SILTY CLAY, trace gravel, sand; firm; w~PL		4.27	8	DO	48	ND			Screen
5		(CL) SILTY CLAY, trace gravel and sand; hard; w~PL		4.88	9	DO	48/48	ND			
		(CL) SILTY CLAY, trace gravel; firm; w~PL		5.49	10	DO	48/48	ND			
6		- Rock layer from 5.87 m to 6.10 m									
		End of Borehole		6.10							
7		Note(s): 1. Water level encountered at a depth of 3.14 m.									
8											

DRAFT

DEPTH SCALE
1 : 50

LOGGED: SA
CHECKED: RN

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RECORD OF BOREHOLE BH23-02

CLIENT: Geranium
PROJECT: Fergus Golf Course Redevelopment, Fergus, Ontario
JOB#: 101987.017
LOCATION: See Borehole Location Plan

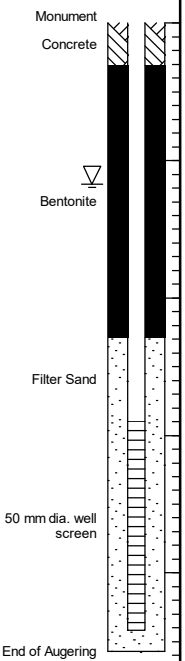
SHEET: 1 OF 1
DATUM: CGVD28
BORING DATE: Nov 15 2023

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
		Ground Surface		428.00				
0	Power Auger Hollow Stem Auger (203 mm)	TOPSOIL		0.00 / 427.75	1	SS	330	4
		(ML) SILT, some sand, trace organics; dark brown; cohesive, w<PL		0.25 / 427.24				
1		(SM) SILTY SAND, trace gravel; brown; non-cohesive, moist to wet, loose to compact		0.76	2	SS	305	7
					3	SS	356	13
2				425.71				
		(CL) SILTY CLAY, trace gravel; grey (TILL); cohesive, w~PL, stiff to very stiff		2.29	4	SS	305	12
3					5	SS	457	13
4								
					6	SS	457	22
5				422.97				
		End of Borehole		5.03				
6		Notes: 1. Borehole dry upon completion of drilling. 2. Monitoring well installed as shown upon completion of drilling.						
7								
8								
9								
10								
11								

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/03/12	1.2 ▽	426.8

GEMTEC
Consulting Engineers and Scientists

LOGGED: CC
CHECKED: MWK

GEO - BOREHOLE LOG 101987.017_FERGUSSOUTH_GEOTECH_R0_2023_11_14.GPJ GEMTEC 2018.GDT 4/18/24

RECORD OF BOREHOLE BH23-09

CLIENT: Geranium
PROJECT: Fergus Golf Course Redevelopment, Fergus, Ontario
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: CGVD28
BORING DATE: Nov 16 2023

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m / DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m / SHEAR STRENGTH (Cu), kPA / WATER CONTENT, %	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger Solid Stem Auger (152 mm)	Ground Surface		428.80							Monument
		TOPSOIL		0.00 / 428.60							Concrete
		(CL-ML) CLAYEY SILT to SILTY CLAY, some sand, trace gravel; brown to grey (TILL); cohesive, w<PL, stiff to hard		0.20	1	SS	406	7			Bentonite
1					2	SS	457	17			Filter Sand
2					3	SS	457	14			50 mm dia. well screen
					4	SS	254	68			
3					5	SS	305	70			
				425.29							End of Augering
4		End of Borehole		3.51							
		Notes:									
		1. Borehole dry upon completion of drilling.									
		2. Monitoring well installed as shown upon completion of drilling.									
5											
6											
7											
8											
9											
10											
11											

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/03/12	1.3 ▽	427.5

GEMTEC
Consulting Engineers and Scientists

LOGGED: CC
CHECKED: MWK

GEO - BOREHOLE LOG 101987.017_FERGUSSOUTH_GEOTECH_R0_2023_11_14.GPJ GEMTEC 2018.GDT 4/18/24

RECORD OF BOREHOLE BH23-20D

CLIENT: Geranium
PROJECT: Fergus Golf Course Redevelopment, Fergus, Ontario
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 1 OF 2
DATUM: CGVD28
BORING DATE: Nov 7 2023

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Ground Surface		426.60						Monument
0		TOPSOIL		426.45 / 0.00						Concrete
		(SM) SILTY SAND; light brown to grey; non-cohesive, moist		0.15	1	SS	305	6		
				425.84						
1		(SP) SAND, some silt; light brown to grey; non-cohesive, wet, loose		0.76	2	SS	152	8		
				425.08						
		(CL-ML) SILTY CLAY to CLAYEY SILT, trace to some gravel, trace to some sand; light brown to grey (TILL), cohesive, w<PL to w~PL, stiff to hard		1.52	3	SS	203	14		
2					4	SS	356	14		
3					5	SS	203	14		Bentonite
4	Power Auger / Hollow Stem Auger (203 mm)	- auger grinding between approximately 3.7 m to 9.1 m depths			6	SS	406	22		
5										
6					7	SS	406	51	MH	
7										Filter Sand
8					8	SS	457	57		50 mm dia. well screen
9					9	SS	457	90		
				417.00						End of Augering
		End of Borehole		9.60						
10		Notes:								
		1. Borehole dry upon completion of drilling.								
		2. Refusal encountered at approximately 6.7 m depth. Borehole moved approximately 1 m east.								
11										

SAMPLES

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L

10 20 30 40 50 60 70 80 90

GEMTEC
Consulting Engineers and Scientists

LOGGED: RH
CHECKED: MWK

GEO - BOREHOLE LOG 101987.017_FERGUSSOUTH_GEOTECH_R0_2023_11_14.GPJ GEMTEC 2018.GDT 4/18/24

RECORD OF BOREHOLE BH23-20D

CLIENT: Geranium
PROJECT: Fergus Golf Course Redevelopment, Fergus, Ontario
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 2 OF 2
DATUM: CGVD28
BORING DATE: Nov 7 2023

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY, mm	SAMPLES: BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m; DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m; SHEAR STRENGTH (Cu), kPA (NATURAL, REMOULDED); WATER CONTENT, % (W_P, W, W_L); 10 20 30 40 50 60 70 80 90	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
11		3. Monitoring well installed as shown upon completion of drilling.									
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/03/12	1.2 ▽	425.4

GEMTEC
Consulting Engineers and Scientists

LOGGED: RH
CHECKED: MWK

GEO - BOREHOLE LOG 101987.017_FERGUSSOUTH_GEOTECH_R0_2023_11_14.GPJ GEMTEC 2018.GDT 4/18/24

RECORD OF BOREHOLE BH23-20S

CLIENT: Geranium
PROJECT: Fergus Golf Course Redevelopment, Fergus, Ontario
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: CGVD28
BORING DATE: Nov 7 2023

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m / DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m / SHEAR STRENGTH (Cu), kPA (NATURAL, REMOULDED) / WATER CONTENT, % (W_P, W, W_L)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger, Hollow Stem Auger (203 mm)	Ground Surface		426.60							Monument, Concrete
		- Refer to BH23-20D for coresponding lithology information.		0.00							
1											Bentonite
2											
3											Filter Sand
4											50 mm dia. well screen
5											
6											
				419.89							
7		End of Borehole 1. Monitoring well installed as shown upon completion of drilling.		6.71							End of Augering
8											
9											
10											
11											

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/03/12	1.1 ▽	425.5

GEMTEC
Consulting Engineers and Scientists

LOGGED: RH
CHECKED: MWK

GEO - BOREHOLE LOG 101987.017_FERGUSSOUTH_GEOTECH_R0_2023_11_14.GPJ GEMTEC 2018.GDT 4/18/24

RECORD OF BOREHOLE BH23-24D

CLIENT: Geranium
PROJECT: Fergus Golf Course Redevelopment, Fergus, Ontario
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: CGVD28
BORING DATE: Nov 6 2023

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING
		Ground Surface	426.70					
0	Power Auger Hollow Stem Auger (203 mm)	TOPSOIL	426.55 0.00					
		(SP/SM) SAND, some silt to silty; brown; non-cohesive, moist, compact	0.15	1	SS	305	11	
1				2	SS	254	18	
			425.18					
		(ML) SILT, some sand, trace gravel; grey (TILL); non-cohesive, compact to dense, moist	1.52	3	SS	305	14	
2				4	SS	305	41	NP
		- auger grinding between approximately 2.7 m and 8.9 m depths						
3			423.60					
		(CL-ML) SILTY CLAY to CLAYEY SILT, some sand to sandy, some gravel; grey (TILL); cohesive, w<PL, hard	3.10	5	SS	254	40	
4								
				6	SS	356	52	
5								
6				7	SS	254	65	
7								
				8	SS	254	76	
8								
9				9	SS	254	61	
			417.10					
		End of Borehole	9.60					
10		Notes: 1. Borehole dry upon completion of drilling. 2. Monitoring well installed as shown upon completion of drilling.						
11								

SAMPLES

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

PIEZOMETER OR STANDPIPE INSTALLATION

Monument
Concrete
Bentonite
Filter Sand
50 mm dia. well screen
End of Augering

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/03/12	1.2 ▽	425.5

GEMTEC
Consulting Engineers and Scientists

LOGGED: RH
CHECKED: MWK

GEO - BOREHOLE LOG 101987.017_FERGUSSOUTH_GEOTECH_R0_2023_11_14.GPJ GEMTEC 2018.GDT 4/18/24

RECORD OF BOREHOLE BH23-24S

CLIENT: Geranium
PROJECT: Fergus Golf Course Redevelopment, Fergus, Ontario
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: CGVD28
BORING DATE: Nov 7 2023

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m / DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m / SHEAR STRENGTH (Cu), kPA (+ NATURAL, ⊕ REMOULDED) / WATER CONTENT, % (W_P, W, W_L)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger Hollow Stem Auger (203 mm)	Ground Surface		426.70							Monument Concrete
		- Refer to BH23-24D for coresponding lithology information.		0.00							
1											Bentonite
2											Filter Sand
3											50 mm dia. well screen
4				422.13							End of Augering
		End of Borehole 1. Monitoring well installed as shown upon completion of drilling.		4.57							
5											
6											
7											
8											
9											
10											
11											

10 20 30 40 50 60 70 80 90

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/03/12	1.0 ▽	425.7

GEMTEC
Consulting Engineers and Scientists

LOGGED: RH
CHECKED: MWK

GEO - BOREHOLE LOG 101987.017_FERGUSSOUTH_GEOTECH_R0_2023_11_14.GPJ GEMTEC 2018.GDT 4/18/24

RECORD OF BOREHOLE BH23-27

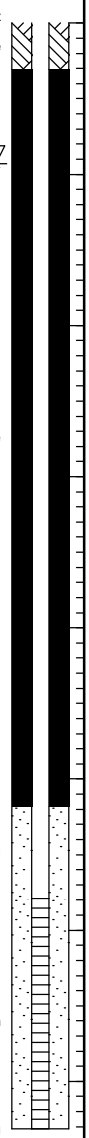
CLIENT: Geranium
PROJECT: Fergus Golf Course Redevelopment, Fergus, Ontario (North Parcel, Site 2)
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: CGVD28
BORING DATE: Nov 16 2023

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING
		Ground Surface		434.20					
0	Power Auger, Hollow Stem Auger (203 mm)	TOPSOIL		0.00 / 434.00	1	SS	203	3	
		(SM) SILTY SAND, trace rootlets; brown; non-cohesive, moist		0.20 / 433.44					
1		(CL-ML) sandy SILTY CLAY, some gravel; brown to grey (TILL); cohesive, w<PL, very stiff to hard		0.76	2	SS	254	15	
					3	SS	178	19	
2					4	SS	406	23	
3					5	SS	254	19	MH
4					6	SS	330	25	
5					7	SS	305	56	
6					8	SS	0	50 / 0.01	
7				426.43					
8		End of Borehole		7.77					
9		Notes: 1. Borehole dry upon completion of drilling. 2. Monitoring well installed as shown upon completion of drilling.							
10									

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL, ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/01/03	0.9 ▽	433.3

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Consulting Engineers and Scientists

LOGGED: CC
CHECKED:

GEO - BOREHOLE LOG 101987.017_FERGUSNORTH_GEOTECH_R0_2023_12_11.GPJ GEMTEC 2018.GDT 3/21/24

RECORD OF BOREHOLE BH23-29

CLIENT: Geranium
PROJECT: Fergus Golf Course Redevelopment, Fergus, Ontario (North Parcel, Site 2)
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 1 OF 2
DATUM: CGVD28
BORING DATE: Nov 10 2023

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger, Hollow Stem Auger (203 mm)	Ground Surface		432.72						Monument
		TOPSOIL		0.00 / 432.52	1	SS	432	6		
		(ML) SILT, some sand, trace gravel; brown; cohesive, w~PL		0.20 / 431.96						
1		(CL) SILTY CLAY, trace sand, trace gravel; brown to brown-grey (mottled); cohesive, w~PL, stiff		0.76	2	SS	457	12		
					3	SS	305	9		
2										
		(ML) gravelly, sandy SILT; brown (TILL); cohesive, w<PL, very stiff to hard - auger grinding on probable cobbles/boulders between approximately 2.3 m and 6.1 m depths		430.43 / 2.29	4	SS	356	24		
3					5	SS	330	66	MH	Bentonite
4										
					6	SS	229	50 / 0.15		
5		- becoming grey at approximately 5.5 m depth								
6					7	SS	254	50 / 0.13		
7										Filter Sand
					8	SS	356	50 / 0.08	MH	
8										50 mm dia. well screen
9					9	SS	203	50 / 0.15		
				423.12						End of Augering
		End of Borehole		9.60						
10		Notes:								

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: NATURAL, REMOULDED
WATER CONTENT, %: W_P, W, W_L
10 20 30 40 50 60 70 80 90

GEMTEC
Consulting Engineers and Scientists

LOGGED: CC
CHECKED:

GEO - BOREHOLE LOG 101987.017_FERGUSNORTH_GEOTECH_R0_2023_12_11.GPJ GEMTEC 2018.GDT 3/21/24

RECORD OF BOREHOLE BH23-29

CLIENT: Geranium
PROJECT: Fergus Golf Course Redevelopment, Fergus, Ontario (North Parcel, Site 2)
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 2 OF 2
DATUM: CGVD28
BORING DATE: Nov 10 2023

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY, mm	SAMPLES: BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m; DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m; SHEAR STRENGTH (Cu), kPA (NATURAL, REMOULDED); WATER CONTENT, % (W_P, W, W_L)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10		1. Borehole dry upon completion of drilling. 2. Monitoring well installed as shown upon completion of drilling.							10 20 30 40 50 60 70 80 90		
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/01/03	1.4 ▽	431.3

GEMTEC
Consulting Engineers and Scientists

LOGGED: CC
CHECKED:

GEO - BOREHOLE LOG 101987.017_FERGUSNORTH_GEOTECH_R0_2023_12_11.GPJ GEMTEC 2018.GDT 3/21/24

RECORD OF BOREHOLE BH23-33

CLIENT: Geranium
PROJECT: Fergus Golf Course Redevelopment, Fergus, Ontario (North Parcel, Site 2)
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: CGVD28
BORING DATE: Nov 13 2023

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Ground Surface		429.94						
0	Power Auger Solid Stem Auger (152 mm)	TOPSOIL		0.00 / 429.74	1	SS	356	7	MH	Monument; Bentonite; Filter Sand; 50 mm dia. well screen; End of Augering
		(SM) SILTY SAND; dark brown; non-cohesive, moist		0.20 / 429.18						
1		(CL) sandy SILTY CLAY, trace gravel, brown-grey (mottled) to grey (TILL); cohesive, w<PL, stiff to hard		0.76	2	SS	457	13		
					3	SS	457	25		
2					4	SS	203	28		
3					5	SS	457	65		
		End of Borehole		426.43 / 3.51						
4		Notes:								
		1. Borehole dry upon completion of drilling.								
		2. Monitoring well installed as shown upon completion of drilling.								
5		3. Ground surface interpolation derived from '21016tp07a.dwg' (RP-E Surveying, December 7, 2023). Location not yet surveyed.								
6										
7										
8										
9										
10										

SAMPLES

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P W W_L
10 20 30 40 50 60 70 80 90

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/01/04	0.7 ▽	429.2

GEMTEC
Consulting Engineers and Scientists

LOGGED: CC
CHECKED:

GEO - BOREHOLE LOG 101987.017_FERGUSNORTH_GEOTECH_R0_2023_12_11.GPJ GEMTEC 2018.GDT 3/21/24

RECORD OF BOREHOLE BH23-36

CLIENT: Geranium
PROJECT: Fergus Golf Course Redevelopment, Fergus, Ontario (North Parcel, Site 2)
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: CGVD28
BORING DATE: Nov 10 2023

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Ground Surface		394.56						
0	Power Auger Hollow Stem Auger (203 mm)	TOPSOIL		0.00 / 394.31	1	SS	254	9		Monument, Concrete
		(SM) SILTY SAND; dark brown; non-cohesive, moist		0.25 / 393.80						
1		(CL-ML) sandy SILTY CLAY, trace gravel; brown to brown-grey (TILL), cohesive, w<PL, stiff to very stiff		0.76	2	SS	178	16		Bentonite
					3	SS	457	14		
2		(SM) SILTY SAND; brown; non-cohesive, wet, compact		2.29 / 392.27	4	SS	356	11	MH	Filter Sand
3		(CL-ML) sandy SILTY CLAY, trace gravel, trace rock fragments; grey (TILL); cohesive, w<PL, hard		3.05 / 391.51	5	SS	406	52		50 mm dia. well screen
4										
5				389.53	6	SS	76	50 / 0.08		End of Augering
		End of borehole		5.03						

Notes:

1. Borehole dry upon completion of drilling.

2. Monitoring well installed as shown upon completion of drilling.

3. Ground surface interpolation derived from '21016tp07a.dwg' (RP-E Surveying, December 7, 2023). Location not yet surveyed.

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/01/04	1.0 ▽	393.6
24/01/08	1.0 ▼	393.5

GEMTEC
Consulting Engineers and Scientists

LOGGED: CC
CHECKED:

GEO - BOREHOLE LOG 101987.017_FERGUSNORTH_GEOTECH_R0_2023_12_11.GPJ GEMTEC 2018.GDT 3/21/24

RECORD OF BOREHOLE BH23-38

CLIENT: Geranium
PROJECT: Fergus Golf Course Redevelopment, Fergus, Ontario (North Parcel, Site 2)
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 1 OF 2
DATUM: CGVD28
BORING DATE: Nov 16 2023

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m / DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m / SHEAR STRENGTH (Cu), kPA / WATER CONTENT, %	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger, Hollow Stem Auger (203 mm)	Ground Surface		434.67							Monument
		TOPSOIL		0.00 / 434.49							Concrete
		(SM) SILTY SAND, trace rootlets; brown; non-cohesive, moist		0.18 / 433.91	1	SS	229	6			
1		(CL-ML / ML) sandy CLAYEY SILT to SILT, trace to some gravel; brown to grey (TILL); cohesive, w<PL to w~PL, very stiff to hard		0.76	2	SS	178	34			
2					3	SS	279	20			
					4	SS	254	43			
3					5	SS	279	47			
4					6	SS	229	39			Bentonite
5											
6					7	SS	127	50 / 0.08		MH	
7											Filter Sand
8					8	SS	279	50 / 0.15			50 mm dia. well screen
9					9	SS	152	50 / 0.15			End of Augering
		End of Borehole		425.07 / 9.60							
10		Notes:									

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL, ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

GEMTEC
Consulting Engineers and Scientists

LOGGED: CC
CHECKED:

GEO - BOREHOLE LOG 101987.017_FERGUSNORTH_GEOTECH_R0_2023_12_11.GPJ GEMTEC 2018.GDT 3/21/24

RECORD OF BOREHOLE BH23-38

CLIENT: Geranium
PROJECT: Fergus Golf Course Redevelopment, Fergus, Ontario (North Parcel, Site 2)
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 2 OF 2
DATUM: CGVD28
BORING DATE: Nov 16 2023

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY, mm	SAMPLES: BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m; DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m; SHEAR STRENGTH (Cu), kPA (NATURAL, REMOULDED); WATER CONTENT, % (W_P, W, W_L)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10		1. Borehole dry upon completion of drilling. 2. Monitoring well installed as shown upon completion of drilling.							10 20 30 40 50 60 70 80 90		
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/01/03	0.9 ▽	433.8

GEMTEC
Consulting Engineers and Scientists

LOGGED: CC
CHECKED:

GEO - BOREHOLE LOG 101987.017_FERGUSNORTH_GEOTECH_R0_2023_12_11.GPJ GEMTEC 2018.GDT 3/21/24

RECORD OF BOREHOLE BH23-41

CLIENT: Geranium
PROJECT: Fergus Golf Course Redevelopment, Fergus, Ontario (North Parcel, Site 2)
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: CGVD28
BORING DATE: Nov 14 2023

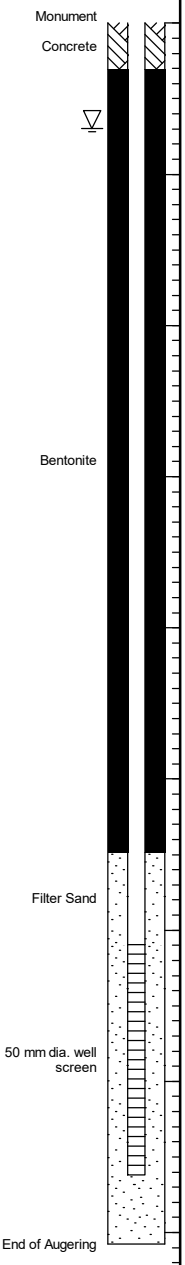
DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
		Ground Surface		434.64				
0	Power Auger / Hollow Stem Auger (203 mm)	TOPSOIL		0.00 / 434.41	1	SS	229	5
		(SM) SILTY SAND; dark brown; non-cohesive, moist		0.23 / 433.88				
1		(ML) sandy SILT, trace gravel; brown-grey (mottled) to grey (TILL), cohesive, w<PL, very stiff to hard		0.76	2	SS	254	30
		- auger grinding on probable cobbles/boulders between approximately 1.5 m and 2.8 m depths			3	SS	330	26
2					4	SS	25	62
3					5	SS	432	30
4					6	SS	178	60
5								
6					7	SS	254	50 / 0.13
7								
8				426.56	8	SS	305	50 / 0.13
		End of Borehole		8.08				
9		Notes: 1. Borehole dry upon completion of drilling. 2. Monitoring well installed as shown upon completion of drilling. 3. Auger refusal encountered at approximately 3.8 m depth. Borehole moved 1 m north.						
10								

SOIL PROFILE | SAMPLES

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/01/03	0.7 ▽	433.9

GEMTEC Consulting Engineers and Scientists

LOGGED: CC
CHECKED:

GEO - BOREHOLE LOG 101987.017_FERGUSNORTH_GEOTECH_R0_2023_12_11.GPJ GEMTEC 2018.GDT 3/21/24

RECORD OF BOREHOLE BH23-43

CLIENT: Geranium
PROJECT: Fergus Golf Course Redevelopment, Fergus, Ontario (North Parcel, Site 2)
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: CGVD28
BORING DATE: Nov 20 2023

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m ● / DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m ▲	SHEAR STRENGTH (Cu), kPA + NATURAL ⊕ REMOULDED / WATER CONTENT, % W_P W W_L	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger / Hollow Stem Auger (203 mm)	Ground Surface		434.63								Monument
		TOPSOIL		0.00 / 434.40	1	SS	229	14	●			Concrete
		(SM) SILTY SAND, trace gravel; brown; non-cohesive, moist		0.23 / 433.87								
1		(CL-ML) sandy SILTY CLAY, trace gravel; brown to grey (TILL); cohesive, w<PL to w~PL, very stiff to hard		0.76	2	SS	279	25	●			
					3	SS	279	16	○ ●			
2					4	SS	305	28	●			
3					5	SS	25	50 / 0.10	○			Bentonite
4					6	SS	254	50 / 0.15				
5												
6					7	SS	25	50 / 0.03	○			Filter Sand
7												50 mm dia. well screen
8				426.55	8	SS	203	50 / 0.15	○			
		End of Borehole		8.08								End of Augering
9												
10												

Notes:

1. Borehole dry upon completion of drilling.

2. Monitoring well installed as shown upon completion of drilling.

3. Auger refusal encountered at approximately 0.6 m depth. Borehole moved 2 m east.

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/01/03	0.7 ▽	434.0

GEMTEC
Consulting Engineers and Scientists

LOGGED: CC
CHECKED:

GEO - BOREHOLE LOG 101987.017_FERGUSNORTH_GEOTECH_R0_2023_12_11.GPJ GEMTEC 2018.GDT 3/21/24

RECORD OF BOREHOLE BH23-44

CLIENT: Geranium
PROJECT: Fergus Golf Course Redevelopment, Fergus, Ontario (North Parcel, Site 2)
JOB#: 101987.017
LOCATION: See Borehole Location Plan

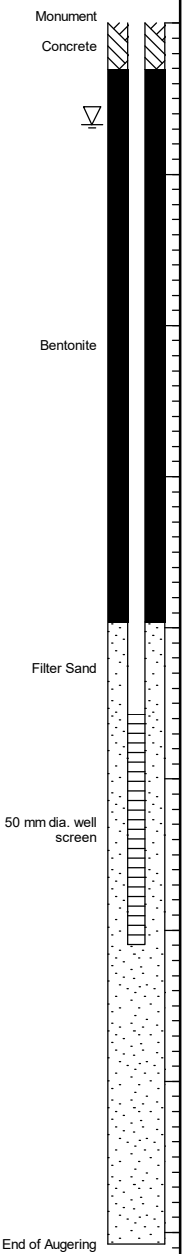
SHEET: 1 OF 1
DATUM: CGVD28
BORING DATE: Nov 20 2023

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
		Ground Surface		434.50				
0	Power Auger / Hollow Stem Auger (203 mm)	TOPSOIL		0.00 / 434.32				
		(SM) SILTY SAND, trace gravel; brown; moist		0.18	1	SS	457	13
				433.74				
1		(CL-ML) sandy SILTY CLAY, trace to some sand, trace to some gravel; brown to grey (TILL); w<PL, very stiff to hard		0.76	2	SS	305	15
					3	SS	76	15
2								
		- auger grinding on probable cobbles/boulders between approximately 2.2 m and 2.4 m depths			4	SS	330	40
3								
					5	SS	51	45
4								
					6	SS	229	30
5								
6					7	SS	203	50 / 0.15
7								
					8	SS	305	90 / 0.15
8				426.42				
		End of Borehole		8.08				
9		Notes: 1. Borehole dry upon completion of drilling. 2. Monitoring well installed as shown upon completion of drilling.						
10								

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/01/03	0.7 ▽	433.8

GEMTEC
Consulting Engineers and Scientists

LOGGED: CC
CHECKED:

GEO - BOREHOLE LOG 101987.017_FERGUSNORTH_GEOTECH_R0_2023_12_11.GPJ GEMTEC 2018.GDT 3/21/24

RECORD OF BOREHOLE BH23-45

CLIENT: Geranium
PROJECT: Fergus Golf Course Redevelopment, Fergus, Ontario (North Parcel, Site 2)
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: CGVD28
BORING DATE: Nov 15 2023

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Ground Surface		433.73						Monument
0		TOPSOIL		433.53 0.20	1	SS	203	5		Concrete
	Power Auger Hollow Stem Auger (203 mm)	(SM) SILTY SAND; dark brown; non-cohesive, moist		432.97 0.76						
1		(CL-ML) sandy SILTY CLAY, trace to some gravel; brown to grey (TILL); cohesive, w<PL, stiff to hard			2	SS	356	12		
					3	SS	305	10	MH	
2					4	SS	279	17		
3					5	SS	457	22		Bentonite
4					6	SS	457	61		
5										
6					7	SS	305	50 / 0.08		Filter Sand
7										50 mm dia. well screen
8				425.65	8	SS	229	50 / 0.10		End of Augering
		End of Borehole		8.08						
9		Notes: 1. Borehole dry upon completion of drilling. 2. Monitoring well installed as shown upon completion of drilling.								
10										

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, % W_P W W_L
10 20 30 40 50 60 70 80 90

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/01/03	0.6 ▽	433.2

GEMTEC
Consulting Engineers and Scientists

LOGGED: CC
CHECKED:

GEO - BOREHOLE LOG 101987.017_FERGUSNORTH_GEOTECH_R0_2023_12_11.GPJ GEMTEC 2018.GDT 3/21/24

RECORD OF BOREHOLE BH23-46

CLIENT: Geranium
PROJECT: Fergus Golf Course Redevelopment, Fergus, Ontario (North Parcel, Site 2)
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: CGVD28
BORING DATE: Nov 16 2023

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Ground Surface		433.75						Monument
0	Power Auger	TOPSOIL		0.00 / 433.55						Concrete
		(SM) SILTY SAND; brown; non-cohesive, moist		0.20	1	SS	254	7		
				432.99						
1		(CL-ML) sandy SILTY CLAY, trace gravel; brown to grey (TILL); cohesive, w<PL, stiff to hard		0.76	2	SS	76	14		Bentonite
					3	SS	279	11		
2										Filter Sand
					4	SS	76	50 / 0.15		
		- auger grinding on probable cobbles/boulders between approximately 2.8 m and 3.1 m depths								
3	Hollow Stem Auger (203 mm)				5	SS	152	80		50 mm dia. well screen
4										
					6	SS	457	86		
				428.72						End of Augering
5		End of Borehole		5.03						
		Notes:								
		1. Borehole dry upon completion of drilling.								
6		2. Monitoring well installed as shown upon completion of drilling.								
		3. Auger refusal encountered at approximately 2.4 m depth. Borehole moved 1 m north.								
7										
8										
9										
10										

SAMPLES

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA
NATURAL
REMOULDED
WATER CONTENT, %
W_P W W_L
10 20 30 40 50 60 70 80 90

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/01/03	0.2	433.6

GEMTEC
Consulting Engineers and Scientists

LOGGED: CC
CHECKED:

GEO - BOREHOLE LOG 101987.017_FERGUSNORTH_GEOTECH_R0_2023_12_11.GPJ GEMTEC 2018.GDT 3/21/24

RECORD OF BOREHOLE BH23-N1

CLIENT: FERGUS DEVELOPMENT INC.
PROJECT: Fergus Golf Course Redevelopment, Fergus, Ontario (North Parcel, Site 2)
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Local
BORING DATE: Dec 20 2023

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY (mm)	BLOWS/0.3m	LABORATORY ANALYSES	COMBUSTIBLE VAPOUR CONCENTRATION (ppm)	ODOUR	TPH (mg/kg)	MONITORING WELL INSTALLATION AND NOTES
		Ground Surface		396.97									Monument
0	Direct Push Dual Tube Lines (50mm)	TOPSOIL		0.00 0.20									Gravel
		(ML) SANDY SILT, trace gravel, trace clay; brown; non-cohesive, moist		396.21	1	DP	762		SA1: M&I, OCPs	HEX: 0 IBL: 0			
1		(SM) SILTY SAND, trace gravel, trace clay; brown; non-cohesive, moist		0.76 395.45	2	DP	356			HEX: 5 IBL: 0			Bentonite
		(CL) SILTY CLAY, trace sand, trace gravel; brown to grey; non-cohesive, moist		1.52	3	DP	533			HEX: 15 IBL: 0			
2					4	DP	0			HEX: 0 IBL: 0			
					5	DP	762		SA5: PHC, BTEX	HEX: 15 IBL: 0			Filter Sand
3		- wet at approximately 3.7 m depth			6	DP	533			HEX: 10 IBL: 0			
					7	DP	762			HEX: 15 IBL: 0			50mm dia. Well Screen
4					8	DP	254			HEX: 0 IBL: 0			
					9	DP				HEX: 0 IBL: 0			
5					10	DP				HEX: 0 IBL: 0			
				389.96									
6		End of Borehole		7.01									End of Augering
		Notes: 1. Groundwater measured at approximately 0.3 m depth in open borehole upon completion of drilling. 2. Monitoring well installed as shown upon completion of drilling.											
7													

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEVATION (m)
Jan. 08/24	0.45 ▽	396.52

GEMTEC
Consulting Engineers and Scientists

LOGGED: CB
CHECKED: SE

RECORD OF BOREHOLE BH23-N2

CLIENT: FERGUS DEVELOPMENT INC.
PROJECT: Fergus Golf Course Redevelopment, Fergus, Ontario (North Parcel, Site 2)
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Local
BORING DATE: Dec 20 2023

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLE DATA: NUMBER	TYPE	RECOVERY (mm)	BLOWS/0.3m	LABORATORY ANALYSES	COMBUSTIBLE VAPOUR CONCENTRATION (ppm)	ODOUR	TPH (mg/kg)	MONITORING WELL INSTALLATION AND NOTES
		Ground Surface		396.41									Monument
0	Direct Push Dual Tube Lines (50mm)	TOPSOIL		0.00 0.20									Gravel
		(SM) SILTY SAND, trace gravel, trace clay; brown; non-cohesive, moist			1	DP	762			HEX: 5 IBL: 5			
1					2	DP	305			HEX: 25 IBL: 2			Bentonite
2					3	DP	762			HEX: 10 IBL: 1			
					4	DP	254			HEX: 15 IBL: 0			Filter Sand
3					5	DP	762			HEX: 5 IBL: 1			
		- wet at approximately 3.7 m depth		392.60									
		(ML) SANDY SILT, some gravel, trace clay; brown to grey; non-cohesive, moist		3.81	6	DP	762			HEX: 25 IBL: 1			
4				391.84									
		(ML) CLAYEY SILT, some sand, trace gravel; grey; non-cohesive, moist		4.57	7	DP	914						50mm dia. Well Screen
5					8	DP	610						
6				390.31									End of Augering
		End of Borehole Notes: 1. Borehole open and dry upon completion of drilling. 2. Monitoring well installed as shown upon completion of drilling.		6.10									

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEVATION (m)
Jan. 08/24	1.08 ▽	395.33

GEMTEC
Consulting Engineers and Scientists

LOGGED: CB
CHECKED: SE

ENV - BOREHOLE LOG 101987.017_GINT_ENVIRO_PHASETWOESA_R0_2024_02_02.GPJ GEMTEC 2018.GDT 3/13/24

RECORD OF BOREHOLE BH24-1

CLIENT: Fergus development Inc.
PROJECT: Fergus Golf Course Redevelopment, Fergus
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Unknown
BORING DATE: Jan 3 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING
0	Power Auger Hollow Stem Auger (200mm OD)	Ground Surface							
		TOPSOIL		0.15	1	SS	254	7	
		(ML) CLAYEY SILT, some sand; brown to grey, mottled; cohesive, w~PL, firm			2	SS	406	7	
		(ML) sandy CLAYEY SILT, some gravel; brown to grey (TILL), mottled; cohesive, w<PL to w>PL, stiff to hard		1.37	3	SS	457	13	
					4	SS	457	34	
					5	SS	457	38	MH
		(CL) SILTY CLAY, trace sand, trace gravel; grey (TILL); cohesive, w<PL to w~PL, very stiff to hard		4.04	6	SS	356	18	
					7	SS	406	22	
					8	SS	152	16	
		- soft to firm between approximately 9.1 m and 9.6 m depths			9A	SS	457	8	MH
					9B				
					10	SS	457	38	
		(ML) SILT, trace sand, trace clay; grey; non-cohesive, wet, dense		11.66	11	SS	203	46	
		(ML) CLAYEY SILT, trace sand, trace gravel; grey (TILL); cohesive, w<PL to w~PL, hard		13.18	12	SS	457	30	
					13	SS	457	44	
		End of Borehole		15.70					

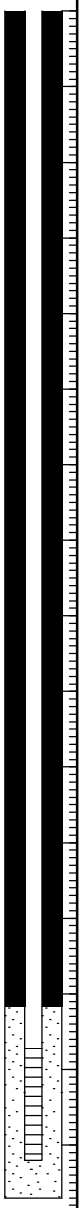
SAMPLES: ● PENETRATION RESISTANCE (N), BLOWS/0.3m; ▲ DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m

SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED

WATER CONTENT, %: W_P — W — W_L

10 20 30 40 50 60 70 80 90

PIEZOMETER OR STANDPIPE INSTALLATION



Notes:

1. Borehole was dry upon completion of drilling.

2. Monitoring well installed as shown upon completion of drilling.

GEMTEC
Consulting Engineers and Scientists

LOGGED: RH
CHECKED: MWK

GEO - BOREHOLE LOG 101987.017_FERGUS_2024_01_12.GPJ GEMTEC 2018.GDT 1/24/24

RECORD OF BOREHOLE BH24-2

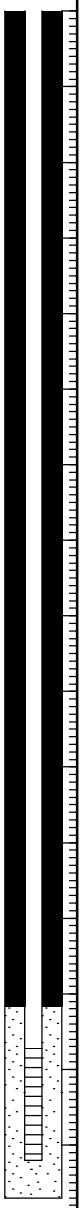
CLIENT: Fergus development Inc.
PROJECT: Fergus Golf Course Redevelopment, Fergus
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Unknown
BORING DATE: Jan 3 2024

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING
0	Power Auger Hollow Stem Auger (200mm OD)	Ground Surface							
		TOPSOIL		0.15	1	SS	406	15	
		(ML) CLAYEY SILT, some sand, trace gravel; brown; cohesive, w<PL to w~PL, stiff to very stiff			2	SS	406	12	
		(ML) CLAYEY SILT, some sand, trace gravel; brown (TILL); cohesive, w<PL, very stiff		1.37	3	SS	406	20	
		(CL) SILTY CLAY, trace sand, trace gravel; grey (TILL); cohesive, w<PL to w~PL, very stiff to hard		2.13	4	SS	457	24	
					5	SS	406	18	
					6	SS	356	19	
					7	SS	406	21	MH
		- stiff between approximately 7.6 m and 8.1 m depths			8	SS	457	14	MH
					9	SS	254	31	
					10	SS	432	71	
					11	SS	457	46	
					12	SS	457	40	
					13	SS	51	67	
		End of Borehole		15.70					

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, % W_P W W_L
10 20 30 40 50 60 70 80 90

PIEZOMETER OR STANDPIPE INSTALLATION



Notes:

1. Borehole was dry upon completion of drilling.

2. Monitoring well installed as shown upon completion of drilling.

GEMTEC
Consulting Engineers and Scientists

LOGGED: RH
CHECKED: MWK

GEO - BOREHOLE LOG 101987.017_FERGUS_2024_01_12.GPJ GEMTEC 2018.GDT 1/24/24

RECORD OF BOREHOLE BH24-3

CLIENT: Fergus development Inc.
PROJECT: Fergus Golf Course Redevelopment, Fergus
JOB#: 101987.017
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Unknown
BORING DATE: Jan 4 2024

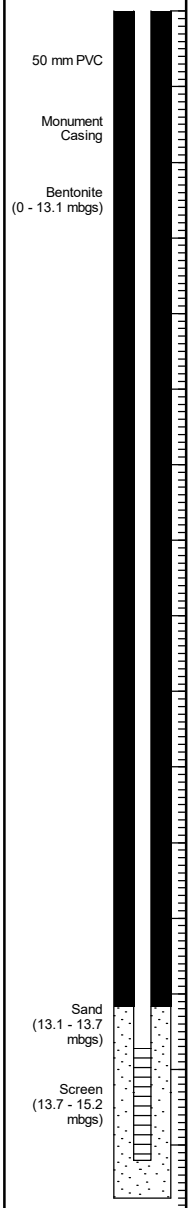
DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
0	Power Auger Hollow Stem Auger (200mm OD)	Ground Surface						
		TOPSOIL		0.20	1	SS	457	12
1		(ML) CLAYEY SILT, some sand, trace gravel; brown; cohesive, w~PL, firm to stiff			2	SS	254	7
				1.37				
2		(CL) SILTY CLAY, trace sand, trace gravel; grey (TILL); cohesive, w<PL to w~PL, very stiff to hard			3	SS	152	28
					4	SS	203	23
3					5	SS	305	28
4								
5					6	SS	51	30
6								
					7	SS	457	20
7								
8					8	SS	457	75
9								
					9	SS	254	100
10								
11					10	SS	457	32
12								
					11	SS	457	41
13								
14					12	SS	457	42
15								
					13	SS	457	45
16		End of Borehole		15.70				
17		Notes:						
		1. Borehole was dry upon completion of drilling.						
18		2. Monitoring well installed as shown upon completion of drilling.						
19								
20								

SAMPLES

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA
NATURAL REMOULDED
WATER CONTENT, %
W_P W W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION



GEMTEC
Consulting Engineers and Scientists

LOGGED: RH
CHECKED: MWK

GEO - BOREHOLE LOG 101987.017_FERGUS_2024_01_12.GPJ GEMTEC 2018.GDT 1/24/24

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act

WATER WELL RECORD

40P/16 W

Ontario

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

(11) 6706528 | MUNICIP 67004 | CON. CON | 03

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	LOT	CON. BLOCK, TRACT, SURVEY, ETC	
Wellington	West Garafraxa		Con. 3	011

[redacted] Metcalfe St. Elora Ontario

DATE COMPLETED: DAY 01 MO 09 YR 77

RC 5 | ELEVATION 1410 | RC 5 | BASIN CODE 23

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
brown	clay	sand		0	34
grey	hardpan	stones		34	50
brown	sand			50	76
grey	clay			76	100
grey	limestone			100	180

(31) 0034000528 | 0050210412 | 0074000428 | 0100205 | 0180215

(32)

(41) WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0180	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

(51) CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
04	1 ☐ STEEL 2 ☒ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	0104
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET	

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

(71) PUMPING TEST

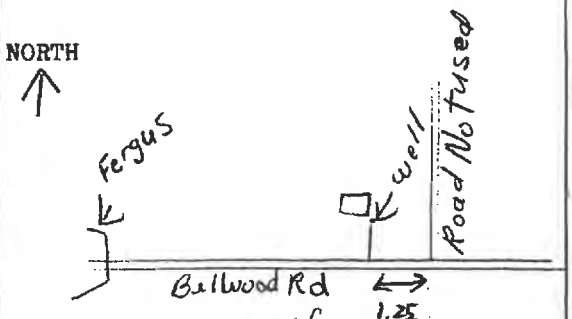
PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER
PUMPING RATE: 0009 GPM
DURATION OF PUMPING: 01 HOURS 00 MINS
WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
027 FEET	075 FEET	FEET	FEET	FEET 075	FEET

IF FLOWING GIVE RATE: GPM
PUMP INTAKE SET AT: 90 FEET
WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING: 090 FEET
RECOMMENDED PUMPING RATE: 0007 GPM
— — — GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS:

FINAL STATUS OF WELL 1
1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE 01
1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED ☐ OTHER

METHOD OF DRILLING 4
1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☒ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Hugh Morrison Well Drilling Ltd. | LICENCE NUMBER: 3740
ADDRESS: R. R. 5, Mount Forest, Ont.
NAME OF DRILLER OR BORER: Hugh Morrison | LICENCE NUMBER: 3740
SIGNATURE OF CONTRACTOR: Hugh Morrison | SUBMISSION DATE: DAY ____ MO. ____ YR. ____

OFFICE USE-ONLY

DATA SOURCE: 1 | CONTRACTOR: 3740 | DATE RECEIVED: J 41078
DATE OF INSPECTION: July 13/78 | INSPECTOR:
REMARKS:
CSS.S8
P
WI

MINISTRY OF THE ENVIRONMENT COPY

FORM 7 MOE 07-091

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 6710384 MUNICIP. 67004 CON.

COUNTY OR DISTRICT: Wellington
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: West Garafraxa
CON. BLOCK, TRACT, SURVEY, ETC.: 23
LOT: 9+10 (1/2)
ADDRESS: [redacted] R.R.#3 Fergus N1M 2W4
DATE COMPLETED: DAY 27 MO 06 YR 90
21 NORTHING RC ELEVATION BC BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
	Top Soil			0	1
	Sand			1	15
	Clay		Hard Pan	15	80
	Boulders	Gravel		80	95
Grey	Limestone			95	130
Brown	Limestone			130	166
			TOTAL =		166'
			6" Casing Shoe		

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
166	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 5 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 5 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 5 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 5 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 5 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
6"	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	95½
6"	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC		95½	166
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE OF OPENING (SLOT NO.) | DIAMETER (INCHES) | LENGTH (FEET)
MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN (FEET)

61 PLUGGING & SEALING RECORD

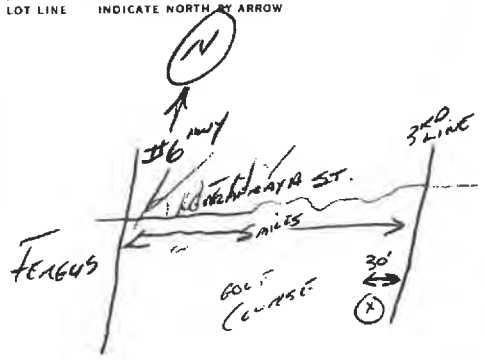
DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER ETC.)

PUMPING TEST

71 PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER
PUMPING RATE: 15 GPM
DURATION OF PUMPING: 1 HOURS
STATIC LEVEL: 40 FEET
WATER LEVEL END OF PUMPING: FEET
WATER LEVELS DURING: 1 ☐ PUMPING 2 ☒ RECOVERY
15 MINUTES: 40 FEET
30 MINUTES: 40 FEET
45 MINUTES: 40 FEET
60 MINUTES: 40 FEET
IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: FEET
WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING: 146 FEET
RECOMMENDED PUMPING RATE: 15 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE INDICATE NORTH BY ARROW



83452

DRILLERS REMARKS

FINAL STATUS OF WELL

1 ☐ WATER SUPPLY 2 ☒ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED ☐ DEWATERING

WATER USE

1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF CONSTRUCTION

1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☒ ROTARY (AIR) ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Hanlon Well Drilling
WELL CONTRACTOR'S LICENCE NUMBER: 2663
ADDRESS: R.R.#5 Guelph Ont. N1H 6J2
NAME OF WELL TECHNICIAN: Henry R. Hanlon
WELL TECHNICIAN'S LICENCE NUMBER: T-0590
SIGNATURE OF TECHNICIAN/CONTRACTOR: [signature]
SUBMISSION DATE: DAY 01 MO 08 YR 90

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR: 2663 | DATE RECEIVED: JUL 17 1990
DATE OF INSPECTION | INSPECTOR
REMARKS: CSS.ES

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/88) FORM 9

Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 | 6712681 | Municipality 67004 | Con CON 103

83-98

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot
WELLINGTON	WEST GARAFRAXA TWP.	CON 3	11

Address: RR#3 FERGUS, ONT. N1M-2W4

Date completed: 11 (day) 09 (month) 98 (year)

21 | Northing | RC | Elevation | RC | Basin Code | i | ii | iii | iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
BROWN	CLAY	STONES		0	10
GREY	CLAY	STONES		10	75
GREY	CLAY	SAND - GRAVEL		75	80
GREY	CLAY	BOULDERS		80	103
GREY	ROCK			103	145
BROWN	ROCK			148	185
			TOTAL DEPTH	185'	
		6" DRIVE SHOE			

31 | 32

41 WATER RECORD

Water found at – feet	Kind of water
180-185	1 [X] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 5 [ ] Gas
	1 [ ] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 5 [ ] Gas
	1 [ ] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 5 [ ] Gas
	1 [ ] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 5 [ ] Gas
	1 [ ] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 5 [ ] Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
6"	1 [X] Steel 2 [ ] Galvanized 3 [ ] Concrete 4 [ ] Open hole 5 [ ] Plastic	188	+2	104
6"	1 [ ] Steel 2 [ ] Galvanized 3 [ ] Concrete 4 [X] Open hole 5 [ ] Plastic		104	185
	1 [ ] Steel 2 [ ] Galvanized 3 [ ] Concrete 4 [ ] Open hole 5 [ ] Plastic			

SCREEN

Sizes of opening (Slot No.) | Diameter (inches) | Length (feet)

Material and type | Depth at top of screen (feet)

61 PLUGGING & SEALING RECORD

[X] Annular space [ ] Abandonment

Depth set at – feet From	Depth set at – feet To	Material and type (Cement grout, bentonite, etc.)
0	25	BENTONITE

71 PUMPING TEST

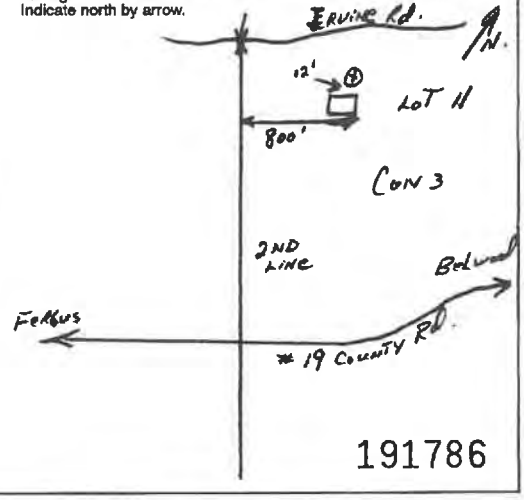
Pumping test method: 1 [X] Pump 2 [ ] Bailer
Pumping rate: 30 GPM
Duration of pumping: ... Hours ... Mins

Static level	Water level end of pumping	Water levels during: 1 [X] Pumping 2 [ ] Recovery			
		15 minutes	30 minutes	45 minutes	60 minutes
30 feet	55 feet	48 feet	55 feet	55 feet	55 feet

If flowing give rate: GPM
Pump intake set at: feet
Water at end of test: [X] Clear [ ] Cloudy
Recommended pump type: [ ] Shallow [X] Deep
Recommended pump setting: 80 feet
Recommended pump rate: 15-20 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



191786

FINAL STATUS OF WELL

1 [X] Water supply 2 [ ] Observation well 3 [ ] Test hole 4 [ ] Recharge well 5 [ ] Abandoned, Insufficient supply 6 [ ] Abandoned, poor quality 7 [ ] Abandoned (Other) 8 [ ] Dewatering 9 [ ] Unfinished 10 [ ] Replacement well

WATER USE

1 [X] Domestic 2 [X] Stock 3 [ ] Irrigation 4 [ ] Industrial 5 [ ] Commercial 6 [ ] Municipal 7 [ ] Public supply 8 [ ] Cooling & air conditioning 9 [ ] Not used 10 [ ] Other

METHOD OF CONSTRUCTION

1 [ ] Cable tool 2 [ ] Rotary (conventional) 3 [ ] Rotary (reverse) 4 [X] Rotary (air) 5 [ ] Air percussion 6 [ ] Boring 7 [ ] Diamond 8 [ ] Jetting 9 [ ] Driving 10 [ ] Digging 11 [ ] Other

Name of Well Contractor	Well Contractor's Licence No.
GRAHAM WELL DRILLING LTD	2336
Address: RR#5 ROCKWOOD, ONT. N0B-2K0	
Name of Well Technician: Jim Wilson	Well Technician's Licence No.: T-1924
Signature of Technician/Contractor: K.J. Graham	Submission date: 30 (day) 09 (mo) 98 (yr)

MINISTRY USE ONLY

Data source | Contractor 2336 | Date received: OCT 07 1998

Date of inspection | Inspector

Remarks

CSS. ES9

0506 (07/94) Front Form 9

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APPENDIX E

Tables

Table E.1: Well construction information - 8243 and 8282 Wellington Road 19, Fergus, Ontario

Well Name	UTM Coordinates		Site	Installation Date	Ground Surface Elevation	Top of Casing Elevation	Measured Stick up	Top of Screen / End of Casing	Bottom of Screen / Well Depth	Top of Screen / End of Casing	Bottom of Screen / Well Depth	Screened Lithology
	Easting	Northing			(masl)	(masl)	(m)	(m bgs)	(m bgs)	(m asl)	(m asl)	
Old Clubhouse Well (MOE#6706408)	551466	4843649	SE	1977/05/18	432.19	433.38	1.19	79.30	108.50	352.89	323.69	Rock
North Irrigation Well (MOE#6712549)	551157	4844464	NW	1998/06/05	429.93	430.20	0.27	32.51	86.98	397.42	342.95	Limestone
South Irrigation Well (MOE#6713016)	551546	4844183	SE	1999/06/24	427.42	428.06	0.64	28.04	94.49	399.38	332.93	Limestone
Clubhouse Well (MOE#6714026)	551256	4844358	NW	2002/05/03	432.18	432.67	0.49	32.92	74.68	399.26	357.50	Limestone
MW101	551430	4844602	NW	2021/05/18	430.36	431.11	0.75	33.80	61.00	396.56	369.36	Dolostone
MW102	551156	4844083	NW	2021/05/26	433.56	434.40	0.84	30.60	61.00	402.96	372.56	Dolostone
MW103	551035	4844853	NW	2021/05/15	426.46	427.44	0.98	30.80	61.00	395.66	365.46	Dolostone
PW21-1	550796	4844515	NW	2021/05/12	429.98	430.63	0.64	32.90	84.10	397.08	345.88	Dolostone
BH21-01	551476	4843276	SE	2021/03/25	426.33	427.42	1.09	4.57	6.10	421.76	420.23	(CL) SILTY CLAY
BH21-03	551427	4843696	SE	2021/03/29	434.96	434.91	-0.05	1.83	4.88	433.13	430.08	(ML-CL) SILTY CLAY to clayey SILT (TILL)
BH21-05	551876	4844077	SE	2021/03/30	428.71	429.99	1.28	1.22	4.27	427.49	424.44	(SM/ML) SILT and Sand; (CL) CLAYEY SILT
BH21-06	551637	4844125	SE	2021/03/30	427.33	428.35	1.02	2.70	4.60	424.63	422.73	(SM) SILTY SAND; (CL) Sandy SILTY CLAY
BH21-07S	551439	4844018	SE	2021/03/30	428.99	428.90	-0.09	1.52	2.74	427.47	426.25	(ML-CL) SILTY CLAY to clayey SILT (TILL)
BH21-07D	551439	4844016	SE	2021/03/30	428.99	428.91	-0.08	7.32	8.84	421.67	420.15	(CL-ML) Sandy SILTY CLAY-CLAYEY SILT
BH21-08	551553	4844380	SE	2021/03/30	427.75	428.86	1.11	1.50	4.60	426.25	423.15	(CL) CLAYEY SILT; (SM) SILTY SAND
BH21-09	551266	4844085	NW	2021/03/22	432.43	433.60	1.17	6.71	8.23	425.72	424.20	(CL) Sandy SILTY CLAY
BH21-10	551239	4844290	NW	2021/03/24	433.20	433.03	-0.17	3.05	6.10	430.15	427.10	(CL) Sandy SILTY CLAY
BH21-11	551602	4844265	SE	2021/03/31	428.46	429.54	1.08	5.20	6.10	423.26	422.36	(CL) SILTY CLAY
BH21-12	551093	4844087	NW	2021/03/23	431.95	433.11	1.16	3.23	4.40	428.72	427.55	(CL-ML) Gravelly SILTY CLAY-CLAYEY SILT
BH21-13	551049	4844452	NW	2021/03/23	429.07	429.00	-0.07	5.79	7.32	423.28	421.75	(CL) SILTY CLAY; (SM-GM) SILTY SAND and GRAVEL
BH21-14	550895	4844279	NW	2021/03/23	431.06	430.96	-0.10	1.52	3.05	429.54	428.01	(CL) Sandy SILTY CLAY
BH21-15	551086	4844267	NW	2021/03/24	432.46	432.30	-0.16	3.00	4.60	429.46	427.86	(CL) Sandy SILTY CLAY
BH21-16	551425	4844256	SE	2021/03/31	429.46	429.35	-0.11	3.33	4.93	426.13	424.53	(CL-ML) SILTY CLAY-CLAYEY SILT
BH21-17	551512	4843492	SE	2021/03/26	428.92	430.09	1.17	3.30	4.90	425.62	424.02	(CL-ML) Sandy SILTY CLAY-CLAYEY SILT
BH21-18	551588	4843776	SE	2021/03/29	427.24	428.41	1.17	0.90	4.00	426.34	423.24	(CL) CLAYEY SILT; (ML) Sandy SILT; (SM-GM) SILTY SAND and GRAVEL; (CL) SILTY CLAY
MW22-01 (NW Site)	551292	4844042	NW	2022/11/21	432.09	433.17	1.08	1.52	4.57	430.57	427.52	(CL) SILTY CLAY
MW22-27 (SE Site)	551483	4843649	SE	2022/11/24	432.96	432.96	0.58	3.35	6.40	428.76	425.71	(CL) SILTY CLAY; (SM) SILTY SAND
MW22-28 (SE Site)	551497	4843637	SE	2022/11/30	433.27	433.27	0.58	3.05	6.10	429.20	426.15	(CL) SILTY CLAY
BH23-02	551750	4844266	SE	2023/11/15	427.99	428.90	0.91	2.90	4.42	425.09	423.57	(CL) SILTY CLAY
BH23-09	551496	4843863	SE	2023/11/16	428.80	429.90	1.10	1.37	2.90	427.43	425.90	(CL-ML) SILTY CLAY to CLAYEY SILT (TILL)
BH23-20S	551668	4843940	SE	2023/11/07	426.56	427.55	1.00	2.90	4.42	423.66	422.14	(CL-ML) SILTY CLAY to CLAYEY SILT (TILL)
BH23-20D	551667	4843940	SE	2023/11/07	426.58	427.55	0.97	7.47	8.99	419.11	417.59	(CL-ML) SILTY CLAY to CLAYEY SILT (TILL)
BH23-24S	551671	4843827	SE	2023/11/07	426.71	427.51	0.79	2.90	4.42	423.81	422.29	(CL-ML) SILTY CLAY to CLAYEY SILT (TILL)
BH23-24D	551672	4843826	SE	2023/11/07	426.66	427.60	0.94	7.47	8.99	419.19	417.67	(CL-ML) SILTY CLAY to CLAYEY SILT (TILL)
BH23-27	551160	4844064	NW	2023/11/16	434.20	434.92	0.72	5.79	7.32	428.41	426.88	(CL-ML) sandy SILTY CLAY (TILL)
BH23-29	551327	4844098	NW	2023/11/10	432.72	433.67	0.95	7.62	9.14	425.10	423.58	(ML) gravelly, sandy SILT (TILL)
BH23-33[1]	550844	4844483	NW	2023/11/13	429.90	430.60	0.70	1.52	3.05	428.40	426.90	(CL) sandy SILTY CLAY (TILL)
BH23-36[1]	551232	4844531	NW	2023/11/13	430.50	431.30	0.80	3.05	4.57	427.50	425.90	(ML) clayey SILT
BH23-38	551187	4843993	NW	2023/11/16	434.67	435.59	0.92	7.62	9.14	427.05	425.53	(CL-ML/ML) sandy CLAYEY SILT to SILT (TILL)
BH23-41	551205	4844016	NW	2023/11/15	434.64	435.56	0.92	6.10	7.62	428.54	427.02	(ML) sandy SILT (TILL)
BH23-43	551178	4844020	NW	2023/11/20	434.63	435.57	0.94	6.10	7.62	428.53	427.01	(CL-ML) sandy SILTY CLAY (TILL)
BH23-44	551190	4844020	NW	2023/11/20	434.50	435.25	0.75	4.57	6.10	429.93	428.40	(CL-ML) sandy SILTY CLAY (TILL)
BH23-45	551131	4844047	NW	2023/11/15	433.73	434.63	0.90	6.10	7.62	427.63	426.11	(CL-ML) sandy SILTY CLAY (TILL)
BH23-46	551189	4844150	NW	2023/11/17	433.75	434.50	0.75	2.90	4.42	430.85	429.33	(CL-ML) sandy SILTY CLAY (TILL)
BH23-N1	551219	4844347	NW	2023/12/20	432.56	433.35	0.79	3.05	6.10	429.51	426.46	(CL) SILTY CLAY
BH23-N2	551291	4844369	NW	2023/12/20	432.00	432.82	0.82	3.05	6.10	428.95	425.90	(SM) SILTY SAND; (ML) SANDY SILT; (ML) CLAYEY SILT
BH24-01	550975	4844725	NW	2024/01/03	425.91	426.73	0.82	13.72	15.20	412.19	410.71	(ML) CLAYEY SILT
BH24-02	551093	4844670	NW	2024/01/03	427.51	428.33	0.82	13.72	15.20	413.79	412.31	(CL) SILTY CLAY
BH24-03	551164	4844790	NW	2024/01/04	428.68	429.50	0.82	13.72	15.20	414.96	413.48	(CL) SILTY CLAY
MW25-1	550261	4843972	NW	2025/12/05	427.86	427.72	-0.14	3.00	6.10	423.42	420.32	Overburden (Gravel and Till)
TW25-2	550899	4844439	NW	2025/06/06	429.98	430.71	0.73	35.05	75.00	394.94	355.04	Dolostone
TW25-3	550903	4844592	NW	2025/10/27	426.68	427.30	0.62	35.10	75.00	394.94	355.04	Dolostone
6607 2nd Line	550505	4844060	NW	-	427.32	428.06	0.74	-	-	-	-	-
6617 2nd Line	550305	4843983	NW	-	427.54	428.11	0.58	-	-	-	-	-
6617 3rd Line (6711152)	551112	4844959	NW	1993/04/12	426.94	427.31	0.38	34.14	50.29	392.80	376.65	GREY LMSN (Limestone)
6622 3rd Line (6708706)	550988	4844972	NW	1986/05/15	427.00	424.67	0.15	34.14	50.29	392.86	376.71	LMSN (Limestone)
6635 3rd Line (6708933)	551056	4845147	NW	1987/09/01	427.15	427.43	0.28	40.23	41.15	386.92	386.00	GREY ROCK (Inferred Limestone)
MP-1	550939	4844521	NW	2021/03/29	427.17	428.12	0.98	-	0.75	-	426.42	-
SG-1	550939	4844521	NW	-	426.59	428.02	1.43	-	-	-	-	-
MP-2	551110	4844459	NW	2021/03/29	429.69	430.21	0.90	-	1.26	-	428.79	-
SG-2	551111	4844458	NW	-	428.78	430.23	1.45	-	-	-	-	-
SG26-1	550248	4844013	Irving Creek	-	421.09	422.53	1.38	-	-	-	-	-
SG26-2	551296	4844579	NW	-	428.72	430.25	1.53	-	-	-	-	-

Notes:

m - metre
m asl - metres above sea level
m bgs - metres below ground surface

Table E.2: Groundwater Depths and Elevations -Fergus, Ontario

Well Name	UTM Zone		Site	Ground Surface Elevation	Top of Casing Elevation	Top of Screen	Bottom of Screen	Date of completion	March 22-31, 2021 (WSP, 2023a)		April 5, 2021 (WSP, 2023a)		April 8, 9, 12, 2021 (WSP, 2023a)		April 14, 2021 (WSP, 2023a)	
									WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.
	Easting	Northing		(masl)	(masl)	(m asl)	(m asl)		(m bgs)	(m asl)	(m bgs)	(m asl)	(m bgs)	(m asl)	(m bgs)	(m asl)
Old Clubhouse Well	551466	4843649	SE	432.19	433.38	-	-	5/15/2021	-	-	-	-	-	-	-	-
North Irrigation Well	551157	4844464	NW	429.93	430.20	-	-	5/15/2021	-	-	-	-	-	-	-	-
South Irrigation Well	551546	4844183	SE	427.42	428.06	-	-	-	-	-	-	-	-	-	-	-
Clubhouse Well	551256	4844358	NW	432.18	432.67	-	-	3/29/2021	-	-	-	-	-	-	-	-
MW101	551430	4844602	NW	430.36	431.11	396.53	369.33	3/29/2021	-	-	-	-	-	-	-	-
MW102	551156	4844083	NW	433.56	434.40	402.99	372.59	3/29/2021	-	-	-	-	-	-	-	-
MW103	551035	4844853	NW	426.46	427.44	395.62	365.42	3/29/2021	-	-	-	-	-	-	-	-
PW21-1	550796	4844515	NW	429.98	430.63	397.14	345.94	5/12/2021	-	-	-	-	-	-		
BH21-01	551476	4843276	SE	426.33	427.42	421.76	420.23	3/25/2021	1.5	425.92	0.81	425.52	2.36	423.97	1.56	424.77
BH21-03	551427	4843696	SE	434.96	434.91	433.13	430.08	3/29/2021	2.1	432.78	0.59	434.37	0.73	434.23	0.40	434.56
BH21-05	551876	4844077	SE	428.71	429.99	427.49	424.44	3/30/2021	0.6	429.39	0.91	427.80	1.01	427.70	0.76	427.95
BH21-06	551637	4844125	SE	427.33	428.35	424.63	422.73	3/30/2021	0.9	427.45	0.45	426.88	0.57	426.76	0.41	426.92
BH21-07S	551439	4844018	SE	428.99	428.90	427.47	426.25	3/30/2021	3	425.9	-	-	0.43	428.56	0.74	428.25
BH21-07D	551439	4844016	SE	428.99	428.91	421.67	420.15	3/30/2021	3	425.91	-	-	1.30	427.69	0.53	428.46
BH21-08	551553	4844380	SE	427.75	428.86	426.25	423.15	3/30/2021	0.2	428.66	0.06	427.69	0.14	427.61	-0.02	427.77
BH21-09	551266	4844085	NW	432.43	433.60	425.72	424.20	3/22/2021	7.3	426.3	1.71	430.72	1.85	430.58	1.57	430.86
BH21-10	551239	4844290	NW	433.20	433.03	430.15	427.10	3/24/2021	3	430.03	1.41	431.79	1.05	432.15	0.62	432.58
BH21-11	551602	4844265	SE	428.46	429.54	423.26	422.36	3/31/2021	1.5	428.04	1.25	427.21	1.30	427.16	1.07	427.39
BH21-12	551093	4844087	NW	431.95	433.11	428.72	427.55	3/23/2021	3.7	429.41	0.42	431.53	0.11	431.84	0.52	431.43
BH21-13	551049	4844452	NW	429.07	429.00	423.28	421.75	3/23/2021	7.4	421.6	1.38	427.69	1.30	427.77	1.31	427.76
BH21-14	550895	4844279	NW	431.06	430.96	429.54	428.01	3/23/2021	1.7	429.26	0.31	430.75	0.29	430.77	0.20	430.86
BH21-15	551086	4844267	NW	432.46	432.30	429.46	427.86	3/24/2021	3.8	428.5	1.35	431.11	0.34	432.12	-	-
BH21-16	551425	4844256	SE	429.46	429.35	426.10	424.50	3/31/2021	0.6	428.75	1.35	428.11	0.65	428.81	0.13	429.33
BH21-17	551512	4843492	SE	428.92	430.09	425.62	424.02	3/26/2021	2.1	427.96	-0.09	429.01	0.74	428.18	0.46	428.46
BH21-18	551588	4843776	SE	427.24	428.41	426.34	423.24	3/29/2021	1.2	427.21	1.29	425.95	1.29	425.95	1.05	426.19
MW22-01 (NW Site)	551292	4844042	NW	432.09	433.17	430.57	427.52	11/21/2022	-	-	-	-	-	-	-	-
MW22-27 (SE Site)	551483	4843649	SE	433.04	432.96	428.76	425.71	11/24/2022	-	-	-	-	-	-	-	-
MW22-28 (SE Site)	551497	4843637	SE	433.04	433.27	429.20	426.15	11/30/2022	-	-	-	-	-	-	-	-
BH23-02	551750	4844266	SE	427.99	428.90	425.09	423.57	11/15/2023	-	-	-	-	-	-	-	-
BH23-09	551496	4843863	SE	428.80	429.90	427.43	425.90	11/16/2023	-	-	-	-	-	-	-	-
BH23-20S	551668	4843940	SE	426.56	427.55	423.66	422.14	11/7/2023	-	-	-	-	-	-	-	-
BH23-20D	551667	4843940	SE	426.58	427.55	419.18	417.66	11/7/2023	-	-	-	-	-	-	-	-
BH23-24S	551671	4843827	SE	426.71	427.51	423.81	422.29	11/7/2023	-	-	-	-	-	-	-	-
BH23-24D	551672	4843826	SE	426.66	427.60	419.19	417.67	11/7/2023	-	-	-	-	-	-	-	-
BH23-27	551160	4844064	NW	434.20	434.92	428.41	426.88	11/16/2023	-	-	-	-	-	-	-	-
BH23-29	551327	4844098	NW	432.72	433.67	425.10	423.58	11/10/2023	-	-	-	-	-	-	-	-
BH23-33[1]	550844	4844483	NW	429.90	430.60	428.40	426.90	11/13/2023	-	-	-	-	-	-	-	-
BH23-36[1]	551232	4844531	NW	430.50	431.30	427.50	425.90	11/13/2023	-	-	-	-	-	-	-	-
BH23-38	551187	4843993	NW	434.67	435.59	427.05	425.53	11/16/2023	-	-	-	-	-	-	-	-
BH23-41	551205	4844016	NW	434.64	435.56	428.54	427.02	11/15/2023	-	-	-	-	-	-	-	-
BH23-43	551178	4844020	NW	434.63	435.57	428.53	427.01	11/20/2023	-	-	-	-	-	-	-	-
BH23-44	551190	4844020	NW	434.50	435.25	429.93	428.40	11/20/2023	-	-	-	-	-	-	-	-
BH23-45	551131	4844047	NW	433.73	434.63	427.63	426.11	11/15/2023	-	-	-	-	-	-	-	-
BH23-46	551189	4844150	NW	433.75	434.50	430.85	429.33	11/17/2023	-	-	-	-	-	-	-	-
BH23-N1	551219	4844347	NW	432.56	433.35	429.51	426.46	12/20/2023	-	-	-	-	-	-	-	-
BH23-N2	551291	4844369	NW	432.00	432.82	428.95	425.90	12/20/2023	-	-	-	-	-	-	-	-
BH24-01	550975	4844725	NW	425.91	426.73	412.19	410.71	1/3/2024	-	-	-	-	-	-	-	-
BH24-02	551093	4844670	NW	427.51	428.33	413.79	412.31	1/3/2024	-	-	-	-	-	-	-	-
BH24-03	551164	4844790	NW	428.68	429.50	414.96	413.48	1/4/2024	-	-	-	-	-	-	-	-
MW25-1	550261	4843972	NW	427.86	427.72	423.42	420.32	12/5/2025								
TW25-2	550899	4844439	NW	429.98	430.71	394.94	355.04	6/6/2025								
TW25-3	550903	4844592	NW	426.68	427.30	394.94	355.04	6/6/2025								
6607 2nd Line	550505	4844060	NW	427.32	428.06	-	-	-								
6617 2nd Line	550305	4843983	NW	427.54	428.11	-	-	-								
6617 3rd Line (6711152)	551112	4844959	NW	426.94	427.31	-	-	-								
6622 3rd Line (6708706)	550988	4844972	NW	427.00	424.67	-	-	-								
6635 3rd Line (6708933)	551056	4845147	NW	427.15	427.43	-	-	-								
MP-1	550939	4844521	NW	427.17	428.12	-	-	3/29/2021	-	-	-	-	-	-	-	-
SG-1	550939	4844521	NW	426.59	428.02	-	426.416	-	-	-	-	-	-	-	-	-
MP-2	551110	4844459	NW	429.69	430.21	-	-	3/29/2021	-	-	-	-	-	-	-	-
SG-2	551111	4844458	NW	428.78	430.23	-	428.79	-	-	-	-	-	-	-	-	-
SG26-1	550248	4844013	Irving Creek	421.09	422.53	-	-	-	-	-						
SG26-2	551296	4844579	NW	428.72	430.25	-	-	-	-	-						

Notes:

Elev. - Elevation
m - metre
m asl - metres above sea level
m bgs - metres below ground surface
m toc - metres below top of casing
WL - Water Level

Survey data was provided by R-PE Surveying Ltd. of Woodbridge Ontario, and GEMTEC in 2026, based on UTM coordinates and Canadian Geodetic Vertical Elevation Datum 2013 (CGVD2013).

Table E.2: Groundwater Depths and Elevations -Fergus, Ontario

Well Name	UTM Zone		Site	Ground Surface Elevation	Top of Casing Elevation	October 7, 2022 (WSP, 2023a)		December 13, 2022 (WSP, 2023b)		December 21, 2022 (WSP, 2023b)		November 30 & December 1, 2023 (GEMTEC)	
						WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.
	Easting	Northing		(masl)	(masl)	(m bgs)	(m asl)	(m bgs)	(m asl)	(m bgs)	(m asl)	(m bgs)	(m asl)
Old Clubhouse Well	551466	4843649	SE	432.19	433.38	-	-	-	-	-	-	-	-
North Irrigation Well	551157	4844464	NW	429.93	430.20	-	-	-	-	-	-	-	-
South Irrigation Well	551546	4844183	SE	427.42	428.06	-	-	-	-	-	-	-	-
Clubhouse Well	551256	4844358	NW	432.18	432.67	-	-	-	-	-	-	-	-
MW101	551430	4844602	NW	430.36	431.11	-	-	-	-	-	-	-	-
MW102	551156	4844083	NW	433.56	434.40	-	-	-	-	-	-	-	-
MW103	551035	4844853	NW	426.46	427.44	-	-	-	-	-	-	-	-
PW21-1	550796	4844515	NW	429.98	430.63			-	-				
BH21-01	551476	4843276	SE	426.33	427.42	1.82	424.51	-	-	-	-	1.36	424.97
BH21-03	551427	4843696	SE	434.96	434.91	2.99	431.97	-	-	-	-	-	-
BH21-05	551876	4844077	SE	428.71	429.99	2.25	426.46	-	-	-	-	1.63	427.08
BH21-06	551637	4844125	SE	427.33	428.35	1.3	426.03	-	-	-	-	0.99	426.34
BH21-07S	551439	4844018	SE	428.99	428.90	2.32	426.67	-	-	-	-	-	-
BH21-07D	551439	4844016	SE	428.99	428.91	0.69	428.3	-	-	-	-	-	-
BH21-08	551553	4844380	SE	427.75	428.86	1.91	425.84	-	-	-	-	0.11	427.64
BH21-09	551266	4844085	NW	432.43	433.60	3.37	429.06	-	-	-	-	1.74	430.69
BH21-10	551239	4844290	NW	433.20	433.03	1.97	431.23	-	-	-	-	-	-
BH21-11	551602	4844265	SE	428.46	429.54	2.48	425.98	-	-	-	-	-	-
BH21-12	551093	4844087	NW	431.95	433.11	1.79	430.16	-	-	-	-	0.54	431.41
BH21-13	551049	4844452	NW	429.07	429.00	2.9	426.17	-	-	-	-	-	-
BH21-14	550895	4844279	NW	431.06	430.96	2.35	428.71	-	-	-	-	-	-
BH21-15	551086	4844267	NW	432.46	432.30	1.53	430.93	-	-	-	-	-	-
BH21-16	551425	4844256	SE	429.46	429.35	1.65	427.81	-	-	-	-	-	-
BH21-17	551512	4843492	SE	428.92	430.09	2.4	426.52	-	-	-	-	0.92	428.00
BH21-18	551588	4843776	SE	427.24	428.41	1.93	425.31	-	-	-	-	1.36	425.88
MW22-01 (NW Site)	551292	4844042	NW	432.09	433.17	-	-	2.34	429.75	2.34	429.75	-	-
MW22-27 (SE Site)	551483	4843649	SE	433.04	432.96	-	-	5.48	427.48	-	-	-	-
MW22-28 (SE Site)	551497	4843637	SE	433.04	433.27	-	-	-	-	-	-	-	-
BH23-02	551750	4844266	SE	427.99	428.90	-	-	-	-	-	-	-0.09	428.08
BH23-09	551496	4843863	SE	428.80	429.90	-	-	-	-	-	-	0.91	427.89
BH23-20S	551668	4843940	SE	426.56	427.55	-	-	-	-	-	-	0.45	426.10
BH23-20D	551667	4843940	SE	426.58	427.55	-	-	-	-	-	-	0.62	425.96
BH23-24S	551671	4843827	SE	426.71	427.51	-	-	-	-	-	-	0.62	426.10
BH23-24D	551672	4843826	SE	426.66	427.60	-	-	-	-	-	-	0.58	426.08
BH23-27	551160	4844064	NW	434.20	434.92	-	-	-	-	-	-	1.42	432.78
BH23-29	551327	4844098	NW	432.72	433.67	-	-	-	-	-	-	1.71	431.01
BH23-33[1]	550844	4844483	NW	429.90	430.60	-	-	-	-	-	-	1.10	428.80
BH23-36[1]	551232	4844531	NW	430.50	431.30	-	-	-	-	-	-	1.12	429.40
BH23-38	551187	4843993	NW	434.67	435.59	-	-	-	-	-	-	1.42	433.25
BH23-41	551205	4844016	NW	434.64	435.56	-	-	-	-	-	-	1.08	433.56
BH23-43	551178	4844020	NW	434.63	435.57	-	-	-	-	-	-	1.19	433.44
BH23-44	551190	4844020	NW	434.50	435.25	-	-	-	-	-	-	1.03	433.47
BH23-45	551131	4844047	NW	433.73	434.63	-	-	-	-	-	-	1.35	432.38
BH23-46	551189	4844150	NW	433.75	434.50	-	-	-	-	-	-	1.35	432.40
BH23-N1	551219	4844347	NW	432.56	433.35	-	-	-	-	-	-	-	-
BH23-N2	551291	4844369	NW	432.00	432.82	-	-	-	-	-	-	-	-
BH24-01	550975	4844725	NW	425.91	426.73	-	-	-	-	-	-	-	-
BH24-02	551093	4844670	NW	427.51	428.33	-	-	-	-	-	-	-	-
BH24-03	551164	4844790	NW	428.68	429.50	-	-	-	-	-	-	-	-
MW25-1	550261	4843972	NW	427.86	427.72								
TW25-2	550899	4844439	NW	429.98	430.71								
TW25-3	550903	4844592	NW	426.68	427.30								
6607 2nd Line	550505	4844060	NW	427.32	428.06								
6617 2nd Line	550305	4843983	NW	427.54	428.11								
6617 3rd Line (6711152)	551112	4844959	NW	426.94	427.31								
6622 3rd Line (6708706)	550988	4844972	NW	427.00	424.67								
6635 3rd Line (6708933)	551056	4845147	NW	427.15	427.43								
MP-1	550939	4844521	NW	427.17	428.12	-	-	-	-	-	-	-	-
SG-1	550939	4844521	NW	426.59	428.02	-	-	-	-	-	-	-	-
MP-2	551110	4844459	NW	429.69	430.21	-	-	-	-	-	-	-	-
SG-2	551111	4844458	NW	428.78	430.23	-	-	-	-	-	-	-	-
SG26-1	550248	4844013	Irving Creek	421.09	422.53								
SG26-2	551296	4844579	NW	428.72	430.25								

Notes:

Elev. - Elevation
m - metre
m asl - metres above sea level
m bgs - metres below ground surface
m toc - metres below top of casing
WL - Water Level

Survey data was provided by R-PE Surveying Ltd. of Woodbridge Ontario, and GEMTEC in 2026, based on UTM coordinates and Canadian Geodetic Vertical Elevation Datum 2013 (CGVD2013).

Table E.2: Groundwater Depths and Elevations -Fergus, Ontario

Well Name	UTM Zone		Site	Ground Surface Elevation	Top of Casing Elevation	December 18-19, 2023 (GEMTEC)		January 3-5, 8, 2024 (GEMTEC)		January 11, 2024 (GEMTEC)		February 5, 2024 (GEMTEC)	
						WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.
	Easting	Northing		(masl)	(masl)	(m bgs)	(m asl)	(m bgs)	(m asl)	(m bgs)	(m asl)	(m bgs)	(m asl)
Old Clubhouse Well	551466	4843649	SE	432.19	433.38	-	-	-	-	-	-	-	-
North Irrigation Well	551157	4844464	NW	429.93	430.20	-	-	-	-	-	-	-	-
South Irrigation Well	551546	4844183	SE	427.42	428.06	-	-	-	-	-	-	-	-
Clubhouse Well	551256	4844358	NW	432.18	432.67	-	-	-	-	-	-	-	-
MW101	551430	4844602	NW	430.36	431.11	-	-	-	-	-	-	-	-
MW102	551156	4844083	NW	433.56	434.40	-	-	-	-	-	-	-	-
MW103	551035	4844853	NW	426.46	427.44	-	-	-	-	-	-	-	-
PW21-1	550796	4844515	NW	429.98	430.63		-			-	-	-	-
BH21-01	551476	4843276	SE	426.33	427.42	-	-	1.13	425.20	-	-	0.95	425.38
BH21-03	551427	4843696	SE	434.96	434.91	-	-	0.82	434.14	-	-	0.29	434.67
BH21-05	551876	4844077	SE	428.71	429.99	-	-	1.21	427.50	-	-	0.81	427.90
BH21-06	551637	4844125	SE	427.33	428.35	-	-	0.49	426.84	-	-	0.41	426.92
BH21-07S	551439	4844018	SE	428.99	428.90	-	-	0.54	428.45	-	-	0.21	428.78
BH21-07D	551439	4844016	SE	428.99	428.91	-	-	-	-	-	-	0.60	428.39
BH21-08	551553	4844380	SE	427.75	428.86	-	-	0.22	427.53	-	-	0.01	427.74
BH21-09	551266	4844085	NW	432.43	433.60	-	-	1.39	431.04	-	-	1.46	430.97
BH21-10	551239	4844290	NW	433.20	433.03	-	-	0.67	432.53	-	-	0.62	432.58
BH21-11	551602	4844265	SE	428.46	429.54	-	-	1.64	426.82	-	-	1.11	427.35
BH21-12	551093	4844087	NW	431.95	433.11	-	-	0.23	431.72	-	-	0.06	431.89
BH21-13	551049	4844452	NW	429.07	429.00	-	-	1.33	427.74	-	-	1.23	427.84
BH21-14	550895	4844279	NW	431.06	430.96	-	-	0.44	430.62	-	-	0.39	430.67
BH21-15	551086	4844267	NW	432.46	432.30	-	-	0.83	431.63	-	-	0.16	432.30
BH21-16	551425	4844256	SE	429.46	429.35	-	-	0.28	429.18	-	-	0.08	429.38
BH21-17	551512	4843492	SE	428.92	430.09	-	-	0.51	428.41	-	-	0.29	428.63
BH21-18	551588	4843776	SE	427.24	428.41	-	-	1.24	426.00	-	-	1.11	426.13
MW22-01 (NW Site)	551292	4844042	NW	432.09	433.17	-	-	0.64	431.45	-	-	0.59	431.50
MW22-27 (SE Site)	551483	4843649	SE	433.04	432.96	-	-	0.38	431.73	-	-	-	-
MW22-28 (SE Site)	551497	4843637	SE	433.04	433.27	-	-	-	-	3.14	430.13	-	-
BH23-02	551750	4844266	SE	427.99	428.90	0.71	427.28	0.61	427.38	-	-	0.39	427.60
BH23-09	551496	4843863	SE	428.80	429.90	0.23	428.57	0.21	428.59	-	-	0.20	428.60
BH23-20S	551668	4843940	SE	426.56	427.55	0.33	426.23	0.31	426.24	-	-	0.25	426.30
BH23-20D	551667	4843940	SE	426.58	427.55	0.88	425.70	0.51	426.07	-	-	0.44	426.14
BH23-24S	551671	4843827	SE	426.71	427.51	0.36	426.36	0.35	426.37	-	-	0.42	426.30
BH23-24D	551672	4843826	SE	426.66	427.60	0.48	426.18	0.40	426.26	-	-	0.34	426.32
BH23-27	551160	4844064	NW	434.20	434.92	0.29	433.91	0.93	433.27	-	-	0.87	433.33
BH23-29	551327	4844098	NW	432.72	433.67	1.40	431.32	1.43	431.30	-	-	1.38	431.34
BH23-33[1]	550844	4844483	NW	429.90	430.60	0.56	429.30	0.75	429.20	-	-	0.62	429.28
BH23-36[1]	551232	4844531	NW	430.50	431.30	1.02	429.50	0.98	429.50	-	-	0.95	429.55
BH23-38	551187	4843993	NW	434.67	435.59	0.92	433.75	0.90	433.77	-	-	0.81	433.86
BH23-41	551205	4844016	NW	434.64	435.56	0.24	434.40	0.69	433.95	-	-	0.60	434.04
BH23-43	551178	4844020	NW	434.63	435.57	0.77	433.86	0.68	433.96	-	-	0.53	434.11
BH23-44	551190	4844020	NW	434.50	435.25	0.71	433.79	0.67	433.83	-	-	0.54	433.96
BH23-45	551131	4844047	NW	433.73	434.63	0.78	432.95	0.58	433.15	-	-	0.45	433.28
BH23-46	551189	4844150	NW	433.75	434.50	0.14	433.62	0.16	433.59	-	-	0.12	433.63
BH23-N1	551219	4844347	NW	432.56	433.35	-	-	-	-	-	-	0.31	432.25
BH23-N2	551291	4844369	NW	432.00	432.82	-	-	-	-	-	-	0.92	431.08
BH24-01	550975	4844725	NW	425.91	426.73	-	-	-	-	-	-	1.67	424.24
BH24-02	551093	4844670	NW	427.51	428.33	-	-	-	-	-	-	3.60	423.91
BH24-03	551164	4844790	NW	428.68	429.50	-	-	-	-	-	-	4.19	424.49
MW25-1	550261	4843972	NW	427.86	427.72								
TW25-2	550899	4844439	NW	429.98	430.71								
TW25-3	550903	4844592	NW	426.68	427.30								
6607 2nd Line	550505	4844060	NW	427.32	428.06								
6617 2nd Line	550305	4843983	NW	427.54	428.11								
6617 3rd Line (6711152)	551112	4844959	NW	426.94	427.31								
6622 3rd Line (6708706)	550988	4844972	NW	427.00	424.67								
6635 3rd Line (6708933)	551056	4845147	NW	427.15	427.43								
MP-1	550939	4844521	NW	427.17	428.12	-	-	-	-	-	-	-	-
SG-1	550939	4844521	NW	426.59	428.02	-	-	-	-	-	-	-	-
MP-2	551110	4844459	NW	429.69	430.21	-	-	-	-	-	-	-	-
SG-2	551111	4844458	NW	428.78	430.23	-	-	-	-	-	-	-	-
SG26-1	550248	4844013	Irving Creek	421.09	422.53								
SG26-2	551296	4844579	NW	428.72	430.25								

Notes:

Elev. - Elevation
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m toc - metres below top of casing
WL - Water Level

Survey data was provided by R-PE Surveying Ltd. of Woodbridge Ontario, and GEMTEC in 2026, based on UTM coordinates and Canadian Geodetic Vertical Elevation Datum 2013 (CGVD2013).

Table E.2: Groundwater Depths and Elevations -Fergus, Ontario

Well Name	UTM Zone		Site	Ground Surface Elevation	Top of Casing Elevation	March 11-12, 2024 (GEMTEC)		May 28, 2024 (GEMTEC)		June 24, 2024 (GEMTEC)		July 10, 2024 (GEMTEC)	
						WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.
	Easting	Northing		(masl)	(masl)	(m bgs)	(m asl)	(m bgs)	(m asl)	(m bgs)	(m asl)	(m bgs)	(m asl)
Old Clubhouse Well	551466	4843649	SE	432.19	433.38	19.27	412.92	-	-	-	-	-	-
North Irrigation Well	551157	4844464	NW	429.93	430.20	-	-	-	-	-	-	-	-
South Irrigation Well	551546	4844183	SE	427.42	428.06	-	-	-	-	-	-	-	-
Clubhouse Well	551256	4844358	NW	432.18	432.67	9.59	422.59	-	-	-	-	-	-
MW101	551430	4844602	NW	430.36	431.11	8.58	421.78	7.45	422.91				
MW102	551156	4844083	NW	433.56	434.40	11.84	421.72	10.86	422.70				
MW103	551035	4844853	NW	426.46	427.44	3.81	422.65	2.88	423.58				
PW21-1	550796	4844515	NW	429.98	430.63	6.73	423.25	-	-	-	-	-	
BH21-01	551476	4843276	SE	426.33	427.42	0.94	425.39	-	-	-	-	-	-
BH21-03	551427	4843696	SE	434.96	434.91	0.45	434.51	-	-	-	-	-	-
BH21-05	551876	4844077	SE	428.71	429.99	0.58	428.13	-	-	-	-	-	-
BH21-06	551637	4844125	SE	427.33	428.35	0.33	427.00	-	-	-	-	-	-
BH21-07S	551439	4844018	SE	428.99	428.90	0.19	428.80	-	-	-	-	-	-
BH21-07D	551439	4844016	SE	428.99	428.91	0.48	428.51	-	-	-	-	-	-
BH21-08	551553	4844380	SE	427.75	428.86	-0.05	427.80	-	-	-	-	-	-
BH21-09	551266	4844085	NW	432.43	433.60	1.43	431.00	-	-	-	-	-	-
BH21-10	551239	4844290	NW	433.20	433.03	0.60	432.60	-	-	-	-	-	-
BH21-11	551602	4844265	SE	428.46	429.54	0.02	428.44	-	-	-	-	-	-
BH21-12	551093	4844087	NW	431.95	433.11	0.13	431.82	-	-	-	-	-	-
BH21-13	551049	4844452	NW	429.07	429.00	1.38	427.69	-	-	-	-	-	-
BH21-14	550895	4844279	NW	431.06	430.96	0.18	430.88	-	-	-	-	-	-
BH21-15	551086	4844267	NW	432.46	432.30	0.18	432.28	-	-	-	-	-	-
BH21-16	551425	4844256	SE	429.46	429.35	0.08	429.38	-	-	-	-	-	-
BH21-17	551512	4843492	SE	428.92	430.09	0.37	428.55	-	-	-	-	-	-
BH21-18	551588	4843776	SE	427.24	428.41	0.98	426.26	-	-	-	-	-	-
MW22-01 (NW Site)	551292	4844042	NW	432.09	433.17	0.55	431.54	-	-	-	-	-	-
MW22-27 (SE Site)	551483	4843649	SE	433.04	432.96	0.28	431.83	-	-	-	-	-	-
MW22-28 (SE Site)	551497	4843637	SE	433.04	433.27	1.45	430.81	-	-	-	-	-	-
BH23-02	551750	4844266	SE	427.99	428.90	0.26	427.73	-	-	-	-	-	-
BH23-09	551496	4843863	SE	428.80	429.90	0.17	428.62	-	-	-	-	-	-
BH23-20S	551668	4843940	SE	426.56	427.55	0.14	426.41	-	-	-	-	-	-
BH23-20D	551667	4843940	SE	426.58	427.55	0.34	426.24	-	-	-	-	-	-
BH23-24S	551671	4843827	SE	426.71	427.51	0.23	426.49	-	-	-	-	-	-
BH23-24D	551672	4843826	SE	426.66	427.60	0.24	426.42	-	-	-	-	-	-
BH23-29	551327	4844098	NW	432.72	433.67	1.46	431.26	-	-	-	-	-	-
BH23-33[1]	550844	4844483	NW	429.90	430.60	0.56	429.34	-	-	-	-	-	-
BH23-36[1]	551232	4844531	NW	430.50	431.30	0.86	429.64	-	-	-	-	-	-
BH23-38	551187	4843993	NW	434.67	435.59	0.73	433.94	-	-	-	-	-	-
BH23-41	551205	4844016	NW	434.64	435.56	0.41	434.23	-	-	-	-	-	-
BH23-43	551178	4844020	NW	434.63	435.57	0.63	434.00	-	-	-	-	-	-
BH23-44	551190	4844020	NW	434.50	435.25	0.81	433.69	-	-	-	-	-	-
BH23-45	551131	4844047	NW	433.73	434.63	0.46	433.27	-	-	-	-	-	-
BH23-46	551189	4844150	NW	433.75	434.50	0.13	433.62	-	-	-	-	-	-
BH23-N1	551219	4844347	NW	432.56	433.35	0.30	432.26	-	-	-	-	-	-
BH23-N2	551291	4844369	NW	432.00	432.82	0.81	431.19	-	-	-	-	-	-
BH24-01	550975	4844725	NW	425.91	426.73	1.56	424.35	-	-	-	-	-	-
BH24-02	551093	4844670	NW	427.51	428.33	3.38	424.13	-	-	-	-	-	-
BH24-03	551164	4844790	NW	428.68	429.50	3.90	424.78	-	-	-	-	-	-
MW25-1	550261	4843972	NW	427.86	427.72								
TW25-2	550899	4844439	NW	429.98	430.71								
TW25-3	550903	4844592	NW	426.68	427.30								
6607 2nd Line	550505	4844060	NW	427.32	428.06								
6617 2nd Line	550305	4843983	NW	427.54	428.11								
6617 3rd Line (6711152)	551112	4844959	NW	426.94	427.31								
6622 3rd Line (6708706)	550988	4844972	NW	427.00	424.67								
6635 3rd Line (6708933)	551056	4845147	NW	427.15	427.43					4.58			
MP-1	550939	4844521	NW	427.17	428.12	-0.08	427.25	-	-	-	-	-	-
SG-1	550939	4844521	NW	426.59	428.02	-0.92	427.51	-	-	-	-	-	-
MP-2	551110	4844459	NW	429.69	430.21	0.03	429.66	-	-	-	-	-	-
SG-2	551111	4844458	NW	428.78	430.23	-	-	-	-	-	-	-	-
SG26-1	550248	4844013	Irving Creek	421.09	422.53								
SG26-2	551296	4844579	NW	428.72	430.25								

Notes:

Elev. - Elevation
m - metre
m asl - metres above sea level
m bgs - metres below ground surface
m toc - metres below top of casing
WL - Water Level

Survey data was provided by R-PE Surveying Ltd. of Woodbridge Ontario, and GEMTEC in 2026, based on UTM coordinates and Canadian Geodetic Vertical Elevation Datum 2013 (CGVD2013).

Table E.2: Groundwater Depths and Elevations -Fergus, Ontario

Well Name	UTM Zone		Site	Ground Surface Elevation	Top of Casing Elevation	August 6 &12, 2024 (GEMTEC)		September 4, 2024 (GEMTEC)		February 20, 2025 (GEMTEC)		June 2, 3 & 6, 2025 (GEMTEC)	
						WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.
	Easting	Northing		(masl)	(masl)	(m bgs)	(m asl)	(m bgs)	(m asl)	(m bgs)	(m asl)	(m bgs)	(m asl)
Old Clubhouse Well	551466	4843649	SE	432.19	433.38	-	-	-	-	-	-	18.42	413.77
North Irrigation Well	551157	4844464	NW	429.93	430.20	-	-	-	-	-	-	-	-
South Irrigation Well	551546	4844183	SE	427.42	428.06	-	-	-	-	-	-	10.56	416.86
Clubhouse Well	551256	4844358	NW	432.18	432.67	-	-	-	-	-	-	-	-
MW101	551430	4844602	NW	430.36	431.11					10.42	419.94	8.16	422.20
MW102	551156	4844083	NW	433.56	434.40					13.46	420.10	11.58	421.98
MW103	551035	4844853	NW	426.46	427.44					5.34	421.12	3.54	422.92
PW21-1	550796	4844515	NW	429.98	430.63	-	-	-	-	-	-	-	-
BH21-01	551476	4843276	SE	426.33	427.42	-	-	-	-	-	-	-	-
BH21-03	551427	4843696	SE	434.96	434.91	-	-	-	-	-	-	-	-
BH21-05	551876	4844077	SE	428.71	429.99	-	-	-	-	-	-	-	-
BH21-06	551637	4844125	SE	427.33	428.35	-	-	-	-	-	-	-	-
BH21-07S	551439	4844018	SE	428.99	428.90	-	-	-	-	-	-	-	-
BH21-07D	551439	4844016	SE	428.99	428.91	-	-	-	-	-	-	-	-
BH21-08	551553	4844380	SE	427.75	428.86	-	-	-	-	-	-	-	-
BH21-09	551266	4844085	NW	432.43	433.60	-	-	-	-	-	-	-	-
BH21-10	551239	4844290	NW	433.20	433.03	-	-	-	-	-	-	-	-
BH21-11	551602	4844265	SE	428.46	429.54	-	-	-	-	-	-	-	-
BH21-12	551093	4844087	NW	431.95	433.11	-	-	-	-	-	-	1.00	430.95
BH21-13	551049	4844452	NW	429.07	429.00	-	-	-	-	-	-	-	-
BH21-14	550895	4844279	NW	431.06	430.96	-	-	-	-	-	-	-	-
BH21-15	551086	4844267	NW	432.46	432.30	-	-	-	-	-	-	-	-
BH21-16	551425	4844256	SE	429.46	429.35	-	-	-	-	-	-	-	-
BH21-17	551512	4843492	SE	428.92	430.09	-	-	-	-	-	-	-	-
BH21-18	551588	4843776	SE	427.24	428.41	-	-	-	-	-	-	-	-
MW22-01 (NW Site)	551292	4844042	NW	432.09	433.17	-	-	-	-	-	-	-	-
MW22-27 (SE Site)	551483	4843649	SE	433.04	432.96	-	-	-	-	-	-	-	-
MW22-28 (SE Site)	551497	4843637	SE	433.04	433.27	-	-	-	-	-	-	-	-
BH23-02	551750	4844266	SE	427.99	428.90	-	-	-	-	-	-	-	-
BH23-09	551496	4843863	SE	428.80	429.90	-	-	-	-	-	-	-	-
BH23-20S	551668	4843940	SE	426.56	427.55	-	-	-	-	-	-	-	-
BH23-20D	551667	4843940	SE	426.58	427.55	-	-	-	-	-	-	-	-
BH23-24S	551671	4843827	SE	426.71	427.51	-	-	-	-	-	-	-	-
BH23-24D	551672	4843826	SE	426.66	427.60	-	-	-	-	-	-	-	-
BH23-27	551160	4844064	NW	434.20	434.92	-	-	-	-	-	-	-	-
BH23-29	551327	4844098	NW	432.72	433.67	-	-	-	-	-	-	-	-
BH23-33[1]	550844	4844483	NW	429.90	430.60	-	-	-	-	-	-	1.02	428.88
BH23-36[1]	551232	4844531	NW	430.50	431.30	-	-	-	-	-	-	0.93	429.57
BH23-38	551187	4843993	NW	434.67	435.59	-	-	-	-	-	-	-	-
BH23-41	551205	4844016	NW	434.64	435.56	-	-	-	-	-	-	-	-
BH23-43	551178	4844020	NW	434.63	435.57	-	-	-	-	-	-	-	-
BH23-44	551190	4844020	NW	434.50	435.25	-	-	-	-	-	-	-	-
BH23-45	551131	4844047	NW	433.73	434.63	-	-	-	-	-	-	-	-
BH23-46	551189	4844150	NW	433.75	434.50	-	-	-	-	-	-	-	-
BH23-N1	551219	4844347	NW	432.56	433.35	-	-	-	-	-	-	0.71	431.85
BH23-N2	551291	4844369	NW	432.00	432.82	-	-	-	-	-	-	1.21	430.79
BH24-01	550975	4844725	NW	425.91	426.73	-	-	-	-	-	-	1.48	424.43
BH24-02	551093	4844670	NW	427.51	428.33	-	-	-	-	-	-	2.81	424.70
BH24-03	551164	4844790	NW	428.68	429.50	-	-	-	-	-	-	-	-
MW25-1	550261	4843972	NW	427.86	427.72								
TW25-2	550899	4844439	NW	429.98	430.71							6.43	423.55
TW25-3	550903	4844592	NW	426.68	427.30								
6607 2nd Line	550505	4844060	NW	427.32	428.06								
6617 2nd Line	550305	4843983	NW	427.54	428.11								
6617 3rd Line (6711152)	551112	4844959	NW	426.94	427.31	5.48							
6622 3rd Line (6708706)	550988	4844972	NW	427.00	424.67	5.22							
6635 3rd Line (6708933)	551056	4845147	NW	427.15	427.43								
MP-1	550939	4844521	NW	427.17	428.12	-	-	-	-	-	-	-0.26	427.43
SG-1	550939	4844521	NW	426.59	428.02	-	-	-	-	-	-	-	-
MP-2	551110	4844459	NW	429.69	430.21	-	-	-	-	-	-	0.01	429.68
SG-2	551111	4844458	NW	428.78	430.23	-	-	-	-	-	-	-	-
SG26-1	550248	4844013	Irving Creek	421.09	422.53								
SG26-2	551296	4844579	NW	428.72	430.25								

Notes:

Elev. - Elevation
m - metre
m asl - metres above sea level
m bgs - metres below ground surface
m toc - metres below top of casing
WL - Water Level

Survey data was provided by R-PE Surveying Ltd. of Woodbridge Ontario, and GEMTEC in 2026, based on UTM coordinates and Canadian Geodetic Vertical Elevation Datum 2013 (CGVD2013).

Table E.2: Groundwater Depths and Elevations -Fergus, Ontario

Well Name	UTM Zone		Site	Ground Surface Elevation	Top of Casing Elevation	June 9, 2025 (GEMTEC)		July 31, 2025 (GEMTEC)		September 9, 2025 (GEMTEC)		September 25 & 26, 2025 (GEMTEC)	
						WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.
	Easting	Northing		(masl)	(masl)	(m bgs)	(m asl)	(m bgs)	(m asl)	(m bgs)	(m asl)	(m bgs)	(m asl)
Old Clubhouse Well	551466	4843649	SE	432.19	433.38	18.40	413.79	-	-	11.80	420.39	11.80	420.39
North Irrigation Well	551157	4844464	NW	429.93	430.20	-	-	-	-	-	-	-	-
South Irrigation Well	551546	4844183	SE	427.42	428.06	10.58	416.84	-	-	13.37	414.05	13.37	414.05
Clubhouse Well	551256	4844358	NW	432.18	432.67	-	-	-	-	14.76	417.42	14.76	417.42
MW101	551430	4844602	NW	430.36	431.11	-	-	10.19	420.17	10.53	419.83	10.53	419.83
MW102	551156	4844083	NW	433.56	434.40	11.64	421.92	13.49	420.07	13.68	419.88	13.68	419.88
MW103	551035	4844853	NW	426.46	427.44	3.62	422.84	5.40	421.06	5.63	420.83	5.63	420.83
PW21-1	550796	4844515	NW	429.98	430.63	6.81	423.17	-	-	8.51	421.47	8.51	421.47
BH21-01	551476	4843276	SE	426.33	427.42	-	-	-	-	-	-	-	-
BH21-03	551427	4843696	SE	434.96	434.91	-	-	-	-	-	-	-	-
BH21-05	551876	4844077	SE	428.71	429.99	-	-	-	-	-	-	-	-
BH21-06	551637	4844125	SE	427.33	428.35	-	-	-	-	-	-	-	-
BH21-07S	551439	4844018	SE	428.99	428.90	-	-	-	-	-	-	-	-
BH21-07D	551439	4844016	SE	428.99	428.91	-	-	-	-	-	-	-	-
BH21-08	551553	4844380	SE	427.75	428.86	-	-	-	-	-	-	-2.22	429.97
BH21-09	551266	4844085	NW	432.43	433.60	-	-	-	-	-	-	-1.17	433.60
BH21-10	551239	4844290	NW	433.20	433.03	-	-	-	-	-	-	-	-
BH21-11	551602	4844265	SE	428.46	429.54	-	-	-	-	-	-	-	-
BH21-12	551093	4844087	NW	431.95	433.11	0.92	431.03	-	-	0.86	431.09	0.86	431.09
BH21-13	551049	4844452	NW	429.07	429.00	-	-	-	-	-	-		
BH21-14	550895	4844279	NW	431.06	430.96	-	-	-	-	-	-		
BH21-15	551086	4844267	NW	432.46	432.30	-	-	-	-	-	-	0.18	432.28
BH21-16	551425	4844256	SE	429.46	429.35	-	-	-	-	-	-	-	-
BH21-17	551512	4843492	SE	428.92	430.09	-	-	-	-	-	-	-	-
BH21-18	551588	4843776	SE	427.24	428.41	-	-	-	-	-	-	-	-
MW22-01 (NW Site)	551292	4844042	NW	432.09	433.17	-	-	-	-	-	-	-	-
MW22-27 (SE Site)	551483	4843649	SE	433.04	432.96	-	-	-	-	3.81	428.30	3.81	428.30
MW22-28 (SE Site)	551497	4843637	SE	433.04	433.27	-	-	-	-	4.30	427.95	4.30	427.95
BH23-02	551750	4844266	SE	427.99	428.90	-	-	-	-	1.30	426.69	1.28	426.71
BH23-09	551496	4843863	SE	428.80	429.90	-	-	-	-	-	-	-	-
BH23-20S	551668	4843940	SE	426.56	427.55	-	-	-	-	0.80	425.75	0.80	425.75
BH23-20D	551667	4843940	SE	426.58	427.55	-	-	-	-	0.68	425.90	0.68	425.90
BH23-24S	551671	4843827	SE	426.71	427.51	-	-	-	-	0.90	425.82	0.90	425.82
BH23-24D	551672	4843826	SE	426.66	427.60	-	-	-	-	0.87	425.79	0.87	425.79
BH23-27	551160	4844064	NW	434.20	434.92	-	-	-	-	2.43	431.77	2.43	431.77
BH23-29	551327	4844098	NW	432.72	433.67	-	-	-	-	2.55	430.17	2.55	430.17
BH23-33[1]	550844	4844483	NW	429.90	430.60	1.12	428.78	-	-	2.47	427.43	2.47	427.43
BH23-36[1]	551232	4844531	NW	430.50	431.30	0.95	429.55	-	-	1.37	429.13	1.37	429.13
BH23-38	551187	4843993	NW	434.67	435.59	-	-	-	-	2.49	432.18	2.49	432.18
BH23-41	551205	4844016	NW	434.64	435.56	-	-	-	-	1.96	432.68	1.96	432.68
BH23-43	551178	4844020	NW	434.63	435.57	-	-	-	-	-	-	-	-
BH23-44	551190	4844020	NW	434.50	435.25	-	-	-	-	-	-	-	-
BH23-45	551131	4844047	NW	433.73	434.63	-	-	-	-	-	-	-	-
BH23-46	551189	4844150	NW	433.75	434.50	-	-	-	-	-	-	-	-
BH23-N1	551219	4844347	NW	432.56	433.35	0.74	431.82	-	-	2.70	429.86	2.72	429.84
BH23-N2	551291	4844369	NW	432.00	432.82	1.23	430.77	-	-	3.29	428.71	3.24	428.76
BH24-01	550975	4844725	NW	425.91	426.73	1.47	424.44	-	-	1.73	424.18	1.73	424.18
BH24-02	551093	4844670	NW	427.51	428.33	3.04	424.47	-	-	4.62	422.89	4.62	422.89
BH24-03	551164	4844790	NW	428.68	429.50	-	-	-	-	5.20	423.48	5.22	423.46
MW25-1	550261	4843972	NW	427.86	427.72					-	-		
TW25-2	550899	4844439	NW	429.98	430.71					9.01	420.97	9.01	420.97
TW25-3	550903	4844592	NW	426.68	427.30					-	-		
6607 2nd Line	550505	4844060	NW	427.32	428.06					-	-		
6617 2nd Line	550305	4843983	NW	427.54	428.11					-	-		
6617 3rd Line (6711152)	551112	4844959	NW	426.94	427.31					-	-		
6622 3rd Line (6708706)	550988	4844972	NW	427.00	424.67					-	-		
6635 3rd Line (6708933)	551056	4845147	NW	427.15	427.43					-	-		
MP-1	550939	4844521	NW	427.17	428.12	-0.05	427.22	-	-	0.32	426.85	0.32	426.85
SG-1	550939	4844521	NW	426.59	428.02	-	-	-	-	-0.29	426.88	-0.29	426.88
MP-2	551110	4844459	NW	429.69	430.21	-0.15	429.84	-	-	0.52	429.17	0.52	429.17
SG-2	551111	4844458	NW	428.78	430.23	-	-	-	-	-	-	-	-
SG26-1	550248	4844013	Irving Creek	421.09	422.53								
SG26-2	551296	4844579	NW	428.72	430.25								

Notes:

Elev. - Elevation
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WL - Water Level

Survey data was provided by R-PE Surveying Ltd. of Woodbridge Ontario, and GEMTEC in 2026, based on UTM coordinates and Canadian Geodetic Vertical Elevation Datum 2013 (CGVD2013).

Table E.2: Groundwater Depths and Elevations -Fergus, Ontario

Well Name	UTM Zone		Site	Ground Surface Elevation	Top of Casing Elevation	November 13, 2025 (GEMTEC)		November 17, 2025 (GEMTEC)		November 18, 2025 (GEMTEC)		Dec 2 to 4, 2025 (GEMTEC)	
						WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.
	Easting	Northing		(masl)	(masl)	(m bgs)	(m asl)	(m bgs)	(m asl)	(m bgs)	(m asl)	(m bgs)	(m asl)
Old Clubhouse Well	551466	4843649	SE	432.19	433.38							22.09	410.10
North Irrigation Well	551157	4844464	NW	429.93	430.20								
South Irrigation Well	551546	4844183	SE	427.42	428.06							14.49	412.93
Clubhouse Well	551256	4844358	NW	432.18	432.67							14.77	417.41
MW101	551430	4844602	NW	430.36	431.11							10.76	419.60
MW102	551156	4844083	NW	433.56	434.40							13.95	419.61
MW103	551035	4844853	NW	426.46	427.44							5.74	420.72
PW21-1	550796	4844515	NW	429.98	430.63							9.20	420.78
BH21-01	551476	4843276	SE	426.33	427.42								
BH21-03	551427	4843696	SE	434.96	434.91								
BH21-05	551876	4844077	SE	428.71	429.99								
BH21-06	551637	4844125	SE	427.33	428.35								
BH21-07S	551439	4844018	SE	428.99	428.90								
BH21-07D	551439	4844016	SE	428.99	428.91								
BH21-08	551553	4844380	SE	427.75	428.86								
BH21-09	551266	4844085	NW	432.43	433.60								
BH21-10	551239	4844290	NW	433.20	433.03								
BH21-11	551602	4844265	SE	428.46	429.54								
BH21-12	551093	4844087	NW	431.95	433.11								
BH21-13	551049	4844452	NW	429.07	429.00								
BH21-14	550895	4844279	NW	431.06	430.96							2.17	428.89
BH21-15	551086	4844267	NW	432.46	432.30							1.60	430.86
BH21-16	551425	4844256	SE	429.46	429.35								
BH21-17	551512	4843492	SE	428.92	430.09								
BH21-18	551588	4843776	SE	427.24	428.41								
MW22-01 (NW Site)	551292	4844042	NW	432.09	433.17								
MW22-27 (SE Site)	551483	4843649	SE	433.04	432.96								
MW22-28 (SE Site)	551497	4843637	SE	433.04	433.27								
BH23-02	551750	4844266	SE	427.99	428.90							1.27	426.72
BH23-09	551496	4843863	SE	428.80	429.90								
BH23-20S	551668	4843940	SE	426.56	427.55								
BH23-20D	551667	4843940	SE	426.58	427.55								
BH23-24S	551671	4843827	SE	426.71	427.51								
BH23-24D	551672	4843826	SE	426.66	427.60								
BH23-27	551160	4844064	NW	434.20	434.92								
BH23-29	551327	4844098	NW	432.72	433.67								
BH23-33[1]	550844	4844483	NW	429.90	430.60								
BH23-36[1]	551232	4844531	NW	430.50	431.30								
BH23-38	551187	4843993	NW	434.67	435.59								
BH23-41	551205	4844016	NW	434.64	435.56								
BH23-43	551178	4844020	NW	434.63	435.57								
BH23-44	551190	4844020	NW	434.50	435.25								
BH23-45	551131	4844047	NW	433.73	434.63								
BH23-46	551189	4844150	NW	433.75	434.50								
BH23-N1	551219	4844347	NW	432.56	433.35							2.15	430.41
BH23-N2	551291	4844369	NW	432.00	432.82							3.00	429.00
BH24-01	550975	4844725	NW	425.91	426.73							3.22	422.69
BH24-02	551093	4844670	NW	427.51	428.33							4.77	422.74
BH24-03	551164	4844790	NW	428.68	429.50							5.41	423.27
MW25-1	550261	4843972	NW	427.86	427.72							2.09	425.77
TW25-2	550899	4844439	NW	429.98	430.71			9.12	417.56	8.67	418.01		
TW25-3	550903	4844592	NW	426.68	427.30	5.55	421.13					5.75	420.93
6607 2nd Line	550505	4844060	NW	427.32	428.06								
6617 2nd Line	550305	4843983	NW	427.54	428.11								
6617 3rd Line (6711152)	551112	4844959	NW	426.94	427.31								
6622 3rd Line (6708706)	550988	4844972	NW	427.00	424.67								
6635 3rd Line (6708933)	551056	4845147	NW	427.15	427.43								
MP-1	550939	4844521	NW	427.17	428.12							0.08	427.09
SG-1	550939	4844521	NW	426.59	428.02							FROZEN	FROZEN
MP-2	551110	4844459	NW	429.69	430.21							0.33	429.36
SG-2	551111	4844458	NW	428.78	430.23							-0.49	429.27
SG26-1	550248	4844013	Irving Creek	421.09	422.53								
SG26-2	551296	4844579	NW	428.72	430.25								

Notes:

Elev. - Elevation
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WL - Water Level

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Table E.2: Groundwater Depths and Elevations -Fergus, Ontario

Well Name	UTM Zone		Site	Ground Surface Elevation	Top of Casing Elevation	December 9, 2025 (GEMTEC)		Dec 16, 2025 (GEMTEC)		Dec 17, 2025 (GEMTEC)		Dec 18, 2025 (GEMTEC)	
						WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.
	Easting	Northing		(masl)	(masl)	(m bgs)	(m asl)	(m bgs)	(m asl)	(m bgs)	(m asl)	(m bgs)	(m asl)
Old Clubhouse Well	551466	4843649	SE	432.19	433.38					22.71	409.48	22.61	409.58
North Irrigation Well	551157	4844464	NW	429.93	430.20								
South Irrigation Well	551546	4844183	SE	427.42	428.06					15.02	412.40	14.94	412.48
Clubhouse Well	551256	4844358	NW	432.18	432.67			11.65	420.53	14.76	417.42	14.76	417.42
MW101	551430	4844602	NW	430.36	431.11			10.94	419.42	10.98	419.38	11.16	419.20
MW102	551156	4844083	NW	433.56	434.40							14.77	418.79
MW103	551035	4844853	NW	426.46	427.44			5.86	420.60	6.05	420.41	6.81	419.65
PW21-1	550796	4844515	NW	429.98	430.63							11.09	418.89
BH21-01	551476	4843276	SE	426.33	427.42								
BH21-03	551427	4843696	SE	434.96	434.91								
BH21-05	551876	4844077	SE	428.71	429.99								
BH21-06	551637	4844125	SE	427.33	428.35								
BH21-07S	551439	4844018	SE	428.99	428.90								
BH21-07D	551439	4844016	SE	428.99	428.91								
BH21-08	551553	4844380	SE	427.75	428.86								
BH21-09	551266	4844085	NW	432.43	433.60								
BH21-10	551239	4844290	NW	433.20	433.03								
BH21-11	551602	4844265	SE	428.46	429.54								
BH21-12	551093	4844087	NW	431.95	433.11								
BH21-13	551049	4844452	NW	429.07	429.00								
BH21-14	550895	4844279	NW	431.06	430.96			1.75	429.31			1.69	429.37
BH21-15	551086	4844267	NW	432.46	432.30			1.45	431.01			1.41	431.05
BH21-16	551425	4844256	SE	429.46	429.35								
BH21-17	551512	4843492	SE	428.92	430.09								
BH21-18	551588	4843776	SE	427.24	428.41								
MW22-01 (NW Site)	551292	4844042	NW	432.09	433.17								
MW22-27 (SE Site)	551483	4843649	SE	433.04	432.96								
MW22-28 (SE Site)	551497	4843637	SE	433.04	433.27								
BH23-02	551750	4844266	SE	427.99	428.90					1.25	426.74	1.25	426.74
BH23-09	551496	4843863	SE	428.80	429.90								
BH23-20S	551668	4843940	SE	426.56	427.55								
BH23-20D	551667	4843940	SE	426.58	427.55								
BH23-24S	551671	4843827	SE	426.71	427.51								
BH23-24D	551672	4843826	SE	426.66	427.60								
BH23-27	551160	4844064	NW	434.20	434.92								
BH23-29	551327	4844098	NW	432.72	433.67								
BH23-33[1]	550844	4844483	NW	429.90	430.60								
BH23-36[1]	551232	4844531	NW	430.50	431.30								
BH23-38	551187	4843993	NW	434.67	435.59								
BH23-41	551205	4844016	NW	434.64	435.56								
BH23-43	551178	4844020	NW	434.63	435.57								
BH23-44	551190	4844020	NW	434.50	435.25								
BH23-45	551131	4844047	NW	433.73	434.63								
BH23-46	551189	4844150	NW	433.75	434.50								
BH23-N1	551219	4844347	NW	432.56	433.35			2.03	430.53	1.98	430.58	2.00	430.56
BH23-N2	551291	4844369	NW	432.00	432.82			2.79	429.21	2.80	429.20	2.76	429.24
BH24-01	550975	4844725	NW	425.91	426.73			3.16	422.75			3.17	422.74
BH24-02	551093	4844670	NW	427.51	428.33			4.73	422.78			4.74	422.77
BH24-03	551164	4844790	NW	428.68	429.50								
MW25-1	550261	4843972	NW	427.86	427.72							2.42	425.44
TW25-2	550899	4844439	NW	429.98	430.71	9.54	417.14			9.36	420.62		
TW25-3	550903	4844592	NW	426.68	427.30								
6607 2nd Line	550505	4844060	NW	427.32	428.06								
6617 2nd Line	550305	4843983	NW	427.54	428.11								
6617 3rd Line (6711152)	551112	4844959	NW	426.94	427.31								
6622 3rd Line (6708706)	550988	4844972	NW	427.00	424.67								
6635 3rd Line (6708933)	551056	4845147	NW	427.15	427.43								
MP-1	550939	4844521	NW	427.17	428.12			0.04	427.13			0.04	427.13
SG-1	550939	4844521	NW	426.59	428.02			-0.53	427.12				
MP-2	551110	4844459	NW	429.69	430.21			0.36	429.33	0.36	429.33	0.34	429.35
SG-2	551111	4844458	NW	428.78	430.23			-0.43	429.21			-0.41	429.19
SG26-1	550248	4844013	Irving Creek	421.09	422.53								
SG26-2	551296	4844579	NW	428.72	430.25								

Notes:

Elev. - Elevation
m - metre
m asl - metres above sea level
m bgs - metres below ground surface
m toc - metres below top of casing
WL - Water Level

Survey data was provided by R-PE Surveying Ltd. of Woodbridge Ontario, and GEMTEC in 2026, based on UTM coordinates and Canadian Geodetic Vertical Elevation Datum 2013 (CGVD2013).

Table E.2: Groundwater Depths and Elevations -Fergus, Ontario

Well Name	UTM Zone		Site	Ground Surface Elevation	Top of Casing Elevation	Dec 19, 2025 (GEMTEC)		January 14, 2026 (GEMTEC)		Feb 3, 2026 (GEMTEC)		April 27, 2026 (GEMTEC)	
						WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.
	Easting	Northing		(masl)	(masl)	(m bgs)	(m asl)	(m bgs)	(m asl)	(m bgs)	(m asl)	(m bgs)	(m asl)
Old Clubhouse Well	551466	4843649	SE	432.19	433.38					21.96	410.23	17.87	414.32
North Irrigation Well	551157	4844464	NW	429.93	430.20								
South Irrigation Well	551546	4844183	SE	427.42	428.06			13.93	418.25	14.41	413.01		
Clubhouse Well	551256	4844358	NW	432.18	432.67			21.26	409.10	22.13	410.05		
MW101	551430	4844602	NW	430.36	431.11			10.14	423.42	10.35	420.01	7.52	422.84
MW102	551156	4844083	NW	433.56	434.40			13.03	413.43	13.44	420.12	10.87	422.69
MW103	551035	4844853	NW	426.46	427.44			5.97	424.01	5.30	421.16	2.86	423.60
PW21-1	550796	4844515	NW	429.98	430.63			7.92	418.41	9.89	420.09		
BH21-01	551476	4843276	SE	426.33	427.42								
BH21-03	551427	4843696	SE	434.96	434.91								
BH21-05	551876	4844077	SE	428.71	429.99								
BH21-06	551637	4844125	SE	427.33	428.35								
BH21-07S	551439	4844018	SE	428.99	428.90								
BH21-07D	551439	4844016	SE	428.99	428.91								
BH21-08	551553	4844380	SE	427.75	428.86								
BH21-09	551266	4844085	NW	432.43	433.60								
BH21-10	551239	4844290	NW	433.20	433.03								
BH21-11	551602	4844265	SE	428.46	429.54								
BH21-12	551093	4844087	NW	431.95	433.11								
BH21-13	551049	4844452	NW	429.07	429.00								
BH21-14	550895	4844279	NW	431.06	430.96	0.81	430.25	0.22	432.24			0.32	430.74
BH21-15	551086	4844267	NW	432.46	432.30	0.77	431.69	0.13	429.33			0.09	432.37
BH21-16	551425	4844256	SE	429.46	429.35								
BH21-17	551512	4843492	SE	428.92	430.09								
BH21-18	551588	4843776	SE	427.24	428.41								
MW22-01 (NW Site)	551292	4844042	NW	432.09	433.17								
MW22-27 (SE Site)	551483	4843649	SE	433.04	432.96								
MW22-28 (SE Site)	551497	4843637	SE	433.04	433.27								
BH23-02	551750	4844266	SE	427.99	428.90			0.38	428.42			0.17	427.82
BH23-09	551496	4843863	SE	428.80	429.90								
BH23-20S	551668	4843940	SE	426.56	427.55								
BH23-20D	551667	4843940	SE	426.58	427.55								
BH23-24S	551671	4843827	SE	426.71	427.51								
BH23-24D	551672	4843826	SE	426.66	427.60								
BH23-27	551160	4844064	NW	434.20	434.92								
BH23-29	551327	4844098	NW	432.72	433.67								
BH23-33[1]	550844	4844483	NW	429.90	430.60								
BH23-36[1]	551232	4844531	NW	430.50	431.30								
BH23-38	551187	4843993	NW	434.67	435.59								
BH23-41	551205	4844016	NW	434.64	435.56								
BH23-43	551178	4844020	NW	434.63	435.57								
BH23-44	551190	4844020	NW	434.50	435.25								
BH23-45	551131	4844047	NW	433.73	434.63								
BH23-46	551189	4844150	NW	433.75	434.50								
BH23-N1	551219	4844347	NW	432.56	433.35			0.50	431.50			0.38	432.18
BH23-N2	551291	4844369	NW	432.00	432.82			0.99	424.92			0.85	431.15
BH24-01	550975	4844725	NW	425.91	426.73			3.04	424.47	2.48	423.43	1.31	424.60
BH24-02	551093	4844670	NW	427.51	428.33			4.56	424.12	4.20	423.31	2.45	425.06
BH24-03	551164	4844790	NW	428.68	429.50			5.93	421.93	4.61	424.07	3.36	425.32
MW25-1	550261	4843972	NW	427.86	427.72								
TW25-2	550899	4844439	NW	429.98	430.71	36.31	393.67	9.28	417.40	8.68	421.30		
TW25-3	550903	4844592	NW	426.68	427.30			5.74	420.94				
6607 2nd Line	550505	4844060	NW	427.32	428.06			6.31	421.01	5.90	421.42		
6617 2nd Line	550305	4843983	NW	427.54	428.11			5.66	421.87	5.60	421.93		
6617 3rd Line (6711152)	551112	4844959	NW	426.94	427.31								
6622 3rd Line (6708706)	550988	4844972	NW	427.00	424.67								
6635 3rd Line (6708933)	551056	4845147	NW	427.15	427.43								
MP-1	550939	4844521	NW	427.17	428.12			-0.17	427.34	-	-	-0.31	427.48
SG-1	550939	4844521	NW	426.59	428.02					-	-	-0.85	427.44
MP-2	551110	4844459	NW	429.69	430.21					-	-	-0.12	429.81
SG-2	551111	4844458	NW	428.78	430.23					-	-		
SG26-1	550248	4844013	Irving Creek	421.09	422.53					-	-	-	-
SG26-2	551296	4844579	NW	428.72	430.25					-	-	-	-

Notes:

Elev. - Elevation
m - metre
m asl - metres above sea level
m bgs - metres below ground surface
m toc - metres below top of casing
WL - Water Level

Survey data was provided by R-PE Surveying Ltd. of Woodbridge Ontario, and GEMTEC in 2026, based on UTM coordinates and Canadian Geodetic Vertical Elevation Datum 2013 (CGVD2013).

Table E.2: Groundwater Depths and Elevations -Fergus, Ontario

Well Name	UTM Zone		Site	Ground Surface Elevation	Top of Casing Elevation	May 11, 2026 (GEMTEC)		May 20 to 22, 2026 (GEMTEC)		May 26, 2026 (GEMTEC)		May 27, 2026 (GEMTEC)	
						WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.
	Easting	Northing		(masl)	(masl)	(m bgs)	(m asl)	(m bgs)	(m asl)	(m bgs)	(m asl)	(m bgs)	(m asl)
Old Clubhouse Well	551466	4843649	SE	432.19	433.38					18.91	413.28	19.01	413.18
North Irrigation Well	551157	4844464	NW	429.93	430.20					6.91	423.02	27.97	401.96
South Irrigation Well	551546	4844183	SE	427.42	428.06			10.77	416.65	10.94	416.48	11.16	416.26
Clubhouse Well	551256	4844358	NW	432.18	432.67			9.23	422.95	9.25	422.93	12.81	419.37
MW101	551430	4844602	NW	430.36	431.11					8.15	422.21	9.92	420.44
MW102	551156	4844083	NW	433.56	434.40					11.58	421.98	14.46	419.10
MW103	551035	4844853	NW	426.46	427.44					3.49	422.97	7.14	419.32
PW21-1	550796	4844515	NW	429.98	430.63			6.62	423.36	6.70	423.28		
BH21-01	551476	4843276	SE	426.33	427.42								
BH21-03	551427	4843696	SE	434.96	434.91								
BH21-05	551876	4844077	SE	428.71	429.99								
BH21-06	551637	4844125	SE	427.33	428.35								
BH21-07S	551439	4844018	SE	428.99	428.90								
BH21-07D	551439	4844016	SE	428.99	428.91								
BH21-08	551553	4844380	SE	427.75	428.86								
BH21-09	551266	4844085	NW	432.43	433.60								
BH21-10	551239	4844290	NW	433.20	433.03								
BH21-11	551602	4844265	SE	428.46	429.54								
BH21-12	551093	4844087	NW	431.95	433.11								
BH21-13	551049	4844452	NW	429.07	429.00								
BH21-14	550895	4844279	NW	431.06	430.96					0.54	430.52	0.64	430.42
BH21-15	551086	4844267	NW	432.46	432.30					0.37	432.09	0.57	431.89
BH21-16	551425	4844256	SE	429.46	429.35								
BH21-17	551512	4843492	SE	428.92	430.09								
BH21-18	551588	4843776	SE	427.24	428.41								
MW22-01 (NW Site)	551292	4844042	NW	432.09	433.17								
MW22-27 (SE Site)	551483	4843649	SE	433.04	432.96								
MW22-28 (SE Site)	551497	4843637	SE	433.04	433.27								
BH23-02	551750	4844266	SE	427.99	428.90					0.39	427.60	0.43	427.56
BH23-09	551496	4843863	SE	428.80	429.90								
BH23-20S	551668	4843940	SE	426.56	427.55								
BH23-20D	551667	4843940	SE	426.58	427.55								
BH23-24S	551671	4843827	SE	426.71	427.51								
BH23-24D	551672	4843826	SE	426.66	427.60								
BH23-27	551160	4844064	NW	434.20	434.92								
BH23-29	551327	4844098	NW	432.72	433.67								
BH23-33[1]	550844	4844483	NW	429.90	430.60								
BH23-36[1]	551232	4844531	NW	430.50	431.30								
BH23-38	551187	4843993	NW	434.67	435.59								
BH23-41	551205	4844016	NW	434.64	435.56								
BH23-43	551178	4844020	NW	434.63	435.57								
BH23-44	551190	4844020	NW	434.50	435.25								
BH23-45	551131	4844047	NW	433.73	434.63								
BH23-46	551189	4844150	NW	433.75	434.50								
BH23-N1	551219	4844347	NW	432.56	433.35					0.57	431.99	0.62	431.94
BH23-N2	551291	4844369	NW	432.00	432.82					1.13	430.87	1.15	430.85
BH24-01	550975	4844725	NW	425.91	426.73					1.18	424.73	1.19	424.72
BH24-02	551093	4844670	NW	427.51	428.33					2.94	424.57	2.99	424.52
BH24-03	551164	4844790	NW	428.68	429.50					3.52	425.16	3.54	425.14
MW25-1	550261	4843972	NW	427.86	427.72			1.11	426.75	0.90	426.96	0.99	426.87
TW25-2	550899	4844439	NW	429.98	430.71			7.25	422.73	7.19	422.79	12.21	417.77
TW25-3	550903	4844592	NW	426.68	427.30			3.65	423.03	3.69	422.99	30.66	396.02
6607 2nd Line	550505	4844060	NW	427.32	428.06			4.68	422.64	4.56	422.76	7.72	419.60
6617 2nd Line	550305	4843983	NW	427.54	428.11			4.67	422.86	4.80	422.73	6.02	421.51
6617 3rd Line (6711152)	551112	4844959	NW	426.94	427.31	3.89	423.04			5.58	421.35		
6622 3rd Line (6708706)	550988	4844972	NW	427.00	424.67			4.13	422.87	5.31	421.69	8.48	418.52
6635 3rd Line (6708933)	551056	4845147	NW	427.15	427.43	4.37	422.78			5.65	421.50	7.92	419.23
MP-1	550939	4844521	NW	427.17	428.12					-0.22	427.39	-0.21	427.38
SG-1	550939	4844521	NW	426.59	428.02					-0.78	427.37	-0.77	427.36
MP-2	551110	4844459	NW	429.69	430.21					-0.06	429.75	-0.14	429.83
SG-2	551111	4844458	NW	428.78	430.23					-0.37	429.15	-0.45	429.23
SG26-1	550248	4844013	Irving Creek	421.09	422.53	-	-	-0.50	421.59	-0.62	421.71	-0.57	421.66
SG26-2	551296	4844579	NW	428.72	430.25	-	-			-0.45	429.17	-0.50	429.22

Notes:

Elev. - Elevation
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m toc - metres below top of casing
WL - Water Level

Survey data was provided by R-PE Surveying Ltd. of Woodbridge Ontario, and GEMTEC in 2026, based on UTM coordinates and Canadian Geodetic Vertical Elevation Datum 2013 (CGVD2013).

Table E.2: Groundwater Depths and Elevations -Fergus, Ontario

Well Name	UTM Zone		Site	Ground Surface Elevation	Top of Casing Elevation	May 28, 2026 (GEMTEC)		May 29, 2026 (GEMTEC)		June 1, 2026 (GEMTEC)	
						WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.
	Easting	Northing		(masl)	(masl)	(m bgs)	(m asl)	(m bgs)	(m asl)	(m bgs)	(m asl)
Old Clubhouse Well	551466	4843649	SE	432.19	433.38	19.21	412.98	19.33	412.86	19.48	412.71
North Irrigation Well	551157	4844464	NW	429.93	430.20					8.41	421.52
South Irrigation Well	551546	4844183	SE	427.42	428.06	11.31	416.11	11.47	415.95		
Clubhouse Well	551256	4844358	NW	432.18	432.67	14.76	417.42	13.57	418.61	14.75	417.43
MW101	551430	4844602	NW	430.36	431.11	11.01	419.35	11.62	418.74	9.52	420.84
MW102	551156	4844083	NW	433.56	434.40	15.54	418.02	15.92	417.64	13.02	420.54
MW103	551035	4844853	NW	426.46	427.44	8.16	418.30	7.85	418.61	4.95	421.51
PW21-1	550796	4844515	NW	429.98	430.63			18.98	411.00	8.21	421.77
BH21-01	551476	4843276	SE	426.33	427.42						
BH21-03	551427	4843696	SE	434.96	434.91						
BH21-05	551876	4844077	SE	428.71	429.99						
BH21-06	551637	4844125	SE	427.33	428.35						
BH21-07S	551439	4844018	SE	428.99	428.90						
BH21-07D	551439	4844016	SE	428.99	428.91						
BH21-08	551553	4844380	SE	427.75	428.86						
BH21-09	551266	4844085	NW	432.43	433.60						
BH21-10	551239	4844290	NW	433.20	433.03						
BH21-11	551602	4844265	SE	428.46	429.54						
BH21-12	551093	4844087	NW	431.95	433.11						
BH21-13	551049	4844452	NW	429.07	429.00						
BH21-14	550895	4844279	NW	431.06	430.96	0.73	430.33	0.77	430.29	0.94	430.12
BH21-15	551086	4844267	NW	432.46	432.30	0.67	431.79	0.74	431.72		
BH21-16	551425	4844256	SE	429.46	429.35						
BH21-17	551512	4843492	SE	428.92	430.09						
BH21-18	551588	4843776	SE	427.24	428.41						
MW22-01 (NW Site)	551292	4844042	NW	432.09	433.17						
MW22-27 (SE Site)	551483	4843649	SE	433.04	432.96						
MW22-28 (SE Site)	551497	4843637	SE	433.04	433.27						
BH23-02	551750	4844266	SE	427.99	428.90	0.48	427.51	0.50	427.49		
BH23-09	551496	4843863	SE	428.80	429.90						
BH23-20S	551668	4843940	SE	426.56	427.55						
BH23-20D	551667	4843940	SE	426.58	427.55						
BH23-24S	551671	4843827	SE	426.71	427.51						
BH23-24D	551672	4843826	SE	426.66	427.60						
BH23-27	551160	4844064	NW	434.20	434.92						
BH23-29	551327	4844098	NW	432.72	433.67						
BH23-33[1]	550844	4844483	NW	429.90	430.60						
BH23-36[1]	551232	4844531	NW	430.50	431.30						
BH23-38	551187	4843993	NW	434.67	435.59						
BH23-41	551205	4844016	NW	434.64	435.56						
BH23-43	551178	4844020	NW	434.63	435.57						
BH23-44	551190	4844020	NW	434.50	435.25						
BH23-45	551131	4844047	NW	433.73	434.63						
BH23-46	551189	4844150	NW	433.75	434.50						
BH23-N1	551219	4844347	NW	432.56	433.35	0.72	431.84	0.76	431.80	1.02	431.54
BH23-N2	551291	4844369	NW	432.00	432.82	1.21	430.79	1.18	430.82	1.34	430.66
BH24-01	550975	4844725	NW	425.91	426.73	1.19	424.72	1.18	424.73	1.21	424.70
BH24-02	551093	4844670	NW	427.51	428.33	3.04	424.47	3.09	424.42	3.40	424.11
BH24-03	551164	4844790	NW	428.68	429.50	3.58	425.10	3.64	425.04	4.13	424.55
MW25-1	550261	4843972	NW	427.86	427.72	1.07	426.79	1.09	426.77	1.26	426.60
TW25-2	550899	4844439	NW	429.98	430.71	13.19	416.79	11.93	418.05	8.73	421.25
TW25-3	550903	4844592	NW	426.68	427.30	32.04	394.64	8.14	418.54	5.24	421.44
6607 2nd Line	550505	4844060	NW	427.32	428.06	8.70	418.62	8.95	418.37	6.06	421.26
6617 2nd Line	550305	4843983	NW	427.54	428.11	6.65	420.88	7.09	420.44	5.93	421.60
6617 3rd Line (6711152)	551112	4844959	NW	426.94	427.31					5.81	421.12
6622 3rd Line (6708706)	550988	4844972	NW	427.00	424.67	9.48	417.52	8.55	418.45	5.73	421.27
6635 3rd Line (6708933)	551056	4845147	NW	427.15	427.43	11.04	416.11	8.56	418.59	5.98	421.17
MP-1	550939	4844521	NW	427.17	428.12	-0.20	427.37	-0.19	427.36	-0.16	427.33
SG-1	550939	4844521	NW	426.59	428.02	-0.76	427.35	-0.75	427.34	-0.72	427.31
MP-2	551110	4844459	NW	429.69	430.21	-0.17	429.86	-0.18	429.87	-0.08	429.77
SG-2	551111	4844458	NW	428.78	430.23	-0.49	429.27	-0.50	429.28	-0.40	429.18
SG26-1	550248	4844013	Irving Creek	421.09	422.53	-0.53	421.62	-0.51	421.60	-0.48	421.57
SG26-2	551296	4844579	NW	428.72	430.25	-0.55	429.27	-0.56	429.28	-0.47	429.19

Notes:

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m toc - metres below top of casing
WL - Water Level

Survey data was provided by R-PE Surveying Ltd. of Woodbridge Ontario, and GEMTEC in 2026, based on UTM coordinates and Canadian Geodetic Vertical Elevation Datum 2013 (CGVD2013).

APPENDIX F

Hydraulic Conductivity Test Results

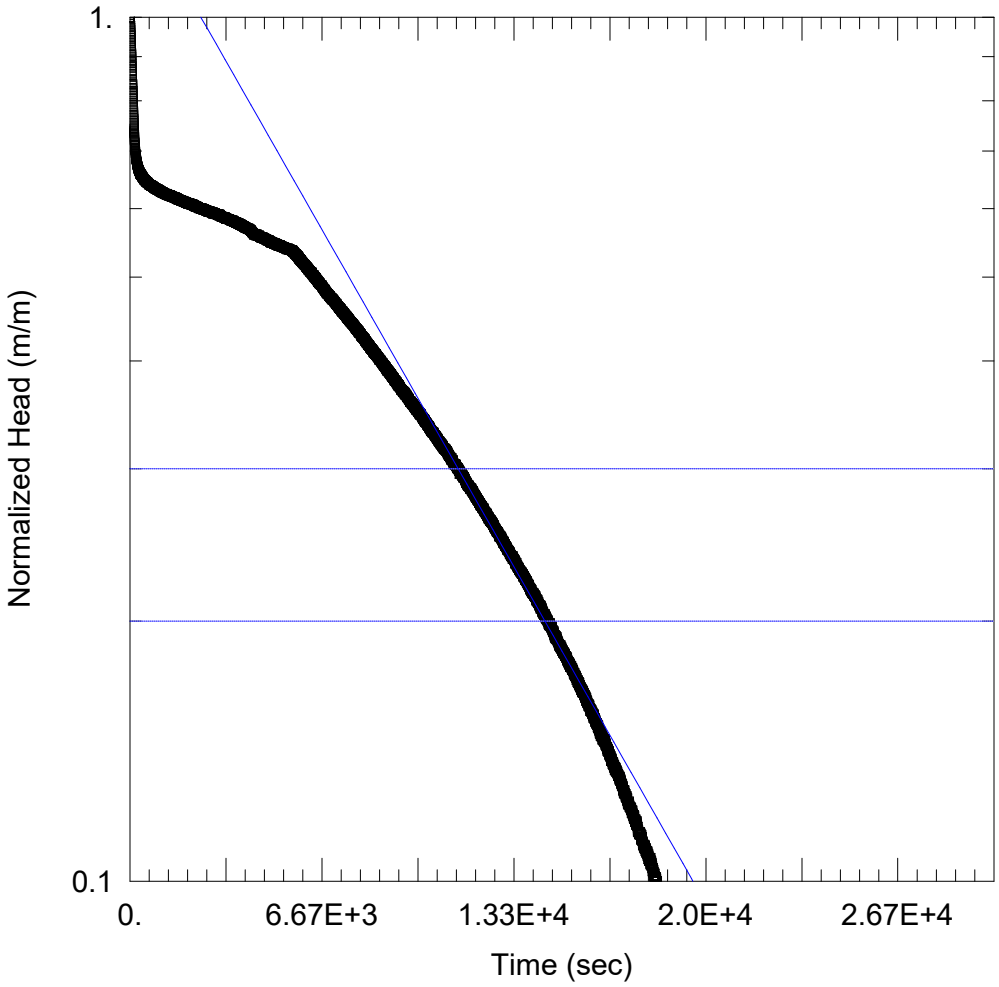
Table F.1: Summary of Hydraulic Conductivity Values - Single Well Response Tests - 8243 and 8282 Wellington Road 19, Fergus, Ontario

Well Name	Date of Test	Ground Surface Elevation (masl)	Top of Screen (m bgs)	Bottom of Screen (m bgs)	Screened Lithology	Type of Test	Hydraulic Conductivity Estimate (m/s)	Notes
South East Site								
BH23-02	12/18/2023	427.991	2.90	4.42	(CL) SILTY CLAY	Rising Head	4.E-07	Completed by GEMTEC, 2024
	9/26/2025					Rising Head	8.E-08	Completed by GEMTEC, 2026
BH23-09	12/18/2023	428.798	1.37	2.90	(CL-ML) SILTY CLAY to CLAYEY SILT (TILL)	Rising Head	6.E-09	Completed by GEMTEC, 2024
BH23-20D	12/18/2023	426.645	7.47	8.99	(CL-ML) SILTY CLAY to CLAYEY SILT (TILL)	Rising Head	2.E-08	Completed by GEMTEC, 2024
BH23-20S	12/18/2023	426.555	2.90	4.42	(CL-ML) SILTY CLAY to CLAYEY SILT (TILL)	Rising Head	6.E-07	Completed by GEMTEC, 2024
BH21-01	4/9/2021	426.33	4.57	6.10	(CL) SILTY CLAY	Rising Head	8.E-09	Completed by WSP, 2023
BH21-03	4/8/2021	434.96	1.83	4.88	(ML-CL) SILTY CLAY to clayey SILT (TILL)	Rising Head	6.E-06	Completed by WSP, 2023
BH21-05	4/8/2021	428.71	1.22	4.27	(SM/ML) SILT and Sand; (CL) CLAYEY SILT	Rising Head	2.E-06	Completed by WSP, 2023
BH21-06	4/8/2021	427.33	2.70	4.60	(SM) SILTY SAND; (CL) Sandy SILTY CLAY	Rising Head	2.E-07	Completed by WSP, 2023
BH21-07S	4/8/2021	428.99	1.52	2.74	(ML-CL) SILTY CLAY to clayey SILT (TILL)	Rising Head	6.E-07	Completed by WSP, 2023
BH21-08	4/8/2021	427.75	1.50	4.60	(CL) CLAYEY SILT; (SM) SILTY SAND	Rising Head	4.E-06	Completed by WSP, 2023
BH21-16	4/9/2021	429.43	3.33	4.93	(CL-ML) SILTY CLAY-CLAYEY SILT	Rising Head	6.E-08	Completed by WSP, 2023
BH21-17	4/14/2021	428.92	3.30	4.90	(CL-ML) Sandy SILTY CLAY-CLAYEY SILT	Rising Head	1.E-08	Completed by WSP, 2023
BH21-18	4/8/2021	427.24	0.90	4.00	(CL) CLAYEY SILT; (ML) Sandy SILT; (SM-GM) SILTY SAND and GRAVEL; (CL) SILTY CLAY	Rising Head	2.E-07	Completed by WSP, 2023
North West Site								
BH21-10	4/9/2021	433.2	3.05	6.10	(CL) Sandy SILTY CLAY	Rising Head	2.E-08	Completed by Golder 2023
BH23-27	12/18/2023	434.2	5.79	7.32	(CL-ML) sandy SILTY CLAY (TILL)	Rising Head	4.E-08	Completed by GEMTEC, 2024
BH23-29	12/19/2023	432.72	7.62	9.14	(ML) gravelly, sandy SILT (TILL)	Rising Head	7.E-09	Completed by GEMTEC, 2024
BH23-33[1]	12/18/2023	429.9	1.52	3.05	(CL) sandy SILTY CLAY (TILL)	Rising Head	2.E-08	Completed by GEMTEC, 2024
BH23-36[1]	12/18/2023	430.5	3.05	4.57	(ML) clayey SILT	Rising Head	1.E-08	Completed by GEMTEC, 2024
BH23-41	12/18/2023	434.64	6.10	7.62	(ML) sandy SILT (TILL)	Rising Head	7.E-08	Completed by GEMTEC, 2024
BH23-46	12/18/2023	433.75	2.90	4.42	(CL-ML) sandy SILTY CLAY (TILL)	Rising Head	2.E-08	Completed by GEMTEC, 2024
BH23-N1	9/26/2025	432.563	3.05	6.10	(CL) SILTY CLAY	Rising Head	8.E-09	Completed by GEMTEC, 2026
BH23-N2	9/26/2025	432.004	3.05	6.10	(SM) SILTY SAND; (ML) SANDY SILT; (ML) CLAYEY SILT	Rising Head	6.E-08	Completed by GEMTEC, 2026
BH24-01	9/26/2025	425.908	13.72	15.20	(ML) CLAYEY SILT	Rising Head	3.E-07	Completed by GEMTEC, 2026
BH24-02	9/26/2025	427.505	13.72	15.20	(CL) SILTY CLAY	Rising Head	8.E-09	Completed by GEMTEC, 2026
BH24-03	9/26/2025	428.682	13.72	15.20	(CL) SILTY CLAY	Rising Head	2.E-08	Completed by GEMTEC, 2026

Notes: All test were analysed using Bouwer and Rice, 1976
m asl - meters above sea level
m bgs - meters below groundsurface
m/s - meters per second

Survey data provided by R-PE Surveying Ltd. of Woodbridge Ontario based on UTM coordinate and Canadian Geodetic Vertical Elevation Datum 2013 (CGVD2013).

Bouwer, H. and R.C. Rice, 1976. A slug test method for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells, Water Resources Research, vol. 12, no. 3, pp. 423-428.



BH23-02 RISING HEAD TEST

Data Set: \...\101987.017_BH23-02 RHT Analysis_2025-11-06_MFC.aqt
Date: 06/26/26 Time: 05:27:16

PROJECT INFORMATION

Company: GEMTEC
Client: Geranium
Project: 101987.017
Location: Fergus, ON
Test Well: BH23-02
Test Date: September 26, 2025

AQUIFER DATA

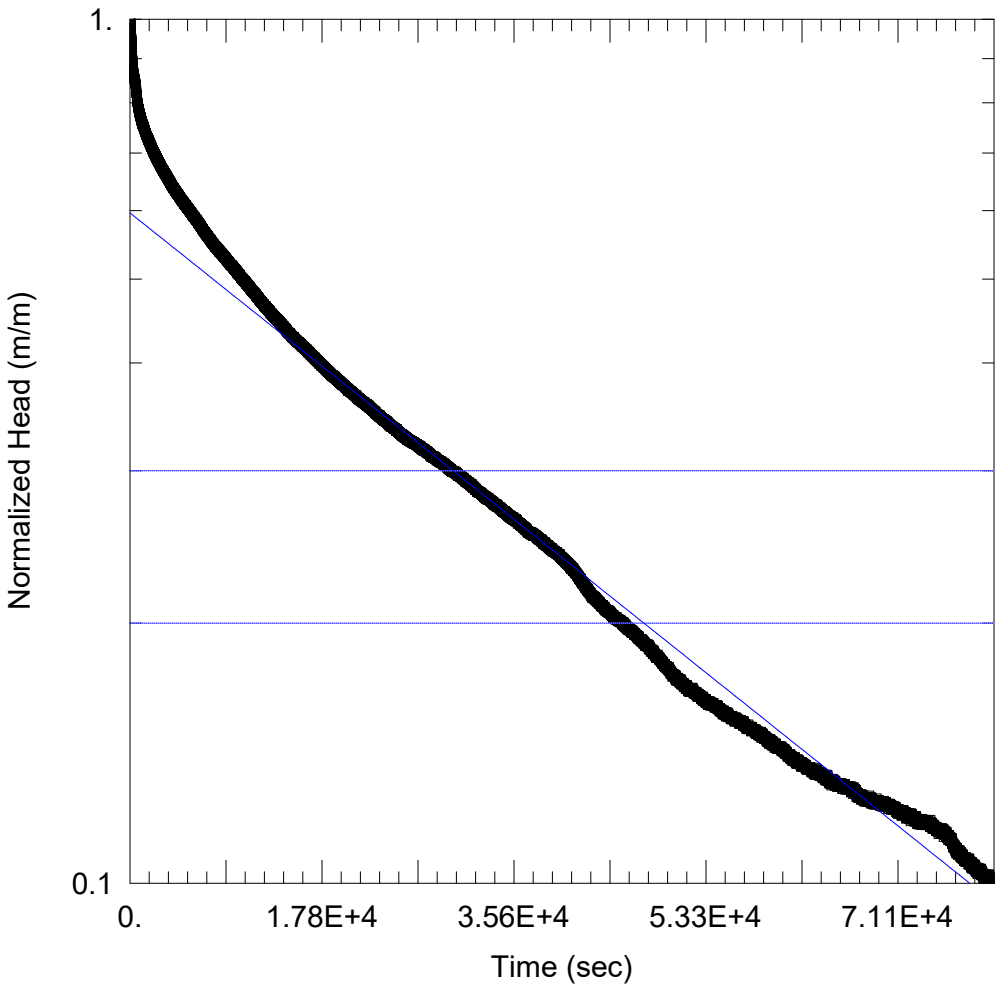
Saturated Thickness: 3.141 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH23-02)

Initial Displacement: 2.942 m
Total Well Penetration Depth: 2.23 m
Casing Radius: 0.0254 m
Static Water Column Height: 3.141 m
Screen Length: 1.524 m
Well Radius: 0.1016 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 8.0E-8 m/sec
y0 = 4.1 m



BH23-N1 RISING HEAD TEST

Data Set: \...\101987.017_BH23-N1 RHT Analysis_2025-11-06_MFC.aqt
Date: 06/26/26 Time: 05:26:24

PROJECT INFORMATION

Company: GEMTEC
Client: Geranium
Project: 101987.017
Location: Fergus, ON
Test Well: BH23-N1
Test Date: September 26, 2025

AQUIFER DATA

Saturated Thickness: 3.374 m Anisotropy Ratio (Kz/Kr): 0.1

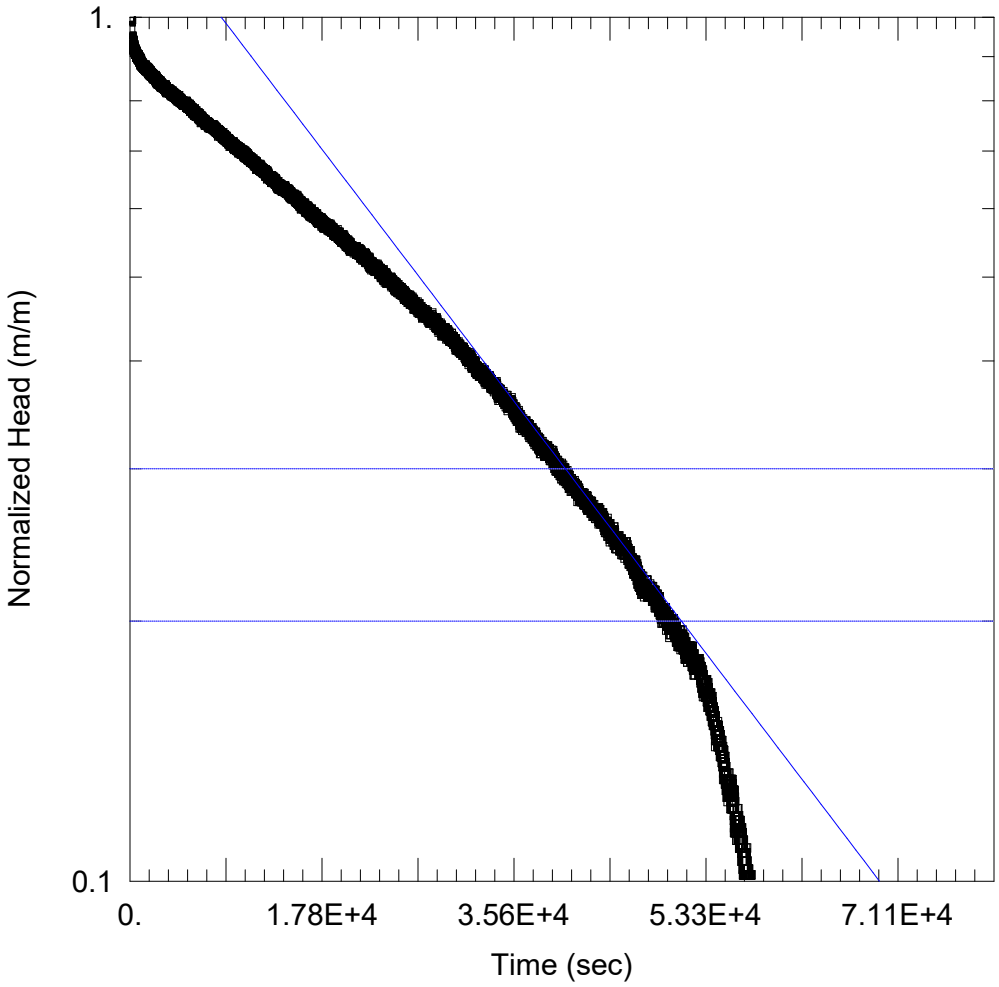
WELL DATA (BH23-N1)

Initial Displacement: 3.025 m
Total Well Penetration Depth: 3.048 m
Casing Radius: 0.0254 m
Static Water Column Height: 3.374 m
Screen Length: 3.048 m
Well Radius: 0.1016 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 8.0E-9 m/sec
y0 = 1.805 m



BH23-N2 RISING HEAD TEST

Data Set: \...\101987.017_BH23-N2 RHT Analysis_2025-11-06_MFC.aqt
Date: 06/26/26 Time: 05:25:55

PROJECT INFORMATION

Company: GEMTEC
Client: Geranium
Project: 101987.017
Location: Fergus, ON
Test Well: BH23-N2
Test Date: September 26, 2025

AQUIFER DATA

Saturated Thickness: 2.854 m Anisotropy Ratio (Kz/Kr): 0.3

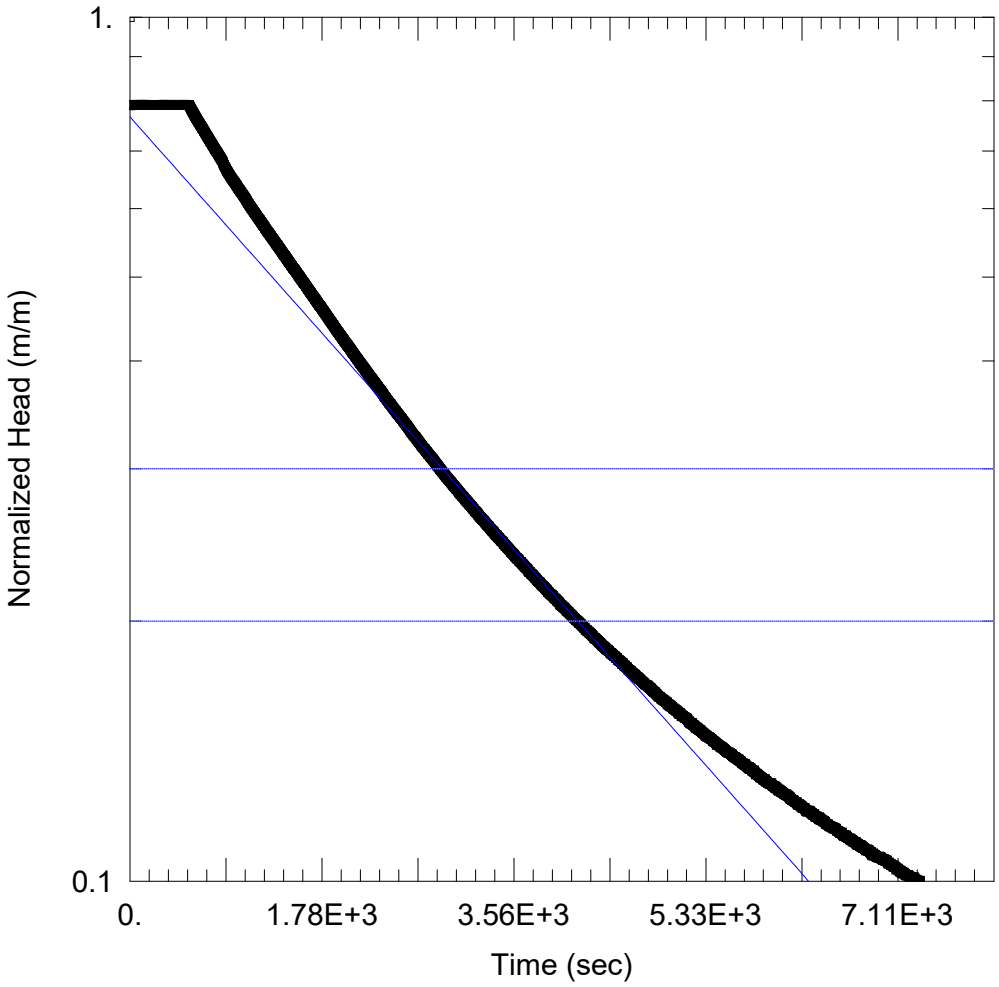
WELL DATA (BH23-N2)

Initial Displacement: 2.543 m
Total Well Penetration Depth: 3.048 m
Casing Radius: 0.0254 m
Static Water Column Height: 2.854 m
Screen Length: 3.048 m
Well Radius: 0.1016 m
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 6.0E-8 m/sec y0 = 3.5 m



BH24-01 RISING HEAD TEST

Data Set: \...\101987.017_BH24-01 RHT Analysis_2025-11-06_MFC.aqt
Date: 06/26/26 Time: 05:25:37

PROJECT INFORMATION

Company: GEMTEC
Client: Geranium
Project: 101987.017
Location: Fergus, ON
Test Well: BH24-01
Test Date: September 26, 2025

AQUIFER DATA

Saturated Thickness: 13.46 m Anisotropy Ratio (Kz/Kr): 0.1

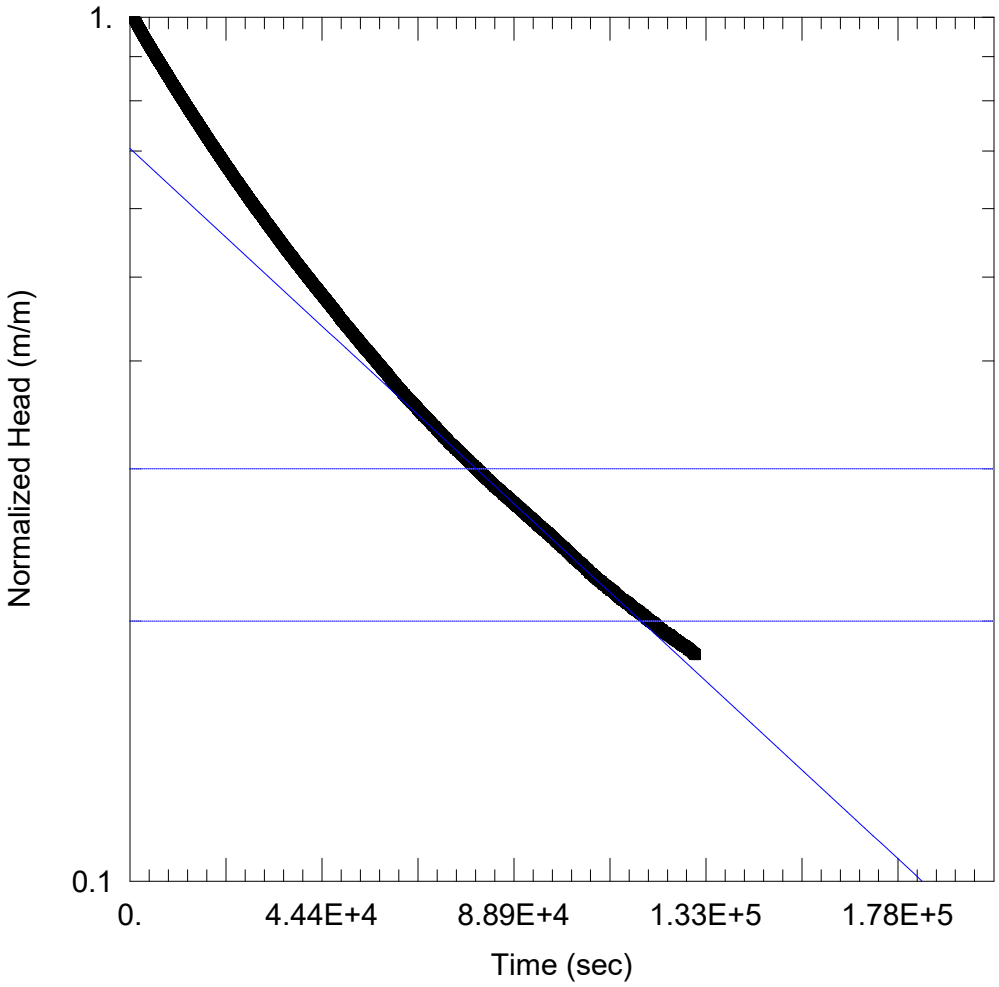
WELL DATA (BH24-01)

Initial Displacement: 7.821 m
Total Well Penetration Depth: 12.64 m
Casing Radius: 0.0254 m
Static Water Column Height: 13.46 m
Screen Length: 1.48 m
Well Radius: 0.1016 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 2.508E-7 m/sec
y0 = 5.994 m



BH24-02 RISING HEAD TEST

Data Set: \...\101987.017_BH24-02 RHT Analysis_2025-11-06_MFC.aqt
Date: 06/26/26 Time: 05:23:59

PROJECT INFORMATION

Company: GEMTEC
Client: Geranium
Project: 101987.017
Location: Fergus, ON
Test Well: BH24-02
Test Date: September 26, 2025

AQUIFER DATA

Saturated Thickness: 10.59 m Anisotropy Ratio (Kz/Kr): 0.1

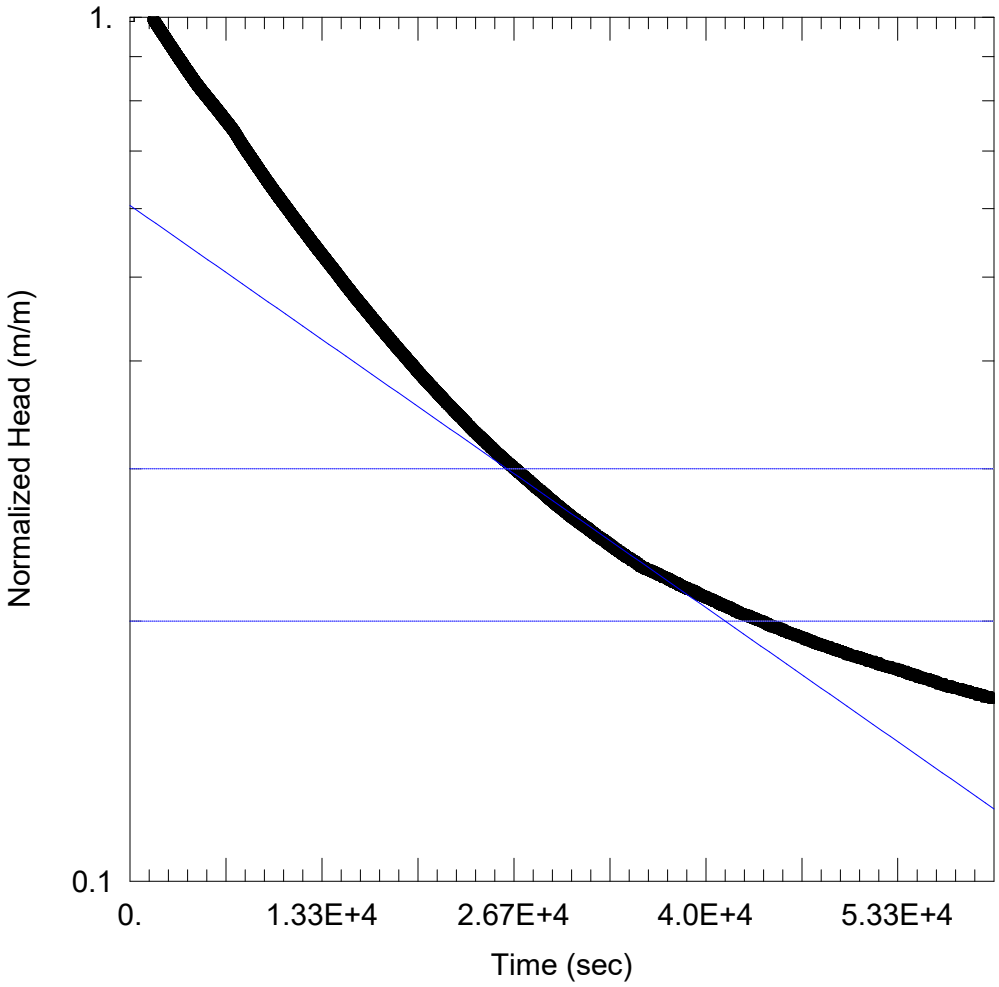
WELL DATA (BH24-02)

Initial Displacement: 7.097 m
Total Well Penetration Depth: 9.76 m
Casing Radius: 0.0254 m
Static Water Column Height: 10.59 m
Screen Length: 1.48 m
Well Radius: 0.1016 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 8.0E-9 m/sec
y0 = 5. m



BH24-03 RISING HEAD TEST

Data Set: \...\101987.017_BH24-03 RHT Analysis_2025-11-06_MFC.aqt
Date: 06/26/26 Time: 05:27:32

PROJECT INFORMATION

Company: GEMTEC
Client: Geranium
Project: 101987.017
Location: Fergus, ON
Test Well: BH24-03
Test Date: September 26, 2025

AQUIFER DATA

Saturated Thickness: 9.977 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH24-03)

Initial Displacement: 8.093 m
Total Well Penetration Depth: 9.16 m
Casing Radius: 0.0254 m
Static Water Column Height: 9.977 m
Screen Length: 1.48 m
Well Radius: 0.1016 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 2.0E-8 m/sec
y0 = 4.9 m

APPENDIX G

Conceptual Site Model

Table G1 – Conceptual Site Model Summary of the Fergus Monitoring Well Network Details.

Well ID	Overburden & Bedrock Thickness (m)	Overburden Description (mbgs)	Overburden Hydrogeology Interpretation	Overburden Hydraulic Parameters	Bedrock Description (mbgs)	Bedrock Hydrogeology Interpretation	Bedrock Hydraulic Parameters
TW25-3	26.7 & 52.7	-Topsoil (0 – 0.6) -Clay (0.6 – 2.1) -Clay s. gravel (2.1 – 4.6) -Gravel s. clay (4.6 – 25.9) -Gravel (25.9 – 26.5)	- TW25-3 is within the range of the aquitards ATB1 (7.2 m thick), ATB3 (3.5 m thick), ATC1 (21.6 m thick) & ATG1 (3 m thick) (Burt & Dodge, 2016 mapping). -The gravel layer could be inferred to be aquifer AFD1, which in the NW area is mentioned to be 2.2 m thick (Burt & Dodge, 2016 mapping).	-	Limestone (26.5 – 79.2) Guelph Fm	-	-
TW25-2	29.6 & 51.9	-Topsoil (0 – 0.3) -Clay s. sand (0.3 – 2.4) -Gravel s. clay (2.4 – 29.6)	- TW25-3 is within the range of the aquitards ATB1 (7.2 m thick), ATB3 (3.5 m thick), ATC1 (21.6 m thick) & ATG1 (3 m thick) (Burt & Dodge, 2016 mapping).	-	Limestone (29.6 – 81.5) Guelph Fm	-	-
Old Clubhouse Well (6706408)	78.9 & 29.6	-Clay s. stones (0 – 78.9)	-Potential aquitard in the Elora buried-bedrock valley (Burt & Dodge, 2016 mapping).	-	Limestone (78.9 – 108.5) Guelph Fm	-	-
North Irrigation Well (6712549 or PW-1 or NIW)	32.0 & 55.0	-Clay s. sand (0 – 30) -Clay till s. stones (30 – 32)	- Potential aquitard, associated with ATB1, ATB3, ATC1 & ATG1 (Burt & Dodge, 2016 mapping).	-	Limestone (32.0 – 87.0) Guelph Fm	Bedrock aquifer (Burnside, 2011). Confined or artisan due to S range, common in fractured media	$T=38\ m^2/day$ $S=1.5E^{-4} – 4E^{-5}$ Rate=3.0 L/s (Pumping Test performed in May 1999; Morrison Environmental Ltd, 1999; Burnside, 2011)

Well ID	Overburden & Bedrock Thickness (m)	Overburden Description (mbgs)	Overburden Hydrogeology Interpretation	Overburden Hydraulic Parameters	Bedrock Description (mbgs)	Bedrock Hydrogeology Interpretation	Bedrock Hydraulic Parameters
South Irrigation Well (6713016 or SIW)	57.3 & 37.2	-Topsoil (0 – 0.3) -Clay s. sand & stones (0.3 – 7.6) -Clay s. gravel (7.6 – 27.4) -Sand s. gravel (27.4 – 38.1) -Clay s. sand (38.1 – 51.8) -Clay s. sand & gravel (51.8 – 57.3)	-Potential aquitard-aquifer sequence in the Elora buried-bedrock valley (Burt & Dodge, 2016 mapping) -Aquitard ATB1, ATB3 & ATC1 (0.3 – 27.4 mbgs) -Aquifer AFD1 (27.4 – 38.1 mbgs) -Aquitard ATG1 (38.1 – 57.3 mbgs)	-	Limestone (57.3 – 94.5) Guelph Fm	-	-
Clubhouse Well (6714026)	31.7 & 43.0	-Topsoil (0 – 0.9) -Clay s. stones (0.9 – 25.9) -Clay s. gravel (25.9 – 31.7)	- Clubhouse Well is within the range of the aquitards ATB1 (7.2 m thick), ATB3 (3.5 m thick), ATC1 (21.6 m thick) & ATG1 (3 m thick) (Burt & Dodge, 2016 mapping).	-	Limestone (31.7 – 74.7) Guelph Fm	-	-
MW101 (A310450)	32.6 & 28.4	-Topsoil (0 – 0.6) -Sandy silt till (0.6 – 15.2) -Gravelly silt till (15.2 – 27.4) -Sandy silt till (27.4 – 32.6)	- MW101 is within the range of the aquitards ATB1 (7.2 m thick), ATB3 (3.5 m thick), ATC1 (21.6 m thick) & ATG1 (3 m thick) (Burt & Dodge, 2016 mapping).	-	-Dolostone (32.6 – 61) Guelph Fm	-	-
MW102 (A310469)	28.7 & 32.3	-Topsoil (0 – 0.6) -Sandy silt till (0.6 – 12.2) -Gravelly silt till (12.2 – 28.7)	- MW102 is within the range of the aquitards ATB1 (7.2 m thick), ATB3 (3.5 m thick), ATC1 (21.6 m thick) & ATG1 (3 m thick) (Burt & Dodge, 2016 mapping).	-	-Dolostone (28.7 – 61) Guelph Fm	-	-

Well ID	Overburden & Bedrock Thickness (m)	Overburden Description (mbgs)	Overburden Hydrogeology Interpretation	Overburden Hydraulic Parameters	Bedrock Description (mbgs)	Bedrock Hydrogeology Interpretation	Bedrock Hydraulic Parameters
MW103 (A310449)	28.7 & 32.3	-Topsoil (0 – 0.6) -Sandy silt till (0.6 – 12.2) -Gravelly silt till (12.2 - 15.2) -Sandy silt till (15.2 – 28.7)	- MW103 is within the range of the aquitards ATB1 (7.2 m thick), ATB3 (3.5 m thick), ATC1 (21.6 m thick) & ATG1 (3 m thick) (Burt & Dodge, 2016 mapping).	-	-Dolostone (28.7 – 61) Guelph Fm	-	-
PW21-1 (A310448)	29.9 & 55.4 (Guelph Fm)	-Topsoil (0 – 0.6) -Sandy silt till (0.6 - 6.1) -Gravelly silt till (6.1 – 29.9)	-Sandy silt till is referred to as the Port Stanley Till (WSP, 2024). -Port Stanley Till is the aquitard ATB1 in Burt & Dodge, 2016 mapping, which is underlaid by aquitards ATB3 (3.5 m thick), ATC1 (21.6 m thick) & ATG1 (3 m thick).	-	-Dolostone (29.9 – 85.3) Guelph Fm - Dolostone (85.3 – 91.4) Eramosa Fm	Bedrock aquifer (WSP, 2024)	T=63 m^2/day S=9 x 10^{-3} Rate=8.8 L/s (Pumping Test performed on August 31 & Sept 3, 2021, by Golder; WSP 2024)
6607 2nd Line	-	-	-	-	-	-	-
6617 2nd Line	-	-	-	-	-	-	-
6617 3rd Line (6711152)	33.22	- Depths in ft. LOAM 0001 BRWN SAND CLAY 0018 BRWN CLAY SAND HPAN 0026 BRWN CLAY SAND GRVL 0109	- Private well is within the range of the aquitards ATB1 (7.2 m thick), ATB3 (3.5 m thick), and ATC1 (21.6 m thick) (Burt & Dodge, 2016 mapping).	-	Grey Limestone (33.22 – 50.3)	- Fractured Aquifer with Bearing Zone Depths (ft) FR 0115 FR 0120 FR 0145 FR 0165	-

Well ID	Overburden & Bedrock Thickness (m)	Overburden Description (mbgs)	Overburden Hydrogeology Interpretation	Overburden Hydraulic Parameters	Bedrock Description (mbgs)	Bedrock Hydrogeology Interpretation	Bedrock Hydraulic Parameters
6622 3rd Line (6708706)	33.5	- Depths in ft. GRVL 0010 CLAY 0100 SAND 0110	- Private well is within the range of the aquitards ATB1 (7.2 m thick), ATB3 (3.5 m thick), and ATC1 (21.6 m thick) (Burt & Dodge, 2016 mapping).	-	Limestone (33.5 – 50.3)	- Fractured Aquifer with Bearing Zone Depths (ft) FR 0150 FR 0165	-
6635 3rd Line (6708993)	36.9	- Depths in ft. BRWN CLAY GRVL STNS 0018 GREY CLAY 0121	- Private well is within the range of the aquitards ATB1 (7.2 m thick), ATB3 (3.5 m thick), and ATC1 (21.6 m thick) (Burt & Dodge, 2016 mapping).	-	Grey Rock; Assumed to be Limestone (36.9 – 41.1)	- Fractured Aquifer with Bearing Zone Depths (ft) FR 0135	-
BH21-10	6.1 in the NW Site	-Sandy silty clay	-Boreholes within aquitard ATB1, which is up to 7.2 m thick in the NW Site area (Burt & Dodge, 2016 mapping).	- RH Testing conducted in 2021 by WSP (2023). - HC = $2E^{-8}$	-	-	-
BH21-01 BH21-03 BH21-05 BH21-06 BH21-07S BH21-08 BH21-16 BH21-17 BH21-18	2.74 to 6.1 m in the SE Site	-All boreholes have silty clay to clayey silt. -Sand, silty sand, or silty sand and gravel layer present in BH21-01, 05, 06, 08, 09, 11, 12, 15, 17, & 18.	-All these boreholes are within the range of the aquitard ATB1, which is up to 10.3 m thick in the SE Site area (Burt & Dodge, 2016 mapping). -Boreholes with layers of sand and others are referred to as part of the upper aquifer AFA2, which is extended in the SE Site area, with 4.8 m thick approx. (Burt & Dodge, 2016 mapping).	- RH Testing conducted in 2021 by WSP (2023). - Min = $8E^{-9}$ (BH21-01) - Max = $6E^{-6}$ (BH21-03) - Mean = $8E^{-8}$ (n = 6)	-	-	-

Well ID	Overburden & Bedrock Thickness (m)	Overburden Description (mbgs)	Overburden Hydrogeology Interpretation	Overburden Hydraulic Parameters	Bedrock Description (mbgs)	Bedrock Hydrogeology Interpretation	Bedrock Hydraulic Parameters
BH23-27 BH23-29 BH23-33 BH23-36 BH23-41 BH23-46	3.05 to 9.14 m in the NW Site	-Sandy silty clay till -Gravelly sandy silt till -Sandy silty clay till -Clayey silt -Sandy silt till -Sandy silty clay till	-Till aquitard (WSP, 2024; Fetter, 1994). -Till (GEMTEC, 2024). -All these boreholes are within the range of the aquitards ATB1 (7.2 m thick) and ATB3 (3.5 m thick) (Burt & Dodge, 2016 mapping).	- RH Testing conducted in 2023 by GEMTEC (2024). - Min = $7E^{-9}$ (BH23-29) - Max = $7E^{-8}$ (BH23-41) - Mean = $3E^{-8}$ (n = 6)	-	-	-
BH23-02 BH23-09 BH23-20D BH23-20S	2.9 to 8.99 m in the SE Site	-Mostly silty clay to clayey silt. -Sand, silty sand, or silty sand and gravel layer present in BH23-02, 20D & 20S.	-All these boreholes are within the range of the aquitard ATB1, which is up to 10.3 m thick in the SE Site area (Burt & Dodge, 2016 mapping). -Boreholes with layers of sand and others are referred to as part of the upper aquifer AFA2, which is extended in the SE Site area, with 4.8 m thick approx. (Burt & Dodge, 2016 mapping).	- RH Testing conducted in 2023 by GEMTEC (2024). - Min = $6E^{-9}$ (BH23-09) - Max = $6E^{-7}$ (BH23-20S) - Mean = $3E^{-8}$ (n = 4)	-	-	-

Well ID	Overburden & Bedrock Thickness (m)	Overburden Description (mbgs)	Overburden Hydrogeology Interpretation	Overburden Hydraulic Parameters	Bedrock Description (mbgs)	Bedrock Hydrogeology Interpretation	Bedrock Hydraulic Parameters
BH23-02 BH23-N1 BH23-N2 BH21-14 BH21-15	6.10 to 7.01 m in the NW Site	-Topsoil (0 – 0.2) -Silty Sand (0.2 – 3.8) -Silty clay, sandy silt, & clayey silt (3.8 – 7.01)	- All these boreholes are within the range of the aquitard ATB1 (7.2 m thick) (Burt & Dodge, 2016 mapping).	- RH Testing conducted in 2025 by GEMTEC (2026). -Min = $8E^{-9}$ (BH23-29) -Max = $8E^{-8}$ (BH23-41) - Mean = $1.7E^{-8}$ (n = 3)	-	-	-
BH24-01 BH24-02 BH24-03	15.7 m in the NW Site	-Topsoil (0 – 0.2) -Silty clay, sandy silt, & clayey silt (0.2 – 15.7)	- All these boreholes are within the range of the aquitards ATB1 (7.2 m thick), ATB3 (3.5 m thick), and ATC1 (21.6 m thick) (Burt & Dodge, 2016 mapping). -The screened interval of the borehole wells (13.7 – 15.2 mbgs) is referred to the ATC1 aquitard (Burt & Dodge, 2016 mapping).	- RH Testing conducted in 2025 by GEMTEC (2026). -Min = $2E^{-9}$ (BH23-29) -Max = $3E^{-8}$ (BH23-41) - Mean = $6.7E^{-8}$ (n = 3)	-	-	-

Notes:
s. = with some (e. g. Clay s. sand = Clay with some sand)
mbgs = metres below the ground surface
HC = Hydraulic Conductivity
RH = Rising Head Testing

[1] Depths are measured from the ground surface
[2] PW25-1 and OW24-1 are both equipped with drive shoes. PW25-1 was equipped with a screen. OW24-1 had its casing perforated over the designated interval.
[3] Well 2 WL MP = Well 2 Water Level Measuring Point (SCADA water level monitoring for Well 2).

APPENDIX H

Lotowater Well Condition Tests

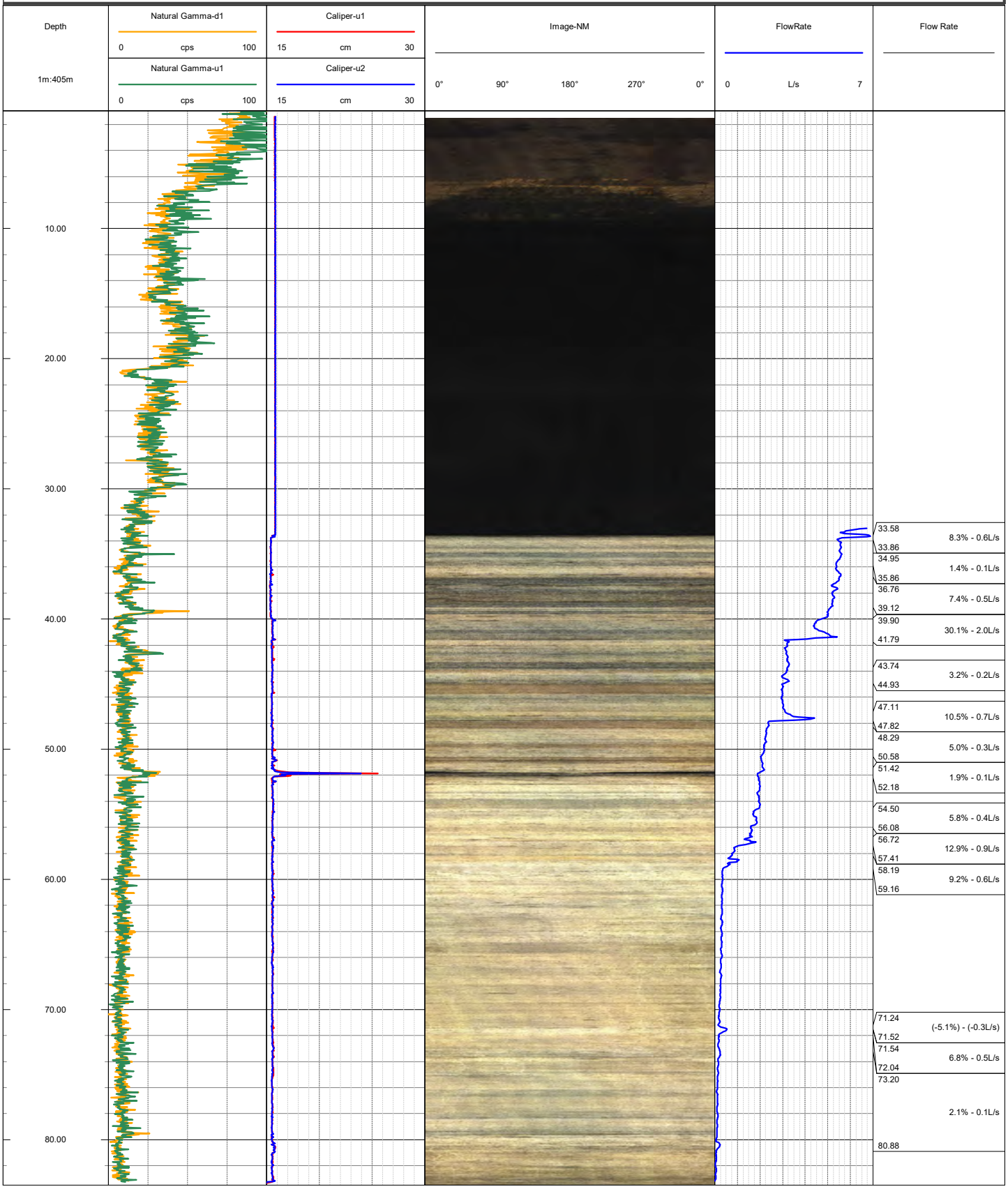
Lotowater TECHNICAL SERVICES INC.

Geophysical Logging Summary

CLIENT

Township of Centre Wellington

LOCATION	*8282 Wellington 19, Fergus, ON*	**BOREHOLE**	**PW21-1**
DEPTH REF.	*Top of casing (0.57 m agl)*	**PROJECT #**	*313-018*
WATER LEVEL	*9.25 m at time of logging*	**LOG DATE**	*2025-11-18*
DRILL METHOD	*n/a*	**LOGGED BY**	*RH*



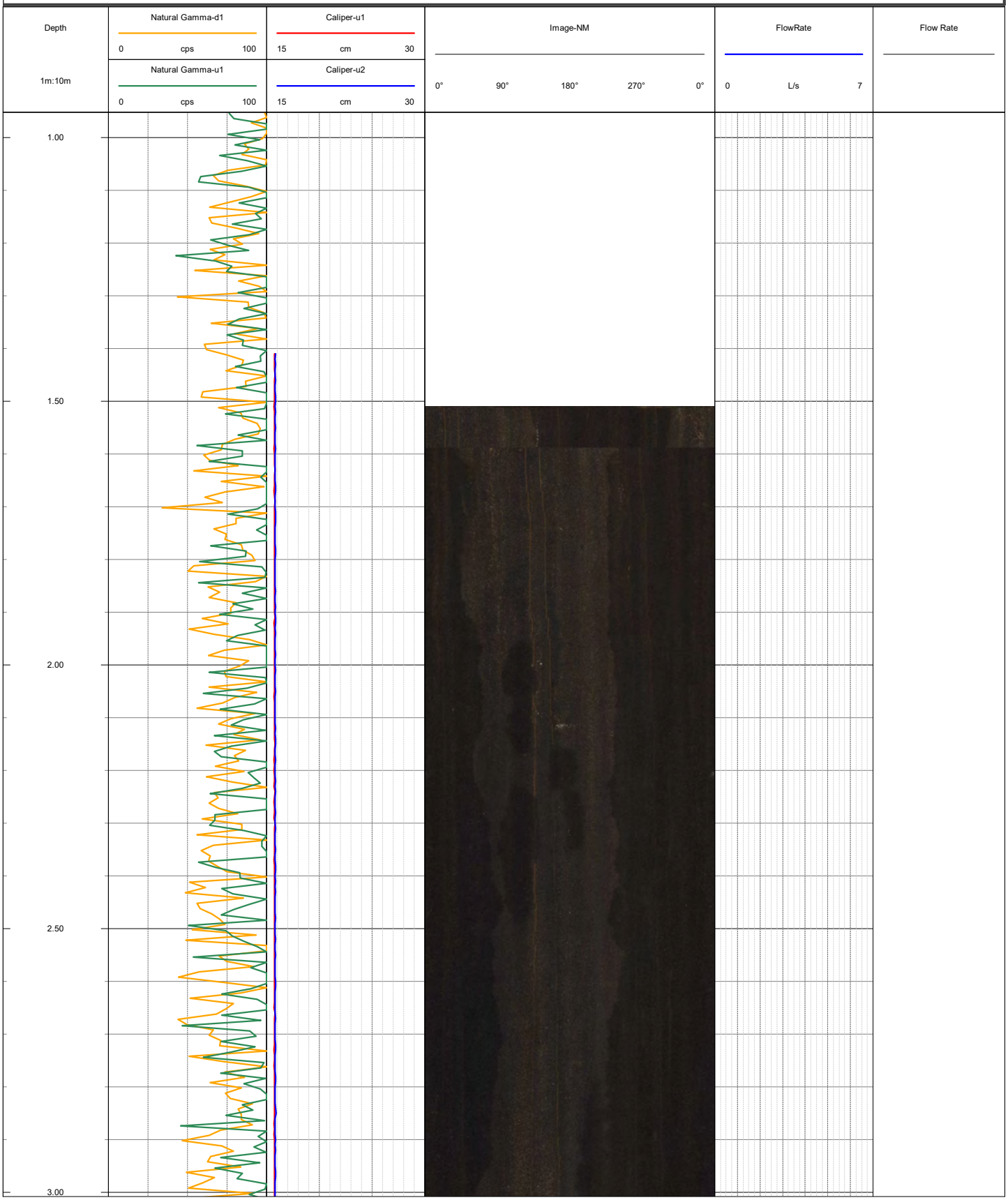
Lotowater TECHNICAL SERVICES INC.

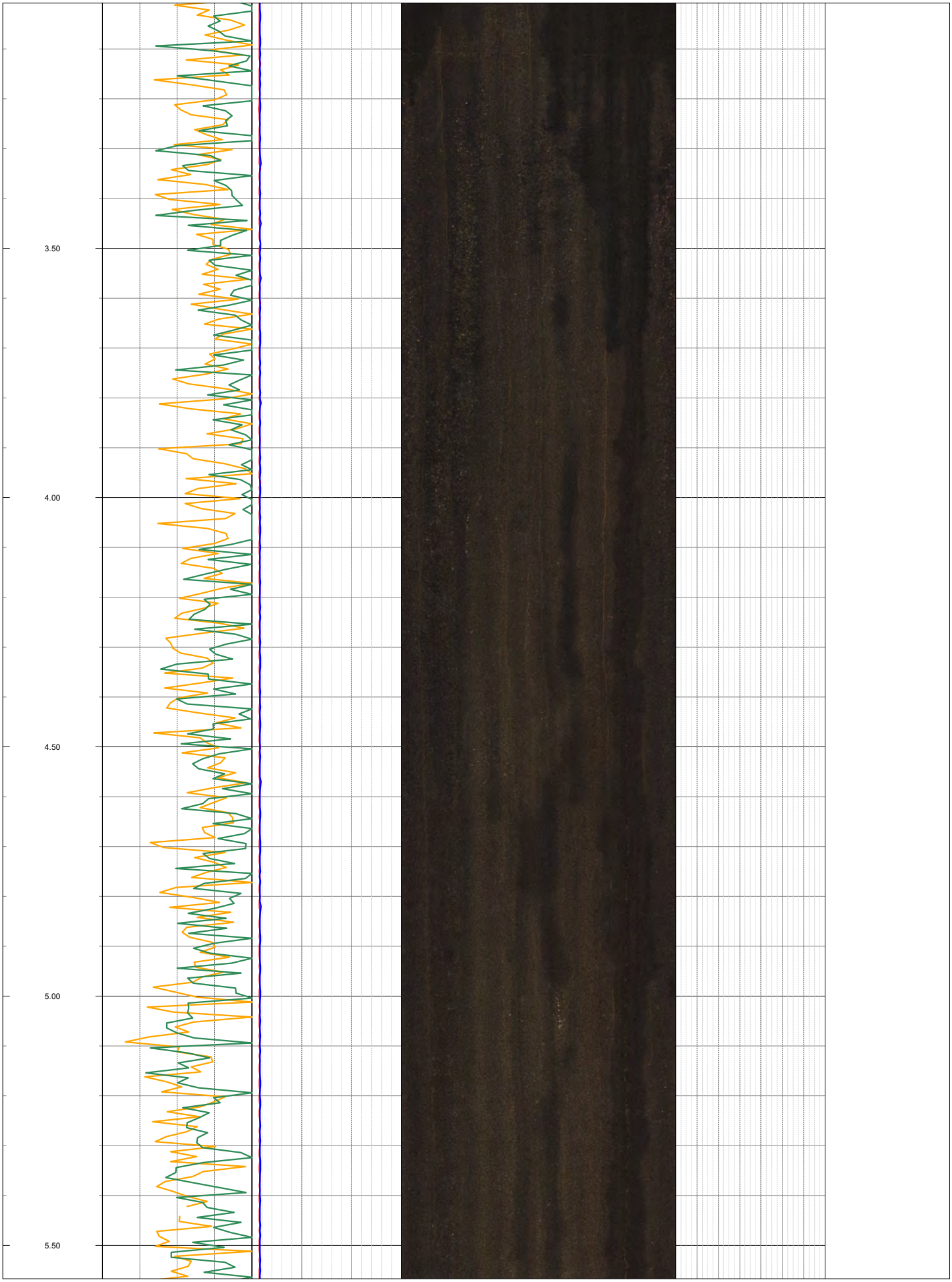
Geophysical Logging Summary

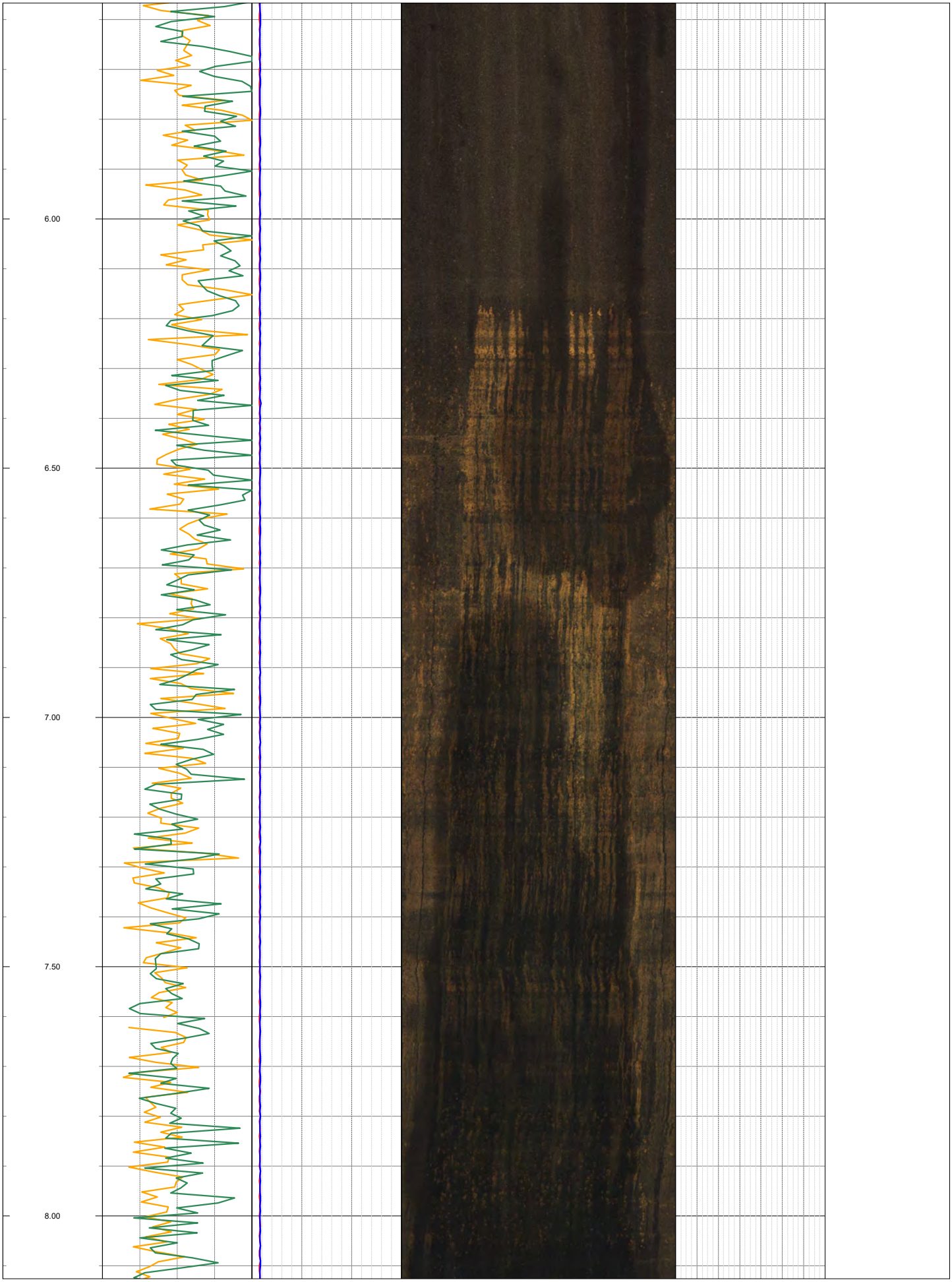
CLIENT

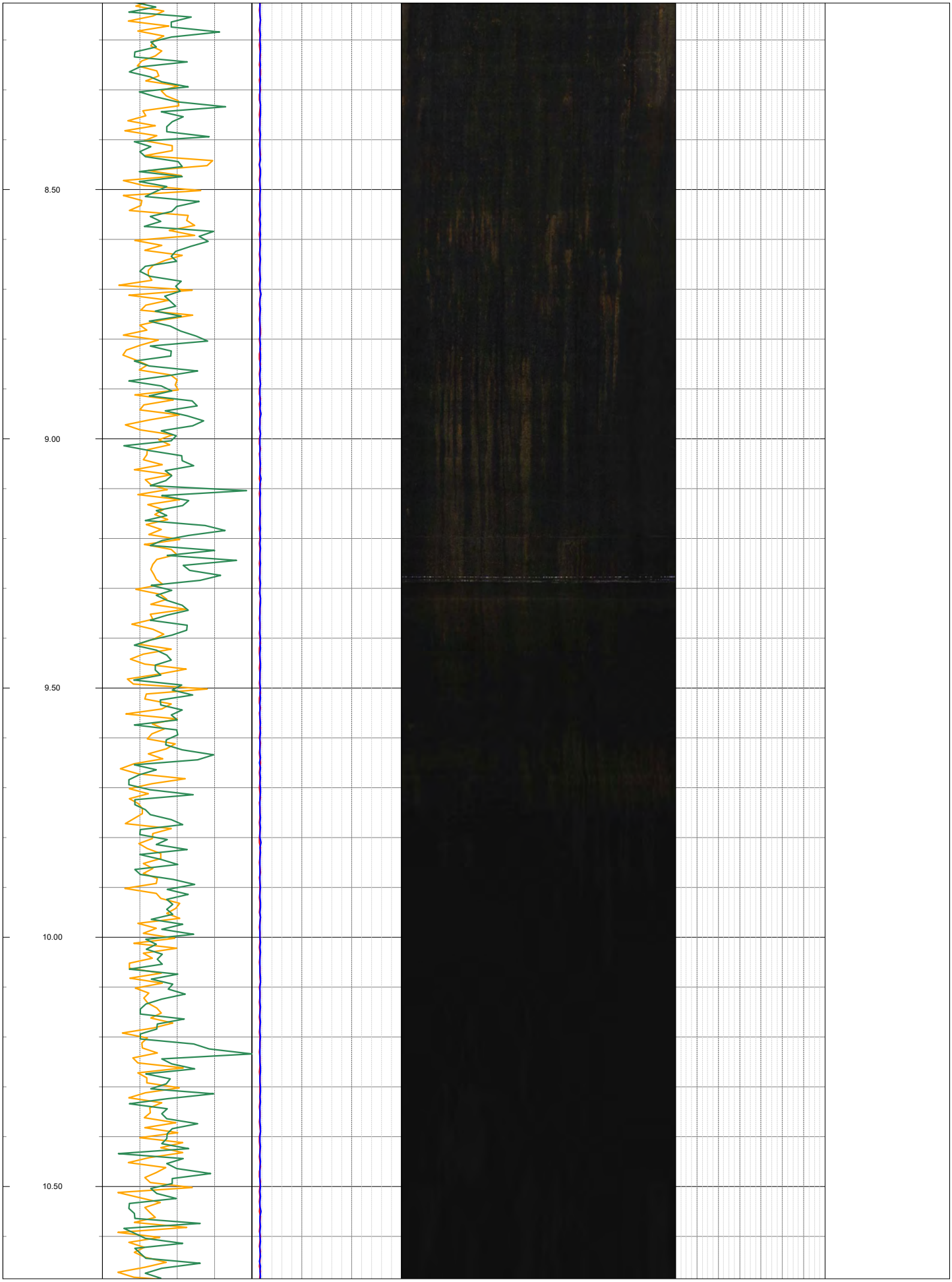
Township of Centre Wellington

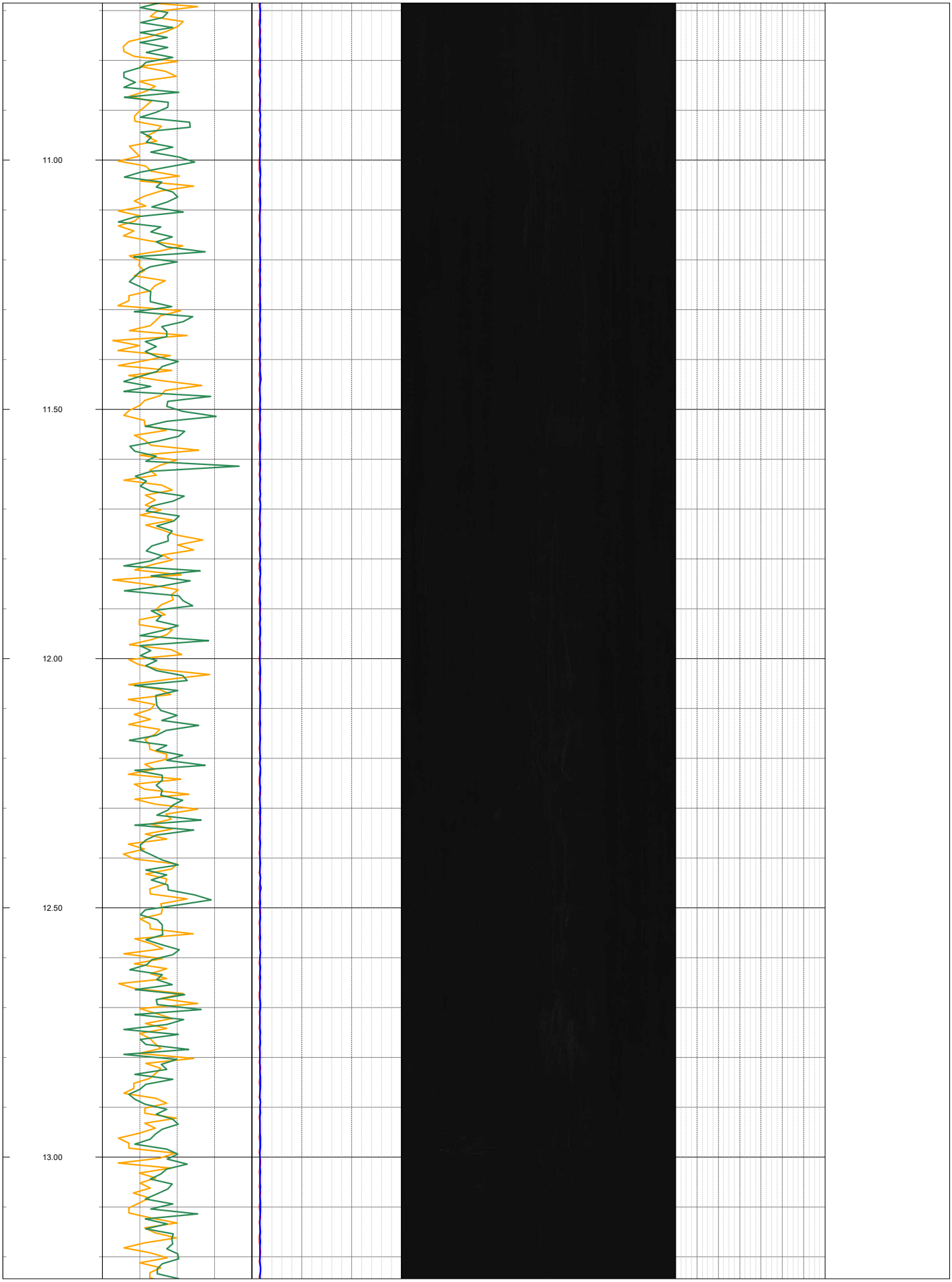
LOCATION	*8282 Wellington 19, Fergus, ON*	**BOREHOLE**	**PW21-1**
DEPTH REF.	*Top of casing (0.57 m agl)*	**PROJECT #**	*313-018*
WATER LEVEL	*9.25 m at time of logging*	**LOG DATE**	*2025-11-18*
DRILL METHOD	*n/a*	**LOGGED BY**	*RH*

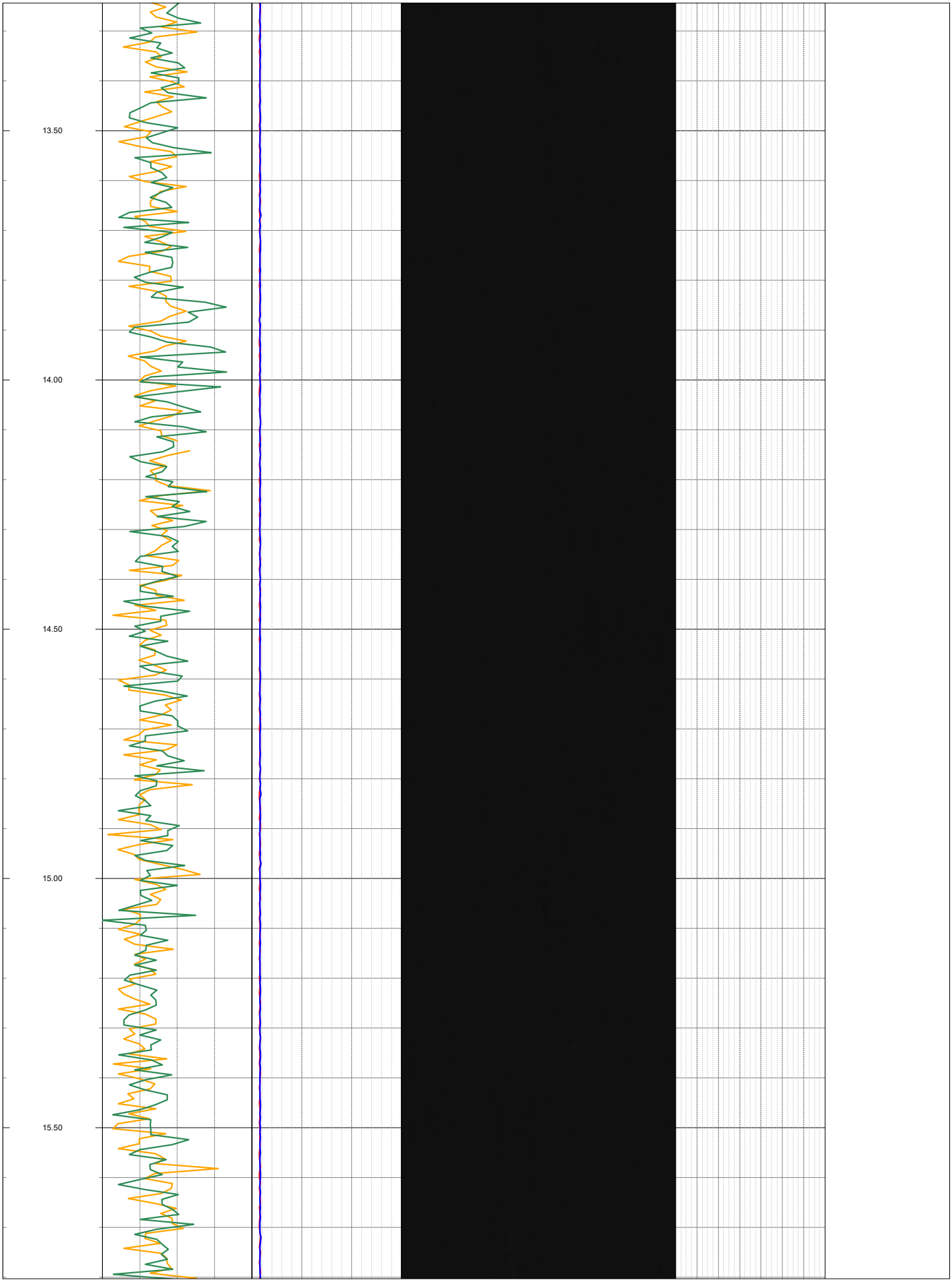


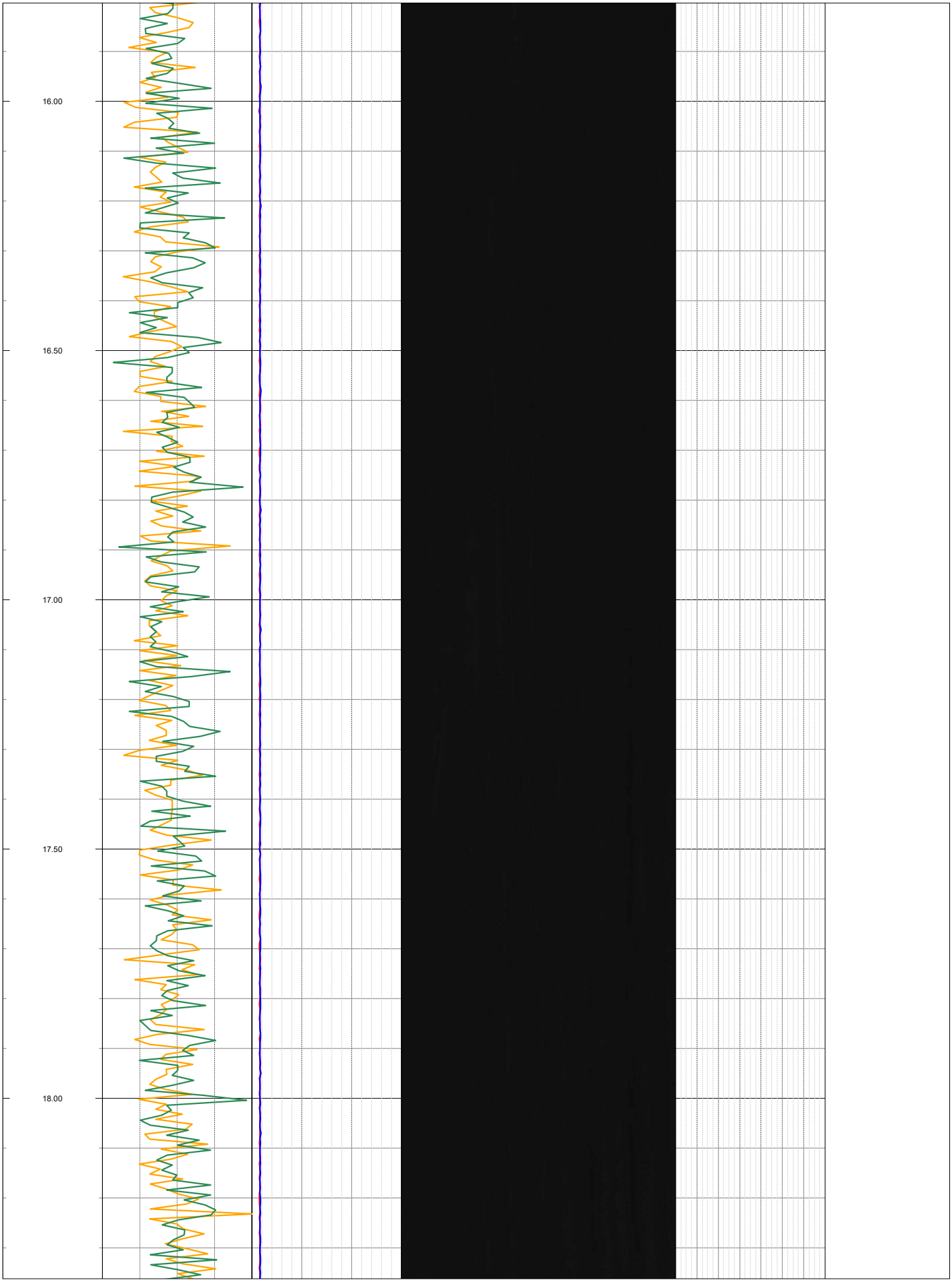

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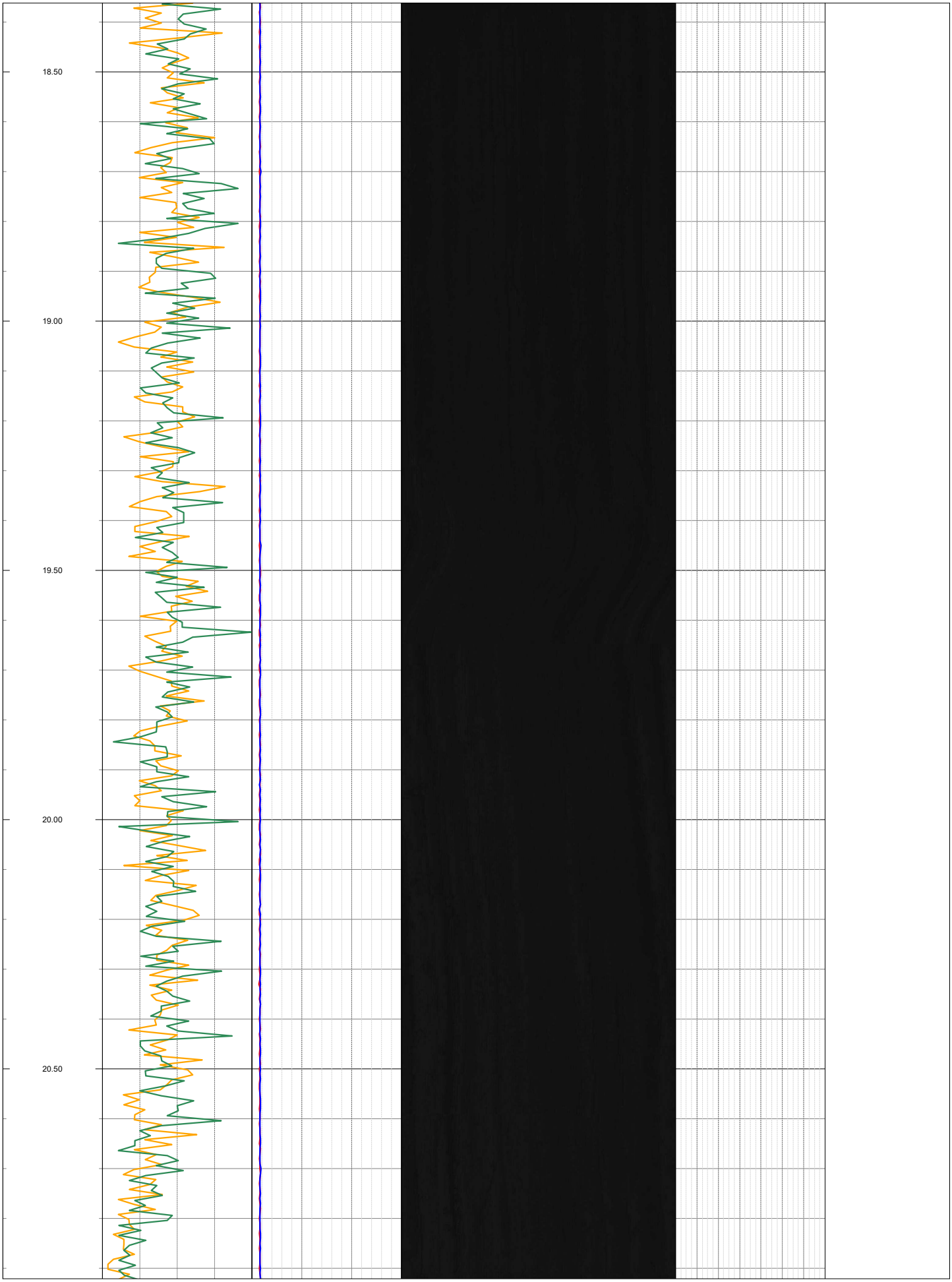

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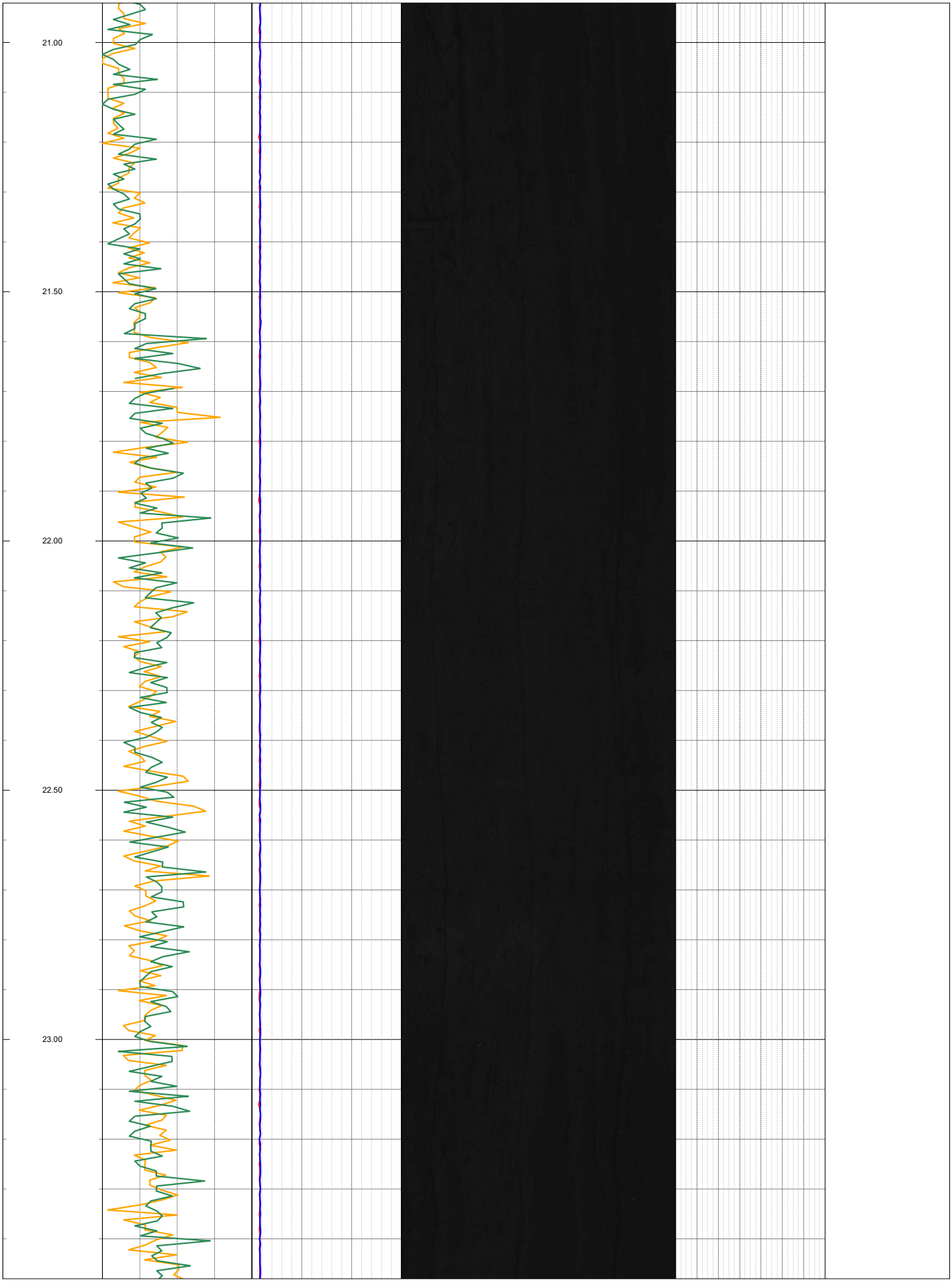

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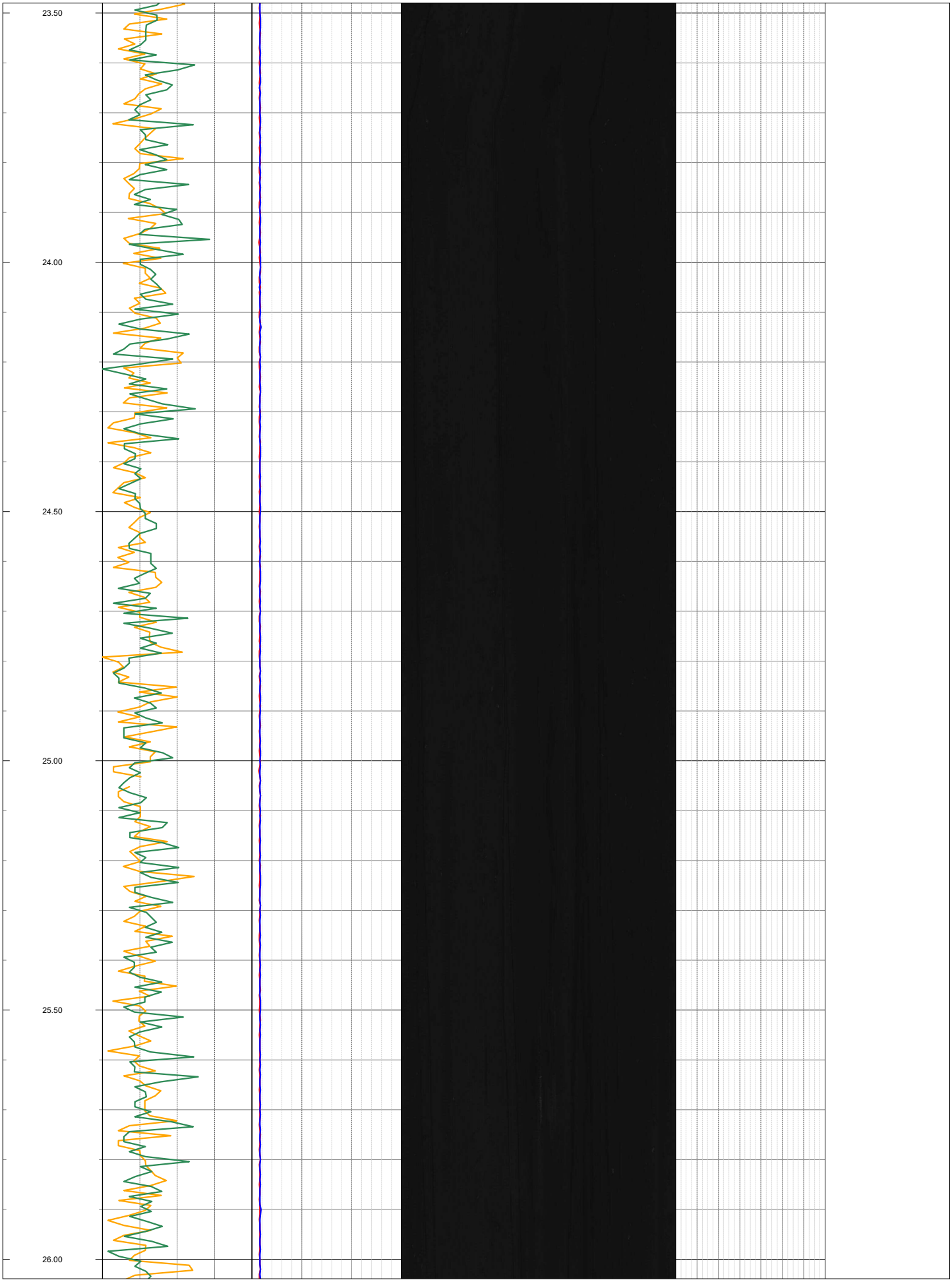

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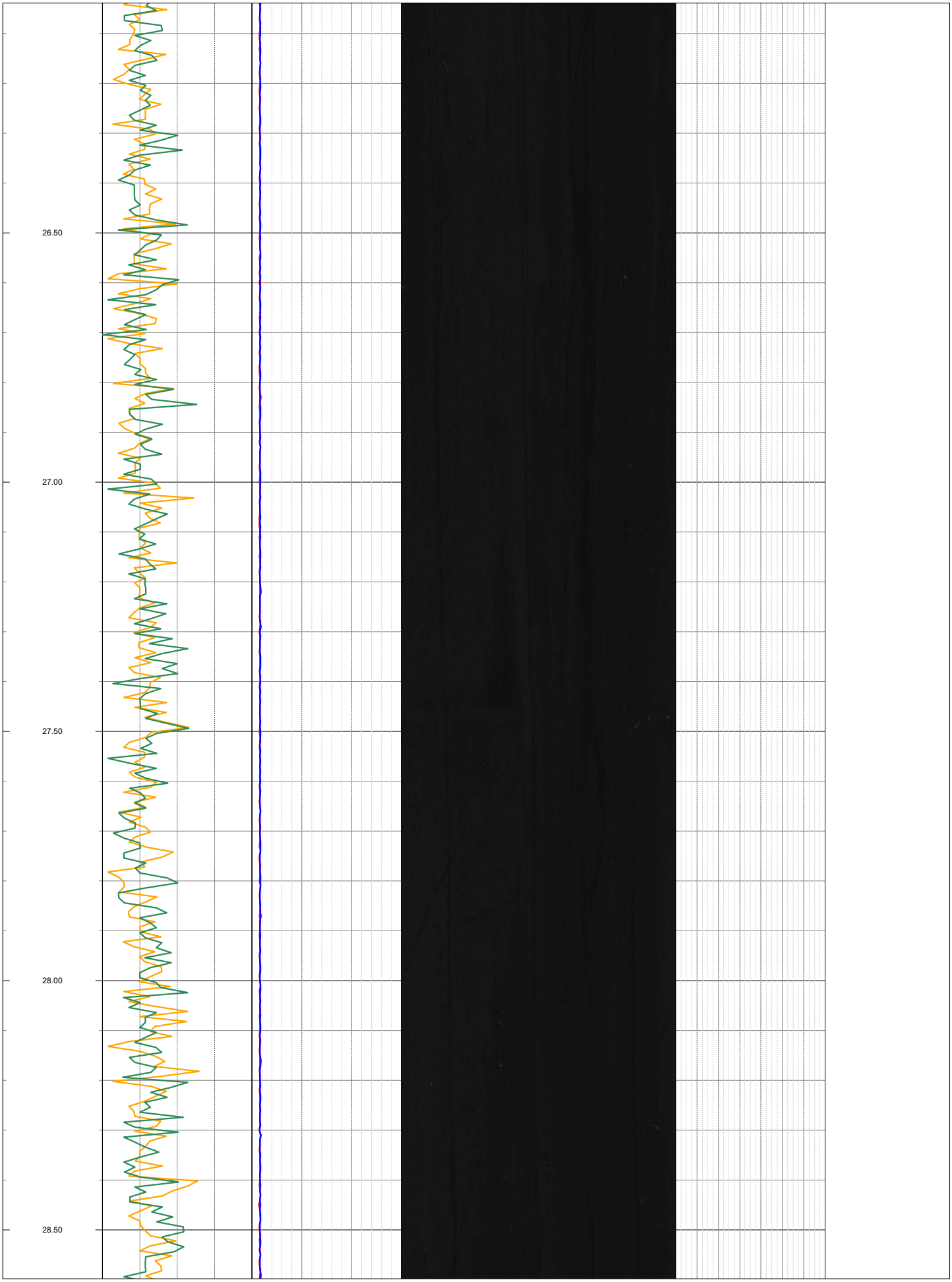

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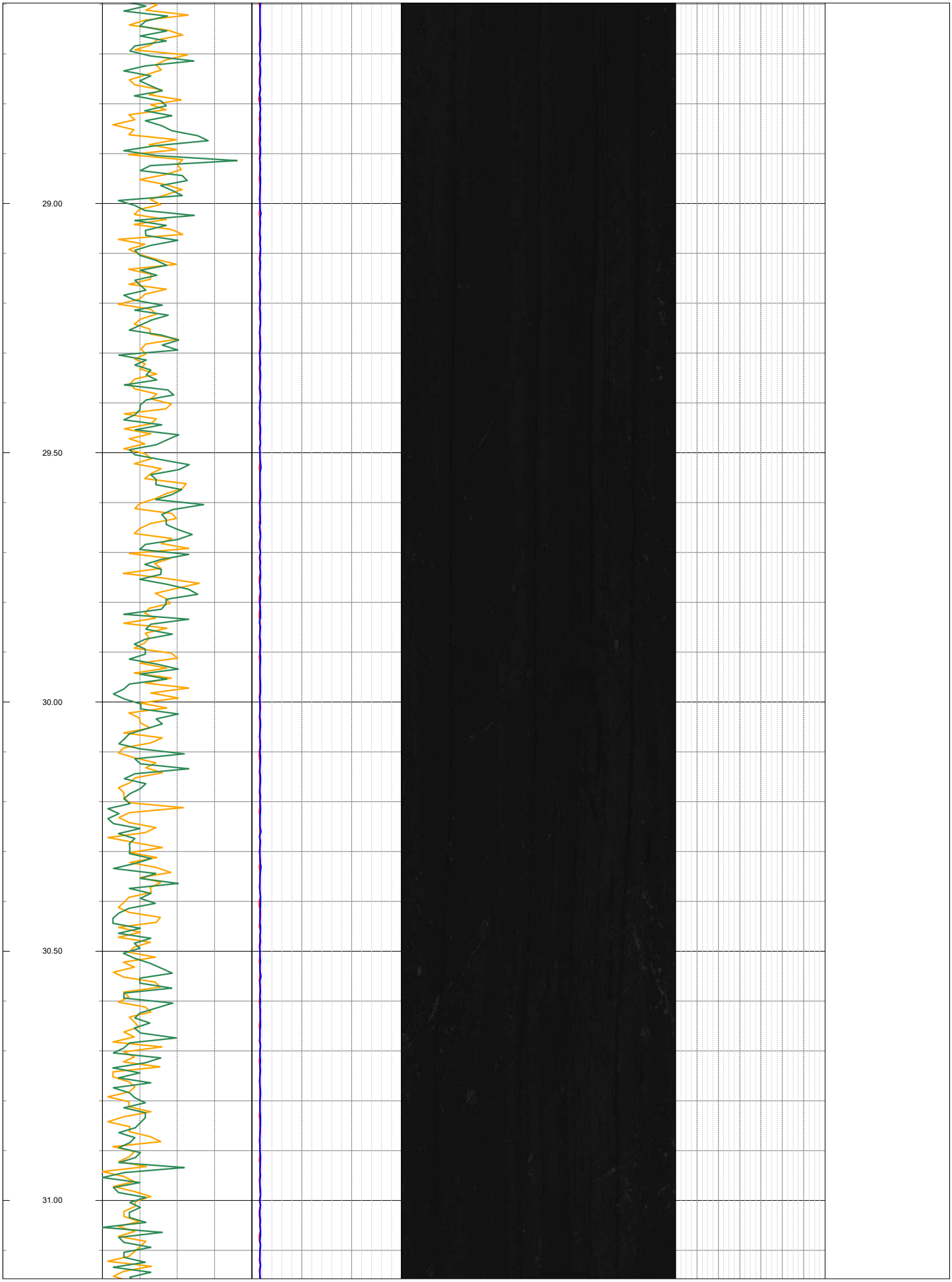

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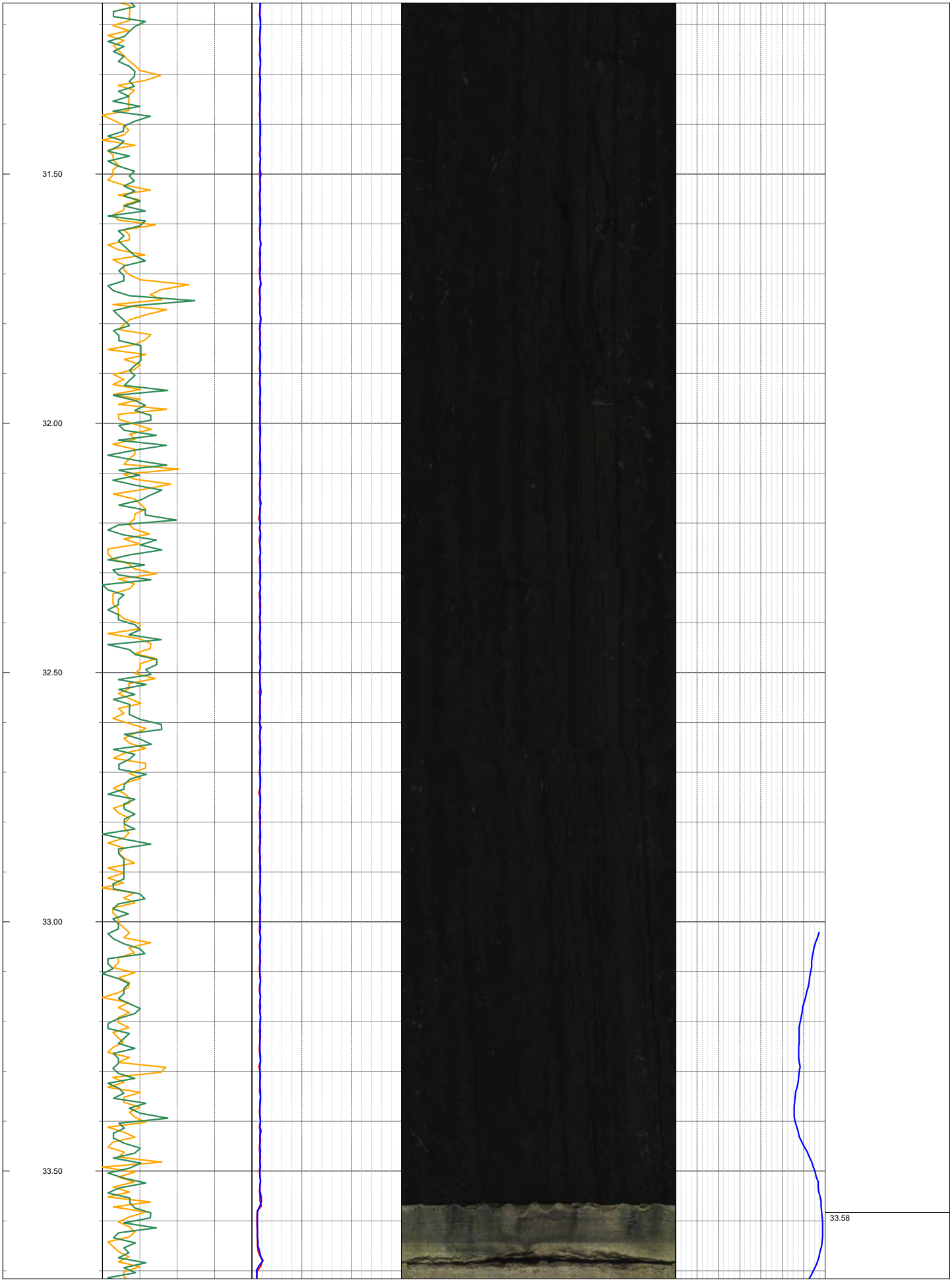

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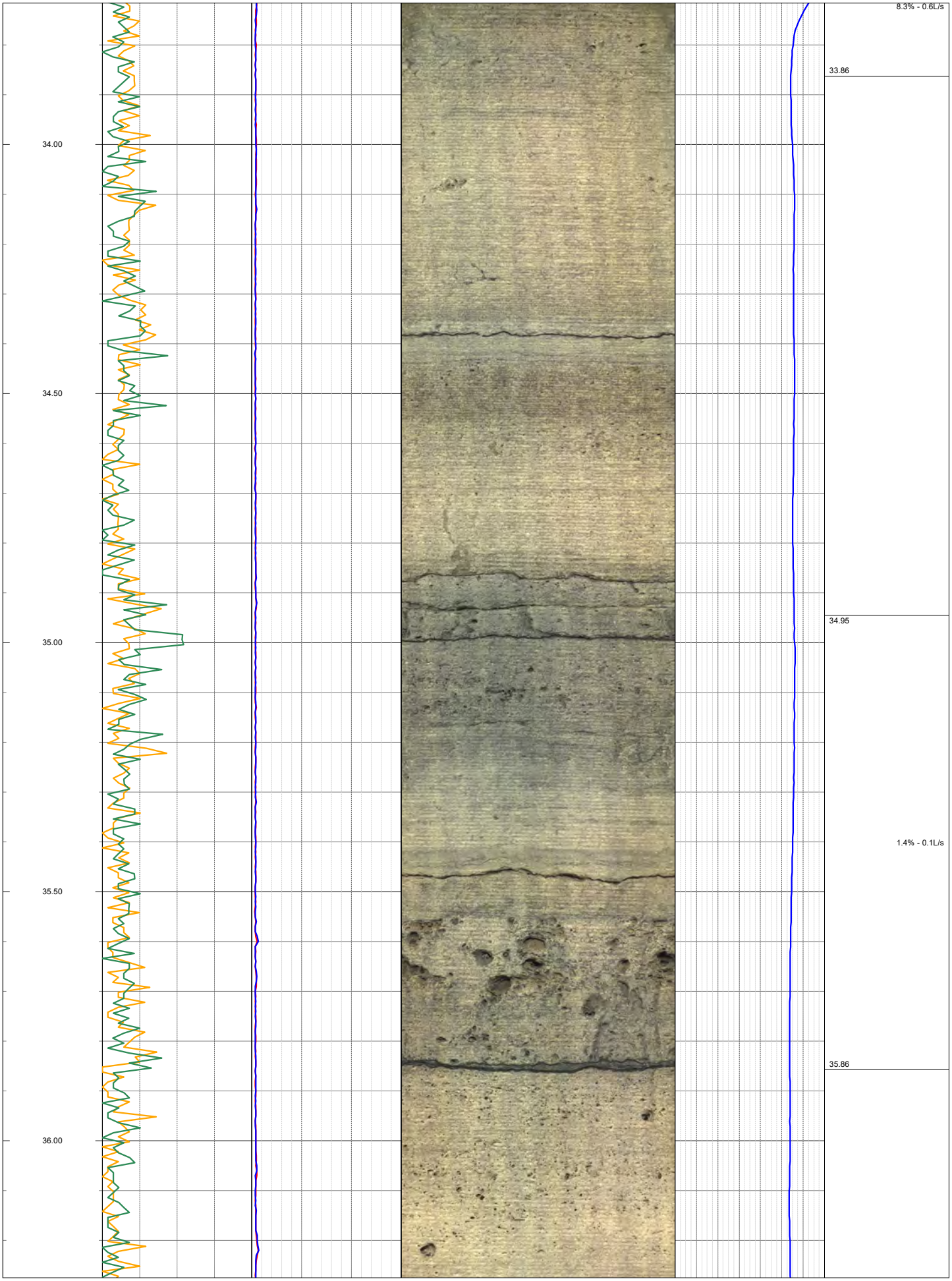

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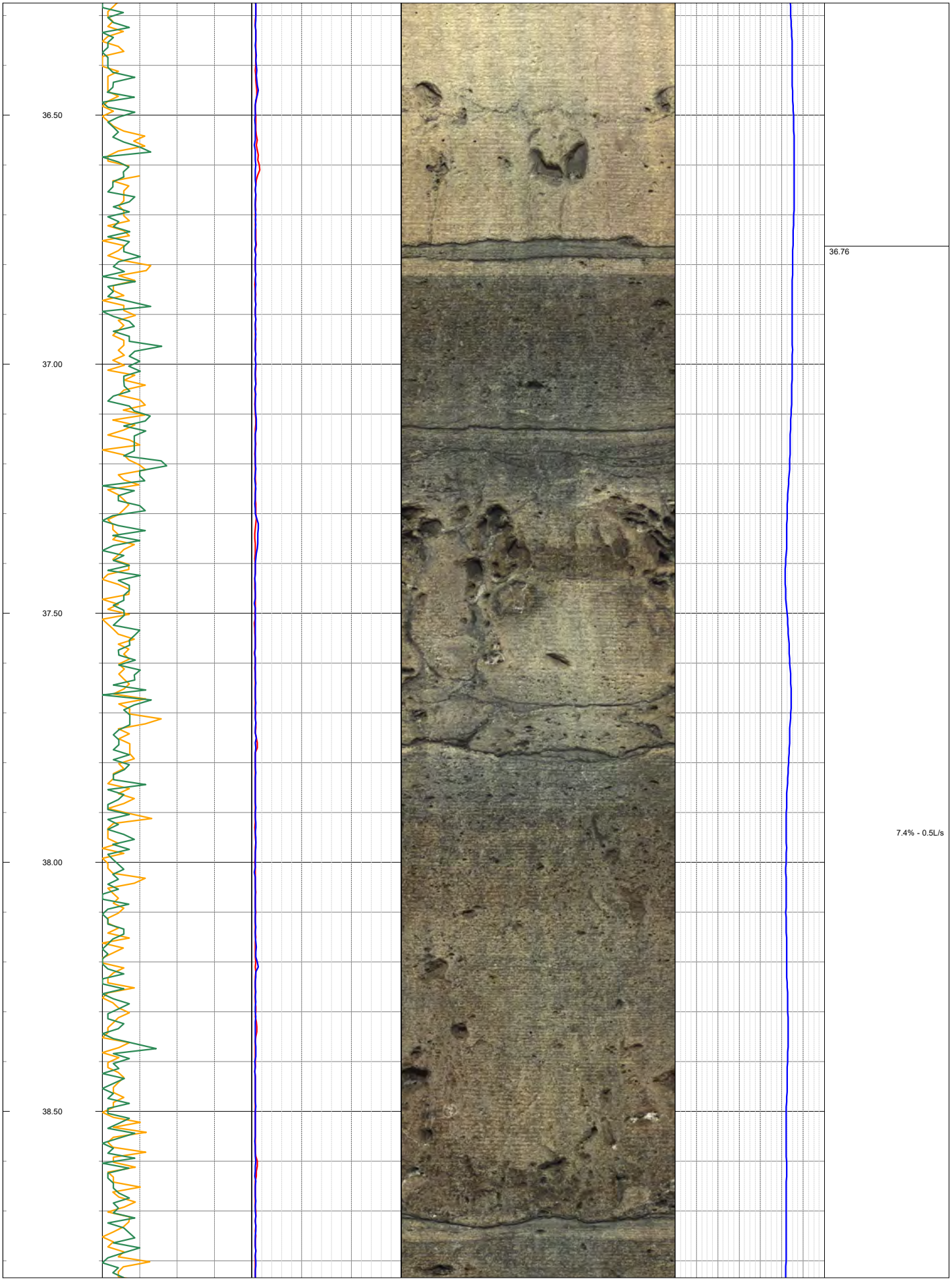

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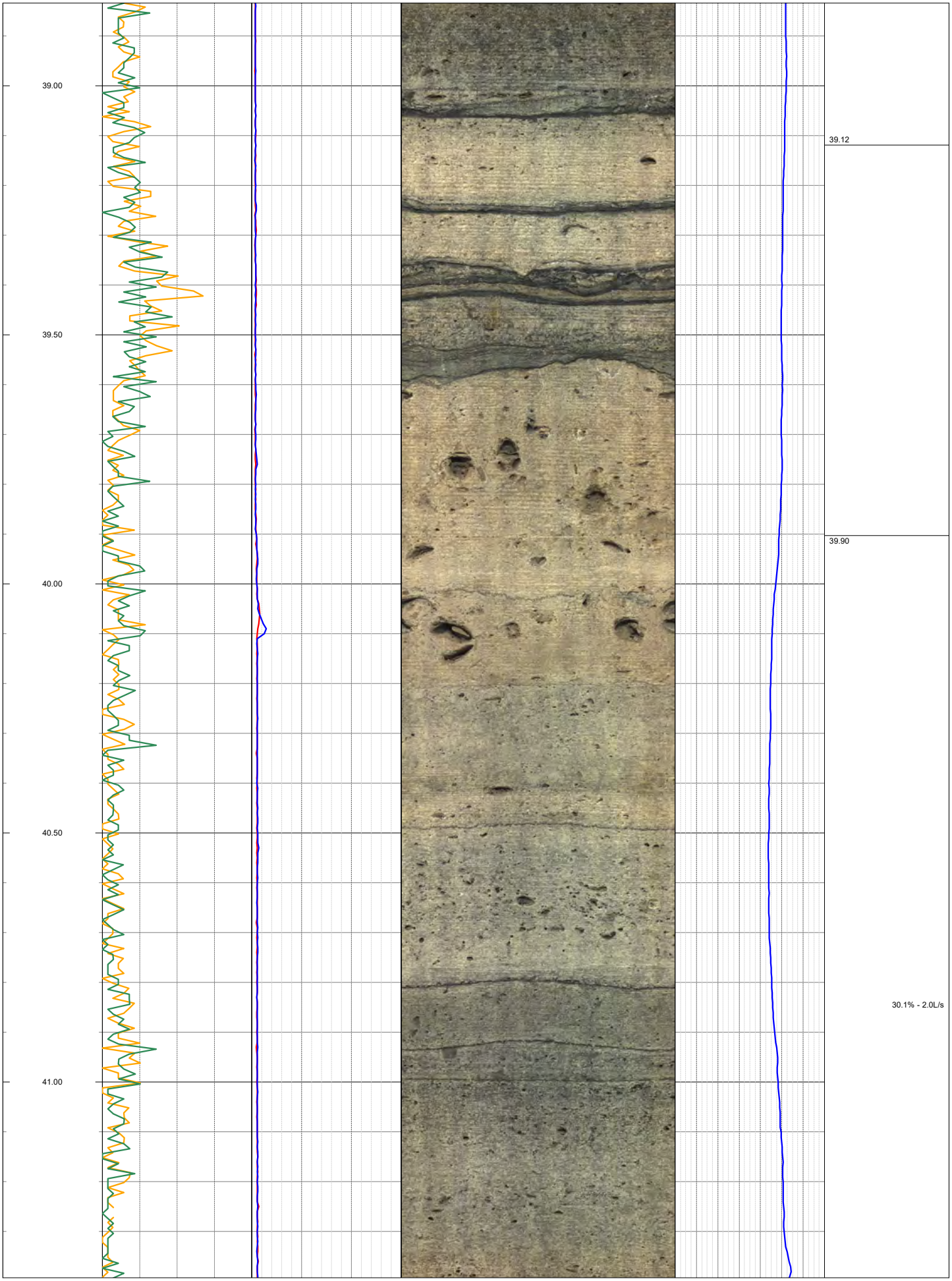

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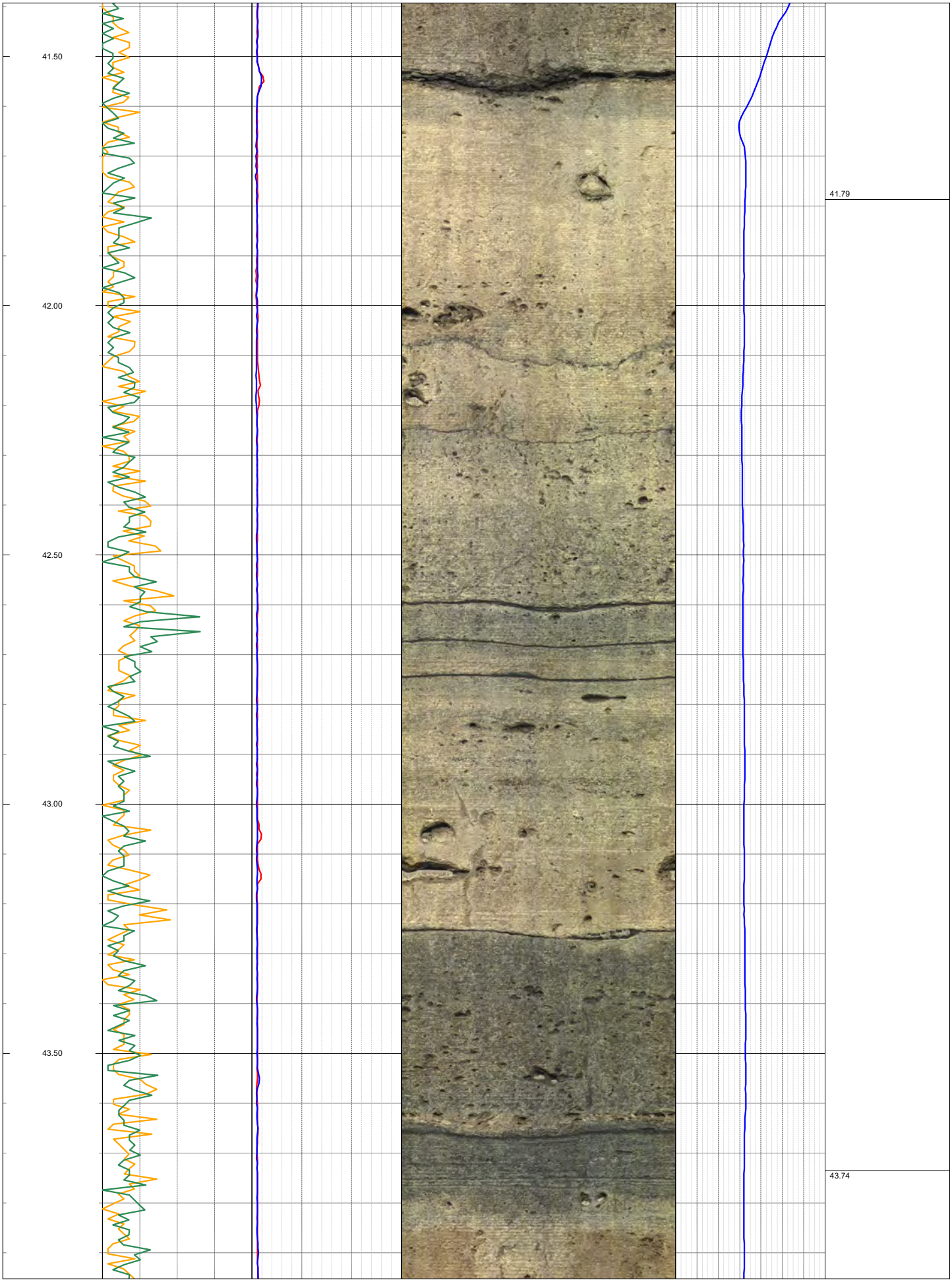

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31.00

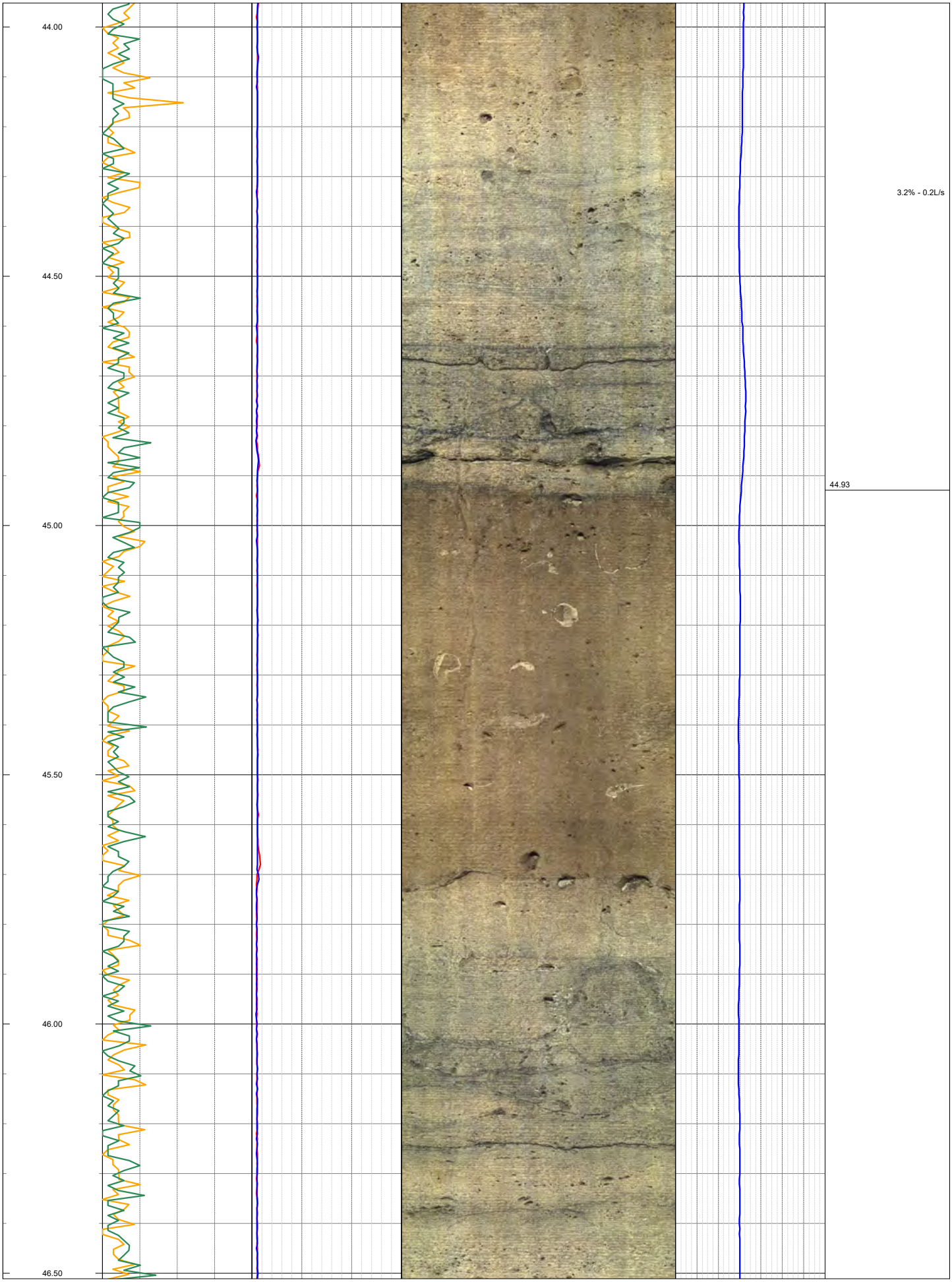

31.50
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32.50
33.00
33.50
33.58

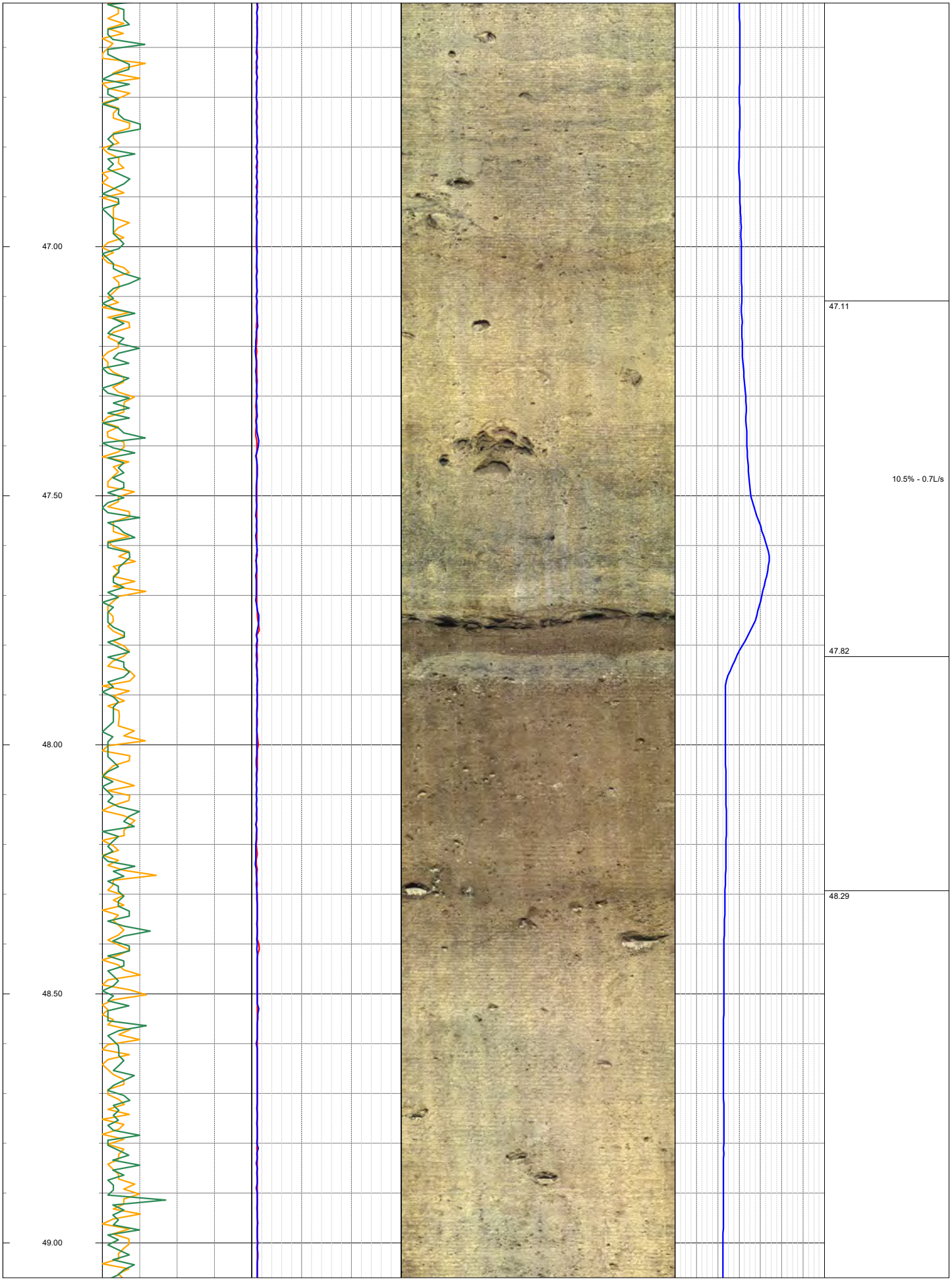

8.3% - 0.6L/s
33.86
34.00
34.50
34.95
35.00
1.4% - 0.1L/s
35.50
35.86
36.00

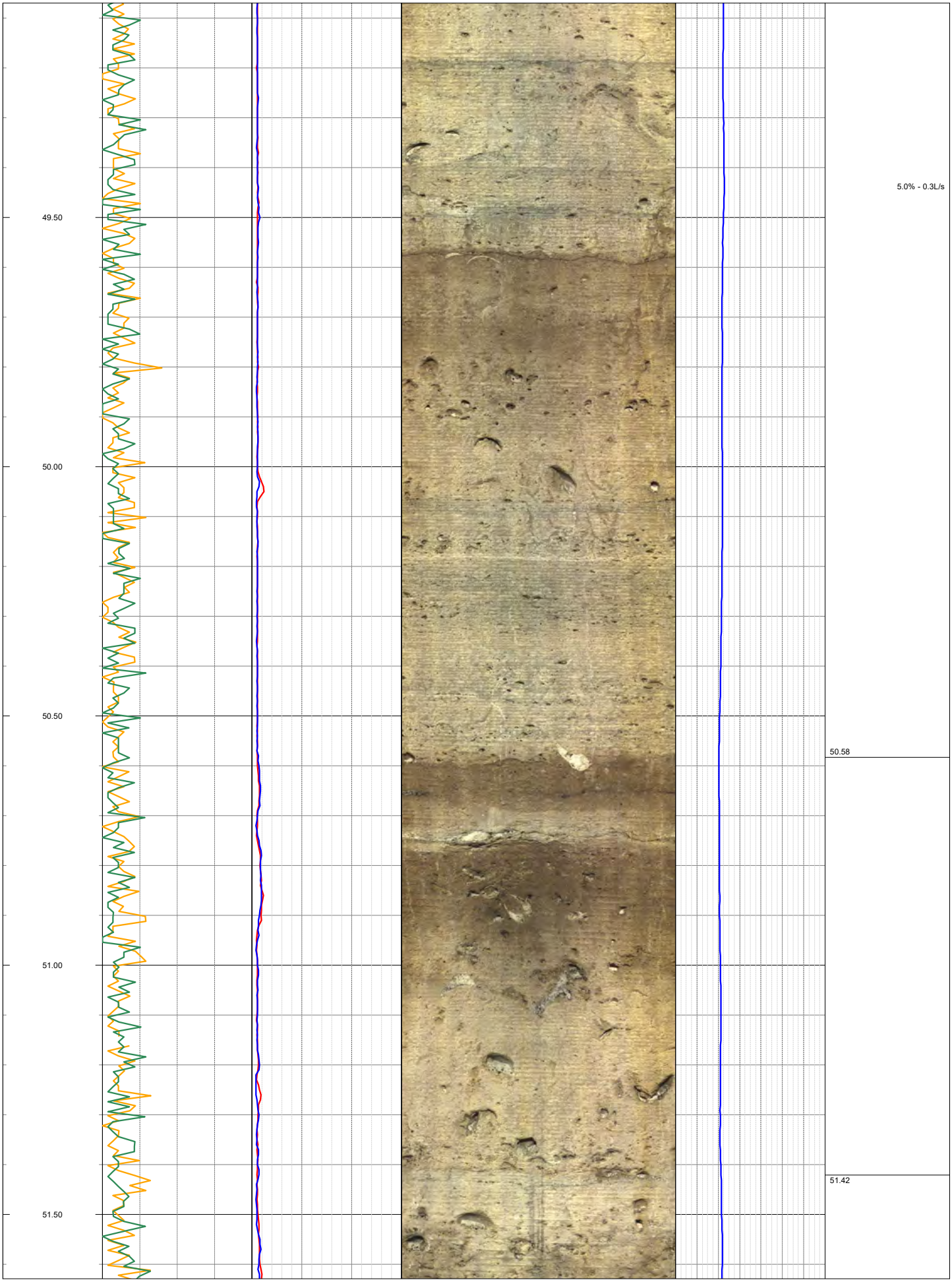

36.50
37.00
37.50
38.00
38.50
36.76
7.4% - 0.5L/s

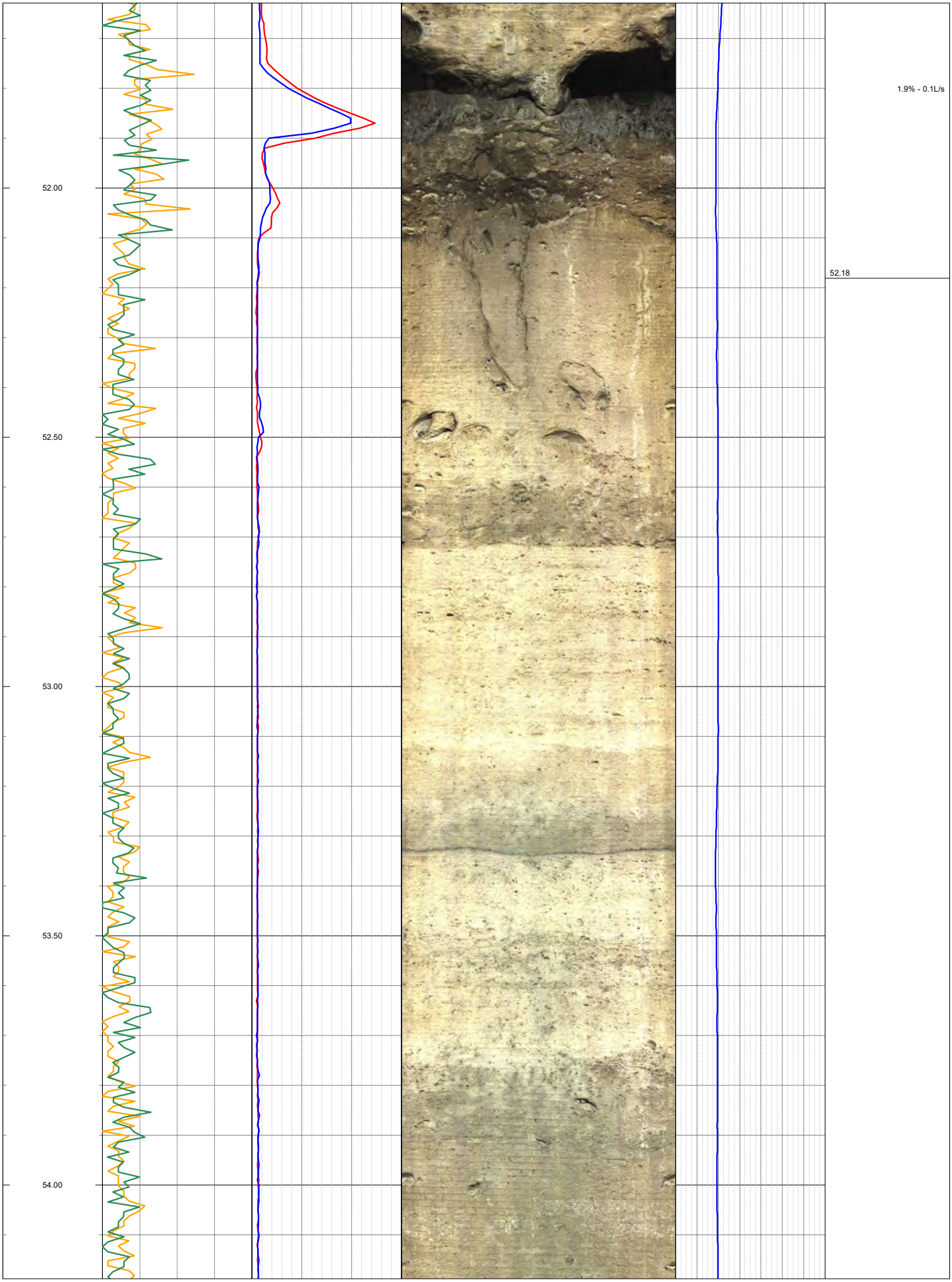

39.00
39.50
40.00
40.50
41.00
39.12
39.90
30.1% - 2.0L/s

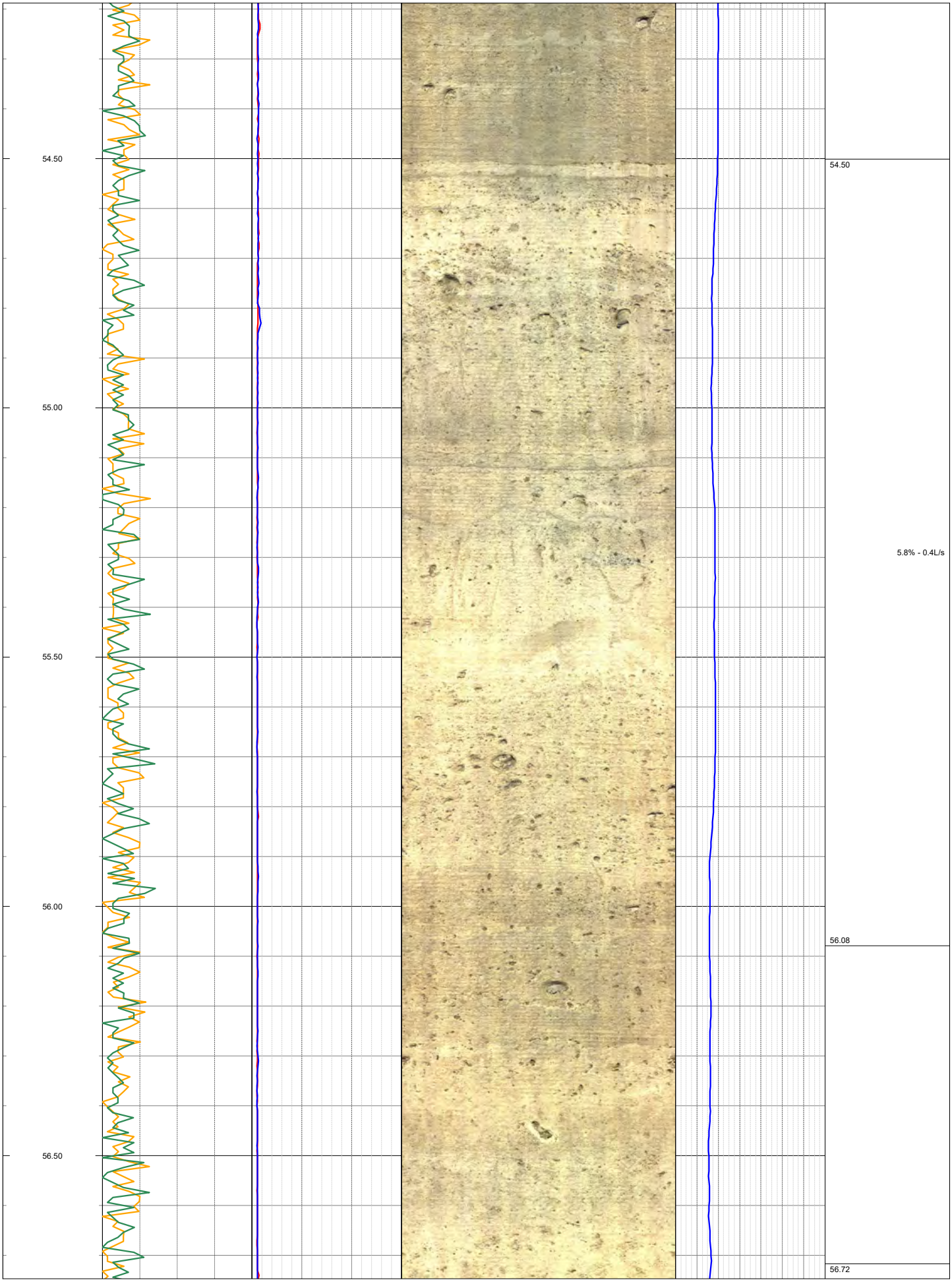

41.50
42.00
42.50
43.00
43.50
41.79
43.74

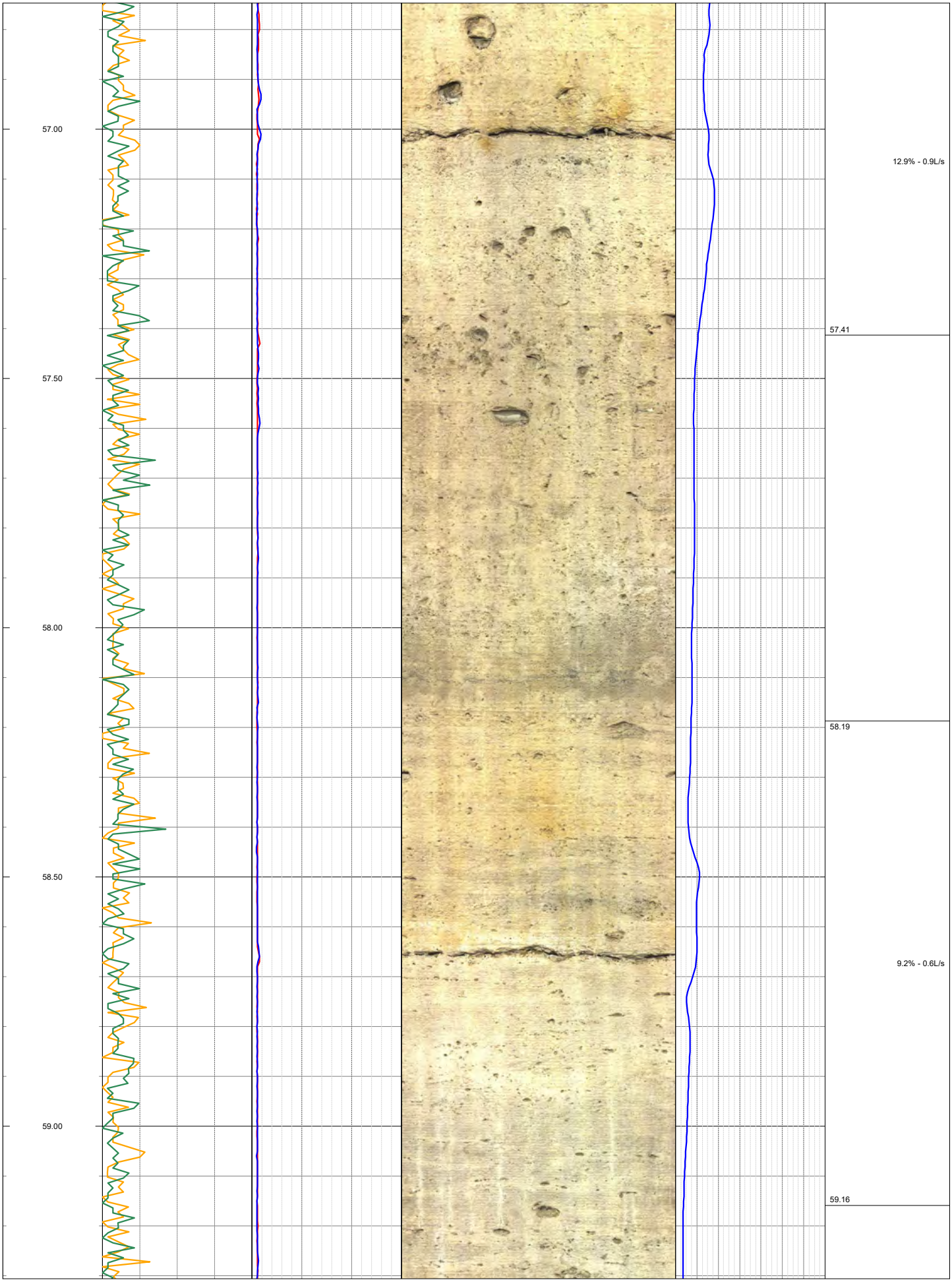

44.00
44.50
45.00
45.50
46.00
46.50
3.2% - 0.2L/s
44.93

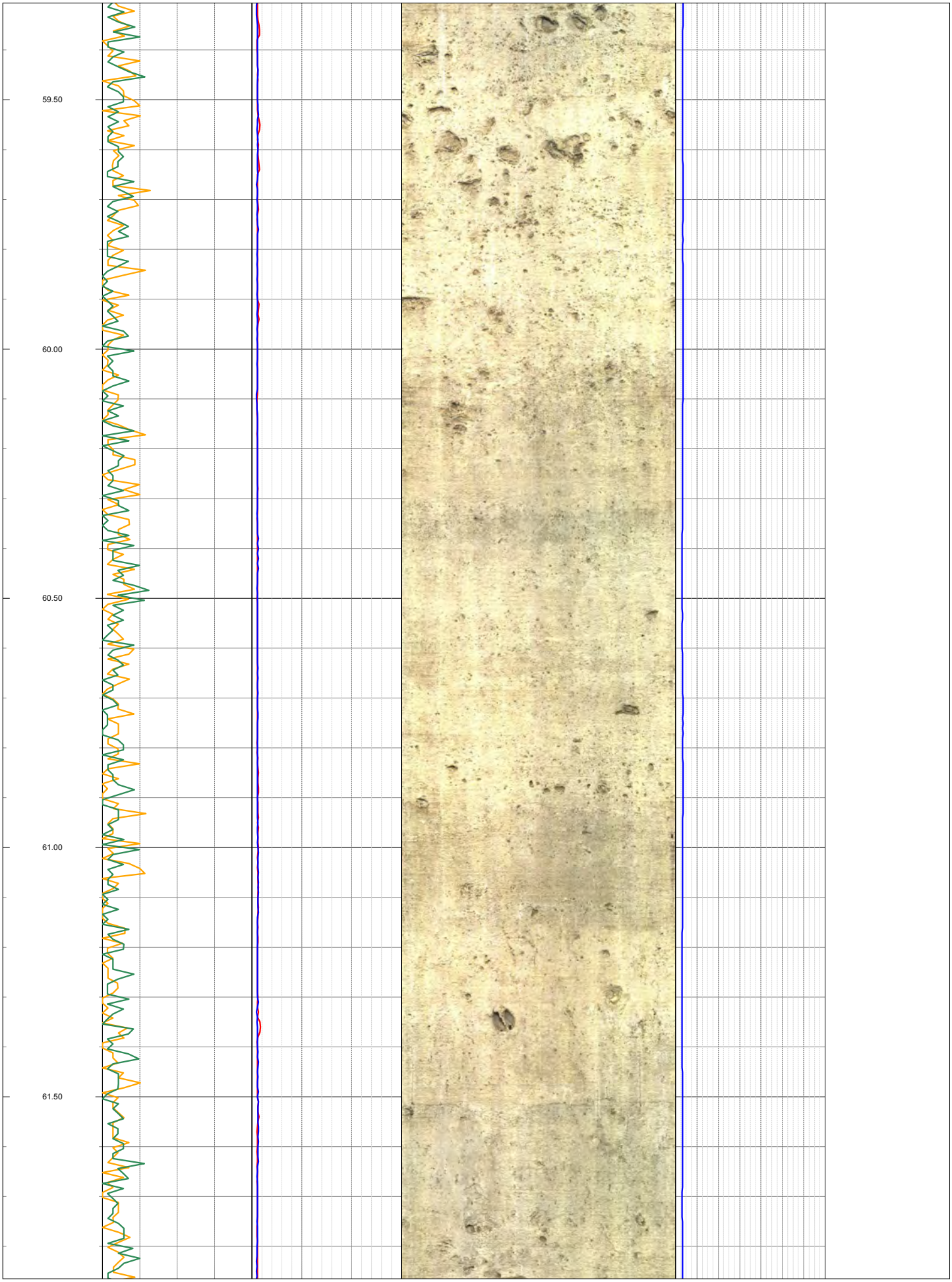

47.00
47.50
48.00
48.50
49.00
47.11
10.5% - 0.7L/s
47.82
48.29

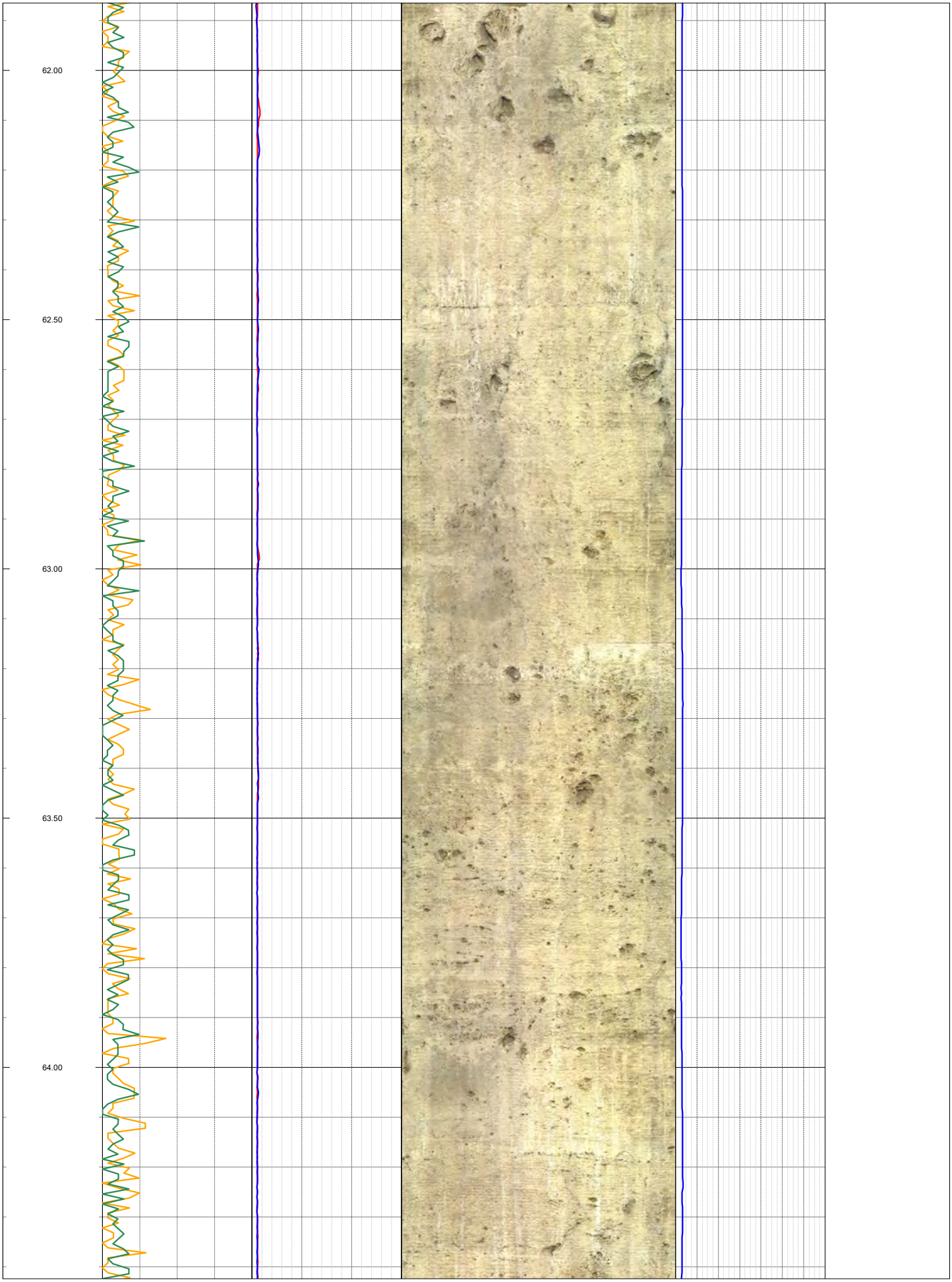

5.0% - 0.3L/s
49.50
50.00
50.50
50.58
51.00
51.42
51.50

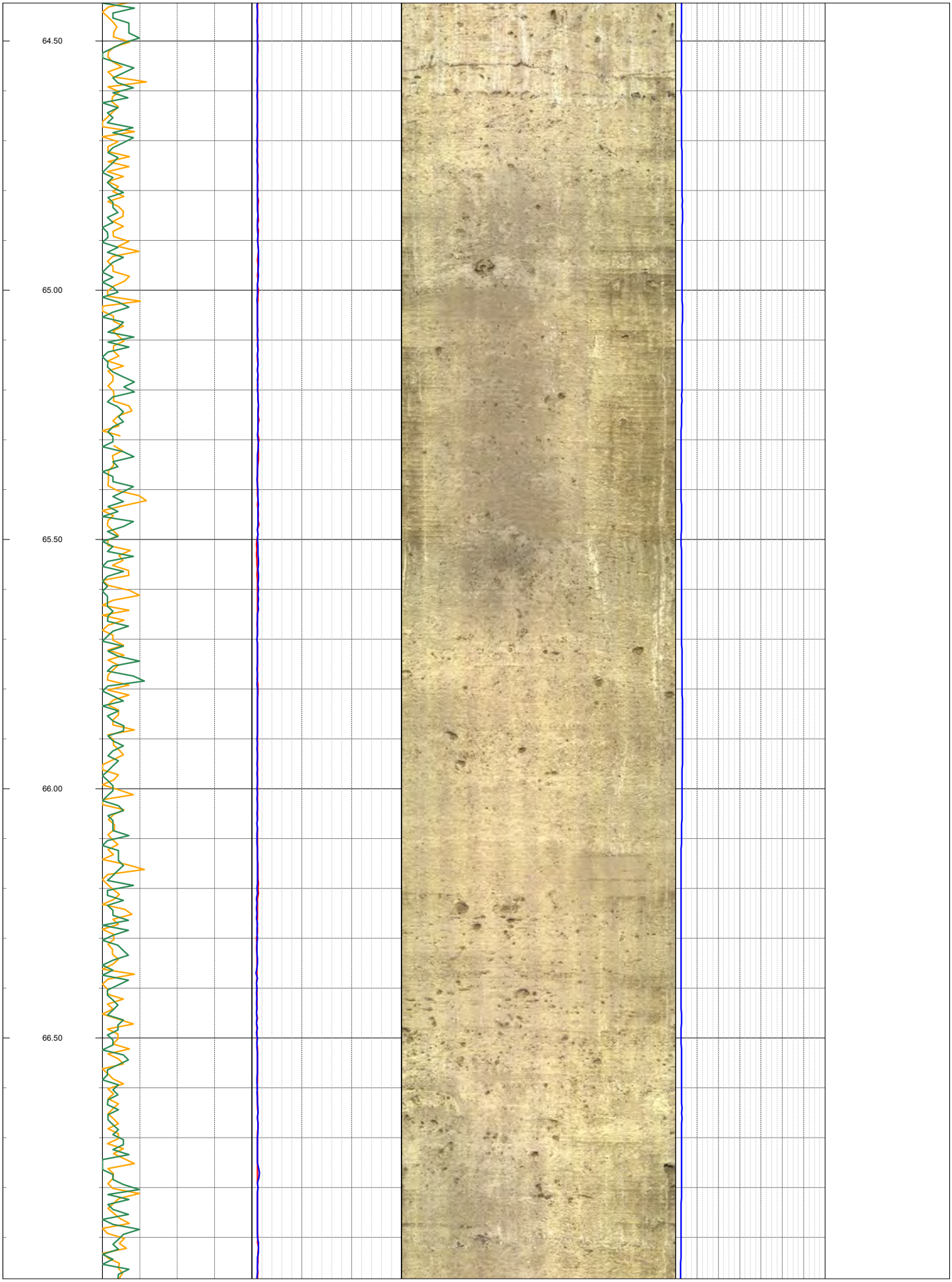

1.9% - 0.1L/s
52.00
52.18
52.50
53.00
53.50
54.00

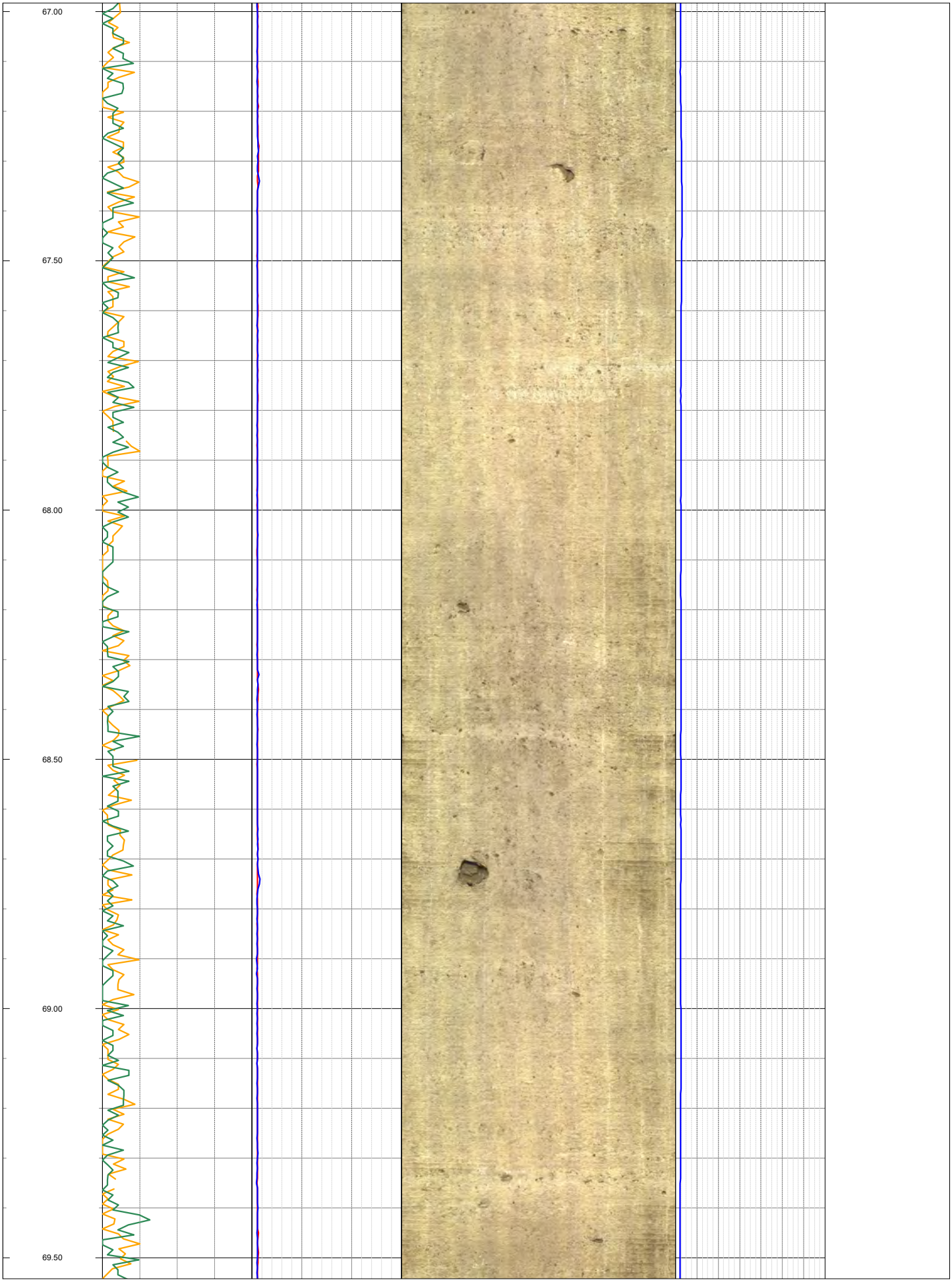

54.50
55.00
55.50
56.00
56.50
54.50
5.8% - 0.4L/s
56.08
56.72

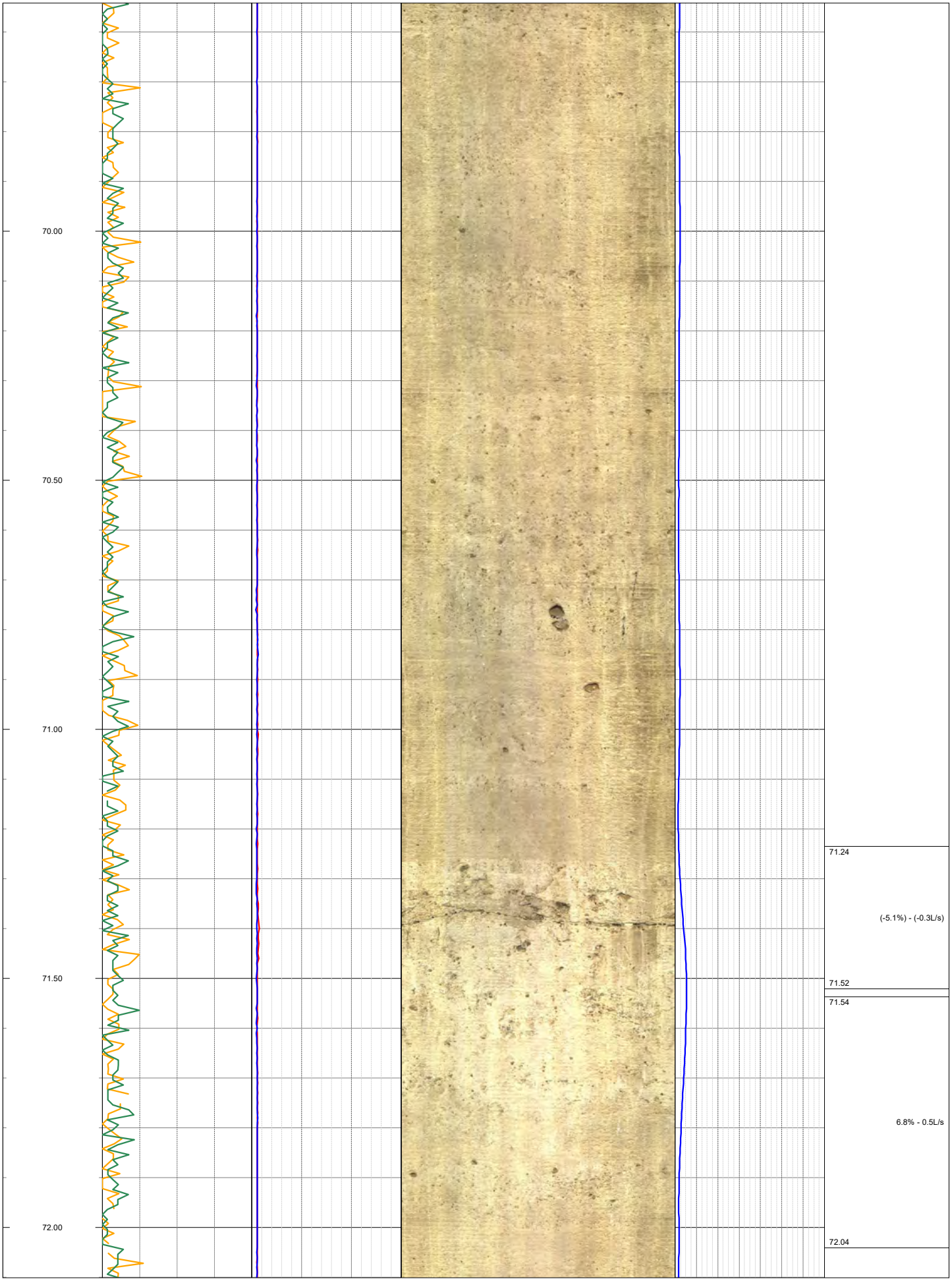

57.00
57.50
58.00
58.50
59.00
12.9% - 0.9L/s
57.41
58.19
9.2% - 0.6L/s
59.16

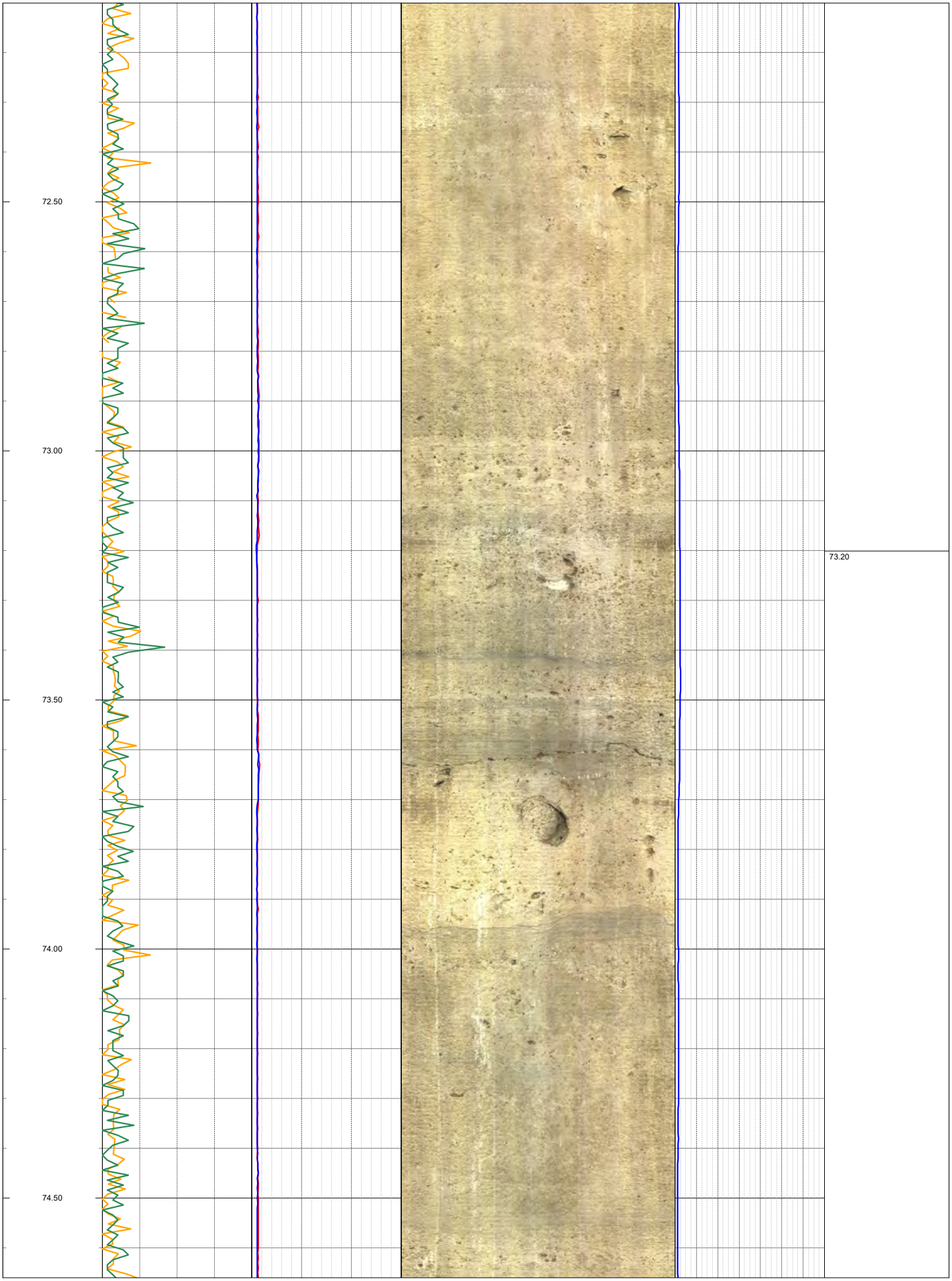

59.50
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60.50
61.00
61.50

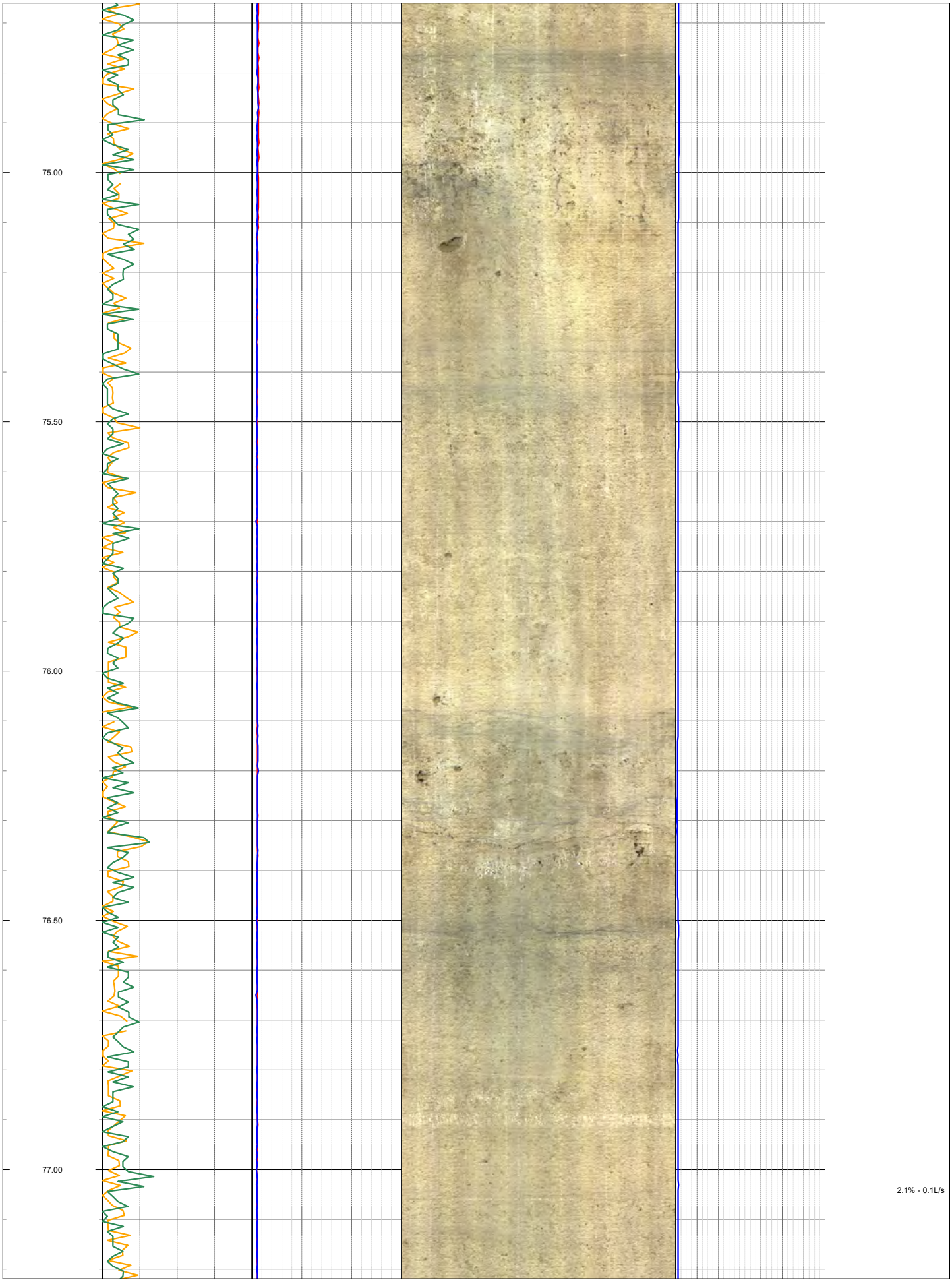

62.00
62.50
63.00
63.50
64.00

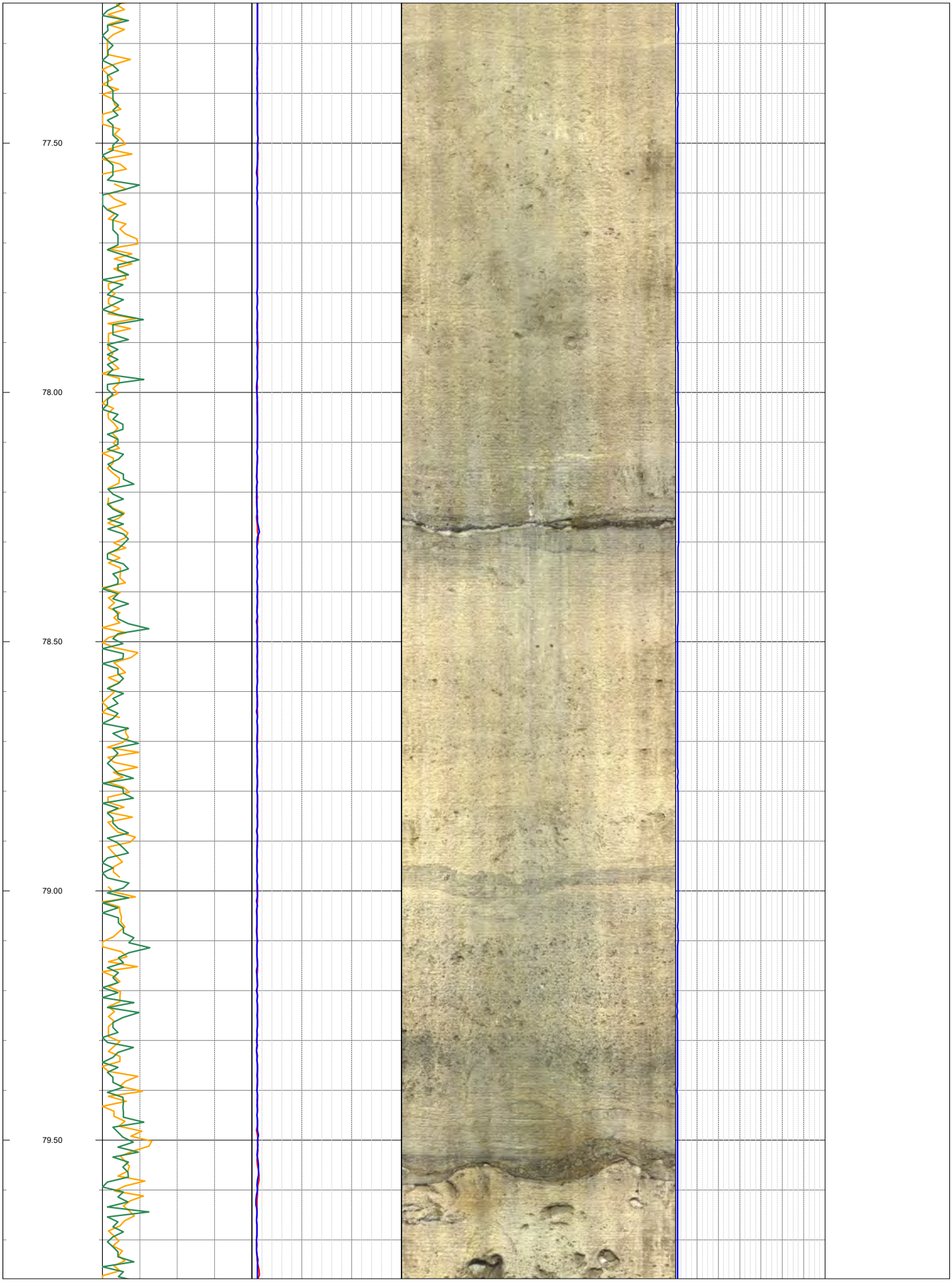

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65.50
66.00
66.50

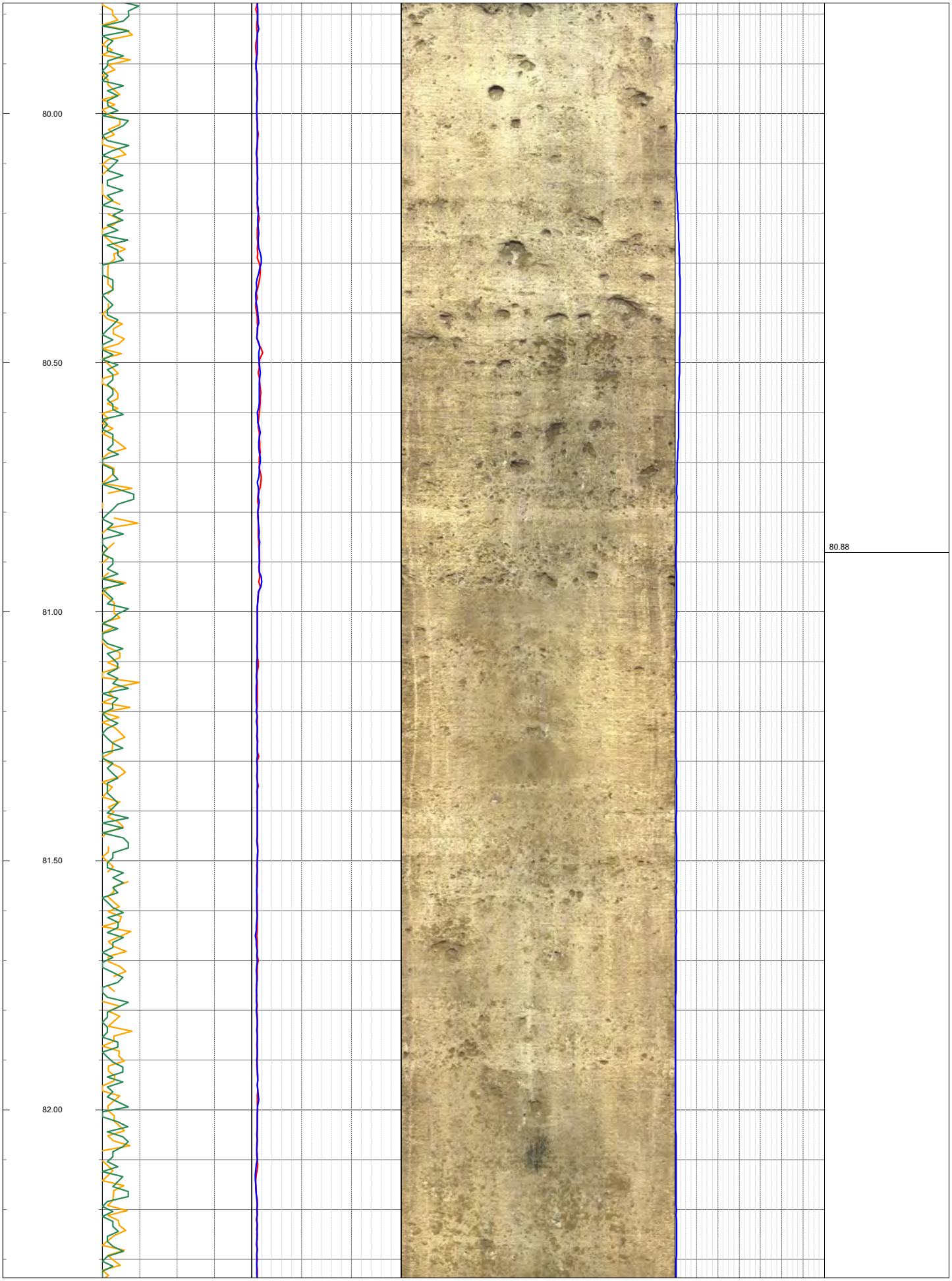

67.00
67.50
68.00
68.50
69.00
69.50

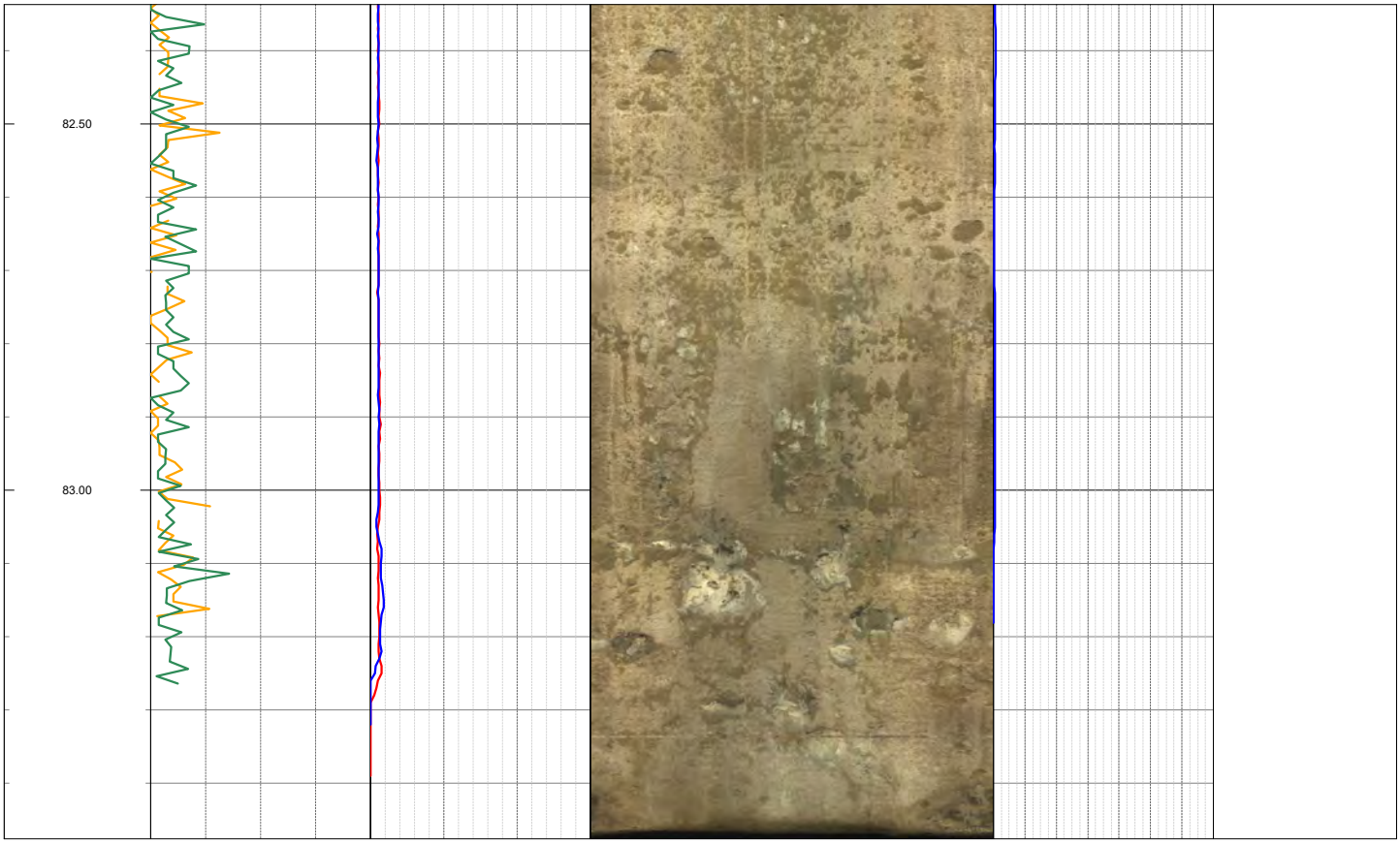

70.00
70.50
71.00
71.50
72.00
71.24
(-5.1%) - (-0.3L/s)
71.52
71.54
6.8% - 0.5L/s
72.04


72.50
73.00
73.50
74.00
74.50
73.20


75.00
75.50
76.00
76.50
77.00
2.1% - 0.1L/s


77.50
78.00
78.50
79.00
79.50


80.00
80.50
81.00
81.50
82.00
80.88


82.50
83.00

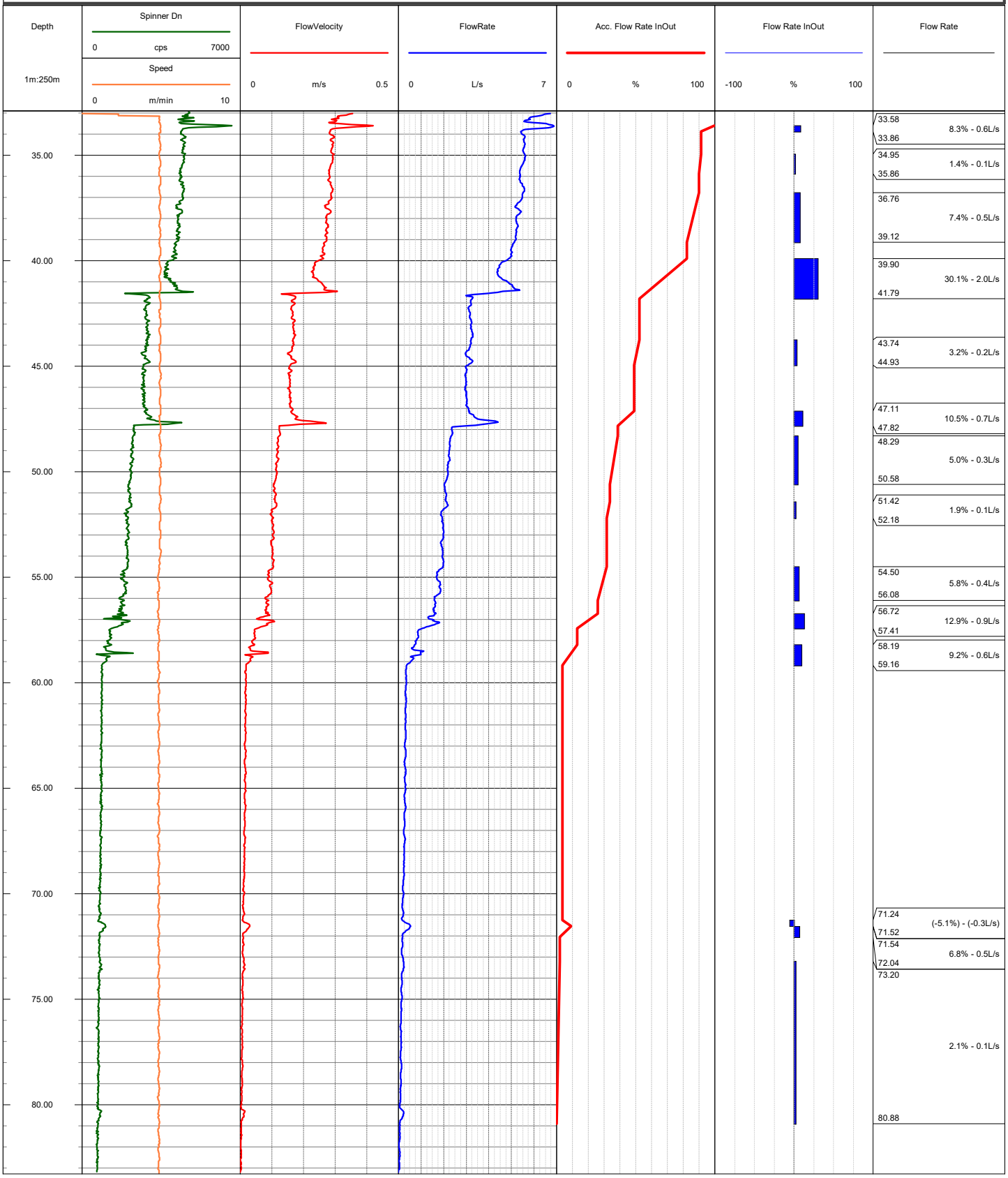
Lotowater TECHNICAL SERVICES INC.

Pumping Flow Profile (6.75 L/s)

CLIENT

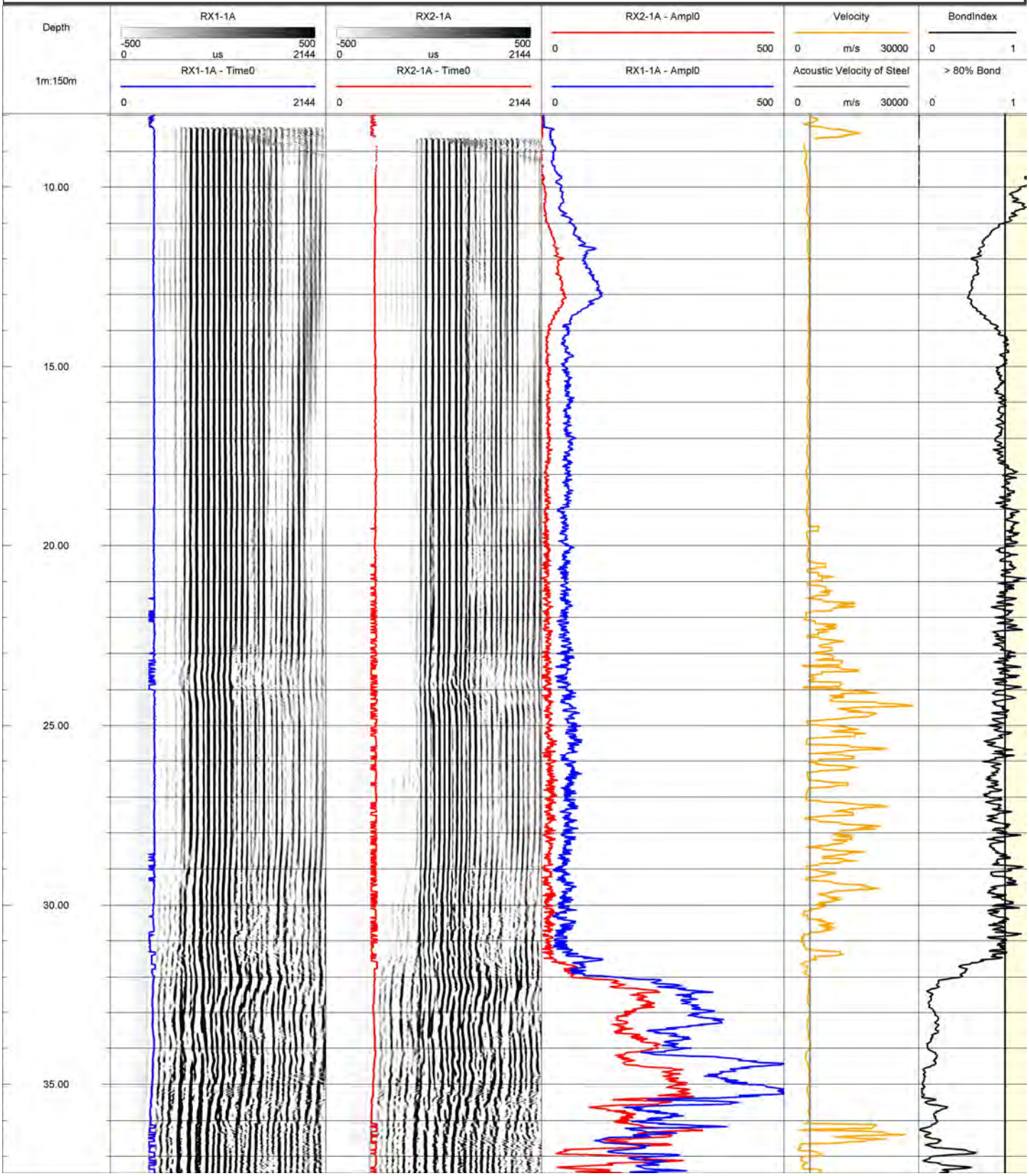
Township of Centre Wellington

LOCATION	*8282 Wellington 19, Fergus, ON*	**BOREHOLE**	**PW21-1**
DEPTH REF.	*Top of casing (0.57 m agl)*	**PROJECT #**	*313-018*
WATER LEVEL	*9.25 m before pumping*	**LOG DATE**	*2025-11-18*
DRILL METHOD	*n/a*	**LOGGED BY**	*RH*



Lotowater TECHNICAL SERVICES INC.

LOG TYPE			
CLIENT			
Township of Centre Wellington			
LOCATION	*8282 Wellington 19, Fergus, ON*	**BOREHOLE**	**Belwood Golf Club**
DEPTH REF.	*Top of casing (0.75 m agl)*	**PROJECT #**	*313-018*
WATER LEVEL	*7.82 m at time of logging*	**LOG DATE**	*2025-06-09*
DRILL METHOD	*n/a*	**LOGGED BY**	*RH*



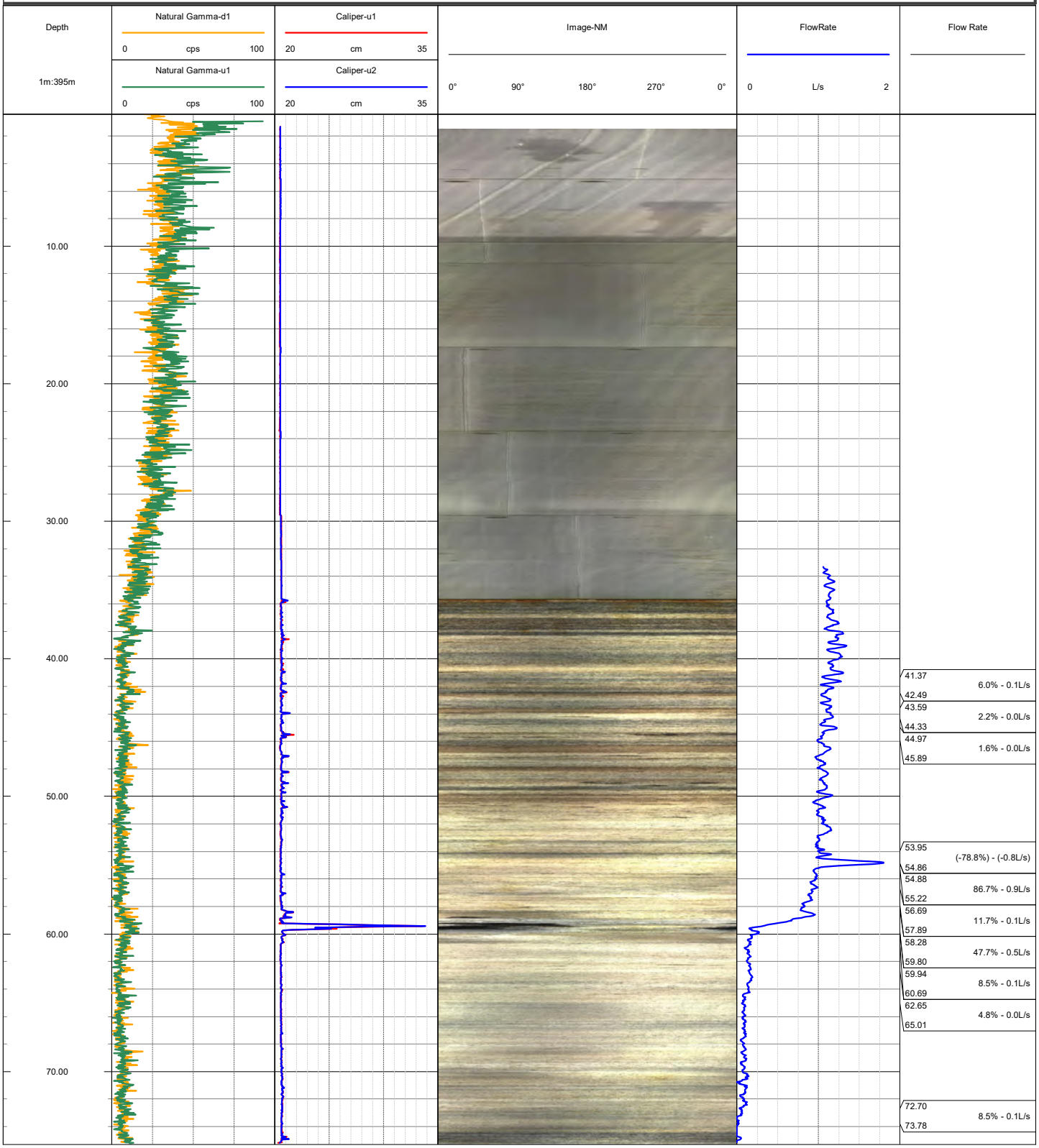
Lotowater TECHNICAL SERVICES INC.

Geophysical Logging Summary

CLIENT

Township of Centre Wellington

LOCATION	*8282 Wellington 19, Fergus, ON*	**BOREHOLE**	**TW25-2**
DEPTH REF.	*Top of casing (0.76 m agl)*	**PROJECT #**	*313-018*
WATER LEVEL	*9.68 m at time of logging*	**LOG DATE**	*2025-11-17*
DRILL METHOD	*n/a*	**LOGGED BY**	*RH*



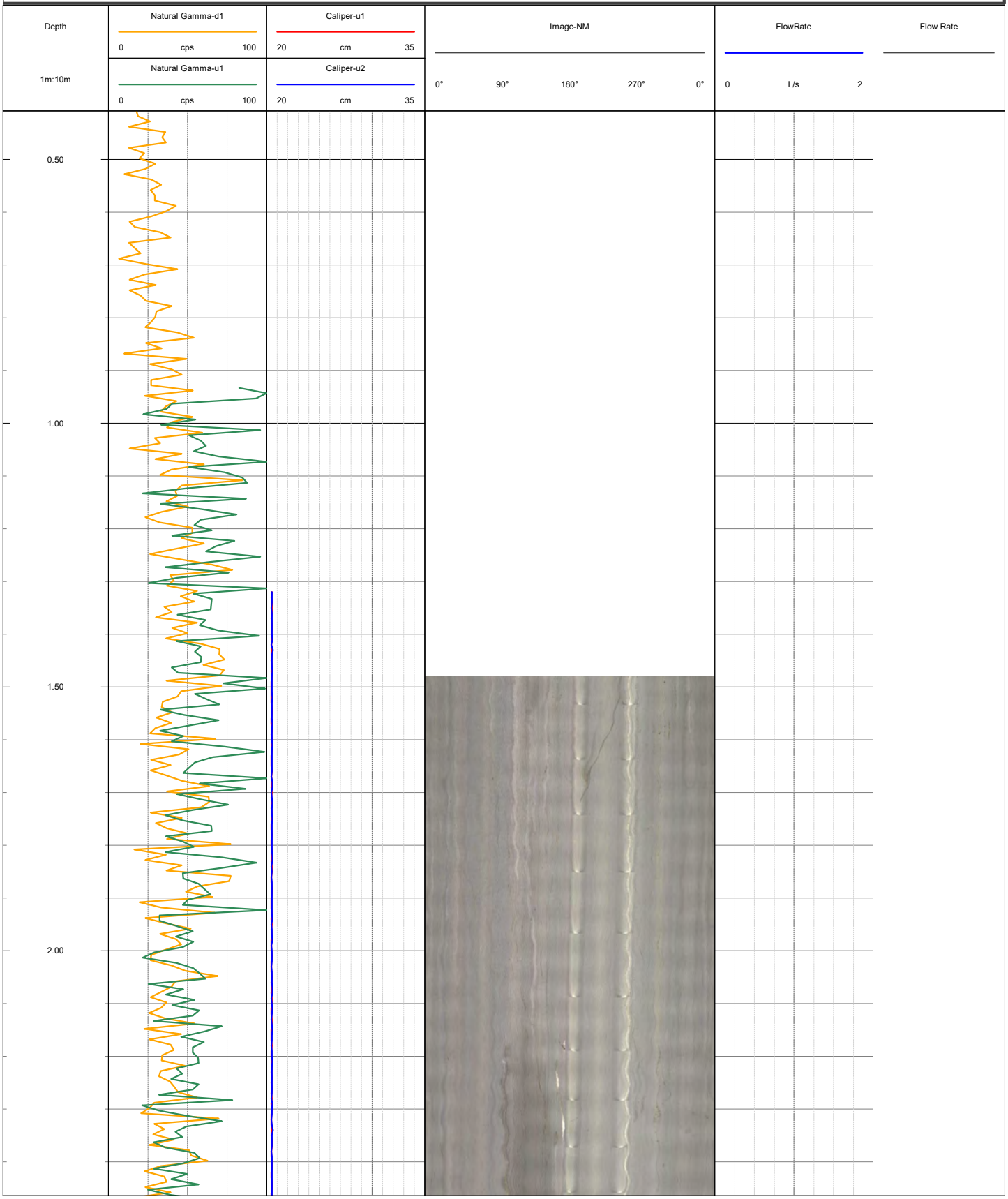
Lotowater TECHNICAL SERVICES INC.

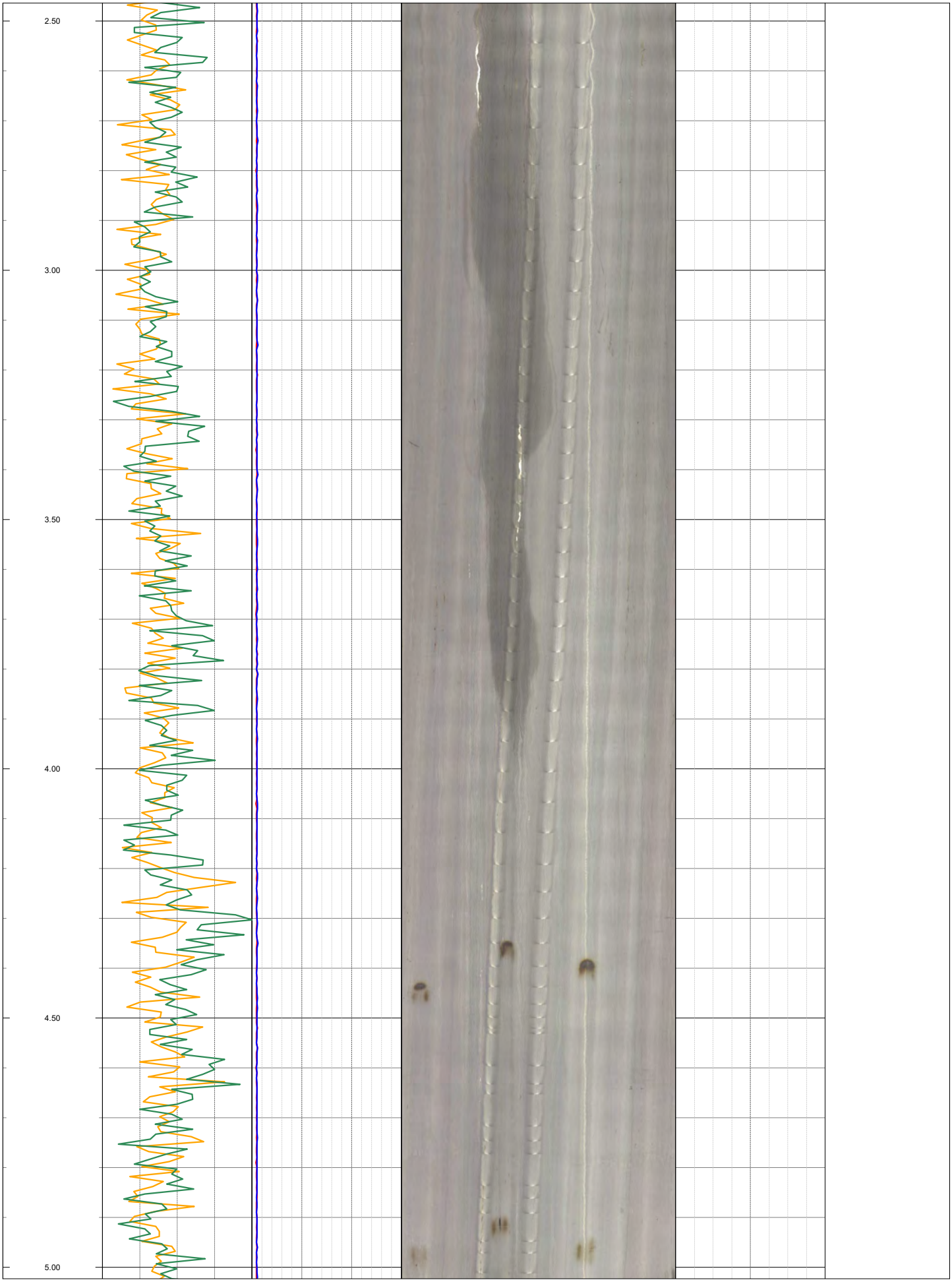
Geophysical Logging Summary

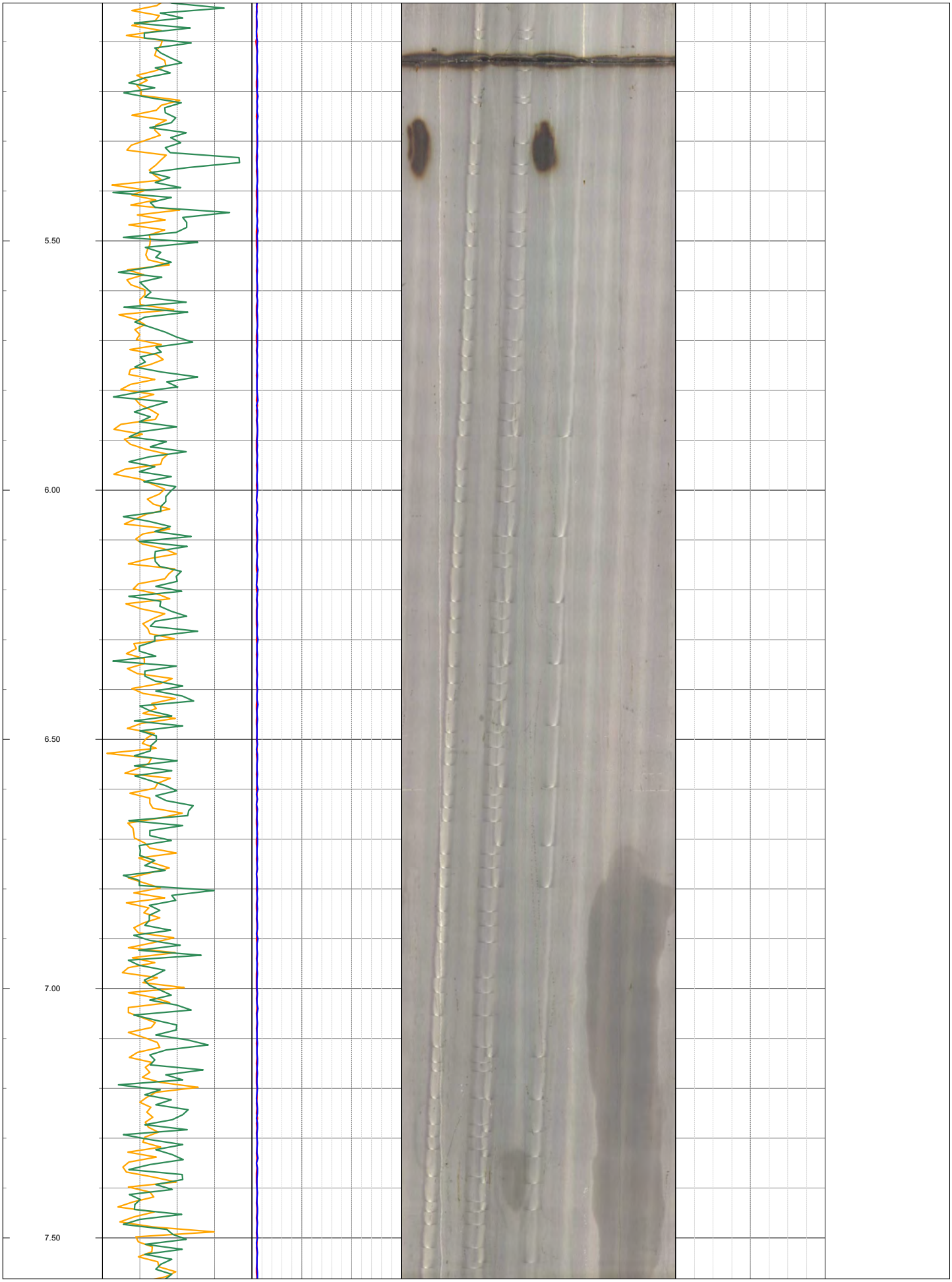
CLIENT

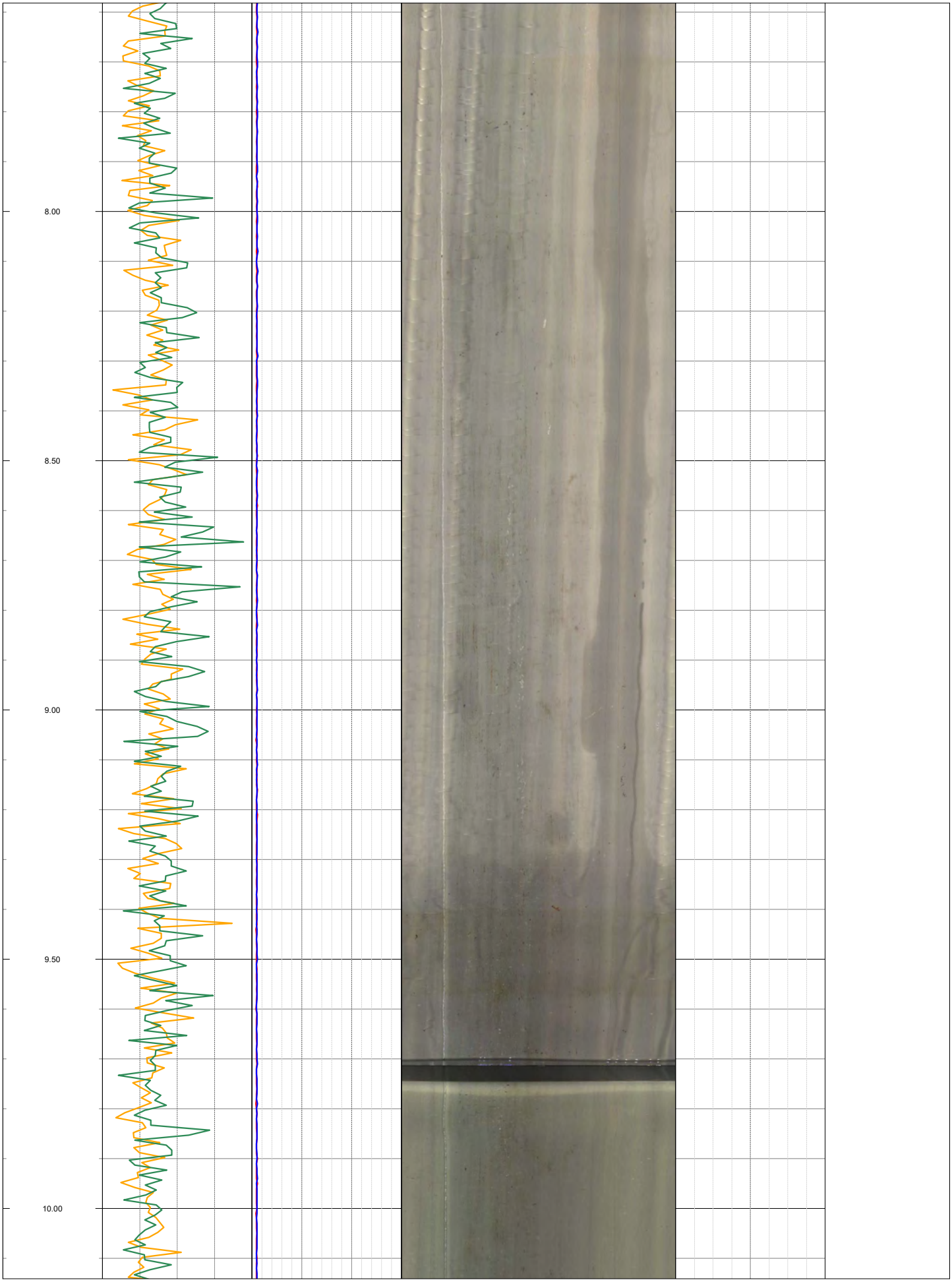
Township of Centre Wellington

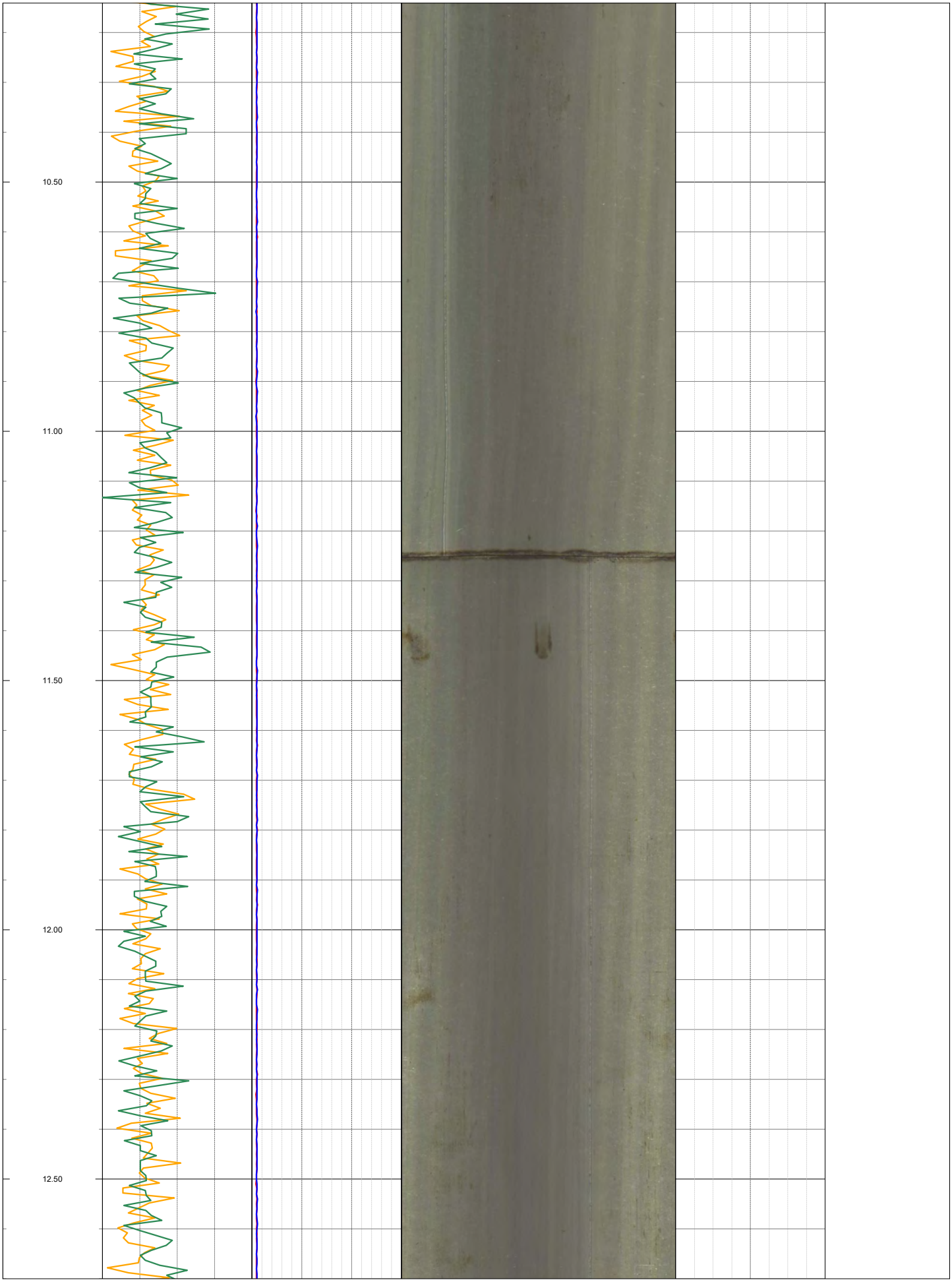
LOCATION	*8282 Wellington 19, Fergus, ON*	**BOREHOLE**	**TW25-2**
DEPTH REF.	*Top of casing (0.76 m agl)*	**PROJECT #**	*313-018*
WATER LEVEL	*9.68 m at time of logging*	**LOG DATE**	*2025-11-17*
DRILL METHOD	*n/a*	**LOGGED BY**	*RH*

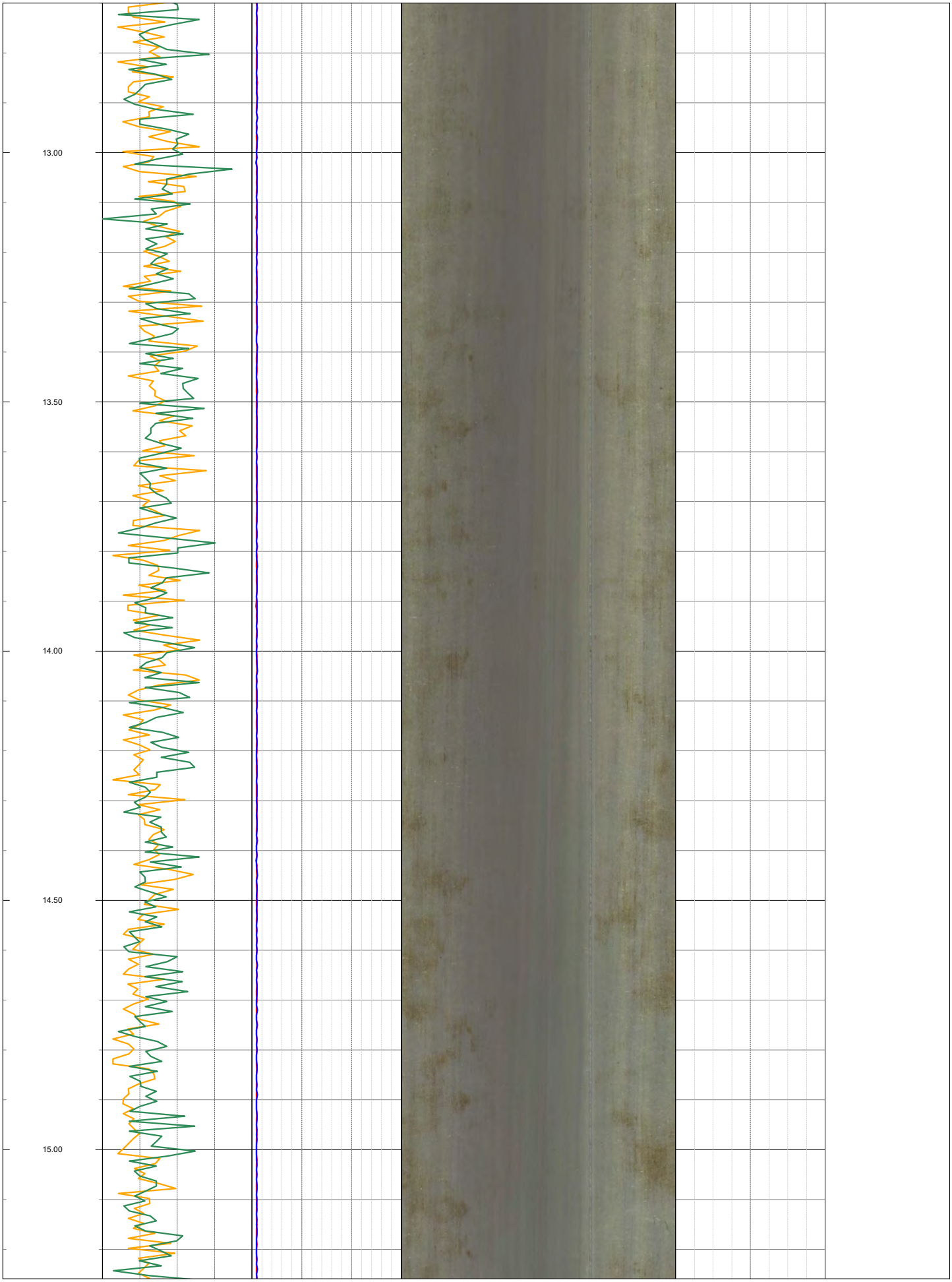


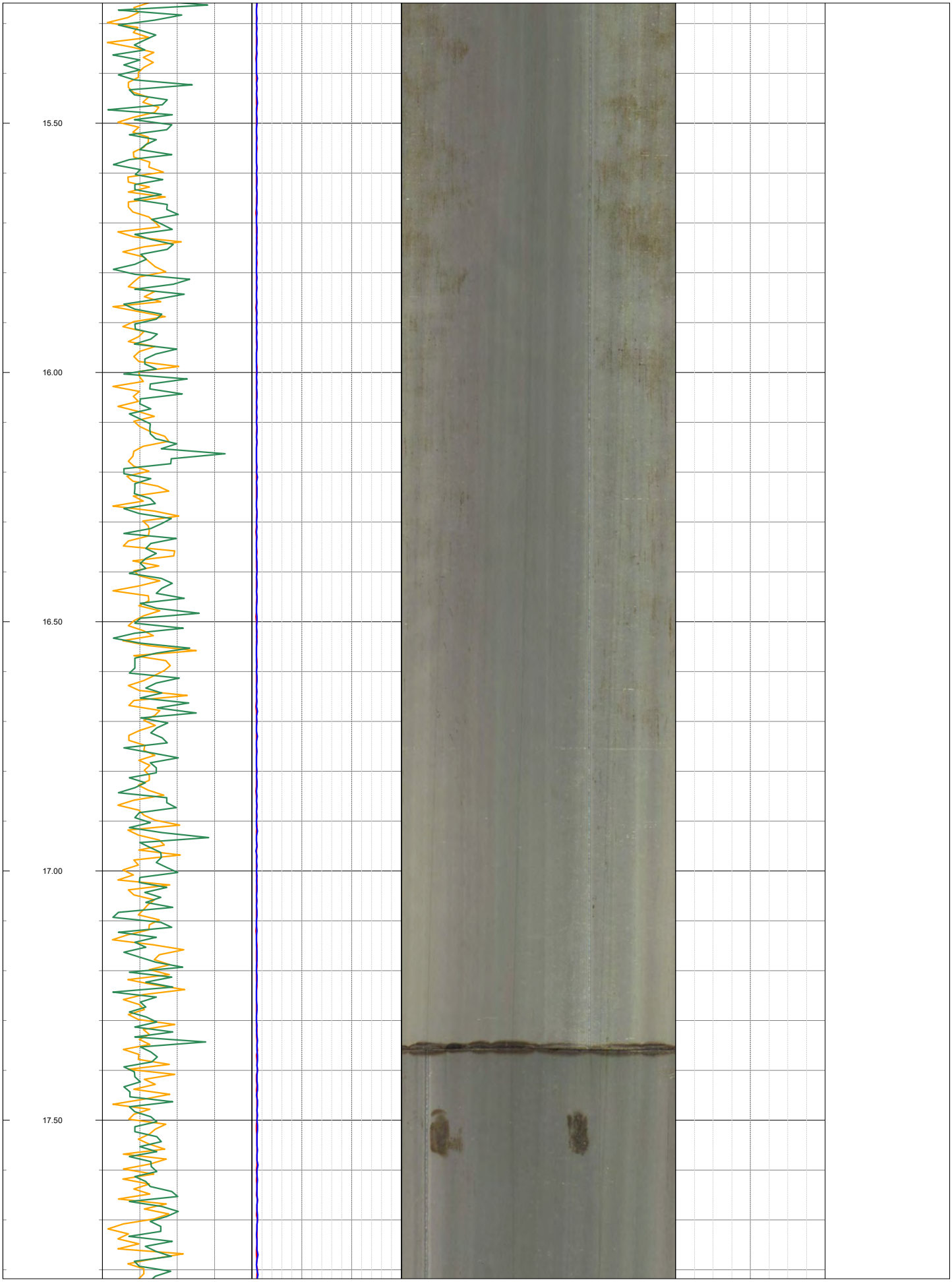

2.50
3.00
3.50
4.00
4.50
5.00

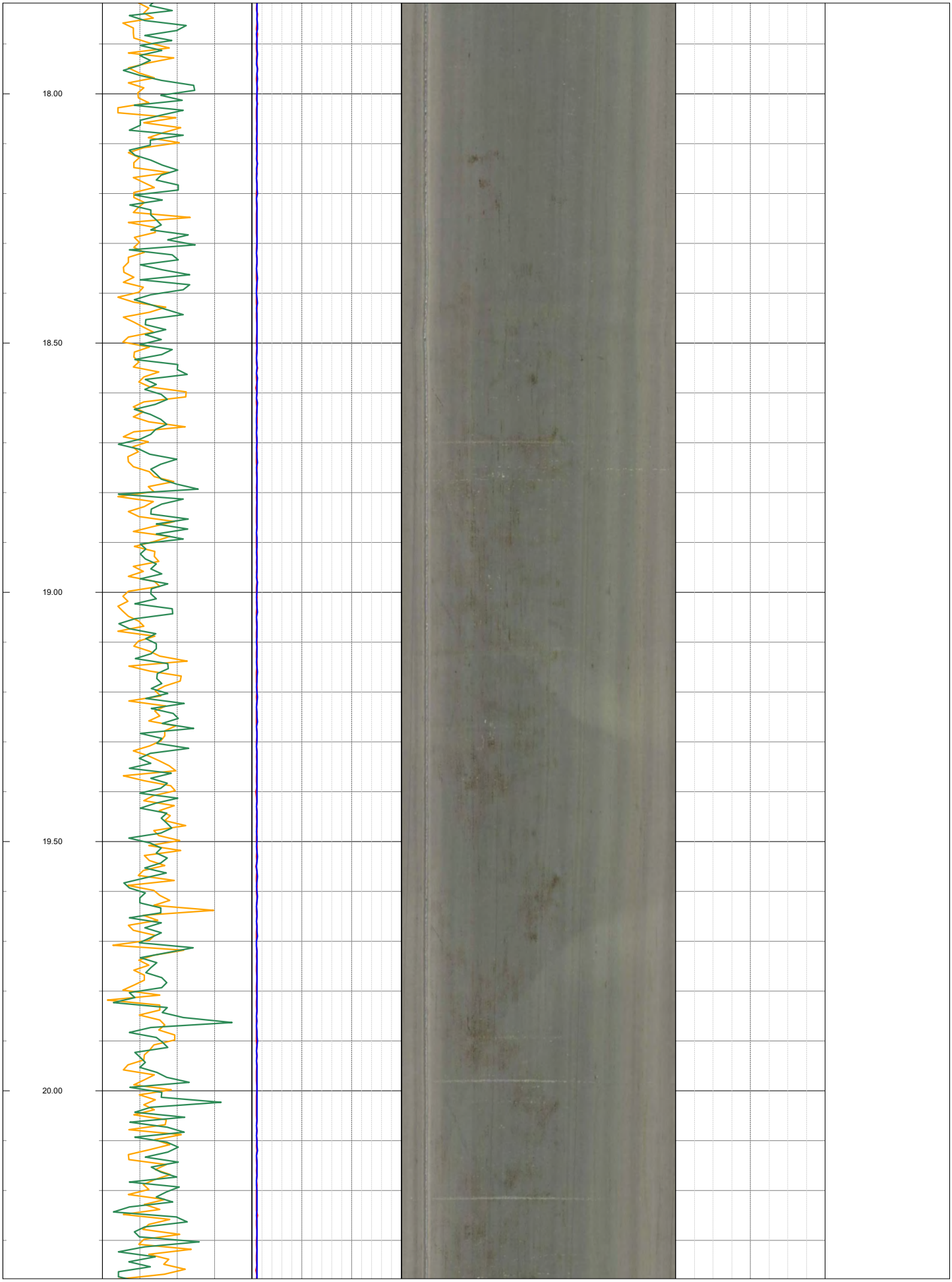

5.50
6.00
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7.00
7.50

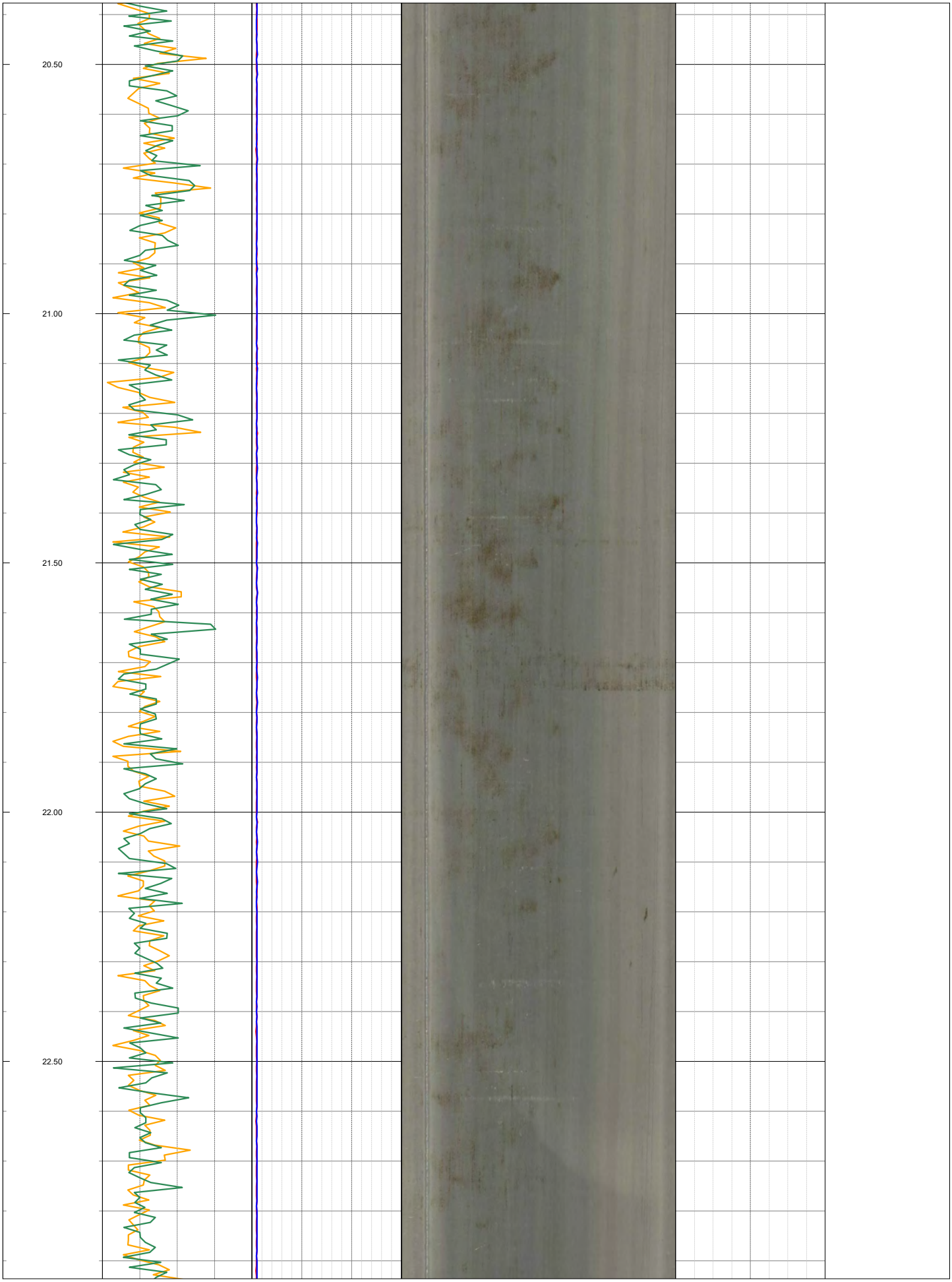

8.00
8.50
9.00
9.50
10.00

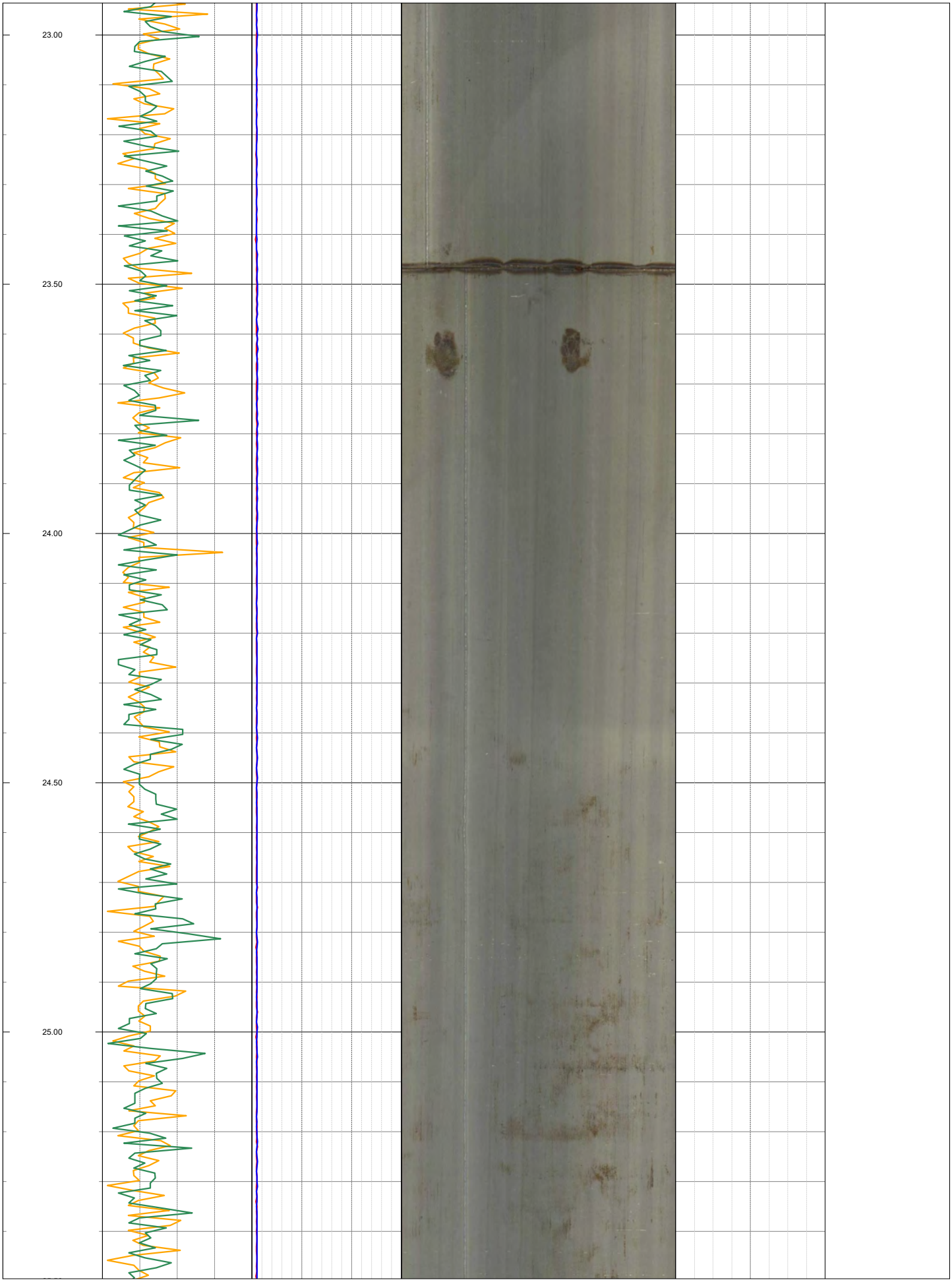

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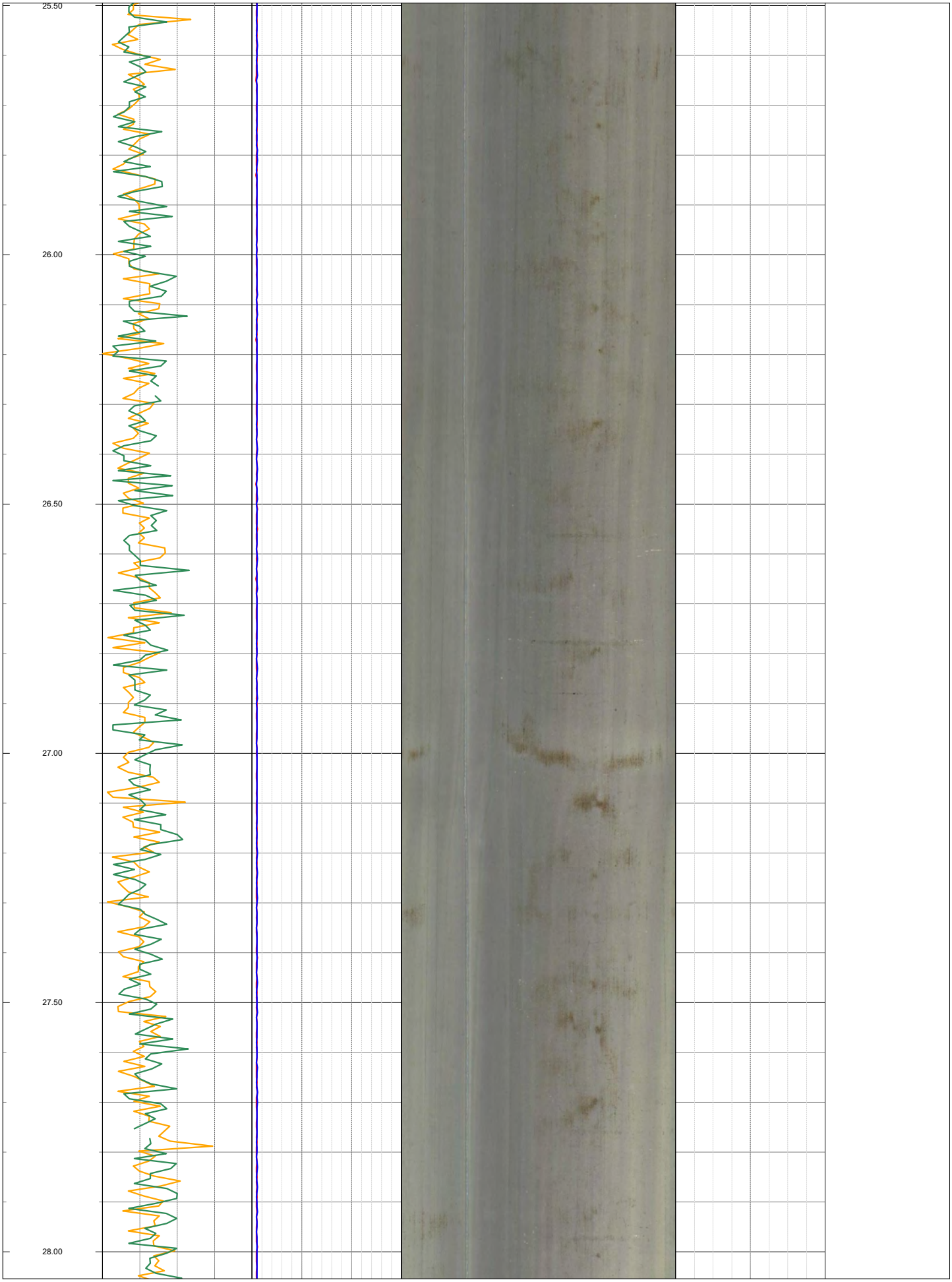

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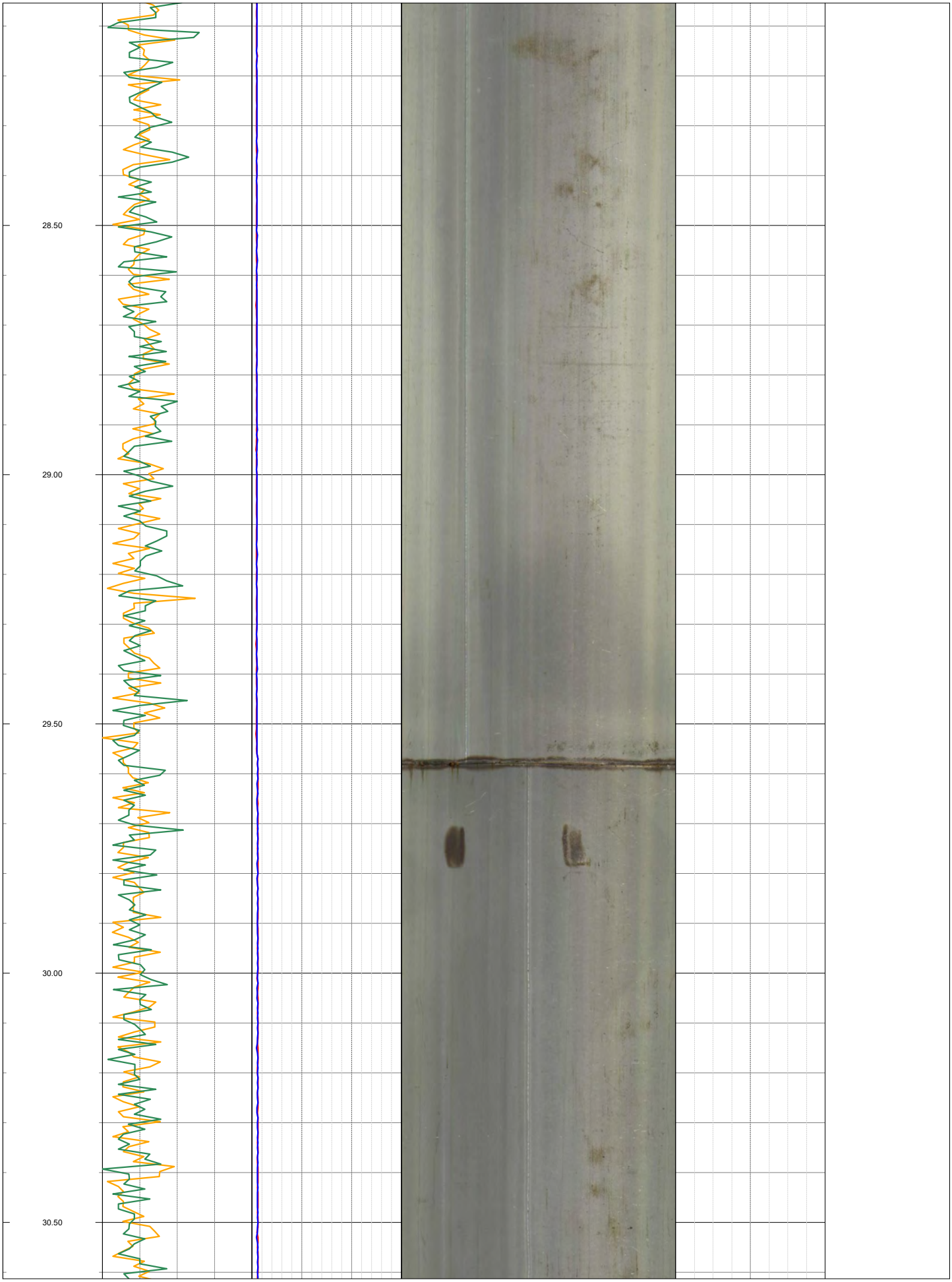

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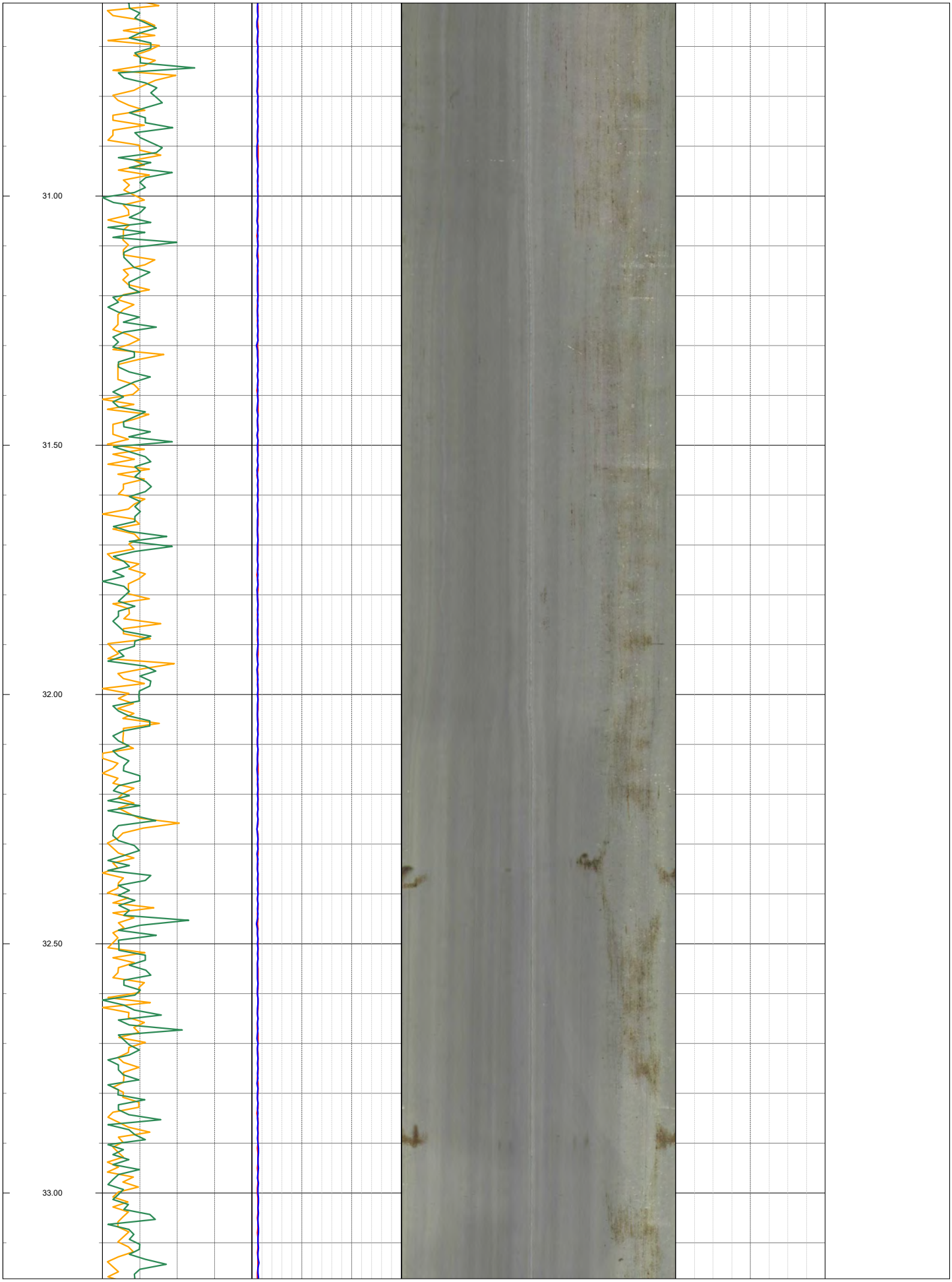

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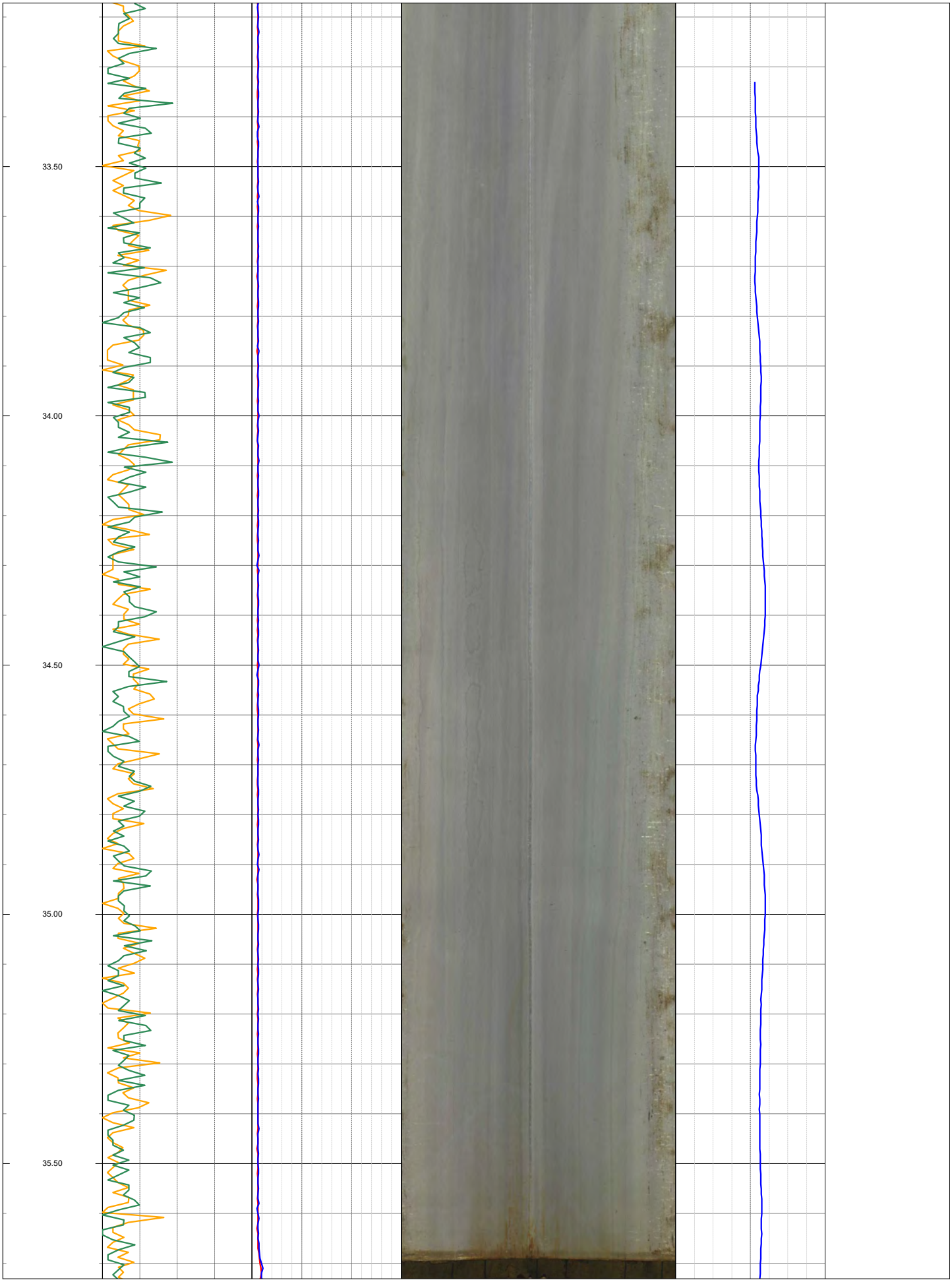

20.50
21.00
21.50
22.00
22.50

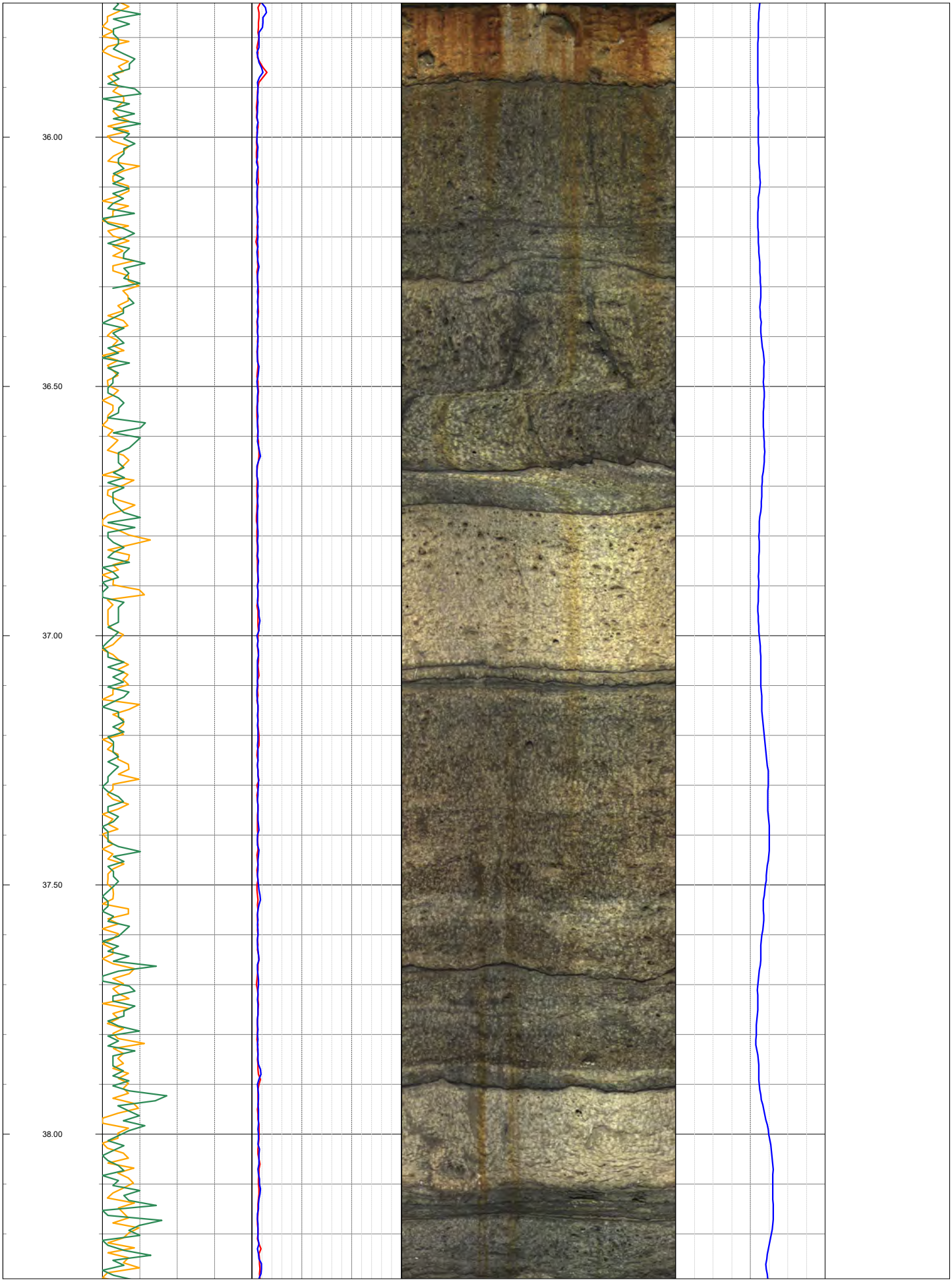

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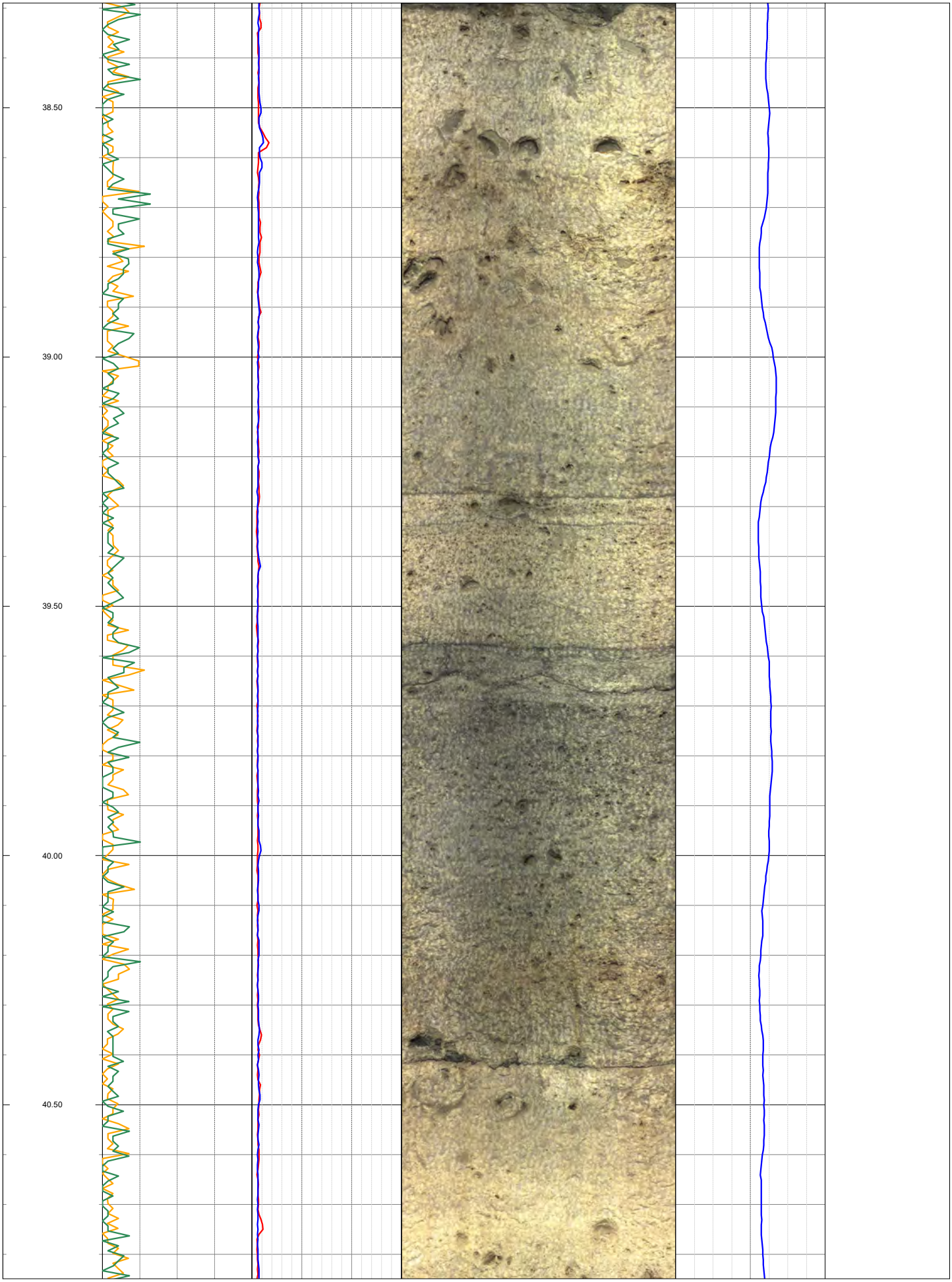

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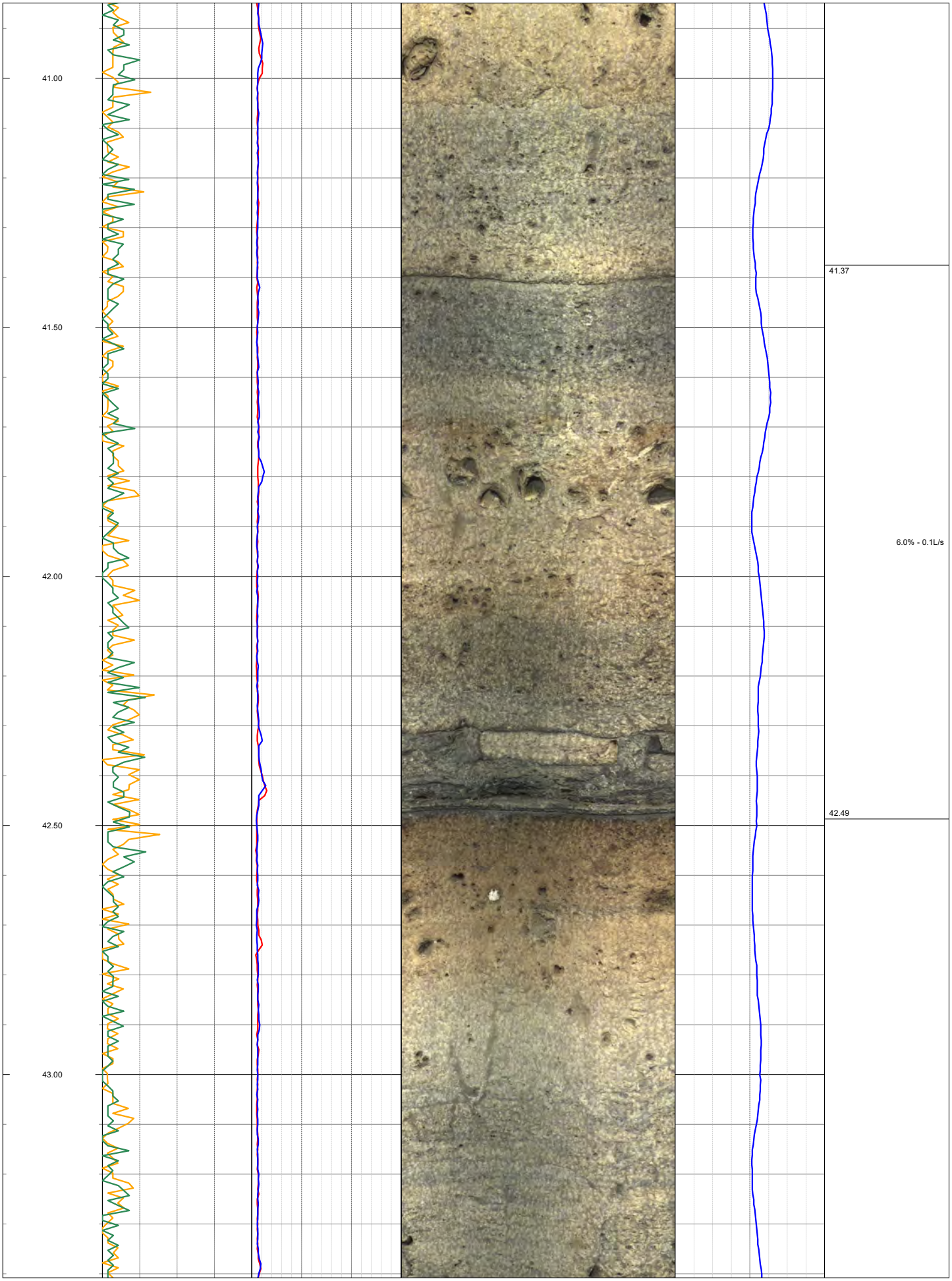

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30.50

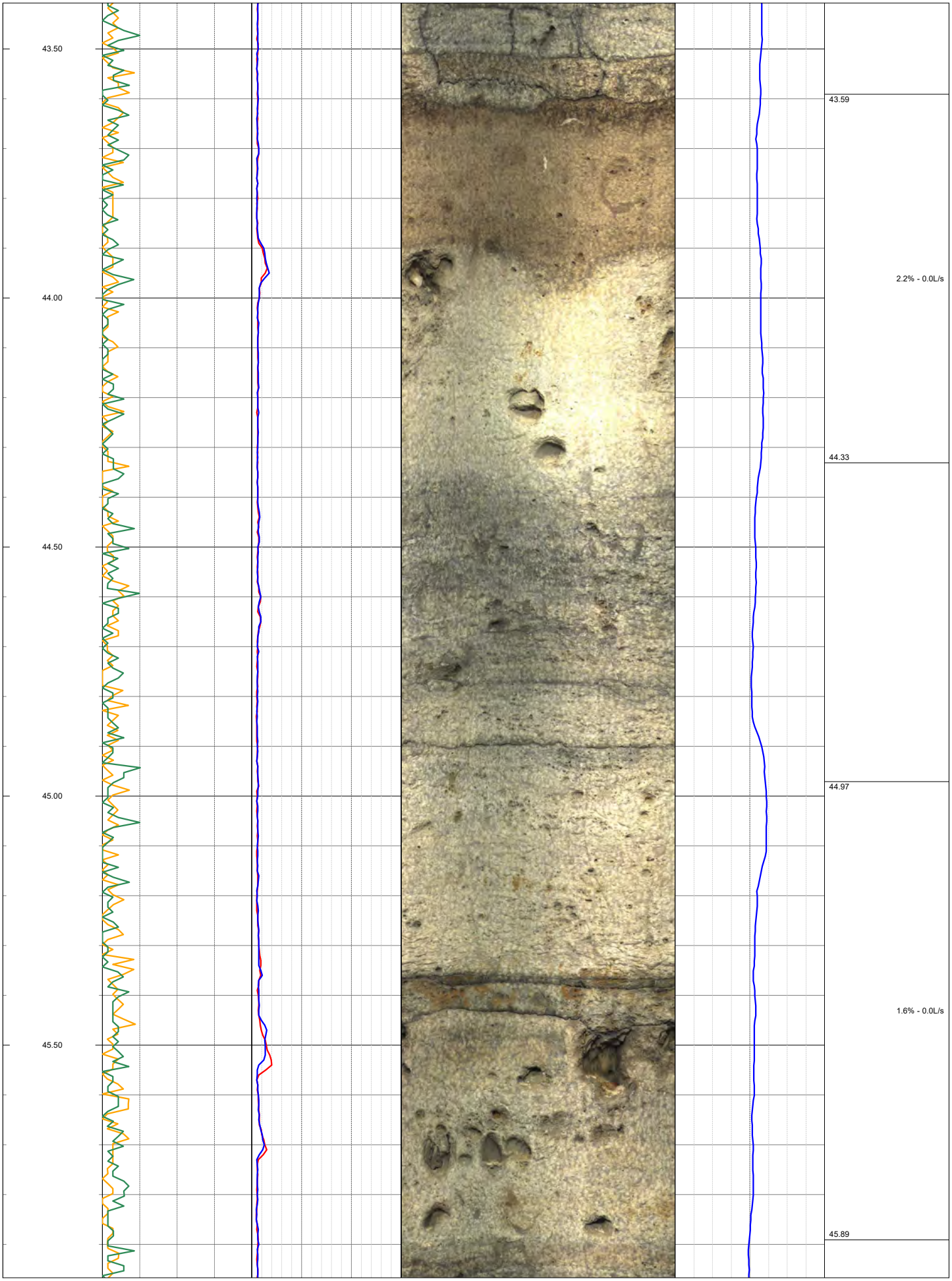

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33.00

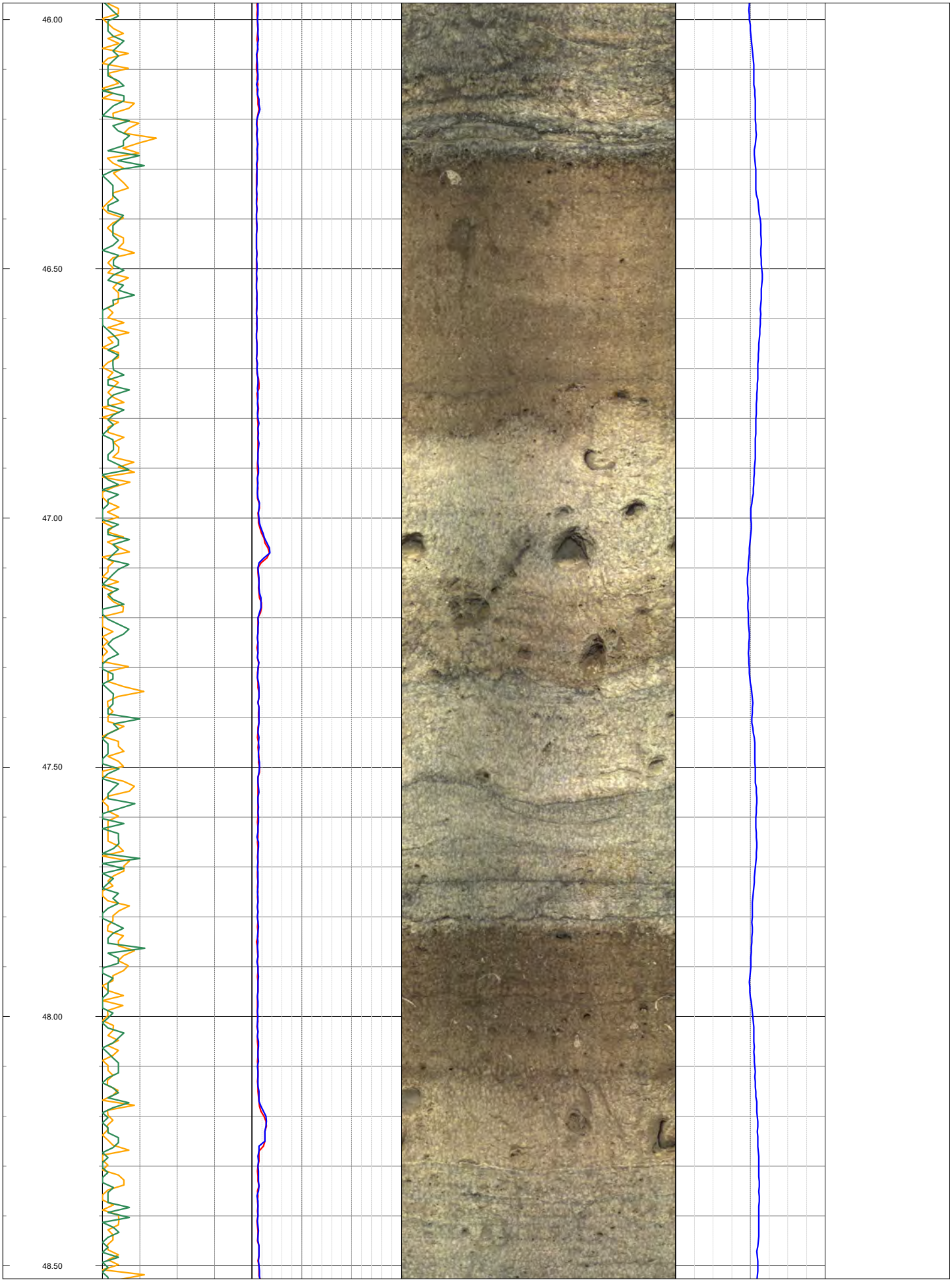

33.50
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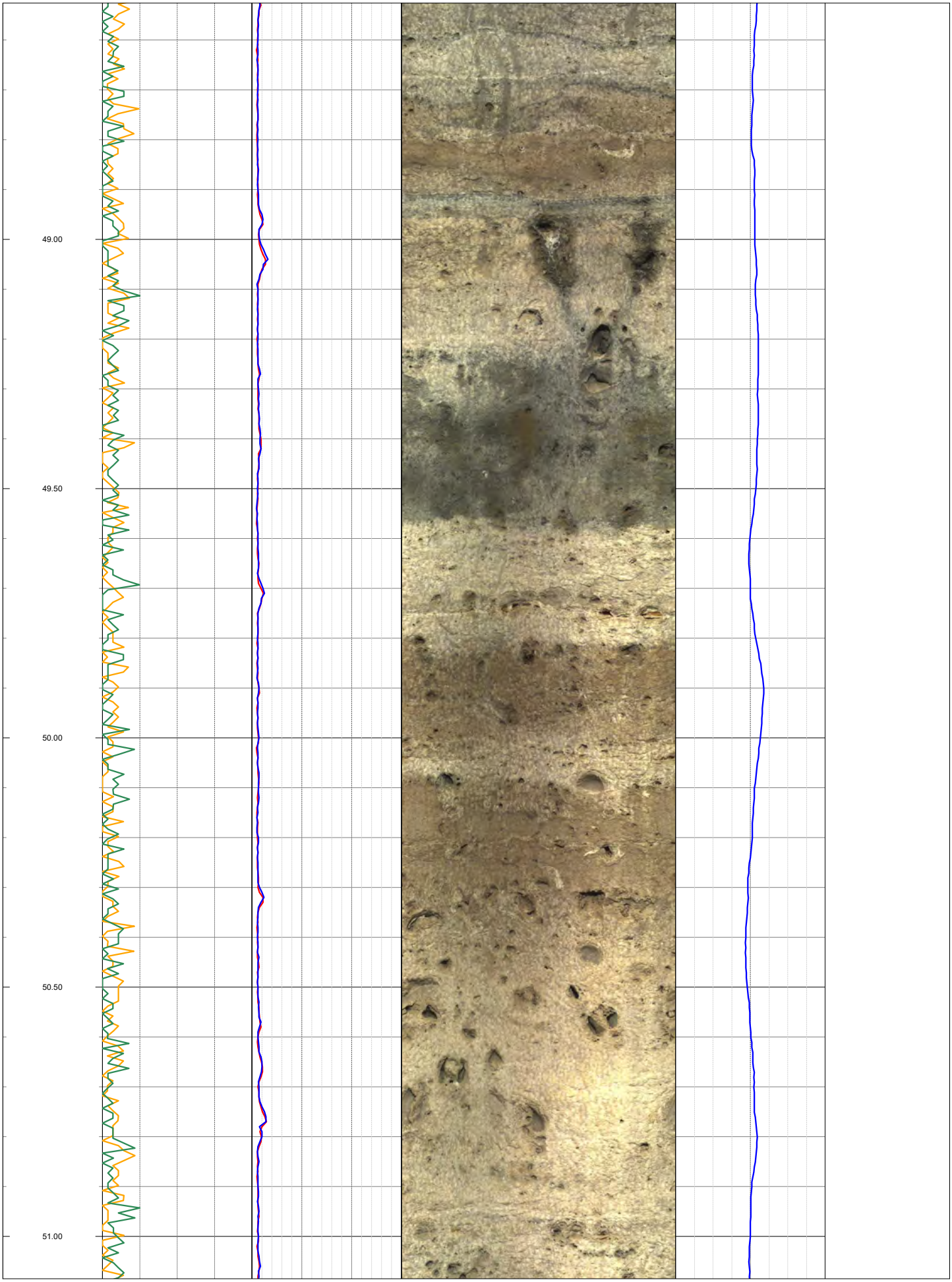

36.00
36.50
37.00
37.50
38.00

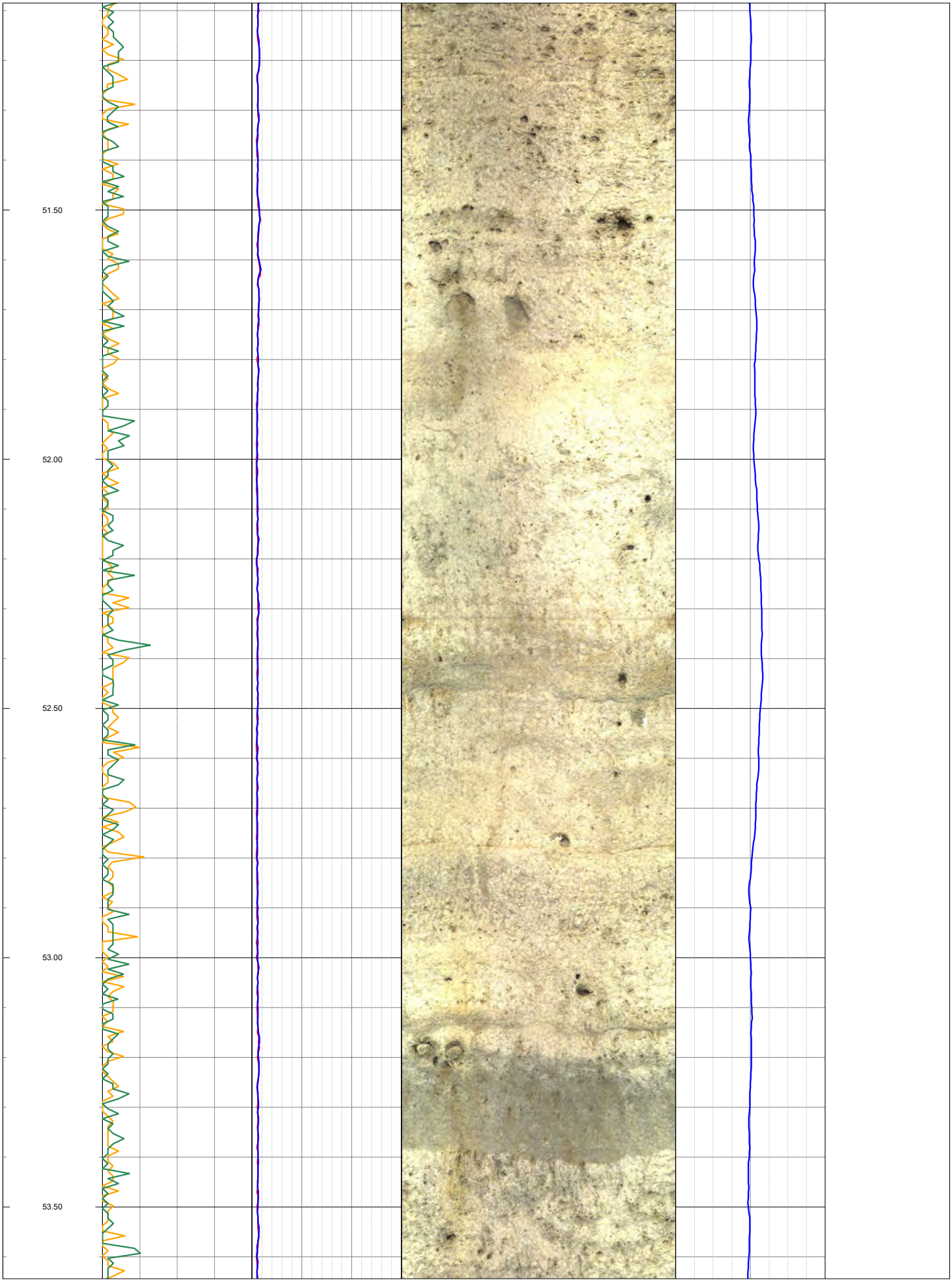

38.50
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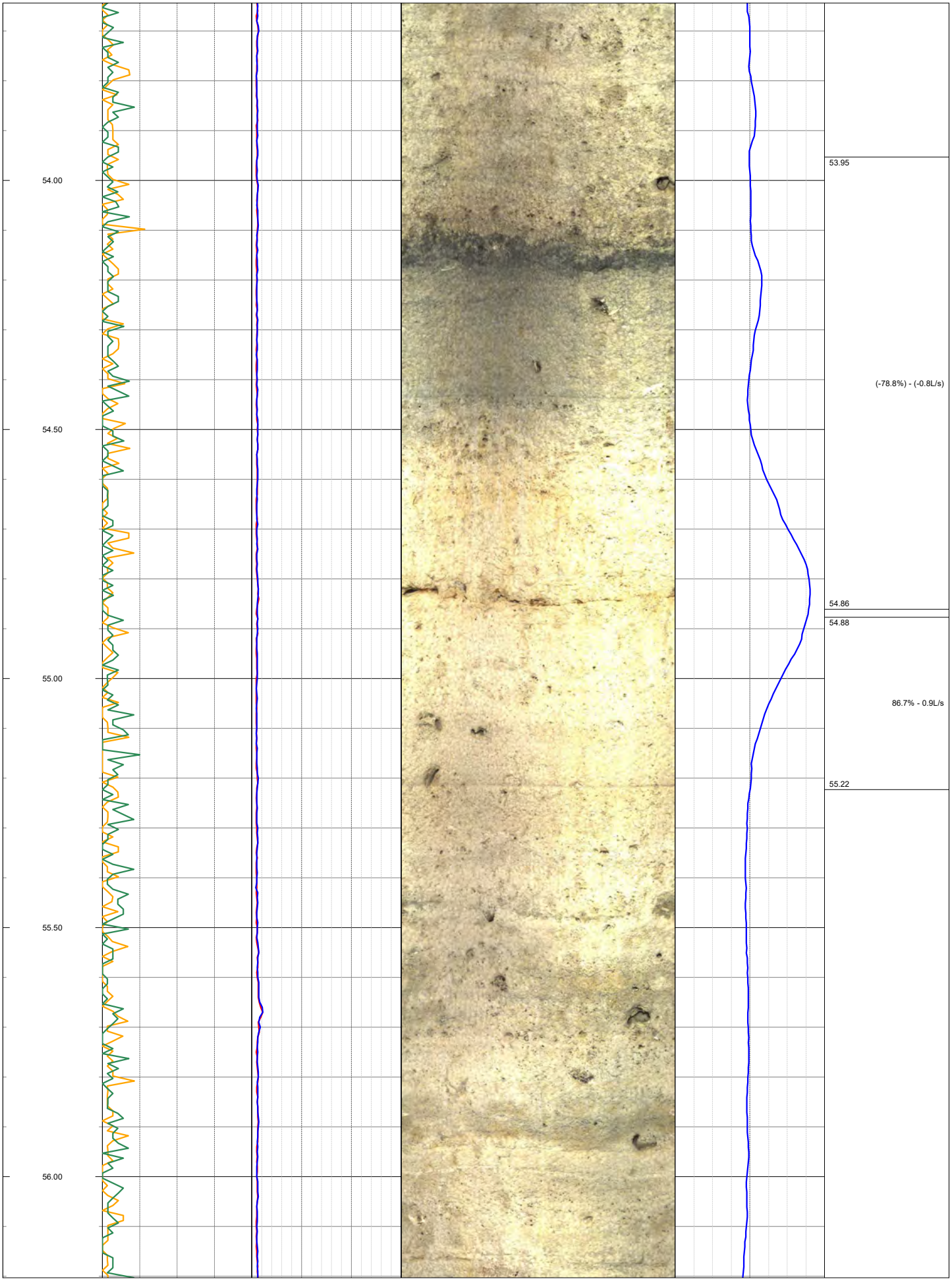

41.00
41.50
42.00
42.50
43.00
41.37
42.49
6.0% - 0.1L/s

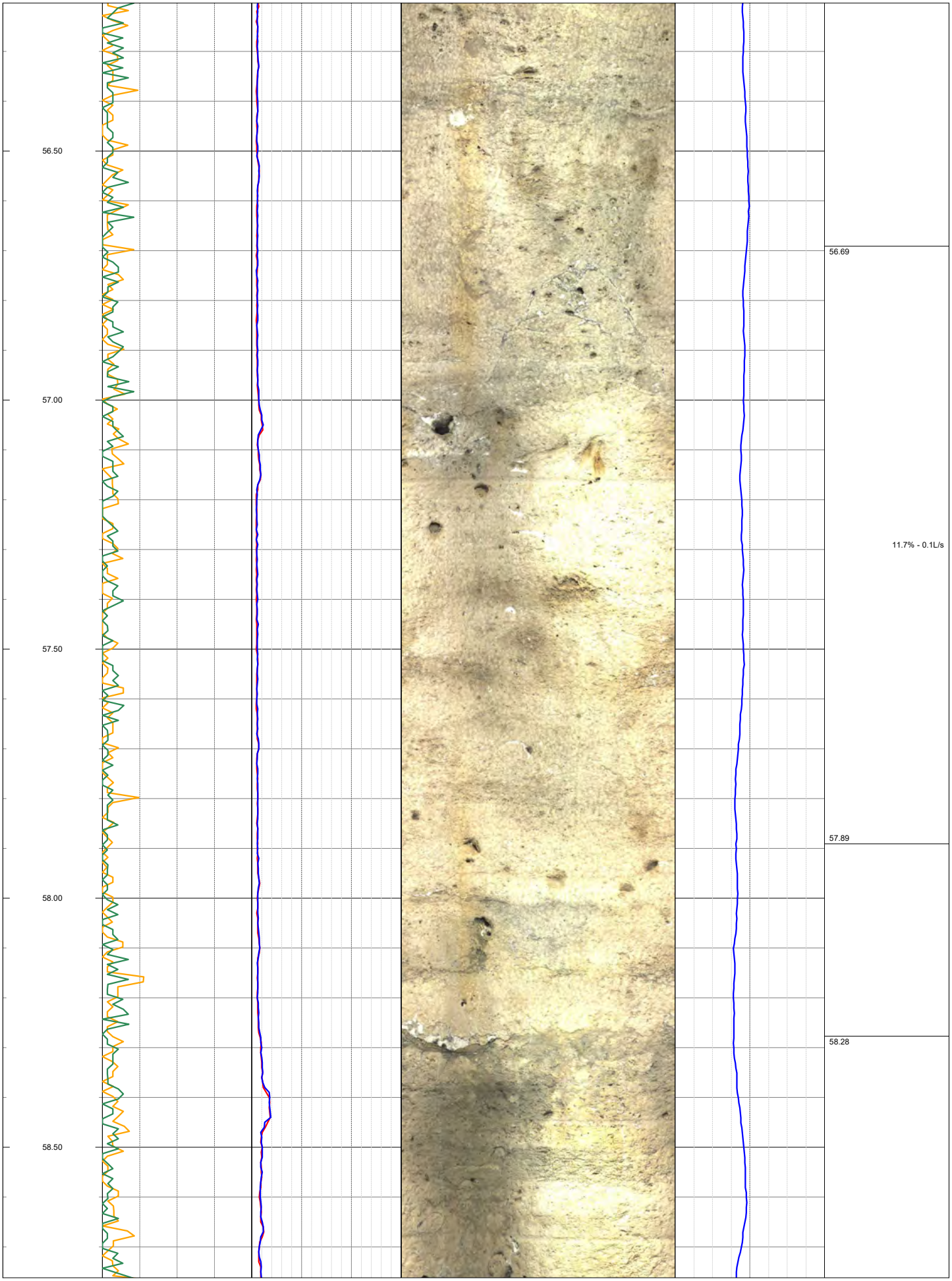

43.50
44.00
44.50
45.00
45.50
43.59
2.2% - 0.0L/s
44.33
44.97
1.6% - 0.0L/s
45.89

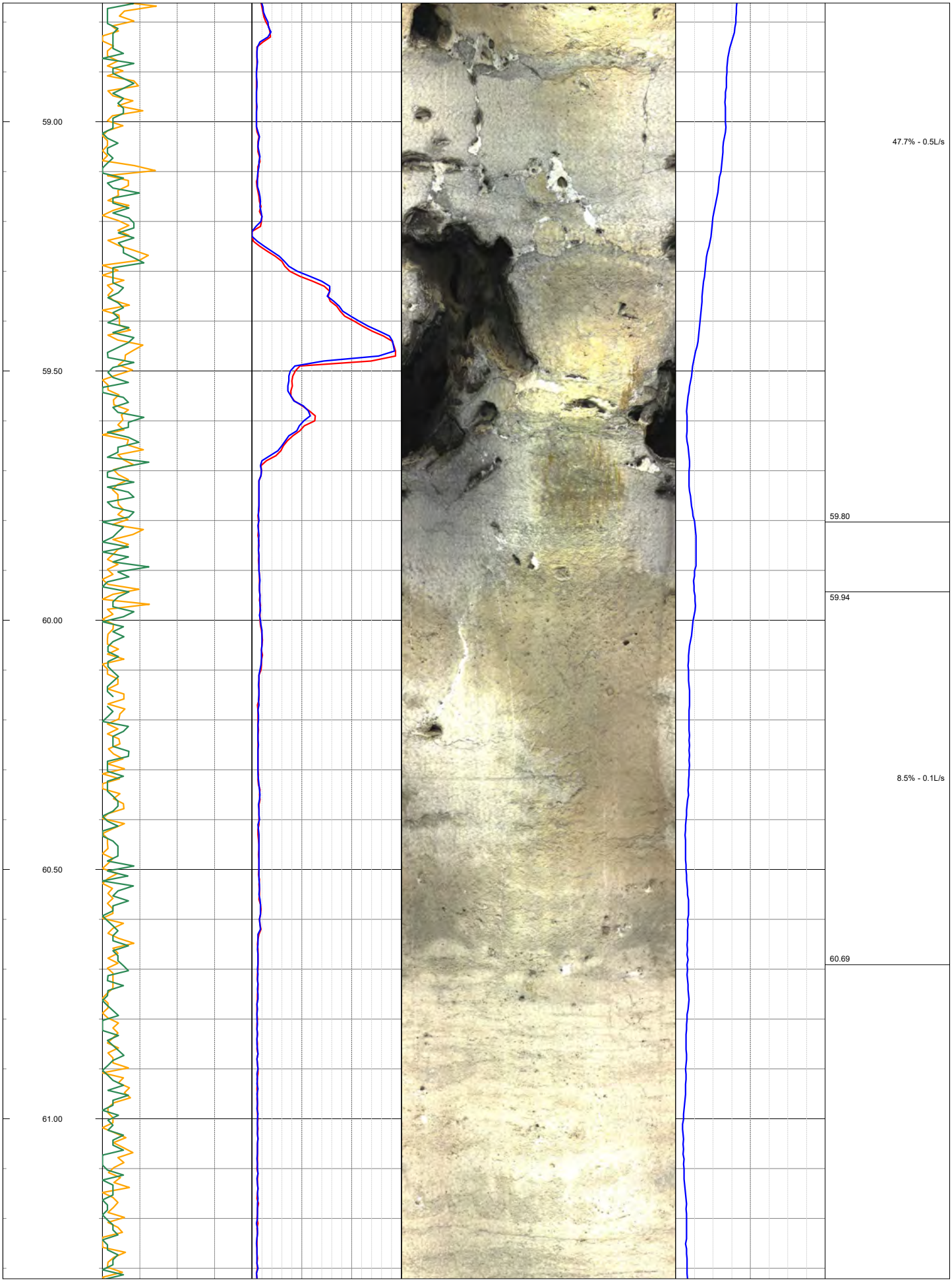

46.00
46.50
47.00
47.50
48.00
48.50

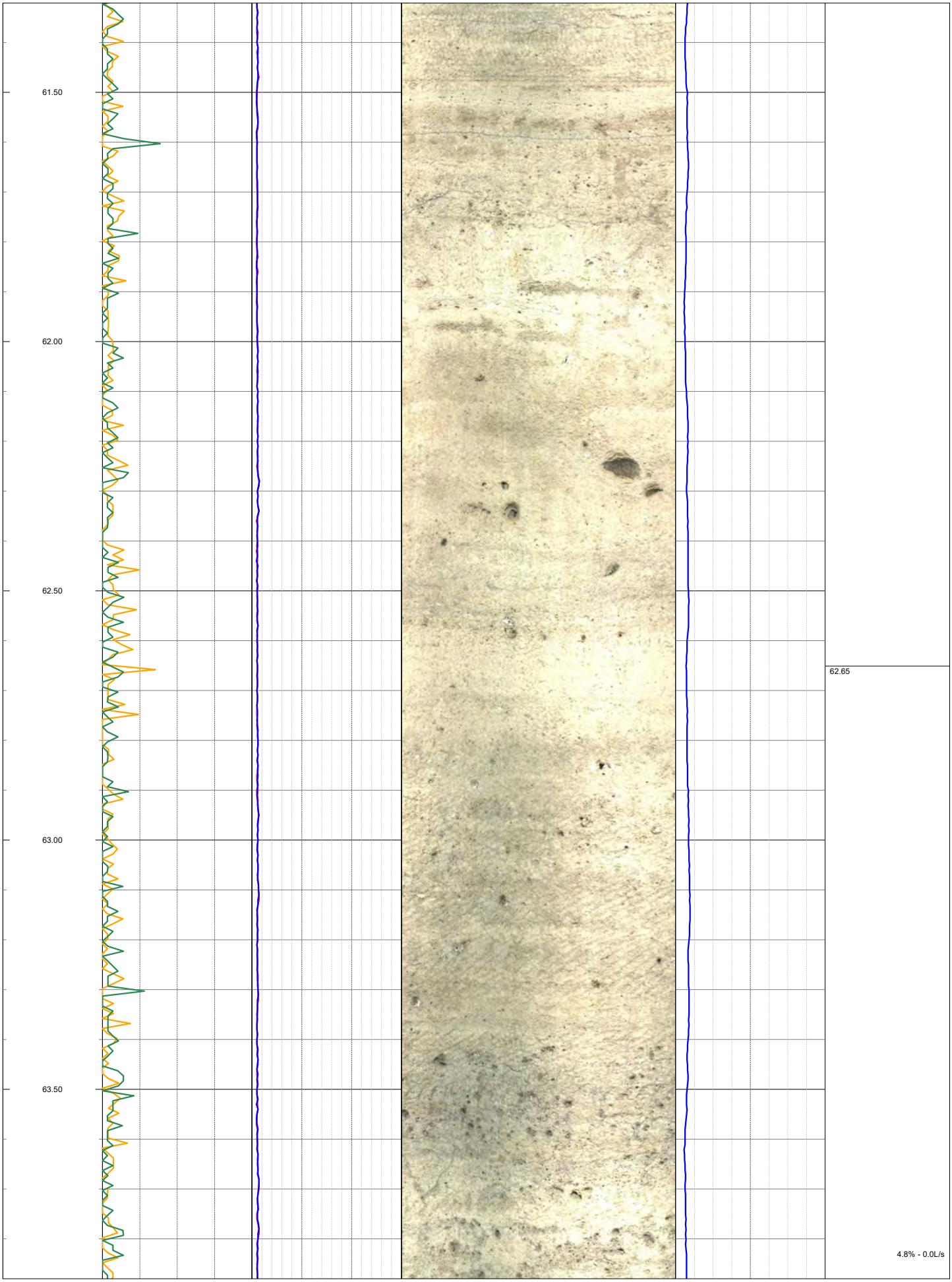

49.00
49.50
50.00
50.50
51.00

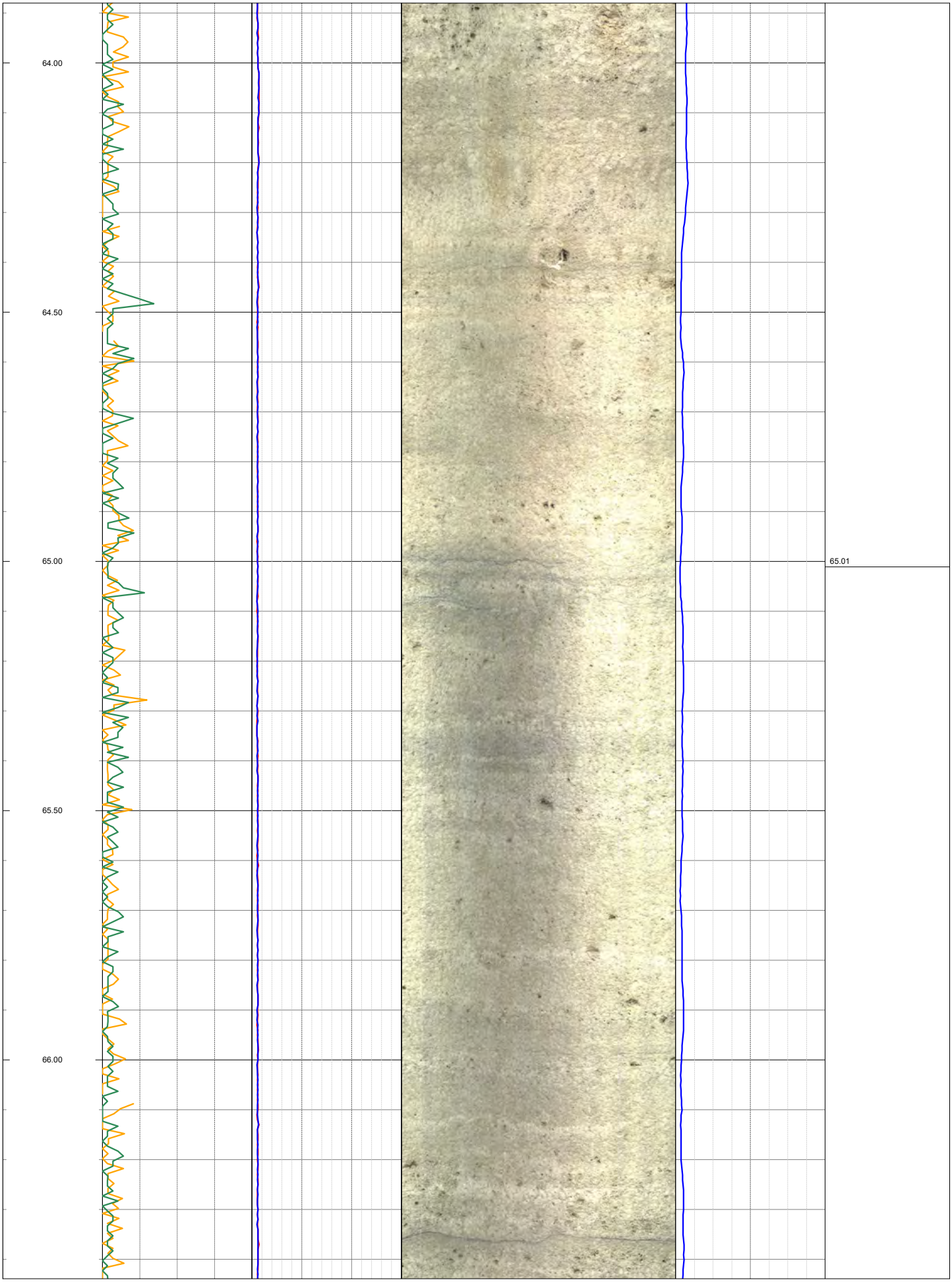

51.50
52.00
52.50
53.00
53.50

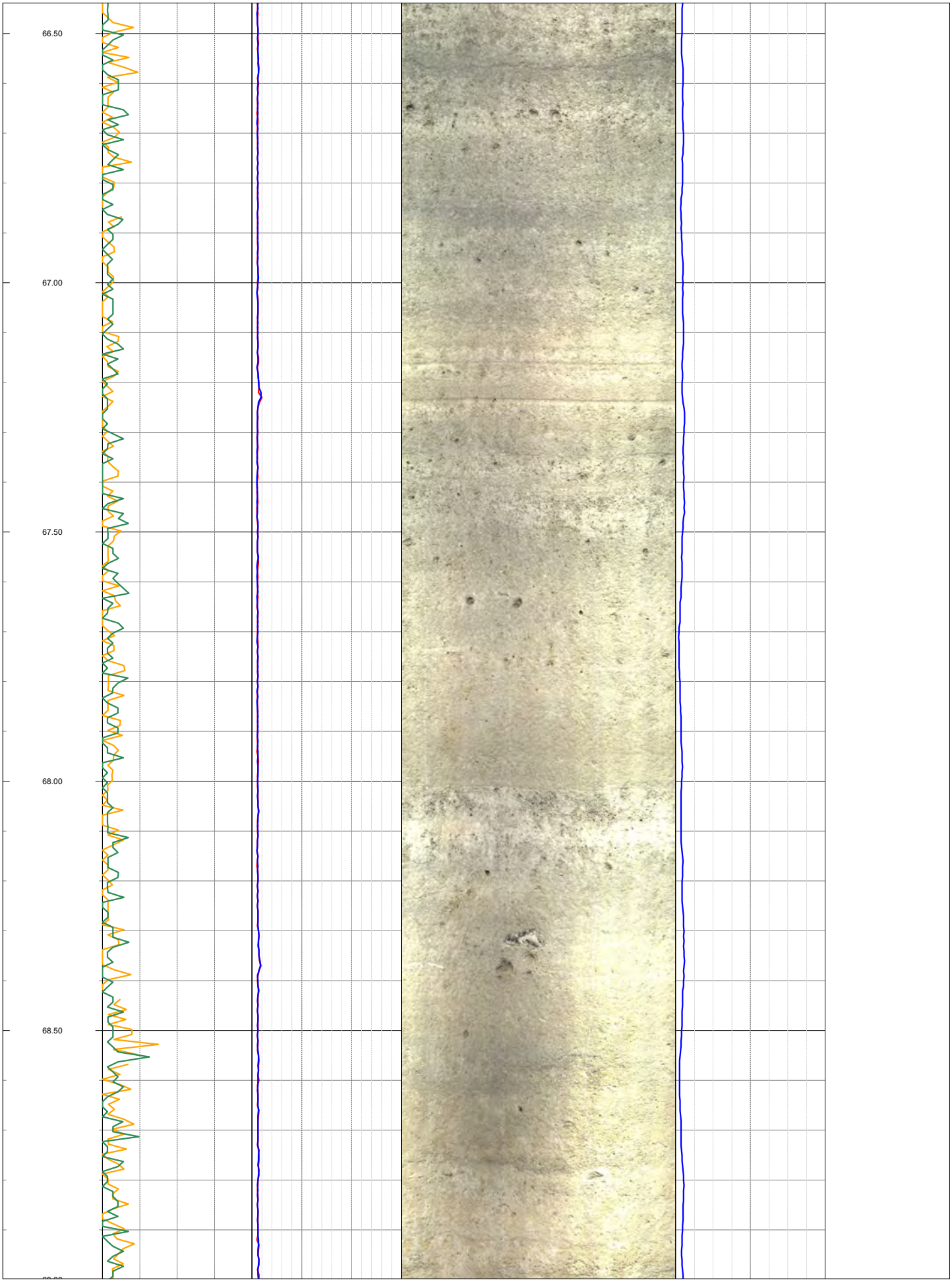

54.00
54.50
55.00
55.50
56.00
53.95
(-78.8%) - (-0.8L/s)
54.86
54.88
86.7% - 0.9L/s
55.22

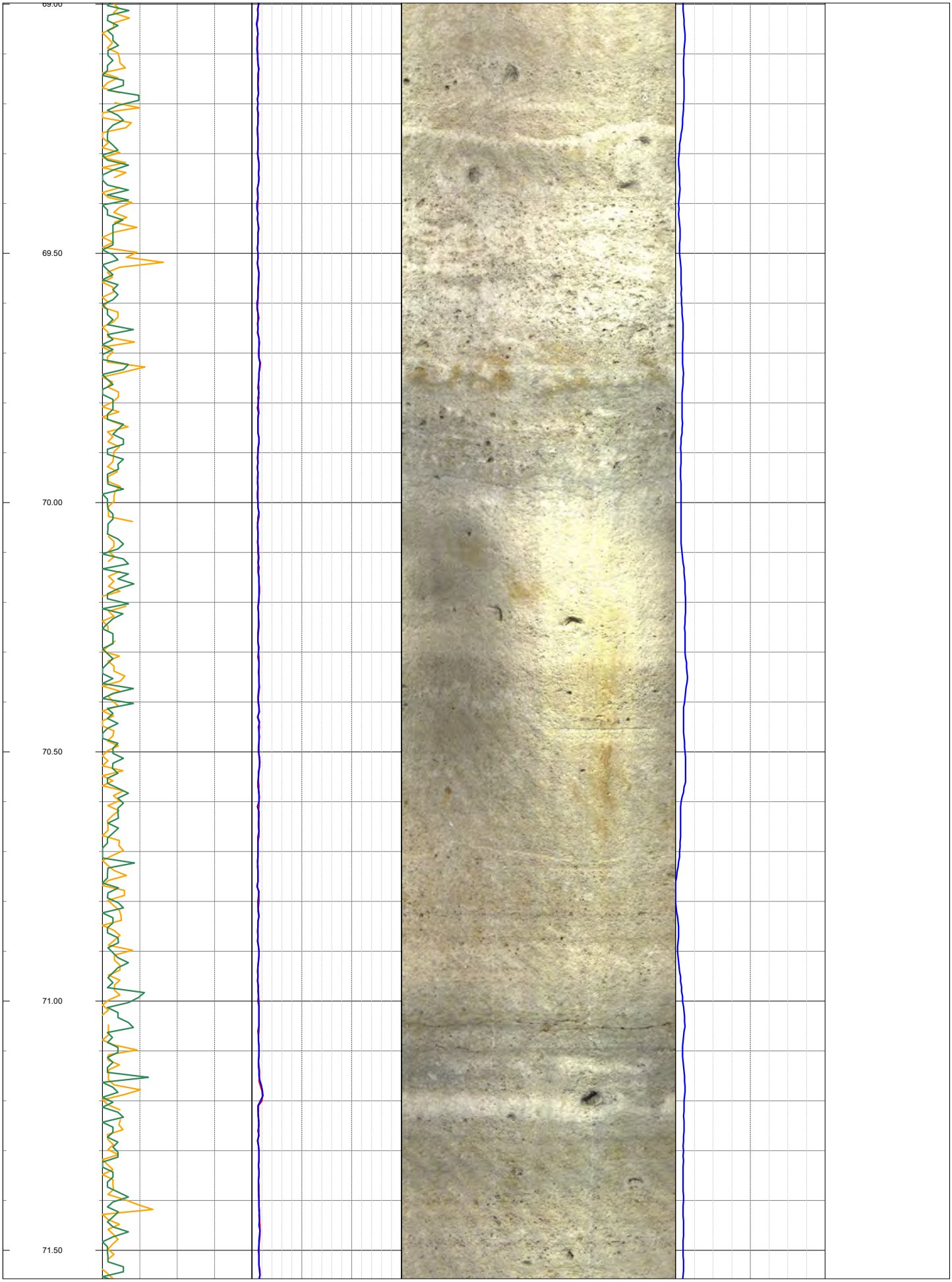

56.50
57.00
57.50
58.00
58.50
56.69
11.7% - 0.1L/s
57.89
58.28

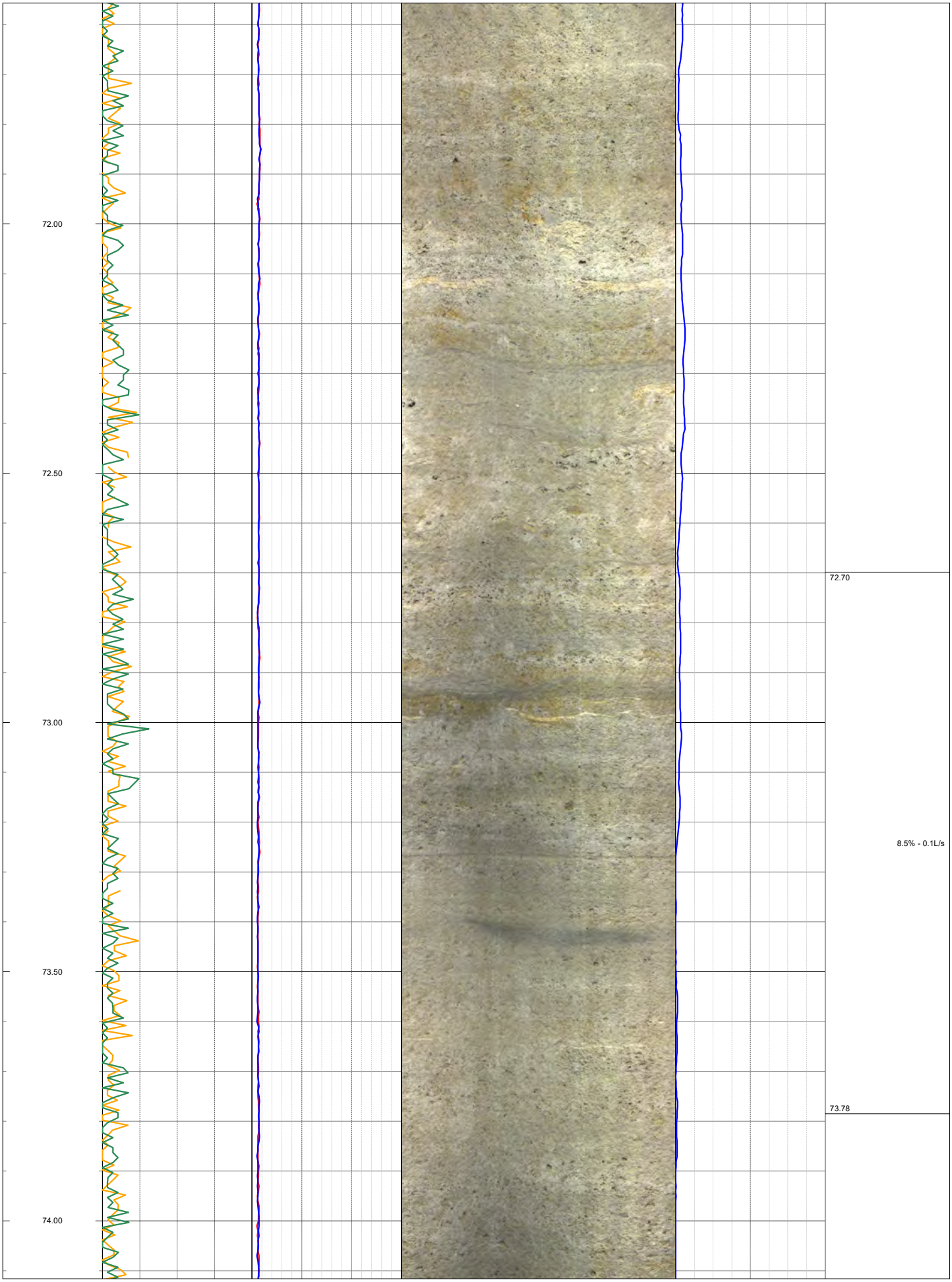

59.00
59.50
60.00
60.50
61.00
47.7% - 0.5L/s
59.80
59.94
8.5% - 0.1L/s
60.69

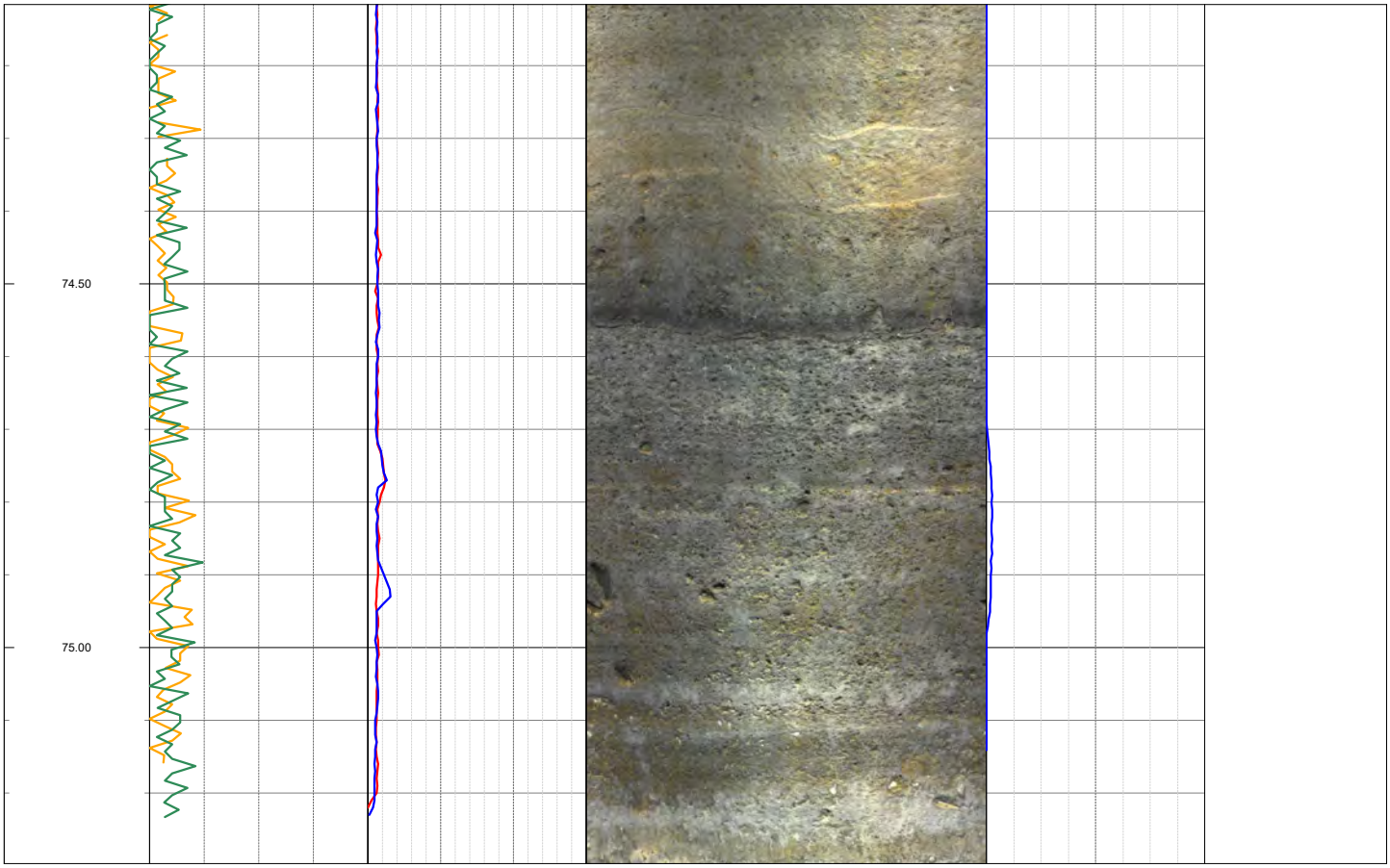

61.50
62.00
62.50
63.00
63.50
62.65
4.8% - 0.0L/s


64.00
64.50
65.00
65.01
65.50
66.00


66.50
67.00
67.50
68.00
68.50


69.50
70.00
70.50
71.00
71.50


72.00
72.50
73.00
73.50
74.00
72.70
8.5% - 0.1L/s
73.78


74.50
75.00

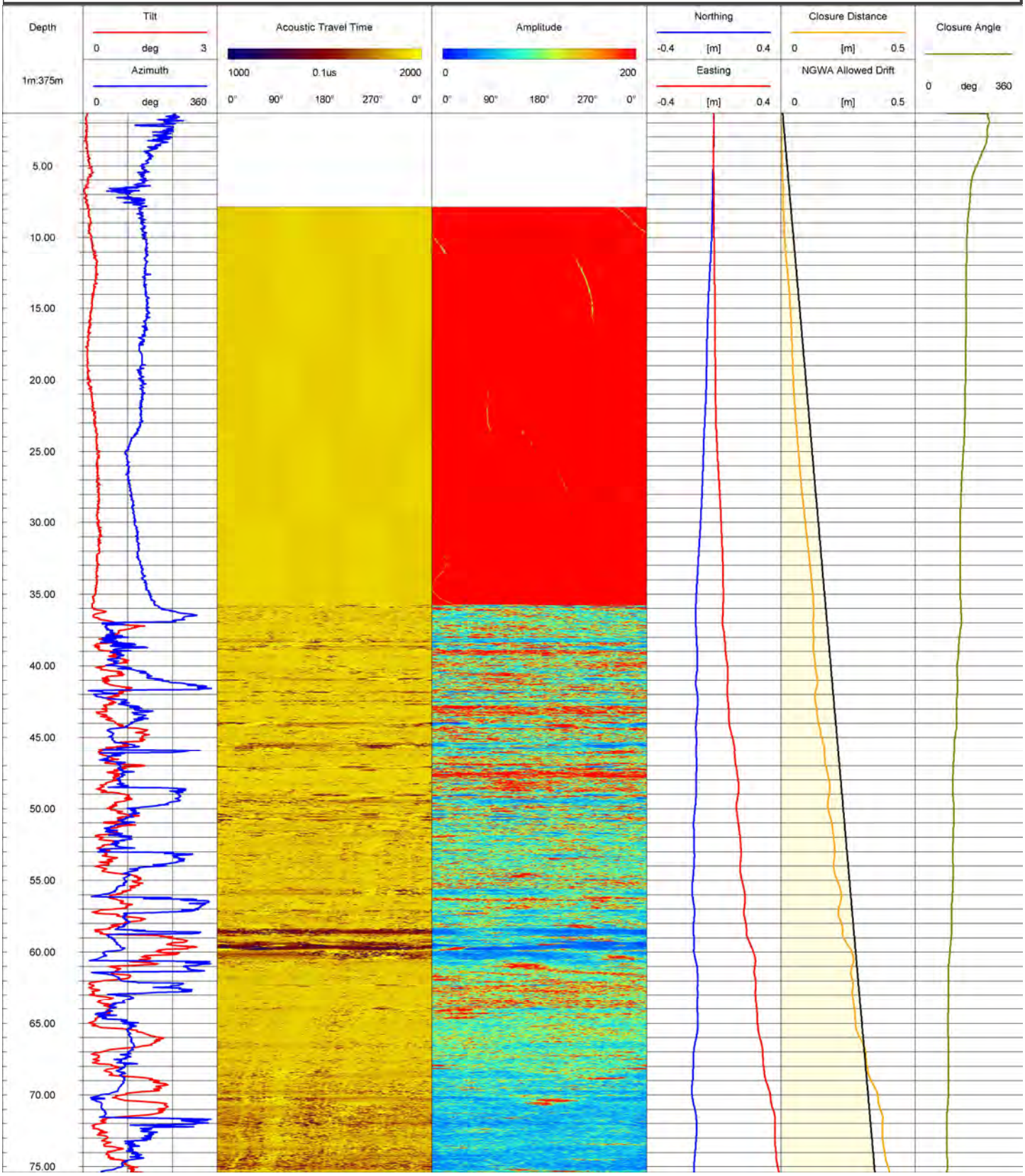
Lotowater TECHNICAL SERVICES INC.

Plumbness & Alignment

CLIENT

Township of Centre Wellingotn

LOCATION	*8282 Wellington 19, Fergus, ON*	**BOREHOLE**	**Belwood Golf Club**
DEPTH REF.	*Top of casing (0.75 m agl)*	**PROJECT #**	*313-018*
WATER LEVEL	*7.82*	**LOG DATE**	*2025-06-09*
DRILL METHOD	*n/a*	**LOGGED BY**	*RH*



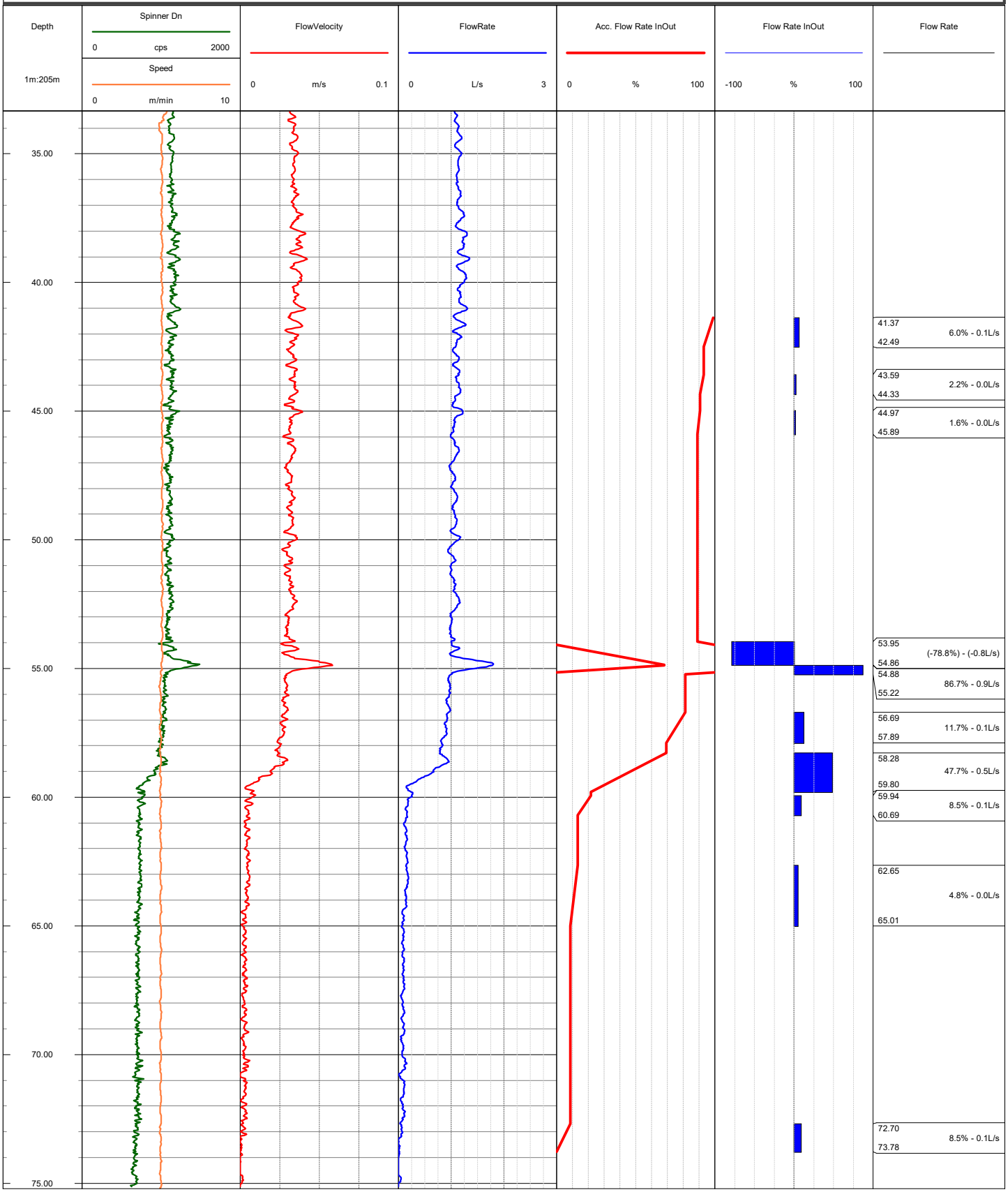
Lotowater TECHNICAL SERVICES INC.

Pumping Flow Profile (1 L/s)

CLIENT

Township of Centre Wellington

LOCATION	*8282 Wellington 19, Fergus, ON*	**BOREHOLE**	**TW25-2**
DEPTH REF.	*Top of casing (0.76 m agl)*	**PROJECT #**	*313-018*
WATER LEVEL	*9.68 m before pumping*	**LOG DATE**	*2025-11-17*
DRILL METHOD	*n/a*	**LOGGED BY**	*RH*



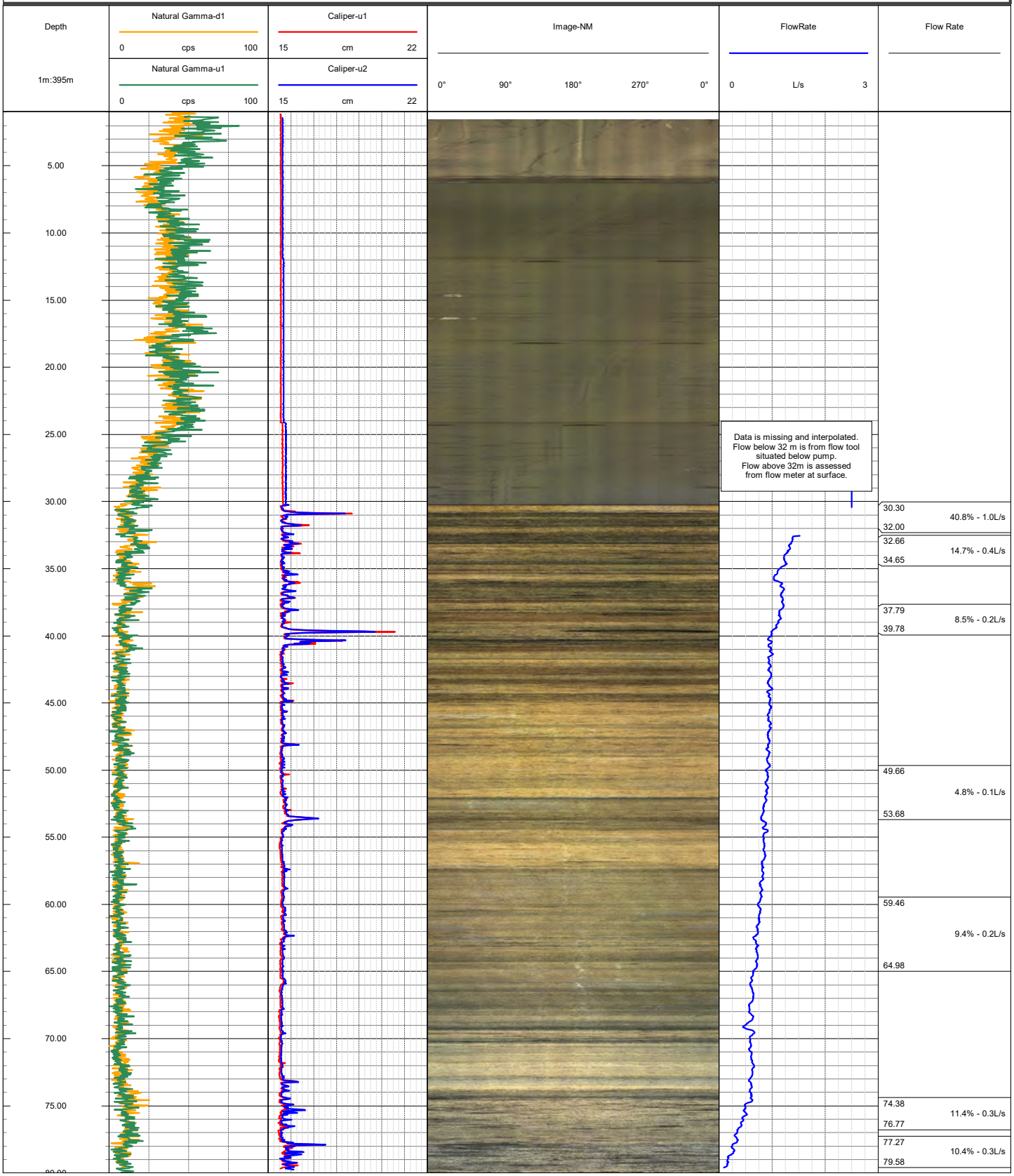
Lotowater TECHNICAL SERVICES INC.

Geophysical Logging Summary

CLIENT

Township of Centre Wellington

LOCATION	*8282 Wellington 19 Fergus, ON*	**BOREHOLE**	**PW25-3**
DEPTH REF.	*Top of casing (0.75 m agl)*	**PROJECT #**	*313-018*
WATER LEVEL	*6.13 m (static)*	**LOG DATE**	*2025-11-13*
DRILL METHOD	*n/a*	**LOGGED BY**	*RH*



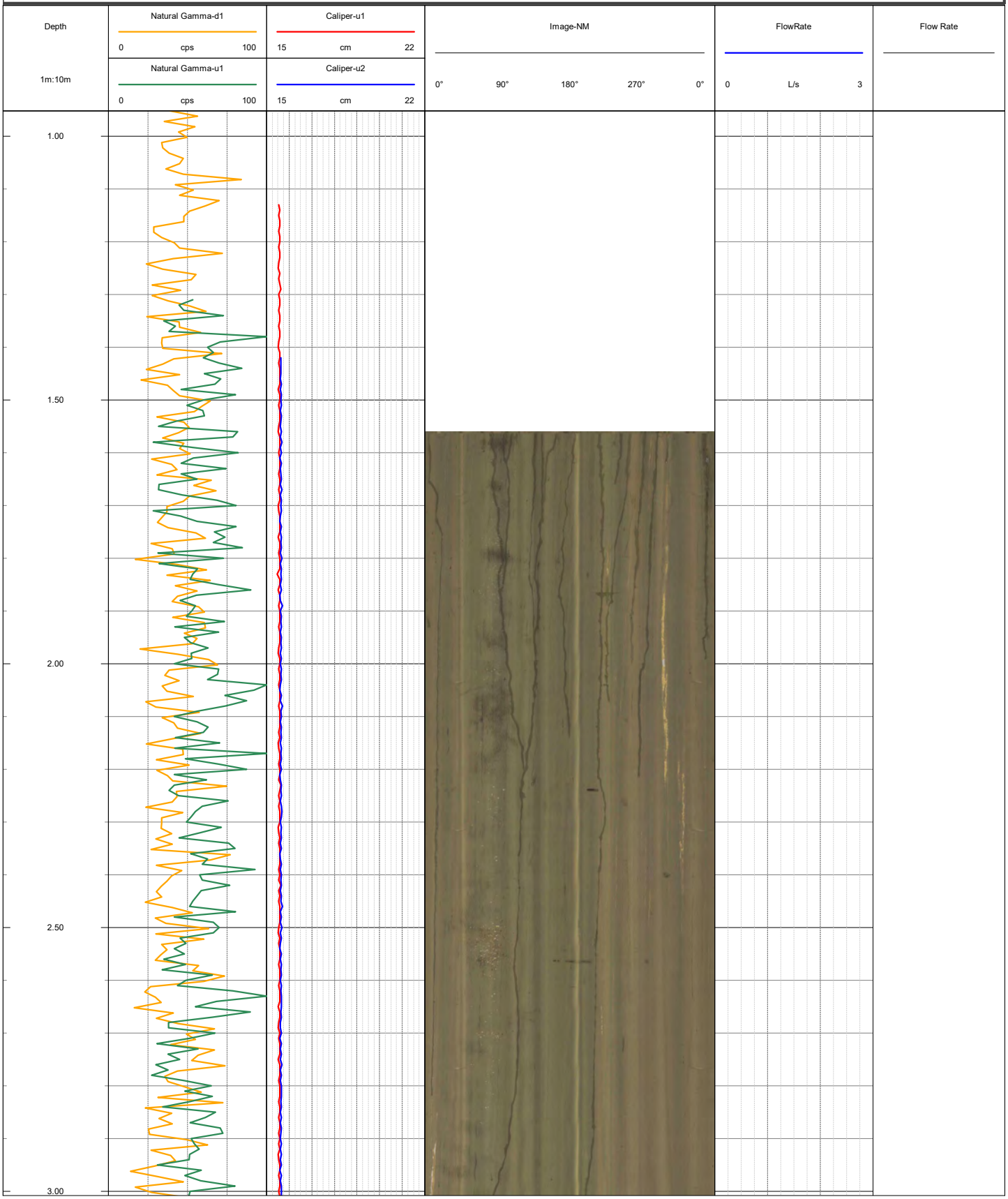
Lotowater TECHNICAL SERVICES INC.

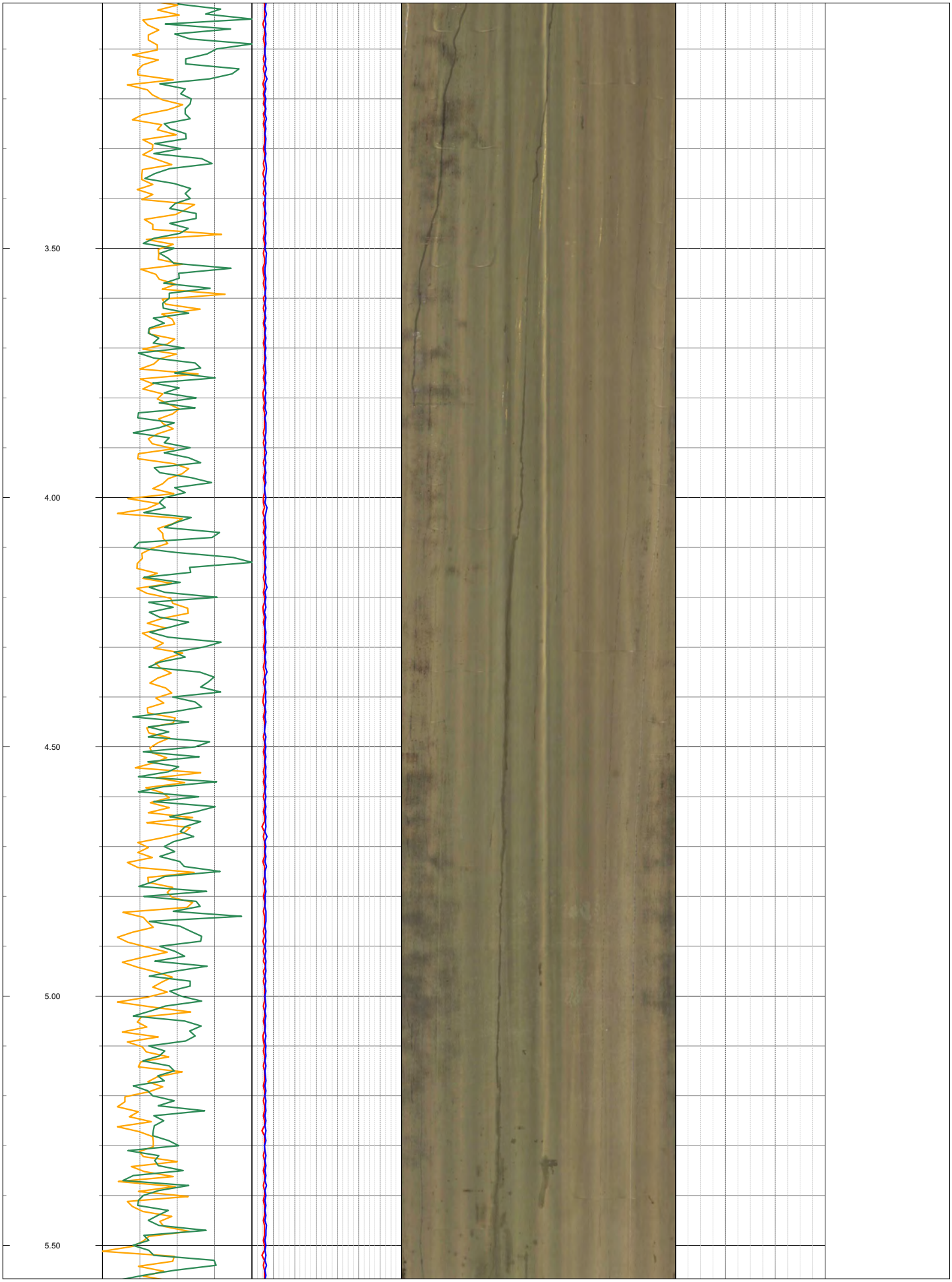
Geophysical Logging Summary

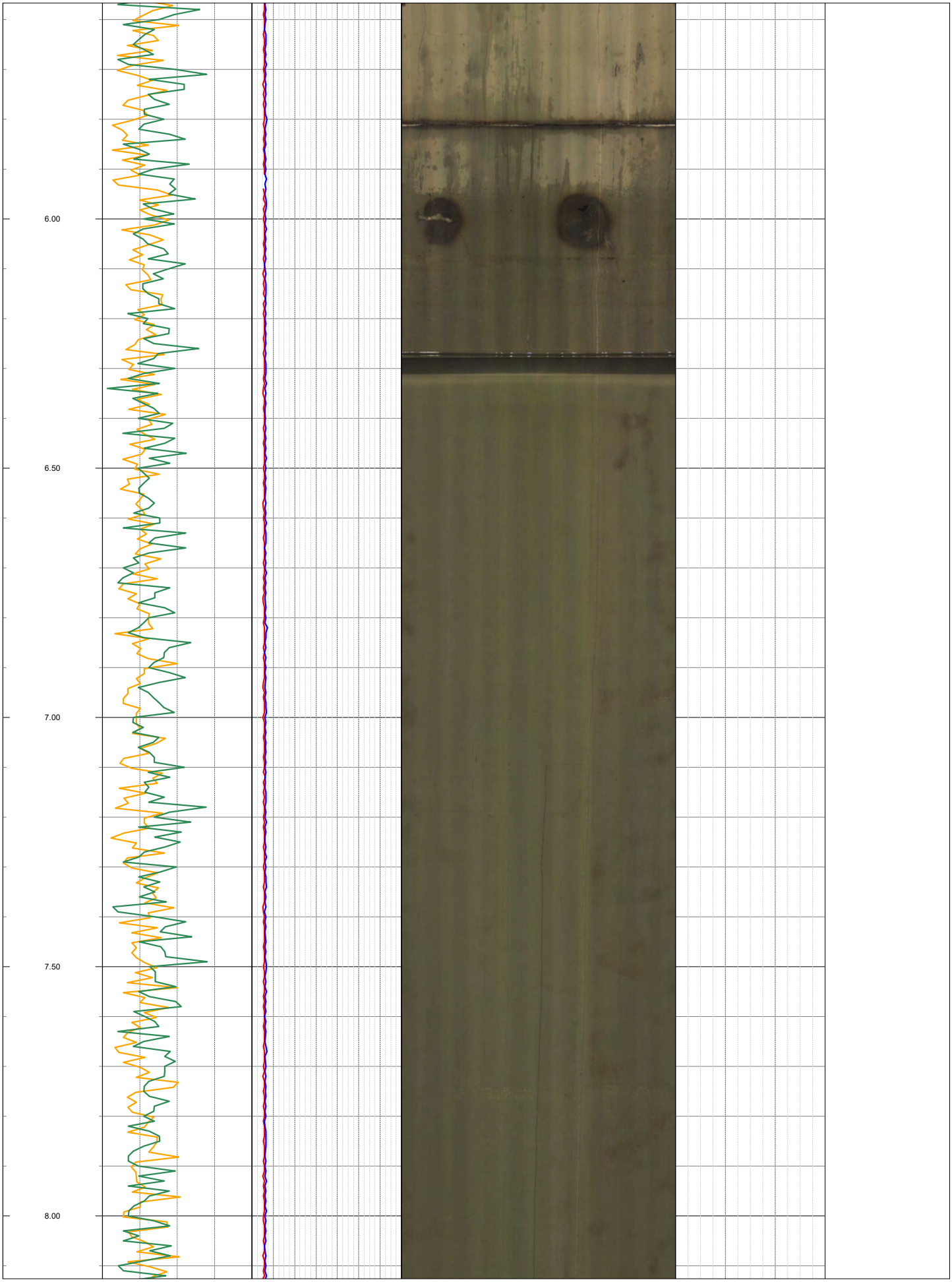
CLIENT

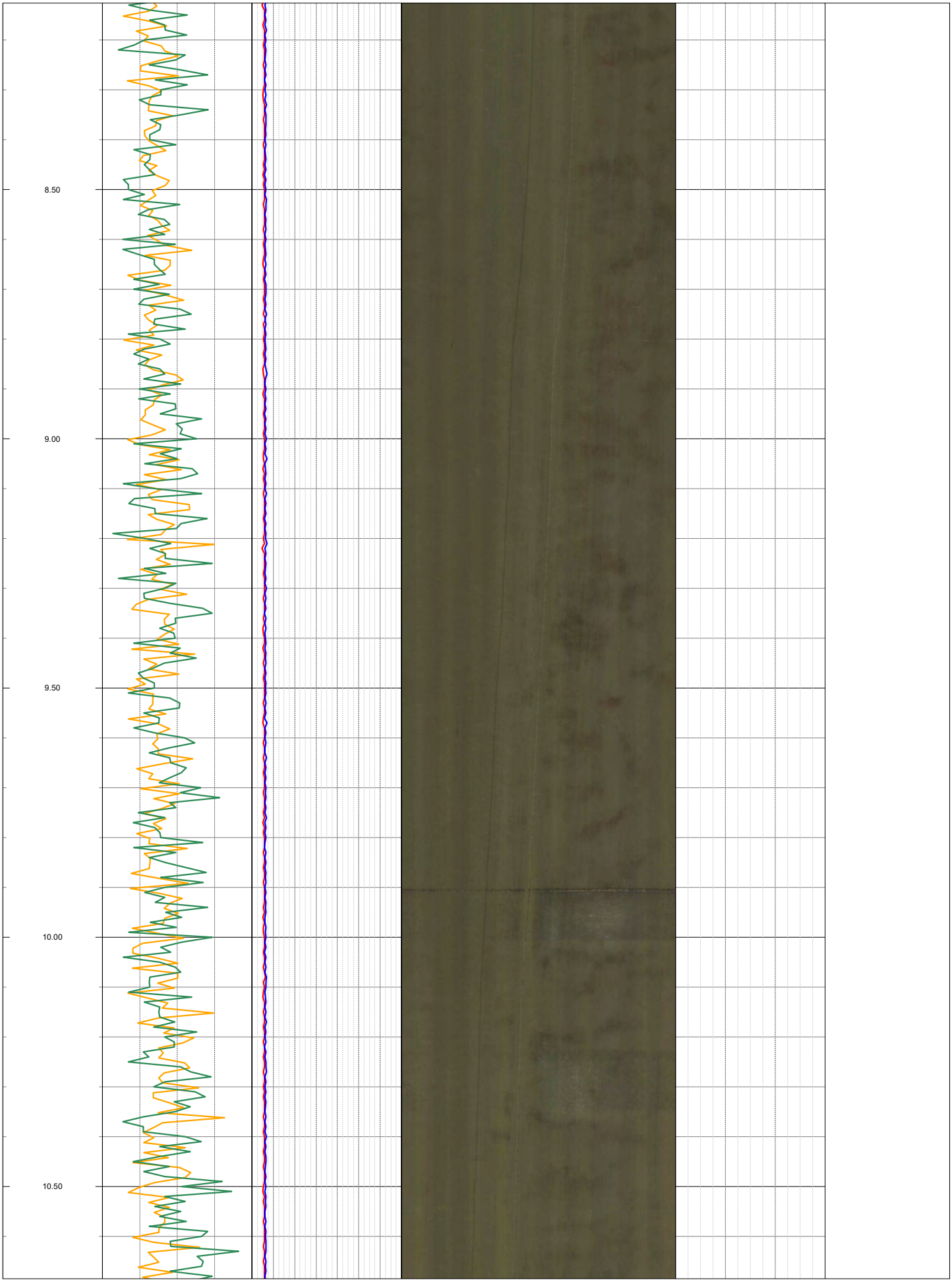
Township of Centre Wellington

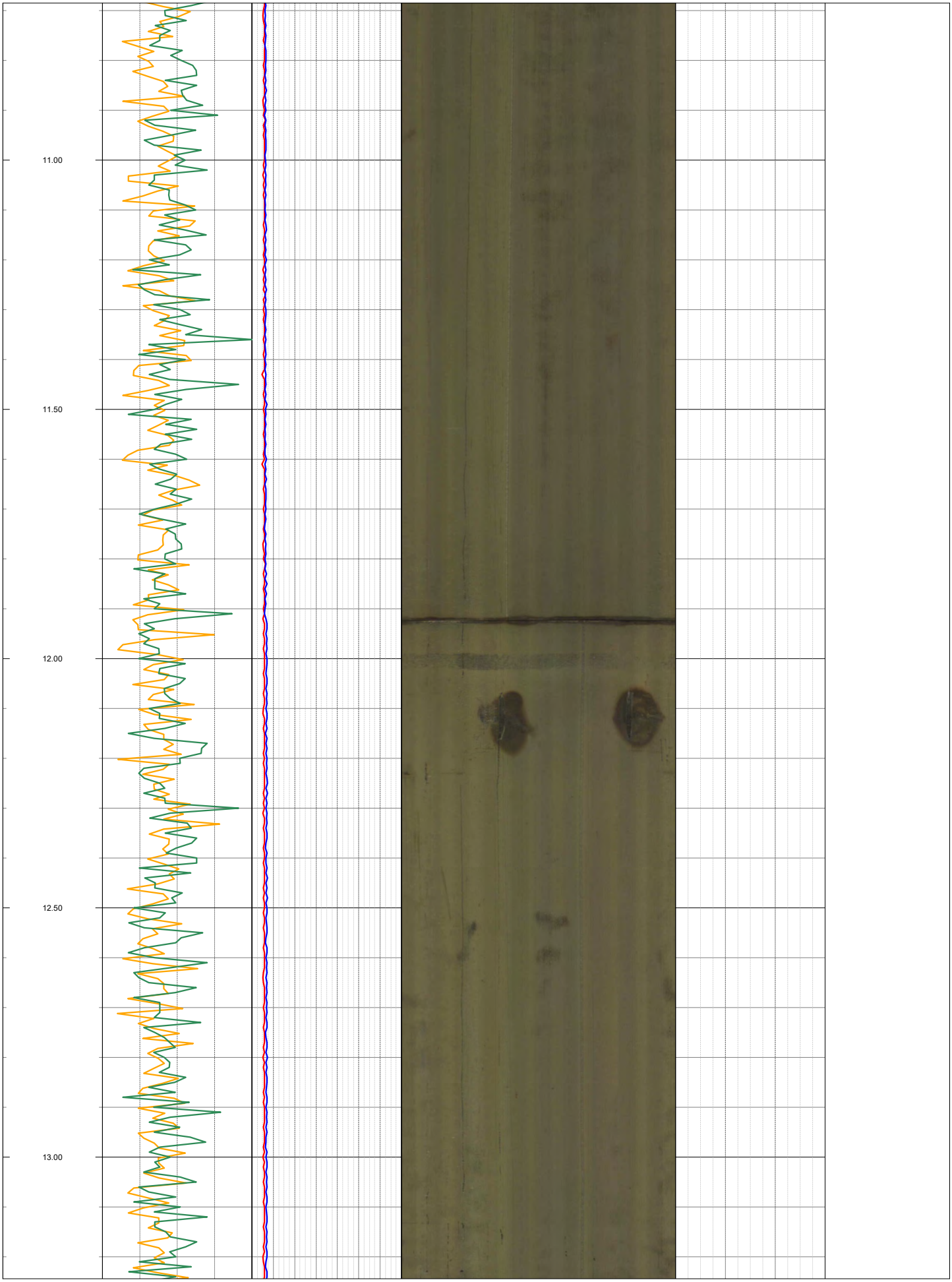
LOCATION	*8282 Wellington 19 Fergus, ON*	**BOREHOLE**	**PW25-3**
DEPTH REF.	*Top of casing (0.75 m agl)*	**PROJECT #**	*313-018*
WATER LEVEL	*6.13 m (static)*	**LOG DATE**	*2025-11-13*
DRILL METHOD	*n/a*	**LOGGED BY**	*RH*

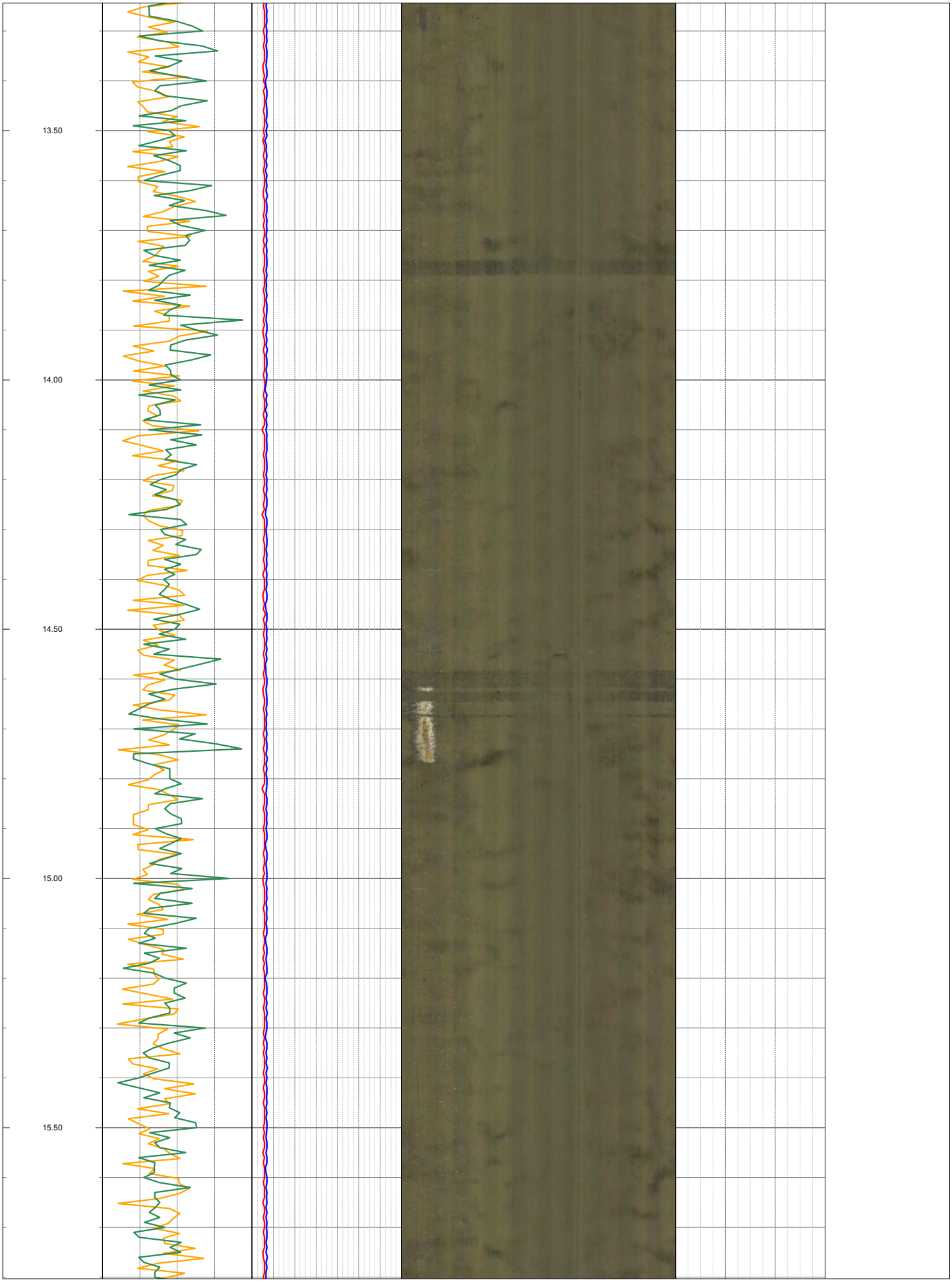


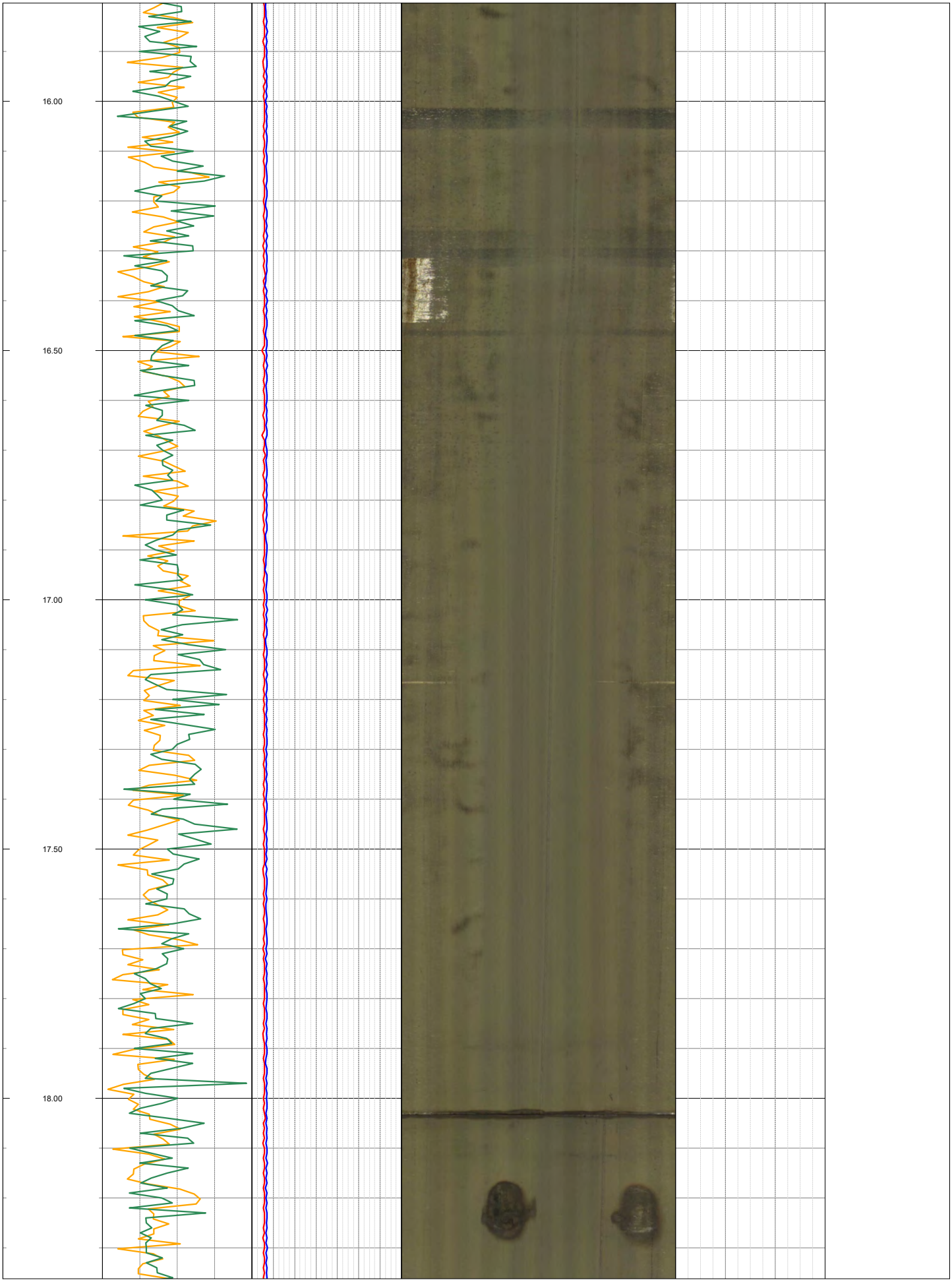

3.50
4.00
4.50
5.00
5.50

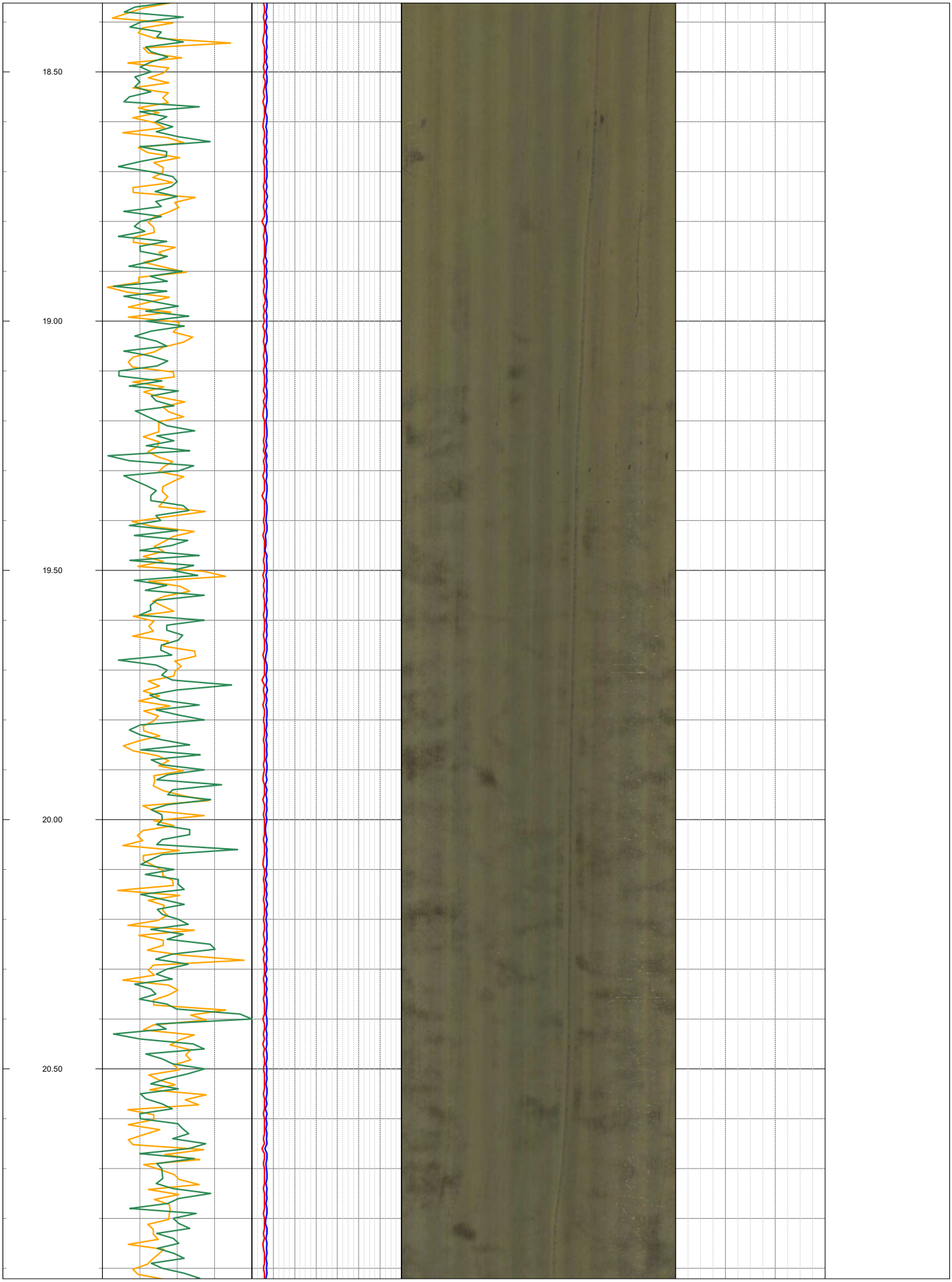

6.00
6.50
7.00
7.50
8.00

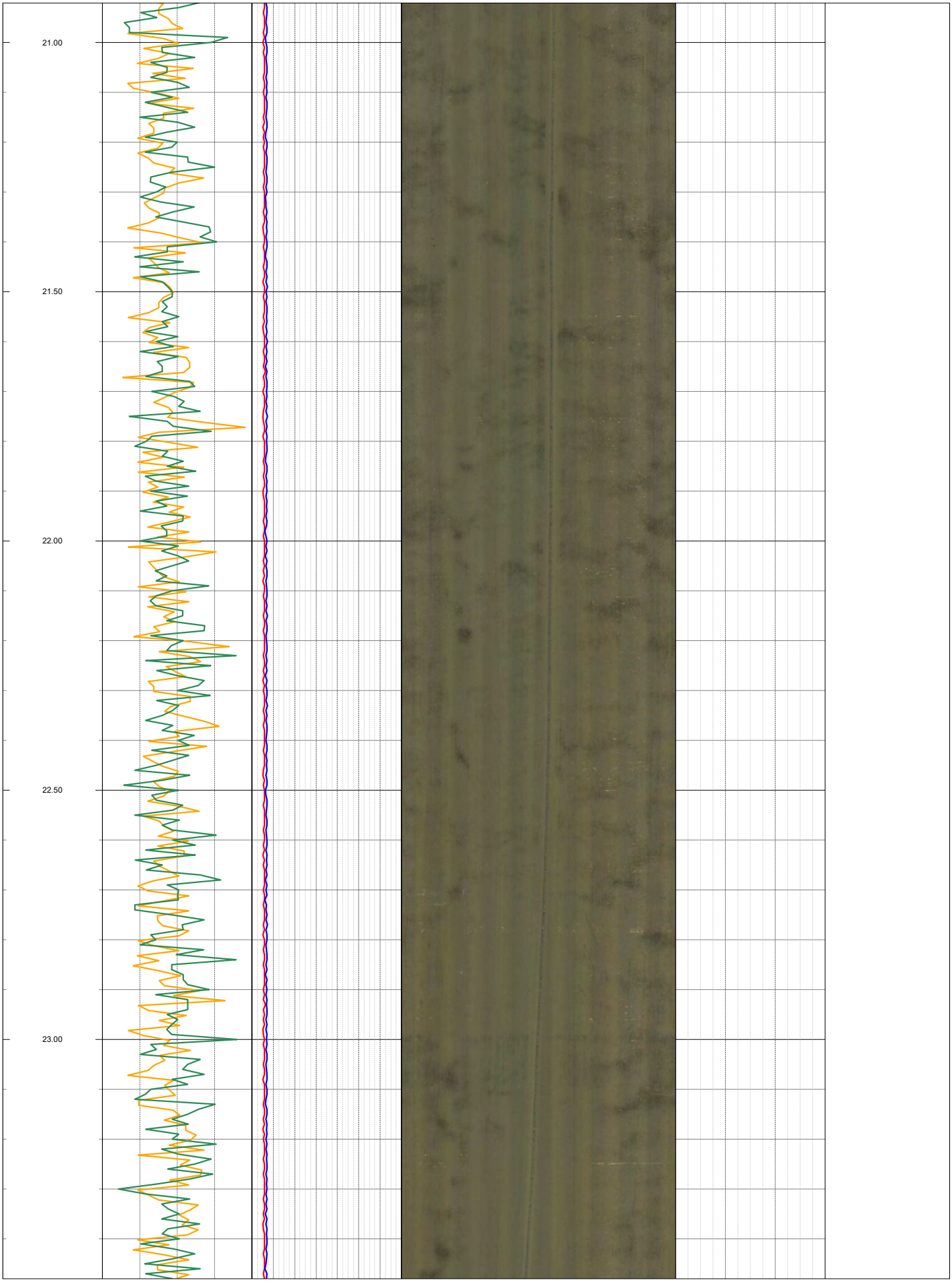

8.50
9.00
9.50
10.00
10.50

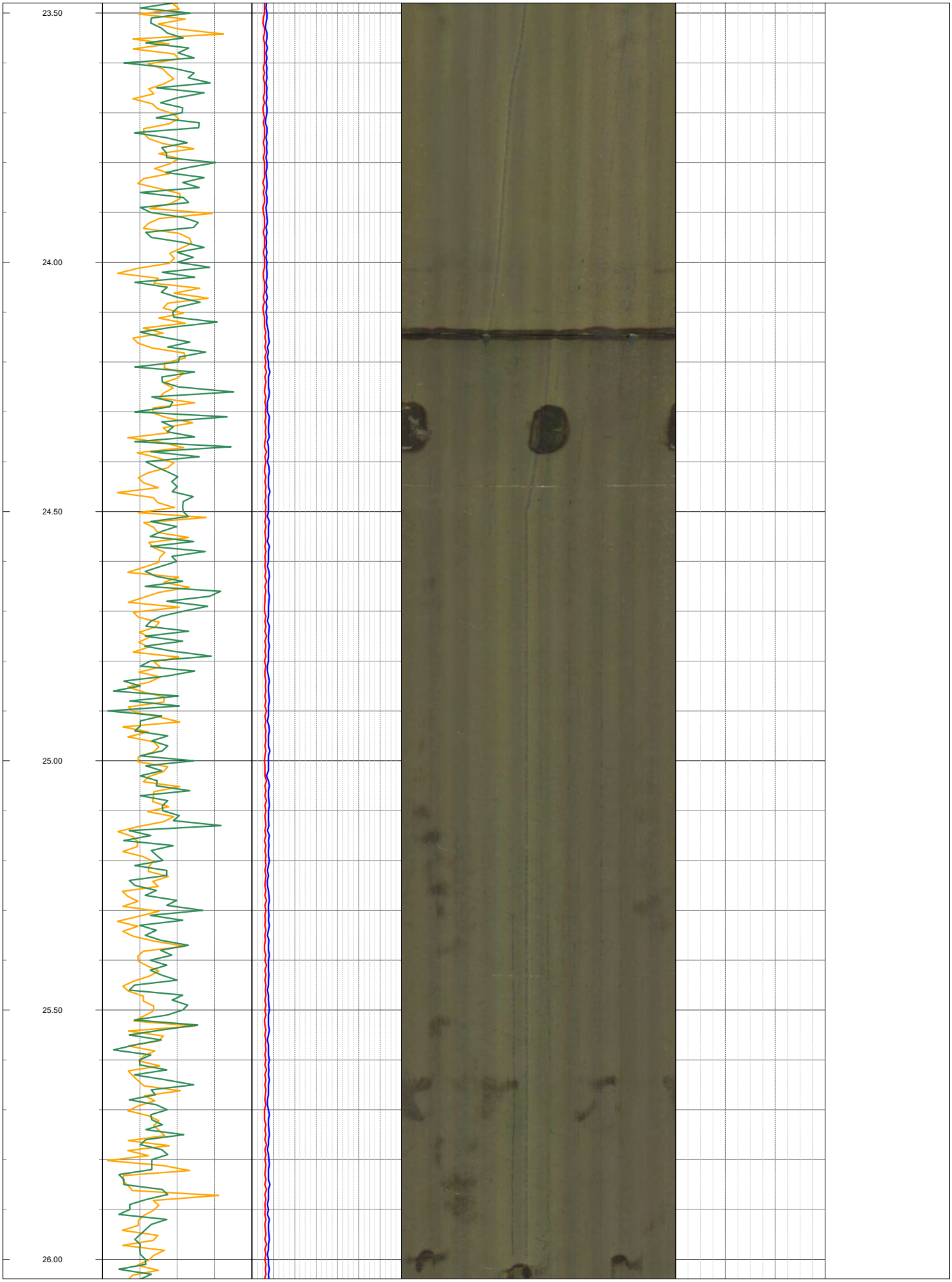

11.00
11.50
12.00
12.50
13.00

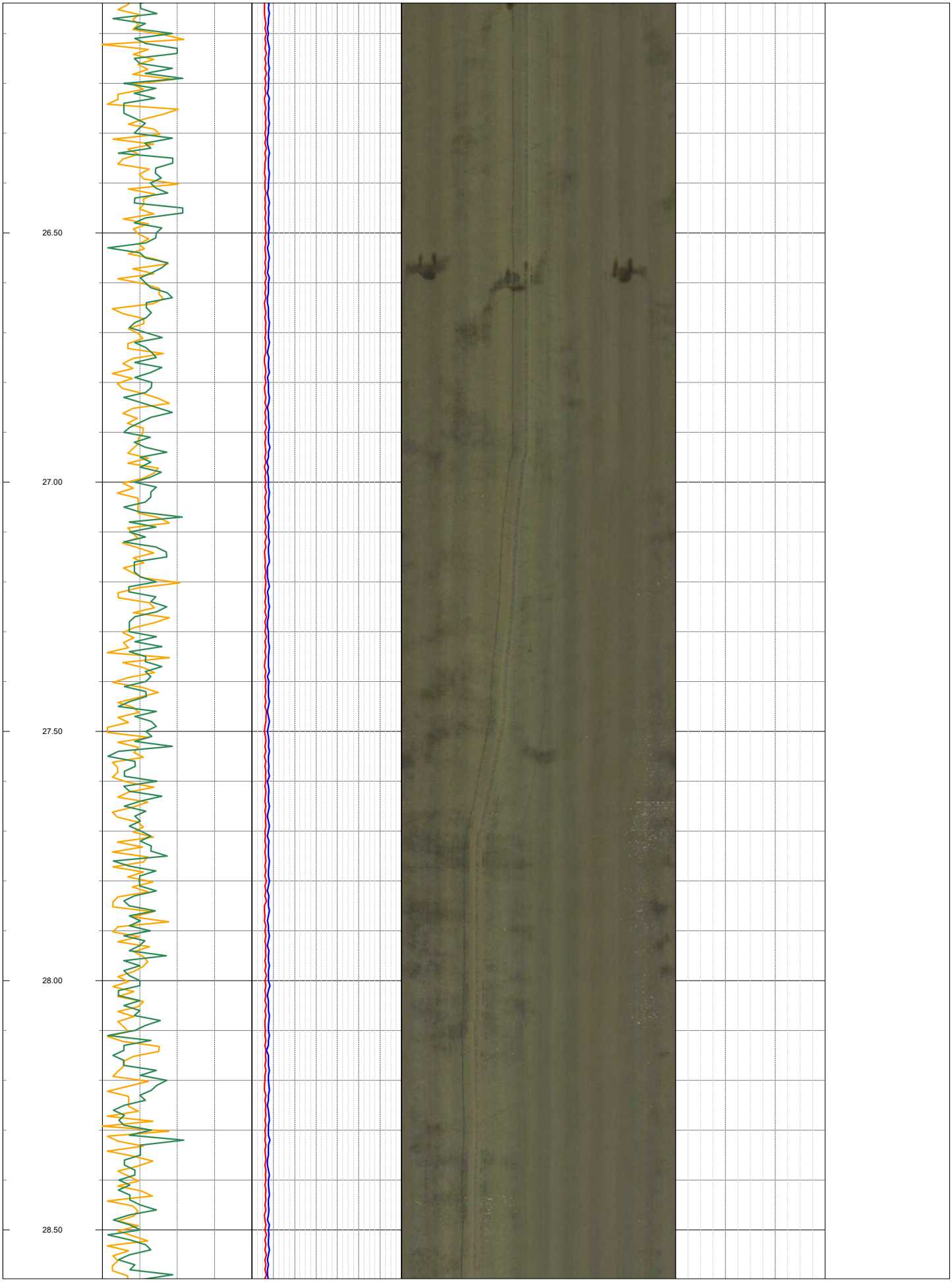

13.50
14.00
14.50
15.00
15.50

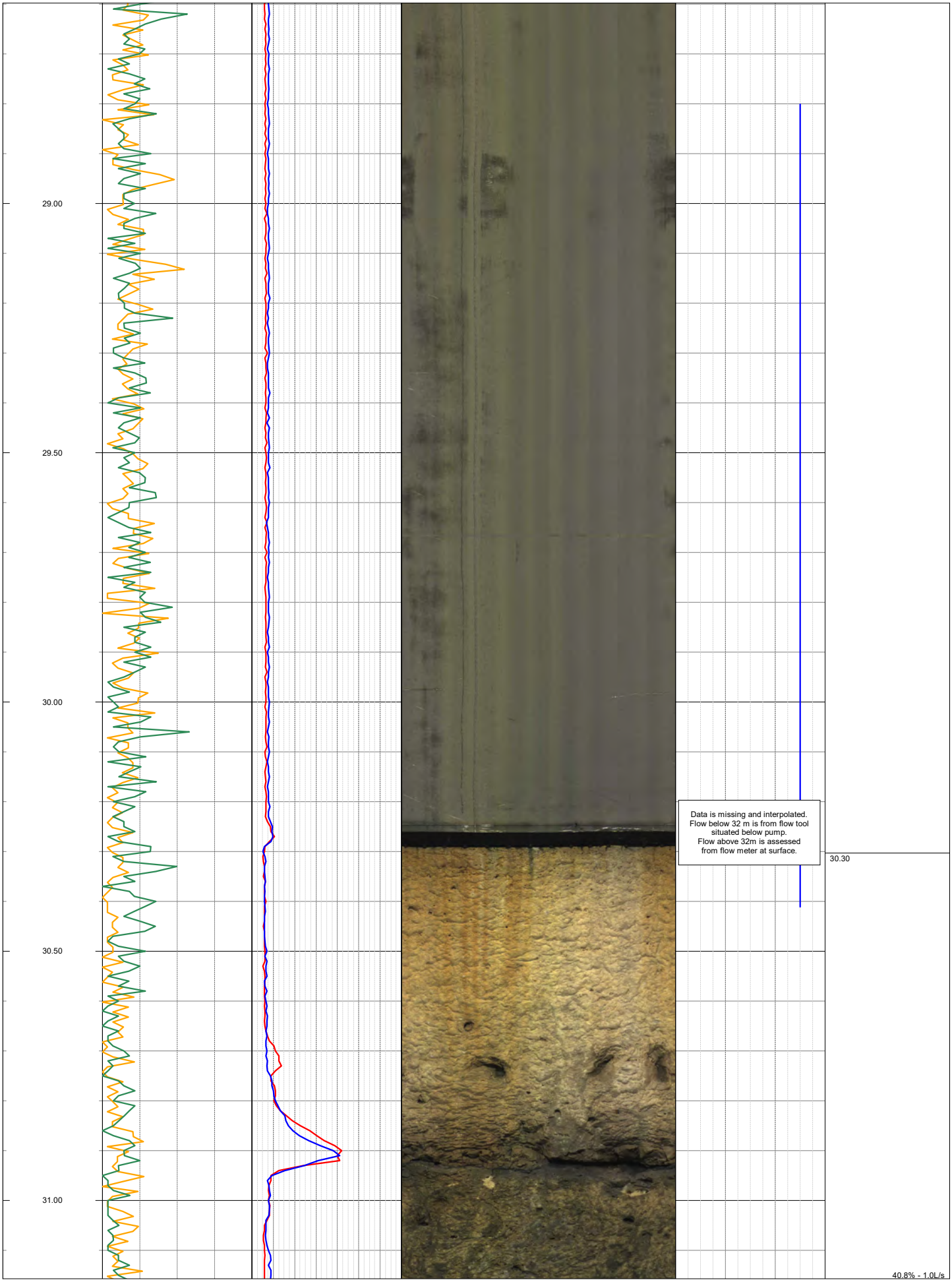

16.00
16.50
17.00
17.50
18.00

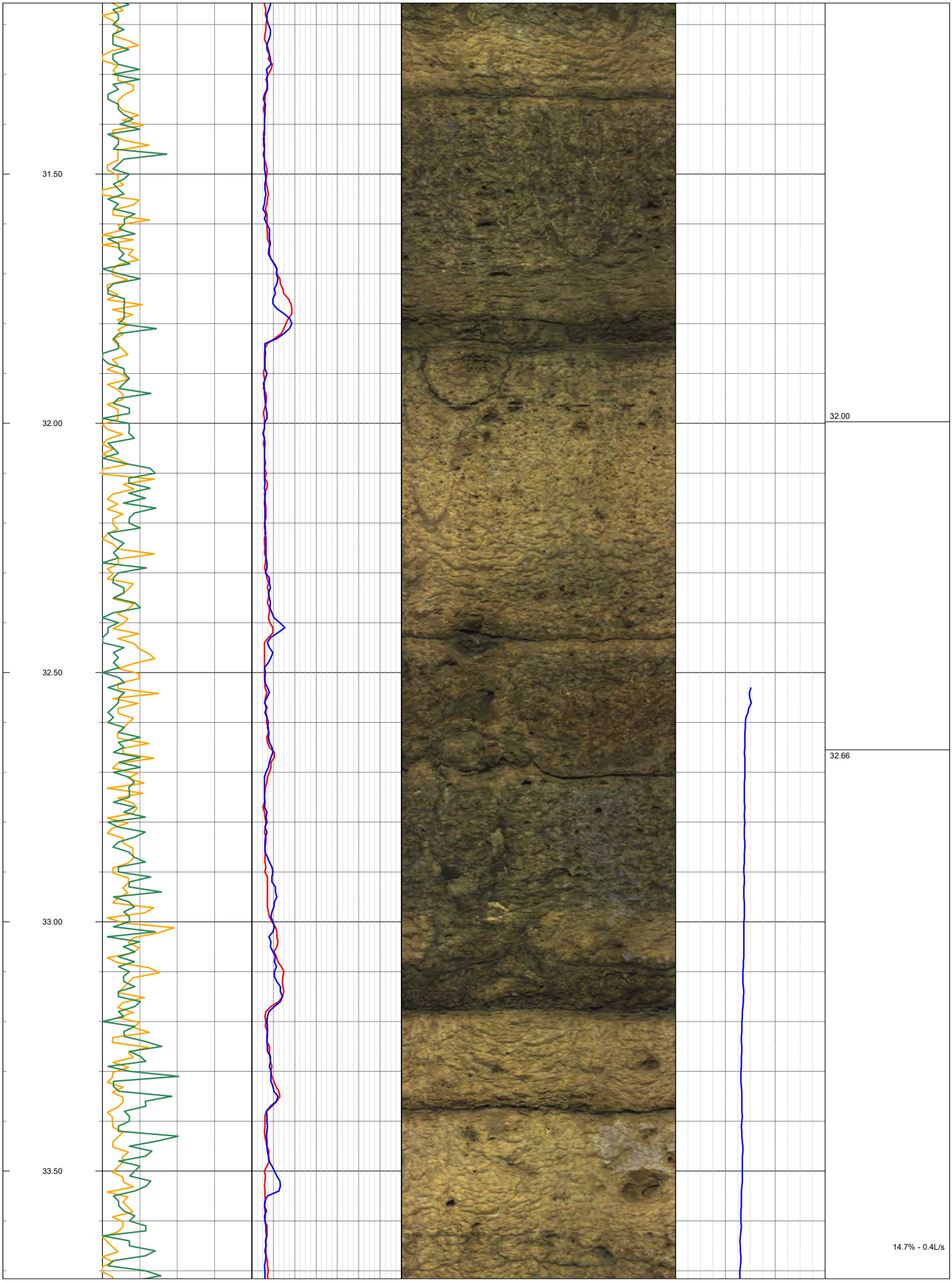

18.50
19.00
19.50
20.00
20.50

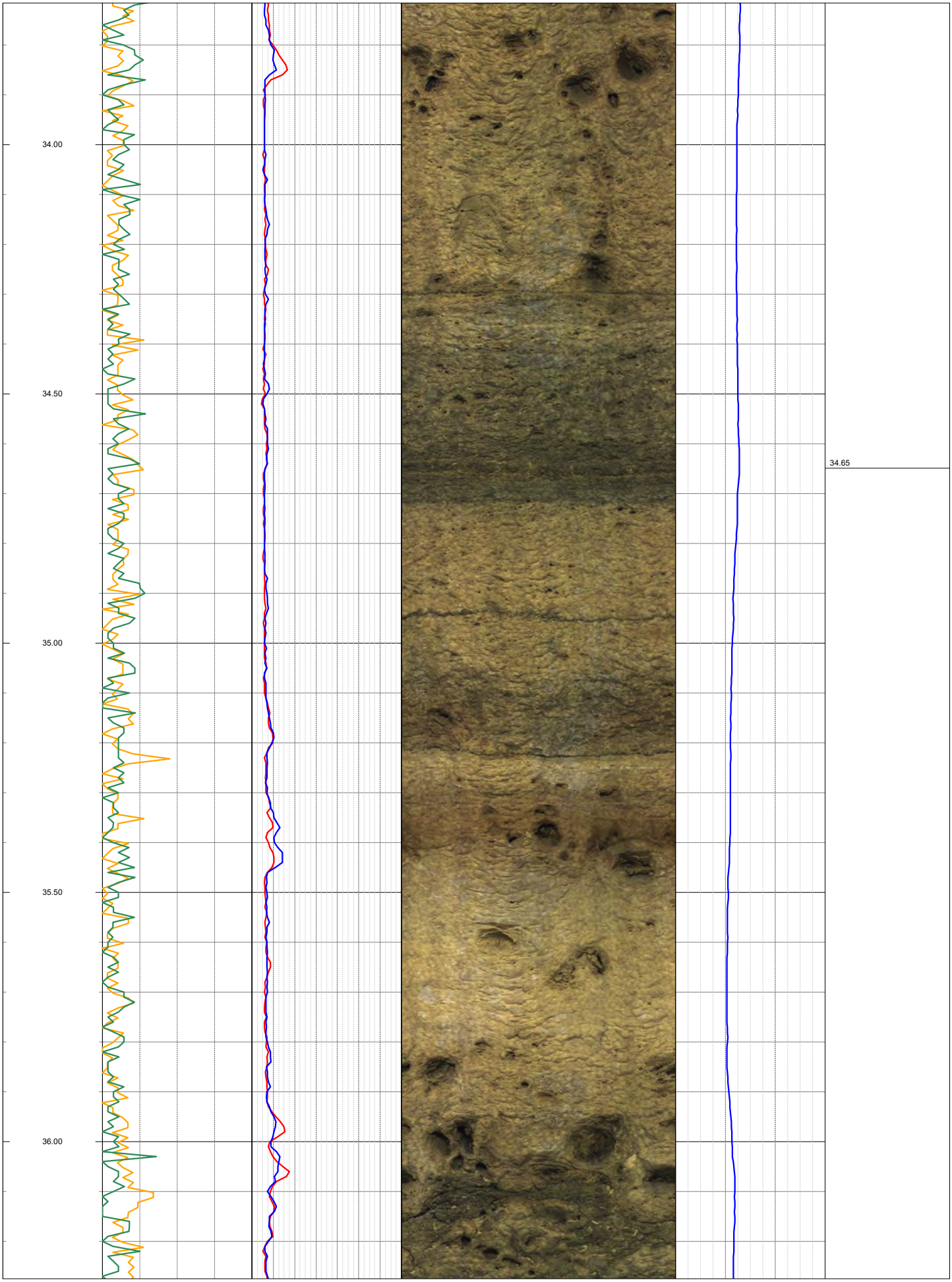

21.00
21.50
22.00
22.50
23.00

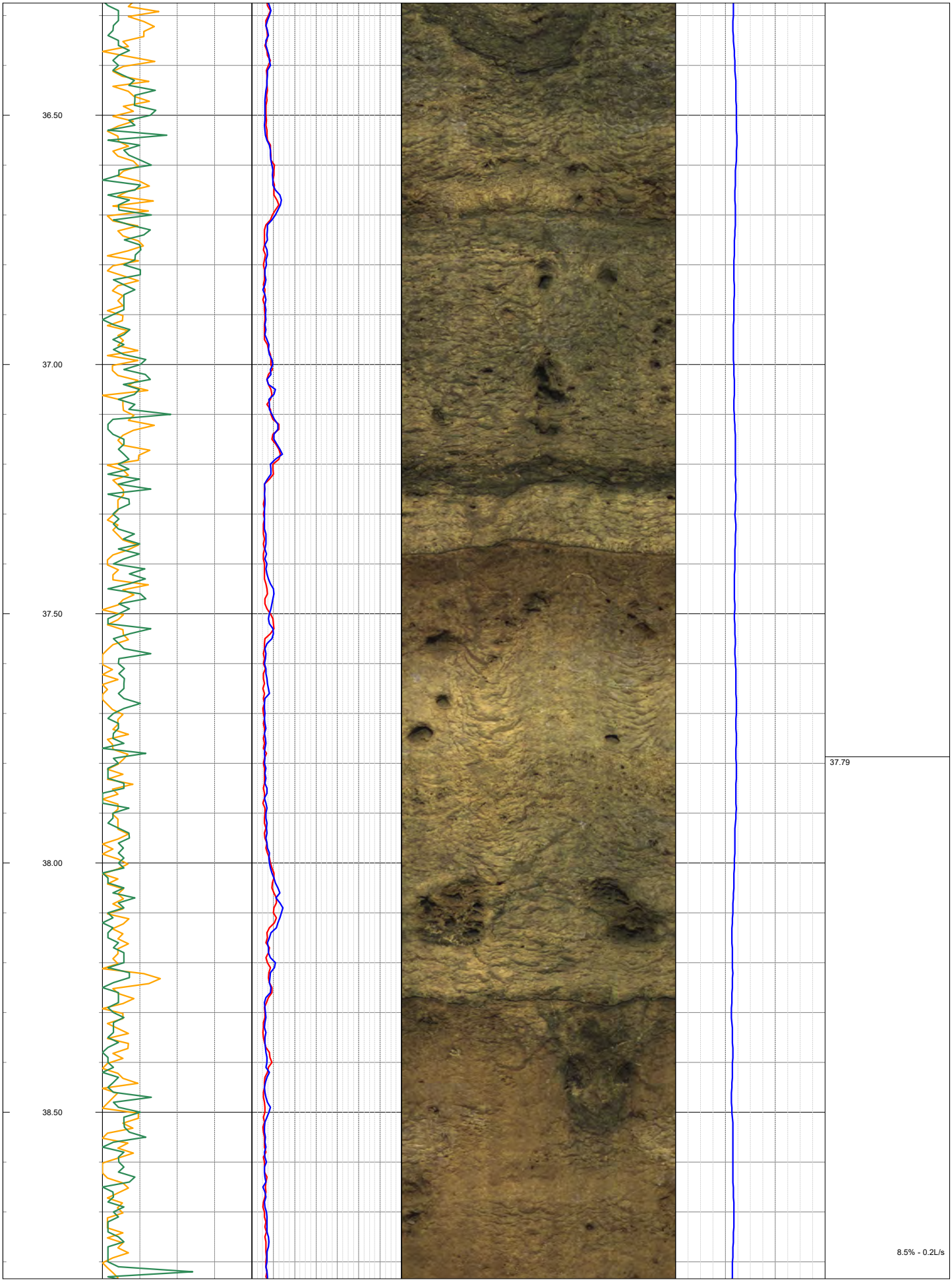

23.50
24.00
24.50
25.00
25.50
26.00

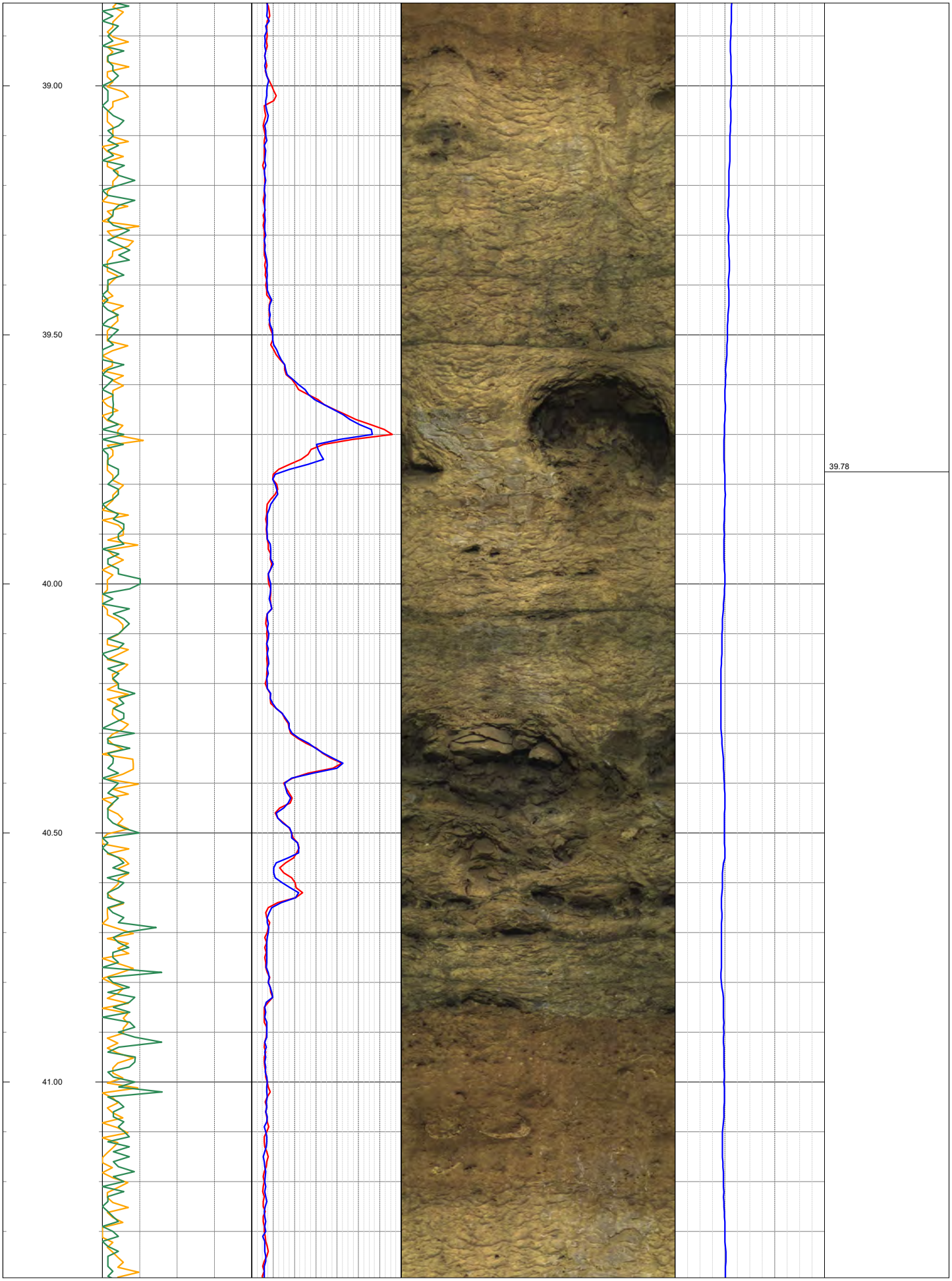

26.50
27.00
27.50
28.00
28.50

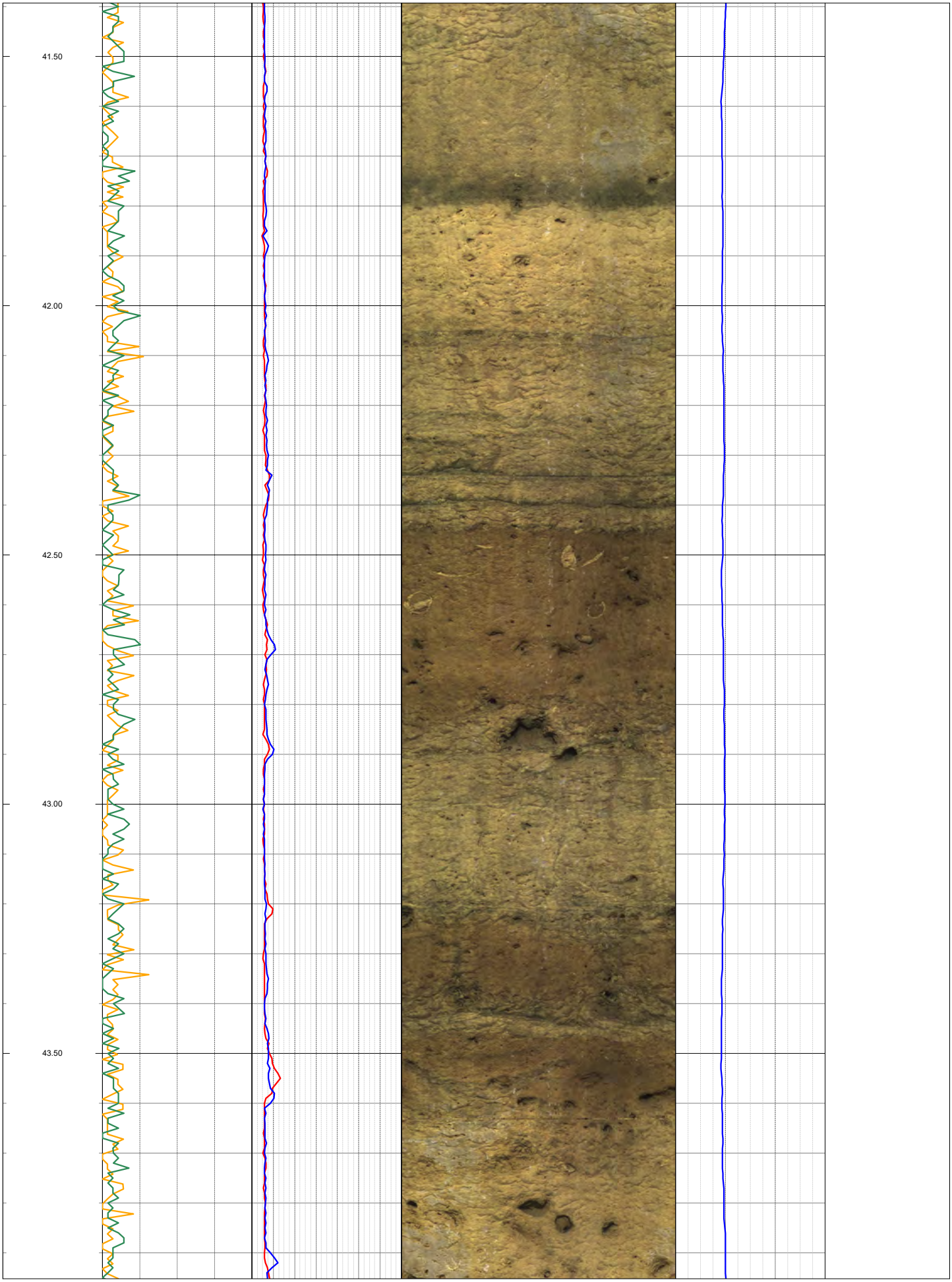

29.00
29.50
30.00
30.50
31.00
Data is missing and interpolated.
Flow below 32 m is from flow tool
situated below pump.
Flow above 32m is assessed
from flow meter at surface.
30.30
40.8% - 1.0L/s

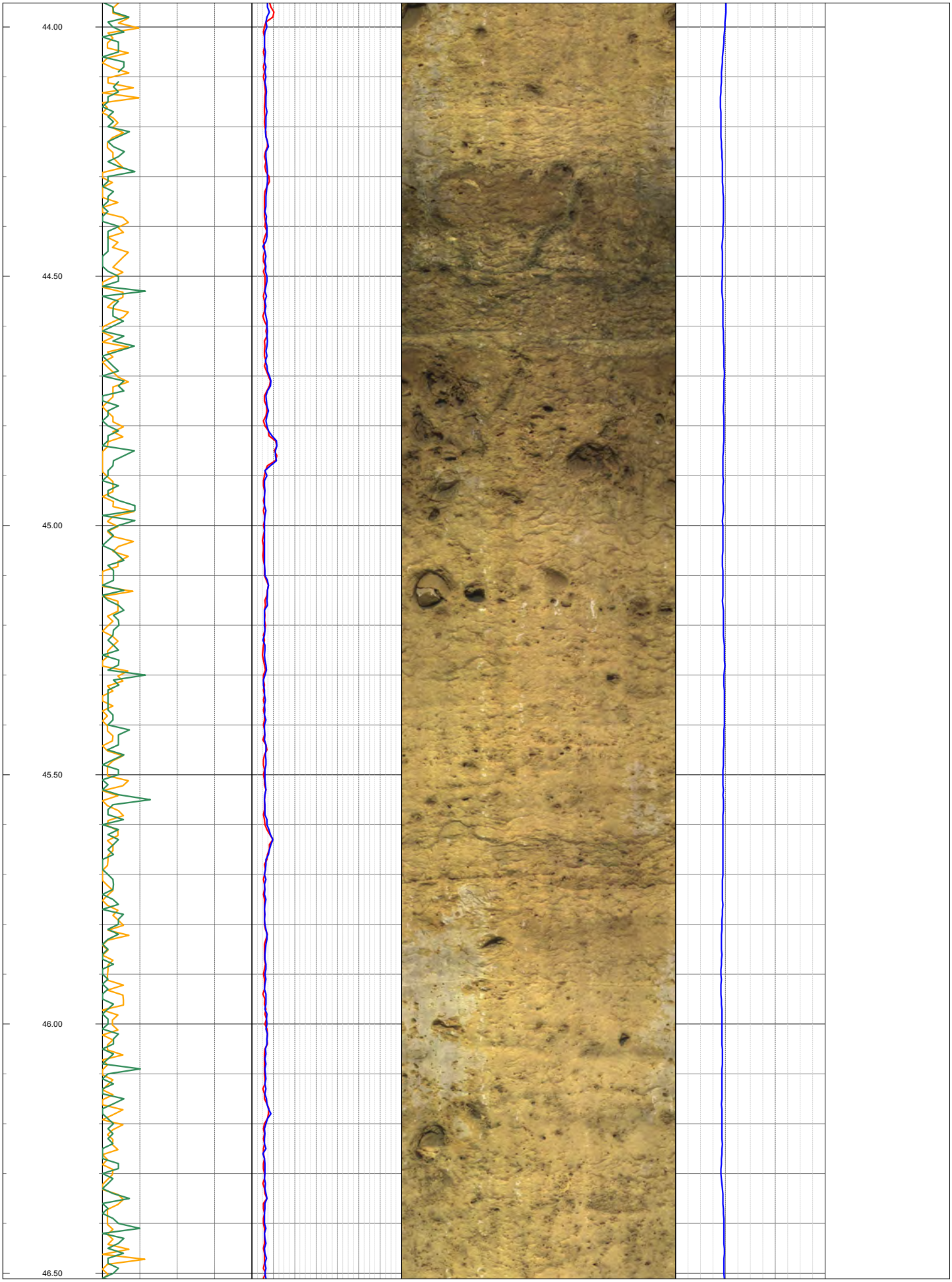

31.50
32.00
32.50
33.00
33.50
32.00
32.66
14.7% - 0.4L/s

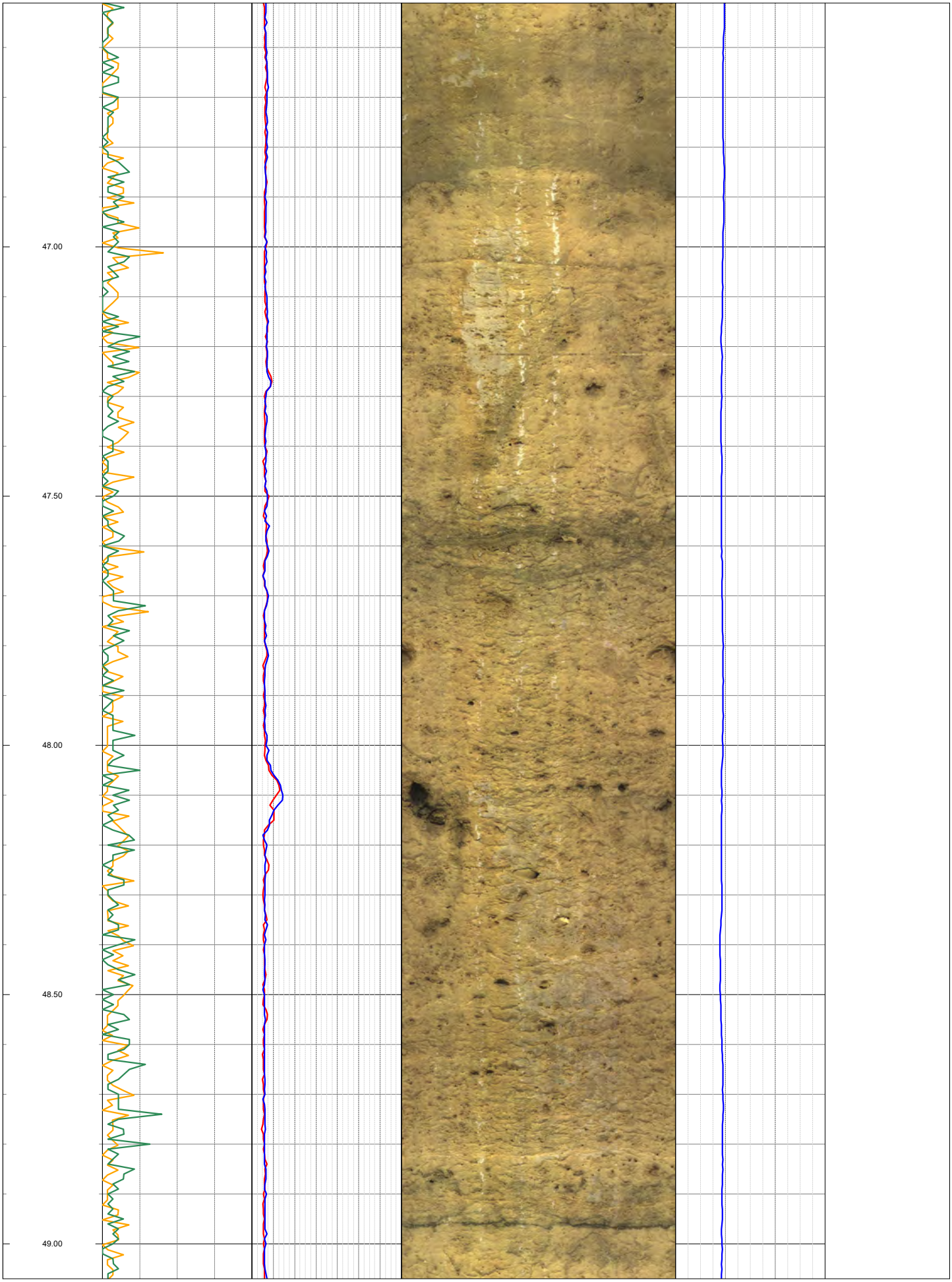

34.00
34.50
34.65
35.00
35.50
36.00

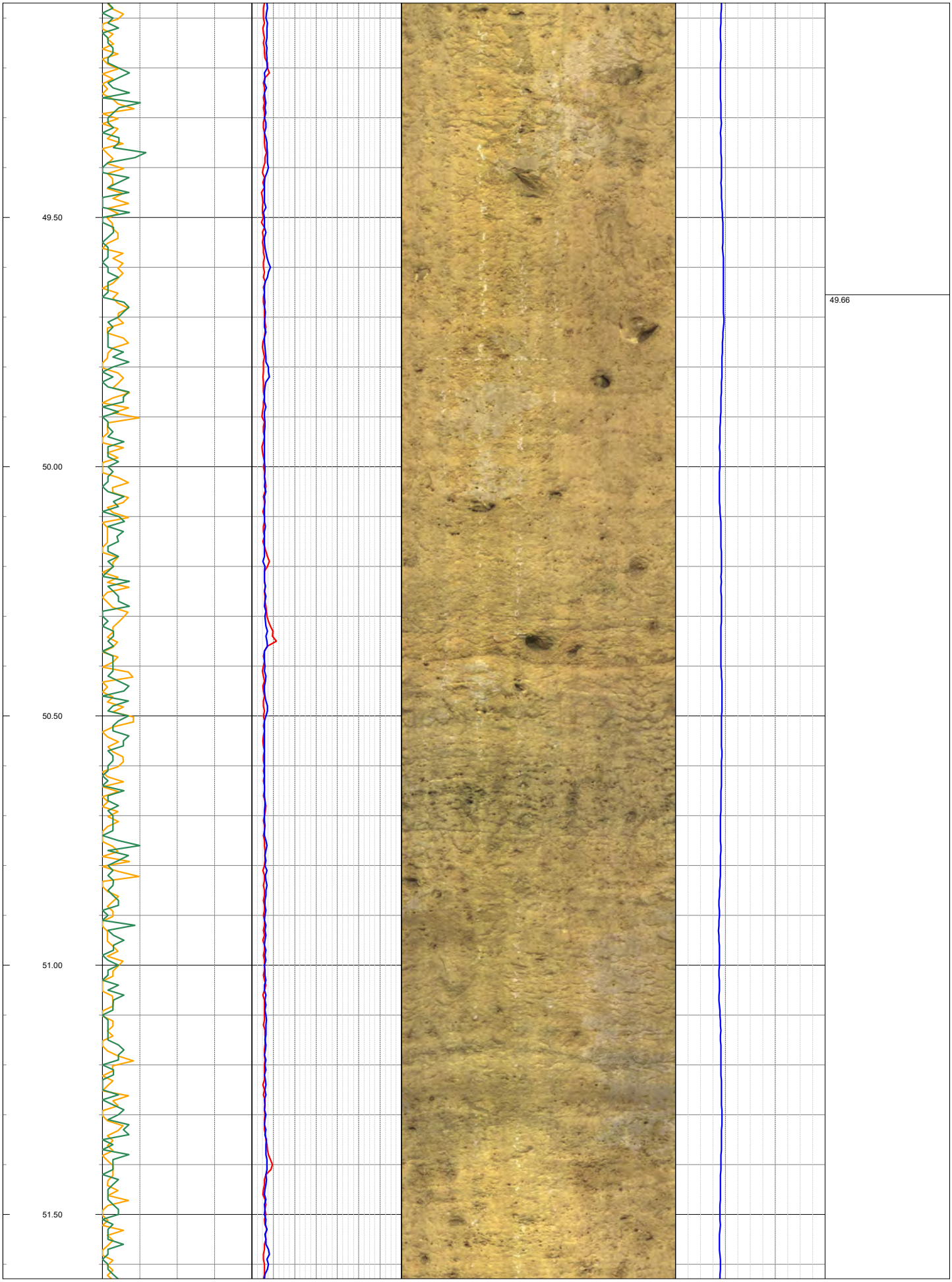

36.50
37.00
37.50
37.79
38.00
38.50
8.5% - 0.2L/s

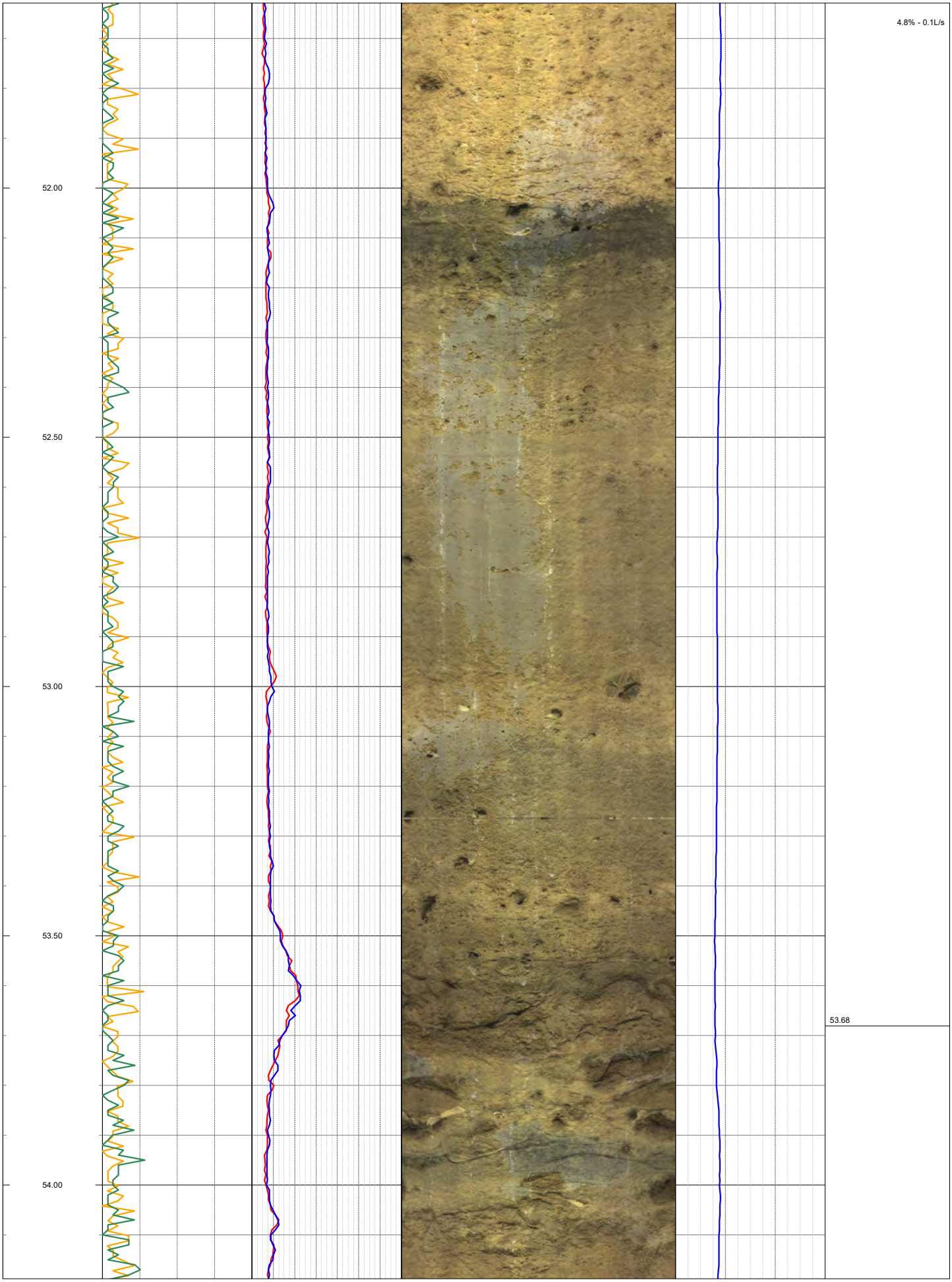

39.00
39.50
40.00
40.50
41.00
39.78

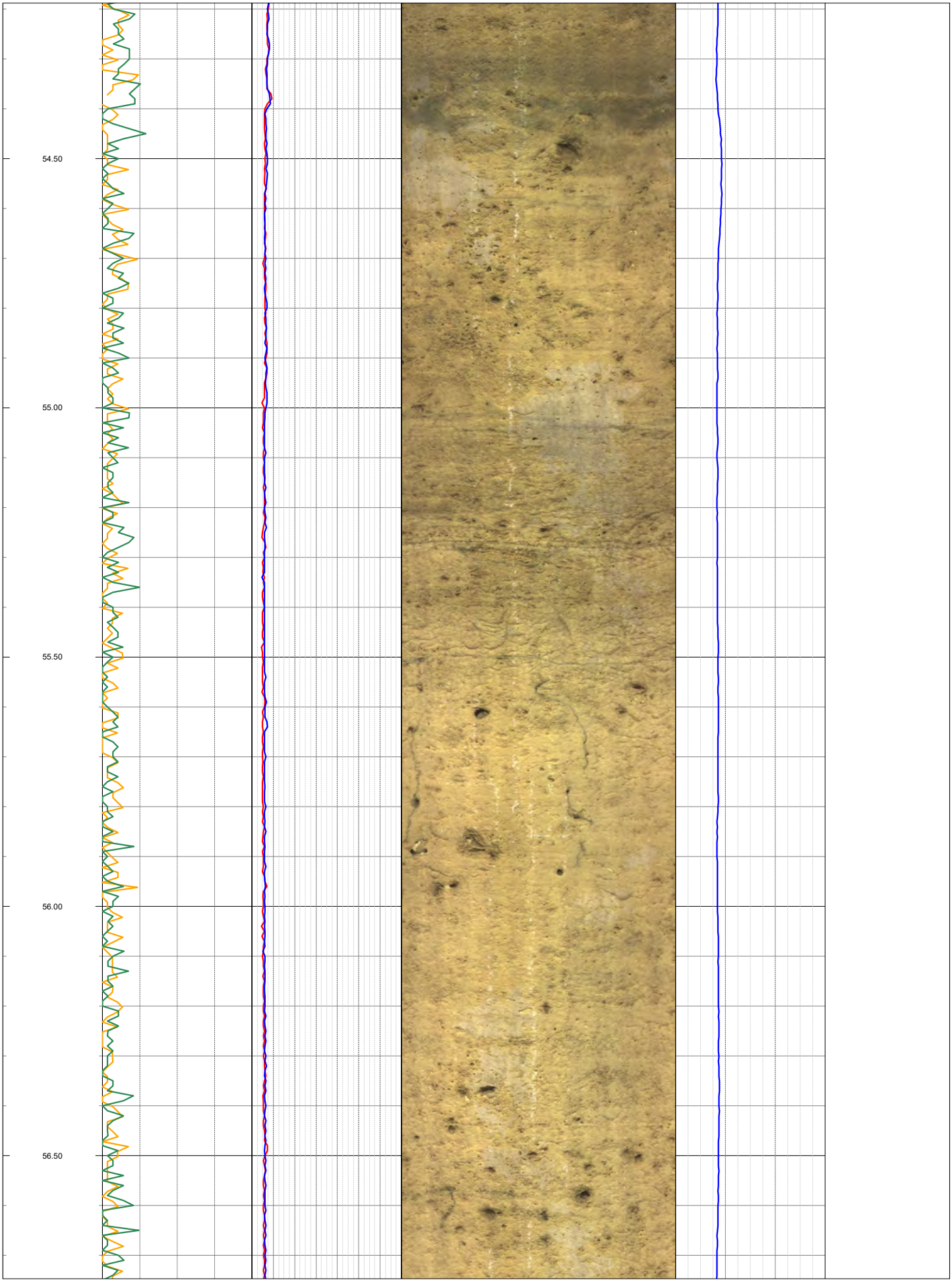

41.50
42.00
42.50
43.00
43.50

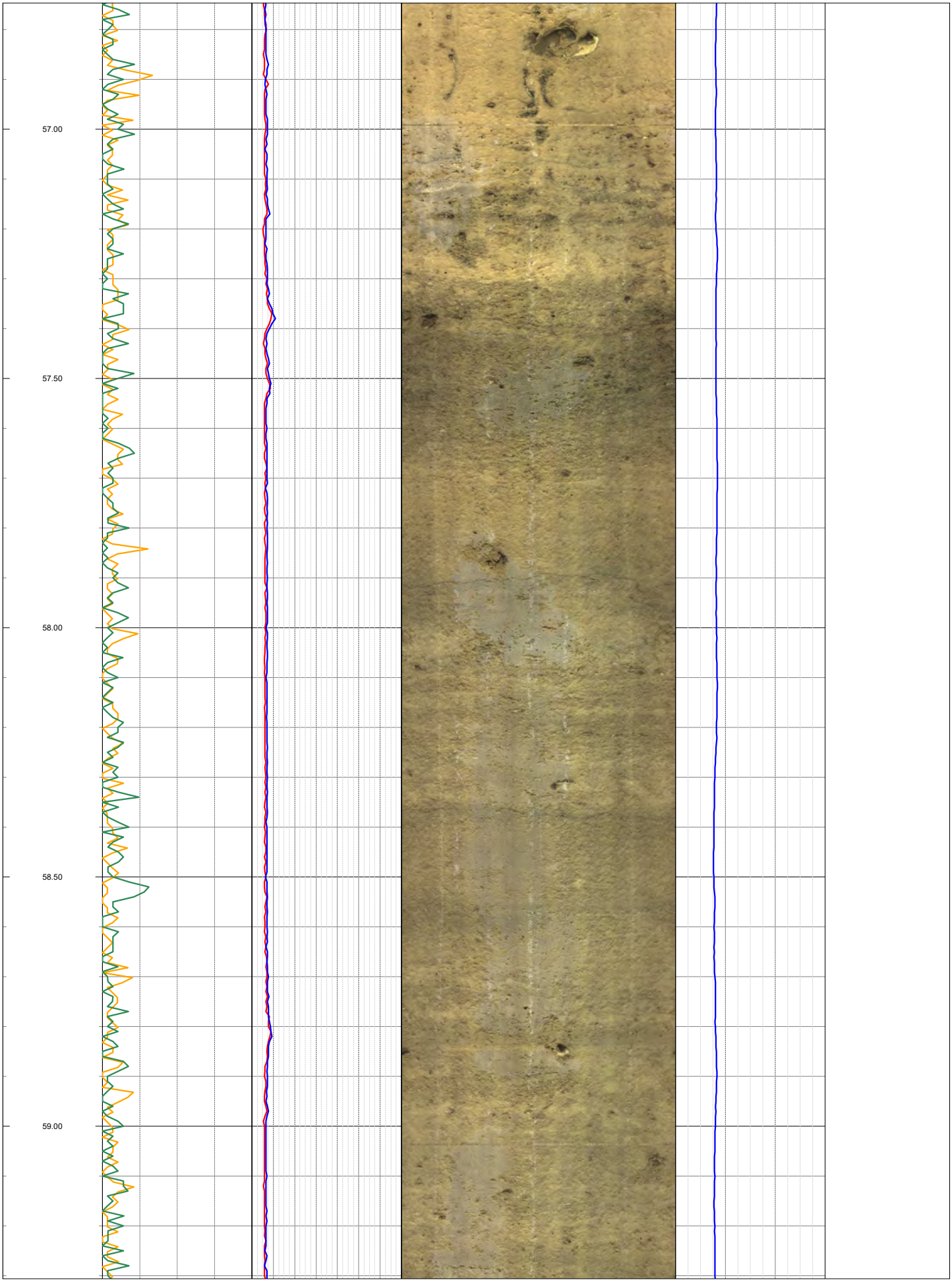

44.00
44.50
45.00
45.50
46.00
46.50

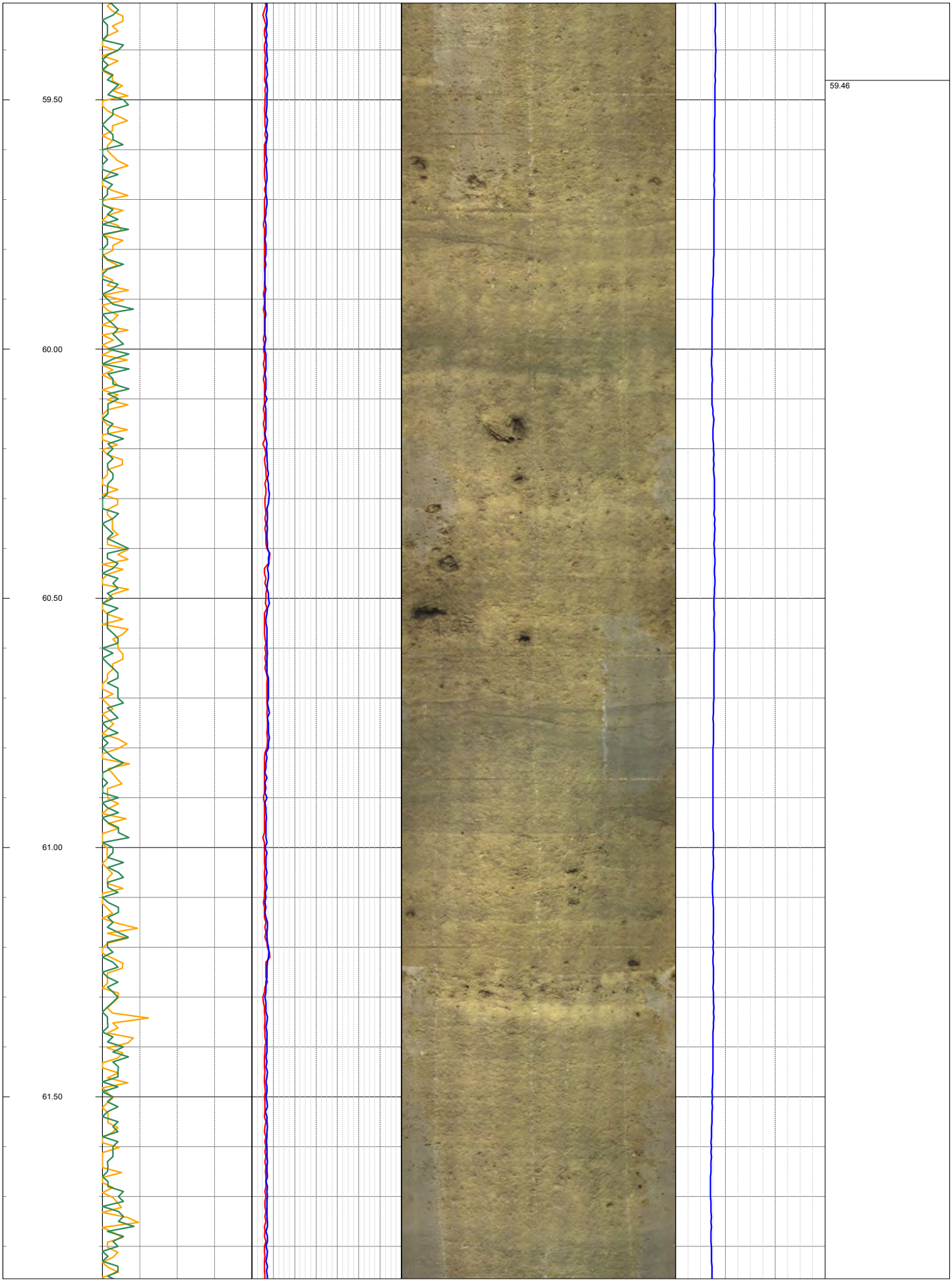

47.00
47.50
48.00
48.50
49.00

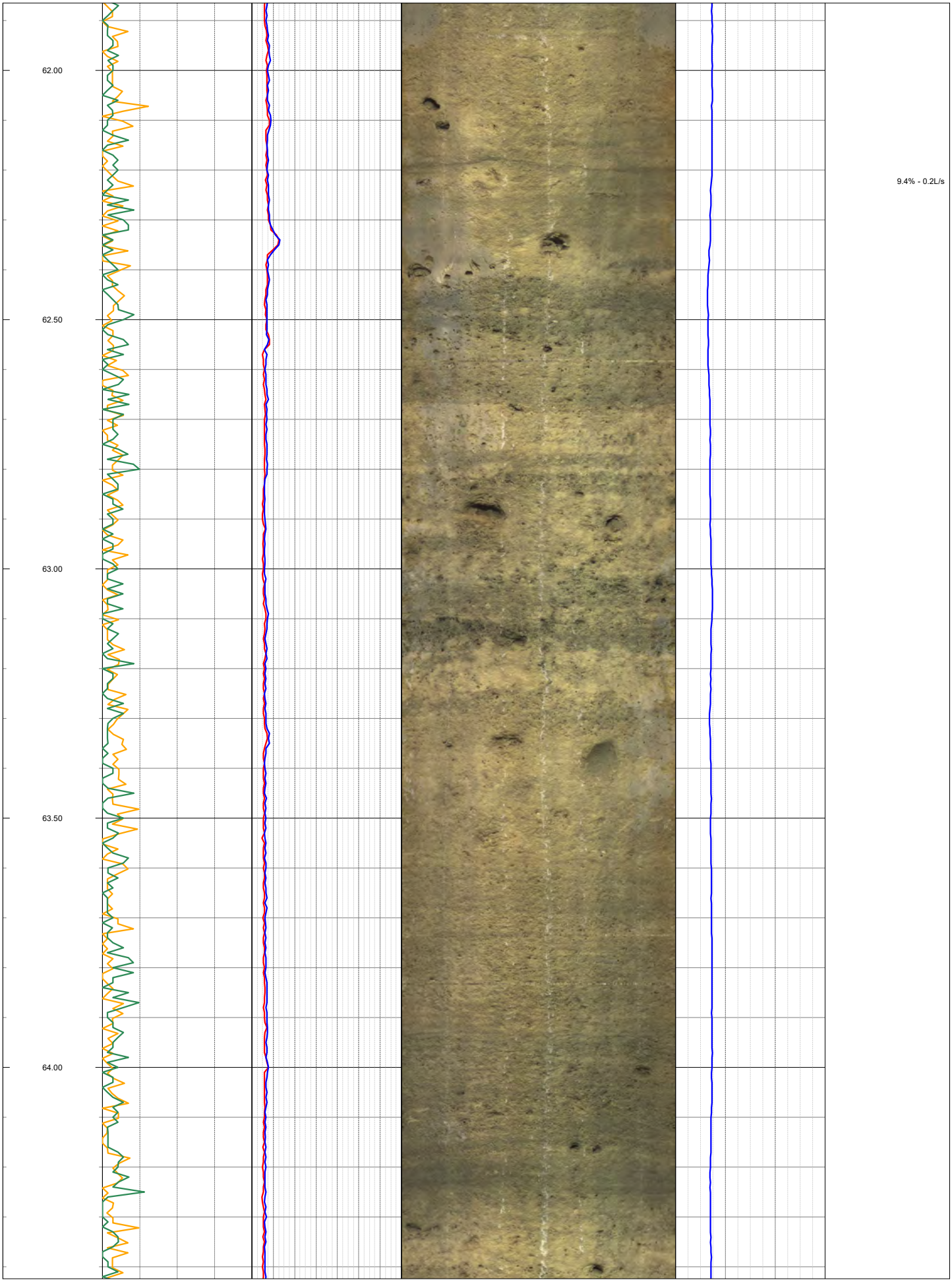

49.50
50.00
50.50
51.00
51.50
49.66

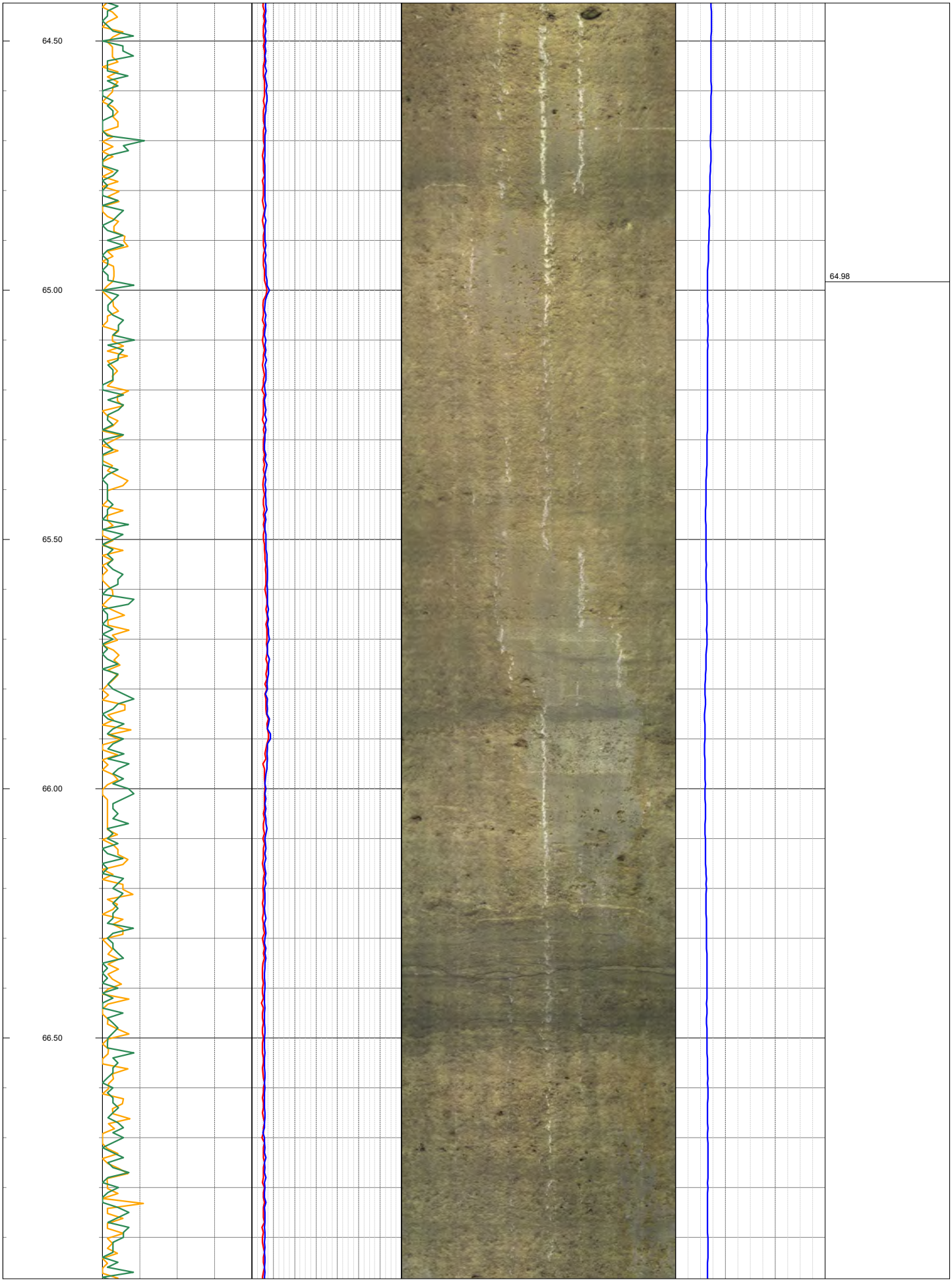

4.8% - 0.1L/s
52.00
52.50
53.00
53.50
53.68
54.00

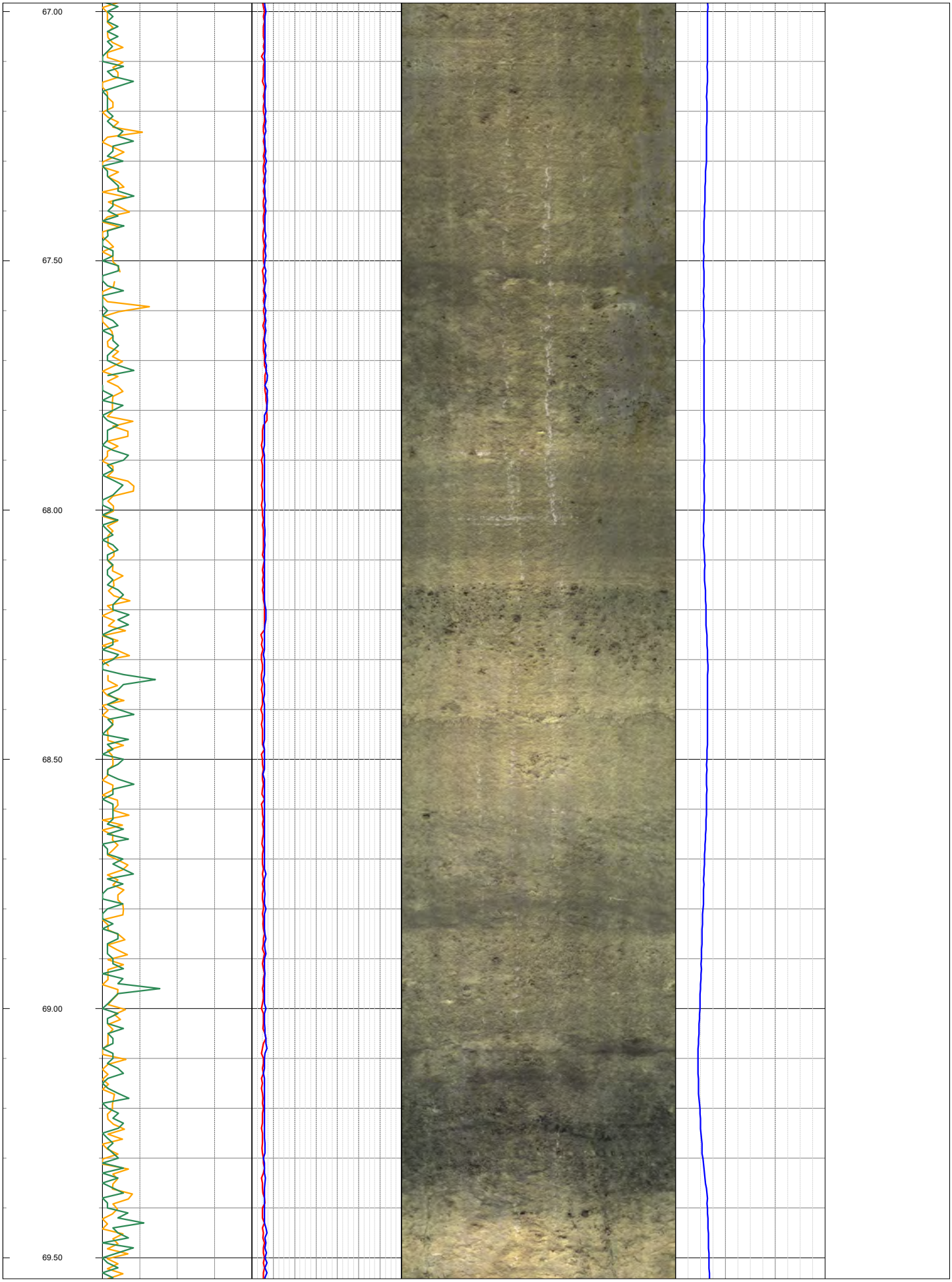

54.50
55.00
55.50
56.00
56.50

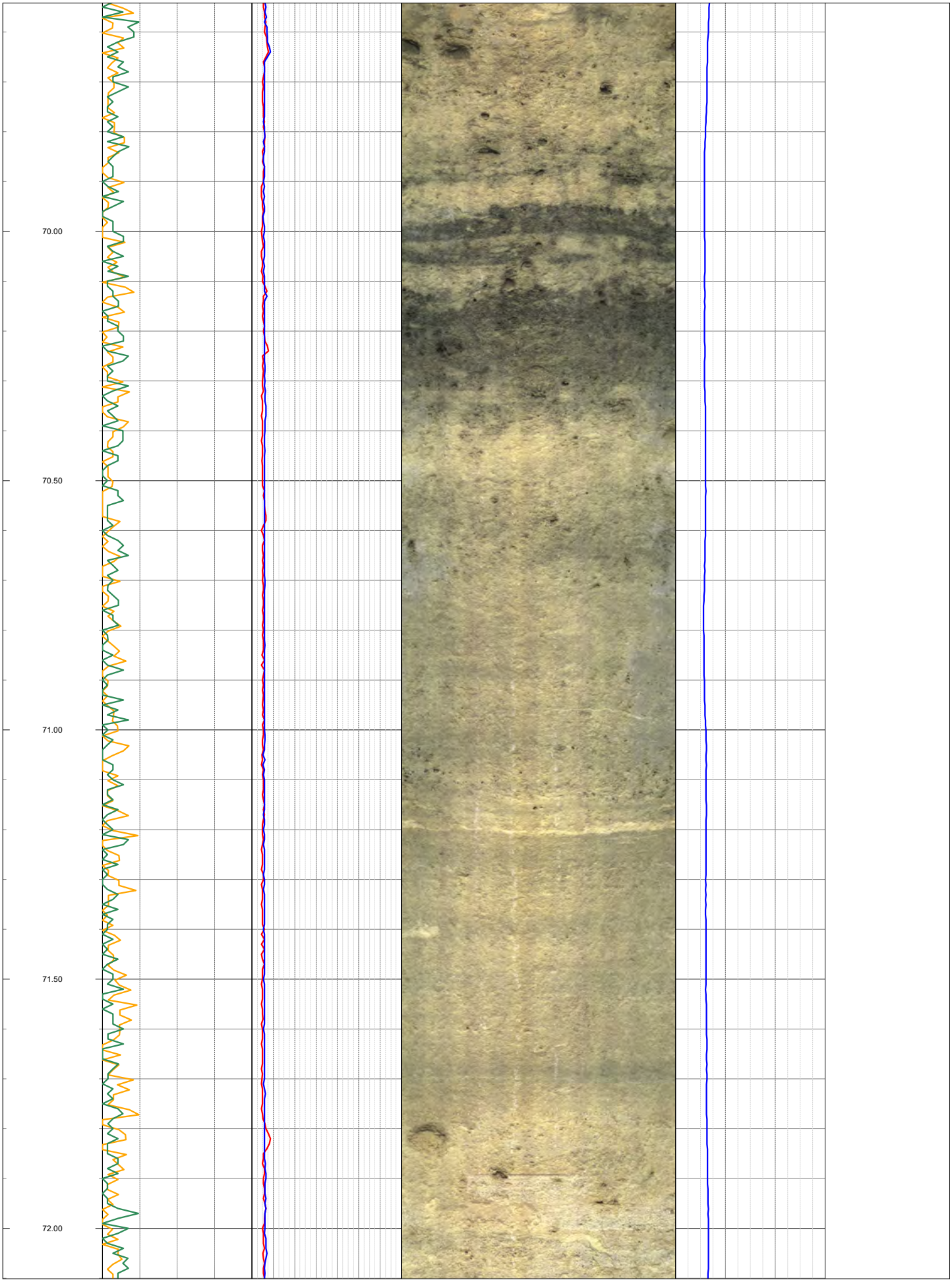

57.00
57.50
58.00
58.50
59.00

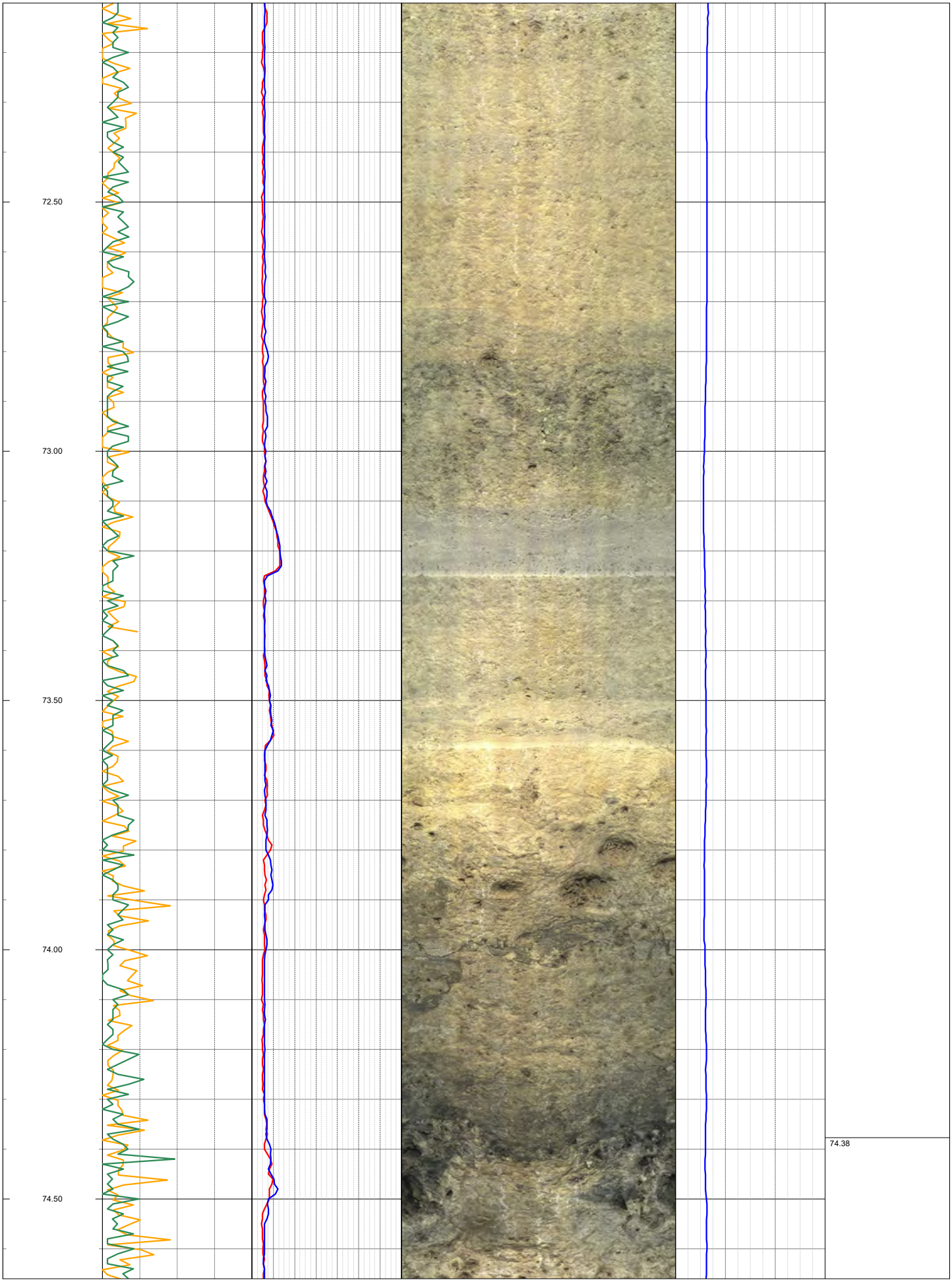

59.46
59.50
60.00
60.50
61.00
61.50

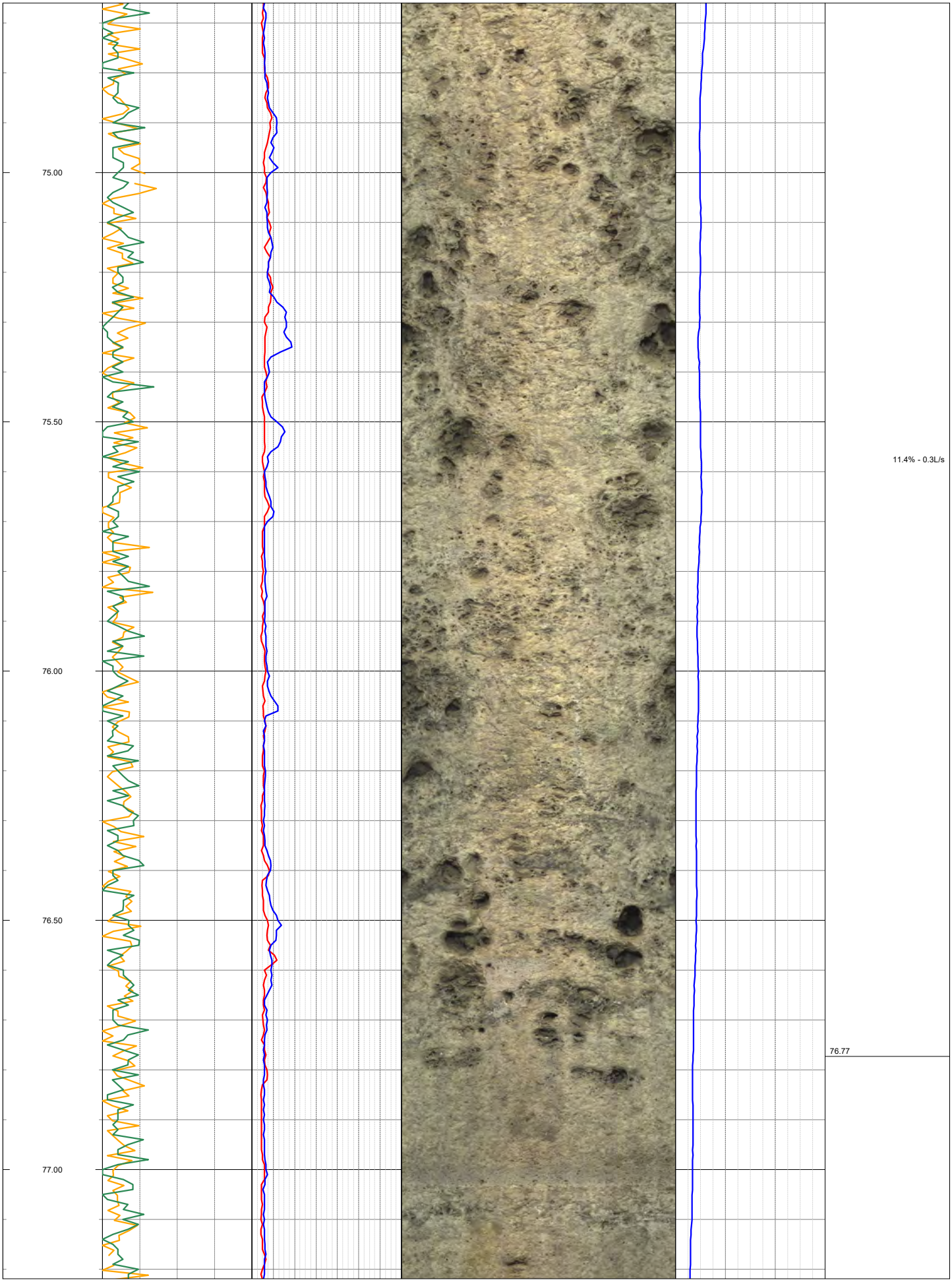

62.00
62.50
63.00
63.50
64.00
9.4% - 0.2L/s

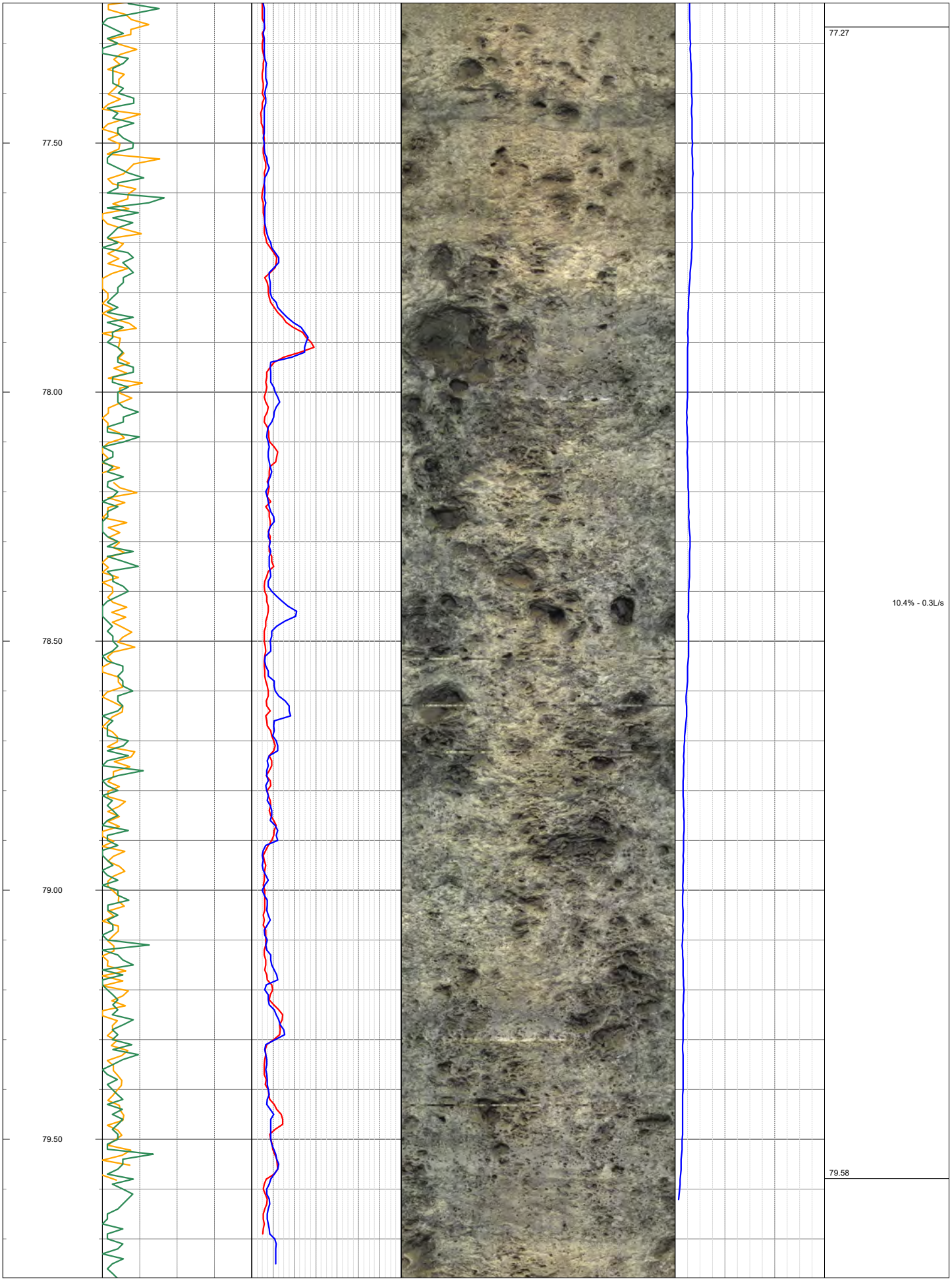

64.50
65.00
65.50
66.00
66.50
64.98

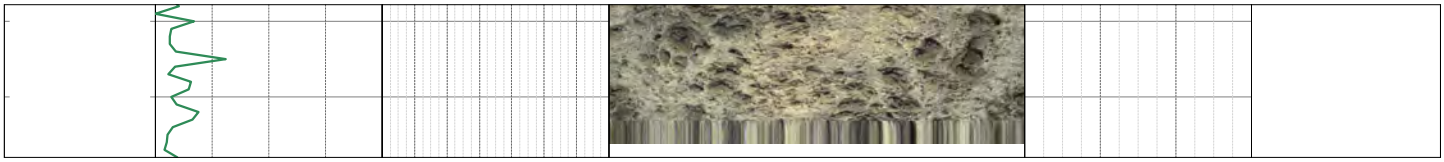

67.00
67.50
68.00
68.50
69.00
69.50


70.00
70.50
71.00
71.50
72.00


72.50
73.00
73.50
74.00
74.50
74.38


75.00
75.50
76.00
76.50
77.00
11.4% - 0.3L/s
76.77


77.27
77.50
78.00
10.4% - 0.3L/s
78.50
79.00
79.50
79.58



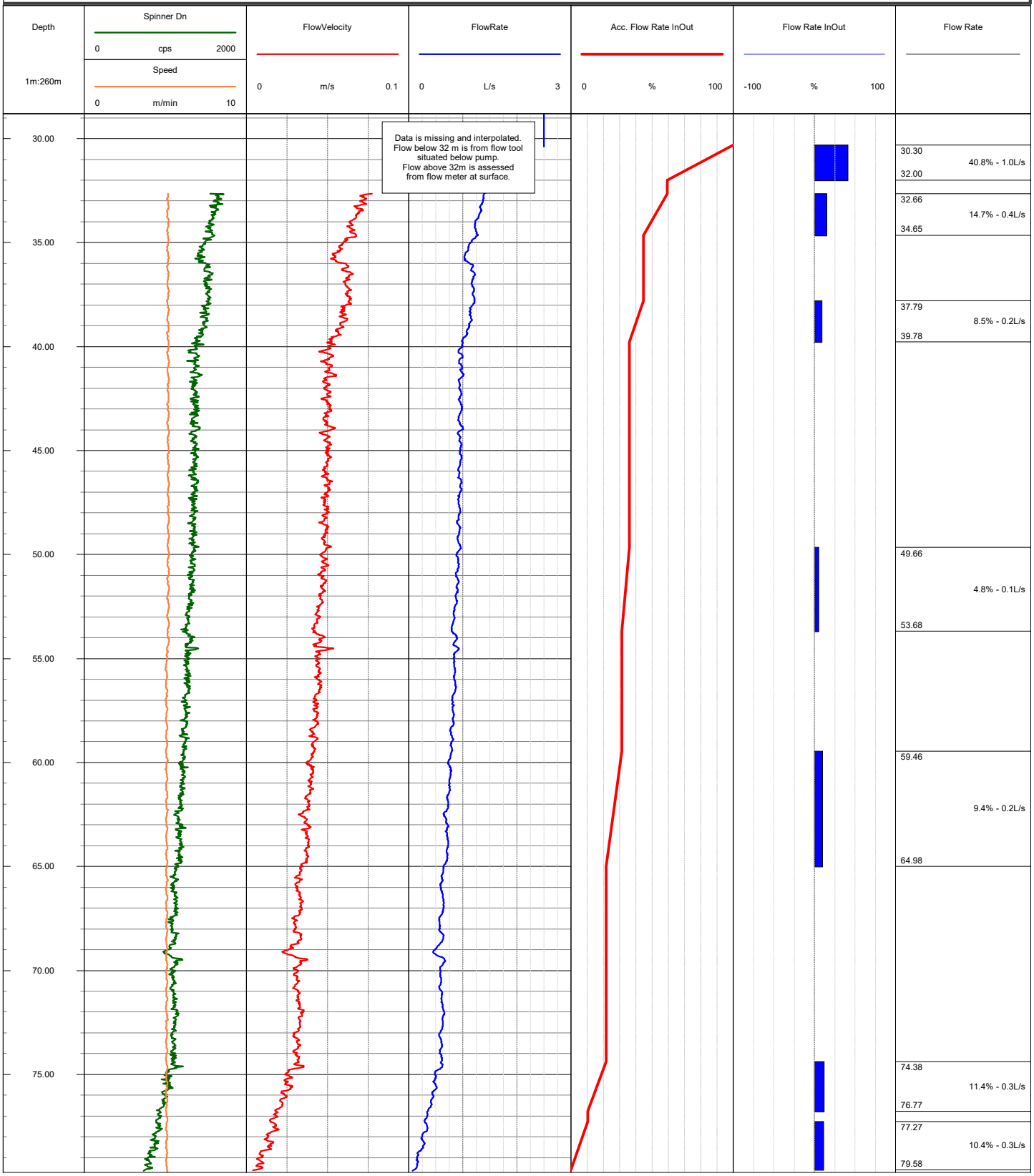
Lotowater TECHNICAL SERVICES INC.

Pumping Flow Profile (2.5 L/s)

CLIENT

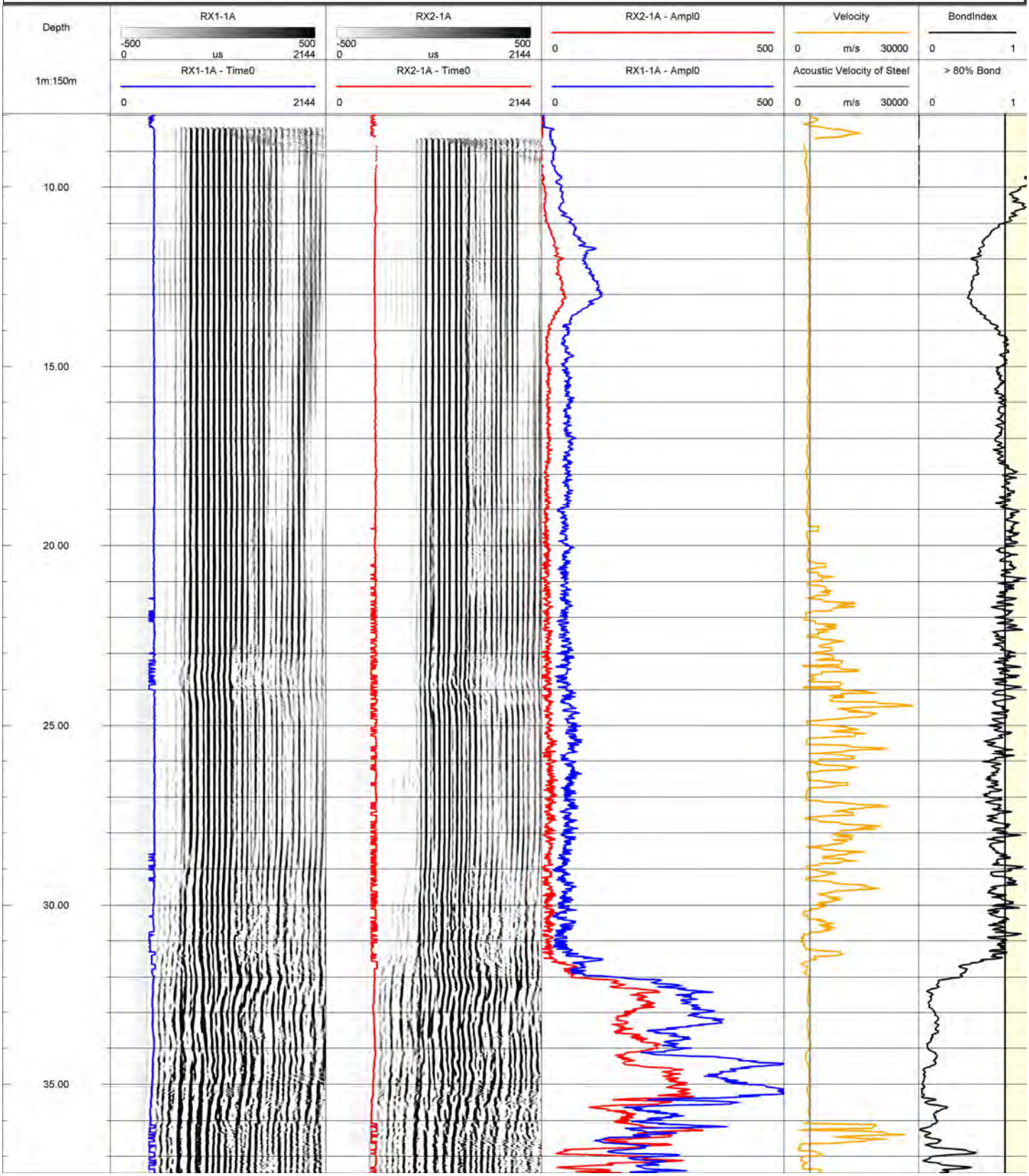
Township of Centre Wellington

LOCATION	*8282 Wellington 19, Fergus, ON*	**BOREHOLE**	**PW25-3**
DEPTH REF.	*Top of casing (0.75 m agl)*	**PROJECT #**	*313-018*
WATER LEVEL	*6.13 m before pumping*	**LOG DATE**	*2025-11-13*
DRILL METHOD	*n/a*	**LOGGED BY**	*RH*



Lotowater TECHNICAL SERVICES INC.

LOG TYPE			
CLIENT			
Township of Centre Wellington			
LOCATION	*8282 Wellington 19, Fergus, ON*	**BOREHOLE**	**Belwood Golf Club**
DEPTH REF.	*Top of casing (0.75 m agl)*	**PROJECT #**	*313-018*
WATER LEVEL	*7.82 m at time of logging*	**LOG DATE**	*2025-06-09*
DRILL METHOD	*n/a*	**LOGGED BY**	*RH*



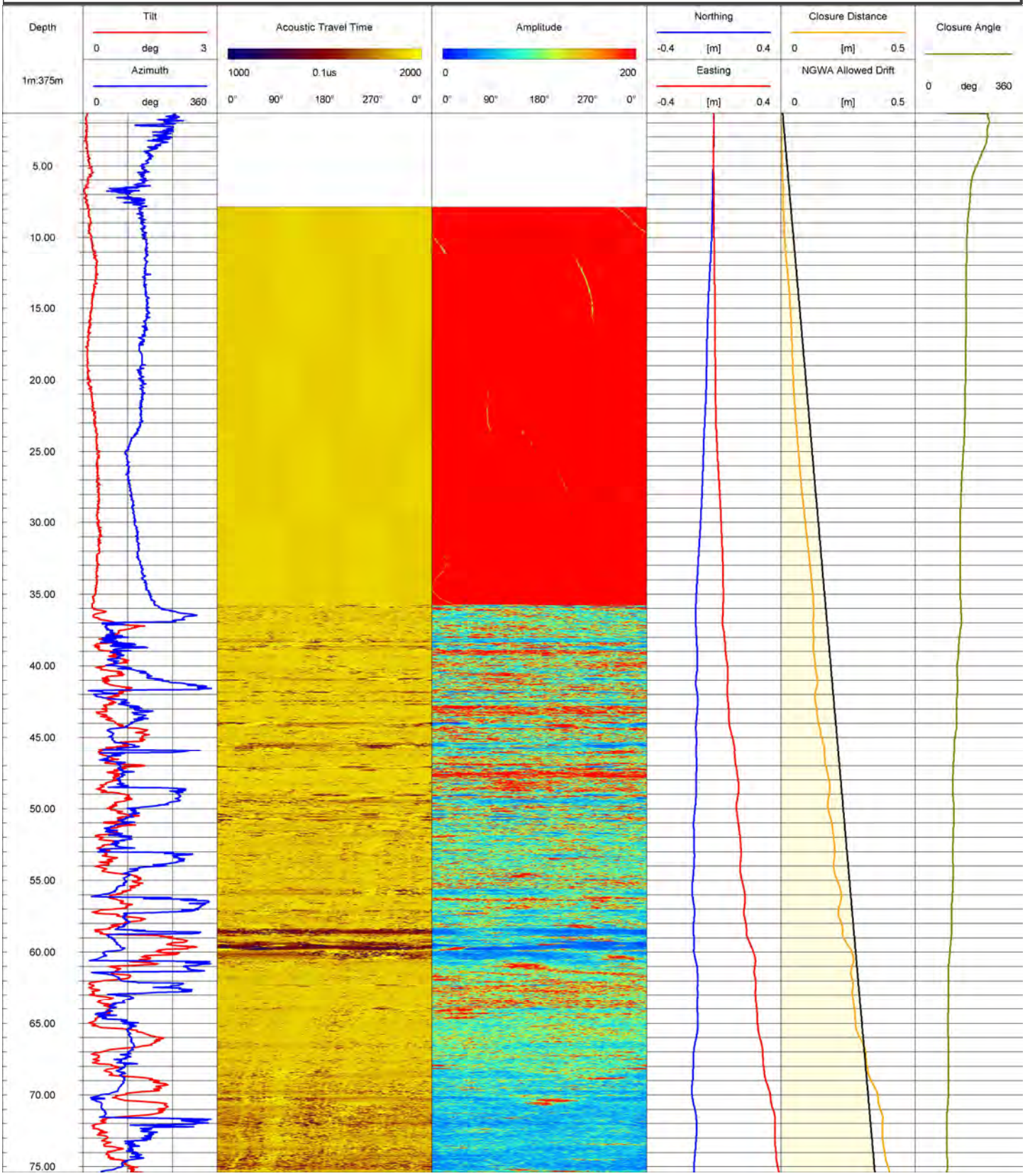
Lotowater TECHNICAL SERVICES INC.

Plumbness & Alignment

CLIENT

Township of Centre Wellingotn

LOCATION	*8282 Wellington 19, Fergus, ON*	**BOREHOLE**	**Belwood Golf Club**
DEPTH REF.	*Top of casing (0.75 m agl)*	**PROJECT #**	*313-018*
WATER LEVEL	*7.82*	**LOG DATE**	*2025-06-09*
DRILL METHOD	*n/a*	**LOGGED BY**	*RH*



APPENDIX I

Step Testing and Pumping Test Data

TABLE 1

VARIABLE RATE PERFORMANCE TEST

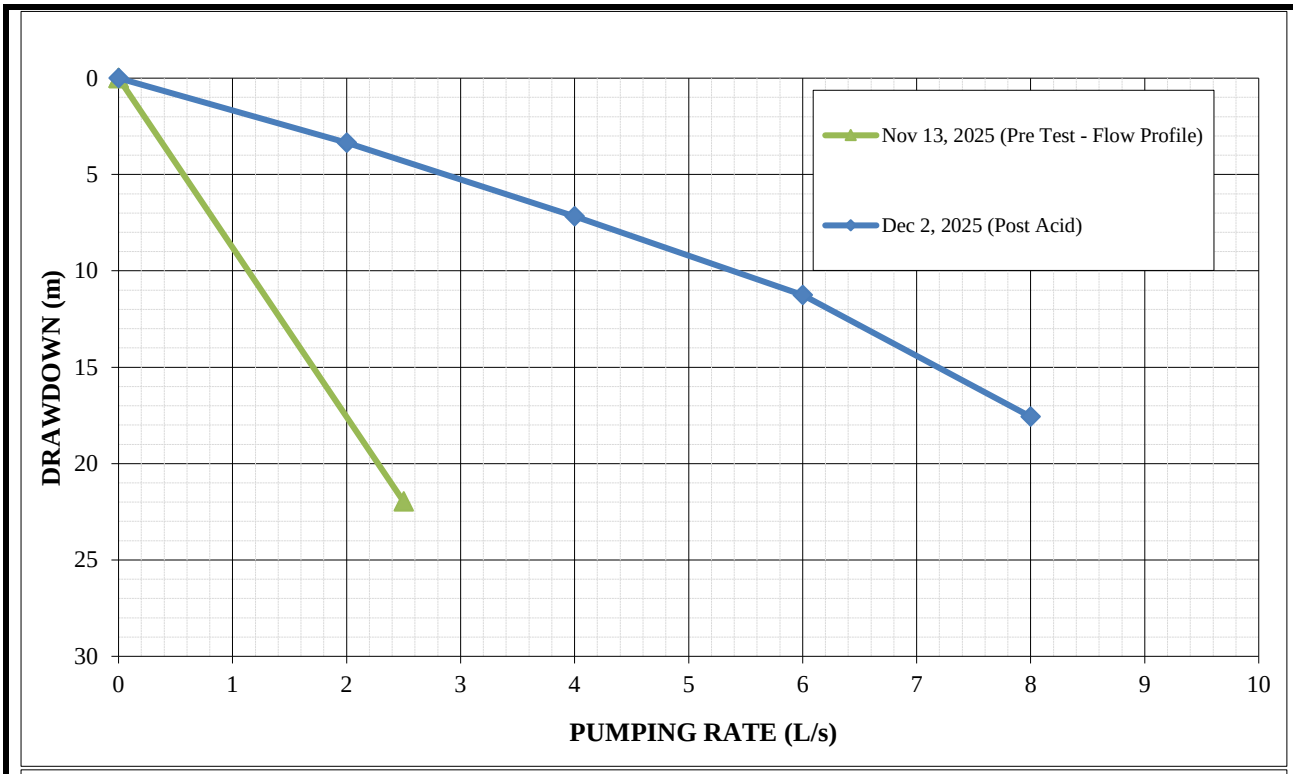
Lotowater TECHNICAL SERVICES INC.

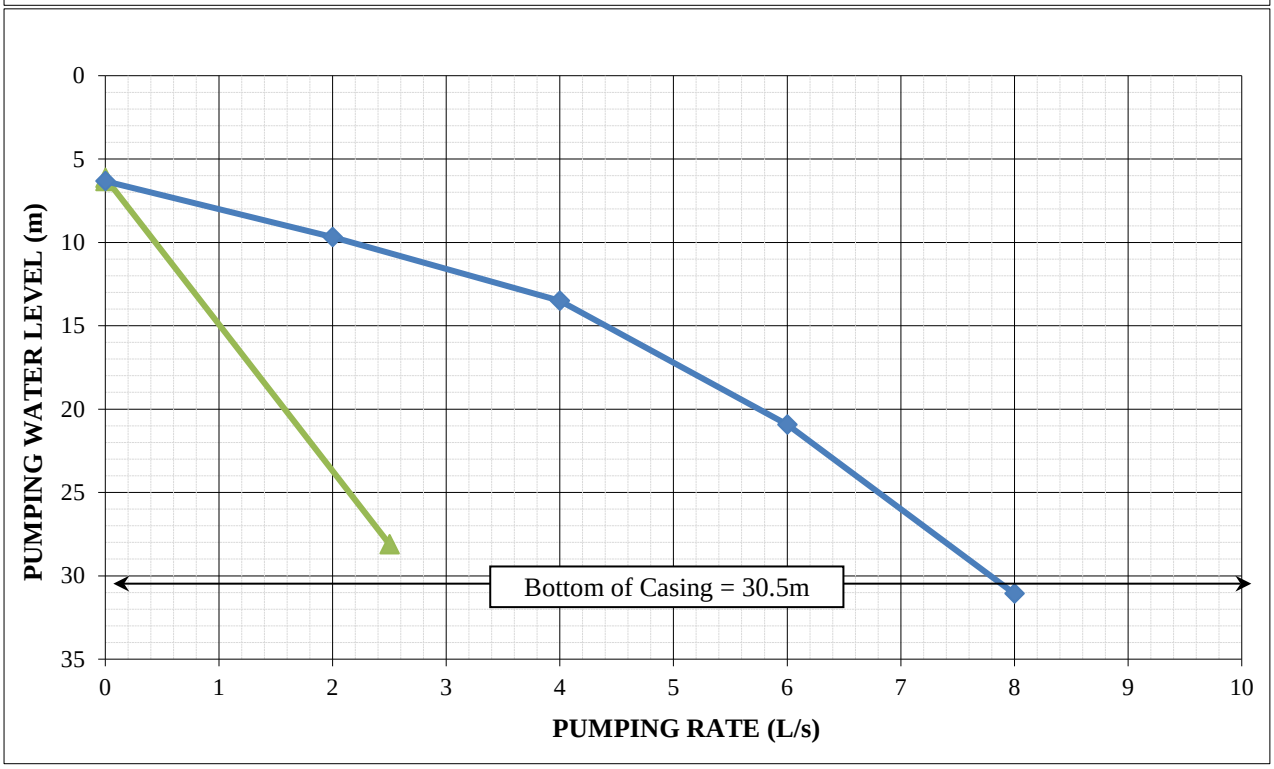
Well Name:	TW25-3	**Project Number:**	313-018
Client:	Fergus - Belwood Golf	**Date:**	12/2/2025
Technician Name:	Doug Willis	**Pump:**	Grundfos 150S75-4 (7.5hp)
Water Level Device:	LTS water level meter	**Pump Inlet:**	32.5m
Water Level Reference:	Top of casing 0.75m ags	**Flow Measuring Device:**	3" McProp
Test Note:	Post Acidification test		
	25mm PVC sounding tube		

Time *hr:min*	Elapsed Time *min*	Level *mbBP*	Drawdown *m*	Flow *L/s*	Note
11:00	0	6.33	0.00	2.0	Start Step 1
11:01	1	9.59	3.26	2.0	
11:02	2	9.47	3.14	2.0	
11:03	3	9.37	3.04	2.0	Pressure = 83 psi
11:04	4	9.38	3.05	2.0	
11:05	5	9.39	3.06	2.0	
11:06	6	9.40	3.07	2.0	
11:08	8	9.44	3.11	2.0	
11:10	10	9.48	3.15	2.0	
11:12	12	9.52	3.19	2.0	
11:15	15	9.55	3.22	2.0	
11:20	20	9.58	3.25	2.0	
11:25	25	9.61	3.28	2.0	
11:30	30	9.64	3.31	2.0	
11:35	35	9.65	3.32	2.0	
11:40	40	9.67	3.34	2.0	
11:45	45	9.68	3.35	2.0	
11:46	1	12.72	6.39	4.0	Start Step 2
11:47	2	13.00	6.67	4.0	
11:48	3	13.07	6.74	4.0	
11:49	4	13.13	6.80	4.0	Pressure = 52 psi
11:50	5	13.19	6.86	4.0	
11:51	6	13.22	6.89	4.0	
11:53	8	13.25	6.92	4.0	
11:55	10	13.29	6.96	4.0	
11:57	12	13.33	7.00	4.0	
12:00	15	13.37	7.04	4.0	
12:05	20	13.40	7.07	4.0	
12:10	25	13.42	7.09	4.0	
12:15	30	13.44	7.11	4.0	
12:20	35	13.45	7.12	4.0	
12:25	40	13.47	7.14	4.0	
12:30	45	13.50	7.17	4.0	
12:31	1	17.42	11.09	6.0	Start Step 3
12:32	2	18.34	12.01	6.0	
12:33	3	18.67	12.34	6.0	
12:34	4	18.88	12.55	6.0	Pressure = 36 psi
12:35	5	19.22	12.89	6.0	
12:36	6	19.60	13.27	6.0	
12:38	8	19.92	13.59	6.0	
12:40	10	20.15	13.82	6.0	
12:42	12	20.28	13.95	6.0	

TABLE 1

12:45	15	20.38	14.05	6.0	
12:50	20	20.57	14.24	6.0	
12:55	25	20.70	14.37	6.0	
13:00	30	20.82	14.49	6.0	
13:05	35	20.87	14.54	6.0	
13:10	40	20.88	14.55	6.0	
13:15	45	20.93	14.60	6.0	
13:16	1	25.86	19.53	7.5	Start Step 4
13:17	2	27.20	20.87	7.5	Pressure = 18 psi
13:18	3	27.88	21.55	7.5	
13:19	4	28.32	21.99	7.5	
13:20	5	28.58	22.25	7.5	
13:21	6	29.30	22.97	8.0	Pressure = 13 psi
13:23	8	30.62	24.29	8.0	
13:25	10	30.90	24.57	8.0	
13:27	12	31.05	24.72	8.0	
13:30	15	31.07	24.74	8.0	
13:31	1	10.82	4.49	0.0	Start recovery
13:32	2	8.68	2.35	0.0	
13:33	3	8.18	1.85	0.0	
13:34	4	7.96	1.63	0.0	
13:35	5	7.81	1.48	0.0	
13:36	6	7.72	1.39	0.0	
13:38	8	7.55	1.22	0.0	
13:40	10	7.44	1.11	0.0	
13:42	12	7.34	1.01	0.0	
13:45	15	7.24	0.91	0.0	
13:50	20	7.11	0.78	0.0	
13:55	25	7.02	0.69	0.0	
14:00	30	6.95	0.62	0.0	Totalizer at 18781 m^3





Notes:

Test date: December 12, 2025

All water levels are referenced from top of casing

Top of casing = 0.75 m above ground surface

Pump Inlet = 32.5m

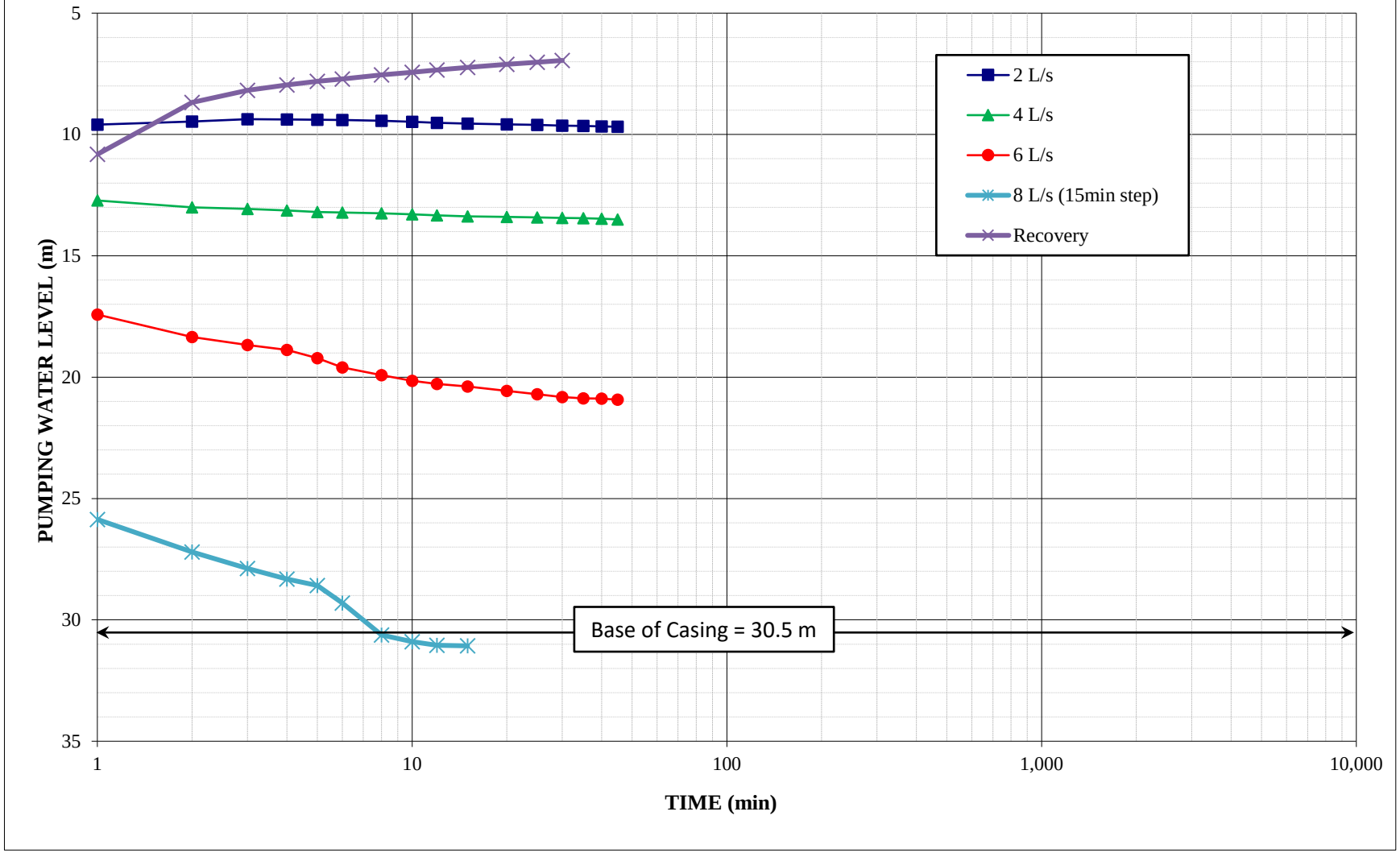
FERGUS GOLF

PW25-3

Comparison of Variable Rate Tests

Lotowater Technical Services Inc. **Figure 1a**

313-018 12/2/2025



Notes:

Test Date November , 2025

Static water level = 6.33 mbtc

All water levels are referenced from top of casing, Top of casing = 0.75 m above ground surface

Pump Inlet = 32.5m

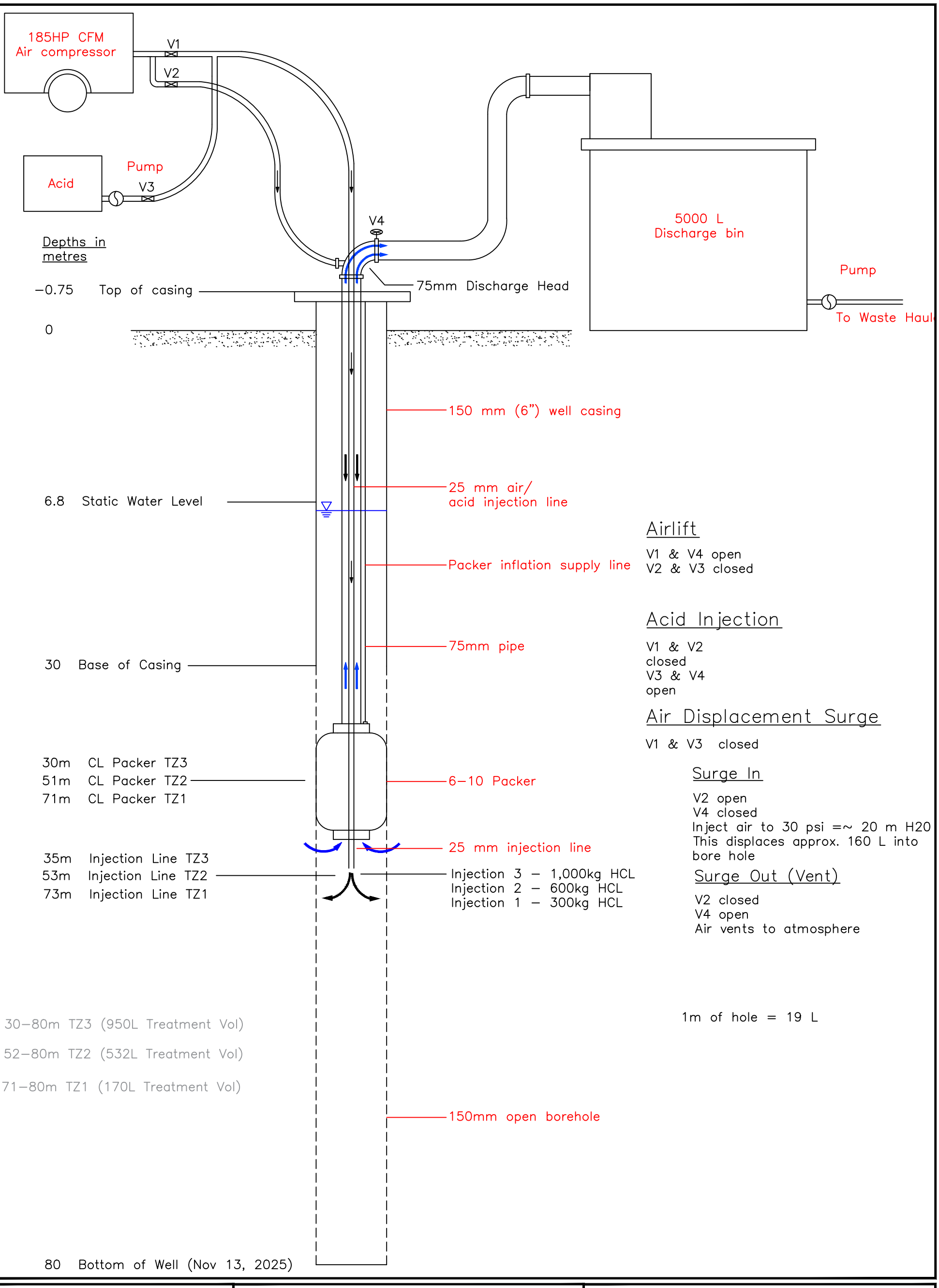
FERGUS GOLF

PW25-3

Comparison of Variable Rate Tests

Lotowater Technical Services Inc. **Figure 1b**

Reference: 313-018 12/2/2025



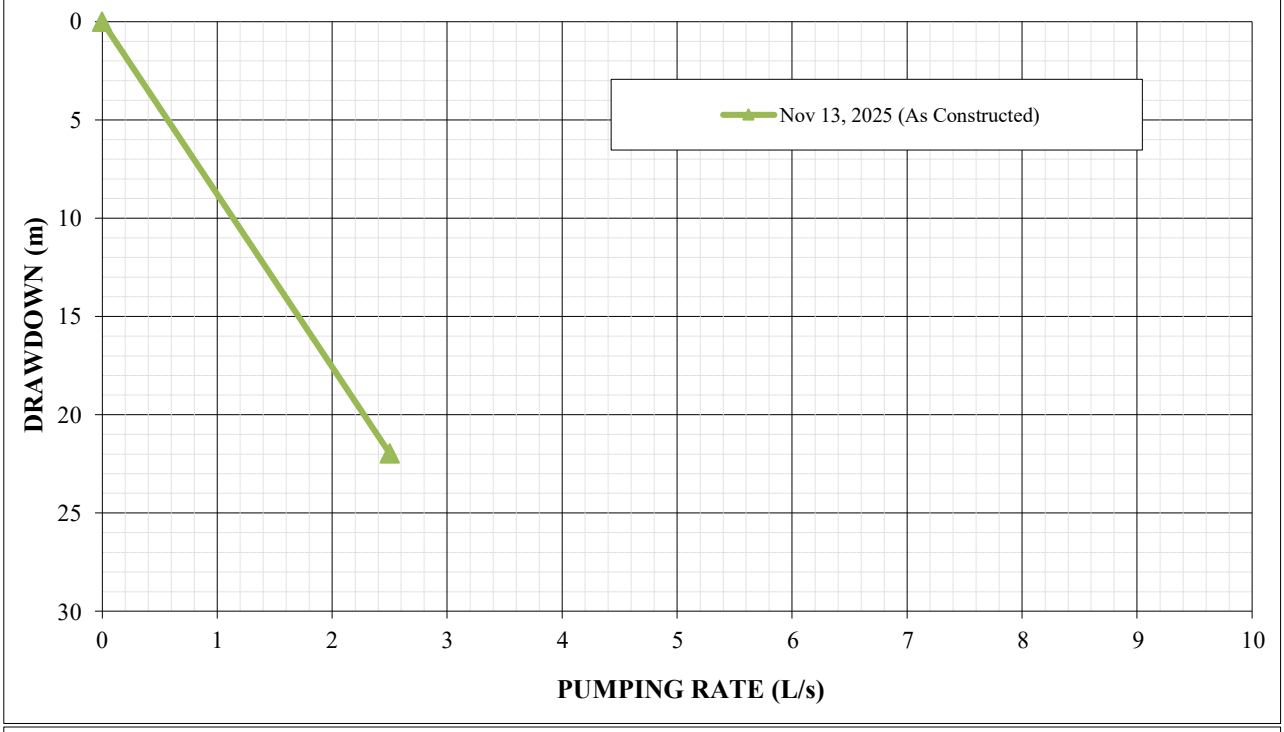
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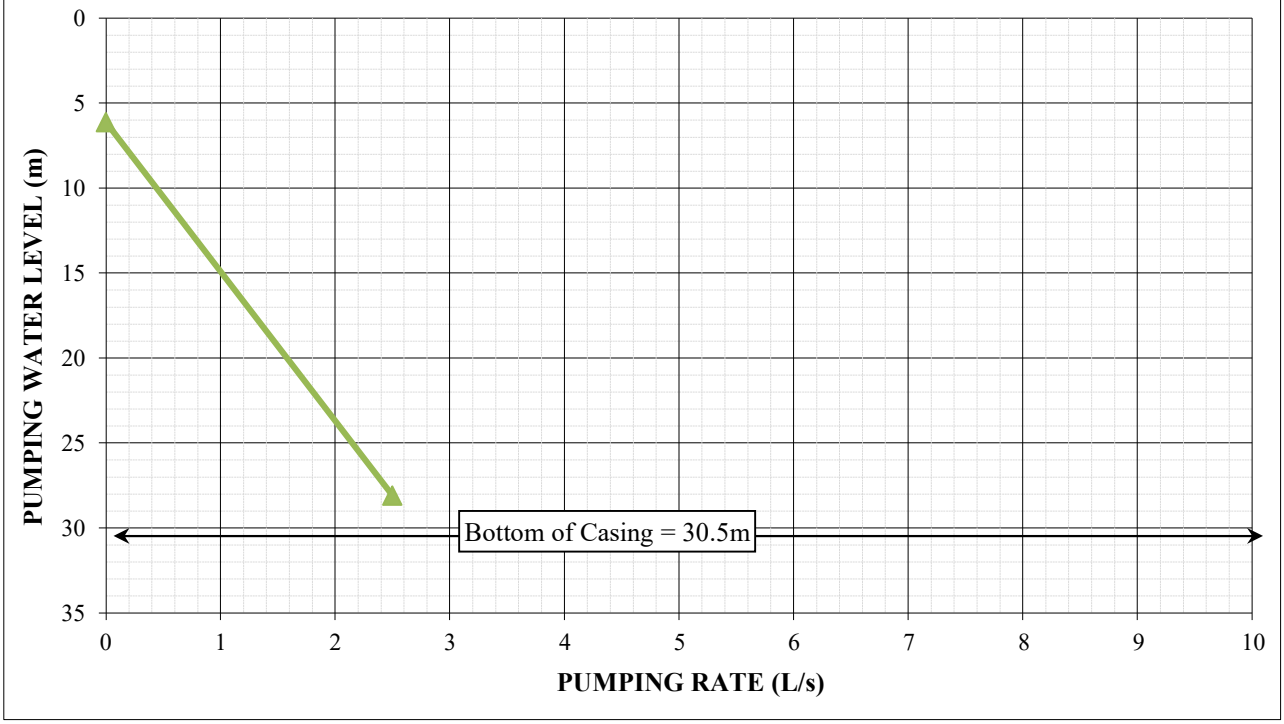
Lotowater TECHNICAL SERVICES INC.

CLIENT: FERGUS GOLF

TITLE: PW25-3 ACID DEVELOPMENT (Proposed)

PROJECT No. 313-018			G:\Lotowater Projects\313... Township of Centre Wellington		
DESIGN			Nov 14, 2025	SCALE N.T.S.	FIGURE 1
DRAWN	BP	2025/11/14			
CHECKED					





Notes:
All water levels are referenced from top of casing
Top of casing = 0.75 m above ground surface
Pump Inlet = 32.5m

FERGUS GOLF

PW25-3

Comparison of Variable Rate Tests

Lotowater Technical Services Inc. **Figure 1a**
313-018 2025-11-14

Aquifer Test (Pumping Well)

Lotowater TECHNICAL SERVICES INC.

Project Number: 313-018

Location: Belwood Golf Club, 8286 Wellington 19, Centre Welligton

Measuring Point: Top of casing

Pump Type: Grundfos 150S100-5

Stick-up: 0.61 m

Pump Inlet: 32 m

SWL: 4.31 m

Technician: B.Pendleton

Pumping Rate: 7 L/s

Transducer Serial #: Clients Solonist

ow Measurement: 3" McCrometer Flow Meter

scharge Location: Pond 240m to NW

Test Note:

WELL NAME: **TW25-3**

Date	Time	Elapsed Time	Water Level	Drawdown	Flow Rate	Totalizer	Comments
yyyy/mm/dd	*hr:min*	*min*	*mbtc*	*m*	*L/s*	*m3*	
2026-05-26	11:30	0	4.31	0.00	8	685.6	Start at 11:30
2026-05-26	11:31	1			8		
2026-05-26	11:32	2			8		
2026-05-26	11:33	3	18.62	14.31	8		
2026-05-26	11:34	4	19.99	15.68	8		
2026-05-26	11:35	5	20.57	16.26	8		
2026-05-26	11:36	6	21.03	16.72	8		69psi
2026-05-26	11:38	8	21.59	17.28	8		
2026-05-26	11:40	10	21.96	17.65	8		
2026-05-26	11:42	12	22.17	17.86	8		
2026-05-26	11:45	15	22.45	18.14	8		
2026-05-26	11:50	20	22.76	18.45	8		
2026-05-26	11:55	25	22.97	18.66	8		
2026-05-26	12:00	30	23.15	18.84	8		69psi
2026-05-26	12:10	40	26.54	22.23	8		
2026-05-26	12:20	50	26.67	22.36	8		69psi
2026-05-26	12:30	60	26.77	22.46	8		
2026-05-26	12:45	75	26.84	22.53	8		
2026-05-26	13:00	90	26.90	22.59	8		64psi
2026-05-26	13:30	120	27.96	23.65	8		
2026-05-26	14:00	150	28.13	23.82	8		
2026-05-26	14:30	180	28.35	24.04	8		60psi
2026-05-26	15:00	210	28.41	24.10	8		
2026-05-26	15:30	240	28.56	24.25	8		
2026-05-26	16:30	300	28.58	24.27	8		60psi
2026-05-26	18:00	390	28.79	24.48	8	841.9	
2026-05-26	19:00	450	28.89	24.58	8	886.6	
2026-05-26	20:00	510	29.00	24.69	8	890.1	
2026-05-26	21:00	570	29.99	25.68	8	916.3	
2026-05-26	22:00	630	30.10	25.79	8	940.2	
2026-05-26	23:00	690	30.20	25.89	8	963.8	
2026-05-27	0:00	750	30.32	26.01	8	988.6	

Aquifer Test (Pumping Well)

Lotowater TECHNICAL SERVICES INC.

WELL NAME: TW25-3

Date	Time	Elapsed Time	Water Level	Drawdown	Flow Rate	Totalizer	Comments
yyyy/mm/dd	*hr:min*	*min*	*mbtc*	*m*	*L/s*	*m3*	
2026-05-27	1:00	810	30.30	25.99	8	1,013.2	
2026-05-27	2:00	870	30.36	26.05	8	1,037.4	
2026-05-27	3:00	930	30.46	26.15	8	1,061.8	
2026-05-27	4:00	990	31.04	26.73	8	1,087.1	
2026-05-27	5:00	1050	8.80	4.49	8	1,089.8	Pump stopped working. Flow rate is very instable (5 pm)
2026-05-27	6:00	1110	31.34	27.03	8	1,112.8	
2026-05-27	7:00	1170	31.34	27.03	8	1,136.7	
2026-05-27	8:00	1230	31.34	27.03	8	1,163.7	
2026-05-27	9:00	1290	31.34	27.03	8	1,188.0	
2026-05-27	10:00	1350	31.34	27.03	8	1,211.8	
2026-05-27	11:00	1410	31.34	27.03	8	1,235.6	
2026-05-27	12:00	1470	31.34	27.03	8	1,261.8	20psi
2026-05-27	13:00	1530	31.34	27.03	8	1,295.1	
2026-05-27	14:00	1590	31.34	27.03	8	1,309.2	21psi
2026-05-27	15:00	1650	31.34	27.03	8	1,330.7	adjusted back to 7l/s
2026-05-27	16:00	1710	31.34	27.03	8	1,359.1	
2026-05-27	17:00	1770	31.34	27.03	8	1,370.2	
2026-05-27	18:00	1830	31.34	27.03	8	1,405.3	
2026-05-27	19:00	1890	31.34	27.03	8	1,428.3	18psi
2026-05-27	20:00	1950	31.34	27.03	8	1,452.4	17psi
2026-05-27	21:00	2010	31.34	27.03	8	1,476.4	17psi
2026-05-27	22:00	2070	31.34	27.03	8	1,499.4	
2026-05-27	23:00	2130	31.34	27.03	8	1,523.0	
2026-05-28	0:00	2190	31.34	27.03	8	1,546.8	11psi
2026-05-28	1:00	2250	31.34	27.03	8	1,569.8	
2026-05-28	2:00	2310	31.34	27.03	8	1,594.0	
2026-05-28	3:00	2370	31.34	27.03	8	1,619.6	
2026-05-28	4:00	2430	31.34	27.03	8	1,640.5	
2026-05-28	5:00	2490	31.34	27.03	8	1,664.0	
2026-05-28	6:00	2550	31.34	27.03	8	1,689.9	11psi
2026-05-28	7:00	2610	31.34	27.03	8	1,710.0	11psi
2026-05-28	8:00	2670	31.34	27.03	8	1,735.9	14psi
2026-05-28	9:00	2730	31.34	27.03	8	1,758.4	14psi
2026-05-28	10:00	2790	31.33	27.02	8	1,782.0	
2026-05-28	11:00	2850	31.33	27.02	8	1,806.0	16psi
2026-05-28	12:00	2910	31.34	27.03	8	1,828.5	
2026-05-28	13:00	2970	31.34	27.03	8	1,852.0	
2026-05-28	14:00	3030	31.34	27.03	8	1,874.7	
2026-05-28	15:00	3090	31.34	27.03	8	1,898.4	14psi
2026-05-28	16:00	3150	31.34	27.03	8	1,922.0	
2026-05-28	17:00	3210	31.34	27.03	8	1,944.4	
2026-05-28	18:00	3270	31.34	27.03	8	1,967.0	14psi

Aquifer Test (Pumping Well)

Lotowater TECHNICAL SERVICES INC.

WELL NAME: TW25-3

Date	Time	Elapsed Time	Water Level	Drawdown	Flow Rate	Totalizer	Comments
yyyy/mm/dd	*hr:min*	*min*	*mbtc*	*m*	*L/s*	*m3*	
2026-05-28	19:00	3330	31.34	27.03	8	1,990.4	
2026-05-28	20:00	3390	31.34	27.03	8	2,012.8	
2026-05-28	21:00	3450	31.34	27.03	8	2,035.5	
2026-05-28	22:00	3510	31.34	27.03	8	2,053.4	11psi
2026-05-28	23:00	3570	31.34	27.03	8	2,080.8	
2026-05-29	0:00	3630	31.34	27.03	8	2,102.6	
2026-05-29	1:00	3690	31.34	27.03	8	2,126.5	
2026-05-29	2:00	3750	31.34	27.03	8	2,148.7	
2026-05-29	3:00	3810	31.34	27.03	8	2,170.2	
2026-05-29	4:00	3870	31.34	27.03	8	2,192.3	
2026-05-29	5:00	3930	31.34	27.03	8	2,222.9	
2026-05-29	6:00	3990	31.34	27.03	8	2,233.7	
2026-05-29	7:00	4050	31.34	27.03	8	2,262.4	11psi
2026-05-29	8:00	4110	31.34	27.03	8	2,286.7	
2026-05-29	9:00	4170	31.34	27.03	8	2,309.6	
2026-05-29	10:00	4230	31.34	27.03	8	2,333.4	
2026-05-29	11:00	4290	25.73	21.42	8	2,353.7	adjusted flow 58 psi
2026-05-29	12:00	4350	30.55	26.24	8	2,372.6	
2026-05-29	12:01	1	14.08	9.77	0		Recovery
2026-05-29	12:02	2	12.58	8.27	0		
2026-05-29	12:03	3	12.02	7.71	0		
2026-05-29	12:04	4	11.68	7.37	0		
2026-05-29	12:05	5	11.61	7.30	0		
2026-05-29	12:06	6	11.40	7.09	0		
2026-05-29	12:08	8	11.19	6.88	0		
2026-05-29	12:10	10	10.74	6.43	0		
2026-05-29	12:12	12	10.70	6.39	0		
2026-05-29	12:15	15	10.66	6.35	0		
2026-05-29	12:20	20	10.44	6.13	0		
2026-05-29	12:25	25	10.27	5.96	0		
2026-05-29	12:30	30	10.16	5.85	0		
2026-05-29	12:40	40	9.94	5.63	0		
2026-05-29	12:50	50	9.79	5.48	0		
2026-05-29	13:00	60	9.69	5.38	0		
2026-05-29	13:15	75	9.53	5.22	0		
2026-05-29	13:30	90	9.36	5.05	0		
2026-05-29	14:00	120	9.19	4.88	0		

TABLE 1

VARIABLE RATE PERFORMANCE TEST

Lotowater TECHNICAL SERVICES INC.

Well Name:	PW21-1	**Project Number:**	313-018
Client:	Centre Wellington - Fergus Golf	**Date:**	11/18/2025
Technician Name:	Tyler Colquhoun	**Pump:**	80GS (7.5hp)
Water Level Device:	LTS water level meter	**Pump Inlet:**	32m
Water Level Reference:	Top of casing 0.57m ags	**Flow Measuring Device:**	3" Banjo
Test Note:	Set on 2" with 2" discahrge to waste 50' from well		

Time *hr:min*	Elapsed Time *min*	Level *mbToC*	Drawdown *m*	Flow *L/s*	Note
10:45	0	9.25	0.00	6.8	Start Step 1
10:46	1	14.55	5.30	6.8	
10:47	2	14.74	5.49	6.8	
10:48	3	13.96	4.71	6.8	Pressure = 42 psi
10:49	4	14.10	4.85	6.8	
10:50	5	14.22	4.97	6.8	
10:51	6	14.28	5.03	6.8	
10:53	8	14.36	5.11	6.8	
10:55	10	14.43	5.18	6.8	
10:57	12	14.51	5.26	6.8	
11:00	15	14.57	5.32	6.8	
11:05	20	14.66	5.41	6.8	
11:10	25	14.74	5.49	6.8	
11:15	30	14.81	5.56	6.8	

TABLE 1

VARIABLE RATE PERFORMANCE TEST

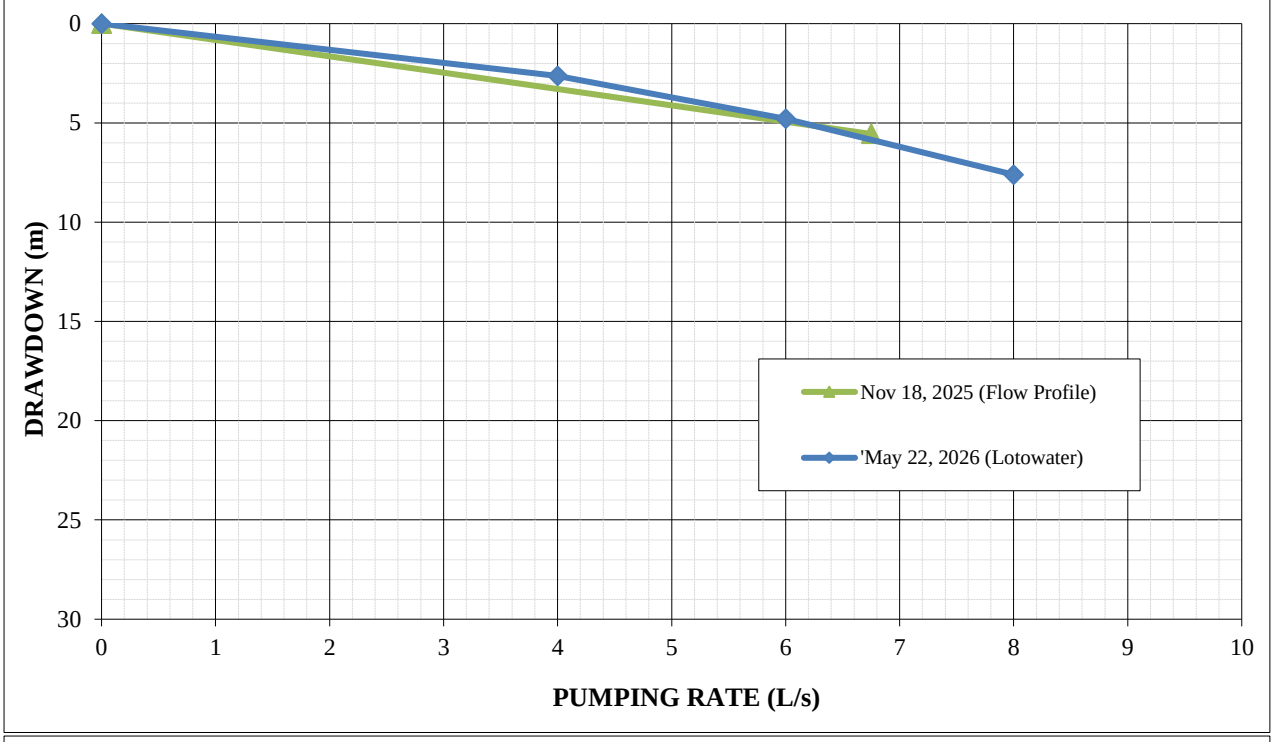
Lotowater TECHNICAL SERVICES INC.

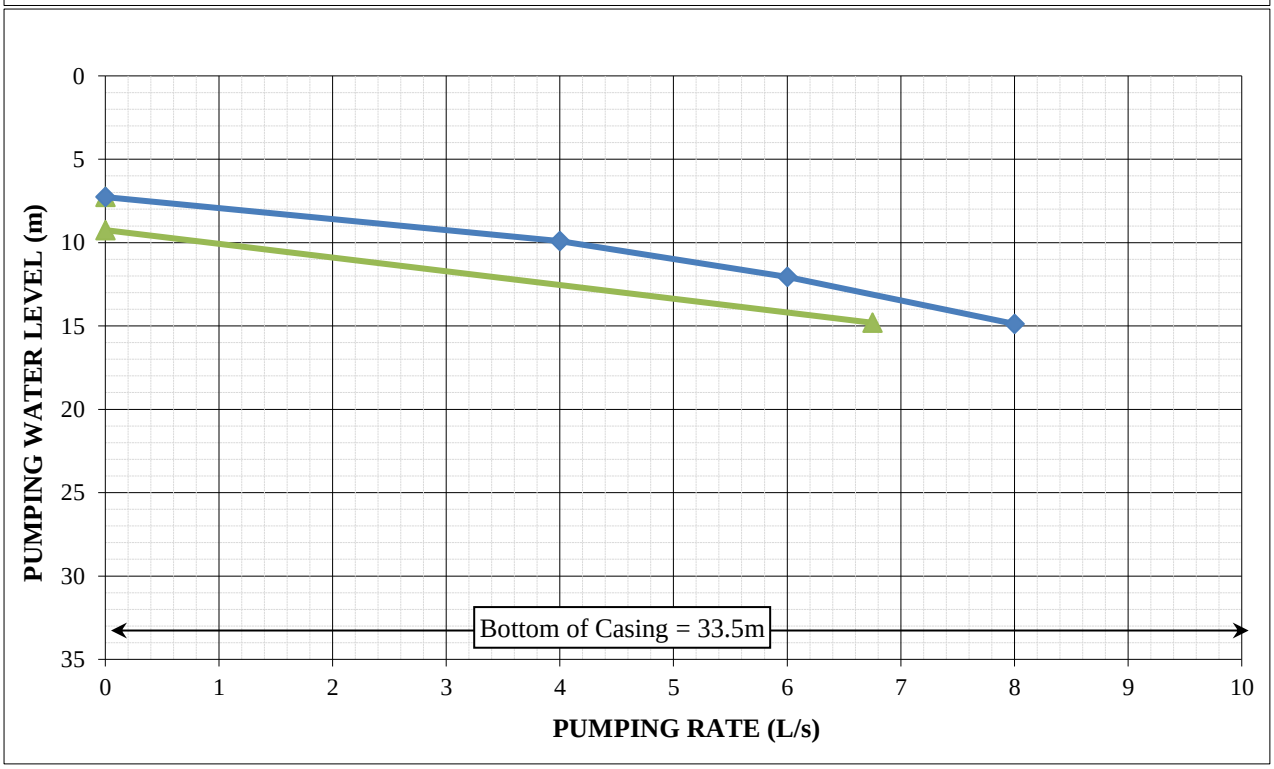
Well Name:	PW21-1	**Project Number:**	313-018
Client:	Centre Wellington - Fergus Golf	**Date:**	5/22/2026
Technician Name:	Nathan Schmitt	**Pump:**	150S100-5 (10hp)
Water Level Device:	LTS water level meter	**Pump Inlet:**	26.5 m
Water Level Reference:	Top of casing 0.57m ags	**Flow Measuring Device:**	3" McCrometer
Test Note:	Set on 2" with 2" discahrge to waste 50' from well		

Time *hr:min*	Elapsed Time *min*	Level *mbToC*	Drawdown *m*	Flow *L/s*	Note
12:07	0	7.27	0.00	4.0	Start Step 1
12:08	1	9.48	2.21	4.0	
12:09	2	9.50	2.23	4.0	
12:10	3	9.51	2.24	4.0	Pressure = 92 psi
12:11	4	9.53	2.26	4.0	
12:12	5	9.53	2.26	4.0	Avg. Amps = 9.8
12:13	6	9.54	2.27	4.0	
12:15	8	9.65	2.38	4.0	
12:17	10	9.67	2.40	4.0	
12:19	12	9.69	2.42	4.0	
12:22	15	9.71	2.44	4.0	
12:27	20	9.72	2.45	4.0	
12:32	25	9.74	2.47	4.0	
12:37	30	9.88	2.61	4.0	
12:42	35	9.89	2.62	4.0	
12:47	40	9.90	2.63	4.0	
12:57	50	9.91	2.64	4.0	
13:07	60	9.91	2.64	4.0	
13:08	1	11.57	4.30	6.0	Start Step 2
13:09	2	11.58	4.31	6.0	
13:10	3	11.60	4.33	6.0	
13:11	4	11.59	4.32	6.0	
13:12	5	11.56	4.29	6.0	
13:13	6	11.74	4.47	6.0	
13:15	8	11.82	4.55	6.0	
13:17	10	11.80	4.53	6.0	Pressure = 80 psi
13:19	12	11.80	4.53	6.0	
13:22	15	11.79	4.52	6.0	
13:27	20	11.94	4.67	6.0	
13:32	25	11.95	4.68	6.0	
13:37	30	11.94	4.67	6.0	
13:42	35	11.90	4.63	6.0	
13:47	40	11.90	4.63	6.0	
13:57	50	11.93	4.66	6.0	
14:07	60	12.07	4.80	6.0	
14:08	1	14.07	6.80	8.0	Start Step 3
14:09	2	14.10	6.83	8.0	
14:10	3	14.07	6.80	8.0	
14:11	4	14.10	6.83	8.0	
14:12	5	14.36	7.09	8.0	
14:13	6	14.49	7.22	8.0	
14:15	8	14.52	7.25	8.0	
14:17	10	14.54	7.27	8.0	Pressure = 68 psi

TABLE 1

14:19	12	14.56	7.29	8.0	
14:22	15	14.60	7.33	8.0	Avg. Amps = 10.7
14:27	20	14.60	7.33	8.0	
14:32	25	14.60	7.33	8.0	
14:37	30	14.60	7.33	8.0	
14:42	35	14.58	7.31	8.0	
14:47	40	14.78	7.51	8.0	
14:57	50	14.81	7.54	8.0	
15:07	60	14.88	7.61	8.0	Stop pumping
15:08	1	9.10	1.83		Start recovery
15:09	2	8.87	1.60		
15:10	3	8.73	1.46		
15:11	4	8.64	1.37		
15:12	5	8.56	1.29		
15:13	6	8.50	1.23		
15:15	8	8.42	1.15		
15:17	10	8.33	1.06		
15:19	12	8.26	0.99		
15:22	15	8.19	0.92		
15:27	20	8.11	0.84		
15:32	25	8.04	0.77		
15:37	30	7.98	0.71		
15:42	35	7.94	0.67		
15:47	40	7.91	0.64		
15:52	45	7.88	0.61		





Notes:

All water levels are referenced from top of casing

Top of casing = 0.57m above ground surface

Pump Inlet = 26.5m

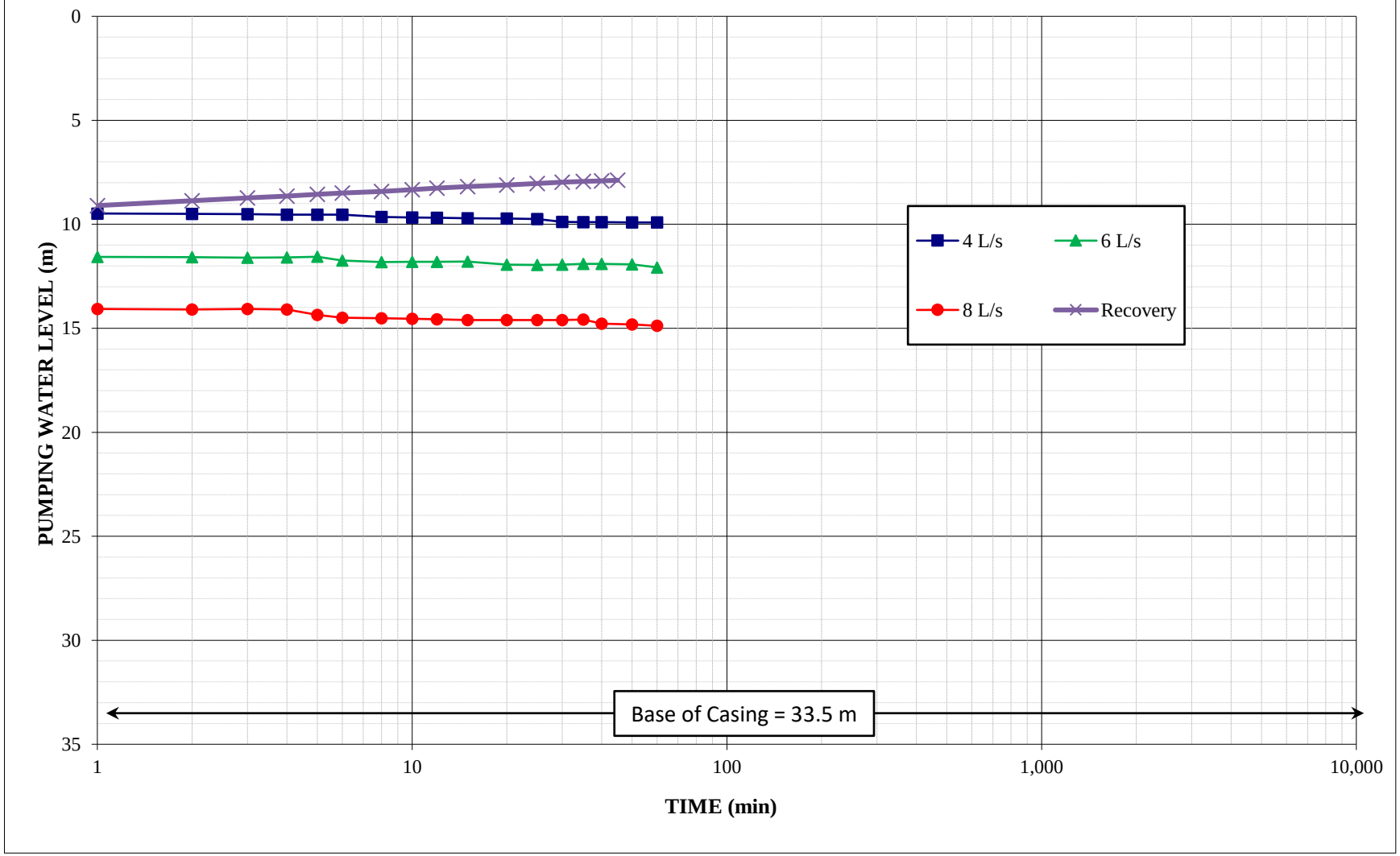
FERGUS GOLF

PW21-1

Comparison of Variable Rate Tests

Lotowater Technical Services Inc. **Figure 1a**

313-018 5/26/2026



Notes:

Test Date: May 22, 2026

All water levels are referenced from top of casing

Top of casing = 0.57m above ground surface

Static water level at 7.27mbtc

FERGUS GOLF

PW21-1

Comparison of Variable Rate Tests

Lotowater Technical Services Inc. **Figure 1a**

313-018 5/26/2026

Aquifer Test (Pumping Well)

Lotowater TECHNICAL SERVICES INC.

Project Number: 313-018

Location: Belwood Golf Club, 8286 Wellington 19, Centre Welligton

Measuring Point: Top of casing **Pump Type:** Grundfos 150S100-5

Stick-up: 0.54 m **Pump Inlet:** 26.5m

SWL: 7.28 m **Technician:** B.Pendleton

Pumping Rate: 8 L/s **Transducer Serial #:** Clients Solonist

Flow Measurement: 3" McCrometer Flow Meter

Discharge Location: Main Pond 325m to E

Test Note:

WELL NAME: **PW21-1** **MOE # A310448**

Date	Time	Elapsed Time	Water Level	Drawdown	Flow Rate	Totalizer	Comments
yyyy/mm/dd	*hr:min*	*min*	*mbtc*	*m*	*L/s*	*m3*	
2026-05-26	11:00	0	7.28	0.00	8	3016	Start at 11:00
2026-05-26	11:01	1	13.00	5.72	8		44psi
2026-05-26	11:02	2	13.01	5.73	8		
2026-05-26	11:03	3	13.07	5.79	8		
2026-05-26	11:04	4	13.17	5.89	8		
2026-05-26	11:05	5	13.23	5.95	8		
2026-05-26	11:06	6	13.25	5.97	8		
2026-05-26	11:08	8	13.34	6.06	8		
2026-05-26	11:10	10	13.40	6.12	8		
2026-05-26	11:12	12	13.47	6.19	8		
2026-05-26	11:15	15	13.54	6.26	8		45psi
2026-05-26	11:20	20	13.69	6.41	8		
2026-05-26	11:25	25	13.76	6.48	8		
2026-05-26	11:30	30	13.82	6.54	8		53psi Start the test of PW25-3
2026-05-26	11:40	40	14.54	7.26	8		
2026-05-26	11:50	50	14.77	7.49	8		
2026-05-26	12:00	60	14.98	7.70	8	3044	46psi
2026-05-26	12:15	75	15.20	7.92	8		
2026-05-26	12:30	90	15.34	8.06	8		
2026-05-26	13:00	120	15.54	8.26	8	3071	67psi
2026-05-26	13:30	150	15.67	8.39	8		
2026-05-26	14:00	180	15.83	8.55	8	3098	67psi
2026-05-26	14:30	210	15.95	8.67	8		
2026-05-26	15:00	240	16.00	8.72	8	3125	68psi
2026-05-26	16:00	300	16.67	9.39	8	3153	66psi
2026-05-26	17:00	360	16.40	9.12	8		
2026-05-26	18:00	420	17.27	9.99	8	3,205	
2026-05-26	19:00	480	17.36	10.08	8	3,235	
2026-05-26	20:00	540	17.40	10.12	8	3,263	
2026-05-26	21:00	600	18.48	11.20	8	3,291	adjusted flow back to 8 l/s
2026-05-26	22:00	660	19.65	12.37	8	3,318	
2026-05-26	23:00	720	17.60	10.32	8	3,345	adjusted flow back to 8 l/s

Aquifer Test (Pumping Well)

Lotowater TECHNICAL SERVICES INC.

WELL NAME: PW21-1 **MOE # A310448**

Date	Time	Elapsed Time	Water Level	Drawdown	Flow Rate	Totalizer	Comments
yyyy/mm/dd	*hr:min*	*min*	*mbtc*	*m*	*L/s*	*m3*	
2026-05-27	0:00	780	17.86	10.58	8	3,373	
2026-05-27	1:00	840	17.96	10.68	8	3,401	
2026-05-27	2:00	900	17.94	10.66	8	3,428	
2026-05-27	3:00	960	18.02	10.74	8	3,456	
2026-05-27	4:00	1,020	18.11	10.83	8	3,483	adjusted flow back to 8 l/s
2026-05-27	5:00	1,080	17.53	10.25	8	3,512	
2026-05-27	6:00	1,140	18.44	11.16	8	3,540	
2026-05-27	7:00	1,200	18.55	11.27	8	3,567	
2026-05-27	8:00	1,260	18.60	11.32	8	3,597	
2026-05-27	9:00	1,320	18.67	11.39	8	3,625	
2026-05-27	10:00	1,380	18.74	11.46	8	3,653	
2026-05-27	11:00	1,440	18.74	11.46	8	3,680	
2026-05-27	12:00	1,500	18.75	11.47	8	3,710	64psi
2026-05-27	13:00	1,560	18.76	11.48	8	3,737	64psi
2026-05-27	14:00	1,620	18.76	11.48	8	3,765	64psi
2026-05-27	15:00	1,680	18.80	11.52	8	3,790	63psi
2026-05-27	16:00	1,740	18.83	11.55	8	3,822	64psi
2026-05-27	17:00	1,800	18.88	11.60	8	3,845	64psi
2026-05-27	18:00	1,860	18.95	11.67	8	3,875	
2026-05-27	19:00	1,920	18.97	11.69	8	3,901	
2026-05-27	20:00	1,980	19.01	11.73	8	3,929	
2026-05-27	21:00	2,040	19.35	12.07	8	3,957	
2026-05-27	22:00	2,100	19.40	12.12	8	3,985	
2026-05-27	23:00	2,160	19.43	12.15	8	4,013	
2026-05-28	0:00	2,220	19.45	12.17	8	4,041	
2026-05-28	1:00	2,280	19.49	12.21	8	4,068	
2026-05-28	2:00	2,340	19.50	12.22	8	4,096	
2026-05-28	3:00	2,400	19.51	12.23	8	4,147	15psi
2026-05-28	4:00	2,460	19.51	12.23	8	4,151	
2026-05-28	5:00	2,520	19.55	12.27	8	4,180	
2026-05-28	6:00	2,580	19.60	12.32	8	4,209	14psi
2026-05-28	7:00	2,640	19.66	12.38	8	4,234	13psi
2026-05-28	8:00	2,700	19.66	12.38	8	4,265	60psi
2026-05-28	9:00	2,760	19.70	12.42	8	4,292	62psi
2026-05-28	10:00	2,820	19.74	12.46	8	4,320	9:44 generator filled
2026-05-28	11:00	2,880	19.77	12.49	8	4,349	63psi
2026-05-28	12:00	2,940	19.82	12.54	8	4,376	61psi
2026-05-28	13:00	3,000	19.83	12.55	8	4,404	
2026-05-28	14:00	3,060	19.88	12.60	8	4,432	
2026-05-28	15:00	3,120	19.87	12.59	8	4,460	
2026-05-28	16:00	3,180	19.88	12.60	8	4,488	
2026-05-28	17:00	3,240	19.91	12.63	8	4,517	

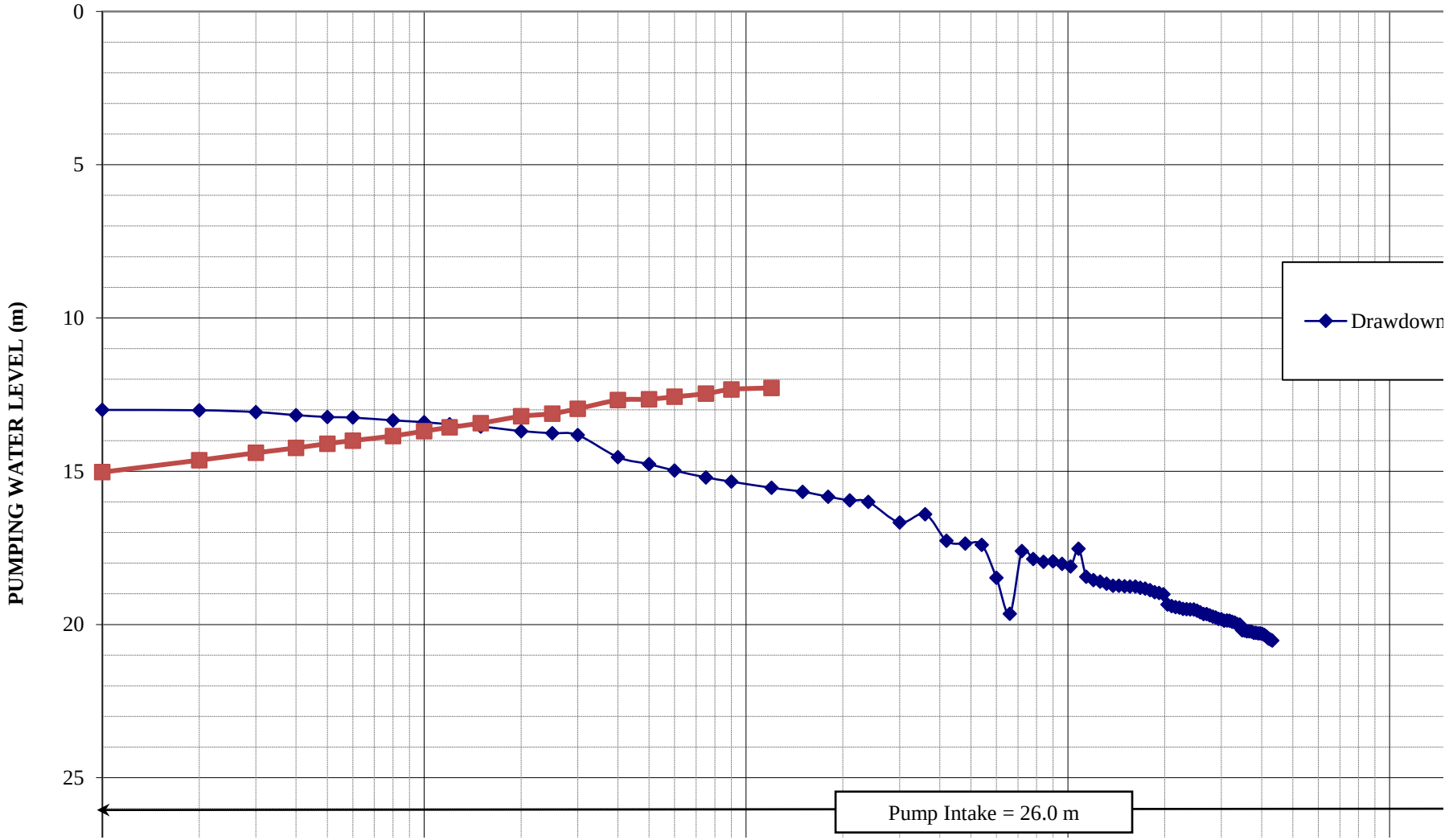
Aquifer Test (Pumping Well)

Lotowater TECHNICAL SERVICES INC.

WELL NAME: PW21-1 **MOE # A310448**

Date	Time	Elapsed Time	Water Level	Drawdown	Flow Rate	Totalizer	Comments
yyyy/mm/dd	*hr:min*	*min*	*mbtc*	*m*	*L/s*	*m3*	
2026-05-28	18:00	3,300	19.94	12.66	8	4,543	
2026-05-28	19:00	3,360	19.99	12.71	8	4,571	
2026-05-28	20:00	3,420	20.00	12.72	8	4,598	
2026-05-28	21:00	3,480	20.19	12.91	8	4,626	
2026-05-28	22:00	3,540	20.20	12.92	8	4,654	
2026-05-28	23:00	3,600	20.22	12.94	8	4,682	
2026-05-29	0:00	3,660	20.22	12.94	8	4,709	
2026-05-29	1:00	3,720	20.23	12.95	8	4,738	
2026-05-29	2:00	3,780	20.27	12.99	8	4,765	
2026-05-29	3:00	3,840	20.27	12.99	8	4,793	
2026-05-29	4:00	3,900	20.29	13.01	8	4,821	
2026-05-29	5:00	3,960	20.29	13.01	8	4,857	
2026-05-29	6:00	4,020	20.31	13.03	8	4,870	
2026-05-29	7:00	4,080	20.34	13.06	8	4,905	
2026-05-29	8:00	4,140	20.39	13.11	8	4,935	
2026-05-29	9:00	4,200	20.46	13.18	8	4,964	
2026-05-29	10:00	4,260	20.49	13.21	8	4,994	
2026-05-29	11:00	4,320	20.52	13.24	8	5,020	
2026-05-29	11:01	1	15.03	7.75	0		Recovery
2026-05-29	11:02	2	14.64	7.36	0		
2026-05-29	11:03	3	14.40	7.12	0		
2026-05-29	11:04	4	14.24	6.96	0		
2026-05-29	11:05	5	14.10	6.82	0		
2026-05-29	11:06	6	14.00	6.72	0		
2026-05-29	11:08	8	13.85	6.57	0		
2026-05-29	11:10	10	13.69	6.41	0		
2026-05-29	11:12	12	13.57	6.29	0		
2026-05-29	11:15	15	13.43	6.15	0		
2026-05-29	11:20	20	13.21	5.93	0		
2026-05-29	11:25	25	13.12	5.84	0		
2026-05-29	11:30	30	12.96	5.68	0		
2026-05-29	11:40	40	12.68	5.40	0		
2026-05-29	11:50	50	12.65	5.37	0		
2026-05-29	12:00	60	12.57	5.29	0		
2026-05-29	12:15	75	12.47	5.19	0		
2026-05-29	12:30	90	12.33	5.05	0		
2026-05-29	13:00	120	12.28	5.00	0		

PW25-1
Q = 8 L/s
SWL = 7.28m
Test Start on May 26, 2026; 11:00



VARIABLE RATE PERFORMANCE TEST

Lotowater TECHNICAL SERVICES INC.

Well Name:	North Irrigation Well	**Project Number:**	313-018
Client:	Bellwood Golf Course	**Date:**	5/25/2026
Technician Name:	Nathan S.	**Pump:**	10SQ
Water Level Device:	LTS water level meter	**Pump Inlet:**	45 m
Water Level Reference:	Top of concrete tile	**Flow Measuring Device:**	Time to fill know volume
Test Note:			

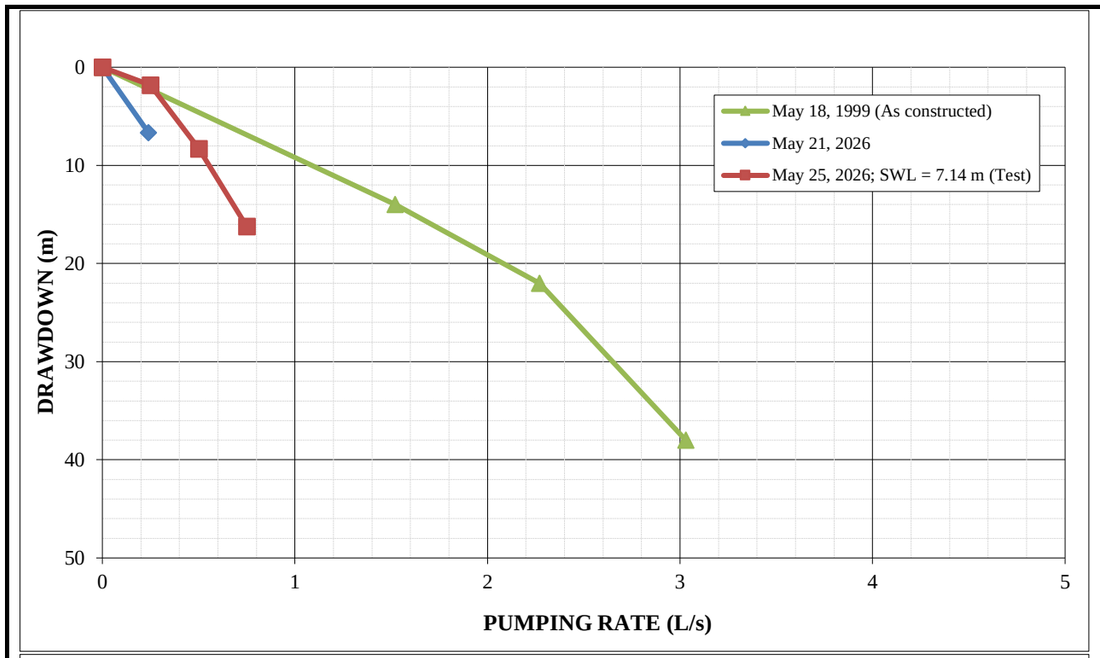
Time *hr:min*	Elapsed Time *min*	Level *mbtconcrete tile*	Drawdown *m*	Flow *L/s*	Note
0:00	0	7.14	0.00	0.25	Start Step 1
0:01	1	8.56	1.42	0.25	Discharge cloudy, Orange
0:02	2	8.67	1.53	0.25	
0:03	3	8.76	1.62	0.25	
0:04	4	8.81	1.67	0.25	
0:05	5	8.83	1.69	0.25	
0:06	6	8.85	1.71	0.25	
0:08	8	8.87	1.73	0.25	
0:10	10	8.89	1.75	0.25	
0:12	12	8.90	1.76	0.25	
0:15	15	8.91	1.77	0.25	
0:20	20	8.92	1.78	0.25	
0:25	25	9.01	1.87	0.25	
0:30	30	8.96	1.82	0.25	
0:35	35	8.96	1.82	0.25	
0:40	40	8.95	1.81	0.25	Discharge still slightly cloudy
0:50	50	8.94	1.80	0.25	
1:00	60	8.94	1.80	0.25	
1:01	1	10.27	3.13	0.50	Start Step 2
1:02	2	10.80	3.66	0.50	
1:03	3	11.30	4.16	0.50	
1:04	4	11.80	4.66	0.50	
1:05	5	12.10	4.96	0.50	
1:06	6	12.40	5.26	0.50	
1:08	8	13.00	5.86	0.50	
1:10	10	13.40	6.26	0.50	
1:12	12	13.70	6.56	0.50	
1:15	15	14.05	6.91	0.50	
1:20	20	14.40	7.26	0.50	
1:25	25	14.58	7.44	0.50	
1:30	30	14.65	7.51	0.50	
1:35	35	14.69	7.55	0.50	
1:40	40	14.72	7.58	0.50	
1:50	50	14.78	7.64	0.50	
2:00	60	15.42	8.28	0.50	Discharge clean and colourless
2:01	1	17.13	9.99	0.75	Start Step 3

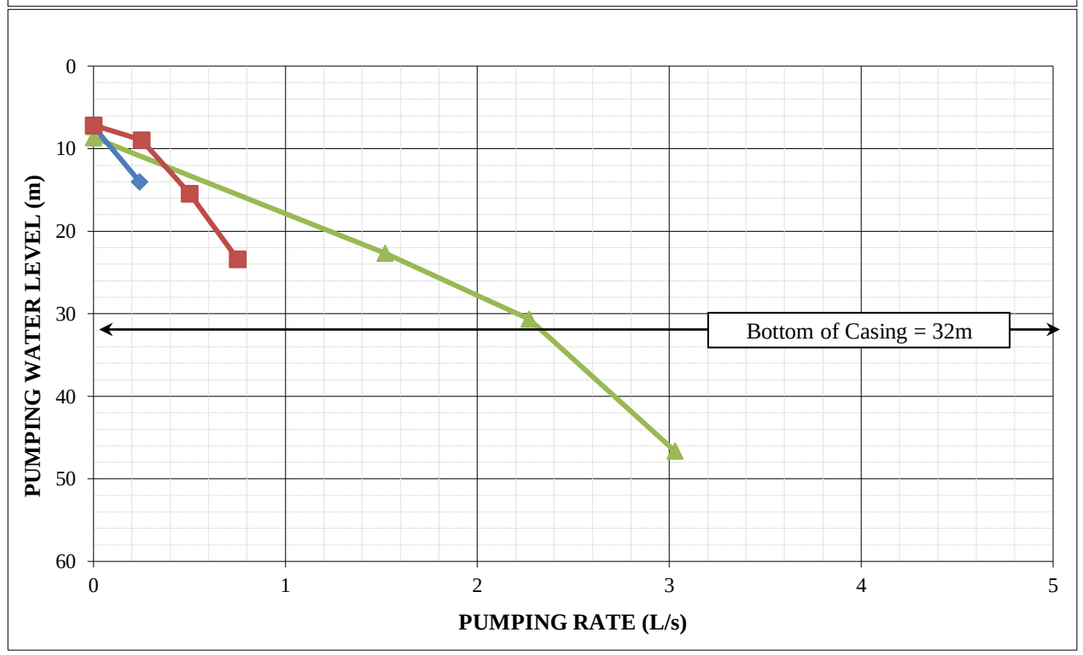
VARIABLE RATE PERFORMANCE TEST

Lotowater TECHNICAL SERVICES INC.

Well Name:	North Irrigation Well	**Project Number:**	313-018
Client:	Bellwood Golf Course	**Date:**	5/25/2026
Technician Name:	Nathan S.	**Pump:**	10SQ
Water Level Device:	LTS water level meter	**Pump Inlet:**	45 m
Water Level Reference:	Top of concrete tile	**Flow Measuring Device:**	Time to fill know volume
Test Note:			

Time *hr:min*	Elapsed Time *min*	Level *mbtconcrete tile*	Drawdown *m*	Flow *L/s*	Note
2:02	2	17.56	10.42	0.75	
2:03	3	17.94	10.80	0.75	
2:04	4	18.30	11.16	0.75	
2:05	5	18.60	11.46	0.75	
2:06	6	18.88	11.74	0.75	
2:08	8	19.36	12.22	0.75	
2:10	10	19.95	12.81	0.75	
2:12	12	20.54	13.40	0.75	
2:15	15	21.20	14.06	0.75	
2:20	20	21.93	14.79	0.75	
2:25	25	22.34	15.20	0.75	
2:30	30	22.53	15.39	0.75	
2:35	35	22.80	15.66	0.75	
2:40	40	22.97	15.83	0.75	
2:50	50	23.20	16.06	0.75	
3:00	60	23.37	16.23	0.75	





Project #:
Well Name: Fergus Golf - North Irrigation Well

Date	Q L/s	PWL mbmp	PWL mbtc	DD m	Specific Capacity L/s/m	Note
May 18, 1999	0.00		8.65	0.00		As constructed
	1.52		22.65	14.00	0.11	
	2.27		30.65	22.00	0.10	
	3.03		46.65	38.00	0.08	
May 21, 2026	0.00		7.32	0.00		to of 36" casing
	0.24		14.00	6.68	0.04	
May 25, 2026	0.00		7.14	0.00		
	0.25		8.94	1.80	0.14	
	0.50		15.42	8.28	0.06	
	0.75		23.37	16.23	0.05	

Notes:

All water levels are referenced from top of concrete tile

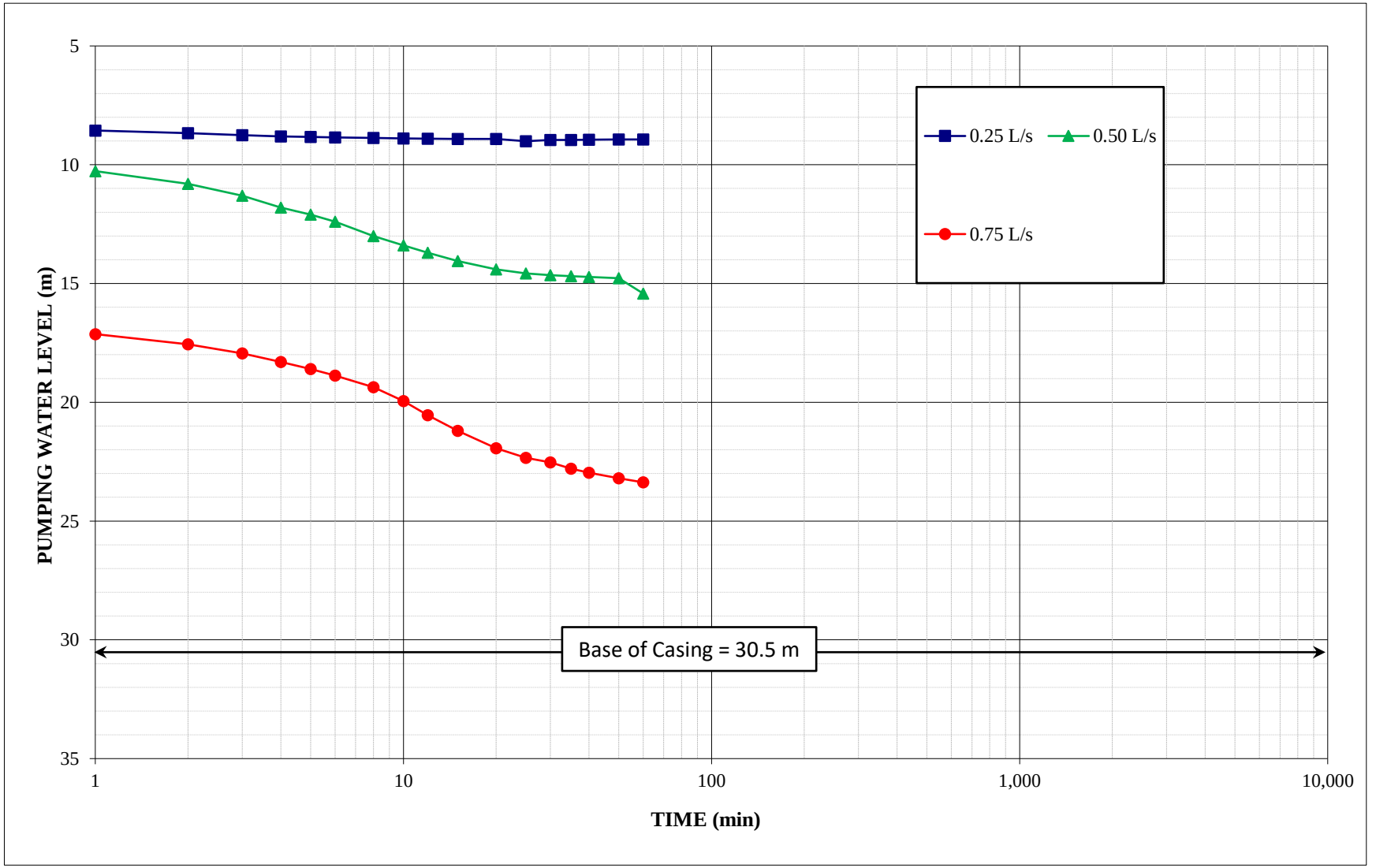
Bellwood Golf Course

North Irrigation Well

Comparison of Variable Rate Tests

Lotowater Technical Services Inc. **Figure 1a**

313-018 5/21/2026



Notes:
Test Date: May 25, 2026
Static water level = 7.14 mbmp

Bellwood Golf Course

North Irrigation Well

Comparison of Variable Rate Tests

Lotowater Technical Services Inc. **Figure 1b**
Reference: 313-018 5/25/2026

Aquifer Test (Pumping Well)

Lotowater TECHNICAL SERVICES INC.

Project Number:	313-018		
Location:	Belwood Golf Club, 8286 Wellington 19		
Measuring Point:	Top of pit lid	**Pump Type:**	Grundfos 30sq - Switch to 10SQ
Stick-up:	0.19 m	**Pump Inlet:**	42.6 m
SWL:	8.76 m	**Technician:**	B.Pendleton
Pumping Rate:	1.0 - 0.8 l/s	**Transducer Serial #:**	Clients Solonist
Flow Measurement:	Time to fill known volume		
Discharge Location:	Pond 10m north of well		
Test Note:	SWL 7.6 10:30AM		

WELL NAME: **North Irrigation Well**

Date	Time	Elapsed Time	Water Level	Drawdown	Flow Rate	Comments
yyyy/mm/dd	*hr:min*	*min*	*mbtc*	*m*	*L/s*	
2026-05-26	12:00	0	8.76	0.00	1.0	Start at 12:00
2026-05-26	12:01	1	11.81	3.05	1.0	44psi
2026-05-26	12:02	2	13.44	4.68	1.0	
2026-05-26	12:03	3	15.07	6.31	1.0	
2026-05-26	12:04	4	16.30	7.54	1.0	
2026-05-26	12:05	5	17.26	8.50	1.0	
2026-05-26	12:06	6	18.30	9.54	1.0	
2026-05-26	12:08	8	20.05	11.29	1.0	
2026-05-26	12:10	10	21.31	12.55	1.0	
2026-05-26	12:12	12	22.70	13.94	1.0	
2026-05-26	12:15	15	24.60	15.84	1.0	
2026-05-26	12:20	20	26.26	17.50	1.0	
2026-05-26	12:25	25	27.37	18.61	1.0	
2026-05-26	12:30	30	28.39	19.63	1.0	
2026-05-26	12:40	40	30.80	22.04	1.0	
2026-05-26	12:50	50	29.50	20.74	1.0	
2026-05-26	13:00	60	30.63	21.87	1.0	
2026-05-26	13:15	75			1.0	
2026-05-26	13:30	90	31.41	22.65	1.0	
2026-05-26	14:00	120	32.20	23.44	1.0	14:18 shut down - Change pump out pump to 10 SQ
2026-05-26	14:18	138	32.21	23.45	1.0	
2026-05-26	14:40	160			0.8	Restart pump at 0.8 L/s
2026-05-26	15:00	180	25.62	16.86	0.8	0 psi
2026-05-26	15:30	210	26.68	17.92	0.8	
2026-05-26	16:00	240	26.78	18.02	0.8	
2026-05-26	17:00	300	27.04	18.28	0.8	

Aquifer Test (Pumping Well)

Lotowater TECHNICAL SERVICES INC.

WELL NAME: North Irrigation Well

Date	Time	Elapsed Time	Water Level	Drawdown	Flow Rate	Comments
yyyy/mm/dd	*hr:min*	*min*	*mbtc*	*m*	*L/s*	
2026-05-26	18:00	360	27.27	18.51	0.8	
2026-05-26	19:00	420	27.37	18.61	0.8	
2026-05-26	20:00	480	27.59	18.83	0.8	
2026-05-26	21:00	540	27.59	18.83	0.8	
2026-05-26	22:00	600	27.56	18.80	0.8	
2026-05-26	23:00	660	27.81	19.05	0.8	
2026-05-27	0:00	720	27.83	19.07	0.8	
2026-05-27	1:00	780	27.91	19.15	0.8	
2026-05-27	2:00	840	28.17	19.41	0.8	
2026-05-27	3:00	900	28.19	19.43	0.8	
2026-05-27	4:00	960	28.29	19.53	0.8	
2026-05-27	5:00	1,020	28.08	19.32	0.8	
2026-05-27	6:00	1,080	28.27	19.51	0.8	
2026-05-27	7:00	1,140	28.38	19.62	0.8	
2026-05-27	8:00	1,200	28.48	19.72	0.8	
2026-05-27	9:00	1,260	28.51	19.75	0.8	
2026-05-27	10:00	1,320	27.70	18.94	0.8	
2026-05-27	11:00	1,380	27.99	19.23	0.8	
2026-05-27	12:00	1,440	28.18	19.42	0.8	
2026-05-27	13:00	1,500	28.18	19.42	0.8	
2026-05-27	14:00	1,560	27.52	18.76	0.8	
2026-05-27	15:00	1,620	28.27	19.51	0.8	
2026-05-27	16:00	1,680	28.42	19.66	0.8	
2026-05-27	17:00	1,740	27.30	18.54	0.8	
2026-05-27	18:00	1,800	28.43	19.67	0.8	
2026-05-27	19:00	1,860	28.49	19.73	0.8	
2026-05-27	20:00	1,920	28.51	19.75	0.8	
2026-05-27	21:00	1,980	28.56	19.80	0.8	
2026-05-27	22:00	2,040	28.60	19.84	0.8	
2026-05-27	23:00	2,100	28.62	19.86	0.8	
2026-05-28	0:00	2,160	28.70	19.94	0.8	
2026-05-28	1:00	2,220	28.60	19.84	0.8	
2026-05-28	2:00	2,280	28.75	19.99	0.8	
2026-05-28	3:00	2,340	28.77	20.01	0.8	
2026-05-28	4:00	2,400	28.80	20.04	0.8	
2026-05-28	5:00	2,460	28.85	20.09	0.8	

Aquifer Test (Pumping Well)

Lotowater TECHNICAL SERVICES INC.

WELL NAME: North Irrigation Well

Date	Time	Elapsed Time	Water Level	Drawdown	Flow Rate	Comments
yyyy/mm/dd	*hr:min*	*min*	*mbtc*	*m*	*L/s*	
2026-05-28	6:00	2,520	28.88	20.12	0.8	
2026-05-28	7:00	2,580	28.92	20.16	0.8	
2026-05-28	8:00	2,640	28.95	20.19	0.8	
2026-05-28	9:00	2,700	29.00	20.24	0.8	
2026-05-28	10:00	2,760	29.04	20.28	0.8	
2026-05-28	11:00	2,820	29.07	20.31	0.8	
2026-05-28	12:00	2,880	29.15	20.39	0.8	
2026-05-28	13:00	2,940	29.18	20.42	0.8	
2026-05-28	14:00	3,000	29.23	20.47	0.8	
2026-05-28	15:00	3,060	29.27	20.51	0.8	
2026-05-28	16:00	3,120	29.28	20.52	0.8	
2026-05-28	17:00	3,180	29.36	20.60	0.8	
2026-05-28	18:00	3,240	29.39	20.63	0.8	
2026-05-28	19:00	3,300	29.42	20.66	0.8	
2026-05-28	20:00	3,360	29.43	20.67	0.8	
2026-05-28	21:00	3,420	29.40	20.64	0.8	
2026-05-28	22:00	3,480	29.43	20.67	0.8	
2026-05-28	23:00	3,540	29.46	20.70	0.8	
2026-05-29	0:00	3,600	29.48	20.72	0.8	
2026-05-29	1:00	3,660	29.51	20.75	0.8	
2026-05-29	2:00	3,720	29.54	20.78	0.8	
2026-05-29	3:00	3,780	29.57	20.81	0.8	
2026-05-29	4:00	3,840	29.60	20.84	0.8	
2026-05-29	5:00	3,900	29.63	20.87	0.8	
2026-05-29	6:00	3,960	25.20	16.44	0.8	switched to other generator and
2026-05-29	7:00	4,020	23.30	14.54	0.8	
2026-05-29	8:00	4,080	28.79	20.03	0.8	
2026-05-29	9:00	4,140	29.01	20.25	0.8	
2026-05-29	10:00	4,200	29.15	20.39	0.8	
2026-05-29	11:00	4,260	29.23	20.47	0.8	
2026-05-29	12:00	4,320	29.28	20.52	0.8	
2026-05-29	12:01	1	26.07	17.31	0.00	Recovery
2026-05-30	12:02	2	24.12	15.36	0.00	
2026-05-31	12:03	3	22.53	13.77	0.00	
2026-06-01	12:04	4	21.07	12.31	0.00	
2026-06-02	12:05	5	19.73	10.97	0.00	

Aquifer Test (Pumping Well)

Lotowater TECHNICAL SERVICES INC.

WELL NAME: North Irrigation Well

Date	Time	Elapsed Time	Water Level	Drawdown	Flow Rate	Comments
yyyy/mm/dd	*hr:min*	*min*	*mbtc*	*m*	*L/s*	
2026-06-03	12:06	6	18.57	9.81	0.00	
2026-06-04	12:08	8	16.70	7.94	0.00	
2026-06-05	12:10	10	15.31	6.55	0.00	
2026-06-06	12:12	12	14.35	5.59	0.00	
2026-06-07	12:15	15	13.40	4.64	0.00	
2026-06-08	12:20	20	12.80	4.04	0.00	
2026-06-09	12:25	25	12.63	3.87	0.00	
2026-06-10	12:30	30	12.55	3.79	0.00	
2026-06-11	12:40	40	12.44	3.68	0.00	
2026-06-12	12:50	50	12.34	3.58	0.00	
2026-06-13	13:00	60	12.26	3.50	0.00	
2026-06-14	13:15	75	12.16	3.40	0.00	
2026-06-15	13:30	90	12.07	3.31	0.00	
2026-06-16	14:00	120	11.92	3.16	0.00	

APPENDIX J

Step Test Analysis

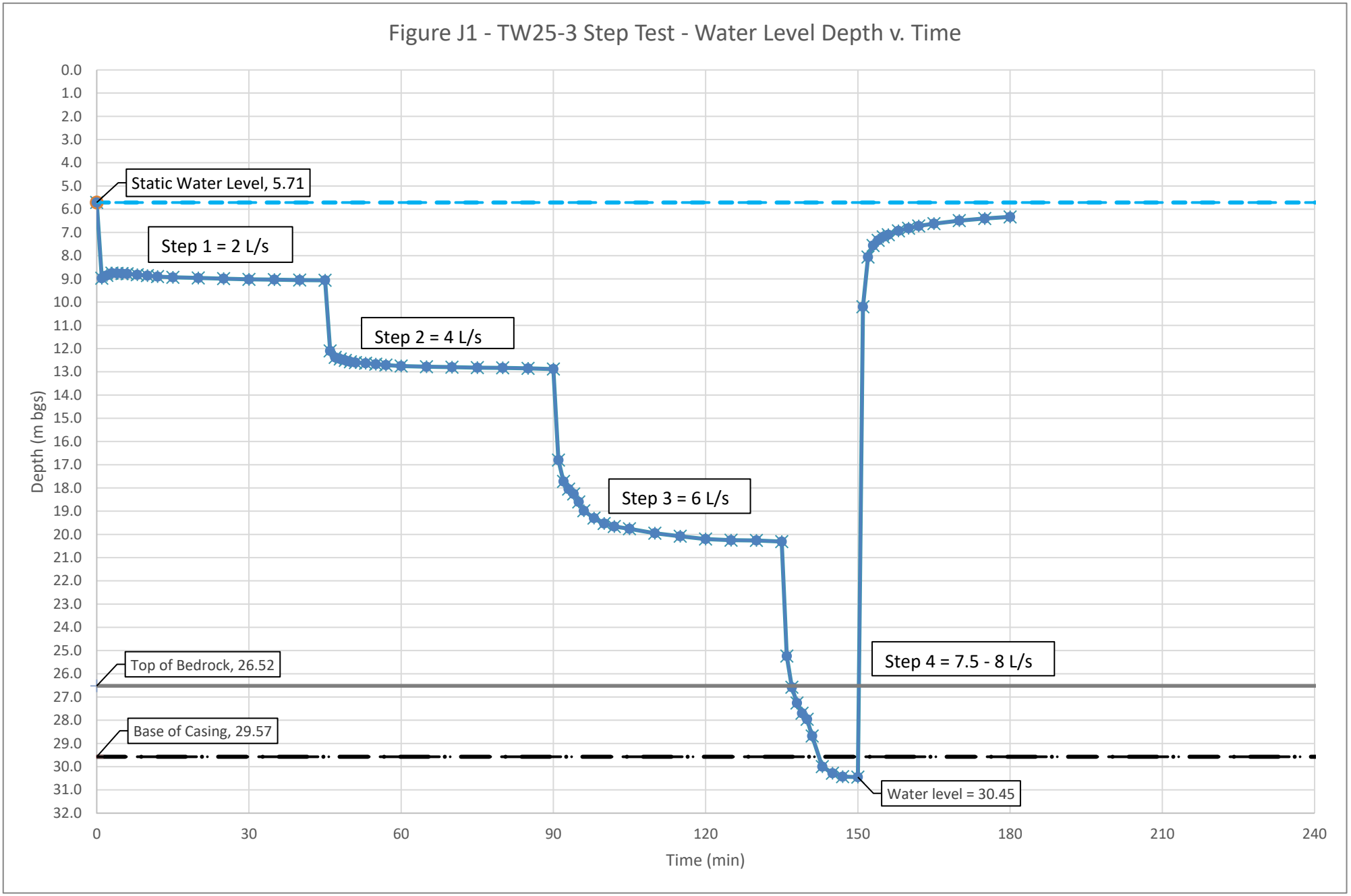
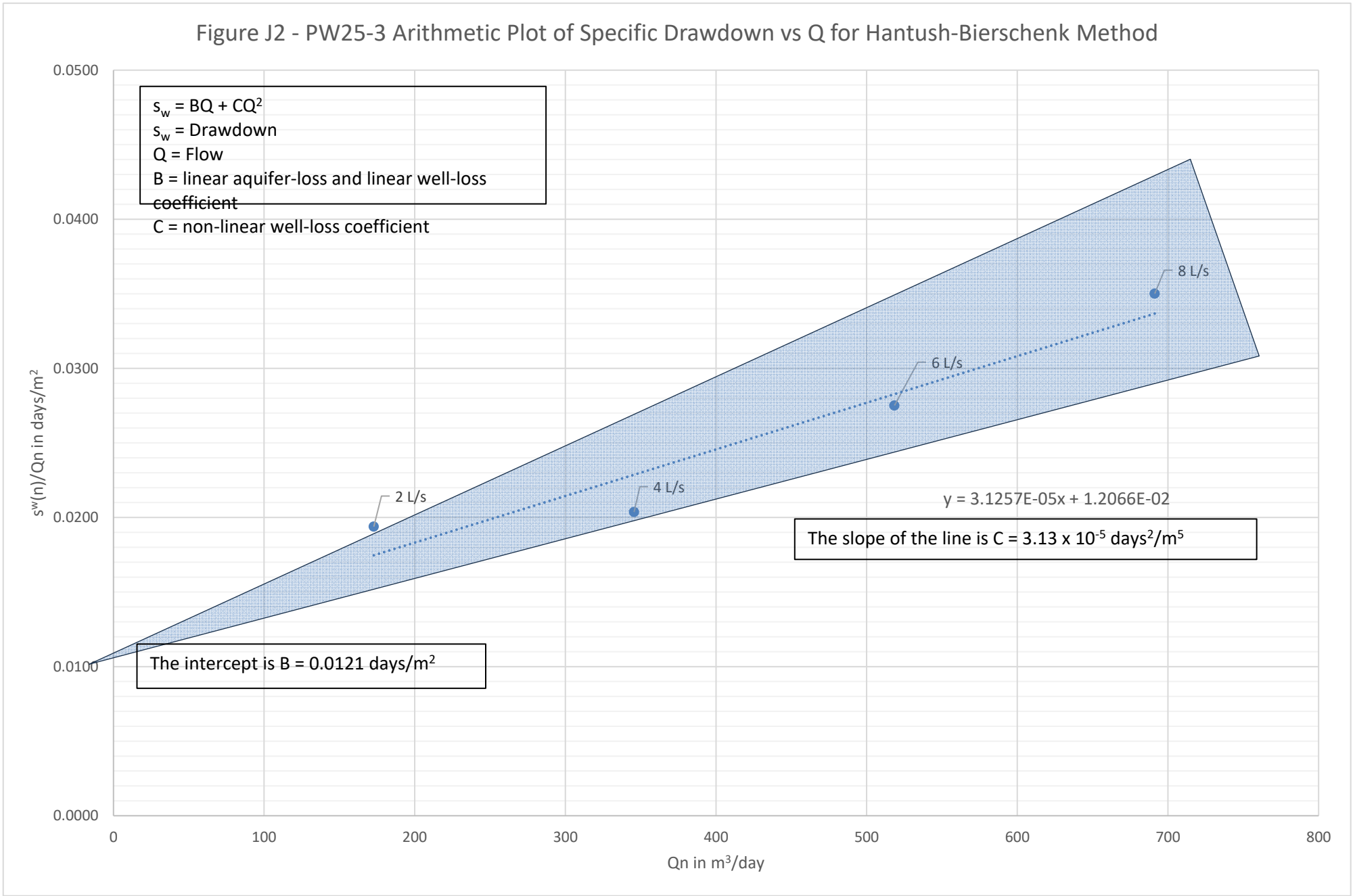

Figure J1 - TW25-3 Step Test - Water Level Depth v. Time
Depth (m bgs)
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
19.0
20.0
21.0
22.0
23.0
24.0
25.0
26.0
27.0
28.0
29.0
30.0
31.0
32.0
0
30
60
90
120
150
180
210
240
Time (min)
Static Water Level, 5.71
Step 1 = 2 L/s
Step 2 = 4 L/s
Step 3 = 6 L/s
Step 4 = 7.5 - 8 L/s
Top of Bedrock, 26.52
Base of Casing, 29.57
Water level = 30.45

Figure J2 - PW25-3 Arithmetic Plot of Specific Drawdown vs Q for Hantush-Bierschenk Method



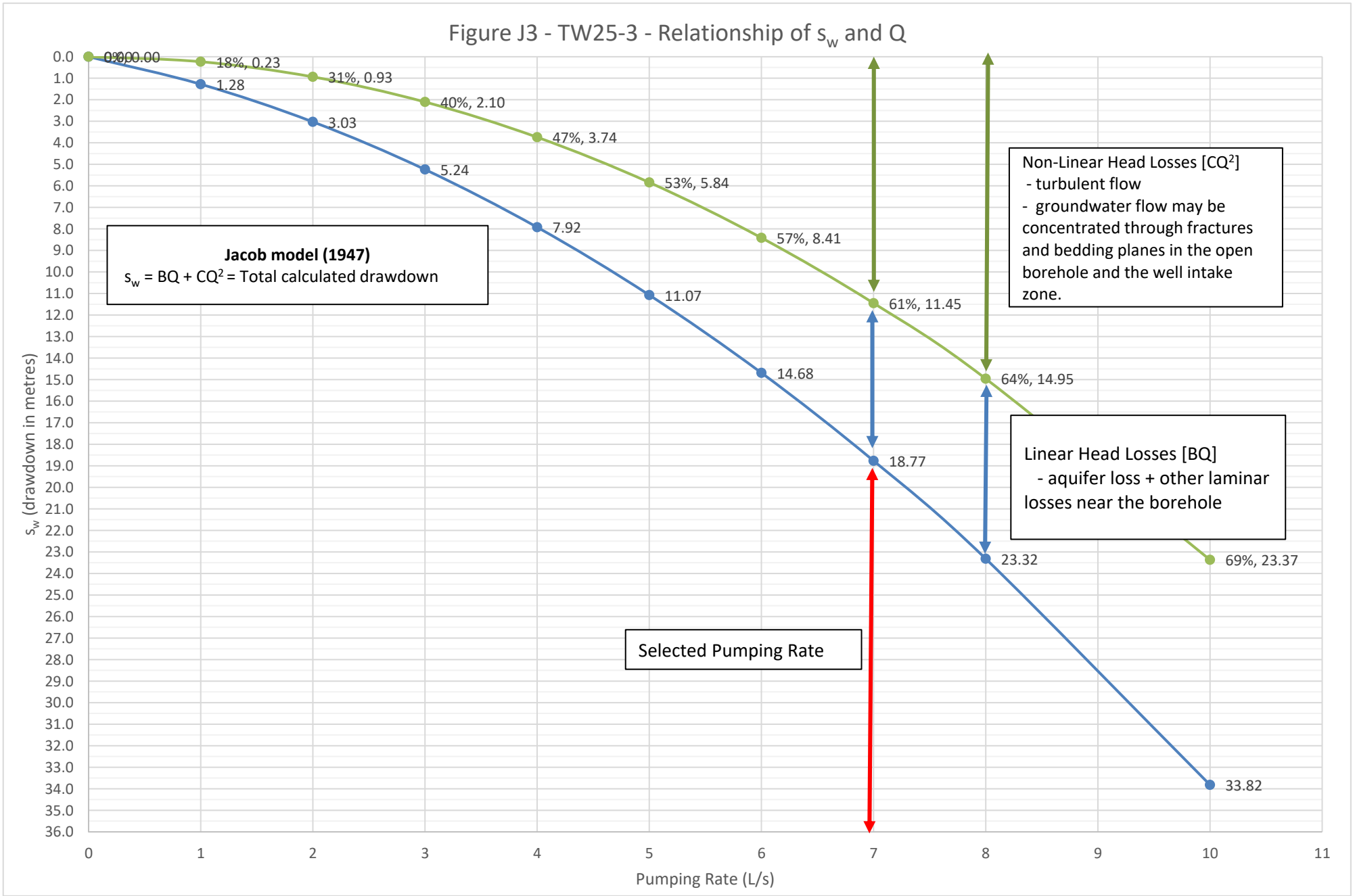

Figure J3 - TW25-3 - Relationship of s_w and Q
0%, 0.00
18%, 0.23
31%, 0.93
40%, 2.10
47%, 3.74
53%, 5.84
57%, 8.41
61%, 11.45
64%, 14.95
69%, 23.37
1.28
3.03
5.24
7.92
11.07
14.68
18.77
23.32
33.82
Jacob model (1947)
$s_w = BQ + CQ^2$ = Total calculated drawdown
Non-Linear Head Losses [CQ^2]
- turbulent flow
- groundwater flow may be concentrated through fractures and bedding planes in the open borehole and the well intake zone.
Linear Head Losses [BQ]
- aquifer loss + other laminar losses near the borehole
Selected Pumping Rate
s_w (drawdown in metres)
Pumping Rate (L/s)
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
19.0
20.0
21.0
22.0
23.0
24.0
25.0
26.0
27.0
28.0
29.0
30.0
31.0
32.0
33.0
34.0
35.0
36.0
0
1
2
3
4
5
6
7
8
9
10
11

Figure J4 - PW21-1 - Water Level Depth v. Time

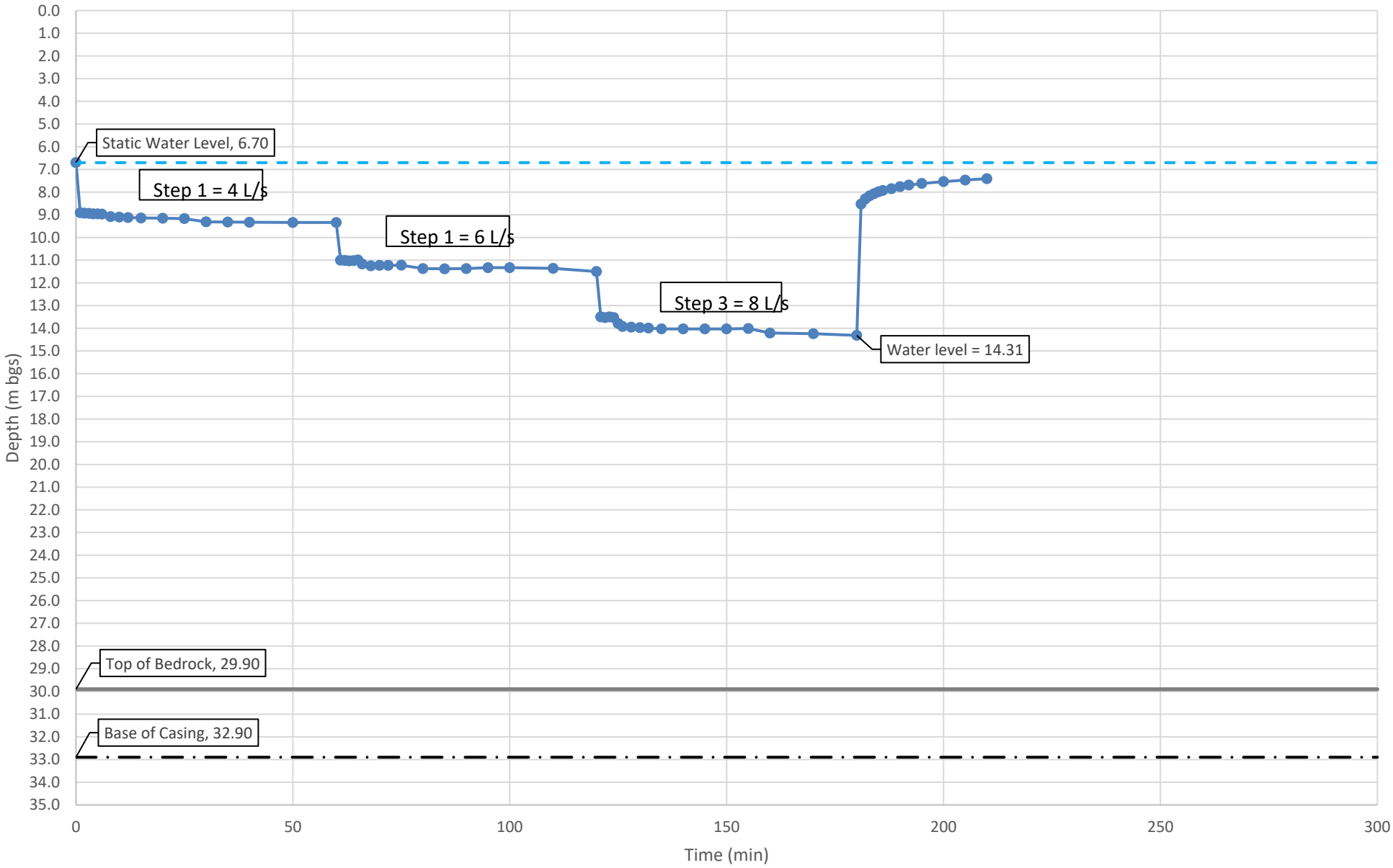
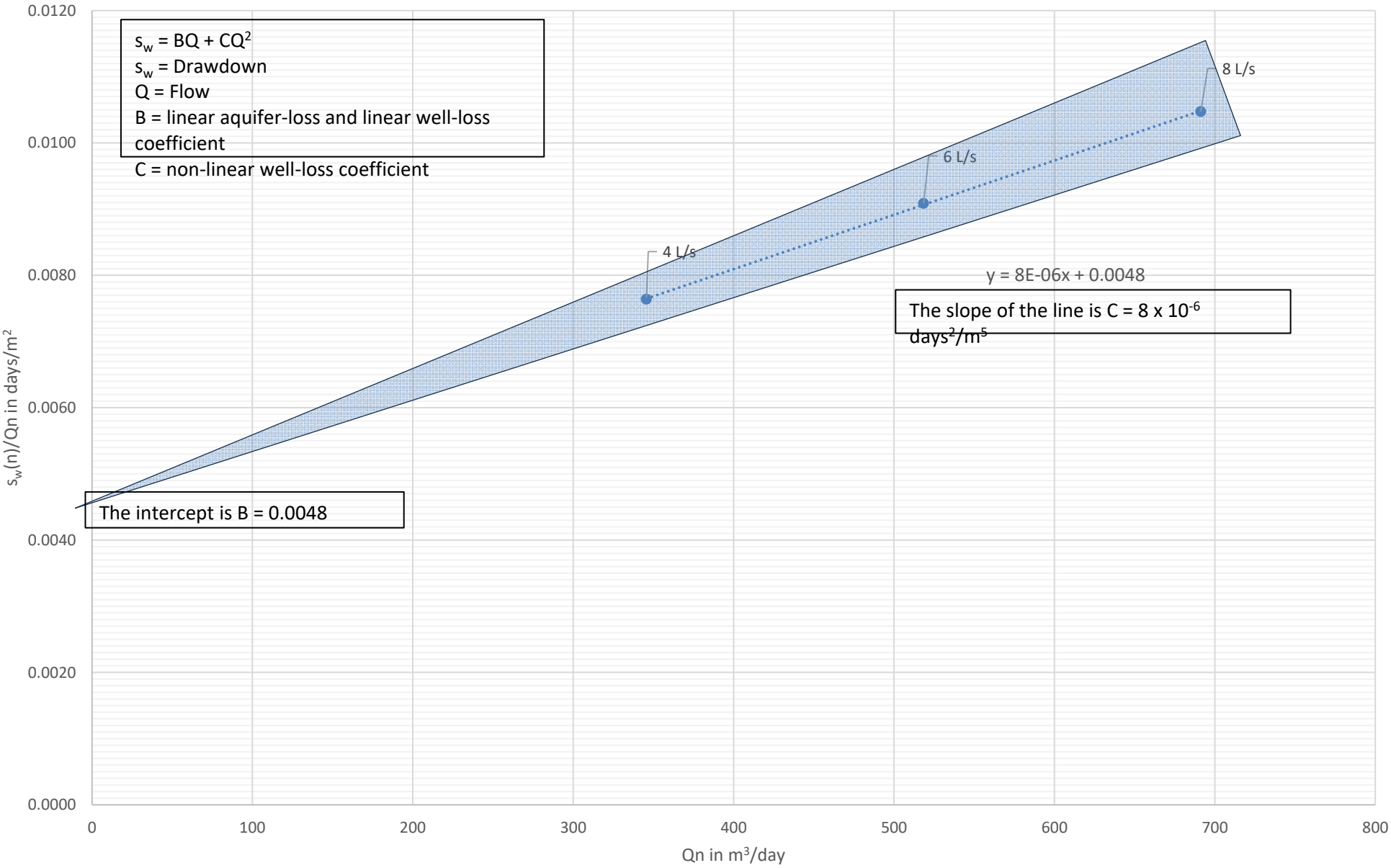
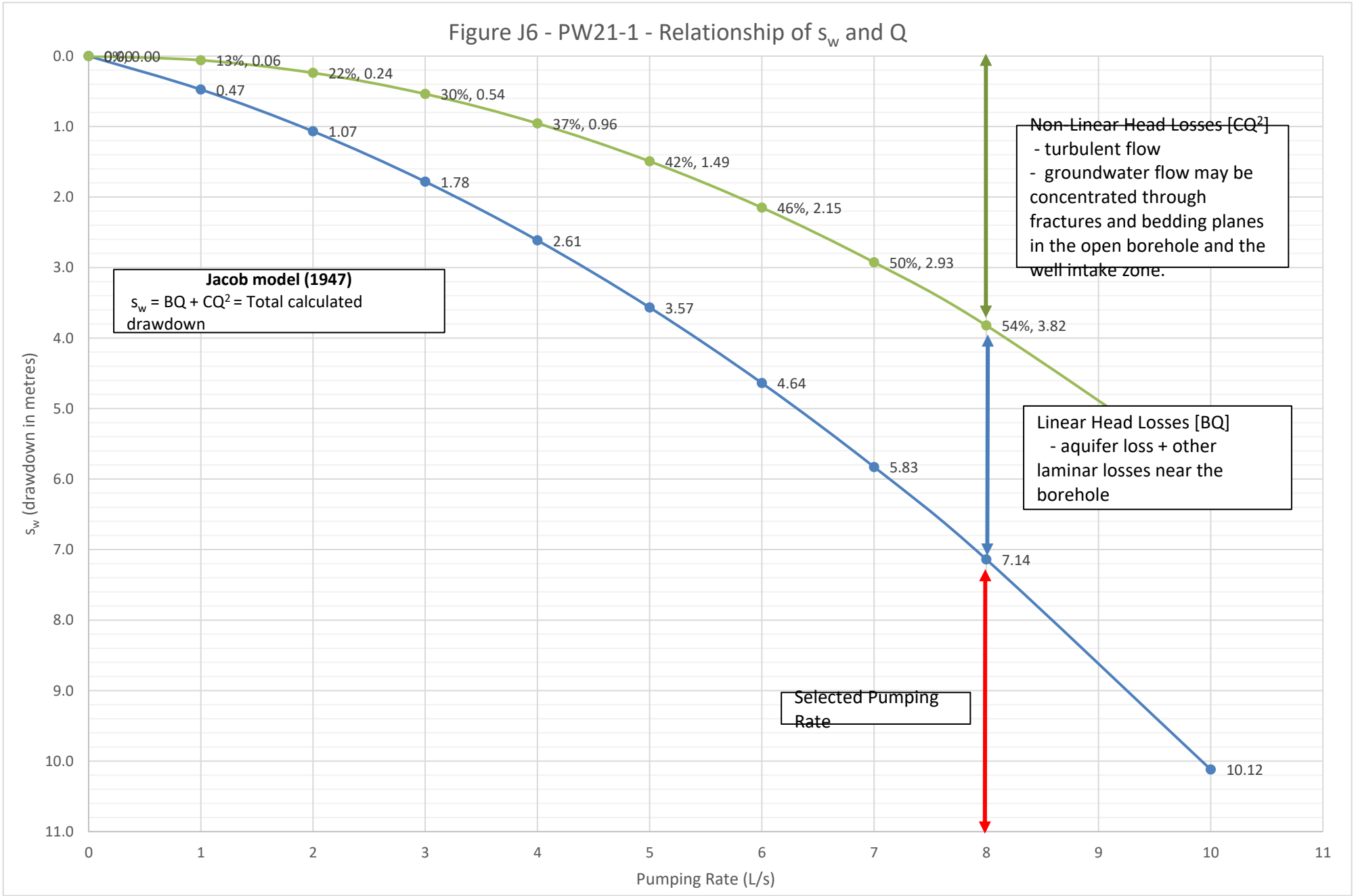


Figure J5 - PW21-1 Arithmetic Plot of Specific Drawdown vs Q for Hantush-Bierschenk Method




Figure J6 - PW21-1 - Relationship of s_w and Q
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
s_w (drawdown in metres)
0
1
2
3
4
5
6
7
8
9
10
11
Pumping Rate (L/s)
0%, 0.00
13%, 0.06
22%, 0.24
30%, 0.54
37%, 0.96
42%, 1.49
46%, 2.15
50%, 2.93
54%, 3.82
0.47
1.07
1.78
2.61
3.57
4.64
5.83
7.14
10.12
Jacob model (1947)
$s_w = BQ + CQ^2$ = Total calculated drawdown
Non-Linear Head Losses [CQ^2]
- turbulent flow
- groundwater flow may be concentrated through fractures and bedding planes in the open borehole and the well intake zone.
Linear Head Losses [BQ]
- aquifer loss + other laminar losses near the borehole
Selected Pumping Rate

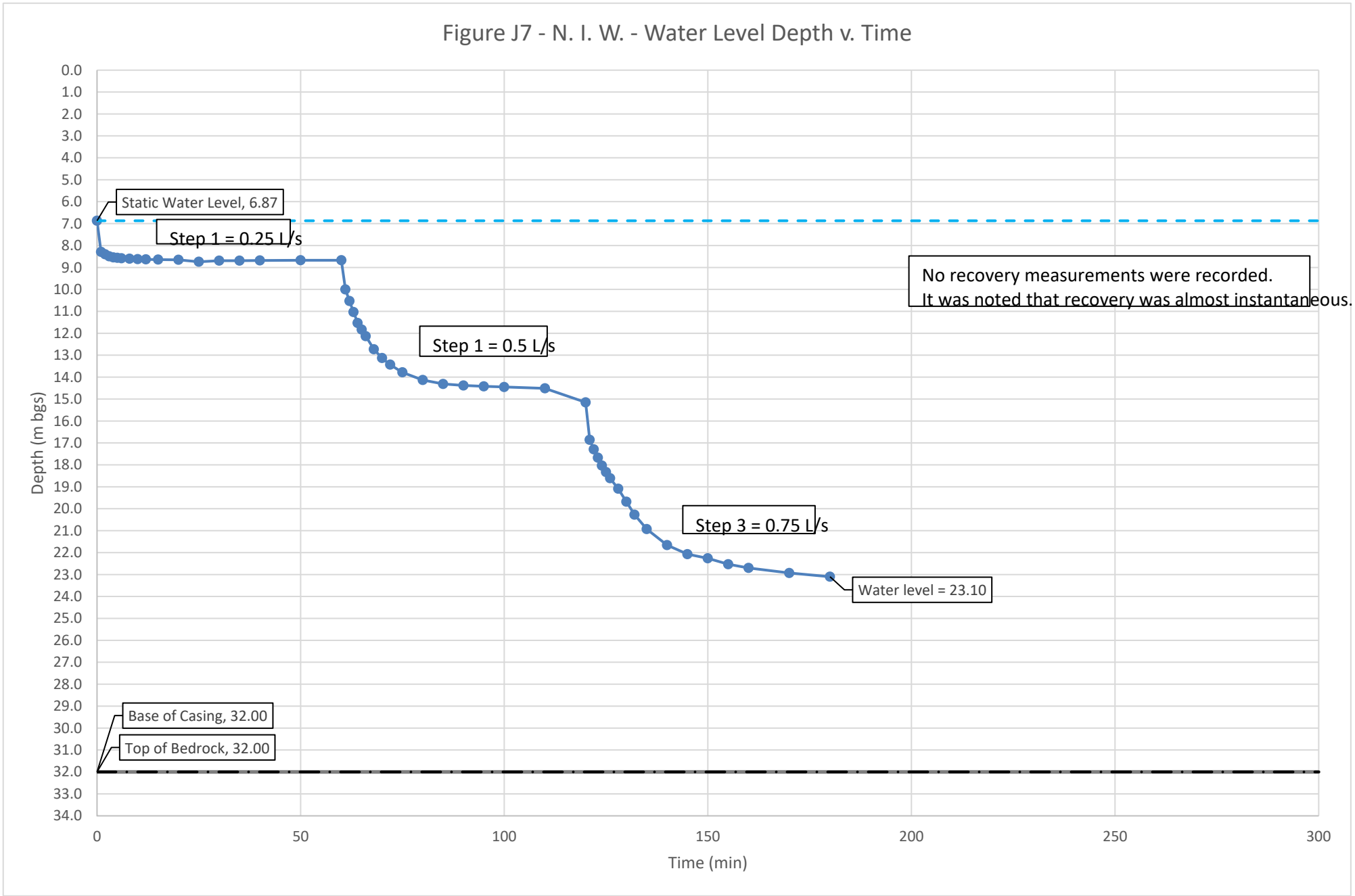
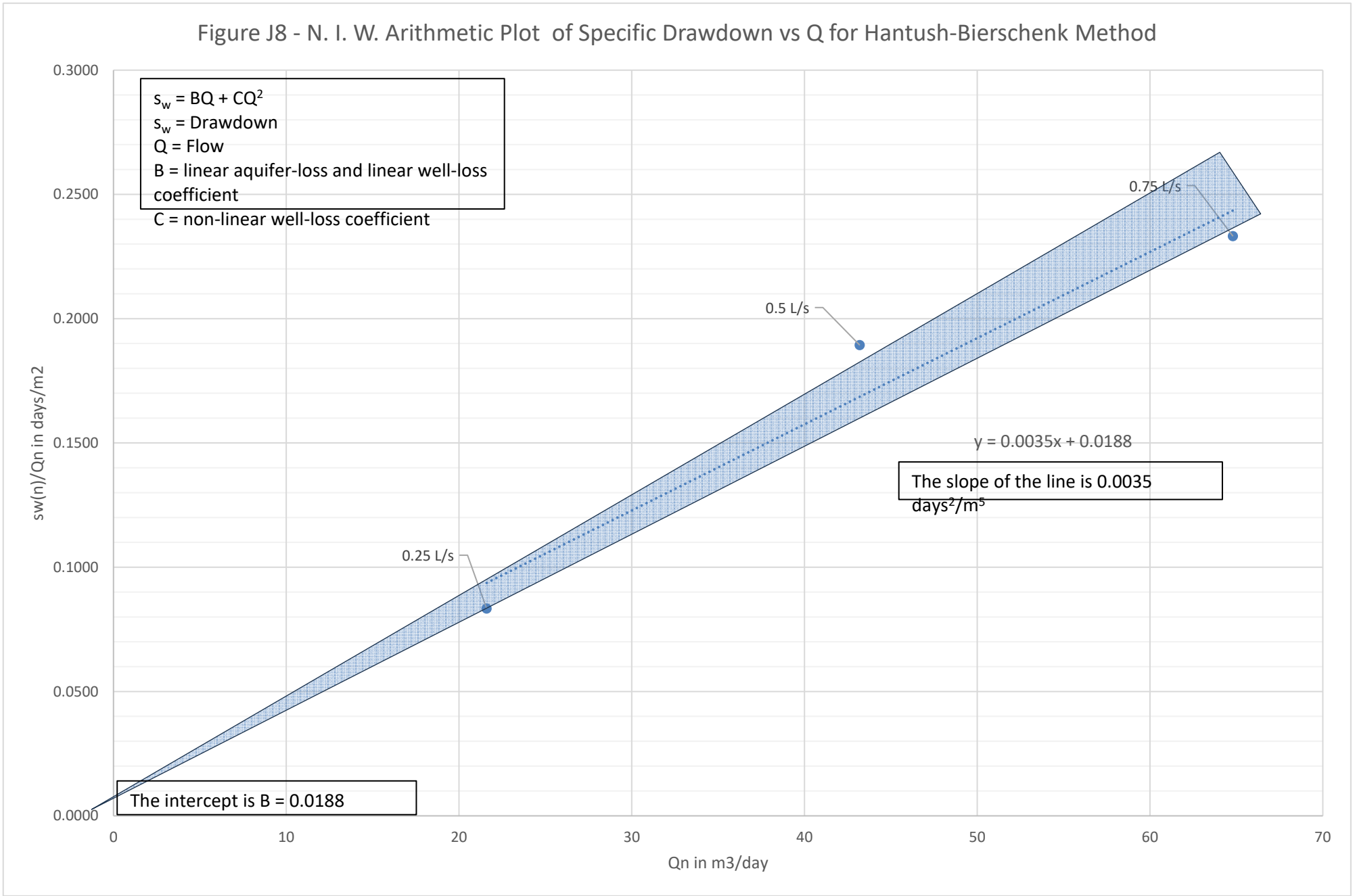
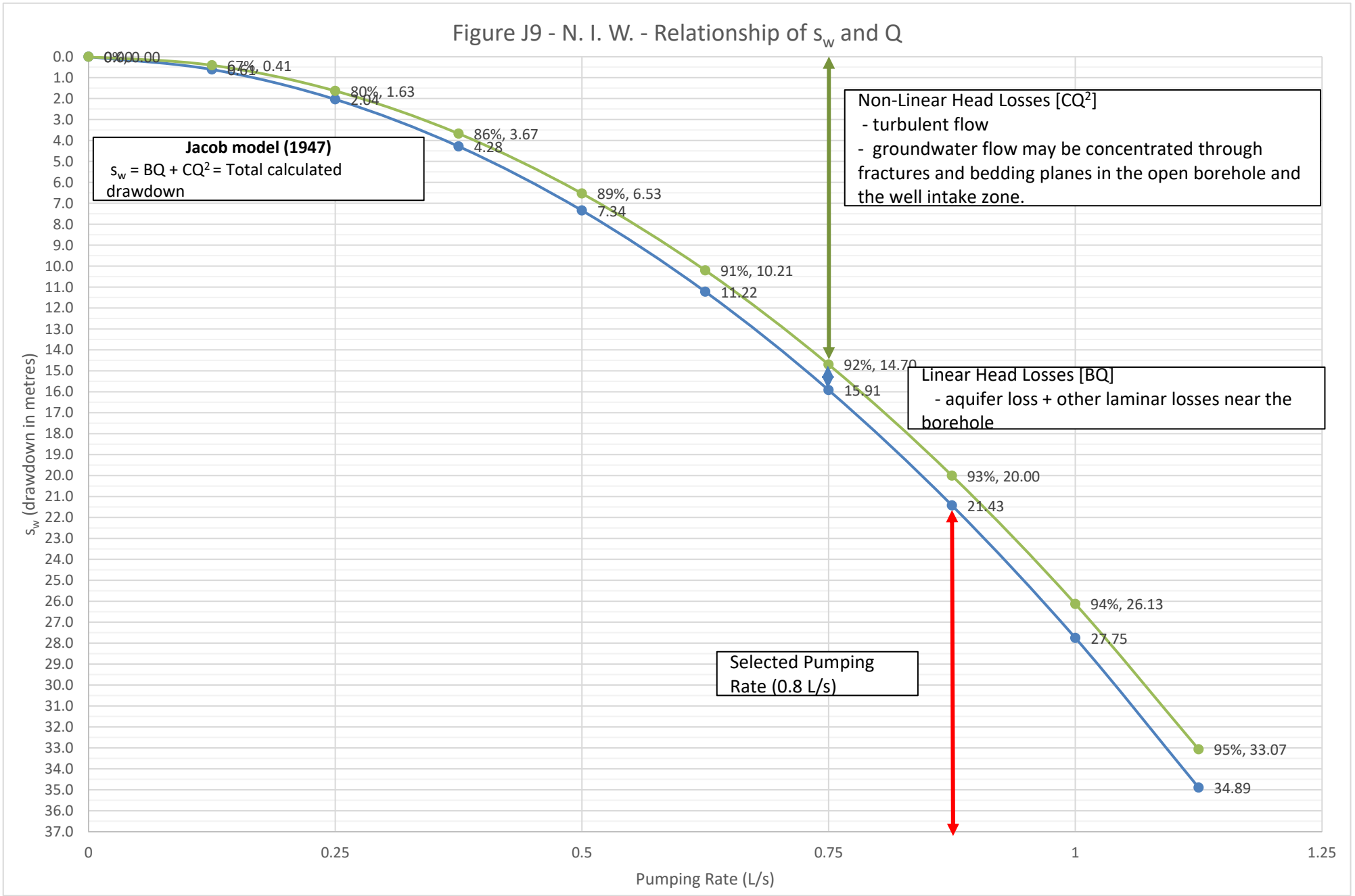

Figure J7 - N. I. W. - Water Level Depth v. Time
Depth (m bgs)
Time (min)
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
19.0
20.0
21.0
22.0
23.0
24.0
25.0
26.0
27.0
28.0
29.0
30.0
31.0
32.0
33.0
34.0
0
50
100
150
200
250
300
Static Water Level, 6.87
Step 1 = 0.25 L/s
Step 1 = 0.5 L/s
Step 3 = 0.75 L/s
Water level = 23.10
No recovery measurements were recorded.
It was noted that recovery was almost instantaneous.
Base of Casing, 32.00
Top of Bedrock, 32.00

Figure J8 - N. I. W. Arithmetic Plot of Specific Drawdown vs Q for Hantush-Bierschenk Method




Figure J9 - N. I. W. - Relationship of s_w and Q
s_w (drawdown in metres)
Pumping Rate (L/s)
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
19.0
20.0
21.0
22.0
23.0
24.0
25.0
26.0
27.0
28.0
29.0
30.0
31.0
32.0
33.0
34.0
35.0
36.0
37.0
0
0.25
0.5
0.75
1
1.25
0%, 0.00
67%, 0.41
0.61
80%, 1.63
2.04
86%, 3.67
4.28
89%, 6.53
7.34
91%, 10.21
11.22
92%, 14.70
15.91
93%, 20.00
21.43
94%, 26.13
27.75
95%, 33.07
34.89
Jacob model (1947)
$s_w = BQ + CQ^2$ = Total calculated drawdown
Non-Linear Head Losses [CQ^2]
- turbulent flow
- groundwater flow may be concentrated through fractures and bedding planes in the open borehole and the well intake zone.
Linear Head Losses [BQ]
- aquifer loss + other laminar losses near the borehole
Selected Pumping Rate (0.8 L/s)

APPENDIX K

Pumping Test Analysis

Figure K1. Groundwater Elevation in Bedrock Wells within the Site during the 72-hour Hydrogeological Testing.

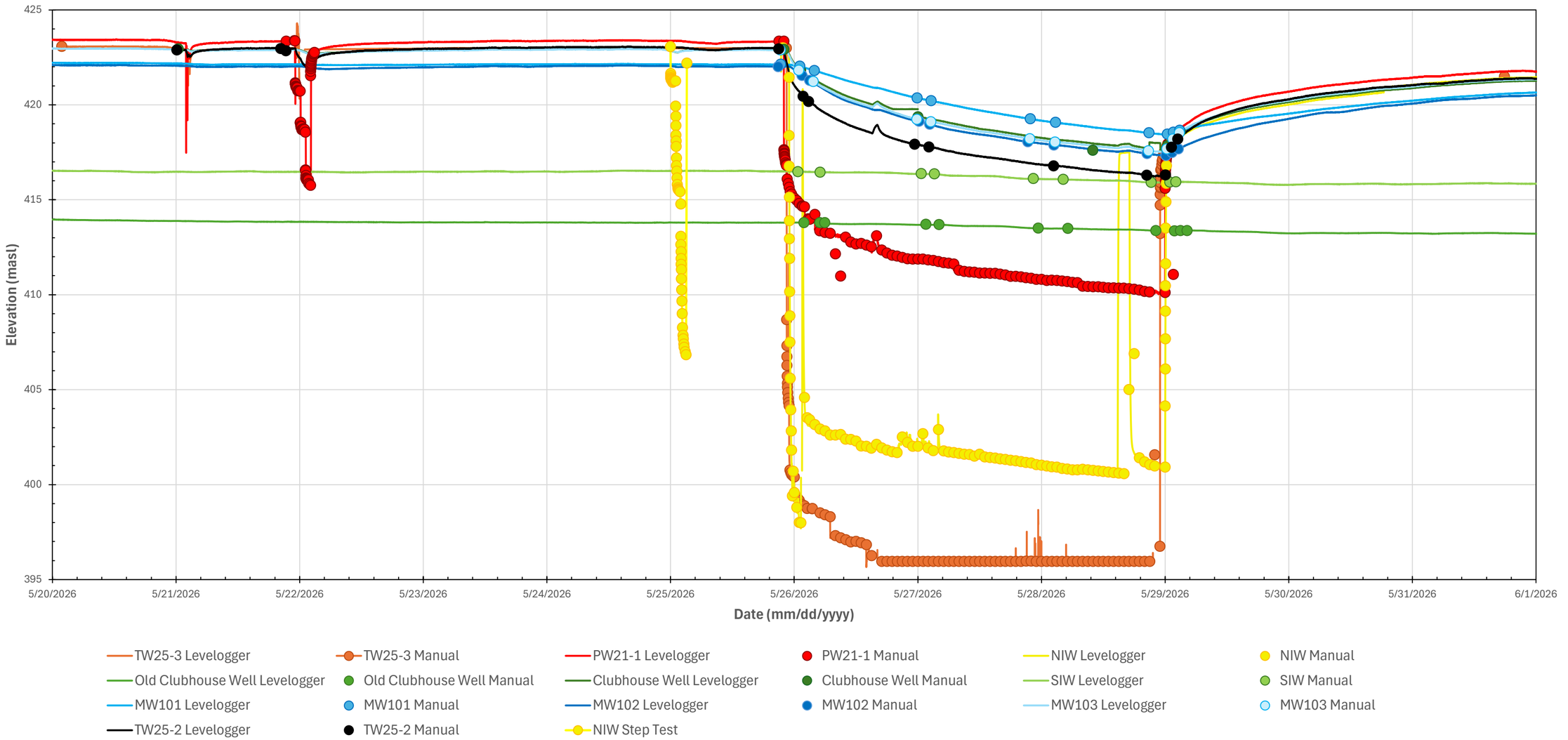


Figure K2. Groundwater Elevation in Private Bedrock Wells surrounding the Site during the 72-Hour Hydrogeological Testing.

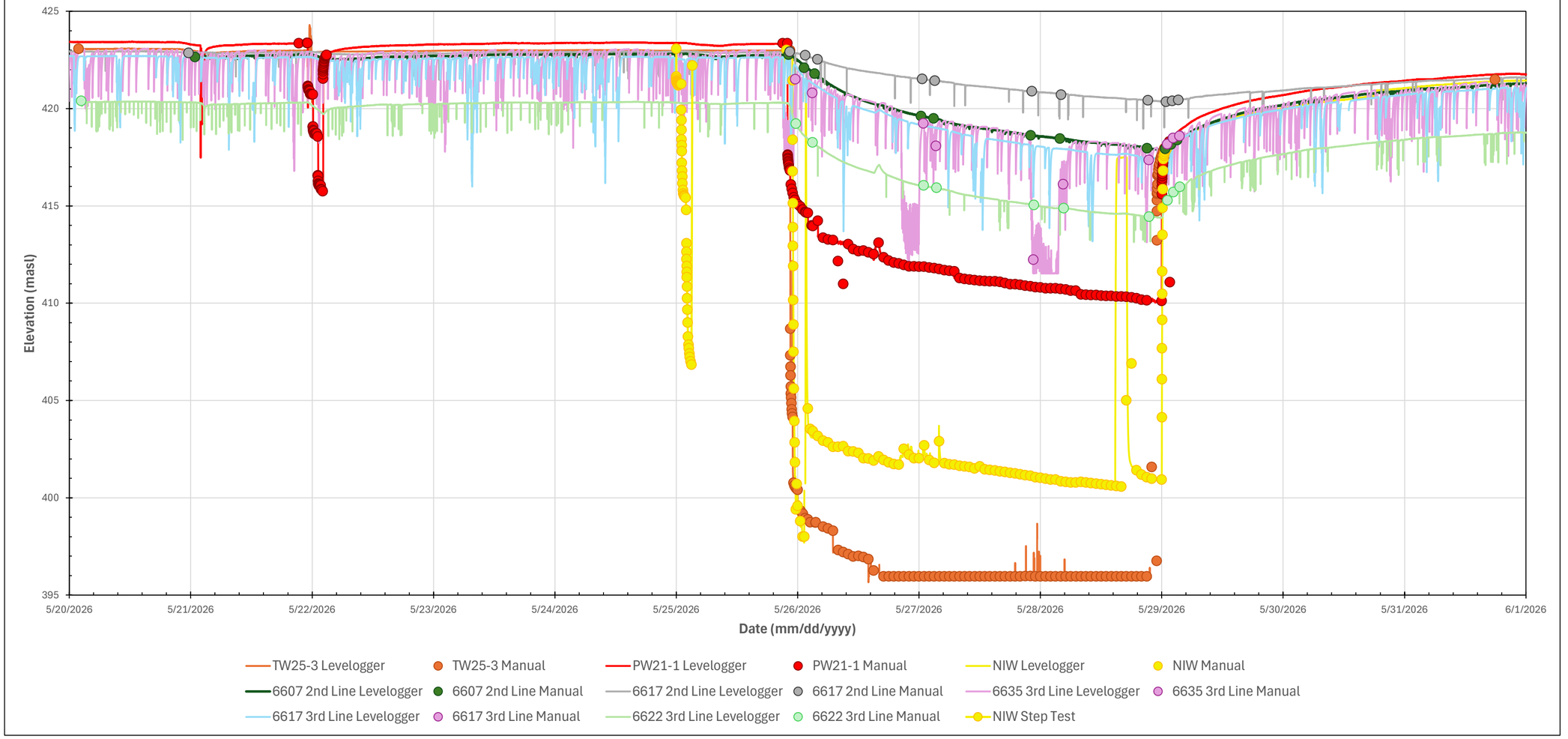
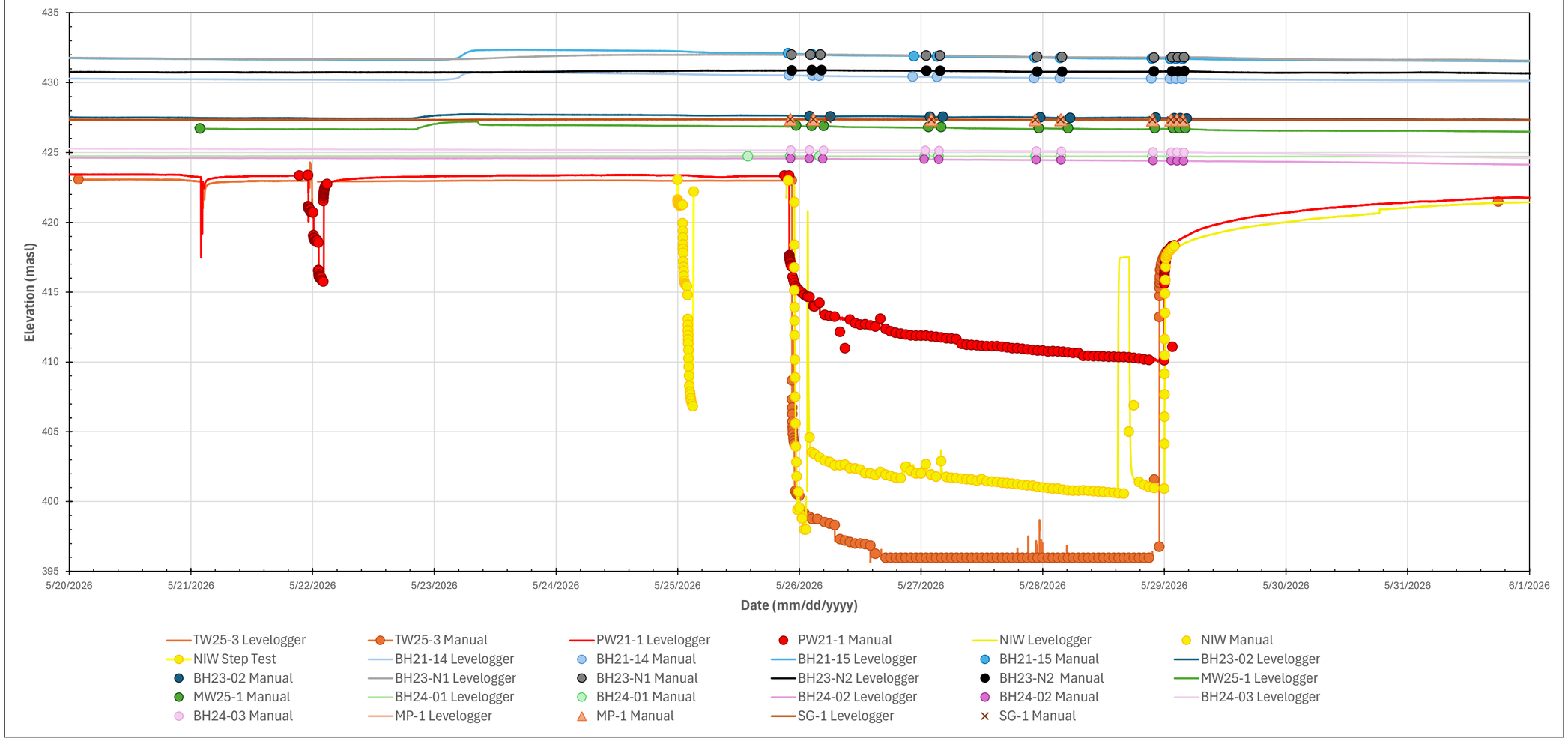
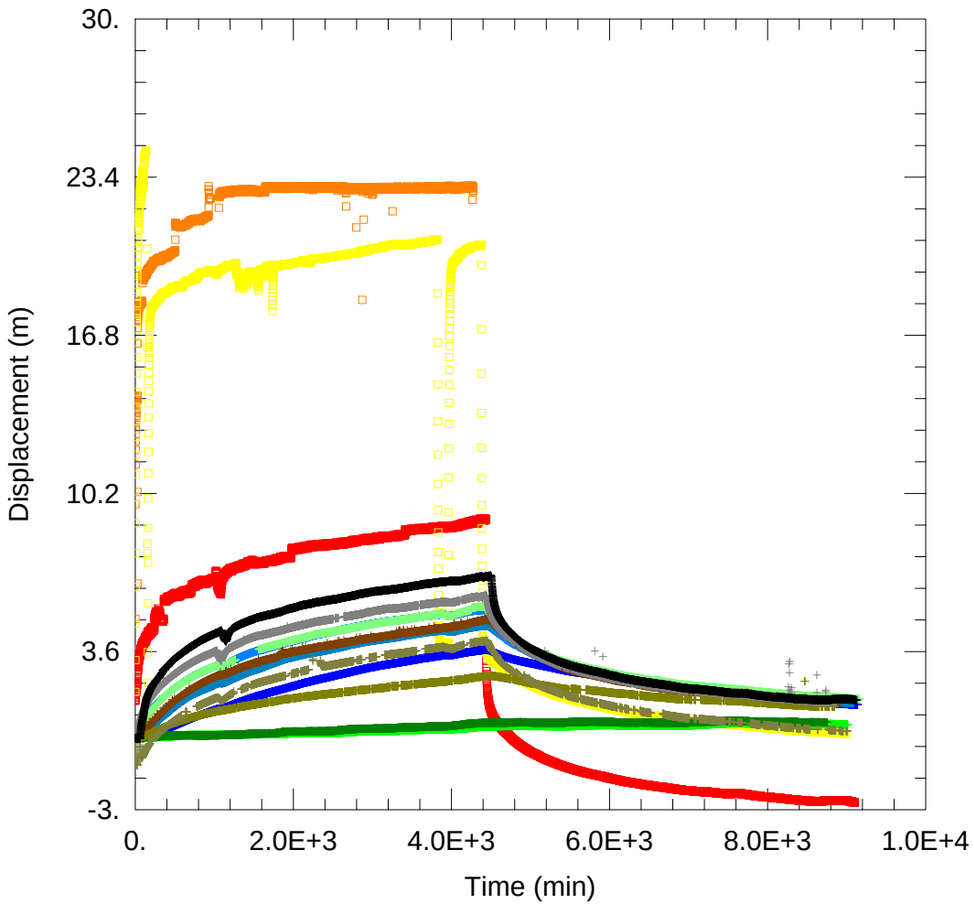


Figure K1. Groundwater Elevation in Overburden Wells within the Site during the 72-hour Hydrogeological Testing.





PW21-1 / TW25-3 / NIW 72-HOUR HYDROGEOLOGICAL TESTING, FERGUS, ON

Data Set: \...\Figure K4 - Drawdown vs Time - 72-hour Hydrogeological Testing, Fergus, ON .aqt
Date: 06/26/26 Time: 11:38:08

PROJECT INFORMATION

Company: GEMTEC
Client: Geranium
Project: 101987.017
Location: Fergus, ON
Test Well: PW21-1 / TW25-3 / NIW
Test Date: May 26, 2026

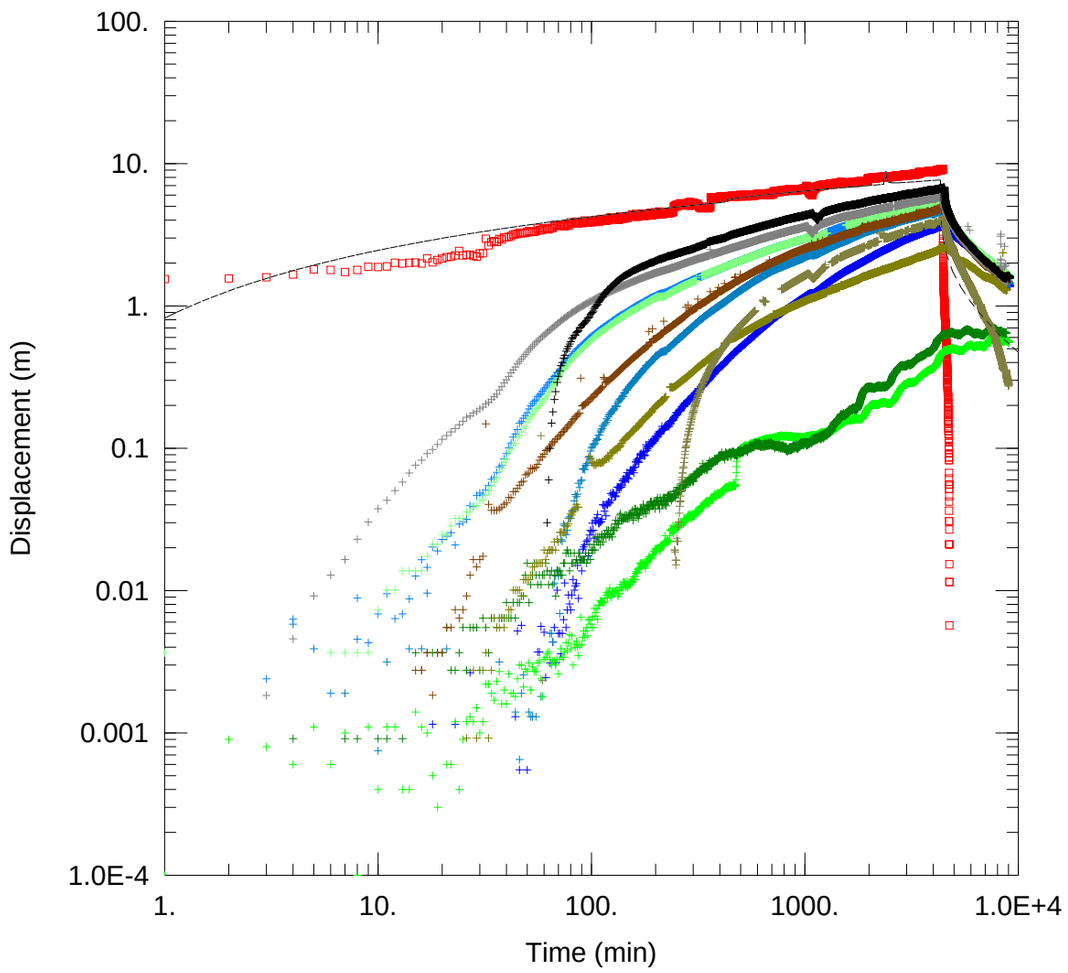
WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
PW21-1	550796	4844515
TW25-3	550903	4844592
N. I. W.	551157	4844464

Observation Wells

Well Name	X (m)	Y (m)
PW21-1	550796	4844515
TW25-3	550903	4844592
N. I. W.	551157	4844464
MW101	551430	4844602
MW102	551156	4844083
MW103	551035	4844853
Clubhouse	551256	4844358
Old Clubhouse Well	551466	4843649
S. I. W.	551546	4844183
6607 2nd Line	550505	4844060
6617 2nd Line	550305	4843983
6617 3rd Line	551112	4844959
6622 3rd Line	550988	4844972
TW25-2	550899	4844439



PW21-1 / TW25-3 / NIW 72-HOUR HYDROGEOLOGICAL TESTING, FERGUS, ON

Data Set: \...\Figure K5 - PW21-1 Theis - 72-hour Hydrogeological Testing, Fergus, ON.aqt
Date: 06/26/26 Time: 11:29:11

PROJECT INFORMATION

Company: GEMTEC
Client: Geranium
Project: 101987.017
Location: Fergus, ON
Test Well: PW21-1 / TW25-3 / NIW
Test Date: May 26, 2026

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
PW21-1	550796	4844515
TW25-3	550903	4844592
N. I. W.	551157	4844464

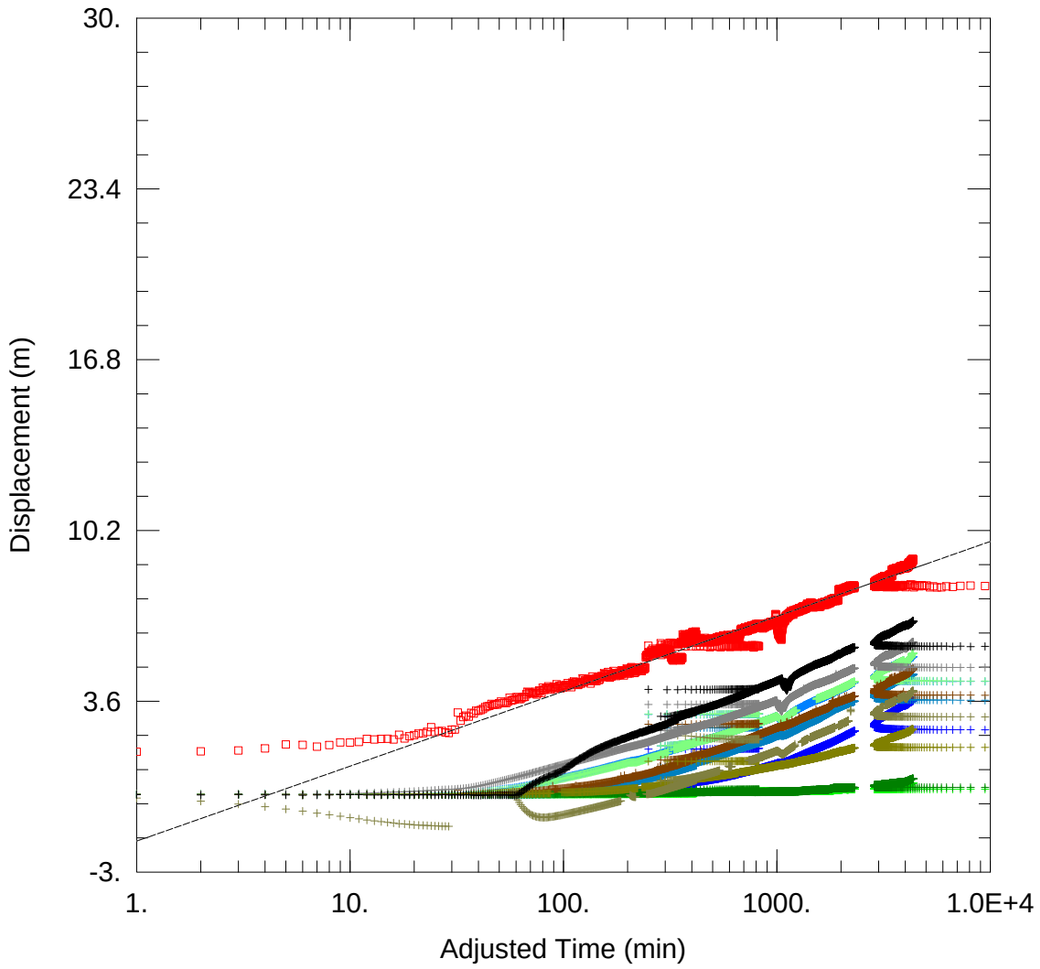
Observation Wells

Well Name	X (m)	Y (m)
PW21-1	550796	4844515
MW101	551430	4844602
MW102	551156	4844083
MW103	551035	4844853
Clubhouse	551256	4844358
Old Clubhouse Well	551466	4843649
S. I. W.	551546	4844183
6607 2nd Line	550505	4844060
6617 2nd Line	550305	4843983
6617 3rd Line	551112	4844959
6622 3rd Line	550988	4844972
TW25-2	550899	4844439

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 64.29 m^2/day
S = 7.662
Kz/Kr = 1.
b = 55.5 m



PW21-1 COOPER-JACOB SOLUTION. 72-HOUR HYDROGEOLOGICAL TESTING, FERGUS, ON

Data Set: \...\Figure K6 - PW21-1 Cooper-Jacob - 72-hour Hydrogeological Testing, Fergus, ON.aqt
Date: 06/26/26 Time: 11:55:50

PROJECT INFORMATION

Company: GEMTEC
Client: Geranium
Project: 101987.017
Location: Fergus, ON
Test Well: PW21-1 / TW25-3 / NIW
Test Date: May 26, 2026

AQUIFER DATA

Saturated Thickness: 55.5 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
PW21-1	550796	4844515
TW25-3	550903	4844592
N. I. W.	551157	4844464

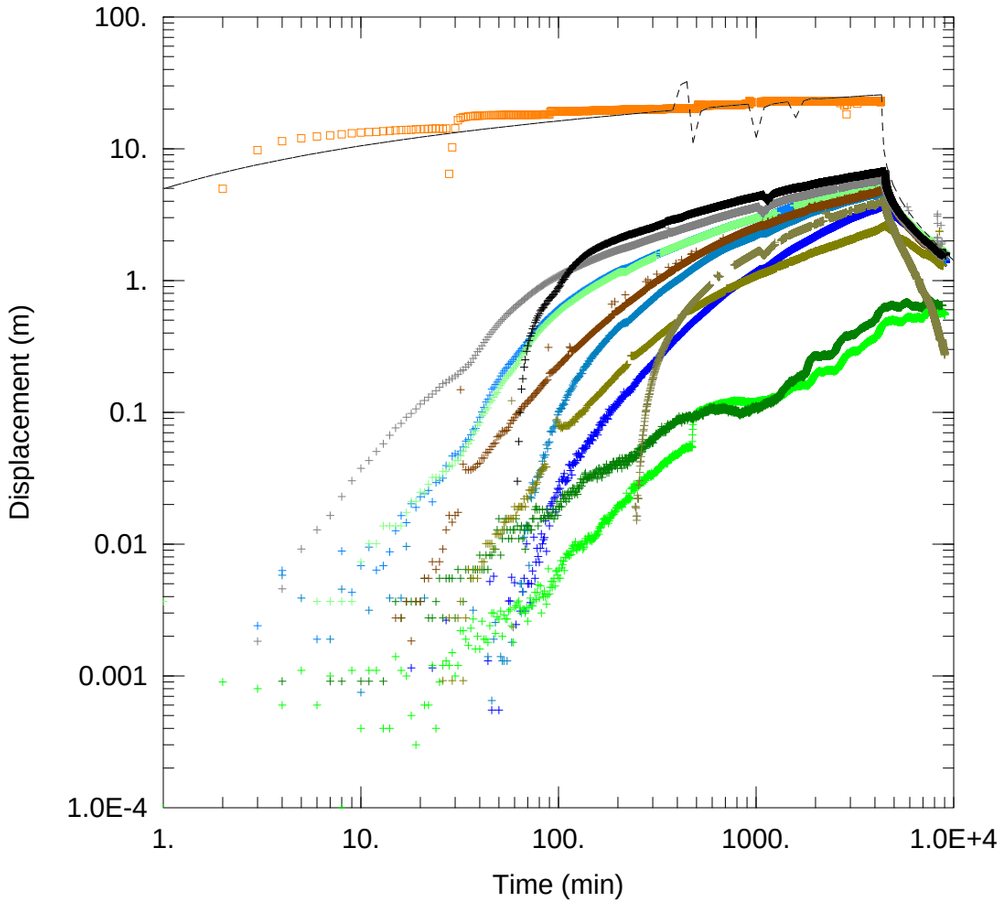
Observation Wells

Well Name	X (m)	Y (m)
PW21-1	550796	4844515
MW101	551430	4844602
MW102	551156	4844083
MW103	551035	4844853
Clubhouse	551256	4844358
Old Clubhouse Well	551466	4843649
S. I. W.	551546	4844183
6607 2nd Line	550505	4844060
6617 2nd Line	550305	4843983
6617 3rd Line	551112	4844959
6622 3rd Line	550988	4844972
TW25-2	550899	4844439

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

T = 42.65 m^2/day S = 48.38



TW25-3 THEIS SOLUTION. 72-HOUR HYDROGEOLOGICAL TESTING, FERGUS, ON

Data Set: \...\Figure K7 - TW25-3 Theis - 72-hour Hydrogeological Testing, Fergus, ON.aqt
Date: 06/26/26 Time: 12:01:06

PROJECT INFORMATION

Company: GEMTEC
Client: Geranium
Project: 101987.017
Location: Fergus, ON
Test Well: PW21-1 / TW25-3 / NIW
Test Date: May 26, 2026

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
PW21-1	550796	4844515
TW25-3	550903	4844592
N. I. W.	551157	4844464

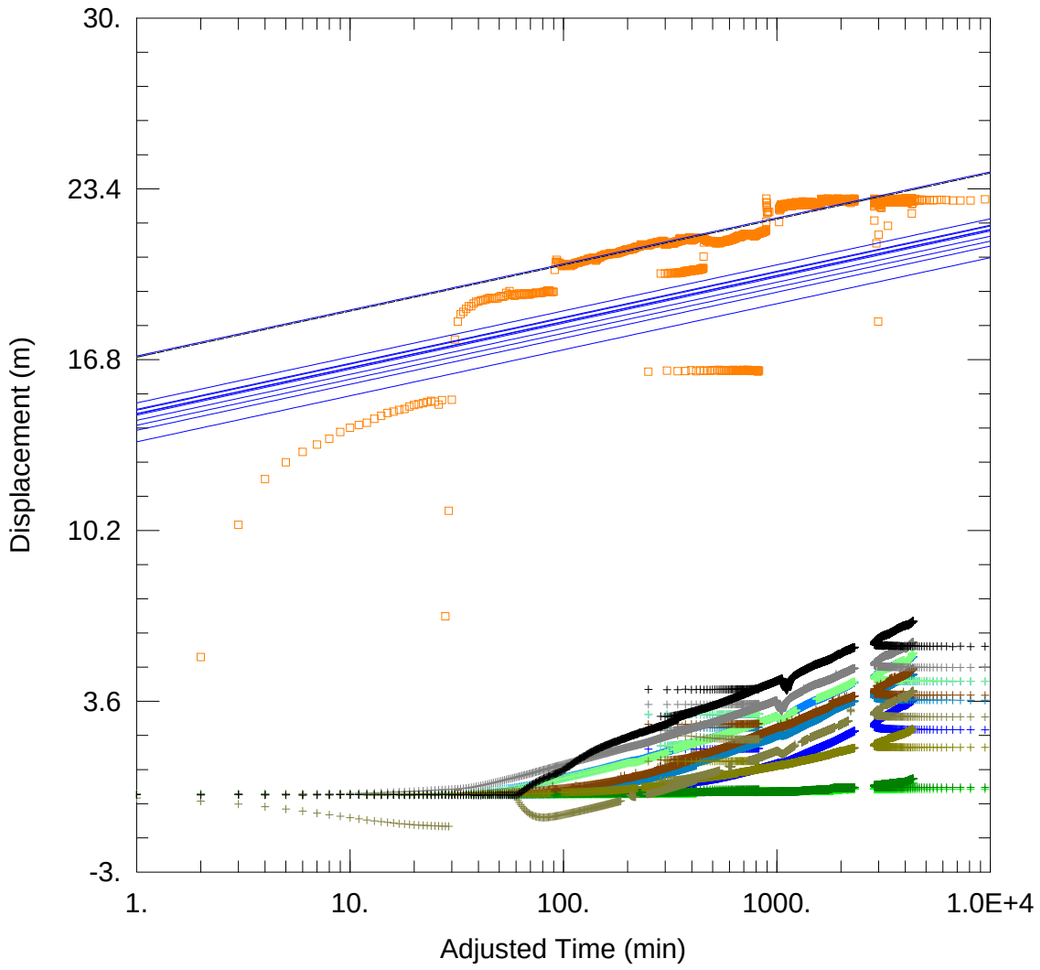
Observation Wells

Well Name	X (m)	Y (m)
TW25-3	550903	4844592
MW101	551430	4844602
MW102	551156	4844083
MW103	551035	4844853
Clubhouse	551256	4844358
Old Clubhouse Well	551466	4843649
S. I. W.	551546	4844183
6607 2nd Line	550505	4844060
6617 2nd Line	550305	4843983
6617 3rd Line	551112	4844959
6622 3rd Line	550988	4844972
TW25-2	550899	4844439

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 18.67 m^2/day
S = 0.7522
Kz/Kr = 1.
b = 55.5 m



TW25-3 COOPER-JACOB SOLUTION. 72-HOUR HYDROGEOLOGICAL TESTING, FERGUS, ON

Data Set: \...\Figure K8 - TW25-3 - Cooper-Jacob - 72-hour Hydrogeological Testing, Fergus, ON.aqt
Date: 06/26/26 Time: 12:07:04

PROJECT INFORMATION

Company: GEMTEC
Client: Geranium
Project: 101987.017
Location: Fergus, ON
Test Well: PW21-1 / TW25-3 / NIW
Test Date: May 26, 2026

AQUIFER DATA

Saturated Thickness: 55.5 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
PW21-1	550796	4844515
TW25-3	550903	4844592
N. I. W.	551157	4844464

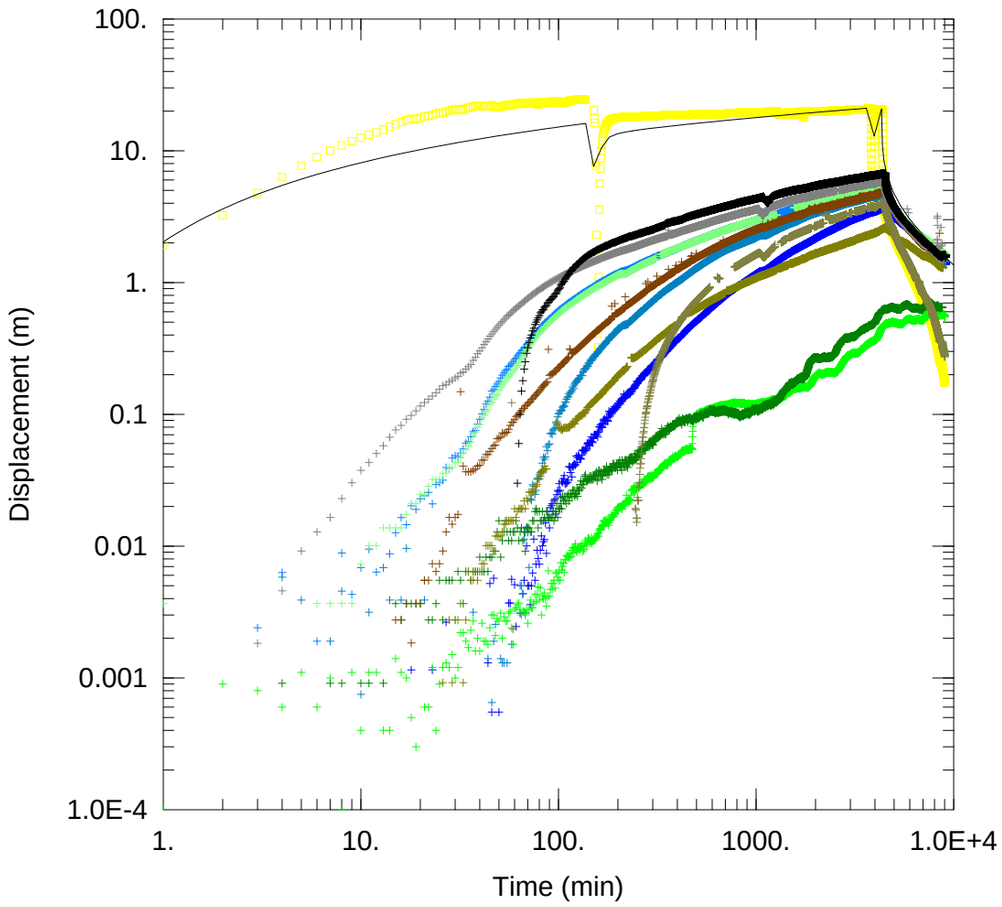
Observation Wells

Well Name	X (m)	Y (m)
TW25-3	550903	4844592
MW101	551430	4844602
MW102	551156	4844083
MW103	551035	4844853
Clubhouse	551256	4844358
Old Clubhouse Well	551466	4843649
S. I. W.	551546	4844183
6607 2nd Line	550505	4844060
6617 2nd Line	550305	4843983
6617 3rd Line	551112	4844959
6622 3rd Line	550988	4844972
TW25-2	550899	4844439

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

T = 69.41 m^2/day S = 1.984E-15



NIW THEIS SOLUTION. 72-HOUR HYDROGEOLOGICAL TESTING, FERGUS, ON

Data Set: \...\Figure K9 - NIW Theis - 72-hour Hydrogeological Testing, Fergus, ON.aqt
Date: 06/26/26 Time: 12:19:26

PROJECT INFORMATION

Company: GEMTEC
Client: Geranium
Project: 101987.017
Location: Fergus, ON
Test Well: PW21-1 / TW25-3 / NIW
Test Date: May 26, 2026

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
PW21-1	550796	4844515
TW25-3	550903	4844592
N. I. W.	551157	4844464

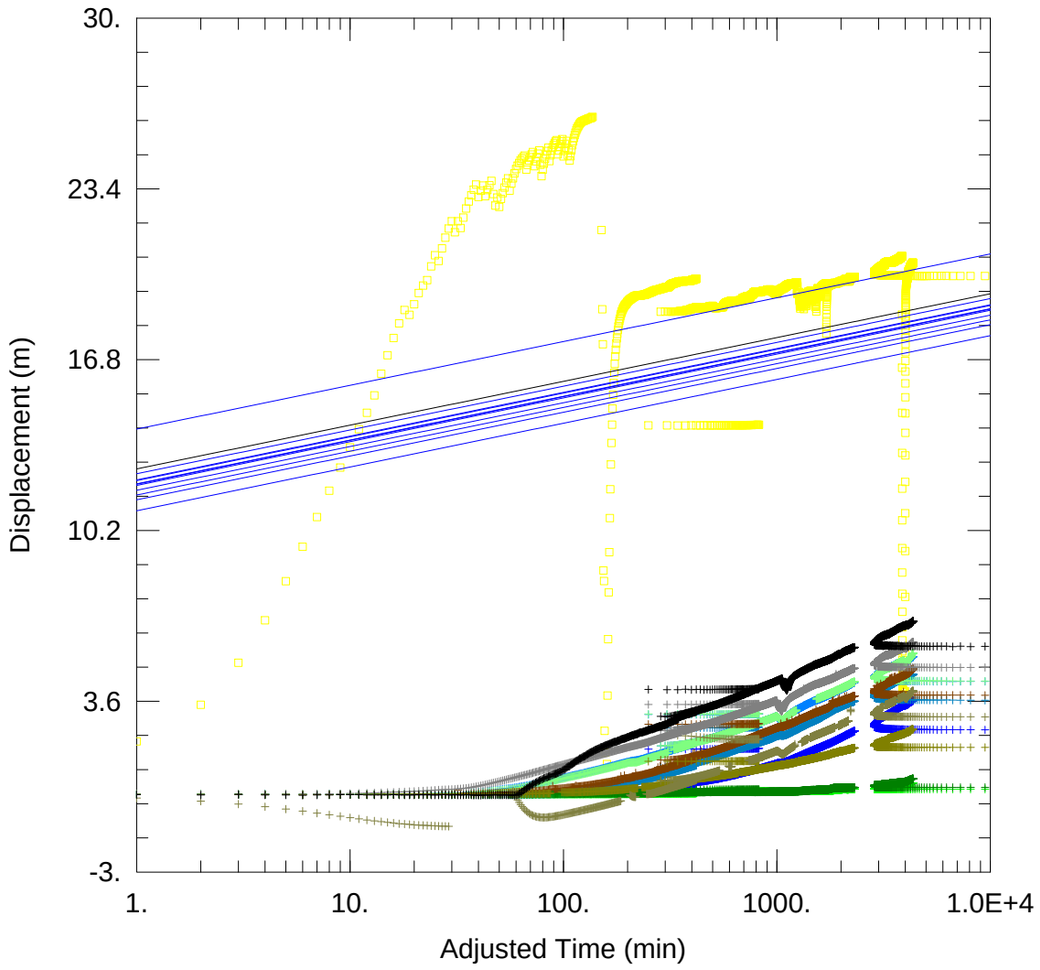
Observation Wells

Well Name	X (m)	Y (m)
N. I. W.	551157	4844464
MW101	551430	4844602
MW102	551156	4844083
MW103	551035	4844853
Clubhouse	551256	4844358
Old Clubhouse Well	551466	4843649
S. I. W.	551546	4844183
6607 2nd Line	550505	4844060
6617 2nd Line	550305	4843983
6617 3rd Line	551112	4844959
6622 3rd Line	550988	4844972
TW25-2	550899	4844439

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 2.217 m^2/day
S = 0.4575
Kz/Kr = 1.
b = 55.5 m



NIW COOPER-JACOB SOLUTION. 72-HOUR HYDROGEOLOGICAL TESTING, FERGUS, ON

Data Set: \...\Figure K10 - NIW Cooper-Jacob - 72-hour Hydrogeological Testing, Fergus, ON.aqt
Date: 06/26/26 Time: 12:31:46

PROJECT INFORMATION

Company: GEMTEC
Client: Geranium
Project: 101987.017
Location: Fergus, ON
Test Well: PW21-1 / TW25-3 / NIW
Test Date: May 26, 2026

AQUIFER DATA

Saturated Thickness: 55.5 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
PW21-1	550796	4844515
TW25-3	550903	4844592
N. I. W.	551157	4844464

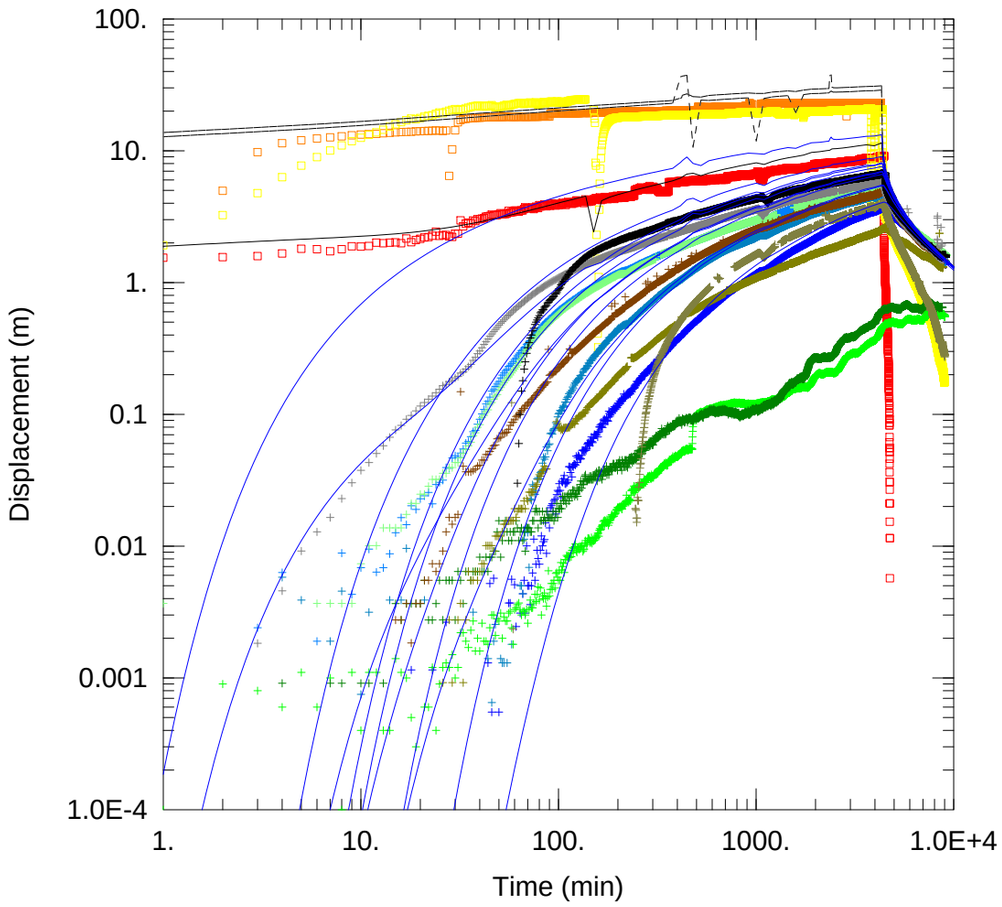
Observation Wells

Well Name	X (m)	Y (m)
N. I. W.	551157	4844464
MW101	551430	4844602
MW102	551156	4844083
MW103	551035	4844853
Clubhouse	551256	4844358
Old Clubhouse Well	551466	4843649
S. I. W.	551546	4844183
6607 2nd Line	550505	4844060
6617 2nd Line	550305	4843983
6617 3rd Line	551112	4844959
6622 3rd Line	550988	4844972
TW25-2	550899	4844439

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

T = 72.98 m^2/day S = 3.154E-14



COMBINED THEIS SOLUTION. 72-HOUR HYDROGEOLOGICAL TESTING, FERGUS, ON

Data Set: \...\Figure K11 - Combined Theis- 72-hour Hydrogeological Testing, Fergus, ON.aqt
Date: 06/26/26 Time: 12:38:07

PROJECT INFORMATION

Company: GEMTEC
Client: Geranium
Project: 101987.017
Location: Fergus, ON
Test Well: PW21-1 / TW25-3 / NIW
Test Date: May 26, 2026

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
PW21-1	550796	4844515
TW25-3	550903	4844592
N. I. W.	551157	4844464

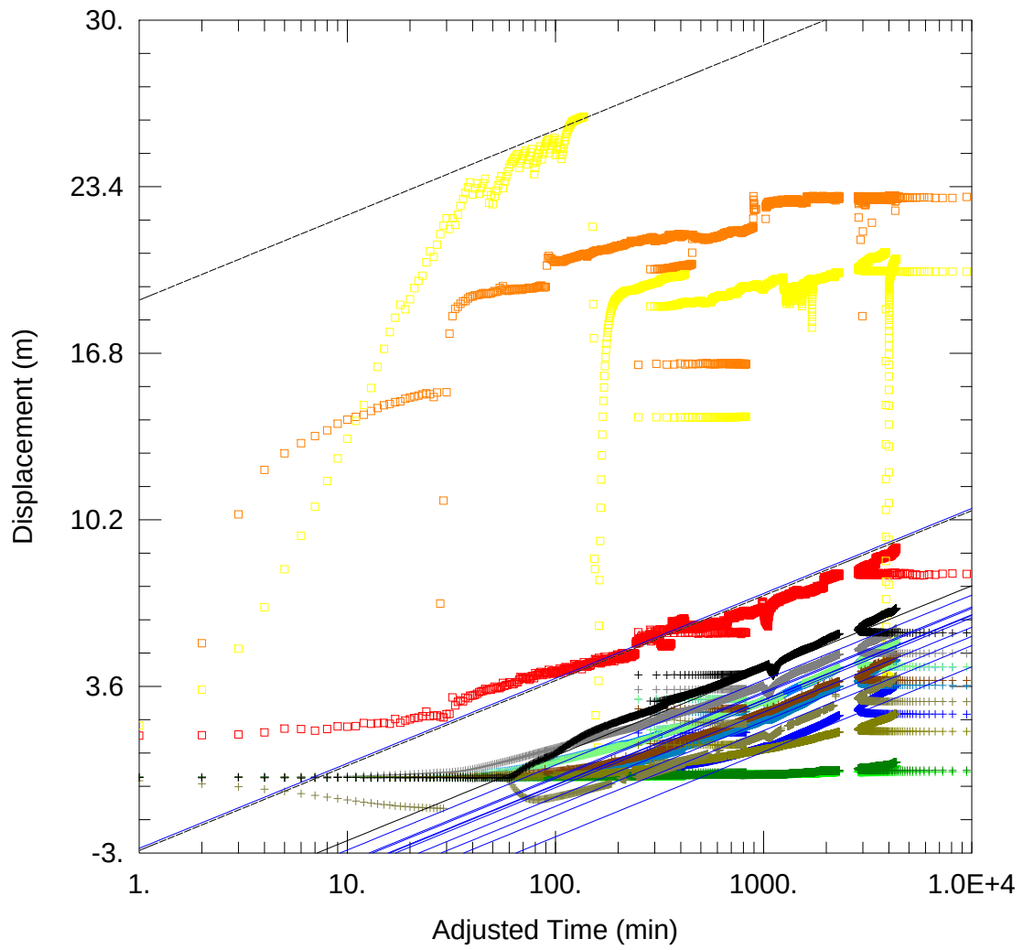
Observation Wells

Well Name	X (m)	Y (m)
PW21-1	550796	4844515
TW25-3	550903	4844592
N. I. W.	551157	4844464
MW101	551430	4844602
MW102	551156	4844083
MW103	551035	4844853
Clubhouse	551256	4844358
Old Clubhouse Well	551466	4843649
S. I. W.	551546	4844183
6607 2nd Line	550505	4844060
6617 2nd Line	550305	4843983
6617 3rd Line	551112	4844959
6622 3rd Line	550988	4844972
TW25-2	550899	4844439

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 45.17 m^2/day
S = 5.135E-5
Kz/Kr = 1.
b = 55.5 m



COMBINED COOPER-JACOB SOLUTION. 72-HOUR HYDROGEOLOGICAL TESTING, FERGUS, ON

PROJECT INFORMATION

Company: GEMTEC
Client: Geranium
Project: 101987.017
Location: Fergus, ON
Test Well: PW21-1 / TW25-3 / NIW
Test Date: May 26, 2026

WELL DATA

Pumping Wells

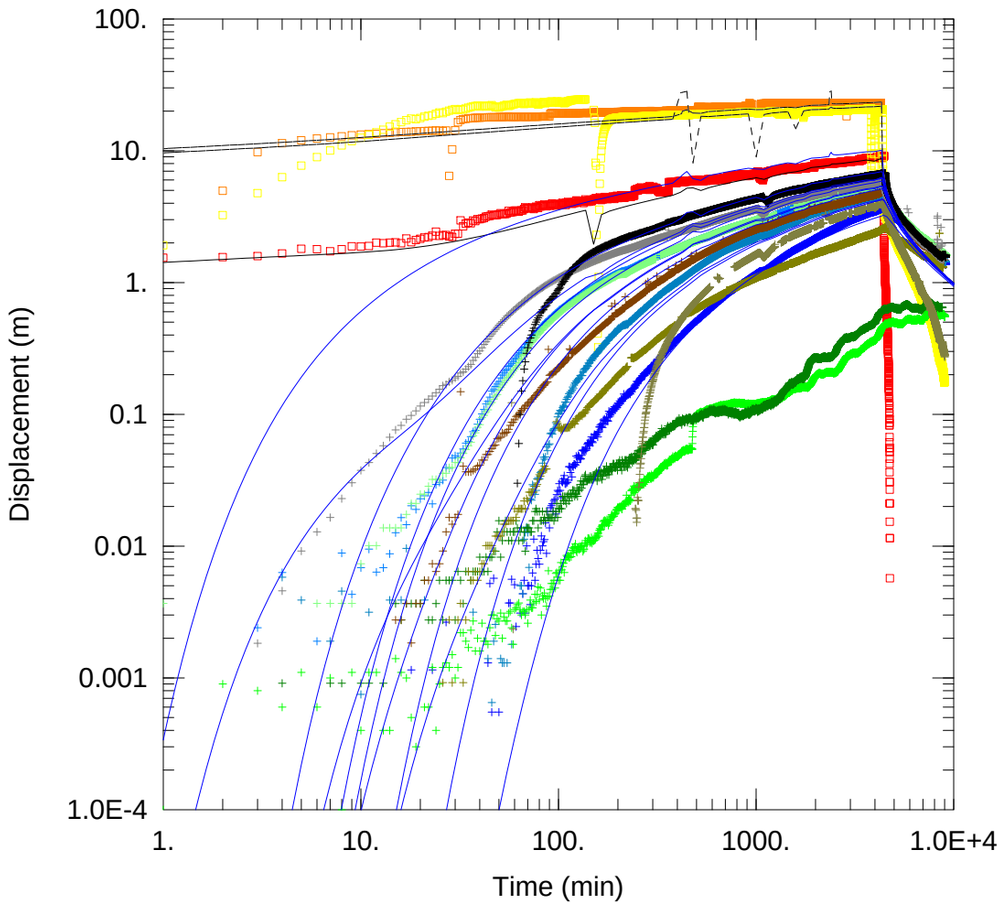
Well Name	X (m)	Y (m)
PW21-1	550796	4844515
TW25-3	550903	4844592
N. I. W.	551157	4844464

Observation Wells

Well Name	X (m)	Y (m)
PW21-1	550796	4844515
TW25-3	550903	4844592
N. I. W.	551157	4844464
MW101	551430	4844602
MW102	551156	4844083
MW103	551035	4844853
Clubhouse	551256	4844358
Old Clubhouse Well	551466	4843649
S. I. W.	551546	4844183
6607 2nd Line	550505	4844060
6617 2nd Line	550305	4843983
6617 3rd Line	551112	4844959
6622 3rd Line	550988	4844972
TW25-2	550899	4844439

SOLUTION

Aquifer Model: Confined
Solution Method: Cooper-Jacob
T = 36.68 m^2/day
S = 2.399E-5



OBSERVATION WELLS - THEIS SOLUTION. 72-HOUR HYDROGEOLOGICAL TESTING, FERGUS, ON

Data Set: \...\Figure K13 - Obs. Wells Theis - 72-hour Hydrogeological Testing, Fergus, ON.aqt
Date: 06/26/26 Time: 12:49:15

PROJECT INFORMATION

Company: GEMTEC
Client: Geranium
Project: 101987.017
Location: Fergus, ON
Test Well: PW21-1 / TW25-3 / NIW
Test Date: May 26, 2026

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
PW21-1	550796	4844515
TW25-3	550903	4844592
N. I. W.	551157	4844464

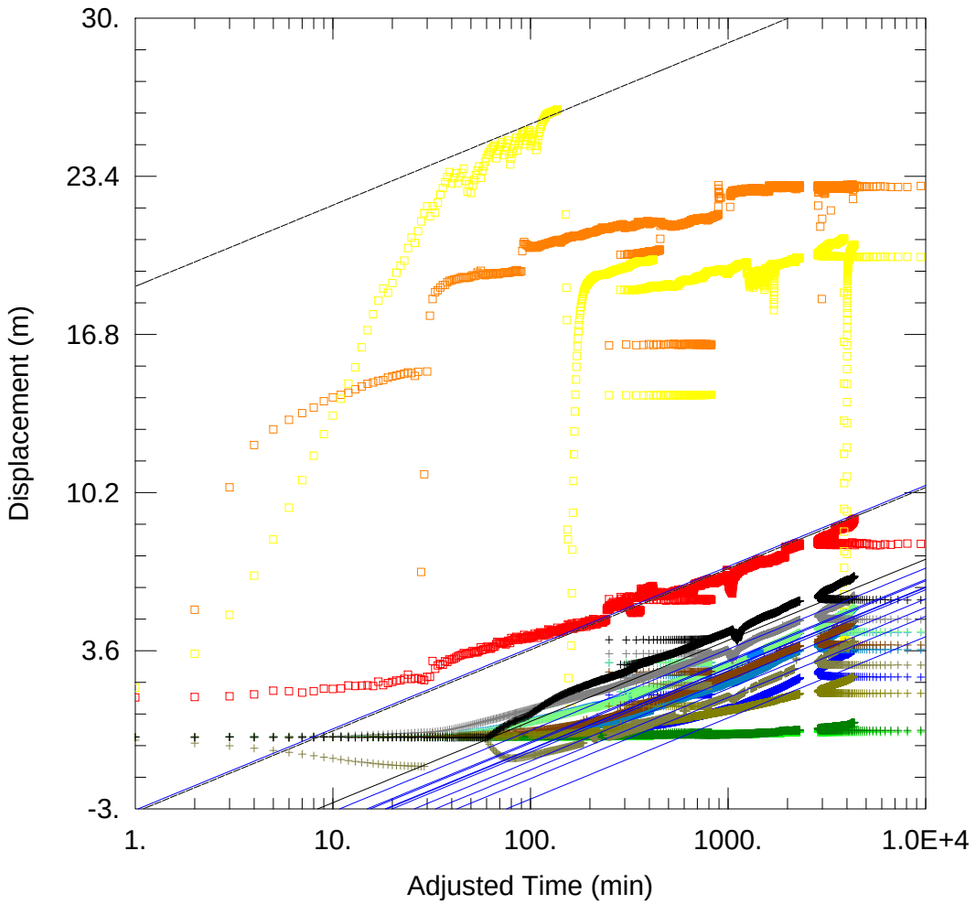
Observation Wells

Well Name	X (m)	Y (m)
PW21-1	550796	4844515
TW25-3	550903	4844592
N. I. W.	551157	4844464
MW101	551430	4844602
MW102	551156	4844083
MW103	551035	4844853
Clubhouse	551256	4844358
Old Clubhouse Well	551466	4843649
S. I. W.	551546	4844183
6607 2nd Line	550505	4844060
6617 2nd Line	550305	4843983
6617 3rd Line	551112	4844959
6622 3rd Line	550988	4844972
TW25-2	550899	4844439

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 60.52 m^2/day
S = 6.093E-5
Kz/Kr = 1.
b = 55.5 m



OBSERVATION WELLS - COOPER-JACOB SO. 72-HOUR HYDROGEOLOGICAL TESTING, FERGUS, ON

Data Set: \...\Figure K14 - Obs. Wells Cooper-Jacob - 72-hour Hydrogeological Testing, Fergus, ON.aqt
Date: 06/26/26 Time: 12:53:08

PROJECT INFORMATION

Company: GEMTEC
Client: Geranium
Project: 101987.017
Location: Fergus, ON
Test Well: PW21-1 / TW25-3 / NIW
Test Date: May 26, 2026

AQUIFER DATA

Saturated Thickness: 55.5 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
PW21-1	550796	4844515
TW25-3	550903	4844592
N. I. W.	551157	4844464

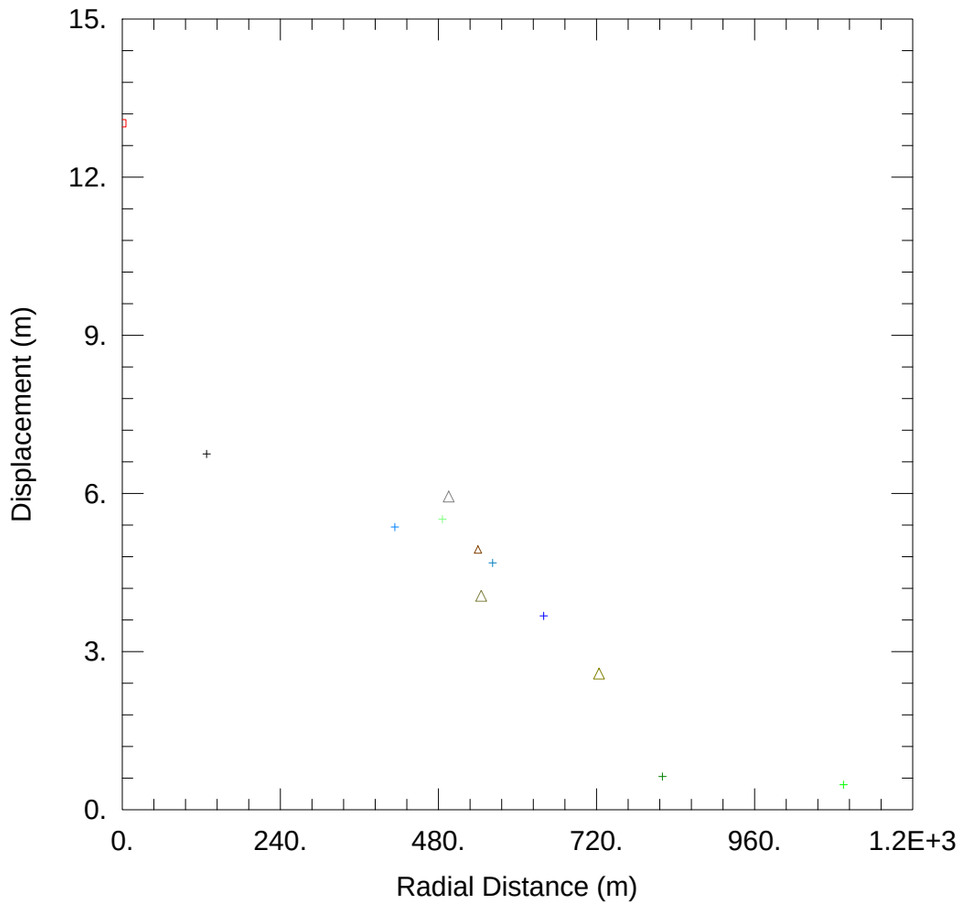
Observation Wells

Well Name	X (m)	Y (m)
PW21-1	550796	4844515
TW25-3	550903	4844592
N. I. W.	551157	4844464
MW101	551430	4844602
MW102	551156	4844083
MW103	551035	4844853
Clubhouse	551256	4844358
Old Clubhouse Well	551466	4843649
S. I. W.	551546	4844183
6607 2nd Line	550505	4844060
6617 2nd Line	550305	4843983
6617 3rd Line	551112	4844959
6622 3rd Line	550988	4844972
TW25-2	550899	4844439

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

T = 36.46 m^2/day S = 2.762E-5



PW21-1 - DRAWDOWN VS DISTANCE - 72-HOUR HYDROGEOLOGICAL TESTING, FERGUS, ON

Data Set: \...\Figure K15 - Drawdown vs Distance- 72-hour Hydrogeological Testing, Fergus, ON.aqt
Date: 06/26/26 Time: 12:55:17

PROJECT INFORMATION

Company: GEMTEC
Client: Geranium
Project: 101987.017
Location: Fergus, ON
Test Well: PW21-1 / TW25-3 / NIW
Test Date: May 26, 2026

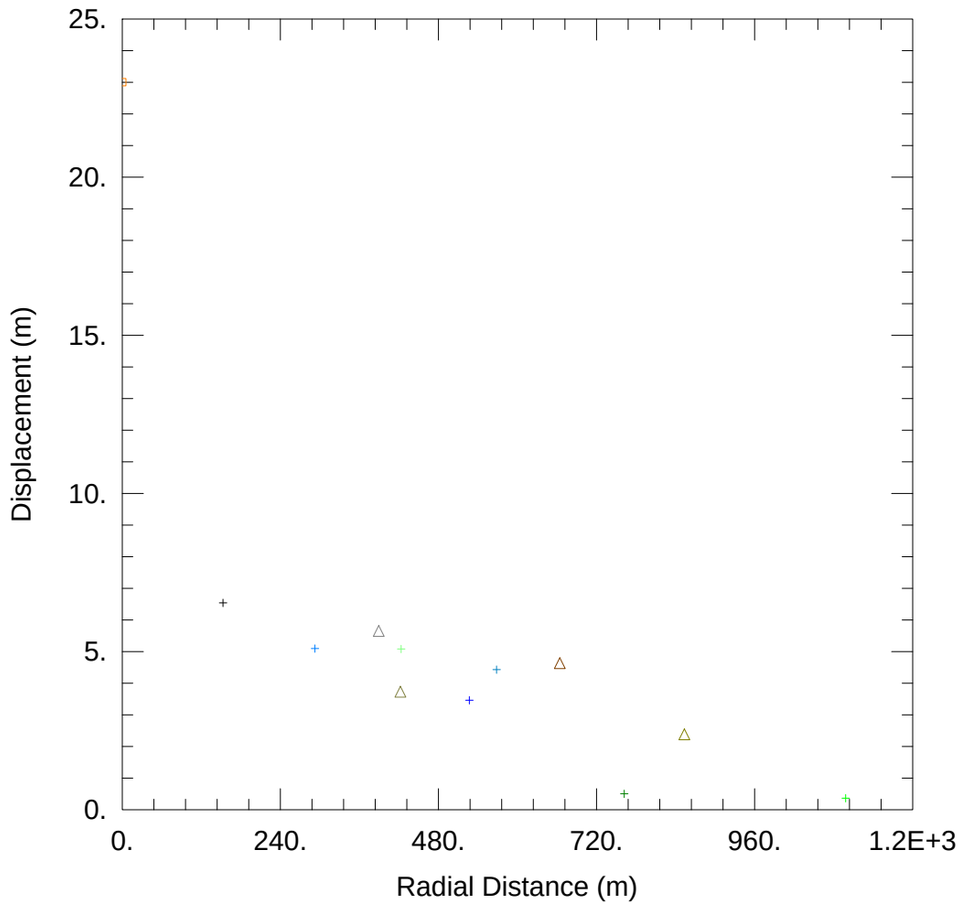
WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
PW21-1	550796	4844515

Observation Wells

Well Name	X (m)	Y (m)
PW21-1	550796	4844515
MW101	551430	4844602
MW102	551156	4844083
MW103	551035	4844853
Clubhouse	551256	4844358
Old Clubhouse Well	551466	4843649
S. I. W.	551546	4844183
6607 2nd Line	550505	4844060
6617 2nd Line	550305	4843983
6617 3rd Line	551112	4844959
6622 3rd Line	550988	4844972
TW25-2	550899	4844439



TW25-3 - DRAWDOWN VS DISTANCE - 72-HOUR HYDROGEOLOGICAL TESTING, FERGUS, ON

Data Set: \...\Figure K16 - TW25-3 Drawdown vs Distance - 72-hour Hydrogeological Testing, Fergus, ON.aqt
Date: 06/26/26 Time: 12:56:36

PROJECT INFORMATION

Company: GEMTEC
Client: Geranium
Project: 101987.017
Location: Fergus, ON
Test Well: PW21-1 / TW25-3 / NIW
Test Date: May 26, 2026

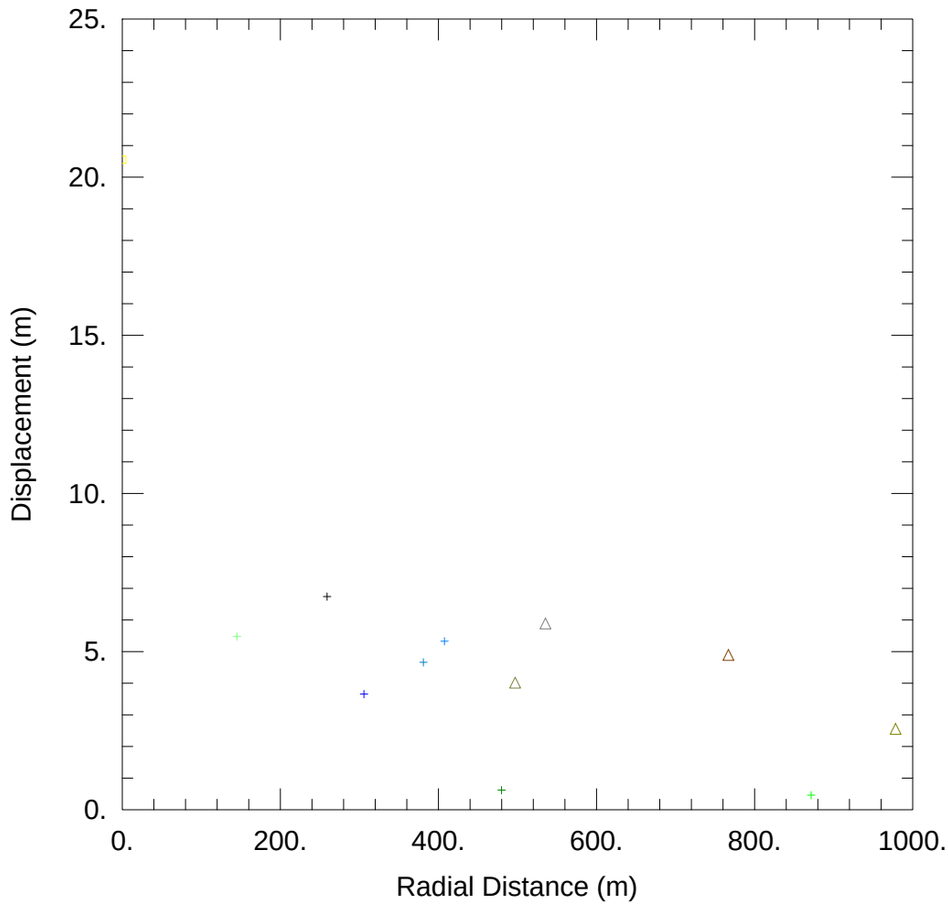
WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
TW25-3	550903	4844592

Observation Wells

Well Name	X (m)	Y (m)
TW25-3	550903	4844592
MW101	551430	4844602
MW102	551156	4844083
MW103	551035	4844853
Clubhouse	551256	4844358
Old Clubhouse Well	551466	4843649
S. I. W.	551546	4844183
6607 2nd Line	550505	4844060
6617 2nd Line	550305	4843983
6617 3rd Line	551112	4844959
6622 3rd Line	550988	4844972
TW25-2	550899	4844439



NIW - DRAWDOWN VS DISTANCE - 72-HOUR HYDROGEOLOGICAL TESTING, FERGUS, ON

Data Set: \...\Figure K17 - NIW - Drawdown vs Distance - 72-hour Hydrogeological Testing, Fergus, ON.aqt
Date: 06/26/26 Time: 12:57:32

PROJECT INFORMATION

Company: GEMTEC
Client: Geranium
Project: 101987.017
Location: Fergus, ON
Test Well: PW21-1 / TW25-3 / NIW
Test Date: May 26, 2026

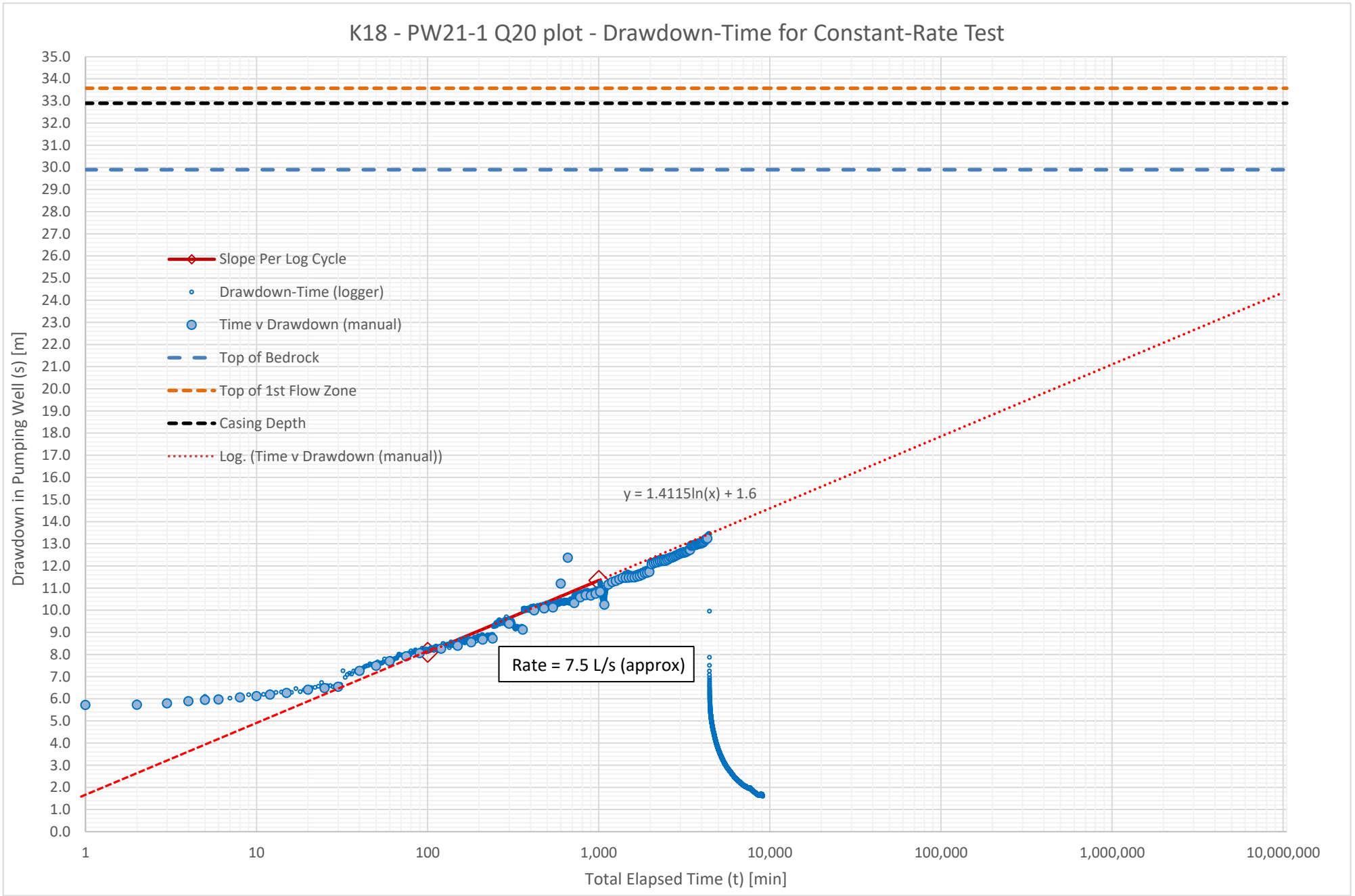
WELL DATA

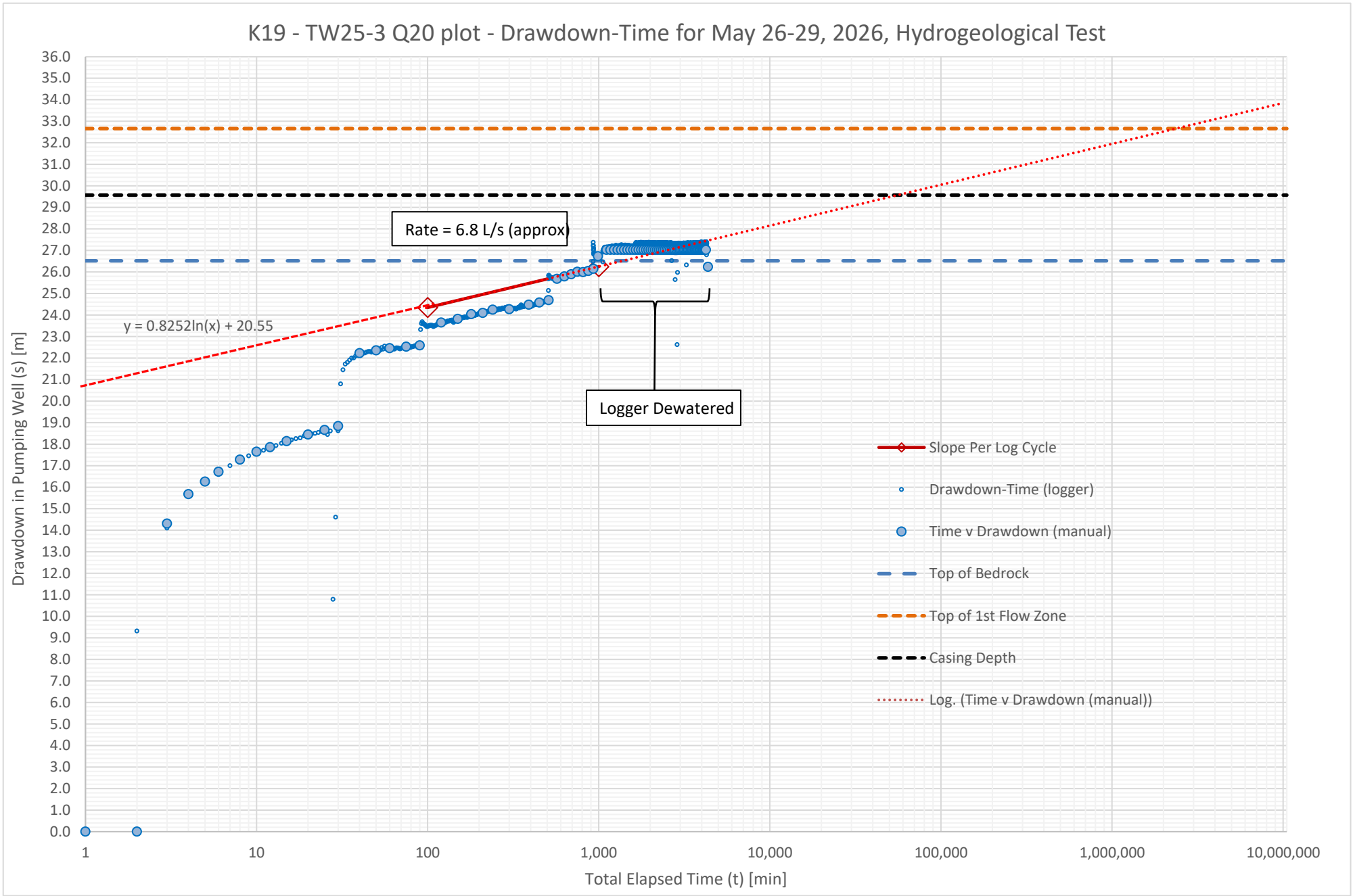
Pumping Wells

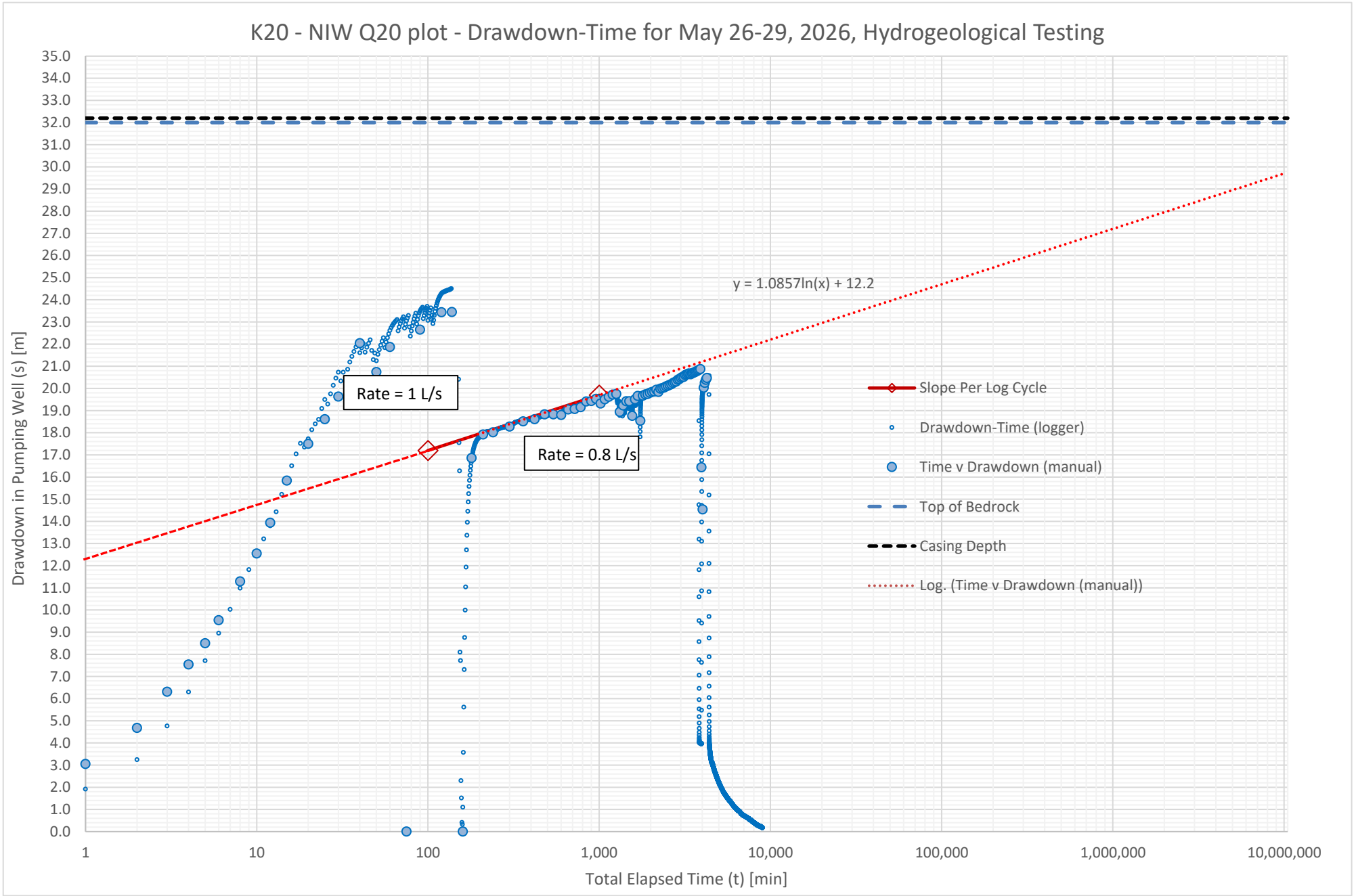
Well Name	X (m)	Y (m)
N. I. W.	551157	4844464

Observation Wells

Well Name	X (m)	Y (m)
N. I. W.	551157	4844464
MW101	551430	4844602
MW102	551156	4844083
MW103	551035	4844853
Clubhouse	551256	4844358
Old Clubhouse Well	551466	4843649
S. I. W.	551546	4844183
6607 2nd Line	550505	4844060
6617 2nd Line	550305	4843983
6617 3rd Line	551112	4844959
6622 3rd Line	550988	4844972
TW25-2	550899	4844439


K18 - PW21-1 Q20 plot - Drawdown-Time for Constant-Rate Test
Drawdown in Pumping Well (s) [m]
Total Elapsed Time (t) [min]
Slope Per Log Cycle
Drawdown-Time (logger)
Time v Drawdown (manual)
Top of Bedrock
Top of 1st Flow Zone
Casing Depth
Log. (Time v Drawdown (manual))
y = 1.4115ln(x) + 1.6
Rate = 7.5 L/s (approx)


K19 - TW25-3 Q20 plot - Drawdown-Time for May 26-29, 2026, Hydrogeological Test
Drawdown in Pumping Well (s) [m]
Total Elapsed Time (t) [min]
Rate = 6.8 L/s (approx)
y = 0.8252ln(x) + 20.55
Logger Dewatered
Slope Per Log Cycle
Drawdown-Time (logger)
Time v Drawdown (manual)
Top of Bedrock
Top of 1st Flow Zone
Casing Depth
Log. (Time v Drawdown (manual))


K20 - NIW Q20 plot - Drawdown-Time for May 26-29, 2026, Hydrogeological Testing
Drawdown in Pumping Well (s) [m]
Total Elapsed Time (t) [min]
y = 1.0857ln(x) + 12.2
Rate = 1 L/s
Rate = 0.8 L/s
Slope Per Log Cycle
Drawdown-Time (logger)
Time v Drawdown (manual)
Top of Bedrock
Casing Depth
Log. (Time v Drawdown (manual))

APPENDIX L

Water Chemistry Results

Summary of Water Quality Analytical Results - PW21-1
Proposed Residential Development, Fergus, Ontario

Sample Location							PW21-1	PW21-1	PW21-1
Sample Date							2026/05/26	2026/05/27	2026/05/29
Sample ID							PW21-1	PW21-1	PW21-1
Sampling Company							GEMTEC	GEMTEC	GEMTEC
Laboratory							BV Labs	BV Labs	BV Labs
Laboratory Work Order							C659333	C660181	C661549
Laboratory Sample ID									
Sample Matrix	Units	ODWQS	MAC	IMAC	AO	OG	Groundwater	Groundwater	Groundwater
General Chemistry									
Alkalinity (as $CaCO_3$)	mg/L	NS	NS	NS	NS	30–500	190	180	190
Chloride	mg/L	NS	NS	NS	250.0	NS	3.8	6.5	7.8
Dissolved Organic Carbon	mg/L	NS	NS	NS	5	NS	0.53	0.62	0.58
Hardness (as $CaCO_3$)	mg/L	NS	NS	NS	NS	80–100	280.0	360.0	390
Nitrate (as Nitrogen)	mg/L	10	10	NS	NS	NS	ND	ND	ND
Nitrite (as Nitrogen)	mg/L	1	1	NS	NS	NS	ND	ND	ND
Nitrate + Nitrite (as Nitrogen)	mg/L	NS	10	NS	NS	NS	ND	ND	ND
pH	pH	NS	NS	NS	NS	6.5–8.5	8.4	8.3	7.9
Sulphate, Dissolved	mg/L	NS	NS	NS	500	NS	140	220	240
Total Ammonia-N	mg/L	NS	NS	NS	NS	NS	0.18	0.19	0.16
Total Dissolved Solids	mg/L	NS	NS	NS	500	NS	400.0	510.0	
Total Metals									
Aluminum	mg/L	NS	NS	NS	NS	0.1	ND	ND	ND
Antimony	mg/L	0.006	NS	0.006	NS	NS	ND	ND	ND
Arsenic	mg/L	0.010	NS	0.025	NS	NS	0.001	0.001	0.001
Barium	mg/L	1	1	NS	NS	NS	0.028	0.025	0.025
Beryllium	mg/L	NS	NS	NS	NS	NS	ND	ND	ND
Boron	mg/L	5	NS	5	NS	NS	0.069	0.067	0.073
Cadmium	mg/L	0.005	0.0	NS	NS	NS	ND	ND	ND
Calcium	mg/L	NS	NS	NS	NS	NS	69	89	96
Chromium	mg/L	0.050	0.1	NS	NS	NS	ND	ND	ND
Cobalt	mg/L	NS	NS	NS	NS	NS	ND	ND	ND
Copper	mg/L	NS	NS	NS	NS	NS	ND	ND	ND
Iron	mg/L	NS	NS	NS	NS	NS	ND	0.130	0.120
Lead	mg/L	0.010	0.0	NS	NS	NS	ND	ND	ND
Magnesium	mg/L	NS	NS	NS	NS	NS	27	33	36
Manganese	mg/L	NS	NS	NS	NS	NS	0.029	0.022	0.022
Molybdenum	mg/L	NS	NS	NS	NS	NS	0.003	0.003	0.003
Nickel	mg/L	NS	NS	NS	NS	NS	ND	ND	ND
Phosphorus	mg/L	NS	NS	NS	NS	NS	ND	ND	ND
Potassium	mg/L	NS	NS	NS	NS	NS	0.970	1.100	1.000
Selenium	mg/L	0.05	0.01	NS	NS	NS	ND	ND	ND
Silicon	mg/L	NS	NS	NS	NS	NS	5.6	5.3	5.5
Silver	mg/L	NS	NS	NS	NS	NS	ND	ND	ND
Sodium	mg/L	NS	NS	NS	NS	NS	27	28	27
Strontium	mg/L	NS	NS	NS	NS	NS	2.8	3.5	4.0
Thallium	mg/L	NS	NS	NS	NS	NS	ND	ND	ND
Titanium	mg/L	NS	NS	NS	NS	NS	ND	ND	ND
Uranium	mg/L	0.020	0.020	NS	NS	NS	0.0002	0.0001	0.0002
Vanadium	mg/L	NS	NS	NS	NS	NS	ND	ND	ND
Zinc	mg/L	NS	NS	NS	NS	NS	0.012	0.020	0.006
Microbiological Analysis									
Background	cfu/100mL	NS	NS	NS	NS	NS	ND	ND	ND
Escherichia coli (E.Coli)	cfu/100mL	0	0	NS	NS	NS	ND	ND	ND
Heterotrophic plate count	cfu/mL	NS	NS	NS	NS	NS	ND	ND	ND
Total Coliforms	cfu/100mL	0	0	NS	NS	NS	ND	ND	ND

Notes:

ODWQS	Standards listed in *Ontario Regulation 169/03: Ontario Drinking Water Quality Standards*
MAC	Maximum Acceptable Concentrations listed in the *Technical Support Document for Ontario Drinking-water Quality Standards, Objectives and Guidelines*
IMAC	Interim Maximum Acceptable Concentrations listed in the *Technical Support Document for Ontario Drinking-water Quality Standards, Objectives and Guidelines*
AO	Aesthetic Objectives listed in the *Technical Support Document for Ontario Drinking-water Quality Standards, Objectives and Guidelines, Table 4 - Objectives and Guidelines*
OG	Operational Guidelines listed in the *Technical Support Document for Ontario Drinking-water Quality Standards, Objectives and Guidelines, Table 4 - Objectives and Guidelines*
6.5	Bold font = concentration greater than those listed in the ODWQS.
6.5	Italicized font = concentration greater than the MAC / IMAC listed in the *Technical Support Document for Ontario Drinking-water Quality Standards, Objectives and Guidelines*
6.5	Underlined font = concentration greater than the aesthetic objectives and/or operational guidelines listed in the *Technical Support Document for Ontario Drinking-water Quality Standards, Objectives and Guidelines*
<	Concentration less than the accompanying reportable detection limit.
NS	No standard listed.
ND	Not detected (below RDL - reading detection limit)

Summary of Water Quality Analytical Results - PW21-1
Proposed Residential Development, Fergus, Ontario

Sample Location							TW25-3	TW25-3	TW25-3
Sample Date							2026/05/26	2026/05/27	2026/05/29
Sample ID							TW25-3	TW25-3	TW25-3
Sampling Company							GEMTEC	GEMTEC	GEMTEC
Laboratory							BV Labs	BV Labs	BV Labs
Laboratory Work Order							C659333	C660181	C661549
Laboratory Sample ID									
Sample Matrix	Units	ODWQS	MAC	IMAC	AO	OG	Groundwater	Groundwater	Groundwater
General Chemistry									
Alkalinity (as $CaCO_3$)	mg/L	NS	NS	NS	NS	30–500	190	190	190
Chloride	mg/L	NS	NS	NS	250.0	NS	14	11	8.9
Dissolved Organic Carbon	mg/L	NS	NS	NS	5	NS	0.49	0.64	0.52
Hardness (as $CaCO_3$)	mg/L	NS	NS	NS	NS	80–100	370.0	350.0	350
Nitrate (as Nitrogen)	mg/L	10	10	NS	NS	NS	ND	ND	ND
Nitrite (as Nitrogen)	mg/L	1	1	NS	NS	NS	ND	ND	ND
Nitrate + Nitrite (as Nitrogen)	mg/L	NS	10	NS	NS	NS	ND	ND	ND
pH	pH	NS	NS	NS	NS	6.5–8.5	8.4	8.3	8.0
Sulphate, Dissolved	mg/L	NS	NS	NS	500	NS	200	220	210
Total Ammonia-N	mg/L	NS	NS	NS	NS	NS	0.17	0.15	0.15
Total Dissolved Solids	mg/L	NS	NS	NS	500	NS	500.0	500.0	
Total Metals									
Aluminum	mg/L	NS	NS	NS	NS	0.1	0.006	ND	ND
Antimony	mg/L	0.006	NS	0.006	NS	NS	ND	ND	ND
Arsenic	mg/L	0.010	NS	0.025	NS	NS	0.002	0.002	0.001
Barium	mg/L	1	1	NS	NS	NS	0.020	0.017	0.016
Beryllium	mg/L	NS	NS	NS	NS	NS	ND	ND	ND
Boron	mg/L	5	NS	5	NS	NS	0.068	0.065	0.073
Cadmium	mg/L	0.005	0.0	NS	NS	NS	ND	ND	ND
Calcium	mg/L	NS	NS	NS	NS	NS	92	88	85
Chromium	mg/L	0.050	0.1	NS	NS	NS	ND	ND	ND
Cobalt	mg/L	NS	NS	NS	NS	NS	ND	ND	ND
Copper	mg/L	NS	NS	NS	NS	NS	ND	ND	ND
Iron	mg/L	NS	NS	NS	NS	NS	ND	ND	0.130
Lead	mg/L	0.010	0.0	NS	NS	NS	ND	ND	ND
Magnesium	mg/L	NS	NS	NS	NS	NS	33	33	33
Manganese	mg/L	NS	NS	NS	NS	NS	0.034	0.023	0.020
Molybdenum	mg/L	NS	NS	NS	NS	NS	0.003	0.003	0.003
Nickel	mg/L	NS	NS	NS	NS	NS	ND	ND	ND
Phosphorus	mg/L	NS	NS	NS	NS	NS	ND	ND	ND
Potassium	mg/L	NS	NS	NS	NS	NS	1.20	1.20	1.10
Selenium	mg/L	0.05	0.01	NS	NS	NS	ND	ND	ND
Silicon	mg/L	NS	NS	NS	NS	NS	5.9	5.4	5.4
Silver	mg/L	NS	NS	NS	NS	NS	ND	ND	ND
Sodium	mg/L	NS	NS	NS	NS	NS	30	29	29
Strontium	mg/L	NS	NS	NS	NS	NS	3.1	3.1	3.3
Thallium	mg/L	NS	NS	NS	NS	NS	ND	ND	ND
Titanium	mg/L	NS	NS	NS	NS	NS	ND	ND	ND
Uranium	mg/L	0.020	0.020	NS	NS	NS	0.0003	0.0003	0.0002
Vanadium	mg/L	NS	NS	NS	NS	NS	ND	ND	ND
Zinc	mg/L	NS	NS	NS	NS	NS	0.011	0.015	ND
Microbiological Analysis									
Background	cfu/100mL	NS	NS	NS	NS	NS	ND	ND	ND
Escherichia coli (E.Coli)	cfu/100mL	0	0	NS	NS	NS	ND	ND	ND
Heterotrophic plate count	cfu/mL	NS	NS	NS	NS	NS	ND	ND	ND
Total Coliforms	cfu/100mL	0	0	NS	NS	NS	ND	ND	ND

Notes:

ODWQS	Standards listed in *Ontario Regulation 169/03: Ontario Drinking Water Quality Standards*
MAC	Maximum Acceptable Concentrations listed in the *Technical Support Document for Ontario Drinking-water Quality Standards, Objectives and Guidelines*
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6.5	Underlined font = concentration greater than the aesthetic objectives and/or operational guidelines listed in the *Technical Support Document for Ontario Drinking-water Quality Standards, Objectives and Guidelines*
<	Concentration less than the accompanying reportable detection limit.
NS	No standard listed.
ND	Not detected (below RDL - reading detection limit)

Your Project #: 101987.017(7)
Your C.O.C. #: C#1117415-01-01

Attention: Kimberly Gilder

GEMTEC Limited
1100 Bennett Rd
Unit 4
Bowmanville, ON
CANADA L1C 0Y7

Report Date: 2026/06/02
Report #: R8752377
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C659333
Received: 2026/05/26, 19:26

Sample Matrix: Ground Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	2	N/A	2026/05/29	CAM SOP-00448	SM 24 2320 B m
Carbonate, Bicarbonate and Hydroxide	2	N/A	2026/05/30	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	2	N/A	2026/06/02	CAM SOP-00463	SM 24 4500-Cl E m
Conductivity	2	N/A	2026/05/29	CAM SOP-00414	SM 24 2510 m
Dissolved Organic Carbon (DOC) (1)	2	N/A	2026/05/28	CAM SOP-00446	SM 24 5310 B m
Hardness (calculated as CaCO3)	2	N/A	2026/06/01	CAM SOP 00102/00408/00447	SM 2340 B
Lab Filtered Metals by ICPMS	2	2026/05/29	2026/06/01	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	2	N/A	2026/06/02		
Anion and Cation Sum	2	N/A	2026/06/01	CAM SOP-00102	SM 24 1030E m
Total Coliforms, (CFU/100mL)	2	N/A	2026/05/27	CAM SOP-00552	SM9222B, MECP E3371
E.coli, (CFU/100mL)	2	N/A	2026/05/27	CAM SOP-00552	SM9222B, MECP E3371
Total Ammonia-N	2	N/A	2026/06/01	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (2)	2	N/A	2026/05/28	CAM SOP-00440	SM 24 4500-NO3I/NO2B
pH (3)	2	2026/05/28	2026/05/30	CAM SOP-00413	SM 24th - 4500H+ B
Orthophosphate	2	N/A	2026/06/01	CAM SOP-00461	SM 24 4500-P E
Sat. pH and Langelier Index (@ 20C)	2	N/A	2026/06/02		Auto Calc
Sat. pH and Langelier Index (@ 4C)	2	N/A	2026/06/02		Auto Calc
Sulphate by Automated Turbidimetry	2	N/A	2026/06/02	CAM SOP-00464	SM 24 4500-SO42- E m
Total Dissolved Solids (TDS calc)	2	N/A	2026/06/02		Auto Calc

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Your Project #: 101987.017(7)
Your C.O.C. #: C#1117415-01-01

Attention: Kimberly Gilder

GEMTEC Limited
1100 Bennett Rd
Unit 4
Bowmanville, ON
CANADA L1C 0Y7

Report Date: 2026/06/02
Report #: R8752377
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C659333

Received: 2026/05/26, 19:26

implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.
(3) "The CCME method and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) requires pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) holding time. Bureau Veritas endeavors to analyze samples as soon as possible after receipt."

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Katherine Szozda, Project Manager
Email: Katherine.Szozda@bureauveritas.com
Phone# (613)274-0573 Ext:7063633
==========
This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C659333
Report Date: 2026/06/02

GEMTEC Limited
Client Project #: 101987.017(7)
Sampler Initials: DH

RESULTS OF ANALYSES OF GROUND WATER

Bureau Veritas ID		BDGA70				BDGA71			
Sampling Date		2026/05/26 12:00				2026/05/26 12:30			
COC Number		C#1117415-01-01				C#1117415-01-01			
	UNITS	PW21-1	RDL	MDL	QC Batch	TW25-3	RDL	MDL	QC Batch
Calculated Parameters									
Anion Sum	me/L	6.82	N/A	N/A	A159337	8.44	N/A	N/A	A159337
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	180	1.0	N/A	A159317	190	1.0	N/A	A159317
Calculated TDS	mg/L	400	1.0	N/A	A159323	500	1.0	N/A	A159323
Carb. Alkalinity (calc. as CaCO3)	mg/L	3.9	1.0	N/A	A159317	4.0	1.0	N/A	A159317
Cation Sum	me/L	6.90	N/A	N/A	A159337	8.67	N/A	N/A	A159337
Hardness (CaCO3)	mg/L	280	1.0	N/A	A159879	370	1.0	N/A	A159879
Ion Balance (% Difference)	%	0.580	N/A	N/A	A159336	1.34	N/A	N/A	A159336
Langelier Index (@ 20C)	N/A	1.02			A159320	1.14			A159320
Langelier Index (@ 4C)	N/A	0.773			A159322	0.887			A159322
Saturation pH (@ 20C)	N/A	7.33			A159320	7.22			A159320
Saturation pH (@ 4C)	N/A	7.58			A159322	7.47			A159322
Inorganics									
Total Ammonia-N	mg/L	0.18	0.050	0.021	A163253	0.17	0.050	0.021	A163253
Conductivity	umho/cm	630	2.0	0.65	A161762	760	2.0	0.65	A161762
Dissolved Organic Carbon	mg/L	0.53	0.40	0.15	A161462	0.49	0.40	0.15	A161456
Orthophosphate (P)	mg/L	<0.010	0.010	0.0020	A162893	<0.010	0.010	0.0020	A162893
pH	pH	8.35			A161766	8.36			A161766
Dissolved Sulphate (SO4)	mg/L	140	2.0	0.98	A162892	200	3.0	1.5	A162892
Alkalinity (Total as CaCO3)	mg/L	190	1.0	0.69	A161765	190	1.0	0.69	A161765
Dissolved Chloride (Cl-)	mg/L	3.8	1.0	0.66	A162891	14	1.0	0.66	A162891
Nitrite (N)	mg/L	<0.010	0.010	0.0020	A161739	<0.010	0.010	0.0020	A161739
Nitrate (N)	mg/L	<0.10	0.10	0.010	A161739	<0.10	0.10	0.010	A161739
Nitrate + Nitrite (N)	mg/L	<0.10	0.10	0.010	A161739	<0.10	0.10	0.010	A161739

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C659333
Report Date: 2026/06/02

GEMTEC Limited
Client Project #: 101987.017(7)
Sampler Initials: DH

RESULTS OF ANALYSES OF GROUND WATER

Bureau Veritas ID		BDGA71			
Sampling Date		2026/05/26 12:30			
COC Number		C#1117415-01-01			
	UNITS	TW25-3 Lab-Dup	RDL	MDL	QC Batch
Inorganics					
Conductivity	umho/cm	770	2.0	0.65	A161762
Dissolved Organic Carbon	mg/L	0.51	0.40	0.15	A161456
pH	pH	8.36			A161766
Alkalinity (Total as CaCO3)	mg/L	190	1.0	0.69	A161765

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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ELEMENTS BY ATOMIC SPECTROSCOPY (GROUND WATER)

Bureau Veritas ID		BDGA70	BDGA71	BDGA71			
Sampling Date		2026/05/26 12:00	2026/05/26 12:30	2026/05/26 12:30			
COC Number		C#1117415-01-01	C#1117415-01-01	C#1117415-01-01			
	UNITS	PW21-1	TW25-3	TW25-3 Lab-Dup	RDL	MDL	QC Batch
Metals							
Dissolved Aluminum (Al)	ug/L	<4.9	5.8	5.2	4.9	4.9	A162414
Dissolved Antimony (Sb)	ug/L	<0.50	<0.50	<0.50	0.50	N/A	A162414
Dissolved Arsenic (As)	ug/L	1.1	1.9	1.8	1.0	N/A	A162414
Dissolved Barium (Ba)	ug/L	28	20	19	2.0	2.0	A162414
Dissolved Beryllium (Be)	ug/L	<0.40	<0.40	<0.40	0.40	0.40	A162414
Dissolved Boron (B)	ug/L	69	68	69	10	N/A	A162414
Dissolved Cadmium (Cd)	ug/L	<0.090	<0.090	<0.090	0.090	0.081	A162414
Dissolved Calcium (Ca)	ug/L	69000	92000	89000	200	N/A	A162414
Dissolved Chromium (Cr)	ug/L	<5.0	<5.0	<5.0	5.0	N/A	A162414
Dissolved Cobalt (Co)	ug/L	<0.50	<0.50	<0.50	0.50	N/A	A162414
Dissolved Copper (Cu)	ug/L	<0.90	<0.90	<0.90	0.90	0.90	A162414
Dissolved Iron (Fe)	ug/L	<100	<100	<100	100	N/A	A162414
Dissolved Lead (Pb)	ug/L	<0.50	<0.50	<0.50	0.50	N/A	A162414
Dissolved Magnesium (Mg)	ug/L	27000	33000	33000	50	N/A	A162414
Dissolved Manganese (Mn)	ug/L	29	34	34	2.0	N/A	A162414
Dissolved Molybdenum (Mo)	ug/L	3.2	3.1	3.1	0.50	0.50	A162414
Dissolved Nickel (Ni)	ug/L	<1.0	<1.0	<1.0	1.0	N/A	A162414
Dissolved Phosphorus (P)	ug/L	<100	<100	<100	100	N/A	A162414
Dissolved Potassium (K)	ug/L	970	1200	1200	200	N/A	A162414
Dissolved Selenium (Se)	ug/L	<1.0	<1.0	<1.0	1.0	N/A	A162414
Dissolved Silicon (Si)	ug/L	5600	5900	5700	50	N/A	A162414
Dissolved Silver (Ag)	ug/L	<0.090	<0.090	<0.090	0.090	0.081	A162414
Dissolved Sodium (Na)	ug/L	27000	30000	30000	100	N/A	A162414
Dissolved Strontium (Sr)	ug/L	2800	3100	3100	1.0	N/A	A162414
Dissolved Thallium (Tl)	ug/L	<0.050	<0.050	<0.050	0.050	N/A	A162414
Dissolved Titanium (Ti)	ug/L	<5.0	<5.0	<5.0	5.0	N/A	A162414
Dissolved Uranium (U)	ug/L	0.15	0.26	0.28	0.10	N/A	A162414
Dissolved Vanadium (V)	ug/L	<0.50	<0.50	<0.50	0.50	0.50	A162414
Dissolved Zinc (Zn)	ug/L	12	11	11	5.0	N/A	A162414

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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MICROBIOLOGY (GROUND WATER)

Bureau Veritas ID		BDGA70	BDGA71			
Sampling Date		2026/05/26 12:00	2026/05/26 12:30			
COC Number		C#1117415-01-01	C#1117415-01-01			
	UNITS	PW21-1	TW25-3	RDL	MDL	QC Batch
Microbiological						
Background	CFU/100mL	<10	<10	10	N/A	A160707
Total Coliforms	CFU/100mL	<10	<10	10	N/A	A160707
Escherichia coli	CFU/100mL	<10	<10	10	N/A	A160706

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	4.0°C

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A161456	GID	Matrix Spike [BDGA71-02]	Dissolved Organic Carbon	2026/05/28		90	%	80 - 120
A161456	GID	Spiked Blank	Dissolved Organic Carbon	2026/05/28		93	%	80 - 120
A161456	GID	Method Blank	Dissolved Organic Carbon	2026/05/28	<0.40		mg/L	
A161456	GID	RPD [BDGA71-02]	Dissolved Organic Carbon	2026/05/28	3.0		%	20
A161462	GID	Matrix Spike	Dissolved Organic Carbon	2026/05/28		92	%	80 - 120
A161462	GID	Spiked Blank	Dissolved Organic Carbon	2026/05/28		94	%	80 - 120
A161462	GID	Method Blank	Dissolved Organic Carbon	2026/05/28	<0.40		mg/L	
A161462	GID	RPD	Dissolved Organic Carbon	2026/05/28	0.80		%	20
A161739	C_N	Matrix Spike	Nitrite (N)	2026/05/28		NC	%	80 - 120
			Nitrate (N)	2026/05/28		82	%	80 - 120
A161739	C_N	Spiked Blank	Nitrite (N)	2026/05/28		106	%	80 - 120
			Nitrate (N)	2026/05/28		95	%	80 - 120
A161739	C_N	Method Blank	Nitrite (N)	2026/05/28	<0.010		mg/L	
			Nitrate (N)	2026/05/28	<0.10		mg/L	
A161739	C_N	RPD	Nitrite (N)	2026/05/28	0.27		%	20
			Nitrate (N)	2026/05/28	0.15		%	20
A161762	SAU	Spiked Blank	Conductivity	2026/05/30		102	%	85 - 115
A161762	SAU	Method Blank	Conductivity	2026/05/29	<2.0		umho/cm	
A161762	SAU	RPD [BDGA71-05]	Conductivity	2026/05/29	0.65		%	10
A161765	SAU	Spiked Blank	Alkalinity (Total as CaCO3)	2026/05/29		99	%	85 - 115
A161765	SAU	Method Blank	Alkalinity (Total as CaCO3)	2026/05/29	<1.0		mg/L	
A161765	SAU	RPD [BDGA71-05]	Alkalinity (Total as CaCO3)	2026/05/29	2.7		%	20
A161766	NGI	Spiked Blank	pH	2026/05/30		102	%	98 - 103
A161766	NGI	RPD [BDGA71-05]	pH	2026/05/30	0.017		%	N/A
A162414	PBA	Matrix Spike [BDGA71-05]	Dissolved Aluminum (Al)	2026/06/01		99	%	80 - 120
			Dissolved Antimony (Sb)	2026/06/01		106	%	80 - 120
			Dissolved Arsenic (As)	2026/06/01		100	%	80 - 120
			Dissolved Barium (Ba)	2026/06/01		102	%	80 - 120
			Dissolved Beryllium (Be)	2026/06/01		96	%	80 - 120
			Dissolved Boron (B)	2026/06/01		93	%	80 - 120
			Dissolved Cadmium (Cd)	2026/06/01		101	%	80 - 120
			Dissolved Calcium (Ca)	2026/06/01		NC	%	80 - 120
			Dissolved Chromium (Cr)	2026/06/01		96	%	80 - 120
			Dissolved Cobalt (Co)	2026/06/01		99	%	80 - 120
			Dissolved Copper (Cu)	2026/06/01		102	%	80 - 120
			Dissolved Iron (Fe)	2026/06/01		100	%	80 - 120
			Dissolved Lead (Pb)	2026/06/01		97	%	80 - 120
			Dissolved Magnesium (Mg)	2026/06/01		NC	%	80 - 120
			Dissolved Manganese (Mn)	2026/06/01		99	%	80 - 120
			Dissolved Molybdenum (Mo)	2026/06/01		102	%	80 - 120
			Dissolved Nickel (Ni)	2026/06/01		96	%	80 - 120
			Dissolved Phosphorus (P)	2026/06/01		104	%	80 - 120
			Dissolved Potassium (K)	2026/06/01		102	%	80 - 120
			Dissolved Selenium (Se)	2026/06/01		97	%	80 - 120
			Dissolved Silicon (Si)	2026/06/01		97	%	80 - 120
			Dissolved Silver (Ag)	2026/06/01		99	%	80 - 120
			Dissolved Sodium (Na)	2026/06/01		NC	%	80 - 120
			Dissolved Strontium (Sr)	2026/06/01		NC	%	80 - 120
			Dissolved Thallium (Tl)	2026/06/01		98	%	80 - 120
			Dissolved Titanium (Ti)	2026/06/01		99	%	80 - 120
			Dissolved Uranium (U)	2026/06/01		99	%	80 - 120
			Dissolved Vanadium (V)	2026/06/01		96	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Zinc (Zn)	2026/06/01		100	%	80 - 120
A162414	PBA	Spiked Blank	Dissolved Aluminum (Al)	2026/06/01		106	%	80 - 120
			Dissolved Antimony (Sb)	2026/06/01		105	%	80 - 120
			Dissolved Arsenic (As)	2026/06/01		102	%	80 - 120
			Dissolved Barium (Ba)	2026/06/01		103	%	80 - 120
			Dissolved Beryllium (Be)	2026/06/01		99	%	80 - 120
			Dissolved Boron (B)	2026/06/01		95	%	80 - 120
			Dissolved Cadmium (Cd)	2026/06/01		102	%	80 - 120
			Dissolved Calcium (Ca)	2026/06/01		104	%	80 - 120
			Dissolved Chromium (Cr)	2026/06/01		98	%	80 - 120
			Dissolved Cobalt (Co)	2026/06/01		105	%	80 - 120
			Dissolved Copper (Cu)	2026/06/01		102	%	80 - 120
			Dissolved Iron (Fe)	2026/06/01		101	%	80 - 120
			Dissolved Lead (Pb)	2026/06/01		100	%	80 - 120
			Dissolved Magnesium (Mg)	2026/06/01		104	%	80 - 120
			Dissolved Manganese (Mn)	2026/06/01		102	%	80 - 120
			Dissolved Molybdenum (Mo)	2026/06/01		102	%	80 - 120
			Dissolved Nickel (Ni)	2026/06/01		100	%	80 - 120
			Dissolved Phosphorus (P)	2026/06/01		106	%	80 - 120
			Dissolved Potassium (K)	2026/06/01		103	%	80 - 120
			Dissolved Selenium (Se)	2026/06/01		101	%	80 - 120
			Dissolved Silicon (Si)	2026/06/01		103	%	80 - 120
			Dissolved Silver (Ag)	2026/06/01		99	%	80 - 120
			Dissolved Sodium (Na)	2026/06/01		101	%	80 - 120
			Dissolved Strontium (Sr)	2026/06/01		99	%	80 - 120
			Dissolved Thallium (Tl)	2026/06/01		99	%	80 - 120
			Dissolved Titanium (Ti)	2026/06/01		104	%	80 - 120
			Dissolved Uranium (U)	2026/06/01		99	%	80 - 120
			Dissolved Vanadium (V)	2026/06/01		97	%	80 - 120
			Dissolved Zinc (Zn)	2026/06/01		102	%	80 - 120
A162414	PBA	Method Blank	Dissolved Aluminum (Al)	2026/06/01	<4.9		ug/L	
			Dissolved Antimony (Sb)	2026/06/01	<0.50		ug/L	
			Dissolved Arsenic (As)	2026/06/01	<1.0		ug/L	
			Dissolved Barium (Ba)	2026/06/01	<2.0		ug/L	
			Dissolved Beryllium (Be)	2026/06/01	<0.40		ug/L	
			Dissolved Boron (B)	2026/06/01	<10		ug/L	
			Dissolved Cadmium (Cd)	2026/06/01	<0.090		ug/L	
			Dissolved Calcium (Ca)	2026/06/01	<200		ug/L	
			Dissolved Chromium (Cr)	2026/06/01	<5.0		ug/L	
			Dissolved Cobalt (Co)	2026/06/01	<0.50		ug/L	
			Dissolved Copper (Cu)	2026/06/01	<0.90		ug/L	
			Dissolved Iron (Fe)	2026/06/01	<100		ug/L	
			Dissolved Lead (Pb)	2026/06/01	<0.50		ug/L	
			Dissolved Magnesium (Mg)	2026/06/01	<50		ug/L	
			Dissolved Manganese (Mn)	2026/06/01	<2.0		ug/L	
			Dissolved Molybdenum (Mo)	2026/06/01	<0.50		ug/L	
			Dissolved Nickel (Ni)	2026/06/01	<1.0		ug/L	
			Dissolved Phosphorus (P)	2026/06/01	<100		ug/L	
			Dissolved Potassium (K)	2026/06/01	<200		ug/L	
			Dissolved Selenium (Se)	2026/06/01	<1.0		ug/L	
			Dissolved Silicon (Si)	2026/06/01	99, RDL=50		ug/L	
			Dissolved Silver (Ag)	2026/06/01	<0.090		ug/L	
			Dissolved Sodium (Na)	2026/06/01	<100		ug/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Strontium (Sr)	2026/06/01	<1.0		ug/L	
			Dissolved Thallium (Tl)	2026/06/01	<0.050		ug/L	
			Dissolved Titanium (Ti)	2026/06/01	<5.0		ug/L	
			Dissolved Uranium (U)	2026/06/01	<0.10		ug/L	
			Dissolved Vanadium (V)	2026/06/01	<0.50		ug/L	
			Dissolved Zinc (Zn)	2026/06/01	<5.0		ug/L	
A162414	PBA	RPD [BDGA71-05]	Dissolved Aluminum (Al)	2026/06/01	11		%	20
			Dissolved Antimony (Sb)	2026/06/01	NC		%	20
			Dissolved Arsenic (As)	2026/06/01	6.5		%	20
			Dissolved Barium (Ba)	2026/06/01	2.6		%	20
			Dissolved Beryllium (Be)	2026/06/01	NC		%	20
			Dissolved Boron (B)	2026/06/01	2.1		%	20
			Dissolved Cadmium (Cd)	2026/06/01	NC		%	20
			Dissolved Calcium (Ca)	2026/06/01	3.5		%	20
			Dissolved Chromium (Cr)	2026/06/01	NC		%	20
			Dissolved Cobalt (Co)	2026/06/01	NC		%	20
			Dissolved Copper (Cu)	2026/06/01	NC		%	20
			Dissolved Iron (Fe)	2026/06/01	NC		%	20
			Dissolved Lead (Pb)	2026/06/01	NC		%	20
			Dissolved Magnesium (Mg)	2026/06/01	0.29		%	20
			Dissolved Manganese (Mn)	2026/06/01	1.3		%	20
			Dissolved Molybdenum (Mo)	2026/06/01	0.78		%	20
			Dissolved Nickel (Ni)	2026/06/01	NC		%	20
			Dissolved Phosphorus (P)	2026/06/01	NC		%	20
			Dissolved Potassium (K)	2026/06/01	0.96		%	20
			Dissolved Selenium (Se)	2026/06/01	NC		%	20
			Dissolved Silicon (Si)	2026/06/01	4.0		%	20
			Dissolved Silver (Ag)	2026/06/01	NC		%	20
			Dissolved Sodium (Na)	2026/06/01	1.8		%	20
			Dissolved Strontium (Sr)	2026/06/01	0.53		%	20
			Dissolved Thallium (Tl)	2026/06/01	NC		%	20
			Dissolved Titanium (Ti)	2026/06/01	NC		%	20
			Dissolved Uranium (U)	2026/06/01	5.5		%	20
			Dissolved Vanadium (V)	2026/06/01	NC		%	20
			Dissolved Zinc (Zn)	2026/06/01	2.5		%	20
A162891	MJ1	Matrix Spike	Dissolved Chloride (Cl-)	2026/06/02		NC	%	80 - 120
A162891	MJ1	Spiked Blank	Dissolved Chloride (Cl-)	2026/06/02		93	%	80 - 120
A162891	MJ1	Method Blank	Dissolved Chloride (Cl-)	2026/06/02	<1.0		mg/L	
A162891	MJ1	RPD	Dissolved Chloride (Cl-)	2026/06/02	0.27		%	20
A162892	MJ1	Matrix Spike	Dissolved Sulphate (SO4)	2026/06/02		NC	%	75 - 125
A162892	MJ1	Spiked Blank	Dissolved Sulphate (SO4)	2026/06/02		101	%	80 - 120
A162892	MJ1	Method Blank	Dissolved Sulphate (SO4)	2026/06/02	<1.0		mg/L	
A162892	MJ1	RPD	Dissolved Sulphate (SO4)	2026/06/02	0.29		%	20
A162893	NCU	Matrix Spike	Orthophosphate (P)	2026/06/01		95	%	75 - 125
A162893	NCU	Spiked Blank	Orthophosphate (P)	2026/06/01		97	%	80 - 120
A162893	NCU	Method Blank	Orthophosphate (P)	2026/06/01	<0.010		mg/L	
A162893	NCU	RPD	Orthophosphate (P)	2026/06/01	NC		%	20
A163253	KJP	Matrix Spike	Total Ammonia-N	2026/06/01		NC	%	75 - 125
A163253	KJP	Spiked Blank	Total Ammonia-N	2026/06/01		97	%	80 - 120
A163253	KJP	Method Blank	Total Ammonia-N	2026/06/01	<0.050		mg/L	

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Bureau Veritas Job #: C659333
Report Date: 2026/06/02

GEMTEC Limited
Client Project #: 101987.017(7)
Sampler Initials: DH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A163253	KJP	RPD	Total Ammonia-N	2026/06/01	0.10		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Cristina Carriere, Senior Scientific Specialist

Paramjit Paramjit, Analyst I

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

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Exceedance Summary Table – Prov. Water Quality Obj.

Result Exceedances

Sample ID	Bureau Veritas ID	Parameter	Criteria	Result	DL	UNITS
No Exceedances						

The exceedance summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

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Your Project #: 101987.017(7)
Site Location: FERGUS
Your C.O.C. #: N/A

Attention: Kimberly Gilder

GEMTEC Limited
1100 Bennett Rd
Unit 4
Bowmanville, ON
CANADA L1C 0Y7

Report Date: 2026/06/03
Report #: R8752848
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C660181
Received: 2026/05/27, 15:34

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	2	N/A	2026/05/29	CAM SOP-00448	SM 24 2320 B m
Carbonate, Bicarbonate and Hydroxide	2	N/A	2026/05/30	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	2	N/A	2026/06/02	CAM SOP-00463	SM 24 4500-Cl E m
Conductivity	2	N/A	2026/05/29	CAM SOP-00414	SM 24 2510 m
Dissolved Organic Carbon (DOC) (1)	2	N/A	2026/05/31	CAM SOP-00446	SM 24 5310 B m
Hardness (calculated as CaCO3)	2	N/A	2026/06/02	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	2	N/A	2026/06/01	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	2	N/A	2026/06/02		
Anion and Cation Sum	2	N/A	2026/06/02	CAM SOP-00102	SM 24 1030E m
Total Coliforms, (CFU/100mL)	2	N/A	2026/05/27	CAM SOP-00552	SM9222B, MECP E3371
E.coli, (CFU/100mL)	2	N/A	2026/05/27	CAM SOP-00552	SM9222B, MECP E3371
Total Ammonia-N	1	N/A	2026/06/02	CAM SOP-00441	USGS I-2522-90 m
Total Ammonia-N	1	N/A	2026/06/03	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (2)	2	N/A	2026/05/29	CAM SOP-00440	SM 24 4500-NO3I/NO2B
pH (3)	2	2026/05/28	2026/05/30	CAM SOP-00413	SM 24th - 4500H+ B
Orthophosphate	2	N/A	2026/06/01	CAM SOP-00461	SM 24 4500-P E
Sat. pH and Langelier Index (@ 20C)	2	N/A	2026/06/02		Auto Calc
Sat. pH and Langelier Index (@ 4C)	2	N/A	2026/06/02		Auto Calc
Sulphate by Automated Turbidimetry	2	N/A	2026/06/02	CAM SOP-00464	SM 24 4500-SO42- E m
Total Dissolved Solids (TDS calc)	2	N/A	2026/06/02		Auto Calc

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Your Project #: 101987.017(7)
Site Location: FERGUS
Your C.O.C. #: N/A

Attention: Kimberly Gilder

GEMTEC Limited
1100 Bennett Rd
Unit 4
Bowmanville, ON
CANADA L1C 0Y7

Report Date: 2026/06/03
Report #: R8752848
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C660181

Received: 2026/05/27, 15:34

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.
(3) "The CCME method and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) requires pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) holding time. Bureau Veritas endeavors to analyze samples as soon as possible after receipt."

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Katherine Szozda, Project Manager
Email: Katherine.Szozda@bureauveritas.com
Phone# (613)274-0573 Ext:7063633
==========
This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C660181
Report Date: 2026/06/03

GEMTEC Limited
Client Project #: 101987.017(7)
Site Location: FERGUS
Sampler Initials: CC

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID			BDHJ96				BDHJ96			
Sampling Date			2026/05/27				2026/05/27			
COC Number			N/A				N/A			
	UNITS	Criteria	PW21-1	RDL	MDL	QC Batch	PW21-1 Lab-Dup	RDL	MDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	-	8.54	N/A	N/A	A160534				
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	180	1.0	N/A	A160393				
Calculated TDS	mg/L	-	510	1.0	N/A	A160538				
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	3.2	1.0	N/A	A160393				
Cation Sum	me/L	-	8.46	N/A	N/A	A160534				
Hardness (CaCO3)	mg/L	-	360	1.0	N/A	A160715				
Ion Balance (% Difference)	%	-	0.440	N/A	N/A	A160533				
Langelier Index (@ 20C)	N/A	-	1.02			A160535				
Langelier Index (@ 4C)	N/A	-	0.772			A160537				
Saturation pH (@ 20C)	N/A	-	7.25			A160535				
Saturation pH (@ 4C)	N/A	-	7.50			A160537				
Inorganics										
Total Ammonia-N	mg/L	-	0.19	0.050	0.021	A164590	0.19	0.050	0.021	A164590
Conductivity	umho/cm	-	770	2.0	0.65	A161762				
Dissolved Organic Carbon	mg/L	-	0.62	0.40	0.15	A162580				
Orthophosphate (P)	mg/L	-	<0.010	0.010	0.0020	A162893				
pH	pH	6.5:8.5	8.27			A161766				
Dissolved Sulphate (SO4)	mg/L	-	220	3.0	1.5	A162892				
Alkalinity (Total as CaCO3)	mg/L	-	180	1.0	0.69	A161765				
Dissolved Chloride (Cl-)	mg/L	-	6.5	1.0	0.66	A162891				
Nitrite (N)	mg/L	-	<0.010	0.010	0.0020	A161737				
Nitrate (N)	mg/L	-	<0.10	0.10	0.010	A161737				
Nitrate + Nitrite (N)	mg/L	-	<0.10	0.10	0.010	A161737				

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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Bureau Veritas Job #: C660181
Report Date: 2026/06/03

GEMTEC Limited
Client Project #: 101987.017(7)
Site Location: FERGUS
Sampler Initials: CC

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID			BDHJ97				BDHJ97			
Sampling Date			2026/05/27				2026/05/27			
COC Number			N/A				N/A			
	UNITS	Criteria	TW25-3	RDL	MDL	QC Batch	TW25-3 Lab-Dup	RDL	MDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	-	8.54	N/A	N/A	A160534				
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	180	1.0	N/A	A160393				
Calculated TDS	mg/L	-	500	1.0	N/A	A160538				
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	3.4	1.0	N/A	A160393				
Cation Sum	me/L	-	8.37	N/A	N/A	A160534				
Hardness (CaCO3)	mg/L	-	350	1.0	N/A	A160715				
Ion Balance (% Difference)	%	-	1.00	N/A	N/A	A160533				
Langelier Index (@ 20C)	N/A	-	1.05			A160535				
Langelier Index (@ 4C)	N/A	-	0.797			A160537				
Saturation pH (@ 20C)	N/A	-	7.25			A160535				
Saturation pH (@ 4C)	N/A	-	7.50			A160537				
Inorganics										
Total Ammonia-N	mg/L	-	0.15	0.050	0.021	A164539	0.15	0.050	0.021	A164539
Conductivity	umho/cm	-	770	2.0	0.65	A161762				
Dissolved Organic Carbon	mg/L	-	0.64	0.40	0.15	A162636				
Orthophosphate (P)	mg/L	-	<0.010	0.010	0.0020	A162893				
pH	pH	6.5:8.5	8.30			A161766				
Dissolved Sulphate (SO4)	mg/L	-	220	3.0	1.5	A162892				
Alkalinity (Total as CaCO3)	mg/L	-	190	1.0	0.69	A161765				
Dissolved Chloride (Cl-)	mg/L	-	11	1.0	0.66	A162891				
Nitrite (N)	mg/L	-	<0.010	0.010	0.0020	A161737				
Nitrate (N)	mg/L	-	<0.10	0.10	0.010	A161737				
Nitrate + Nitrite (N)	mg/L	-	<0.10	0.10	0.010	A161737				

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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Bureau Veritas Job #: C660181
Report Date: 2026/06/03

GEMTEC Limited
Client Project #: 101987.017(7)
Site Location: FERGUS
Sampler Initials: CC

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID			BDHJ96	BDHJ97			
Sampling Date			2026/05/27	2026/05/27			
COC Number			N/A	N/A			
	UNITS	Criteria	PW21-1	TW25-3	RDL	MDL	QC Batch
Metals							
Dissolved Aluminum (Al)	ug/L	-	<4.9	<4.9	4.9	3.0	A162373
Dissolved Antimony (Sb)	ug/L	20	<0.50	<0.50	0.50	0.20	A162373
Dissolved Arsenic (As)	ug/L	100	1.4	1.5	1.0	0.10	A162373
Dissolved Barium (Ba)	ug/L	-	25	17	2.0	0.30	A162373
Dissolved Beryllium (Be)	ug/L	11	<0.40	<0.40	0.40	0.050	A162373
Dissolved Boron (B)	ug/L	200	67	65	10	0.60	A162373
Dissolved Cadmium (Cd)	ug/L	0.2	<0.090	<0.090	0.090	0.090	A162373
Dissolved Calcium (Ca)	ug/L	-	89000	88000	200	25	A162373
Dissolved Chromium (Cr)	ug/L	-	<5.0	<5.0	5.0	0.70	A162373
Dissolved Cobalt (Co)	ug/L	0.9	<0.50	<0.50	0.50	0.040	A162373
Dissolved Copper (Cu)	ug/L	5	<0.90	1.6	0.90	0.30	A162373
Dissolved Iron (Fe)	ug/L	300	130	220	100	5.0	A162373
Dissolved Lead (Pb)	ug/L	5	<0.50	<0.50	0.50	0.050	A162373
Dissolved Magnesium (Mg)	ug/L	-	33000	33000	50	4.0	A162373
Dissolved Manganese (Mn)	ug/L	-	22	23	2.0	0.30	A162373
Dissolved Molybdenum (Mo)	ug/L	40	3.1	3.4	0.50	0.070	A162373
Dissolved Nickel (Ni)	ug/L	25	<1.0	<1.0	1.0	0.40	A162373
Dissolved Phosphorus (P)	ug/L	-	<100	<100	100	19	A162373
Dissolved Potassium (K)	ug/L	-	1100	1200	200	18	A162373
Dissolved Selenium (Se)	ug/L	100	<1.0	<1.0	1.0	0.20	A162373
Dissolved Silicon (Si)	ug/L	-	5300	5400	50	4.0	A162373
Dissolved Silver (Ag)	ug/L	0.1	<0.090	<0.090	0.090	0.020	A162373
Dissolved Sodium (Na)	ug/L	-	28000	29000	100	20	A162373
Dissolved Strontium (Sr)	ug/L	-	3500	3100	1.0	0.30	A162373
Dissolved Thallium (Tl)	ug/L	0.3	<0.050	<0.050	0.050	0.020	A162373
Dissolved Titanium (Ti)	ug/L	-	<5.0	<5.0	5.0	2.0	A162373
Dissolved Uranium (U)	ug/L	5	0.14	0.21	0.10	0.010	A162373
Dissolved Vanadium (V)	ug/L	6	<0.50	<0.50	0.50	0.090	A162373
Dissolved Zinc (Zn)	ug/L	30	20	15	5.0	1.0	A162373

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999

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Bureau Veritas Job #: C660181
Report Date: 2026/06/03

GEMTEC Limited
Client Project #: 101987.017(7)
Site Location: FERGUS
Sampler Initials: CC

MICROBIOLOGY (WATER)

Bureau Veritas ID			BDHJ96	BDHJ97			
Sampling Date			2026/05/27	2026/05/27			
COC Number			N/A	N/A			
	UNITS	Criteria	PW21-1	TW25-3	RDL	MDL	QC Batch
Microbiological							
Background	CFU/100mL	-	<10	<10	10	N/A	A160921
Total Coliforms	CFU/100mL	-	<10	<10	10	N/A	A160921
Escherichia coli	CFU/100mL	100	<10	<10	10	N/A	A160920

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
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Criteria: Ontario Provincial Water Quality Objectives
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N/A = Not Applicable

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	7.0°C

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A161737	C_N	Matrix Spike	Nitrite (N)	2026/05/29		80	%	80 - 120
			Nitrate (N)	2026/05/29		91	%	80 - 120
A161737	C_N	Spiked Blank	Nitrite (N)	2026/05/29		103	%	80 - 120
			Nitrate (N)	2026/05/29		88	%	80 - 120
A161737	C_N	Method Blank	Nitrite (N)	2026/05/29	<0.010		mg/L	
			Nitrate (N)	2026/05/29	<0.10		mg/L	
A161737	C_N	RPD	Nitrite (N)	2026/05/29	NC		%	20
			Nitrate (N)	2026/05/29	0.69		%	20
A161762	SAU	Spiked Blank	Conductivity	2026/05/30		102	%	85 - 115
A161762	SAU	Method Blank	Conductivity	2026/05/29	<2.0		umho/cm	
A161762	SAU	RPD	Conductivity	2026/05/29	0.65		%	10
A161765	SAU	Spiked Blank	Alkalinity (Total as CaCO3)	2026/05/29		99	%	85 - 115
A161765	SAU	Method Blank	Alkalinity (Total as CaCO3)	2026/05/29	<1.0		mg/L	
A161765	SAU	RPD	Alkalinity (Total as CaCO3)	2026/05/29	2.7		%	20
A161766	NGI	Spiked Blank	pH	2026/05/30		102	%	98 - 103
A161766	NGI	RPD	pH	2026/05/30	0.017		%	N/A
A162373	PBA	Matrix Spike	Dissolved Aluminum (Al)	2026/06/01		104	%	80 - 120
			Dissolved Antimony (Sb)	2026/06/01		105	%	80 - 120
			Dissolved Arsenic (As)	2026/06/01		98	%	80 - 120
			Dissolved Barium (Ba)	2026/06/01		97	%	80 - 120
			Dissolved Beryllium (Be)	2026/06/01		97	%	80 - 120
			Dissolved Boron (B)	2026/06/01		95	%	80 - 120
			Dissolved Cadmium (Cd)	2026/06/01		100	%	80 - 120
			Dissolved Calcium (Ca)	2026/06/01		NC	%	80 - 120
			Dissolved Chromium (Cr)	2026/06/01		94	%	80 - 120
			Dissolved Cobalt (Co)	2026/06/01		99	%	80 - 120
			Dissolved Copper (Cu)	2026/06/01		100	%	80 - 120
			Dissolved Iron (Fe)	2026/06/01		98	%	80 - 120
			Dissolved Lead (Pb)	2026/06/01		99	%	80 - 120
			Dissolved Magnesium (Mg)	2026/06/01		102	%	80 - 120
			Dissolved Manganese (Mn)	2026/06/01		98	%	80 - 120
			Dissolved Molybdenum (Mo)	2026/06/01		99	%	80 - 120
			Dissolved Nickel (Ni)	2026/06/01		94	%	80 - 120
			Dissolved Phosphorus (P)	2026/06/01		107	%	80 - 120
			Dissolved Potassium (K)	2026/06/01		101	%	80 - 120
			Dissolved Selenium (Se)	2026/06/01		97	%	80 - 120
			Dissolved Silicon (Si)	2026/06/01		101	%	80 - 120
			Dissolved Silver (Ag)	2026/06/01		86	%	80 - 120
			Dissolved Sodium (Na)	2026/06/01		NC	%	80 - 120
			Dissolved Strontium (Sr)	2026/06/01		96	%	80 - 120
			Dissolved Thallium (Tl)	2026/06/01		97	%	80 - 120
			Dissolved Titanium (Ti)	2026/06/01		103	%	80 - 120
			Dissolved Uranium (U)	2026/06/01		100	%	80 - 120
			Dissolved Vanadium (V)	2026/06/01		94	%	80 - 120
			Dissolved Zinc (Zn)	2026/06/01		97	%	80 - 120
A162373	PBA	Spiked Blank	Dissolved Aluminum (Al)	2026/06/01		105	%	80 - 120
			Dissolved Antimony (Sb)	2026/06/01		104	%	80 - 120
			Dissolved Arsenic (As)	2026/06/01		98	%	80 - 120
			Dissolved Barium (Ba)	2026/06/01		98	%	80 - 120
			Dissolved Beryllium (Be)	2026/06/01		94	%	80 - 120
			Dissolved Boron (B)	2026/06/01		91	%	80 - 120
			Dissolved Cadmium (Cd)	2026/06/01		100	%	80 - 120
			Dissolved Calcium (Ca)	2026/06/01		104	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Chromium (Cr)	2026/06/01		94	%	80 - 120
			Dissolved Cobalt (Co)	2026/06/01		99	%	80 - 120
			Dissolved Copper (Cu)	2026/06/01		101	%	80 - 120
			Dissolved Iron (Fe)	2026/06/01		99	%	80 - 120
			Dissolved Lead (Pb)	2026/06/01		98	%	80 - 120
			Dissolved Magnesium (Mg)	2026/06/01		102	%	80 - 120
			Dissolved Manganese (Mn)	2026/06/01		98	%	80 - 120
			Dissolved Molybdenum (Mo)	2026/06/01		99	%	80 - 120
			Dissolved Nickel (Ni)	2026/06/01		94	%	80 - 120
			Dissolved Phosphorus (P)	2026/06/01		101	%	80 - 120
			Dissolved Potassium (K)	2026/06/01		103	%	80 - 120
			Dissolved Selenium (Se)	2026/06/01		98	%	80 - 120
			Dissolved Silicon (Si)	2026/06/01		103	%	80 - 120
			Dissolved Silver (Ag)	2026/06/01		97	%	80 - 120
			Dissolved Sodium (Na)	2026/06/01		98	%	80 - 120
			Dissolved Strontium (Sr)	2026/06/01		95	%	80 - 120
			Dissolved Thallium (Tl)	2026/06/01		97	%	80 - 120
			Dissolved Titanium (Ti)	2026/06/01		104	%	80 - 120
			Dissolved Uranium (U)	2026/06/01		95	%	80 - 120
			Dissolved Vanadium (V)	2026/06/01		93	%	80 - 120
			Dissolved Zinc (Zn)	2026/06/01		104	%	80 - 120
A162373	PBA	Method Blank	Dissolved Aluminum (Al)	2026/06/01	<4.9		ug/L	
			Dissolved Antimony (Sb)	2026/06/01	<0.50		ug/L	
			Dissolved Arsenic (As)	2026/06/01	<1.0		ug/L	
			Dissolved Barium (Ba)	2026/06/01	<2.0		ug/L	
			Dissolved Beryllium (Be)	2026/06/01	<0.40		ug/L	
			Dissolved Boron (B)	2026/06/01	<10		ug/L	
			Dissolved Cadmium (Cd)	2026/06/01	<0.090		ug/L	
			Dissolved Calcium (Ca)	2026/06/01	<200		ug/L	
			Dissolved Chromium (Cr)	2026/06/01	<5.0		ug/L	
			Dissolved Cobalt (Co)	2026/06/01	<0.50		ug/L	
			Dissolved Copper (Cu)	2026/06/01	<0.90		ug/L	
			Dissolved Iron (Fe)	2026/06/01	<100		ug/L	
			Dissolved Lead (Pb)	2026/06/01	<0.50		ug/L	
			Dissolved Magnesium (Mg)	2026/06/01	<50		ug/L	
			Dissolved Manganese (Mn)	2026/06/01	<2.0		ug/L	
			Dissolved Molybdenum (Mo)	2026/06/01	<0.50		ug/L	
			Dissolved Nickel (Ni)	2026/06/01	<1.0		ug/L	
			Dissolved Phosphorus (P)	2026/06/01	<100		ug/L	
			Dissolved Potassium (K)	2026/06/01	<200		ug/L	
			Dissolved Selenium (Se)	2026/06/01	<1.0		ug/L	
			Dissolved Silicon (Si)	2026/06/01	<50		ug/L	
			Dissolved Silver (Ag)	2026/06/01	<0.090		ug/L	
			Dissolved Sodium (Na)	2026/06/01	<100		ug/L	
			Dissolved Strontium (Sr)	2026/06/01	<1.0		ug/L	
			Dissolved Thallium (Tl)	2026/06/01	<0.050		ug/L	
			Dissolved Titanium (Ti)	2026/06/01	<5.0		ug/L	
			Dissolved Uranium (U)	2026/06/01	<0.10		ug/L	
			Dissolved Vanadium (V)	2026/06/01	<0.50		ug/L	
			Dissolved Zinc (Zn)	2026/06/01	<5.0		ug/L	
A162373	PBA	RPD	Dissolved Aluminum (Al)	2026/06/01	NC		%	20
			Dissolved Antimony (Sb)	2026/06/01	NC		%	20
			Dissolved Arsenic (As)	2026/06/01	NC		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Barium (Ba)	2026/06/01	0.87		%	20
			Dissolved Beryllium (Be)	2026/06/01	NC		%	20
			Dissolved Boron (B)	2026/06/01	1.7		%	20
			Dissolved Cadmium (Cd)	2026/06/01	NC		%	20
			Dissolved Calcium (Ca)	2026/06/01	4.6		%	20
			Dissolved Chromium (Cr)	2026/06/01	NC		%	20
			Dissolved Cobalt (Co)	2026/06/01	4.0		%	20
			Dissolved Copper (Cu)	2026/06/01	NC		%	20
			Dissolved Iron (Fe)	2026/06/01	5.7		%	20
			Dissolved Lead (Pb)	2026/06/01	NC		%	20
			Dissolved Magnesium (Mg)	2026/06/01	3.9		%	20
			Dissolved Manganese (Mn)	2026/06/01	2.0		%	20
			Dissolved Molybdenum (Mo)	2026/06/01	17		%	20
			Dissolved Nickel (Ni)	2026/06/01	11		%	20
			Dissolved Phosphorus (P)	2026/06/01	NC		%	20
			Dissolved Potassium (K)	2026/06/01	1.9		%	20
			Dissolved Selenium (Se)	2026/06/01	NC		%	20
			Dissolved Silicon (Si)	2026/06/01	7.1		%	20
			Dissolved Silver (Ag)	2026/06/01	NC		%	20
			Dissolved Sodium (Na)	2026/06/01	2.2		%	20
			Dissolved Strontium (Sr)	2026/06/01	1.0		%	20
			Dissolved Thallium (Tl)	2026/06/01	NC		%	20
			Dissolved Titanium (Ti)	2026/06/01	NC		%	20
			Dissolved Uranium (U)	2026/06/01	5.3		%	20
			Dissolved Vanadium (V)	2026/06/01	12		%	20
			Dissolved Zinc (Zn)	2026/06/01	NC		%	20
A162580	GID	Matrix Spike	Dissolved Organic Carbon	2026/05/31		92	%	80 - 120
A162580	GID	Spiked Blank	Dissolved Organic Carbon	2026/05/31		97	%	80 - 120
A162580	GID	Method Blank	Dissolved Organic Carbon	2026/05/31	<0.40		mg/L	
A162580	GID	RPD	Dissolved Organic Carbon	2026/05/31	5.4		%	20
A162636	GID	Matrix Spike	Dissolved Organic Carbon	2026/05/31		93	%	80 - 120
A162636	GID	Spiked Blank	Dissolved Organic Carbon	2026/05/31		98	%	80 - 120
A162636	GID	Method Blank	Dissolved Organic Carbon	2026/05/31	<0.40		mg/L	
A162636	GID	RPD	Dissolved Organic Carbon	2026/05/31	17		%	20
A162891	MJ1	Matrix Spike	Dissolved Chloride (Cl-)	2026/06/02		NC	%	80 - 120
A162891	MJ1	Spiked Blank	Dissolved Chloride (Cl-)	2026/06/02		93	%	80 - 120
A162891	MJ1	Method Blank	Dissolved Chloride (Cl-)	2026/06/02	<1.0		mg/L	
A162891	MJ1	RPD	Dissolved Chloride (Cl-)	2026/06/02	0.27		%	20
A162892	MJ1	Matrix Spike	Dissolved Sulphate (SO4)	2026/06/02		NC	%	75 - 125
A162892	MJ1	Spiked Blank	Dissolved Sulphate (SO4)	2026/06/02		101	%	80 - 120
A162892	MJ1	Method Blank	Dissolved Sulphate (SO4)	2026/06/02	<1.0		mg/L	
A162892	MJ1	RPD	Dissolved Sulphate (SO4)	2026/06/02	0.29		%	20
A162893	NCU	Matrix Spike	Orthophosphate (P)	2026/06/01		95	%	75 - 125
A162893	NCU	Spiked Blank	Orthophosphate (P)	2026/06/01		97	%	80 - 120
A162893	NCU	Method Blank	Orthophosphate (P)	2026/06/01	<0.010		mg/L	
A162893	NCU	RPD	Orthophosphate (P)	2026/06/01	NC		%	20
A164539	KJP	Matrix Spike [BDHJ97-04]	Total Ammonia-N	2026/06/02		95	%	75 - 125
A164539	KJP	Spiked Blank	Total Ammonia-N	2026/06/02		98	%	80 - 120
A164539	KJP	Method Blank	Total Ammonia-N	2026/06/02	<0.050		mg/L	
A164539	KJP	RPD [BDHJ97-04]	Total Ammonia-N	2026/06/02	0.72		%	20
A164590	KJP	Matrix Spike [BDHJ96-04]	Total Ammonia-N	2026/06/03		96	%	75 - 125
A164590	KJP	Spiked Blank	Total Ammonia-N	2026/06/03		98	%	80 - 120
A164590	KJP	Method Blank	Total Ammonia-N	2026/06/03	<0.050		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A164590	KJP	RPD [BDHJ96-04]	Total Ammonia-N	2026/06/03	1.7		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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Bureau Veritas Job #: C660181
Report Date: 2026/06/03

GEMTEC Limited
Client Project #: 101987.017(7)
Site Location: FERGUS
Sampler Initials: CC

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Louise Harding, Scientific Specialist

Paramjit Paramjit, Analyst I

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Bureau Veritas Job #: C660181
Report Date: 2026/06/03

GEMTEC Limited
Client Project #: 101987.017(7)
Site Location: FERGUS
Sampler Initials: CC

Exceedance Summary Table – Prov. Water Quality Obj.

Result Exceedances

Sample ID	Bureau Veritas ID	Parameter	Criteria	Result	DL	UNITS
No Exceedances						

The exceedance summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

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Your Project #: 101987.017(7)
Your C.O.C. #: N/A

Attention: Kimberly Gilder

GEMTEC Limited
1100 Bennett Rd
Unit 4
Bowmanville, ON
CANADA L1C 0Y7

Report Date: 2026/06/05
Report #: R8754866
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C661549
Received: 2026/05/29, 18:35

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	2	N/A	2026/06/03	CAM SOP-00448	SM 24 2320 B m
Carbonate, Bicarbonate and Hydroxide	2	N/A	2026/06/03	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	2	N/A	2026/06/05	CAM SOP-00463	SM 24 4500-Cl E m
Conductivity	2	N/A	2026/06/03	CAM SOP-00414	SM 24 2510 m
Dissolved Organic Carbon (DOC) (1)	2	N/A	2026/06/02	CAM SOP-00446	SM 24 5310 B m
Hardness (calculated as CaCO3)	2	N/A	2026/06/04	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	2	N/A	2026/06/02	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	2	N/A	2026/06/05		
Anion and Cation Sum	2	N/A	2026/06/04	CAM SOP-00102	SM 24 1030E m
Total Coliforms, (CFU/100mL)	2	N/A	2026/05/29	CAM SOP-00552	SM9222B, MECP E3371
E.coli, (CFU/100mL)	2	N/A	2026/05/29	CAM SOP-00552	SM9222B, MECP E3371
Total Ammonia-N	2	N/A	2026/06/05	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (2)	2	N/A	2026/06/02	CAM SOP-00440	SM 24 4500-NO3I/NO2B
pH (3)	2	2026/06/02	2026/06/03	CAM SOP-00413	SM 24th - 4500H+ B
Orthophosphate	2	N/A	2026/06/03	CAM SOP-00461	SM 24 4500-P E
Sat. pH and Langelier Index (@ 20C)	2	N/A	2026/06/05		Auto Calc
Sat. pH and Langelier Index (@ 4C)	2	N/A	2026/06/05		Auto Calc
Sulphate by Automated Turbidimetry	2	N/A	2026/06/05	CAM SOP-00464	SM 24 4500-SO42- E m
Total Dissolved Solids (TDS calc)	2	N/A	2026/06/05		Auto Calc

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or

Your Project #: 101987.017(7)
Your C.O.C. #: N/A

Attention: Kimberly Gilder

GEMTEC Limited
1100 Bennett Rd
Unit 4
Bowmanville, ON
CANADA L1C 0Y7

Report Date: 2026/06/05
Report #: R8754866
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C661549

Received: 2026/05/29, 18:35

implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.
(3) "The CCME method and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) requires pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) holding time. Bureau Veritas endeavors to analyze samples as soon as possible after receipt."

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Katherine Szozda, Project Manager
Email: Katherine.Szozda@bureauveritas.com
Phone# (613)274-0573 Ext:7063633
==========
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Bureau Veritas Job #: C661549
Report Date: 2026/06/05

GEMTEC Limited
Client Project #: 101987.017(7)
Sampler Initials: MFC

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID			BDKA07				BDKA07			
Sampling Date			2026/05/29 11:30				2026/05/29 11:30			
COC Number			N/A				N/A			
	UNITS	Criteria	PW21-1	RDL	MDL	QC Batch	PW21-1 Lab-Dup	RDL	MDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	-	9.04	N/A	N/A	A161890				
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	190	1.0	N/A	A162675				
Calculated TDS	mg/L	-	540	1.0	N/A	A161892				
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	1.5	1.0	N/A	A162675				
Cation Sum	me/L	-	8.95	N/A	N/A	A161890				
Hardness (CaCO3)	mg/L	-	390	1.0	N/A	A162556				
Ion Balance (% Difference)	%	-	0.490	N/A	N/A	A161889				
Langelier Index (@ 20C)	N/A	-	0.722			A161886				
Langelier Index (@ 4C)	N/A	-	0.474			A161887				
Saturation pH (@ 20C)	N/A	-	7.22			A161886				
Saturation pH (@ 4C)	N/A	-	7.47			A161887				
Inorganics										
Total Ammonia-N	mg/L	-	0.16	0.050	0.021	A166836	0.16	0.050	0.021	A166836
Conductivity	umho/cm	-	840	2.0	0.65	A164738				
Dissolved Organic Carbon	mg/L	-	0.58	0.40	0.15	A162841				
Orthophosphate (P)	mg/L	-	<0.010	0.010	0.0020	A164442				
pH	pH	6.5:8.5	7.94			A164737				
Dissolved Sulphate (SO4)	mg/L	-	240	3.0	1.5	A165613				
Alkalinity (Total as CaCO3)	mg/L	-	190	1.0	0.69	A164733				
Dissolved Chloride (Cl-)	mg/L	-	7.8	1.0	0.66	A164436				
Nitrite (N)	mg/L	-	<0.010	0.010	0.0020	A164344				
Nitrate (N)	mg/L	-	<0.10	0.10	0.010	A164344				
Nitrate + Nitrite (N)	mg/L	-	<0.10	0.10	0.010	A164344				

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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Bureau Veritas Job #: C661549
Report Date: 2026/06/05

GEMTEC Limited
Client Project #: 101987.017(7)
Sampler Initials: MFC

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID			BDKA08			
Sampling Date			2026/05/29 12:00			
COC Number			N/A			
	UNITS	Criteria	TW25-3	RDL	MDL	QC Batch
Calculated Parameters						
Anion Sum	me/L	-	8.30	N/A	N/A	A161890
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	180	1.0	N/A	A162675
Calculated TDS	mg/L	-	490	1.0	N/A	A161892
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	1.6	1.0	N/A	A162675
Cation Sum	me/L	-	8.16	N/A	N/A	A161890
Hardness (CaCO3)	mg/L	-	350	1.0	N/A	A162676
Ion Balance (% Difference)	%	-	0.880	N/A	N/A	A161889
Langelier Index (@ 20C)	N/A	-	0.692			A161886
Langelier Index (@ 4C)	N/A	-	0.444			A161887
Saturation pH (@ 20C)	N/A	-	7.27			A161886
Saturation pH (@ 4C)	N/A	-	7.52			A161887
Inorganics						
Total Ammonia-N	mg/L	-	0.15	0.050	0.021	A166836
Conductivity	umho/cm	-	780	2.0	0.65	A164738
Dissolved Organic Carbon	mg/L	-	0.52	0.40	0.15	A162841
Orthophosphate (P)	mg/L	-	<0.010	0.010	0.0020	A164442
pH	pH	6.5:8.5	7.96			A164737
Dissolved Sulphate (SO4)	mg/L	-	210	3.0	1.5	A165613
Alkalinity (Total as CaCO3)	mg/L	-	190	1.0	0.69	A164733
Dissolved Chloride (Cl-)	mg/L	-	8.9	1.0	0.66	A164436
Nitrite (N)	mg/L	-	<0.010	0.010	0.0020	A164344
Nitrate (N)	mg/L	-	<0.10	0.10	0.010	A164344
Nitrate + Nitrite (N)	mg/L	-	<0.10	0.10	0.010	A164344

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID			BDKA07	BDKA08			
Sampling Date			2026/05/29 11:30	2026/05/29 12:00			
COC Number			N/A	N/A			
	UNITS	Criteria	PW21-1	TW25-3	RDL	MDL	QC Batch
Metals							
Dissolved Aluminum (Al)	ug/L	-	<4.9	<4.9	4.9	3.0	A163190
Dissolved Antimony (Sb)	ug/L	20	<0.50	<0.50	0.50	0.20	A163190
Dissolved Arsenic (As)	ug/L	100	1.4	1.3	1.0	0.10	A163190
Dissolved Barium (Ba)	ug/L	-	25	16	2.0	0.30	A163190
Dissolved Beryllium (Be)	ug/L	11	<0.40	<0.40	0.40	0.050	A163190
Dissolved Boron (B)	ug/L	200	73	73	10	0.60	A163190
Dissolved Cadmium (Cd)	ug/L	0.2	<0.090	<0.090	0.090	0.090	A163190
Dissolved Calcium (Ca)	ug/L	-	96000	85000	200	25	A163190
Dissolved Chromium (Cr)	ug/L	-	<5.0	<5.0	5.0	0.70	A163190
Dissolved Cobalt (Co)	ug/L	0.9	<0.50	<0.50	0.50	0.040	A163190
Dissolved Copper (Cu)	ug/L	5	<0.90	<0.90	0.90	0.30	A163190
Dissolved Iron (Fe)	ug/L	300	120	130	100	5.0	A163190
Dissolved Lead (Pb)	ug/L	5	<0.50	<0.50	0.50	0.050	A163190
Dissolved Magnesium (Mg)	ug/L	-	36000	33000	50	4.0	A163190
Dissolved Manganese (Mn)	ug/L	-	22	20	2.0	0.30	A163190
Dissolved Molybdenum (Mo)	ug/L	40	3.1	3.2	0.50	0.070	A163190
Dissolved Nickel (Ni)	ug/L	25	<1.0	<1.0	1.0	0.40	A163190
Dissolved Phosphorus (P)	ug/L	-	<100	<100	100	19	A163190
Dissolved Potassium (K)	ug/L	-	1000	1100	200	18	A163190
Dissolved Selenium (Se)	ug/L	100	<1.0	<1.0	1.0	0.20	A163190
Dissolved Silicon (Si)	ug/L	-	5500	5400	50	4.0	A163190
Dissolved Silver (Ag)	ug/L	0.1	<0.090	<0.090	0.090	0.020	A163190
Dissolved Sodium (Na)	ug/L	-	27000	28000	100	20	A163190
Dissolved Strontium (Sr)	ug/L	-	4000	3300	1.0	0.30	A163190
Dissolved Thallium (Tl)	ug/L	0.3	<0.050	<0.050	0.050	0.020	A163190
Dissolved Titanium (Ti)	ug/L	-	<5.0	<5.0	5.0	2.0	A163190
Dissolved Uranium (U)	ug/L	5	0.15	0.17	0.10	0.010	A163190
Dissolved Vanadium (V)	ug/L	6	<0.50	<0.50	0.50	0.090	A163190
Dissolved Zinc (Zn)	ug/L	30	6.0	<5.0	5.0	1.0	A163190

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999

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Bureau Veritas Job #: C661549
Report Date: 2026/06/05

GEMTEC Limited
Client Project #: 101987.017(7)
Sampler Initials: MFC

MICROBIOLOGY (WATER)

Bureau Veritas ID			BDKA07	BDKA08			
Sampling Date			2026/05/29 11:30	2026/05/29 12:00			
COC Number			N/A	N/A			
	UNITS	Criteria	PW21-1	TW25-3	RDL	MDL	QC Batch
Microbiological							
Background	CFU/100mL	-	<10	<10	10	N/A	A162683
Total Coliforms	CFU/100mL	-	<10	<10	10	N/A	A162683
Escherichia coli	CFU/100mL	100	<10	<10	10	N/A	A162682

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	0.7°C

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A162841	GID	Matrix Spike	Dissolved Organic Carbon	2026/06/02		91	%	80 - 120
A162841	GID	Spiked Blank	Dissolved Organic Carbon	2026/06/01		94	%	80 - 120
A162841	GID	Method Blank	Dissolved Organic Carbon	2026/06/01	<0.40		mg/L	
A162841	GID	RPD	Dissolved Organic Carbon	2026/06/02	0.20		%	20
A163190	TLG	Matrix Spike	Dissolved Aluminum (Al)	2026/06/02		98	%	80 - 120
			Dissolved Antimony (Sb)	2026/06/02		98	%	80 - 120
			Dissolved Arsenic (As)	2026/06/02		100	%	80 - 120
			Dissolved Barium (Ba)	2026/06/02		94	%	80 - 120
			Dissolved Beryllium (Be)	2026/06/02		100	%	80 - 120
			Dissolved Boron (B)	2026/06/02		97	%	80 - 120
			Dissolved Cadmium (Cd)	2026/06/02		98	%	80 - 120
			Dissolved Calcium (Ca)	2026/06/02		NC	%	80 - 120
			Dissolved Chromium (Cr)	2026/06/02		93	%	80 - 120
			Dissolved Cobalt (Co)	2026/06/02		98	%	80 - 120
			Dissolved Copper (Cu)	2026/06/02		94	%	80 - 120
			Dissolved Iron (Fe)	2026/06/02		96	%	80 - 120
			Dissolved Lead (Pb)	2026/06/02		94	%	80 - 120
			Dissolved Magnesium (Mg)	2026/06/02		NC	%	80 - 120
			Dissolved Manganese (Mn)	2026/06/02		NC	%	80 - 120
			Dissolved Molybdenum (Mo)	2026/06/02		94	%	80 - 120
			Dissolved Nickel (Ni)	2026/06/02		96	%	80 - 120
			Dissolved Phosphorus (P)	2026/06/02		97	%	80 - 120
			Dissolved Potassium (K)	2026/06/02		99	%	80 - 120
			Dissolved Selenium (Se)	2026/06/02		100	%	80 - 120
			Dissolved Silicon (Si)	2026/06/02		94	%	80 - 120
			Dissolved Silver (Ag)	2026/06/02		38 (1)	%	80 - 120
			Dissolved Sodium (Na)	2026/06/02		94	%	80 - 120
			Dissolved Strontium (Sr)	2026/06/02		NC	%	80 - 120
			Dissolved Thallium (Tl)	2026/06/02		93	%	80 - 120
			Dissolved Titanium (Ti)	2026/06/02		96	%	80 - 120
			Dissolved Uranium (U)	2026/06/02		97	%	80 - 120
			Dissolved Vanadium (V)	2026/06/02		95	%	80 - 120
			Dissolved Zinc (Zn)	2026/06/02		99	%	80 - 120
A163190	TLG	Spiked Blank	Dissolved Aluminum (Al)	2026/06/02		97	%	80 - 120
			Dissolved Antimony (Sb)	2026/06/02		95	%	80 - 120
			Dissolved Arsenic (As)	2026/06/02		99	%	80 - 120
			Dissolved Barium (Ba)	2026/06/02		95	%	80 - 120
			Dissolved Beryllium (Be)	2026/06/02		102	%	80 - 120
			Dissolved Boron (B)	2026/06/02		97	%	80 - 120
			Dissolved Cadmium (Cd)	2026/06/02		94	%	80 - 120
			Dissolved Calcium (Ca)	2026/06/02		96	%	80 - 120
			Dissolved Chromium (Cr)	2026/06/02		91	%	80 - 120
			Dissolved Cobalt (Co)	2026/06/02		96	%	80 - 120
			Dissolved Copper (Cu)	2026/06/02		94	%	80 - 120
			Dissolved Iron (Fe)	2026/06/02		94	%	80 - 120
			Dissolved Lead (Pb)	2026/06/02		92	%	80 - 120
			Dissolved Magnesium (Mg)	2026/06/02		96	%	80 - 120
			Dissolved Manganese (Mn)	2026/06/02		97	%	80 - 120
			Dissolved Molybdenum (Mo)	2026/06/02		91	%	80 - 120
			Dissolved Nickel (Ni)	2026/06/02		97	%	80 - 120
			Dissolved Phosphorus (P)	2026/06/02		93	%	80 - 120
			Dissolved Potassium (K)	2026/06/02		96	%	80 - 120
			Dissolved Selenium (Se)	2026/06/02		100	%	80 - 120
			Dissolved Silicon (Si)	2026/06/02		91	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Silver (Ag)	2026/06/02		92	%	80 - 120
			Dissolved Sodium (Na)	2026/06/02		94	%	80 - 120
			Dissolved Strontium (Sr)	2026/06/02		96	%	80 - 120
			Dissolved Thallium (Tl)	2026/06/02		97	%	80 - 120
			Dissolved Titanium (Ti)	2026/06/02		94	%	80 - 120
			Dissolved Uranium (U)	2026/06/02		93	%	80 - 120
			Dissolved Vanadium (V)	2026/06/02		94	%	80 - 120
			Dissolved Zinc (Zn)	2026/06/02		99	%	80 - 120
A163190	TLG	Method Blank	Dissolved Aluminum (Al)	2026/06/02	<4.9		ug/L	
			Dissolved Antimony (Sb)	2026/06/02	<0.50		ug/L	
			Dissolved Arsenic (As)	2026/06/02	<1.0		ug/L	
			Dissolved Barium (Ba)	2026/06/02	<2.0		ug/L	
			Dissolved Beryllium (Be)	2026/06/02	<0.40		ug/L	
			Dissolved Boron (B)	2026/06/02	<10		ug/L	
			Dissolved Cadmium (Cd)	2026/06/02	<0.090		ug/L	
			Dissolved Calcium (Ca)	2026/06/02	<200		ug/L	
			Dissolved Chromium (Cr)	2026/06/02	<5.0		ug/L	
			Dissolved Cobalt (Co)	2026/06/02	<0.50		ug/L	
			Dissolved Copper (Cu)	2026/06/02	<0.90		ug/L	
			Dissolved Iron (Fe)	2026/06/02	<100		ug/L	
			Dissolved Lead (Pb)	2026/06/02	<0.50		ug/L	
			Dissolved Magnesium (Mg)	2026/06/02	<50		ug/L	
			Dissolved Manganese (Mn)	2026/06/02	<2.0		ug/L	
			Dissolved Molybdenum (Mo)	2026/06/02	<0.50		ug/L	
			Dissolved Nickel (Ni)	2026/06/02	<1.0		ug/L	
			Dissolved Phosphorus (P)	2026/06/02	<100		ug/L	
			Dissolved Potassium (K)	2026/06/02	<200		ug/L	
			Dissolved Selenium (Se)	2026/06/02	<1.0		ug/L	
			Dissolved Silicon (Si)	2026/06/02	<50		ug/L	
			Dissolved Silver (Ag)	2026/06/02	<0.090		ug/L	
			Dissolved Sodium (Na)	2026/06/02	<100		ug/L	
			Dissolved Strontium (Sr)	2026/06/02	<1.0		ug/L	
			Dissolved Thallium (Tl)	2026/06/02	<0.050		ug/L	
			Dissolved Titanium (Ti)	2026/06/02	<5.0		ug/L	
			Dissolved Uranium (U)	2026/06/02	<0.10		ug/L	
			Dissolved Vanadium (V)	2026/06/02	<0.50		ug/L	
			Dissolved Zinc (Zn)	2026/06/02	<5.0		ug/L	
A163190	TLG	RPD	Dissolved Lead (Pb)	2026/06/02	1.4		%	20
A164344	C_N	Matrix Spike	Nitrite (N)	2026/06/02		104	%	80 - 120
			Nitrate (N)	2026/06/02		92	%	80 - 120
A164344	C_N	Spiked Blank	Nitrite (N)	2026/06/02		107	%	80 - 120
			Nitrate (N)	2026/06/02		93	%	80 - 120
A164344	C_N	Method Blank	Nitrite (N)	2026/06/02	<0.010		mg/L	
			Nitrate (N)	2026/06/02	<0.10		mg/L	
A164344	C_N	RPD	Nitrite (N)	2026/06/02	1.5		%	20
			Nitrate (N)	2026/06/02	1.5		%	20
A164436	MJ1	Matrix Spike	Dissolved Chloride (Cl-)	2026/06/05		NC	%	80 - 120
A164436	MJ1	Spiked Blank	Dissolved Chloride (Cl-)	2026/06/05		100	%	80 - 120
A164436	MJ1	Method Blank	Dissolved Chloride (Cl-)	2026/06/05	<1.0		mg/L	
A164436	MJ1	RPD	Dissolved Chloride (Cl-)	2026/06/05	2.4		%	20
A164442	NCU	Matrix Spike	Orthophosphate (P)	2026/06/03		102	%	75 - 125
A164442	NCU	Spiked Blank	Orthophosphate (P)	2026/06/03		97	%	80 - 120
A164442	NCU	Method Blank	Orthophosphate (P)	2026/06/03	<0.010		mg/L	
A164442	NCU	RPD	Orthophosphate (P)	2026/06/03	5.3		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A164733	SAU	Spiked Blank	Alkalinity (Total as CaCO3)	2026/06/03		98	%	85 - 115
A164733	SAU	Method Blank	Alkalinity (Total as CaCO3)	2026/06/03	<1.0		mg/L	
A164733	SAU	RPD	Alkalinity (Total as CaCO3)	2026/06/03	1.2		%	20
A164737	SAU	Spiked Blank	pH	2026/06/03		102	%	98 - 103
A164737	SAU	RPD	pH	2026/06/03	0.58		%	N/A
A164738	SAU	Spiked Blank	Conductivity	2026/06/03		103	%	85 - 115
A164738	SAU	Method Blank	Conductivity	2026/06/03	<2.0		umho/cm	
A164738	SAU	RPD	Conductivity	2026/06/03	0.69		%	10
A165613	MJ1	Matrix Spike	Dissolved Sulphate (SO4)	2026/06/05		NC	%	75 - 125
A165613	MJ1	Spiked Blank	Dissolved Sulphate (SO4)	2026/06/05		99	%	80 - 120
A165613	MJ1	Method Blank	Dissolved Sulphate (SO4)	2026/06/05	<1.0		mg/L	
A165613	MJ1	RPD	Dissolved Sulphate (SO4)	2026/06/05	1.7		%	20
A166836	KJP	Matrix Spike [BDKA07-03]	Total Ammonia-N	2026/06/05		98	%	75 - 125
A166836	KJP	Spiked Blank	Total Ammonia-N	2026/06/05		99	%	80 - 120
A166836	KJP	Method Blank	Total Ammonia-N	2026/06/05	<0.050		mg/L	
A166836	KJP	RPD [BDKA07-03]	Total Ammonia-N	2026/06/05	4.1		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Bureau Veritas Job #: C661549
Report Date: 2026/06/05

GEMTEC Limited
Client Project #: 101987.017(7)
Sampler Initials: MFC

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Louise Harding, Scientific Specialist

Paramjit Paramjit, Analyst I

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

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Exceedance Summary Table – Prov. Water Quality Obj.

Result Exceedances

Sample ID	Bureau Veritas ID	Parameter	Criteria	Result	DL	UNITS
No Exceedances						

The exceedance summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

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York-Durham Regional Environmental Laboratory
901 McKay Road
Pickering, ON L1W 3A3
Phone (905)686-0041 Fax (905)686-0664

LABORATORY ANALYSIS REPORT

Work Order #: 161029 **Work ID:** REL26-1251

Description: 101987.017(7)
Client: GEMTEC
Profile: Non-regulated Water Sampling
Sampled By: Dean Hiler
Sample Count: 2

Report To: Susan Vodden
Gemtec Limited
1100 Bennett Rd. Unit 4
Bowmanville, ON L1C3K5

Authorized by: Jennifer Koene-Fenton, Laboratory Superintendent

Workorder Summary

Workorder Comments

Cryptosporidium and Giardia Internal Control – Percent Recovery: Cryptosporidium, 87%; Giardia, 50%.

Sample volumes provided by client.

Sample Comments

16102901 (PW21-1) - Ground Water

The bioindicators Giardia, Cryptosporidium, Diatoms, Other Algae, Rotifers, Insect/Larvae and Plant Debris (Chlorophyll containing), were calculated to have a relative risk factor of 0 (not significant). According to the USEPA Consensus method (1992, EPA910/9-92-029) the relative risk score of surface water contamination is 0 – Low Risk.

16102902 (TW25-3) - Ground Water

The bioindicators Giardia, Cryptosporidium, Diatoms, Other Algae, Rotifers, Insect/Larvae and Plant Debris (Chlorophyll containing), were calculated to have a relative risk factor of 0 (not significant). According to the USEPA Consensus method (1992, EPA910/9-92-029) the relative risk score of surface water contamination is 0 – Low Risk.

Analysis Results Comments

16102901 (PW21-1) - Filtered Volume

Microscopic Particulate Analysis - Parameter results have been adjusted to reflect 100L of the original sample volume.

16102902 (TW25-3) - Filtered Volume

Microscopic Particulate Analysis - Parameter results have been adjusted to reflect 100L of the original sample volume.

The results pertain to the items tested and apply to the sample as received.This report shall not be reproduced, except in full, without the written consent of York-Durham Regional Environmental Laboratory. All supporting analytical information including measurement uncertainty is available upon request. The statement of conformity is based on simple acceptance, whether the result is within or outside the acceptance limits. The uncertainty is not taken into account in the statement of conformity. The end user is responsible for determining conformity.

Legend: MDL = Method Detection Limit; RDL = Reporting Detection Limit; MU = Measurement Uncertainty; < or ND = Less Than or Non-detect; ^ = Result outside limit; Limit = MAC; DF = Dilution Factor; OG = Operational Guideline; AO = Aesthetic Objective; HC = Health Canada; C = Comment; * = Comment Present

York-Durham Regional Environmental Laboratory
901 McKay Road
Pickering, ON L1W 3A3
Phone (905)686-0041 Fax (905)686-0664

LABORATORY ANALYSIS REPORT

Work Order #: 161029 **Work ID:** REL26-1251

Analytical Results

Lab ID: 16102901 **Sample ID:** PW21-1 **Criteria:** N/A **Date Received:** 6/1/2026
Matrix: Water **Location:** PW21-1 10L **Date Collected:** 5/29/2026
Type: Ground Water **Description:**

Parameter	Results	Units	MDL	RDL	DF	Limit	Prepared	Analyzed	C
CRYPTOSPORIDIUM / GIARDIA (RELM-9)									
Cryptosporidium oocysts	0	n/a	1	1	1		06/02/2026	06/03/2026	
Filtered Volume	10	L					06/02/2026	06/03/2026	
Giardia cysts	0	n/a	1	1	1		06/02/2026	06/03/2026	
PHYTOPLANKTON (RELM-15)									
Algae >15um	0	n/a		50	1		06/05/2026	06/05/2026	
Algae 2-7um	0	n/a		50	1		06/05/2026	06/05/2026	
Algae 7-15um	0	n/a		50	1		06/05/2026	06/05/2026	
Amoebae	0	n/a		50	1		06/05/2026	06/05/2026	
Crustaceans, Parts	0	n/a		50	1		06/05/2026	06/05/2026	
Diatoms	0	n/a		50	1		06/05/2026	06/05/2026	
Filtered Volume	10	L					06/05/2026	06/05/2026	*
Gastrotrichs	0	n/a		50	1		06/05/2026	06/05/2026	
Insects, Parts	0	n/a		50	1		06/05/2026	06/05/2026	
Invertebrate eggs	0	n/a		50	1		06/05/2026	06/05/2026	
Nematodes, eggs	0	n/a		50	1		06/05/2026	06/05/2026	
Pollen	200	n/a		50	1		06/05/2026	06/05/2026	
Protozoa	0	n/a		50	1		06/05/2026	06/05/2026	
Rotifers, eggs	0	n/a		50	1		06/05/2026	06/05/2026	
Spores	0	n/a		50	1		06/05/2026	06/05/2026	
Tardigrades	0	n/a		50	1		06/05/2026	06/05/2026	
Vegetative debris	0	n/a		50	1		06/05/2026	06/05/2026	

The results pertain to the items tested and apply to the sample as received.This report shall not be reproduced, except in full, without the written consent of York-Durham Regional Environmental Laboratory. All supporting analytical information including measurement uncertainty is available upon request. The statement of conformity is based on simple acceptance, whether the result is within or outside the acceptance limits. The uncertainty is not taken into account in the statement of conformity. The end user is responsible for determining conformity.

Legend: MDL = Method Detection Limit; RDL = Reporting Detection Limit; MU = Measurement Uncertainty; < or ND = Less Than or Non-detect; ^ = Result outside limit; Limit = MAC; DF = Dilution Factor; OG = Operational Guideline; AO = Aesthetic Objective; HC = Health Canada; C = Comment; * = Comment Present

York-Durham Regional Environmental Laboratory
901 McKay Road
Pickering, ON L1W 3A3
Phone (905)686-0041 Fax (905)686-0664

LABORATORY ANALYSIS REPORT

Work Order #: 161029 **Work ID:** REL26-1251

Analytical Results

Lab ID: 16102902 **Sample ID:** TW25-3 **Criteria:** N/A **Date Received:** 6/1/2026
Matrix: Water **Location:** TW25-3 10L **Date Collected:** 5/29/2026
Type: Ground Water **Description:**

Parameter	Results	Units	MDL	RDL	DF	Limit	Prepared	Analyzed	C
CRYPTOSPORIDIUM / GIARDIA (RELM-9)									
Cryptosporidium oocysts	0	n/a	1	1	1		06/02/2026	06/03/2026	
Filtered Volume	10	L					06/02/2026	06/03/2026	
Giardia cysts	0	n/a	1	1	1		06/02/2026	06/03/2026	
PHYTOPLANKTON (RELM-15)									
Algae >15um	0	n/a		50	1		06/05/2026	06/05/2026	
Algae 2-7um	0	n/a		50	1		06/05/2026	06/05/2026	
Algae 7-15um	0	n/a		50	1		06/05/2026	06/05/2026	
Amoebae	0	n/a		50	1		06/05/2026	06/05/2026	
Crustaceans, Parts	0	n/a		50	1		06/05/2026	06/05/2026	
Diatoms	0	n/a		50	1		06/05/2026	06/05/2026	
Filtered Volume	10	L					06/05/2026	06/05/2026	*
Gastrotrichs	0	n/a		50	1		06/05/2026	06/05/2026	
Insects, Parts	0	n/a		50	1		06/05/2026	06/05/2026	
Invertebrate eggs	0	n/a		50	1		06/05/2026	06/05/2026	
Nematodes, eggs	0	n/a		50	1		06/05/2026	06/05/2026	
Pollen	1200	n/a		50	1		06/05/2026	06/05/2026	
Protozoa	0	n/a		50	1		06/05/2026	06/05/2026	
Rotifers, eggs	0	n/a		50	1		06/05/2026	06/05/2026	
Spores	200	n/a		50	1		06/05/2026	06/05/2026	
Tardigrades	0	n/a		50	1		06/05/2026	06/05/2026	
Vegetative debris	0	n/a		50	1		06/05/2026	06/05/2026	

The results pertain to the items tested and apply to the sample as received.This report shall not be reproduced, except in full, without the written consent of York-Durham Regional Environmental Laboratory. All supporting analytical information including measurement uncertainty is available upon request. The statement of conformity is based on simple acceptance, whether the result is within or outside the acceptance limits. The uncertainty is not taken into account in the statement of conformity. The end user is responsible for determining conformity.

Legend: MDL = Method Detection Limit; RDL = Reporting Detection Limit; MU = Measurement Uncertainty; < or ND = Less Than or Non-detect; ^ = Result outside limit; Limit = MAC; DF = Dilution Factor; OG = Operational Guideline; AO = Aesthetic Objective; HC = Health Canada; C = Comment; * = Comment Present

York-Durham Regional Environmental Laboratory

901 McKay Road
Pickering, ON L1W 3A3
Phone (905)686-0041 Fax (905)686-0664

LABORATORY ANALYSIS REPORT

Work Order #: 161029 **Work ID:** REL26-1251

York-Durham
Regional Environmental Laboratory
901 McKay Road, Pickering ON L1W 3A3 Toll Free: 1-877-551-8877 Local: 905-686-0041
Fax: 905-686-0664 Email: rel@durham.ca Web: www.durham.ca

REL26-1251

Page 1 of 1

Non-regulated Water, Wastewater,Biosolid,Soil
Chain of Custody Form

Client Information	Invoice To (leave blank if same as Client)	Report to (email address)
Company Name: GEMTEC Limited	Company:	1) Kimberly.gilder@gemtec.ca
Facility Name:		2) ramiro.munoz@gemtec.ca
Facility Address: 1100 Bennett Rd. Unit 4, Bowmanville L1C 3K5	Quote #:	3) susan.vedden@gemtec.ca
Facility Contact:	PO #:	4)
Email: Kimberly.gilder@gemtec.ca Tel: 905 751 7063	accountspayable@gemtec.ca	5)

Project Information (if applicable)
Description: 101987.017(7)

Standard Turnaround Time (TAT) is 10 business days ☐ *RUSH *Rush TAT requires lab approval in advance. Surcharge will apply.

Sample(s) Information

Lab ID (lab use only)	Field ID	Location/Description/Comment(s)	Matrix	Type	Collection mm-dd-yy	Collection HH:MM	Test Group(s)	Container Type	Container Sent	Container Rec'd	Chlorine Free	Chlorine Total	Apply Criteria (Y/N) (*1)
01	PW21-1	PW21-1 10L	GW	GW	05/29/26	12:00 pm	MBCGMPA		1	1		0.00	
02	TW25-3	TW25-3 10L	GW	GW	05/29/26	12:00 pm	MBCGMPA		1	1		0.00	

Sampled By: Dean Hiler Tel:

Relinquished By (Print/Sign): Dean Hiler Date/Time: June 1, 2026

(1) Select One Applicable Criteria — Provide Municipality / City / Description
☐ Sanitary Sewer Use By-law
☐ Storm Sewer Use By-law
☐ New Water Main
☐ Other

LABORATORY USE ONLY

Delivery Method: Courier ☐ Drop Off ☒ YDREL Pickup ☐
Sorted by: Labelled by:
Checked by: Proofed by:
WO #: 161029
161029
Received Date/Time: JUN 1 2026 10:28
Received By: BB
Comments: Sample 01 & 02 received at Temp°. 7.1°C and 7.5°C.

REL-COC-NONREG-NOV-2019-REV-1

The results pertain to the items tested and apply to the sample as received.This report shall not be reproduced, except in full, without the written consent of York-Durham Regional Environmental Laboratory. All supporting analytical information including measurement uncertainty is available upon request. The statement of conformity is based on simple acceptance, whether the result is within or outside the acceptance limits. The uncertainty is not taken into account in the statement of conformity. The end user is responsible for determining conformity.

Legend: MDL = Method Detection Limit; RDL = Reporting Detection Limit; MU = Measurement Uncertainty; < or ND = Less Than or Non-detect; ^ = Result outside limit; Limit = MAC; DF = Dilution Factor; OG = Operational Guideline; AO = Aesthetic Objective; HC = Health Canada; C = Comment; * = Comment Present

APPENDIX M

Previous Reports

883890 Ontario Limited
o/a Fergus Golf Club

Permit to Take Water Application

Prepared By:

R.J. Burnside & Associates Limited
292 Speedvale Avenue West Unit 20 Guelph ON N1H 1C4

Prepared for:

883890 Ontario Limited o/a Fergus Golf Club

May 2011

File No: PGD019883.0000

The material in this report reflects best judgement in light of the information available at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. R.J. Burnside & Associates Limited accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

R.J. Burnside & Associates Limited 292 Speedvale Avenue West Unit 20 Guelph ON N1H 1C4 Canada
telephone (519) 823-4995 **fax** (519) 836-5477 **web** www.rjburnside.com

BURNSIDE
[THE DIFFERENCE IS OUR PEOPLE]

May 4, 2011

Via: Courier

Permit to Take Water Director
Environmental Assessment and Approvals Branch
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, ON M4V 1L5

Dear Director:

Re: 883890 Ontario Limited o/a Fergus Golf Club
8243 County Road 19, Fergus, Ontario
Permit to Take Water Application
File No.: PGD019883.0000

Enclosed is an application for a Permit to Take Water (PTTW) for the Fergus Golf Club. To support this Category 3 Permit to Take Water (PTTW) application, we have attached a hydrogeological report. This report includes the previous PTTW and previous studies completed at the site.

The Fergus Golf Club consists of three 9-hole courses (Fergus South, East and West) located on County Road 19 north of Fergus near Lake Belwood. The Fergus Golf Club was formed in 2010 with the merger of Lake Belwood Golf Club (now Fergus East and West) and Fairview Gold Club (Fergus South).

This application applies to water sources located on the Fergus East and West courses, previously permitted under Permit No. 00-P-2653 which expired March 31, 2010. Since the permit has expired this is a Category 3 application. Sources for the Fergus South course are still permitted under Permit No. 1577-6LCQQ9 which expires February 28, 2015.

As part of the application completion process Burnside reviewed the following pumping test reports that were submitted as part of previous PTTW applications:

- Well Testing Program at the Proposed 18 Hole Golf Course Expansion, Morrison Environmental Limited, June 1999; and
- Long Term Test of PW1, Fairview Golf Course Expansion, Fergus, Ontario, R.J. Burnside & Associates Limited, February 2, 2000.

The findings of these reports are discussed in the hydrogeological report we have completed for this application and copies of the reports are included as appendices.

In the attached hydrogeology report we calculate the irrigation demand of the golf course and propose a new pumping rate for the irrigation ponds that will be able to accommodate the water demands of the Fergus Golf Club in the future.

We trust that this application is suitable. If you have any questions do not hesitate to contact the undersigned.

Yours truly,

R.J. Burnside & Associates Limited

Jim Baxter, P.Eng.
Groundwater Resource Engineer

Stephanie Charity, P.Geo
Hydrogeologist

JB/SC:cl
Enc.

cc: Mr. Shawn Evans, Golf North Properties Inc. (enc.) (Via: Courier)

019883_PTTW app cov letter.doc
04/05/2011 3:36 PM

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Application for Permit to Take Water
Master Business Licence & Articles of Amendment
Schedule 1 – Water Conservation Measures

Ontario
Ministry of the Environment

Application for Permit to Take Water

Ce formulaire est disponible en français

For Office Use Only			
Reference Number	Payment Received $	Date *(y/m/d)*	Initials

General Information and Instructions

General:

Information requested in this form is collected under the authority of the *Ontario Water Resources Act*, R.S.O. 1990 (OWRA) and the *Environmental Bill of Rights*, C. 28, Statutes of Ontario, 1993, (EBR) and will be used to evaluate applications for a Permit to Take Water as required by Section 34 (OWRA).

Instructions:

1. **Applicants are responsible for ensuring that they complete the most recent application form.** When completing this form, please refer to the "Guide to Permit to Take Water Application Form" (referred to as the Guide). Application forms and supporting documentation are available from your local Regional or District Office of the Ministry of the Environment, and in the "Publications" section of the Ministry of the Environment website at http://www.ene.gov.on.ca/envision/gp/index.htm.

2. Questions regarding completion and submission of this application should be directed to local Regional Office of the Ministry of the Environment. Contact information for these offices is available in the Guide or on the Ministry of the Environment website at http://www.ene.gov.on.ca/envision/org/op.htm

3. This form must be completed with respect to all the requirements of the Guide for it to be considered an application for approval. **Incomplete applications will be returned to the applicant.**

4. A complete application consists of:

   (1) a completed, signed application form
   (2) all required supporting information identified in this form and the Guide, and
   (3) a certified cheque or money order, in Canadian funds, made payable to the ***Ontario Minister of Finance*** for the application fee when required. Payment may also be made by Visa, MasterCard or American Express,

   The Ministry may require additional information during the technical review of any application initially accepted as complete.

5. The original application, along with supporting information and the application fee should be sent to:

   Ministry of the Environment,
   Attention: Permit to Take Water
   Director, Environmental Assessment and Approvals Branch,
   2 St. Clair Avenue West, Floor 12A
   Toronto, Ontario, M4V 1L5

6. Information contained in this application form is not considered confidential and will be made available to the public upon request. Information submitted as supporting information may be claimed as confidential but will be subject to the *Freedom of Information and Protection of Privacy Act* (FOIPPA) and the *EBR*. If you do not claim confidentiality at the time of submitting the information, the Ministry of the Environment may make the information available to the public without further notice to you. If you are identifying confidential material, please indicate why you believe the information is confidential.

1. Permit Administration

Please indicate if this is an application for a:

- ☒ New Permit
- ☐ Amendment to Permit (attach a photocopy of permit)
- ☐ Renewal of Permit (attach a photocopy of permit)

2. Classification

Classification	Fee Required	No Fee Required
☐ Category 1	☐ $750	☐ Reason _____
☐ Category 2	☐ $750	☐ Reason _____
☒ Category 3	☒ $3,000	☐ Reason _____

PIBS 5046e02

3. Applicant Information

Applicant Name *(legal name of individual or organization as evidenced by legal documents such as a copy of Driver's Licence or Master Business Licence)*	Business Identification Number
883890 Ontario Limited	200130375

Business Name *(the name under which the entity is operating or trading if different from the Applicant Name - also referred to as trade name)*

Fergus Golf Club

Applicant Type:

- [x] Corporation
- [ ] Individual
- [ ] Partnership
- [ ] Sole Proprietor
- [ ] Federal Government
- [ ] Municipal Government
- [ ] Provincial Government
- [ ] Other *(describe)*:

North American Industry Classification System (NAICS) Code: 7 1 3 9 1 0

4. Applicant Physical Address

Civic Address - Street information *(street number/name/type/direction/unit/suite/emergency 911 location number and street)*

8243 County Road 19

Municipality/Unorganized Township	County/District	Province/State	Country	Postal Code
Fergus	Wellington	Ontario	Canada	N1M 2R3

Telephone Number *(including area code)*	Fax Number *(including area code)*	E-mail Address
1-888-833-8787	(519) 664-1639	sevans@golfnorth.ca

5. Applicant Mailing Address

Same as Applicant Physical Address? [ ] Yes [x] No **If no, complete below**

Civic Address - Street information *(street number/name/type/direction/unit/suite/emergency 911 location number and street/P.O.Box/Rural Route Number)*

400 Golf Course Road

Municipality	Province/State	Country	Postal Code
Conestoga	Ontario	Canada	N0B 1N0

6. Project Technical Information Contact

Same as Applicant? [ ] Yes [x] No **If no, complete below**

Name	Company
Jim Baxter, P.Eng.	R.J. Burnside & Associates Limited

Address Information:

Same as Applicant Mailing Address? [ ] Yes [x] No **If no, please provide technical information contact mailing address below**

Civic Address - Street information *(street number/name/type/direction/unit/suite/emergency 911 location number and street/P.O.Box/Rural Route Number)*

292 Speedvale Avenue, West Unit 20

Municipality	Province/State	Country	Postal Code
Guelph	Ontario	Canada	N1H 1C4

Telephone Number *(including area code & extension)*	Fax Number *(including area code)*	E-mail Address
(519) 823-4995	(519) 836-5477	jbaxter@rjburnside.com

7. Source Information – *Note: Source Information must be provided separately for each source. Please complete and submit multiple copies of this Source Information section (pages 3 and 4 of this form) if your application includes more than one source.*

Number of Water Taking Sources Included in this Application *(do not include domestic uses that do not require a permit)*

Total Number of Wells	Total Number of Lake Intakes	Total Number of Ponds	Total Number of Watercourse Intakes
1		1	

Source Location Information *(if multiple sources are included in application, provide information for each source)*

Civic Address - Street information *(street number/name/type/direction/unit/suite/emergency 911 location number and street)*: 8243 County Road 19

Lot	Concession	Part	Reference Plan
11	3		

Municipality/Unorganised Township	County/District	Original Geographic Township
Fergus	Wellington	West Garafraxa

Geographic (GPS) Coordinates *(to be provided in Datum NAD83)*

Method of Collection	Accuracy Estimate	UTM Zone	Easting	Northing
Google	+/- 20 m	17	551159	4844481

Is the Applicant the owner of the site where water taking will occur?
- [x] Yes
- [ ] No **if no, attach the owner's name, address and a signed letter granting consent for the applicant to access the water taking location**

Is the site where water taking will occur located in an area of development control as defined by the *Niagara Escarpment Planning & Development Act*?
- [ ] Yes [x] No

Is the site where water taking will occur located on the Oak Ridges Moraine Conservation Area as defined by the Oak Ridges Moraine Conservation Plan (a regulation made under the *Oak Ridges Moraine Conservation Act*)?
- [ ] Yes [x] No

Are you aware of any complaints or impacts resulting from water takings at the site?
- [ ] Yes **if yes, please describe:** _____
- [x] No

Will water from the site be packaged in a container (bottled water, tanks)?
- [ ] Yes **If yes, what size of containers?** [ ] greater than 20 litres [ ] 20 litres or less
- [x] No

Are wells located within 500 m of the site where water taking will occur?
- [x] Yes
- [ ] No **if no, what is the distance to the nearest well?** _____

Is municipal water available to all dwellings within 500m of the site where water taking will occur?
- [ ] Yes [x] No [ ] Unknown

Estimated start date of water taking	Water taking to extend for a period of:
May 2011	10 [ ] days [ ] weeks [ ] months [x] years [ ] indefinite

Is activity subject to the *Environmental Assessment Act*?
- [ ] Yes **if yes, please attach approval or Notice of Completion**
- [x] No

If yes, did the project receive any Part II Orders / Bump-Up requests?
- [ ] Yes **if yes, what was the date of the Minister's Decision?** _____ [ ] Decision pending
- [ ] No

List any public consultation/notification that has occurred related to the proposed water taking (i.e., public hearings, notification of First Nations, etc.)

[ ] **Watercourse** - *please complete this table if applying to take water from a watercourse (i.e., stream, municipal ditch, open drain, etc.)*

Watercourse Name	Tributary to

Does flow in the watercourse stop at any time during the year?
- [ ] Yes **if yes, during which months?** _____ For what period of time? _____
- [ ] No

Do you move/relocate the water intake (pump)?
- [ ] Yes **if yes, please provide primary and secondary locations on attached map**
- [ ] No

☒ **Well** - *please complete this table if applying to take water from a well (includes sumps for mines and quarries)*

Well Name / Identifier	Water Well Record Number	If not available, provide name of property owner at time of well construction
PW-1	6712549	

Has the well been deepened?

☐ Yes **if yes, what was the date of deepening?** _____

☒ No

Type of Well: ☒ Drilled ☐ Bored ☐ Dug ☐ Driven or Jetted (sandpoints/wellpoints)

If 'Driven or Jetted', provide the following:

Total number of sandpoints/wellpoints: _____

Number of interconnected sandpoint/wellpoint systems: _____

Can you measure the depth to water in this well?

☒ Yes **if yes, what is the depth to static water level?** 8.66 m bgs Date Measured: Dec 17, 1999

☐ No

Has a pumping test been done?

☒ Yes **if yes, please attach report**

☐ No

☐ **Lake** - *please complete this table if applying to take water from a lake*

Lake Name

☐ **Pond/Reservoir** - *please complete this table if applying to take water from a pond/reservoir*

Pond Name / Identifier

Was the pond constructed (man made)?

☐ Yes **if yes, please provide date of construction** _____

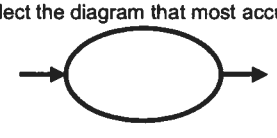
☐ No

Pond Size

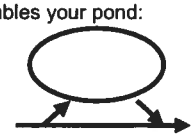
Average Length	Average Width	Average Depth of Water	Maximum Depth of Water	Approximate Volume of Pond

Pond Type

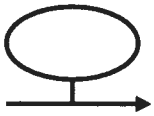
Select the diagram that most accurately resembles your pond:



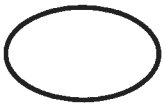
☐ online



☐ by-pass



☐ connected



☐ dugout

Source of pond water (select all that apply)

☐ Seepage / springs / groundwater

☐ Surface water runoff (including tile drains, does not include watercourse or open channel)

☐ Pumped water (if water is pumped into a pond, complete section information for source from which water is pumped - i.e., well, lake or watercourse)

☐ Flowing water (watercourse, open drains, ditches, etc.)

If "flowing water",

1. Does water flow into the pond (inflow)? ☐ Yes ☐ No

   If yes, is there a structure to regulate the inflow? ☐ Yes ☐ No If yes, describe: _____

2. Does water flow out of the pond (outflow)? ☐ Yes ☐ No

   If yes, is there a control structure to regulate the outflow? ☐ Yes ☐ No If yes, describe: _____

7. Source Information – *Note: Source Information must be provided separately for each source. Please complete and submit multiple copies of this Source Information section (pages 3 and 4 of this form) if your application includes more than one source.*

Number of Water Taking Sources Included In this Application *(do not include domestic uses that do not require a permit)*

Total Number of Wells	Total Number of Lake Intakes	Total Number of Ponds	Total Number of Watercourse Intakes
1		1	

Source Location Information *(if multiple sources are included in application, provide information for each source)*

Civic Address - Street information *(street number/name/type/direction/unit/suite/emergency 911 location number and street)*: 8243 County Road 19

Lot	Concession	Part	Reference Plan
11 or 10	3		

Municipality/Unorganised Township	County/District	Original Geographic Township
Fergus	Wellington	West Garafraxa

Geographic (GPS) Coordinates *(to be provided in Datum NAD83)*

Method of Collection	Accuracy Estimate	UTM Zone	Easting	Northing
Google	+/- 20 m	17	551146	4844524

Is the Applicant the owner of the site where water taking will occur?

- ☐ Yes
- ☐ No **if no, attach the owner's name, address and a signed letter granting consent for the applicant to access the water taking location**

Is the site where water taking will occur located in an area of development control as defined by the *Niagara Escarpment Planning & Development Act*?

☐ Yes ☒ No

Is the site where water taking will occur located on the Oak Ridges Moraine Conservation Area as defined by the Oak Ridges Moraine Conservation Plan (a regulation made under the *Oak Ridges Moraine Conservation Act*)?

☐ Yes ☐ No

Are you aware of any complaints or impacts resulting from water takings at the site?

- ☐ Yes **if yes, please describe:** _____
- ☒ No

Will water from the site be packaged in a container (bottled water, tanks)?

- ☐ Yes **If yes, what size of containers?** ☐ greater than 20 litres ☐ 20 litres or less
- ☒ No

Are wells located within 500 m of the site where water taking will occur?

- ☒ Yes
- ☐ No **if no, what is the distance to the nearest well?** _____

Is municipal water available to all dwellings within 500m of the site where water taking will occur?

☐ Yes ☒ No ☐ Unknown

Estimated start date of water taking	Water taking to extend for a period of:
May 2011	10 ☐ days ☐ weeks ☐ months ☒ years ☐ indefinite

Is activity subject to the *Environmental Assessment Act*?

- ☐ Yes **if yes, please attach approval or Notice of Completion**
- ☒ No

If yes, did the project receive any Part II Orders / Bump-Up requests?

- ☐ Yes **if yes, what was the date of the Minister's Decision?** _____ ☐ Decision pending
- ☐ No

List any public consultation/notification that has occurred related to the proposed water taking (i.e., public hearings, notification of First Nations, etc.)

☐ **Watercourse** - *please complete this table if applying to take water from a watercourse (i.e., stream, municipal ditch, open drain, etc.)*

Watercourse Name	Tributary to

Does flow in the watercourse stop at any time during the year?

- ☐ Yes **if yes, during which months?** _____ For what period of time? _____
- ☐ No

Do you move/relocate the water intake (pump)?

- ☐ Yes **if yes, please provide primary and secondary locations on attached map**
- ☐ No

☐ **Well** - *please complete this table if applying to take water from a well (includes sumps for mines and quarries)*

Well Name / Identifier	Water Well Record Number	If not available, provide name of property owner at time of well construction

Has the well been deepened?

☐ Yes **if yes, what was the date of deepening?** _____

☐ No

Type of Well: ☐ Drilled ☐ Bored ☐ Dug ☐ Driven or Jetted (sandpoints/wellpoints)

If 'Driven or Jetted', provide the following:

Total number of sandpoints/wellpoints: _____

Number of interconnected sandpoint/wellpoint systems: _____

Can you measure the depth to water in this well?

☐ Yes **if yes, what is the depth to static water level?** _____ Date Measured: _____

☐ No

Has a pumping test been done?

☐ Yes **if yes, please attach report**

☐ No

☐ **Lake** - *please complete this table if applying to take water from a lake*

Lake Name

☒ **Pond/Reservoir** - *please complete this table if applying to take water from a pond/reservoir*

Pond Name / Identifier

East Pond / West Pond

Was the pond constructed (man made)?

☒ Yes **if yes, please provide date of construction** 1998

☐ No

Pond Size

Average Length	Average Width	Average Depth of Water	Maximum Depth of Water	Approximate Volume of Pond
130 m / 125 m	70 m / 30 m	5 m	8 m	64,250,000 L

Pond Type

Select the diagram that most accurately resembles your pond:



☐ online ☐ by-pass ☐ connected ☒ dugout

Source of pond water (select all that apply)

☐ Seepage / springs / groundwater

☒ Surface water runoff (including tile drains, does not include watercourse or open channel)

☒ Pumped water (if water is pumped into a pond, complete section information for source from which water is pumped - i.e., well, lake or watercourse)

☐ Flowing water (watercourse, open drains, ditches, etc.)

If "flowing water",

1. Does water flow into the pond (inflow)? ☐ Yes ☐ No

   If yes, is there a structure to regulate the inflow? ☐ Yes ☐ No If yes, describe: _____

2. Does water flow out of the pond (outflow)? ☐ Yes ☐ No

   If yes, is there a control structure to regulate the outflow? ☐ Yes ☐ No If yes, describe: _____

8. Public Consultation / Environmental Bill of Rights (EBR) Requirements

Is this application for water taking to extend for a period of less than one year?

☐ Yes ☒ No If no, this application may be subject to posting and/or public consultation requirements under the Environmental Bill of Rights. For more information, please refer to the Guide.

Is this application for agricultural use or aquaculture?

☐ Yes ☒ No If no, this application may be subject to posting and/or public consultation requirements under the Environmental Bill of Rights. For more information, please refer to the Guide.

9. Water Taking Volumes

Purpose Options for Water Taking

	Purpose
Agriculture	irrigation of (includes frost protection): field and pasture crops; fruit orchard; market garden/flowers; nursery; sod farm; tender fruits; tobacco, other (must specify)
Commercial	aquaculture, bottled water, golf course irrigation, mall/business; snowmaking, other (must specify)
Dewatering	pits and quarries; construction; other (must specify)
Industrial	aggregate washing, brewing/soft drinks, cooling water, food processing, manufacturing; pipeline testing; power generation; other (must specify)
Institutional	school, hospital, other (must specify)
Recreation	aesthetic, fish pond, wetland, other (must specify)
Remediation	groundwater; other (must specify)
Water Supply	campground, communal, municipal, other (must specify)
Miscellaneous	dam/reservoir, heat pump, wildlife conservation, pumping test, other (must specify)

Water Source Information – Table A (Units in Litres)

Source Name	Purpose (select from "purpose" column in table above)	Maximum rate per minute	Maximum number of hours of taking a day	Maximum volume per day	Typical volume per day	Maximum number of days of taking in a year	Earliest calendar date of taking (mm/dd)	Latest calendar date of taking (mm/dd)
PW-1	Commercial	136	24	196,560	70,000	214	04/15	11/15
East/West Ponds	Commercial	1322	10	793,200	70,000	214	04/15	11/15

10. Attachments

The following must be attached for all applications (Category 1, 2 and 3) to be complete:

☒ Map Requirements
On a 1:10 000 OBM (Ontario Base Map) (1:50 000 only acceptable in locations where 1:10 000 is not obtainable), mark and label:
- all existing and proposed water taking locations with sources corresponding with source name
- all of the following features within 500m of each source: existing wells (indicate use of existing well, springs, watercourses, wetlands, water bodies, property lines, locations and name of property owners, nearest road intersection, dwellings.

☒ Describe **in detail** how, where and when all water is obtained, stored, transferred, used and returned to the environment (if applicable). Details must include the source of all water takings (and corresponding source name if applicable), purpose of the water taking, period of water taking, and maximum quantity requested (see Guide for further instruction).
Note: If your application is subject to posting on the Environmental Bill of Rights (EBR) Registry, this description will be used to create the Proposal Notice. The ministry may change the wording as required, to meet the EBR posting requirements.

☒ Describe how water taking needs (rates, amounts and time periods) were determined. Provide all relevant information and calculations to demonstrate the water takings requested are warranted. Calculation worksheets are available. Refer to Appendix E of the Guide.

☒ Attach completed water conservation Schedule 1.

The following must be attached for all Category 2 applications:

☐ Completed Schedule 2 and/or Schedule 3 signed by a Qualified Person.

The following must be attached for all Category 3 applications:

☒ Study Hydrogeological Study - Fergus Golf Club

11. Statement/Signature of Applicant

I, the undersigned, hereby declare that to the best of my knowledge:

- The information contained herein and the information submitted in support of this application is complete and accurate in every way and I am aware of the penalties against providing false information.
- The Project Technical Information Contact identified in Section 6 if this form is authorized to act on my behalf for the purpose of obtaining this approval.

Print Name	Signature	Date (yyyy/mm/dd)
SHAWN EVANS		2011/05/03

Ontario
Ministry of the Environment

Application for Permit to Take Water

Ce formulaire est disponible en français

For Office Use Only			
Reference Number	Payment Received $	Date *(y/m/d)*	Initials

12. Payment Information

Application Category

☐ Category 1 ($750) ☐ Category 2 ($750) ☒ Category 3 ($3000)

Amount Enclosed

$ 3,000.00 ☐ no fee required

Method of Payment

☐ Certified Cheque ☐ Money Order ☒ VISA ☐ MasterCard ☐ American Express

Credit Card Information *(if paying by VISA, MasterCard or American Express)**

Name on Card *(please print)*	Credit Card Number	Expiry Date (yy/mm)
SHAWN EVANS		14

Cardholder Signature

2011/04/30

**NOTE: credit card accepted for payments UNDER $10,000.00 only.*

Ontario

Master Business Licence

Date Issued: 2010-02-03
(yyyy-mm-dd)

Business Number:

Business Name and Mailing Address:
FERGUS GOLF CLUB
400 GOLF COURSE ROAD
CONESTOGO, ONTARIO CANADA N0B 1N0

Business Address: 8243 COUNTY ROAD 19
FERGUS, ONTARIO CANADA N1M 2R3

Telephone: **Ext:** **Fax:**

Email:

Legal Name(s): 883890 ONTARIO LIMITED

Type of Legal Entity: CORPORATION

Business Activity: GOLF COURSE

Business Information	Number	Effective Date (yyyy-mm-dd)	Expiry Date (yyyy-mm-dd)
BUSINESS NAME REGISTRATION	200130375	2010-02-03	2015-02-02
INCORPORATED (ONTARIO)	000883890	1990-03-15	

To the Client: Clients should do a corporation search to ensure that the information pertaining to corporations contained on this Master Business Licence is correct and up to date.

To the Client: When the Master Business Licence is presented to any Ontario business program, you are not required to repeat information contained on this licence. Each Ontario business program is required to accept this licence when presented as part of its registration process.
If you have any questions about this Master Business Licence call the ServiceOntario Contact Centre at 1-800-565-1921 or 1-416-314-9151 or TTY 1-416-326-8566.
For more information, or to access other business-related services, call the Business Info Line, a collaboration between ServiceOntario and Industry Canada, at 1-888-745-8888 or 1-416-212-8888 or TTY 800-268-7095.

To the Ontario business program: A client is not required to repeat any information contained in this licence in any other form used in your registration process.

2010-02-03

For Ministry Use Only
À l'usage exclusif du ministère

Ontario Corporation Number
Numéro de la société en Ontario

883890

1.

Ministry of Consumer and Commercial Relations
Ontario

Ministère de la Consommation et du Commerce

CERTIFICATE
This is to certify that these articles are effective on

CERTIFICAT
Ceci certifie que les présents statuts entrent en vigueur le

OCTOBER 02 OCTOBRE, 1998

Director / Directeur
Business Corporations Act / Loi sur les sociétés par actions

Form 3
Business Corporations Act

Formule 3
Loi sur les sociétés par actions

ARTICLES OF AMENDMENT
STATUTS DE MODIFICATION

1. The name of the corporation is: *Dénomination sociale de la société:*

8	8	3	8	9	0		O	N	T	A	R	I	O		L	I	M	I	T	E	D							

2. The name of the corporation is changed to (if applicable): *Nouvelle dénomination sociale de la société (s'il y a lieu):*

3. Date of incorporation/amalgamation: *Date de la constitution ou de la fusion:*

15 March, 1990

(Year, Month, Day)
(année, mois, jour)

4. The articles of the corporation are amended as follows: *Les statuts de la société sont modifiés de la façon suivante.*

4.1 The registered office of the Corporation will be changed from 4046 Summit Court, Mississauga, Ontario L5L 3J2 to 701 Westmount Road West, Kitchener, Ontario, N2M 1S1. Hereafter, the Board of Directors may from time to time by resolution fix the location of the registered office of the Corporation within the municipality or geographic township within Ontario.

4.2 To change the number and classes of shares that the Corporation is authorized to issue:

(a) by removing the Class "A" Special Shares, none of which are issued and outstanding at the date hereof and deleting the paragraphs in the Articles of Amendment dated April 27, 1990 relating to the restrictions on the allotment, issue or transfer of the Class "A" Special shares;

(b) by changing the number of Common Shares to an unlimited number of Common Shares.

4.3 By deleting paragraphs 4.4(a) to 4.4(e) in the Articles of Amendment dated April 27, 1990 relating to the existing objects of the Corporation and replacing it with the following:

> The restrictions, if any, on the business the Corporation may carry on or the powers that the Corporation may exercise:
>
> "The Corporation is not restricted by these Articles of Amendment from carrying on any business or businesses or from exercising any power or powers."

4.4 By deleting paragraphs 4.5 and 4.6 of the Articles of Amendment dated April 27, 1990.

4.5 By deleting paragraphs 8.1, 8.2 and 8.3 of the Articles of Incorporation and replacing them with the following:

"No share in the capital of the Corporation shall be transferred without the consent of the Board of Directors expressed by resolution passed by not less than a majority of the votes at a meeting of the Board of Directors or by an instrument or instruments in writing signed by a majority of the Directors."

4.6 By adding the following provisions as paragraph 9.2 to the Articles of Incorporation:

"(a) The number of shareholders of the Corporation exclusive of persons who are in its employment and exclusive of persons who, having been formerly in the employment of the Corporation, were, while in that employment, and have continued after termination of that employment to be, shareholders of the Corporation, is limited to not more than 50, 2 or more persons holding 1 or more shares jointly being counted as 1 shareholder.

(b) Any invitation to the public to subscribe for any securities of the Corporation is prohibited.

(c) The Corporation may, at any time and from time to time, purchase for cancellation the whole or any part of the Common shares at the lowest price at which, in the opinion of the directors, such shares are obtainable, but not exceeding the initial issue price thereof, together with all dividends declared thereon and unpaid."

5. The amendment has been duly authorized as required by Sections 168 & 170 (as applicable) of the Business Corporations Act.

La modification a été dûment autorisée conformément aux articles 168 et 170 (selon le cas) de la Loi sur les sociétés par actions.

6. The resolution authorizing the amendment was approved by the shareholders/directors (as applicable) of the corporation on

Les actionnaires ou les administrateurs (selon le cas) de la société ont approuvé la résolution autorisant la modification le

30th September, 1998

(Year, Month, Day)
(année, mois, jour)

These articles are signed in duplicate.

Les présents status sont signés en double exemplaire.

883890 ONTARIO LIMITED

(Name of Corporation)
(Dénomination sociale de la société)

By:/*Par:* _____ President

(Signature)
(Signature)

(Description of Office)
(Fonction)

RESOLUTION OF THE SHAREHOLDERS
OF
883890 ONTARIO LIMITED

BE IT RESOLVED THAT:

RESIGNATION AND ELECTION OF DIRECTORS

1. The resignation of Al Kavanagh as a director of the Corporation is hereby accepted.

2. The following persons be and they are hereby elected Directors of the Corporation to hold office until the next annual election of Directors or until their successors have been elected or appointed:

   JAMES BALSILLIE SHAWN EVANS

The foregoing resolutions are hereby passed and consented to by the Sole Shareholder of the Corporation, pursuant to the *Business Corporations Act* (Ontario), as evidenced by its signature hereto.

DATED this 25 day of November 2010.

GOLFNORTH PROPERTIES INC.

Al Kavanagh, President

RESOLUTION OF THE BOARD OF DIRECTORS
OF
883890 ONTARIO LIMITED

BE IT RESOLVED THAT:

APPOINTMENT OF OFFICERS

The following persons are hereby appointed to the office or offices set opposite their names to hold office until their respective successors are appointed:

President	Shawn Evans
Secretary-Treasurer	Shawn Evans

The foregoing resolution is hereby consented to in accordance with the *Business Corporations Act* as evidenced by the signatures of all the directors of the Corporation. The foregoing resolution may be signed in one or more counterparts and may be evidenced by a facsimile copy thereof.

Dated this 25 Day of November 2010.

James Balsillie

Shawn Evans

APPENDIX E

Schedule for Water Conservation Measures

Schedule 1 – Implementation of Water Conservation in accordance with Best Management Practices and Standards for the Relevant Sector

General Information and Instructions

Section 1: General Information

Information on this Schedule is collected under the authority of the *Ontario Water Resources Act, R.S.O. 1990* (OWRA), and the new *Environmental Bill of Rights, C.* 28. Statutes of Ontario, 1993, and will be used to evaluate applications for a Permit to Take Water as required by Section 34 (OWRA).

Instructions:

1. This Schedule forms part of the Permit to Take Water application form and is subject to all provisions and instructions where applicable.
2. All questions of Section 2 of this Schedule must be answered for this Schedule to be considered complete.

Purpose:
The purpose of this Schedule is to allow persons applying for a permit required by the Ministry to document in the application all water conservation measures and practices that are currently being undertaken or that is anticipated to be undertaken for the duration of the permit.
Persons applying for a permit are encouraged to take all reasonable and practical measures to conserve water and to be up to date with sector-specific best management practices and standards for water conservation (i.e. whether you are currently implementing or anticipate implementing water conservation best water management standards and practices relevant to your sector).
Various sector associations publish information on best practices that may be useful in determining practices and standards for water conservation. Examples of these sector-specifc assocations include the following:

- **Municipal Sector** – Ontario Water Works Association
- **Agricultural Sector** – Ontario Ministry of Agriculture (Fact Sheets and Guides on Best Management Practices containing information on efficient irrigation systems, staggering irrigation schedules and preparing Environmental Farm Plans)
- **Other Sectors** – For information on up-to-date best management practices and measures for water conservation, contact your relevant sector association.

Section 2: Water Conservation Best Management Practices and Standards

Use this section of the Schedule to indicate what conservation measures and practices you are currently implementing or anticipate implementing. Where relevant, additional information can be attached as an appendix to this Schedule.

State your goals for reducing the use, loss or waste of water or for increasing the efficiency of water use (e.g., litres per day per unit of production or litres per day per capita for the residential sector).

Schedule 1 continued

Check off which of the following water conservation best management measures and practices that you have implemented or will implement for the duration of the permit:

	Implemented	To be Implemented
Water Use Audit	☐	☐
Universal metering of all users (municipalities)	■	☐
Water Efficient Fixtures/Equipment/Technology	☐	☐
Develop and Implement an Overall Water Conservation and Efficiency Program	☐	■
Leak Detection/Loss Prevention/Control Program	☐	☐
Public/Employee Information/Education/Outreach	☐	☐
Landscaping techniques/Site and Urban Design Principles	☐	☐
Water Efficient production processes/practices (e.g. re-use of water)	■	☐
Economic Incentives/Cost-Share/Full Costing recovery/ tax credits/rebate programs	☐	☐

Other (please specify): _____

Of the measures and practices checked off above, provide specific details of the best management practices applied or to be applied including equipment (e.g. pump specification), processes, such as water used for industrial production and/or irrigation system(s), current and proposed technology, approach, processes and procedures:

See attached report for details.

For the above measures and practices, list information relevant for your sector and/or other sources of information used in determining water conservation and efficiency management practices and measures:

none

List dates of when the best management measures and practices were or will be applied for the duration of the permit:

Identify any approval or certification that you have received for implementing water conservation and efficiency best management practices, e.g. Environmental Farm Plan, Audubon Cooperative Sanctuary Program for Golf Courses:

none

883890 Ontario Limited
o/a Fergus Golf Club

Hydrogeological Report in Support of Permit to Take Water Application

Prepared By:

R.J. Burnside & Associates Limited
292 Speedvale Avenue West Unit 20 Guelph ON N1H 1C4

Prepared for:

Fergus Golf Club (883890 Ontario Limited)

May 2011

File No: PGD019883.0000

The material in this report reflects best judgement in light of the information available at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. R.J. Burnside & Associates Limited accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Table of Contents

1.0 Introduction 1

2.0 Irrigation Water Demand 3

3.0 Physical Setting 5
3.1 Geology 5
3.2 Hydrogeology 5
3.3 Surface Water 7

4.0 Discussion of Water Taking Impacts and Monitoring 8

5.0 Water Conservation 9

6.0 Conclusions and Recommendations 11

7.0 References 12

Tables

Table 1 Irrigation Areas 3
Table 2 Typical Daily Turf Irrigation Requirements 3
Table 3 Proposed Water Taking Schedule 11

Figures

Figure 1 Site Location Map
Figure 2 Well Location Plan
Figure 3 Quaternary Geology
Figure 4 Cross Section A-A’

Appendices

A Previous Permit to Take Water No. 00-P-2653
B Water Well Records
C Well Testing Program *(Morrison Environmental Ltd, 1999)*
D Long Term Test of PW1 *(Burnside, 2000)*
E Monitoring Data *(Graph)*

1.0 Introduction

R.J. Burnside & Associates Limited (Burnside) has been retained by 883890 Ontario Limited operating as Fergus Golf Club to apply for and secure a Permit to Take Water (PTTW) from the Ministry of the Environment (MOE).

Fergus Golf Club consists of three 9-hole courses (Fergus South, East and West) located on County Road 19 north of Fergus near Lake Belwood. The address for the golf club is 8243 County Road 19, Fergus, Ontario. The legal description of the property is Lot 11, Concession 3, Township of West Garafaraxa, County of Wellington. The general location of the property is shown on Figure 1. The Fergus Golf Club was formed in 2010 with the merger of Lake Belwood Golf Club (now Fergus East and West) and Fairview Gold Club (Fergus South). Currently, Fergus South is in possession of a valid PTTW (No. 1577-6LCQQ9) and maintains a separate irrigation system for the south course.

This report is in support of a PTTW renewal for water taking on the Fergus East and West courses. A previous application was made as a Category 1 renewal, but since the permit had expired and the applicant was requesting additional water from the irrigation ponds the MOE requested a Category 3 application. The water taking at this site was previously permitted under Permit No. 00-P-2653 which expired in March 2010. A copy of this permit is included in Appendix A.

The previous Lake Belwood (Fergus East and West) permit included water taking from:

- well PW-1 (MOE 6712549) at 136 L/min
- two connected irrigation ponds at 91 L/min (considered one source).

The allowable pumping rate from the irrigation ponds on the previous permit is significantly less than what is required. As a result, Fergus Golf Club is applying for an increased rate of 1,322 L/min (291 Igpm) from the pond in this application. The rate for irrigation well PW-1 will remain the same. Figure 2 provides the locations of PW-1 and the irrigation ponds.

PW-1 is a bedrock well that was installed in 1998. The well is 150 mm in diameter and has a depth of 85.95 m below ground surface. The water well record for PW-1 is provided in Appendix B. The two irrigation ponds were constructed in 1998, with a combined storage of 64,250,000 L (14.0 MIgal). The average pond depth is 5 m. The irrigation ponds receive water from the pumping of PW-1 as well as from drains that collect surface runoff and seepage from the golf course. The ponds are connected by an underground pipeline with a valve that allows flow separation between the storage

ponds (Morrison, 1999). Since the ponds are connected and have similar characteristics they are considered to be one source listed on the permit application.

The data provided in this report provides the required technical information to support the proposed water takings that have been in place for the past 11 years and includes new monitoring using automatic recorders to document the impact of the taking.

2.0 Irrigation Water Demand

The Fergus East and West courses employ primarily a single row irrigation system on Holes 1, 3, 4 and 6 of the west course and Holes 10, 11, 12, 16, and 18 of the east course, with the remaining holes having no fairway irrigation. The tees and greens for each hole are irrigated with up to 5 surrounding heads. Water for irrigation is pumped from the irrigation pond using two pumps capable of producing up to 566 L/min (125 Igpm) each. The irrigation pond is fed by surface drainage throughout the site and water pumped from irrigation well PW-1 at a constant rate of 136 L/min.

In order to develop a reliable water supply for the golf course, it is necessary to determine the water demands for irrigation purposes. Water demands vary from day to day, month to month and year to year depending on climatic conditions. The average irrigation demands of the golf course are based on the following assumptions:

- The irrigation season generally extends from April 15 to November 15 of each year (potentially 214 days), with July and August being peak demand periods.

- The total irrigated area is estimated to be approximately 2.1 hectares (5.3 acres) based on records provided by the property manager and aerial mapping. The breakdown of the area and maximum irrigation requirement is shown in Table 1.

- The daily turf requirement varies monthly up to a maximum of 5.443 mm/day, which translates to an average turf requirement of 38.1 mm/week (1.5 inch/week) during peak irrigation periods. This value is representative of an average irrigation requirement for turfgrass, and results in a total average daily volume for the golf course of approximately 117,500 L, or 25,854 Igal. Typical daily turf irrigation requirements are summarized in Table 2.

Table 1: Irrigation Areas

	Area (m^2)	Maximum Irrigation Requirement mm/week (in/week)
Green	4,047	38.1 (1.5)
Tees	4,047	38.1 (1.5)
Fairways	13,500	38.1 (1.5)
Total	21,594	38.1 (1.5)

Table 2: Typical Daily Turf Irrigation Requirements

	April	May	June	July	Aug.	Sept.	Oct.	Nov.
mm/day	0.272	1.361	2.721	5.443	5.443	2.721	0.544	0.272
Igal/day	1,293	6,463	12,927	25,854	25,854	12,927	2,585	1,293
L/day	6,000	29,400	58,800	117,500	117,500	58,800	11,800	6,000

The water demands for the golf course are calculated using a computerized daily water balance model. In this case thirty (30) years of daily rainfall records from a nearby Environment Canada Climate Station in Orangeville were used to determine the water demand for the golf club. The model assumes water is always available for irrigation, either from natural precipitation or from other water sources. Both the demands for irrigation and the losses due to evaporation, including on-site ponds/reservoirs, are calculated. Irrigation water demand, therefore, is determined by assuming that if precipitation occurred, the daily irrigation demand is adjusted to use natural rainfall for irrigation before using other available water supplies.

It should be noted that current irrigation practices implemented at the golf course are based on irrigating primarily tees and greens, with irrigation conducting every other day during the summer. As a result, the typical daily irrigation volume is estimated to be less than 70,000 L based on information provided by the golf course superintendent, for a full green and tee cycle.

The well can produce 136 L/min (30 Igpm) or 196,560 L/day which is enough to sustain the water irrigation practices discussed above.

3.0 Physical Setting

3.1 Geology

Background information for the site was obtained from previous reports completed on the site, MOE water well records, geologic reports and mapping for the area. The geology is generally glacial till and glacial sediments overlying limestone/dolostone bedrock.

Based upon a review of the Ontario Geological Survey Map 2508 "*Quaternary Geology of the Orangeville Area*" the overburden in the area consists of glacial till. Mapped on the northern portion of the site is silt to clayey silt till known as the Tavistock Till and on the southern portion of the site is a sandy till known as the Port Stanley Till. Both tills are dominantly fine grained with aquitard characteristics. These descriptions correlate with golf staff reports that the ponds retain stored water with no observable loss to infiltration. Glaciofluvial deposits of outwash sand are located east of site around Lake Belwood. Figure 3 illustrates the quaternary geology of the area.

The bedrock underlying the overburden at the site is the Guelph Formation (Telford, 1974). The Guelph Formation consists of brown or tan porous dolostone with a medium to massive and irregular bedded nature. Reefal structures and fracturing are common. The Guelph Formation has a highly variable thickness ranging from 4.0 m to 100 m (Singer et al., 2003). Underlying the Guelph Formation is the Amabel Formation which is a massive white to grey-brown dolostone. The upper zones of the Amabel are only weakly fractured, while the middle zone contains large cavities, reefal structures, bedding planes and fractures that contribute to the high permeability of the rock. This middle zone is considered to be a highly productive aquifer. This regional bedrock aquifer is the source of water for the irrigation well PW-1.

3.2 Hydrogeology

The main bedrock aquifer in the area is the Guelph-Amabel aquifer. The Guelph-Amabel aquifer is an extensive dolostone aquifer with a maximum thickness of 60 m. Well yields in the aquifer are variable as they depend on the degree of fracturing and available drawdown. Generally most domestic wells obtain water from the upper 15 m of the aquifer while municipal and industrial wells may drill to depths of 30 to 188 m (Singer et al, 2003). The potential for high capacity wells in the aquifer is good. Porous overburden sediments have been found just above the top of bedrock, described as contact aquifers. Within the overburden till, discontinuous lenses of courser grained sediments of sand or gravel also act as aquifers.

The location of existing wells in the area based on the MOE Well Record Database, are presented in Figure 2. Most wells are completed in the bedrock with a few overburden wells screened across the contact aquifer just above the bedrock or in glacial fluvial outwash sediments found around Lake Belwood. Depth to bedrock in the wells ranges from 25.9 m to 78.9 m. The deeper wells are completed in a buried bedrock valley that is encountered by the Fergus South clubhouse well at a depth of 78.9 m. Water well records and the water well record summary for wells in the area are provided in Appendix B. A geological cross-section along the east boundary of the site is provided in Figure 4.

We note that the Fergus South Golf Course obtains its water from a well and pond permitted under PTTW No. 1577-6LCQQ9 which allows well 6713016 (Figure 2) to be pumped at a rate of 104 L/min for 8 hrs/day and the pond to be pumped at 454 L/min for 3 hrs/day.

In 1999, Morrison Environmental Ltd (MEL) completed a report on the well PW-1. The report included a characterization of the aquifer and the results of a 24 hour pumping test. Monitoring during the 24 hour pumping test included nearby shallow and deep domestic wells. One of the conclusions of the report was that pumping may have measurable impacts on surrounding domestic wells. A copy of the report is provided in Appendix C.

A review of the MEL report completed on behalf of the Township recommended that a long-term pumping test be complete that included detailed monitoring of surrounding domestic wells. Burnside was retained and completed a long-term pumping test on PW-1 in December 1999. The test results are provided in the report included in Appendix D.

The long-term test was conducted at a pumping rate of 2.3 L/s (30 Igpm) for a period of 6 days. Selected domestic wells in the area were monitored and it was determined that pumping from PW-1 could potentially result in 3-4 m of drawdown in the closest domestic wells surrounding the site. As part of the conditions of the municipal site plan approval, Golf North (Fergus Golf Club) entered into an agreement with the residential home owners to provide a new water supply, should pumping at the golf course impact their water supply. There have been no reports of adverse impact due to water taking operations during the permit timeline.

The Fergus South irrigation well (Figure 2) was monitored during the 6 day test of the Fergus East/West irrigation well. The measured drawdown after 6 days of pumping was 0.56 m and the 180 day drawdown was predicted to be 2.56 m. This represents less than 5 % of the available drawdown in the Fergus South irrigation well and as a result

the two wells can operate together without adverse water level impacts. This has taken place with no complaints over the past five years.

3.3 Surface Water

The primary surface water feature in the study area is Lake Belwood, which located approximately 500 m east of both irrigation wells. The water level in Lake Belwood is controlled using the Shand Dam by the Grand River Conservation Authority. The water level in Lake Belwood fluctuates by approximately 9 m during the year.

The Irvine River flows from northeast to southwest 250 m northwest of the golf course.

The only surface water bodies found on site are two dug out ponds constructed in 1998. Two of these ponds are used as the East and West Irrigation Ponds. Both ponds are located in areas mapped as glacial till and have an average depth of 5 m. Based on the well log for PW-1 (located beside the West Irrigation Pond) clayey till was encountered from 0 to 29 m below ground surface. There is over 20 m of clayey till separating the surface water features, ponds and dug wells in the area from the bedrock aquifer. This was confirmed during testing of PW1 in 1999 discussed below.

We note that the irrigation ponds are surrounded by golf holes and are therefore in play. As a result the water level in the ponds would never be drawn down more than 1 m as it negatively impacts the appearance of the holes in the surrounding area.

4.0 Discussion of Water Taking Impacts and Monitoring

Flow measuring devices are installed in the pumphouses for the water well and irrigation ponds. Daily volume pumped from the irrigation ponds was provided for 2009 and 2010 and are plotted in Figure E-1, Appendix E. Figure E-1 illustrates that daily water-taking from the ponds was approximately 68,000 L/day. This amount severely limits the irrigation of the golf course and is actually less than the amount available from the well on a daily basis. As a result this application is requesting a rate to match the pumps currently in place at the Fergus East/West pumphouse that would allow the pumps to be operated up to 10 hrs/day. This would exceed the volume of water available from PW-1 and would represent the peak pumping day that would only occur on the highest water use day each year.

The total volume of water pumped from well PW-1 in 2010 was 3,753 m^3. Pumping occurred over a four (4) month period resulting in an average daily rate of 31,275 L/day. This is less than the maximum rate of 195,840 L/day listed in the previous PTTW. This is due to the fact that the ponds fill due to stormwater runoff and PW-1 is only used when drawdown in the pond allows water from the well to be stored in the pond.
Over the past five (5) years the current irrigation facilities have been in place and there were no reports of adverse impacts due to pumping. This is largely due to the relatively low water use and limited irrigation requirements on these golf courses.

Considering the fact that the historic level of groundwater monitoring at these sites has been limited it is recommended that automatic water level recorders be installed in both the Fergus East/West and Fergus South clubhouse wells. These wells are within 300 m of both irrigation wells and will provide an indication of any short and long-term water level fluctuations as a result of the irrigation wells.

5.0 Water Conservation

Water conservation is one of the most important tools that a golf course has to ensure that the available water supply will be sufficient for its daily, weekly, monthly and yearly irrigation demands and to provide for healthy turfgrass. Water conservation has been occurring at the golf club for many years and Fergus Golf Club uses much less water than an average 18 hole golf facility. Moving forward water conservation measures at Fergus East and West will include the following:

- Irrigate only those areas that require it, specifically tees, greens, and some fairways. The longer grasses of the out-of-play areas are more tolerant of dry periods and do not require irrigation.

- Irrigation will take place at night when the losses due to evapotranspiration are at a minimum and the water can be retained in the soil structure before the plants absorb the water.

- Not all areas will require the same amount of water. The fairways, tees and greens will use different grass types and will be cut to different heights. Sprinkler heads will be set individually to provide the optimum amount of water to each area depending on the grass type and length.

- Localized hand watering of “hot-spot” areas will take place, which will avoid over-water in many areas.

- Turfgrass will be aerated regularly to prevent the formation of thatch. Thatch is a thick mat of grass roots that grows so densely that the passage of water to the bottom of the root system is reduced. Thatch means that an increased amount of water must be applied to an area to be able to water it effectively.

- The irrigation practices will adjust to the local weather conditions such as solar radiation or precipitation. For instance if it starts raining while irrigating, the irrigation system will be shut down to conserve water.

- Lower fertility rates and plant growth regulators to slow down plant growth, which requires less watering. The use of soil surfactants on greens and tees ensures more efficient water distribution and improves the moisture content of soils.

- Regular monitoring of all water takings will increase awareness and assist in monitoring the success of water conservation efforts.

The overall water conservation strategy at the golf course is to water for plant sustainability and health and the golf club is proactive in reviewing procedures and looking for ways to improve on irrigation efficiency.

6.0 Conclusions and Recommendations

Based on the information reviewed, the following can be discerned:

- The irrigation ponds are built in clayey till overburden consisting of greater than 20 meters of fine grained sediments overlying the bedrock. These sediments will prevent any hydraulic connection between the ponds and the underlying bedrock aquifer and limit any observable loss due to infiltration.

- The proposed increase in water taking will not have any measureable off site impact but will allow the existing pumps to be operated as designed.
- There have been no complaints from residents regarding water levels in surrounding domestic wells however the well has been pumping at a much lower rate than the permitted rate. The proposed monitoring of the two clubhouse wells will confirm the expected water level impacts due to pumping.
- Although this application is a Category 3 application it is essentially a renewal of an old permit and existing water taking that has been in place for over 10 years with no reported adverse impacts on existing wells.
- The golf club should be issued a 10 year PTTW from the MOE to take water from the irrigation ponds and PW-1 for the irrigation of the golf course, as summarized below in Table 3.

Table 3: Proposed Water Taking Schedule

Name of Source or Description	Maximum Amount Taken/Minute (l/min)	Maximum Amount Taken/Day (l/day)	Typical Volume Taken/Day (l/day)	Number of Hours of Taking/Day (Maximum)	Maximum Number of Days Taking/Year
Irrigation Ponds	1322	793,200	70,000	10	214
PW-1	136	196,560	70,000	24	214

Report Prepared by:

R.J. Burnside & Associates Limited

Stephanie Charity, P.Geo
Hydrogeologist

Jim Baxter, P.Eng.
Groundwater Resource Engineer

SC/JB:cl

7.0 References

Burnside, 2000. Long Term Test of PW1, Fairview Golf Course Expansion, Fergus, Ontario, Burnside Golf Services, A division of R.J. Burnside & Associates Limited, February 2, 2000.

Cowan, W.R. 1976. Quaternary Geology of Orangeville Area, Southern Ontario. Ontario Geological Survey Report 141, 98p. Accompanied by Map 2508, Scale 1:50,000, Queens Printer for Ontario, 1976

Morrison, 1999. Well Testing Program at the Proposed 18 Hole Golf Course Expansion, Fairview Golf and Country Club, Morrison Environmental Limited, June 1999.

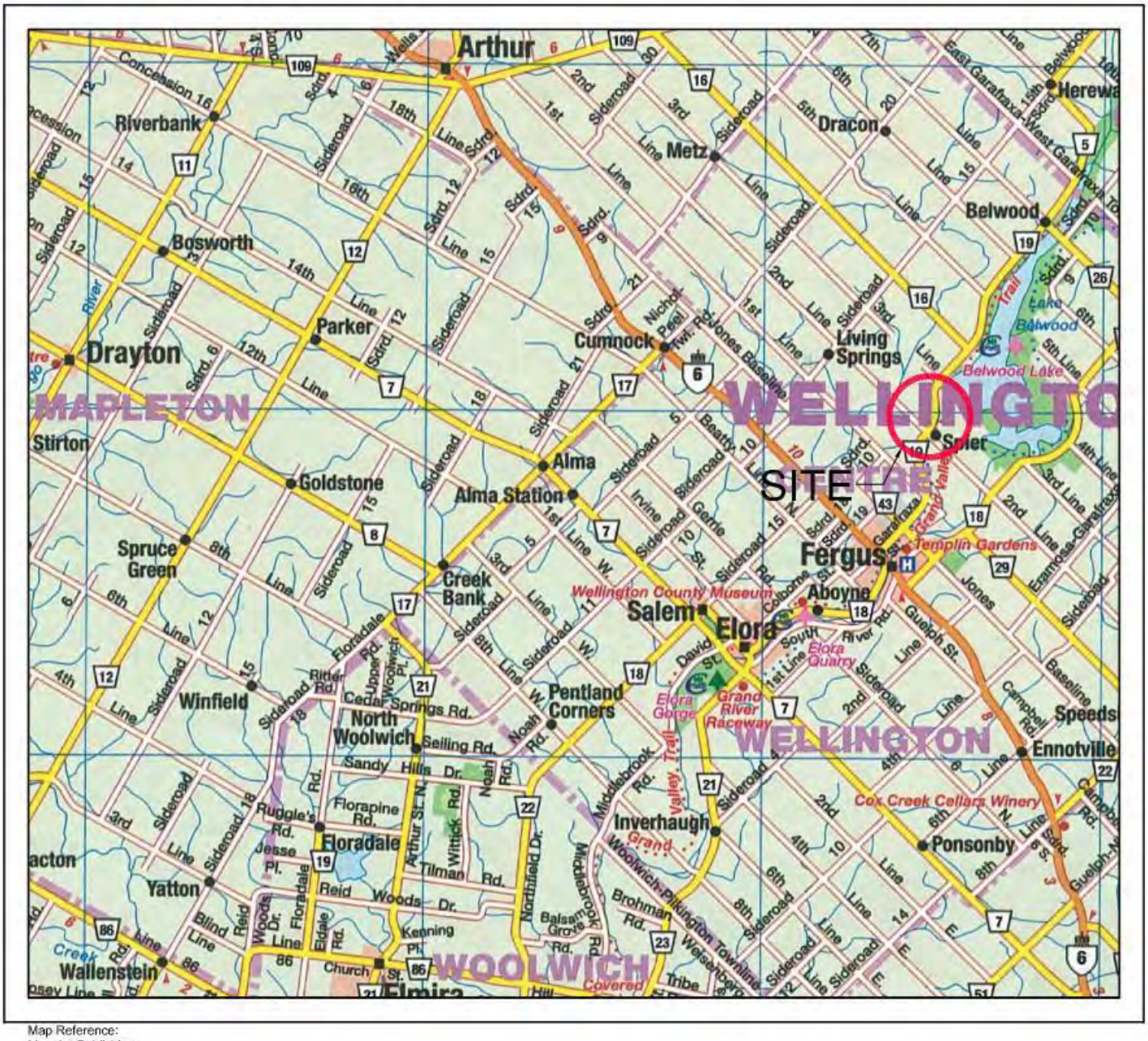
Ontario Ministry of the Environment, Water Well Records

Singer, S.N., C.K., Cheng and M.G. Scafe. 2003. *The Hydrogeology of Southern Ontario, 2nd Ed*. Environmental Monitoring and Reporting Branch, Ministry of Environment. Toronto, Ontario, 2003.

Telford, P.G., 1974. Paleozoic Geology of Orangeville Area, Southern Ontario, Ontario Division of Mines, Prelim. Map P.947 Geol. Ser., Scale 1:50,000, Geology 1972, 1973.

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Figures



Map Reference:
Map Art Publishing
Ontario Road Atlas



KEY MAP OF ONTARIO

FIGURE 1 - SITE LOCATION MAP

FERGUS GOLF CLUB
FERGUS, ONTARIO

HYDROGEOLOGICAL REPORT

March 2011
Project Number: PGD019883

Prepared by: Z. Nevar Verified by: S. Charity

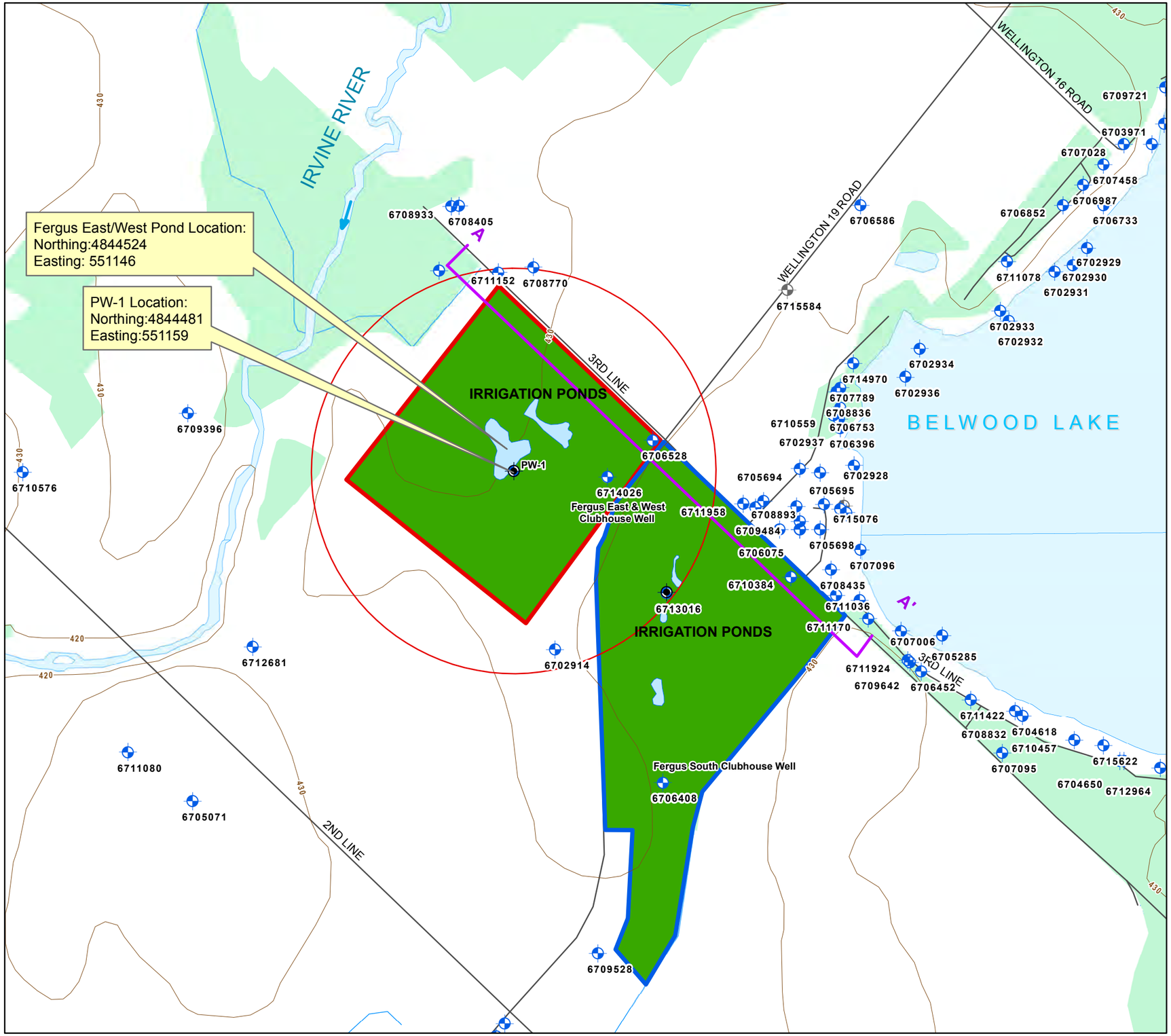
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019883 SL.dwg

Plot Time: Mar 18, 2011 - 10:11am

FIGURE 2
FERGUS GOLF CLUB
FERGUS, ONTARIO
HYDROGEOLOGICAL REPORT

WELL LOCATION PLAN



LEGEND

- Irrigation Wells
- Borehole: Water Supply (Other Than Municipal)
- Borehole: Other
- Cross Section Location
- 500m Buffer Area of PW-1
- Irrigation Ponds
- Fergus East & West Golf Course
- Fergus South Golf Course
- Contour (masl)
- Roads
- Creek/Stream/Etc.
- Wetland
- Waterbody
- Wooded Area

The primary source of base features on this map originated from Natural Resource Canada's CanVec product. Supplementation using GIS or remote sensing based data from provincial, municipal, or private courses may also be present.

N

0 175 350 525 700
Meters

Scale: 1:10,000
April, 2011
Project Number: PGD019883

Projection: UTM Zone 17
Datum: NAD 83

Prepared By: Z. Nevar

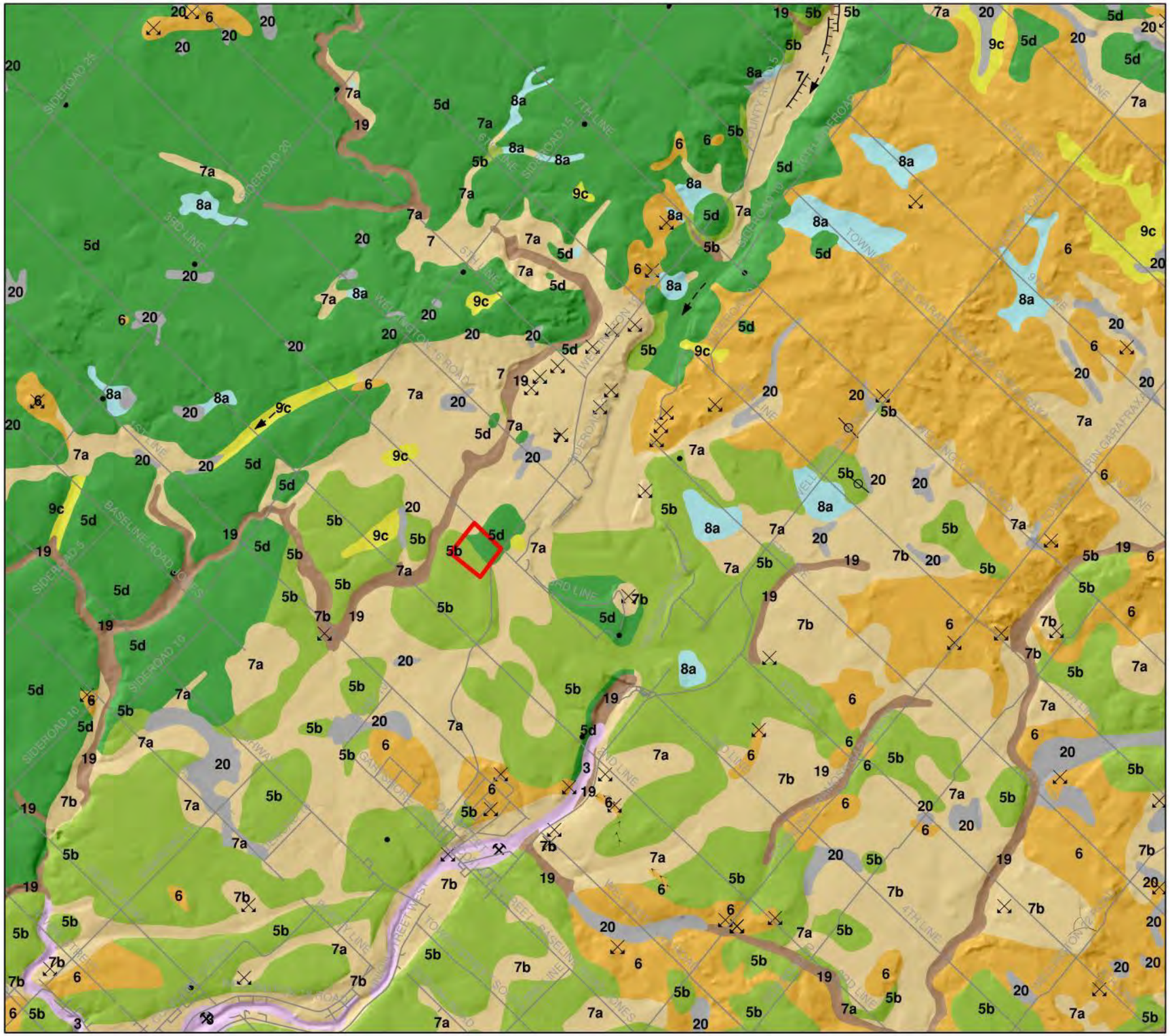
Verified By: S. Charity

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E:\Project\P Jobs\PG Jobs\PGD019883\Map\019883 WELL LOCATION PLAN.mxd

FIGURE 3
FERGUS GOLF CLUB
FERGUS, ONTARIO
HYDROGEOLOGICAL REPORT

QUATERNARY GEOLOGY



LEGEND

- Study Area
- Roads
- Quarry
- Pit
- Delta: Glaciolacustrine
- Drumlin
- Flute
- Sample Location
- Esker: Direction of Flow Known
- Meltwater Channel: Inferred Direction of Flow
- Fluvial Terrace
- 3: Paleozoic bedrock
- 5b: Stone-poor, carbonate-derived silty to sandy till
- 5d: Glaciolacustrine-derived silty to clayey till
- 6: Ice-contact stratified deposits
- 7: Glaciofluvial deposits
- 7a: Sandy deposits
- 7b: Gravelly deposits
- 8: Fine-textured glaciolacustrine deposits
- 8a: Massive-well laminated
- 9: Coarse-textured glaciolacustrine deposits
- 9c: Foreshore-basinal deposits
- 19: Modern alluvial deposits
- 20: Organic deposits

N

Ontario Geological Survey 2003, Surficial Geology of Southern Ontario: Ontario Geological Survey, Miscellaneous Release 128.

0 780 1,560 2,340 3,120 3,900 4,680
Meters

Scale: 1:60,000
March, 2011
Project Number: PGD019883

Projection: UTM Zone 17
Datum: NAD 83

Prepared By: Z. Nevar

Verified By: S. Charity

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E:\Project\P Jobs\PG Jobs\PGD019883\Map\019883 QUATERNARY MAP.mxd

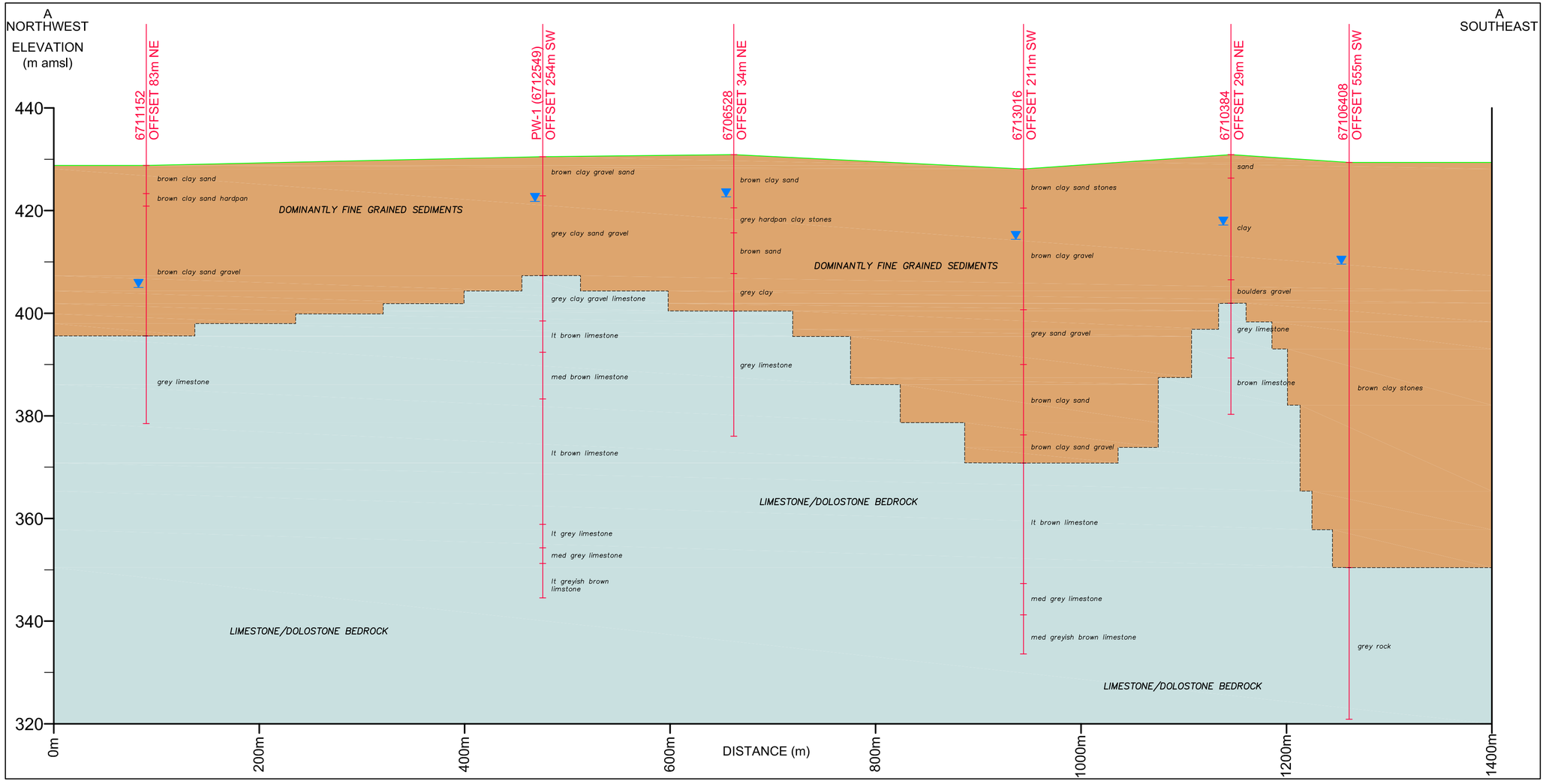


FIGURE 4

FERGUS GOLF CLUB
FERGUS, ONTARIO
HYDROGEOLOGICAL REPORT

CROSS SECTION A - A'

LEGEND

5893 — WELL LOCATION & NUMBER

EXISTING GROUND PROFILE

silty sand — GEOLOGICAL STRATIGRAPHY

STATIC WATER LEVEL

WELL SCREEN

Produced using information provided by the Ministry of Natural Resources, Copyright © Queen's Printer.

Horizontal Scale 1:3,000
Vertical Scale 1:600
Vertical Exaggeration 5x

April, 2011
Project Number: PGD019883

Prepared by: Z. Nevar

Verified by: S. Charity

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019883 XSA.dwg

Plot Time: May 02, 2011 - 11:14am

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Appendix A

Previous PTTW No. 00-P-2653

Ministry of the Environment
119 King Street West
12th Floor
Hamilton ON L8P 4Y7

Ministère de l'Environnement
119 rue King ouest
12e étage
Hamilton ON L8P 4Y7

Ontario

PERMIT TO TAKE WATER Nº.00-P-2653

Under Section 34 of The Ontario Water Resources Act, R.S.O. 1990, this permit is issued to:

Golf North Properties Inc. (o/a 883890 Ontario Limited)

whose address for all purposes pertaining to this permit is:

RR#32 Kossuth Road, Cambridge, Ontario N3H 4R7

for the taking of water in accordance with the terms and conditions set out below and on the back of this form.

TERMS AND CONDITIONS
PARTICULARS

SOURCE:	1. One well (PW-1) 2. Two ponds
LOCATION:	North half Lot 11, Concession 3, Township of West Garafaraxa, County of Wellington
PURPOSE:	Irrigation
PERIOD:	From date of issue to March 31, 2010 Inclusive
RATE NOT TO EXCEED:	Well: 136 LPM (30 IGPM) Subject to Special Conditions Combined ponds: 91 LPM (20 IGPM) Subject to Special Conditions
AMOUNT NOT TO EXCEED:	Well: 195,840 LPD (43,200 IGPD) Subject to Special Conditions Combined ponds: 49,140 LPD (10,800 IGPD) Subject to Special Conditions

SPECIAL

See Schedule "A" Attached

Dated at: Hamilton, Ontario, this 18th **day of** October **20** 00

P. Odom

Director
Section 34
Ontario Water Resources Act
R.S.O. 1990

Notice of Terms and Conditions
The Ontario Water Resources Act, Section 100
R.S.O. 1990

Take notice that in issuing this Permit to Take Water, terms and conditions pertaining to the taking of water and to the results of the taking have been imposed. The terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

You may appeal the terms and conditions by giving written notice to the Director of the Ministry at the appropriate Region Office (see information sheet), and to the Environmental Appeal Board, Suite 502, 112 St. Clair Avenue West, Toronto, Ontario M4V 1N3, within fifteen days after service of this Notice. In the event of an appeal, the terms and conditions of the Permit, as issued, would remain in effect until the appeal has been finalized.

General Terms and Conditions

These terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

1. **Permit**
This Permit shall be kept available at all times for inspection.

2. **Measurement and Reporting of Water Taking**
The Director may, from time to time, where a situation of interference or anticipated interference with water supplies exists, or in a situation requiring information on water takings for purposes of water resource inventory and planning, give written notice to the Permit holder to undertake any of the following actions.
The Permit holder shall comply with any such notice:
   (a) To establish and maintain a system for the measurement of the quantities of water taken;
   (b) To operate such a system and to record measurements of the quantities of water taken on forms provided by the Director, with such frequency or for such time periods as the Director may specify;
   (c) To return to the Director records made pursuant to clause 2 (b) at such times or with such frequency as the Director may specify;
   (d) To keep records made pursuant to clause 2 (b) available for inspection until such time as they are returned to the Director pursuant to clause 2 (c).

3. **Interference with Other Water Supplies**
The Permit holder shall immediately notify the Director of any complaint arising from the taking of water authorized by this Permit and shall report upon any action which has been taken or is proposed with regard to such complaint.

   For Surface-Water Takings, the taking of water (including the taking of water into storage and the subsequent or simultaneous withdrawal from storage) shall be carried out in such a manner that streamflow is not stopped and is not reduced to a rate that will cause interference with downstream uses of water or with the natural functions of the stream.

   For Ground-Water Takings, if the taking of water is forecast to interfere seriously, or is observed to interfere seriously with other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit holder shall take such action as will make available to those affected a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking so as to prevent the forecast interference or alleviate the observed interference. Pending permanent restoration of the affected supplies, the Permit holder shall provide to those affected temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of so doing.

4. **Reporting of Changes**
The Permit holder shall report to the Director any changes of address or telephone number, or change of ownership of the property for which this Permit is issued and shall report to the Director any changes in the general conditions of water taking from those described in the Permit application within thirty days of any such change.

   The Permit holder shall not assign his rights under this Permit to another person without the written consent of the Director.

5. **Expiry**
No water may be taken under authority of this Permit after the expiry date shown on the face of this Permit, unless the Permit is renewed, or after the expiry date shown on any renewal of this Permit.

6. **Liability**
This Permit does not release the permittee from any legal liability or obligation and remains in force subject to all limitations, requirements, and liabilities imposed by law. This Permit shall not be construed as estopping or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the permittee, its officers, employees, agents, and contractors.

7. **Transfers**
This permit does not abrogate the permit holder's responsibility to comply with all applicable legislation, including O. Reg. 285/99, which provides, among other things, that no person shall use water by transferring it out of a water basin (as defined in the Regulation) in a container having a volume greater than 20 litres. The regulation divides Ontario into three water basins, being the Great Lakes-St. Lawrence, the Nelson and Hudson Bay Basins.

8. **Water Shortages**
The Director may, during times of drought or water shortage in the locality of the taking, give notice to the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the notice to the Environmental Appeal Board under the Ontario Water Resources Act, Section 100(3).

SCHEDULE "A"

SPECIAL TERMS AND CONDITIONS

Nº1. If the taking of water under this permit is forecast to interfere seriously or is observed to interfere seriously with other water supplies obtained from any adequate sources that were in use prior to the date of this permit, the permittee shall take such action as will make available to those affected a supply of water equivalent to their normal takings under terms and conditions that the Director, OWRA §34, deems fair or shall reduce the rate and amount of taking so as to prevent the forecast interference or alleviate the observed interference. Pending permanent restoration of affected water supplies, the permittee shall provide to those affected sufficient potable, temporary water supplies to meet their normal requirements.

Nº2. i. The rates and amounts of water taken from each source shall be monitored by a flow measuring device.

ii. Flow records shall be made on a daily basis.

iii The flow device(s) shall be installed and operating prior to the taking of water.

iv. The flow records shall be kept available at all times for inspection by Ministry staff and submitted to the MOE Regional Office by March 31 of each year for the previous calender year.

Ministry of the Environment

Ontario

NOTICE OF TERMS AND CONDITIONS

In accordance with Section 100 of the ***Ontario Water Resources Act***, R.S.O. 1990, notice is hereby given of the issuance of Permit To Take Water

No.**00-P-2653**

which contains terms and conditions pertaining to the taking of water and to the results of the taking. The terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.

You may, by written notice served upon me, the Environmental Appeal Board and the Environmental Commissioner, **Environmental Bill of Rights**, S.O. 1993, Chapter 28, within fifteen days after receipt of this Notice, require a hearing by the Board. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 101 of the ***Ontario Water Resources Act***, as amended provides that this Notice requiring a hearing shall state:

1. The portions of the permit or each term or condition in the permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice shall also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works is located;

and the Notice should be signed and dated by the appellant.

The Notice must be served upon:

The Secretary, Environmental Appeal Board, P.O. Box 2382, 2300 Yonge St., Suite 1201 Toronto, Ontario, M4P 1E4	The Director, Section 34, Ontario Water Resources Act Ministry of the Environment (issuing office)	The Environmental Commissioner, 1075 Bay St., 6th floor, Suite 605, Toronto, Ontario M5S 2W5

Further information on the Environmental Appeal Board's requirements for an appeal can be obtained directly from the Board by telephone at (416) 314-4600 by fax at (416) 314-4506 or website at www.ert.gov.on.ca

In the event of an appeal, the terms and conditions of the permit, as issued, would remain in effect until the appeal has been finalized. This instrument is subject to Section 38 of the ***Environmental Bill of Rights***, that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek leave to appeal for 15 days from the date of this decision is placed on the Environmental Registry. By accessing the Environmental Registry, you can determine when the leave to appeal period ends.

Dated at Hamilton, Ontario

This 18th day of October 2000

P. Odom

Director Section 34
Ontario Water Resources Act R.S.O. 1990

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Appendix B

Water Well Records

PW-1

Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 — 6712549 — Municipality 67004 — Con. CON 03

County or District: WELLINGTON
Township/Borough/City/Town/Village: WEST GARAFRAXA
Con / block / tract / survey, etc.: 3
Lot: 11
Owner's surname: FAIRVIEW GOLF & COUNTRY CLUB
First name:
Address: R.R.#3 FERGUS ONT. N1M 2W4
Date completed: 05 day 06 month 98 year

21 — Zone — Easting — Northing — RC — Elevation — RC — Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
BROWN	CLAY	SAND + GRAVEL		0	25
GREY	CLAY	SAND + GRAVEL		25	95
GREY	CLAY	GRAVEL + LIMESTONE	BROKEN	95	105
LIGHT BROWN	LIMESTONE			105	125
MED BROWN	LIMESTONE			125	155
LIGHT BROWN	LIMESTONE			155	235
LIGHT GREY	LIMESTONE			235	250
MED GREY	LIMESTONE			250	260
LIGHT GREY + BROWN	LIMESTONE			260	282
			TOTAL = 282 FT.		
6" CASING DRIVE	SHOE				

31
32

41 WATER RECORD

Water found at – feet	Kind of water
145	1 ☑ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
260	1 ☑ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
282	1 ☑ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
6"	1 ☑ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	+2	105
6"	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☑ Open hole 5 ☐ Plastic		105	282
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Sizes of opening (Slot No.) | Diameter inches | Length feet
Material and type | Depth at top of screen feet

G1 PLUGGING & SEALING RECORD

☑ Annular space ☐ Abandonment

Depth set at – feet From	Depth set at – feet To	Material and type (Cement grout, bentonite, etc.)
0	20	BENSEAL

71 PUMPING TEST

Pumping test method: 1 ☑ Pump 2 ☐ Bailer
Pumping rate: 30 GPM
Duration of pumping: ..... Hours ..... Mins
Water levels during: 1 ☑ Pumping 2 ☐ Recovery

Static level	Water level end of pumping	15 minutes	30 minutes	45 minutes	60 minutes
26 feet	66 feet	67 feet	68 feet	66 feet	66 feet

If flowing give rate: GPM
Pump intake set at: feet
Water at end of test: ☑ Clear ☐ Cloudy
Recommended pump type: ☐ Shallow ☑ Deep
Recommended pump setting: 100 feet
Recommended pump rate: 30 GPM

FINAL STATUS OF WELL

1 ☑ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

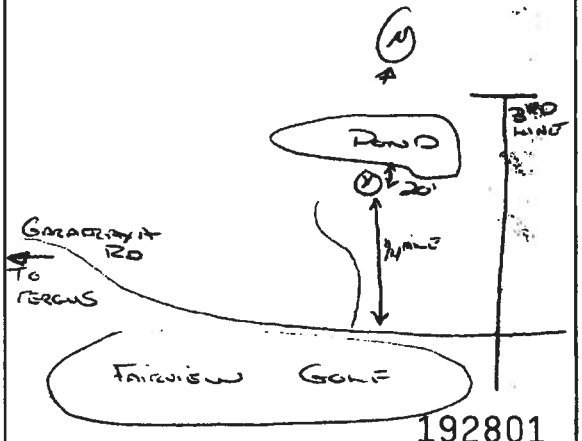
1 ☑ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not used 10 ☐ Other .....

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☑ Rotary (air) 5 ☐ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other .....

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



192801

Name of Well Contractor: JOHNSON WATER DRILLING INC. — Well Contractor's Licence No.: 2663
Address: R.R.#5 GUELPH ONT. N1H 6J2
Name of Well Technician: HENRY R. JOHNSON — Well Technician's Licence No.: T-0570
Signature of Technician/Contractor: — Submission date: 98 day 06 mo 98 yr

MINISTRY USE ONLY
Data source | Contractor: 2663 | Date received: JUN 18 1998
Date of inspection | Inspector
Remarks: CSS. SG

2 - MINISTER OF ENVIRONMENT & ENERGY COPY

0506 (07/94) Front Form 9

Water Well Stratigraphy and Completion Log

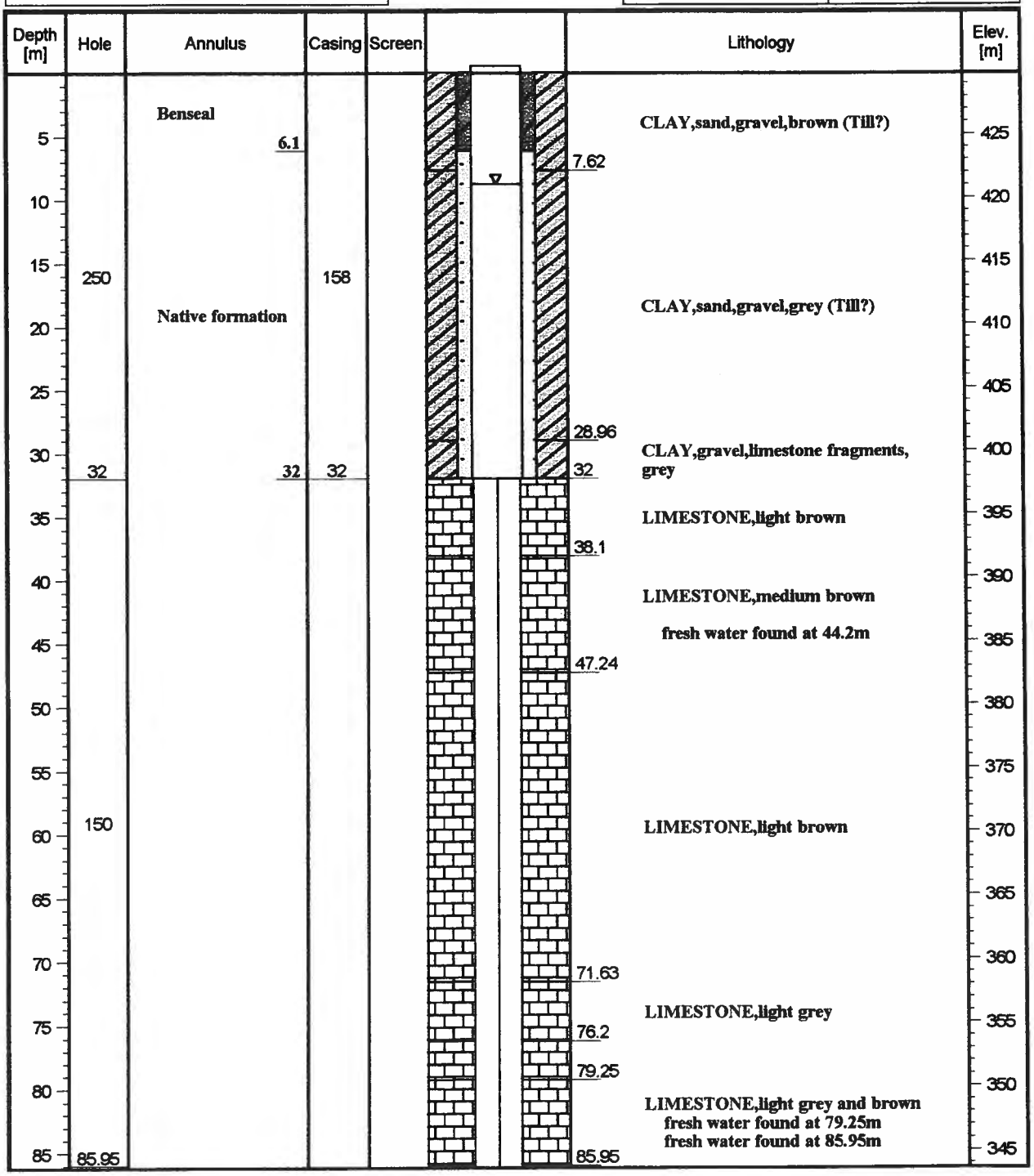
Well Ident	Name
192801	Irrigation Well PW-1, Fairview Golf and Club, Lot 11, Conc 3, W. Garafraxa

Drill. Method	Air Rotary	Drill. Dates	June 5, 1998

X	5511175	Y	4944590	Z	429.77	Meas. Pt. Elev.	430.37

Depths and elevations are in metres with diameters in millimetres. *Scales (1: xxx)*

Water Level (AMSL)	Vertical	Horizontal
421.05	485.0	20.0



Morrison Environmental Limited
Mississauga, Ontario

Figure 4

Ontario Ministry of the Environment

The Ontario Water Resources Act

WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 (1 2) **6714026** Municipality 67004 (10 14) Con. CON (15 22 23 24) 03

County or District	Township/Borough/City/Town/Village	Con	block	tract	survey, etc.	Lot (25-27)
HERNINGTON	WEST GARAFRAXA	3				11

Owner's surname (28-47)	First Name	Address	Date completed (48-53)
GILL NORTH		1171 KUSSUTH RD. CAMBRIDGE N3H 4R7	03 15 02 (day month year)

21 (1 2) UTM: Zone (10) Easting (12-17) Northing (18-24) RC (25) Elevation (26) RC (30) Basin Code (31) ii iii iv (47)

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
BLACK	TOP SOIL			0	3
BROWN	CLAY	STONES		3	35
BROWN	CLAY		HARD PAN	35	85
BROWN	CLAY	GRAVEL		85	104
GREY	LIMESTONE		BROKEN	104	108
GREY	LIMESTONE			108	165
BLUE	LIMESTONE			115	245
			TOTAL = 245 FT.		
		6 1/4" Casing	DRIVE SHOE		

31 (10 14 15 21) 32 (32 43 54 65 75 80)

41 WATER RECORD

Water found at - feet (10-13)	Kind of water					
245	1 ☑ Fresh	2 ☐ Salty	3 ☐ Sulphur	4 ☐ Minerals	5 ☐ Gas	6 (14)
(15-18)	1 ☐ Fresh	2 ☐ Salty	3 ☐ Sulphur	4 ☐ Minerals	5 ☐ Gas	6 (19)
(20-23)	1 ☐ Fresh	2 ☐ Salty	3 ☐ Sulphur	4 ☐ Minerals	5 ☐ Gas	6 (24)
(25-28)	1 ☐ Fresh	2 ☐ Salty	3 ☐ Sulphur	4 ☐ Minerals	5 ☐ Gas	6 (29)
(30-33)	1 ☐ Fresh	2 ☐ Salty	3 ☐ Sulphur	4 ☐ Minerals	5 ☐ Gas	6 (34) 60

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
(10-11) 6"	1 ☑ Steel (12) 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188 + 1		(13-16) 108
(17-18)	1 ☐ Steel (19) 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic		108	(20-23) 245
(24-25)	1 ☐ Steel (26) 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			(27-30)

SCREEN

Sizes of opening (Slot No.) (31-33)	Diameter (34-38) inches	Length (39-40) feet
Material and type	Depth at top of screen (41-44) feet	(30)

61 PLUGGING & SEALING RECORD

☑ Annular space ☐ Abandonment

Depth set at - feet From (10-13)	To (14-17)	Material and type (Cement grout, bentonite, etc.)
0	2	GROUT SEAL
(18-21)	(22-25)	
(26-29)	(30-33)	(80)

71 PUMPING TEST

Pumping test method (10) 1 ☐ Pump 2 ☐ Bailer	Pumping rate (11-14) GPM	Duration of pumping (15-16) Hours (17-18) Mins
	15	1

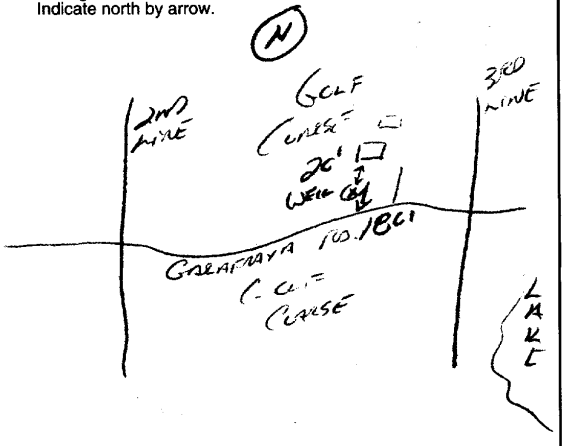
Static level (19-21)	Water level end of pumping (22-24)	Water levels during (25) 1 ☑ Pumping 2 ☐ Recovery			
		15 minutes (26-28)	30 minutes (29-31)	45 minutes (32-34)	60 minutes (35-37)
31 feet	119 feet	101 feet	112 feet	118 feet	119 feet

If flowing give rate (38-41) GPM	Pump intake set at feet	Water at end of test (42) ☑ Clear ☐ Cloudy
Recommended pump type ☐ Shallow ☑ Deep	Recommended pump setting (43-45) 150 feet	Recommended pump rate (46-49) GPM

(50-53)

LOCATION OF WELL

In diagram below show distances of well from road and lot line.
Indicate north by arrow.



235147

FINAL STATUS OF WELL (54)

1 ☑ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE (55-56)

1 ☑ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not use 10 ☐ Other

METHOD OF CONSTRUCTION (57)

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☑ Rotary (air) 5 ☐ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

Name of Well Contractor	Well Contractor's Licence No.
JOHNSON WELL DRILLING LTD	2663
Address: RR #5 GUELPH ONT. N1H 6J2	
Name of Well Technician: JOHN WHITNEY	Well Technician's Licence No. T-2790
Signature of Technician/Contractor	Submission date: 04 02 (day mo yr)

MINISTRY USE ONLY

Data source (58)	Contractor (59-62)	Date received (63-68) (80)
	2663	APR 15 2002
Date of inspection	Inspector	
Remarks		

CSS.ES2

0506 (07/00) Front Form 9

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Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 — 6713016 — Municipality 67004 — Con. CON 03

County or District	Township/Borough/City/Town/Village	Con	Block	tract	survey, etc.	Lot
WELLINGTON	WEST GARAFRAXA		3			11

Owner's surname	First name	Address	Date completed (day / month / year)
FAIRVIEW GOLF CLUB		RR#3 FERGUS N1M 2W4	24 / 06 / 99

21 — UTM Zone — Easting — Northing — RC — Elevation — RC — Basin Code — ii — iii — iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
	TOP SOIL			0	1
BROWN	CLAY	SAND, STONES		1	25
BROWN	CLAY	GRAVEL		25	90
GREY	SAND	GRAVEL		90	125
BROWN	CLAY	SAND		125	170
BROWN	CLAY	SAND GRAVEL		170	188
LIGHT BROWN	LIMESTONE		BROKEN	188	192
LIGHT BROWN	LIMESTONE			192	265
MED GREY	LIMESTONE			265	285
MED GREY-BROWN	LIMESTONE			285	310
	6" CASING DRIVE SHOE		TOTAL = 310'		

31

32

41 WATER RECORD

Water found at – feet	Kind of water
210	1 ☑ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
260	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
300	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
310	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
6"	1 ☑ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	+2	92
6"	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☑ Open hole 5 ☐ Plastic		92	310
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter inches	Length feet
Material and type	Depth at top of screen feet	

61 PLUGGING & SEALING RECORD

☑ Annular space ☐ Abandonment

Depth set at – feet From	To	Material and type (Cement grout, bentonite, etc.)
0	26	BENSEAL

71 PUMPING TEST

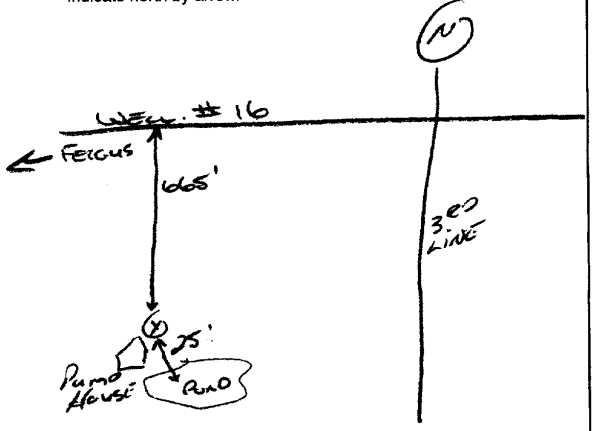
Pumping test method	Pumping rate	Duration of pumping Hours Mins
1 ☑ Pump 2 ☐ Bailer	30 GPM	1 Hours 0 Mins

Static level	Water level end of pumping	Water levels during 1 ☑ Pumping 2 ☐ Recovery: 15 minutes	30 minutes	45 minutes	60 minutes
45 feet	110 feet	65 feet	85 feet	110 feet	110 feet

If flowing give rate	Pump intake set at	Water at end of test
GPM	feet	☐ Clear ☐ Cloudy
Recommended pump type: ☐ Shallow ☐ Deep	Recommended pump setting: 180 feet	Recommended pump rate: 30 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line.
Indicate north by arrow.



198880

FINAL STATUS OF WELL

1 ☑ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

1 ☑ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not used 10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☑ Rotary (air) 5 ☐ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

Name of Well Contractor	Well Contractor's Licence No.
HAMILTON WELL DRILLING LTD	2663
Address: RR#5 GUELPH N1H 6J2	
Name of Well Technician: Henry McHamilton	Well Technician's Licence No. T-6590
Signature of Technician/Contractor	Submission date: 07 / 07 / 99 (day / mo / yr)

MINISTRY USE ONLY

Data source	Contractor	Date received
	2663	JUL 06 1999
Date of inspection	Inspector	
Remarks		

0506 (07/94) Front Form 9

2 - MINISTER OF ENVIRONMENT & ENERGY COPY

MINISTRY OF THE ENVIRONMENT

The Ontario Water Resources Act

Ontario

WATER WELL RECORD

CORRESPONDENCE TO 408/GW
A.M. CILWRAITH
490 TOWER SIS
FERGUS ONT

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 | 6706408 | MUNICIP. 67004 | CON. CON | 03

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
WELLINGTON	WEST GARAFRAXA	THREE	9 & 10

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
FAIRVIEW COUNTRY CLUB	R.R.3 FERGUS	DAY 18 MO 05 YR 77

21 | UTM ZONE 17 | EASTING 551500 | NORTHING 4843600 | PC 5 | ELEVATION 1410 | PC 5 | BASIN CODE 23

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown		Surface stones		0	259
Gray		rock		259	356

31 | 02596 05 12 | 03562 12

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0356	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
5	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	0260
05			260	356
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			0356
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET	

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☐ PUMP 2 ☐ BAILER	0015 GPM	05 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
065 FEET	085 FEET		085 FEET	085 FEET	085 FEET	085 FEET

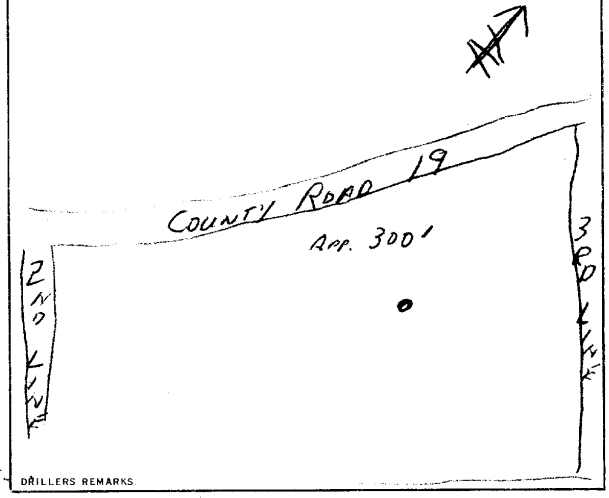
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	150 FEET	1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☒ DEEP	100 FEET	0015 GPM

50-53 ____ GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS:

FINAL STATUS OF WELL 1	1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL	5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED
WATER USE 01	1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER	5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED
METHOD OF DRILLING 2	1 ☐ CABLE TOOL 2 ☒ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION	6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR	LICENCE NUMBER
Albert Earley	1906
ADDRESS: 202 Meeve St Guelph	
NAME OF DRILLER OR BORER	LICENCE NUMBER
Albert Earley	1906
SIGNATURE OF CONTRACTOR: Albert Earley	SUBMISSION DATE: DAY 18 MO May YR 77

OFFICE USE ONLY

DATA SOURCE	CONTRACTOR	DATE RECEIVED
1	1906	2 10677

DATE OF INSPECTION: July 1979 INSPECTOR: EJ

REMARKS: CSS.S8

P

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FORM 7 MOE 07-091

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act

WATER WELL RECORD

40P/16 W

Ontario

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

(11) 6706528 | MUNICIP 67004 | CON. CON 03

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Wellington	West Garafraxa	Con. 3	011

[redacted] Metcalfe St. Elora Ontario

DATE COMPLETED: DAY 01 MO 09 YR 77

UTM: 544200 | RC 5 | ELEVATION 1410 | RC 5 | BASIN CODE 23

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
brown	clay	sand		0	34
grey	hardpan	stones		34	50
brown	sand			50	76
grey	clay			76	100
grey	limestone			100	180

(31) 0034160528 | 0050214/12 | 0076028 | 0100205 | 0180215

(32)

(41) WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0180	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

(51) CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
04	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	0104
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

(61) PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

(71) PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☒ PUMP 2 ☐ BAILER	0009 GPM	01 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
027 FEET	075 FEET		FEET	FEET	FEET 075	FEET

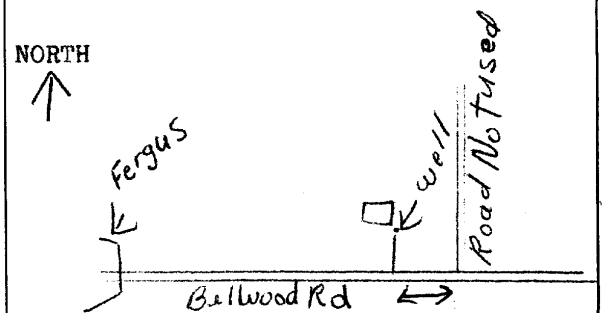
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	90 FEET	1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☒ DEEP	090 FEET	0007 GPM

GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS:

FINAL STATUS OF WELL 1 — 1 ☒ WATER SUPPLY; 2 ☐ OBSERVATION WELL; 3 ☐ TEST HOLE; 4 ☐ RECHARGE WELL; 5 ☐ ABANDONED, INSUFFICIENT SUPPLY; 6 ☐ ABANDONED, POOR QUALITY; 7 ☐ UNFINISHED

WATER USE 01 — 1 ☒ DOMESTIC; 2 ☐ STOCK; 3 ☐ IRRIGATION; 4 ☐ INDUSTRIAL; ☐ OTHER; 5 ☐ COMMERCIAL; 6 ☐ MUNICIPAL; 7 ☐ PUBLIC SUPPLY; 8 ☐ COOLING OR AIR CONDITIONING; 9 ☐ NOT USED

METHOD OF DRILLING 4 — 1 ☐ CABLE TOOL; 2 ☐ ROTARY (CONVENTIONAL); 3 ☐ ROTARY (REVERSE); 4 ☒ ROTARY (AIR); 5 ☐ AIR PERCUSSION; 6 ☐ BORING; 7 ☐ DIAMOND; 8 ☐ JETTING; 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Hugh Morrison Well Drilling Ltd. | LICENCE NUMBER: 3740

ADDRESS: R. R. 5, Mount Forest, Ont.

NAME OF DRILLER OR BORER: Hugh Morrison | LICENCE NUMBER: 3740

SIGNATURE OF CONTRACTOR: Hugh Morrison | SUBMISSION DATE: DAY ____ MO. ____ YR. ____

OFFICE USE ONLY

DATA SOURCE 1 | CONTRACTOR 3740 | DATE RECEIVED J 41088

DATE OF INSPECTION July 13/78 | INSPECTOR

REMARKS:

CSS.S8 | P | WI

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FORM 7 MOE 07-091

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 | 6710384 | MUNICIP 67004 | CON.

COUNTY OR DISTRICT: WELLINGTON | TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: WEST GARAFRAXA | CON | BLOCK, TRACT, SURVEY, ETC | LOT: 1/2 9+10

ADDRESS OF WELL LOCATION: [redacted] RR#3 FERGUS NIM 2W4 | DATE COMPLETED: DAY 27 MO 06 YR 90

21 | UTM | NORTHING | RC | ELEVATION | RC | BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
	TOP SOIL			0	1
	SAND			1	15
	CLAY		HARD PAN	15	80
	BOULDERS	GRAVEL		80	95
GREY	LIMESTONE			95	130
BROWN	LIMESTONE			130	166
			TOTAL		166'
			6" CASING SHOE		

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
166	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6"	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	95½
6"	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC		95½	166
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.) | DIAMETER (INCHES) | LENGTH (FEET)

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN (FEET)

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD, PACKER, ETC.)
10-13	14-17	
18-21	22-25	
26-29	30-33	

71 PUMPING TEST

METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☐ PUMP 2 ☒ BAILER	15 GPM	1 HOURS — MINS

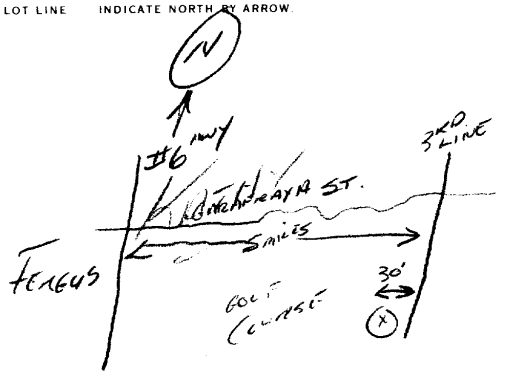
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☐ PUMPING 2 ☒ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
40 FEET	FEET		40 FEET	40 FEET	40 FEET	40 FEET

IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	FEET	1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☒ DEEP	146 FEET	15 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



83452

DRILLERS REMARKS

FINAL STATUS OF WELL

1 ☒ WATER SUPPLY | 2 ☐ OBSERVATION WELL | 3 ☐ TEST HOLE | 4 ☐ RECHARGE WELL | 5 ☐ ABANDONED, INSUFFICIENT SUPPLY | 6 ☐ ABANDONED, POOR QUALITY | 7 ☐ UNFINISHED | ☐ DEWATERING

WATER USE

1 ☒ DOMESTIC | 2 ☐ STOCK | 3 ☐ IRRIGATION | 4 ☐ INDUSTRIAL | ☐ OTHER | 5 ☐ COMMERCIAL | 6 ☐ MUNICIPAL | 7 ☐ PUBLIC SUPPLY | 8 ☐ COOLING OR AIR CONDITIONING | 9 ☐ NOT USED

METHOD OF CONSTRUCTION

1 ☐ CABLE TOOL | 2 ☐ ROTARY (CONVENTIONAL) | 3 ☐ ROTARY (REVERSE) | 4 ☒ ROTARY (AIR) | ☐ AIR PERCUSSION | 6 ☐ BORING | 7 ☐ DIAMOND | 8 ☐ JETTING | 9 ☐ DRIVING | ☐ DIGGING | ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: HANLEY WELL DRILLING | WELL CONTRACTOR'S LICENCE NUMBER: 2663

ADDRESS: RR#5 GUELPH ONT. N1H 6J2

NAME OF WELL TECHNICIAN: HENRY R. HANLEY | WELL TECHNICIAN'S LICENCE NUMBER: T-0590

SIGNATURE OF TECHNICIAN/CONTRACTOR: [signature] | SUBMISSION DATE: DAY 01 MO 08 YR 90

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR: 2663 | DATE RECEIVED: JUL 17 1990

DATE OF INSPECTION | INSPECTOR

REMARKS: CSS.ES

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 6712681 Municipality 67004 Con. CON 03

83-98

County or District: WELLINGTON
Township/Borough/City/Town/Village: WEST GARAFRAXA TWP.
Con block tract survey, etc.: CON 3
Lot: 11
Address: RR#3 FERGUS, ONT. N1M-2W4
Date completed: 11 day 09 month 98 year

21 Northing RC Elevation RC Basin Code ii iii iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
BROWN	CLAY	STONES		0	10
GREY	CLAY	STONES		10	75
GREY	CLAY	SAND - GRAVEL		75	80
GREY	CLAY	BOULDERS		80	103
GREY	ROCK			103	145
BROWN	ROCK			148	185
			TOTAL DEPTH	185'	
		6" DRIVE SHOE			

31
32

41 WATER RECORD

Water found at - feet	Kind of water
180-185	1 [X] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 6 [ ] Gas
	1 [ ] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 6 [ ] Gas
	1 [ ] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 6 [ ] Gas
	1 [ ] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 6 [ ] Gas
	1 [ ] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 6 [ ] Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
6"	1 [X] Steel 2 [ ] Galvanized 3 [ ] Concrete 4 [ ] Open hole 5 [ ] Plastic	.188	+2	104
6"	1 [ ] Steel 2 [ ] Galvanized 3 [ ] Concrete 4 [X] Open hole 5 [ ] Plastic		104	185
	1 [ ] Steel 2 [ ] Galvanized 3 [ ] Concrete 4 [ ] Open hole 5 [ ] Plastic			

SCREEN

Sizes of opening (Slot No.) | Diameter inches | Length feet
Material and type | Depth at top of screen feet

61 PLUGGING & SEALING RECORD

[X] Annular space [ ] Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
0	25	BENTONITE

71 PUMPING TEST

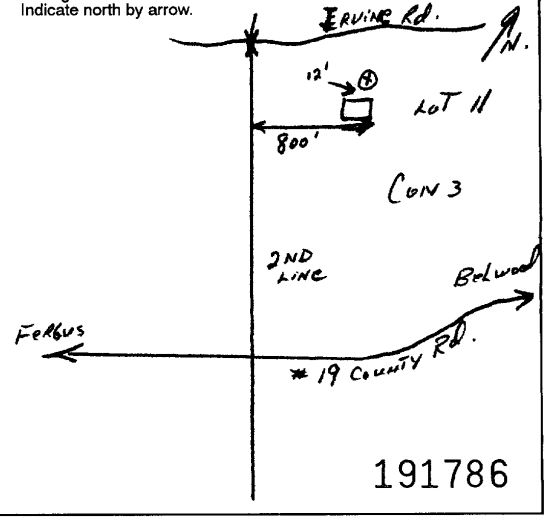
Pumping test method: 1 [X] Pump 2 [ ] Bailer
Pumping rate: 30 GPM
Duration of pumping: 1 Hours 0 Mins

Static leve	Water level end of pumping	Water levels during: 1 [X] Pumping 2 [ ] Recovery	15 minutes	30 minutes	45 minutes	60 minutes
30 feet	55 feet		48 feet	55 feet	55 feet	55 feet

If flowing give rate: GPM
Pump intake set at: feet
Water at end of test: [X] Clear [ ] Cloudy
Recommended pump type: [ ] Shallow [X] Deep
Recommended pump setting: 80 feet
Recommended pump rate: 15-20 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line.
Indicate north by arrow.



191786

FINAL STATUS OF WELL

1 [X] Water supply 2 [ ] Observation well 3 [ ] Test hole 4 [ ] Recharge well 5 [ ] Abandoned, insufficient supply 6 [ ] Abandoned, poor quality 7 [ ] Abandoned (Other) 8 [ ] Dewatering 9 [ ] Unfinished 10 [ ] Replacement well

WATER USE

1 [X] Domestic 2 [X] Stock 3 [ ] Irrigation 4 [ ] Industrial 5 [ ] Commercial 6 [ ] Municipal 7 [ ] Public supply 8 [ ] Cooling & air conditioning 9 [ ] Not used 10 [ ] Other

METHOD OF CONSTRUCTION

1 [ ] Cable tool 2 [ ] Rotary (conventional) 3 [ ] Rotary (reverse) 4 [X] Rotary (air) 5 [ ] Air percussion 6 [ ] Boring 7 [ ] Diamond 8 [ ] Jetting 9 [ ] Driving 10 [ ] Digging 11 [ ] Other

Name of Well Contractor: GRAHAM WELL DRILLING LTD
Well Contractor's Licence No.: 2336
Address: RR#5 ROCKWOOD, ONT. N0B-2K0
Name of Well Technician: Jim Wilson
Well Technician's Licence No.: T-1924
Signature of Technician/Contractor:
Submission date: 30 day 09 mo 98 yr

MINISTRY USE ONLY
Data source | Contractor 2336 | Date received OCT 07 1998
Date of inspection | Inspector
Remarks

CSS. ES9

0506 (07/94) Front Form 9

2 - MINISTER OF ENVIRONMENT & ENERGY COPY

9

UTM Z E
9 R N
Elev. 9 R 1410
Basin 23

ONTARIO

The Well Drillers Act
Department of Mines, Province of Ontario

67 No. 2915
DEPARTMENT OF MINES
JAN 18 1951
TO W 1/4

Water Well Record

County or Territorial District WELLINGTON Township, ~~Village, Town or City~~ WEST CARAFRAXA
Con. 3 Lot 11 Street and Number (if in Village, Town or City)
Owner [redacted] Address R.R.#3 FERGUS
Date Completed 12 (day) 1 (month) 1951 (year) Cost of Well (excluding pump) 540.00

Pipe and Casing Record

Casing diameter(s) 4" steel
Length(s) of casing(s) Stick up 125
Type of screen
Length of screen
Distance from top of screen to ground level
Is well a gravel-wall type? No

Pumping Test

Date Jan 12/51
Static level 23 ft.
Pumping level 130 ft
Pumping rate 11 gal per min
Duration of test 1 hr
Distance from cylinder or bowls to ground level

Water Record

Kind (fresh or mineral) FRESH
Quality (hard, soft, contains iron, sulphur, etc.) HARD
Appearance (clear, cloudy, coloured) CLEAR
For what purpose(s) is the water to be used? FARM PURPOSE
How far is well from possible source of contamination? 150 ft.
What is the source of contamination? SEPTIC TANK
Enclose a copy of any mineral analysis that has been made of water

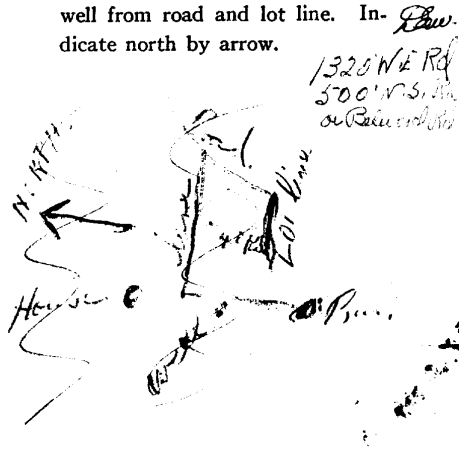
Depth(s) to Water Horizon(s)	Kind of Water	No. of Feet Water Rises
~~3 [illegible]~~	HARD	1.5
156		

Well Log

Overburden and Bedrock Record	From	To
	0 ft.	....ft.
Clay	0	80
Sand	80	120
Rock	120	156

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



Situation: Is well on upland, in valley, or on hillside? upland
Drilling Firm Charles Hill
Address St. Mary's
Name of Driller Charles Hill Address St. Mary's
Date Jan 12/51 Licence Number 74
Charles Hill
Signature of Licensee

FORM 5

CSS.S8

UTM Z E
R N
Elev. R

67 No 2914

The Ontario Water Resources Commission Act

WATER WELL RECORD

Basin
County or District Wellington
Township, Village, Town or City West Garafraxa
Con. #3 III Lot #10
Date completed 13th (day) December (month) 1967 (year)
[redacted]
dress R R # 3, Fergus, Ont.

Casing and Screen Record

Inside diameter of casing 5 inch
Total length of casing 99 ft
Type of screen ---
Length of screen ---
Depth to top of screen ---
Diameter of finished hole 5 inch
with 5 inch shoe

Pumping Test

Static level 40 ft
Test-pumping rate 10 G.P.M.
Pumping level 60 ft
Duration of test pumping 1½ hours
Water clear or cloudy at end of test Clear
Recommended pumping rate 10 G.P.M.
with pump setting of 80 feet below ground surface

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Water Record: Depth(s) at which water(s) found	Water Record: Kind of water (fresh, salty, sulphur)
tpp soil	0	2	175 ft	fresh
dark brown clay & stones	2	30		
light brown clay & stones	30	84		
brown clay & gravel	84	97		
light brown rock	97	145		
light brown & grey rock	145	160		
light brown rock	160	180		
total Depth - 180 ft.				

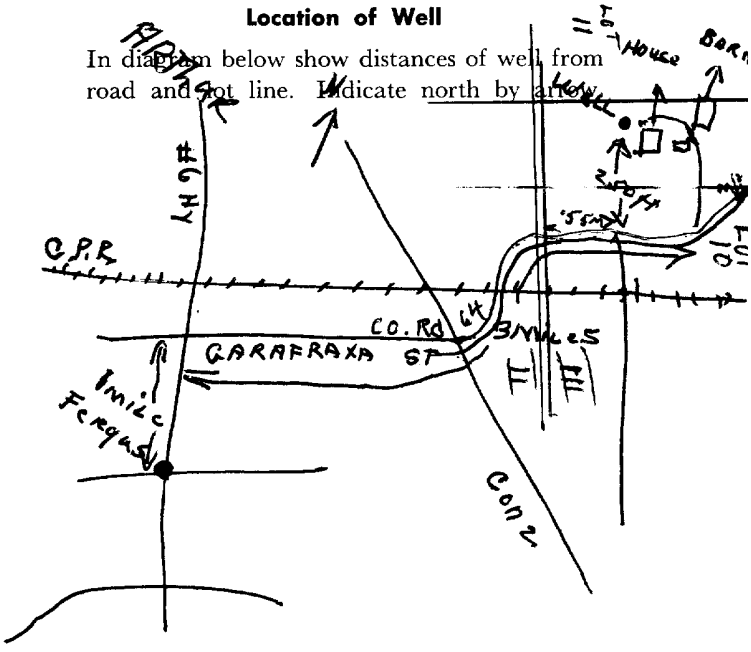
For what purpose(s) is the water to be used? D. & S.
farm
Is well on upland, in valley, or on hillside? upland
Drilling or Boring Firm Graham Well Drilling
Address 19 Kingsley Crt. Guelph Ont.
Licence Number 2453
Name of Driller or Borer James Hawkins
Address Sheridan Street Guelph Ont.
Date Dec 18/67
J L Graham per NEG.
(Signature of Licensed Drilling or Boring Contractor)

Form 7 15M-60-4138

OWRC COPY

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



CSS.S8

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix C

Well Testing Program Report

(Morrison Environmental Ltd, 1999)

Well Testing Program

at the

Proposed 18 Hole Golf Course Expansion

Lot 11, Concession 3, Township of West Garafraxa Wellington County

Prepared For

Fairview Golf and Country Club

File no.: 149-991

June 1999

Morrison Environmental Limited
1087 Meyerside Drive, Unit 1
Mississauga, Ontario
L5T 1M5
Phone: (905) 564-8944
Fax: (905) 564-8952
E-mail: morrison.env@sympatico.ca

TABLE OF CONTENTS

Text

1.0 INTRODUCTION 1

2.0 BACKGROUND 1

3.0 WATER REQUIREMENTS 2

4.0 GEOLOGY 3

4.1 Overburden 3
4.2 Bedrock 3

5.0 HYDROGEOLOGY 4

5.1 Surface Water 4
5.2 Overburden 4
5.3 Bedrock 4

6.0 PUMPING AND OBSERVATION WELLS 5

6.1 Proposed Irrigation Well PW-1 Completion 5
6.2 Observation Wells 6

7.0 HYDRAULIC TESTING 7

7.1 Step-Drawdown Pumping Test 8
7.2 Aquifer Performance Pumping Test 8
7.3 Discussion of Results 9
7.3.1 Step-Drawdown Pumping Test 9
7.3.2 Aquifer Performance Pumping Test 10

8.0 INTERFERENCE EFFECTS 13

9.0 SAFE PERENNIAL WELL YIELD 14

10.0 RECHARGE 15

11.0 WATER QUALITY TESTING 15

11.1 Chemical Water Quality 15
11.2 Bacteriological Water Quality 16

12.0 CONCLUSIONS 17

13.0 RECOMMENDATIONS 17

Figures

Figure 1 Topographic Location Plan
Figure 2 Air Photograph Location Plan
Figure 3 Water Well Record – PW-1
Figure 4 Well Log – Stratigraphy and Well Completion Log - PW-1
Figure 5 Observation Well Location Plan
Figure 6 Water Well Stratigraphy and Completion Log Heseltine Drilled Well MoE #67-2915
Figure 7 Site Photograph Heseltine Drilled Well – MoE #67-2915
Figure 8 Water Well Record – "Snider" Observation Well – MoE #83452
Figure 9 Step Drawdown Pumping Test – Semi-logarithmic Plot - Drawdown Versus Time –Irrigation Well – PW-1
Figure 10 Step Drawdown Pumping Test – Arithmetic Plot – Drawdown versus Pumping Test –Irrigation Well – PW-1
Figure 11 Aquifer Performance Pumping Test – Semi-logarithmic Plot - Drawdown Versus Time Irrigation Well PW-1
Figure 12 Aquifer Performance Pumping Test – Semi-logarithmic Plot - Drawdown Versus Time Heseltine Drilled Observation Well - MoE #67-2915
Figure 13 Aquifer Performance Pumping Test – Semi-logarithmic Plot - Drawdown Versus Time Heseltine Bored Observation Well
Figure 14 Aquifer Performance Pumping Test – Drawdown Versus Time "Snider" Observation Well MoE #83452
Figure 15 Aquifer Performance Pumping Test – Semi-logarithmic Plot - Drawdown Versus Time Iravani Drilled Observation Well
Figure 16 Aquifer Performance Pumping Test – Semi-logarithmic Plot - Drawdown Versus Time Kerr Drilled Observation Well
Figure 17 Aquifer Performance Pumping Test – Semi-logarithmic Plot - Drawdown Versus Time "Smeltzer" Drilled Observation Well
Figure 18 Aquifer Performance Pumping Test – Semi-logarithmic Plot – Drawdown Versus Time "Smeltzer" Bored Observation Well
Figure 19 Aquifer Performance Pumping Test – Semi-logarithmic Plot - Drawdown Versus Distance

Appendices

Appendix A MoE Water Well Record – Summaries
Appendix B Laboratory Water Quality Results
Appendix C Permit to Take Water

1.0 INTRODUCTION

At the request of Mr. Gordon Phillips on behalf of Fairview Golf and Country Club, Morrison Environmental Limited (MEL) undertook a testing program for a proposed irrigation well on lands within Part of Lot 11, Concession 3, Township of West Garafraxa in Wellington County.

A proposed 18 hole golf course expansion on an approximate 38 hectare (94 acre) site, is located west of County Road 19 and south of the Third Concession Road. The existing Fairview Golf and Country Club, 9 hole course immediately east of County Road 19 abuts the proposed expansion lands. The owner has indicated that the proposed irrigation well will provide topping-up capability for two on-site ponds. These ponds will be used for turf irrigation.

In our study, we will look at the background work that has been performed at the site, review the water supply requirements, regional geology and hydrogeology, briefly outline the irrigation well completion, discuss the hydraulic testing, interference effects, safe well yield and recharge. We will then provide conclusions and make recommendations.

2.0 BACKGROUND

Initial golf course grading and landscaping have occurred on the proposed subject site. We understand that four manmade ponds were constructed in 1998 on the holding. From a sketch plan provided by the owners, two principal irrigation storage ponds, each about 8,400 m^2 (2 acres) have a combined storage of about 84,000 m^2 (18,500,000 gallons). Pond depth is understood to average 5 m (17 ft). A pumphouse has been constructed adjacent the principal

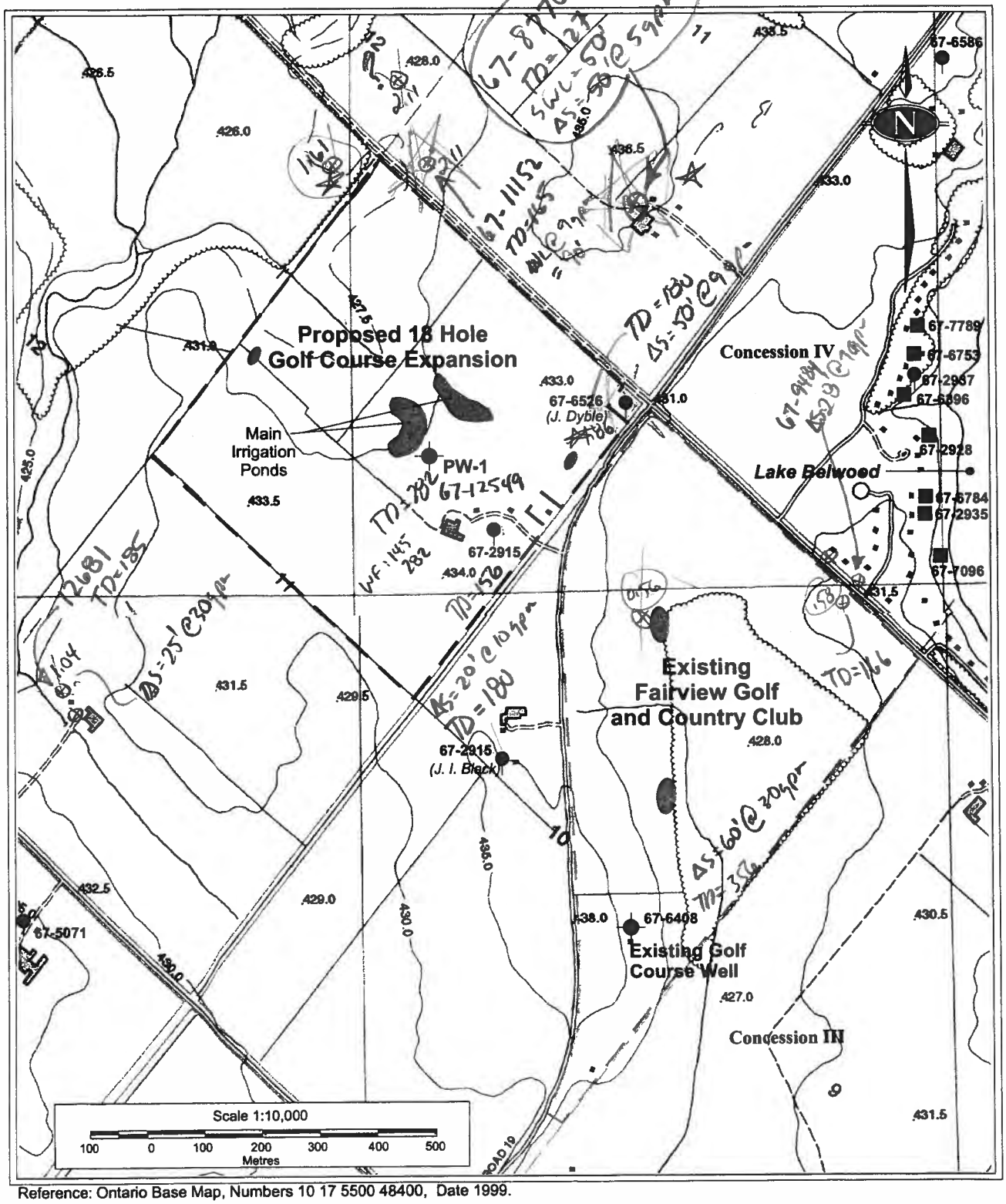
pond and draws water through a wet well and buried line leading from the primary pond. An underground pipeline fitted with a valve connects the two main ponds. The below ground valve allows flow separation between the storage ponds. The proposed irrigation supply well is situated immediately east of the pumphouse. At the time of the test pumping, the wellhead piping arrangement allowed flow to discharge to the pond, or to the irrigation system, or to both.

Figure 1 shows a 1:10000 topographic location map showing the general location of the proposed golf course expansion and the existing Fairview Golf and Country Club 9 hole course in relation to topography, geographic features and surface water bodies. Also plotted on the same figure are the location of water wells on file with the Ministry of the Environment (MoE). Appendix A presents the water well record summary printouts from which the well locations were obtained.

3.0 WATER REQUIREMENTS

The irrigation requirement for the "topping-up" irrigation well has been identified by the owners as 2.3 L/s (30 lgpm) continuously for 150 days. The estimated demand is therefore approximately 1,375,000 L/week (302,400 lgal/week) or about 0.93 L/s (12.3 lgpm) continuously on an annual basis.

Total irrigation requirements according to the owners is to be provided by a combination of surface water, field tile drainage and groundwater from the tested bedrock aquifer.



Reference: Ontario Base Map, Numbers 10 17 5500 48400, Date 1999.

LEGEND

— — — - SUBJECT PROPERTY LINE

- PUMPING WELL

■ - DRILLED/BORED OVERBURDEN WELL (on File with MOE Water Well Records)

● - DRILLED BEDROCK WELL (on File with MOE Water Well Records)

Morrison Environmental Limited
Groundwater Experts

Well Testing Program

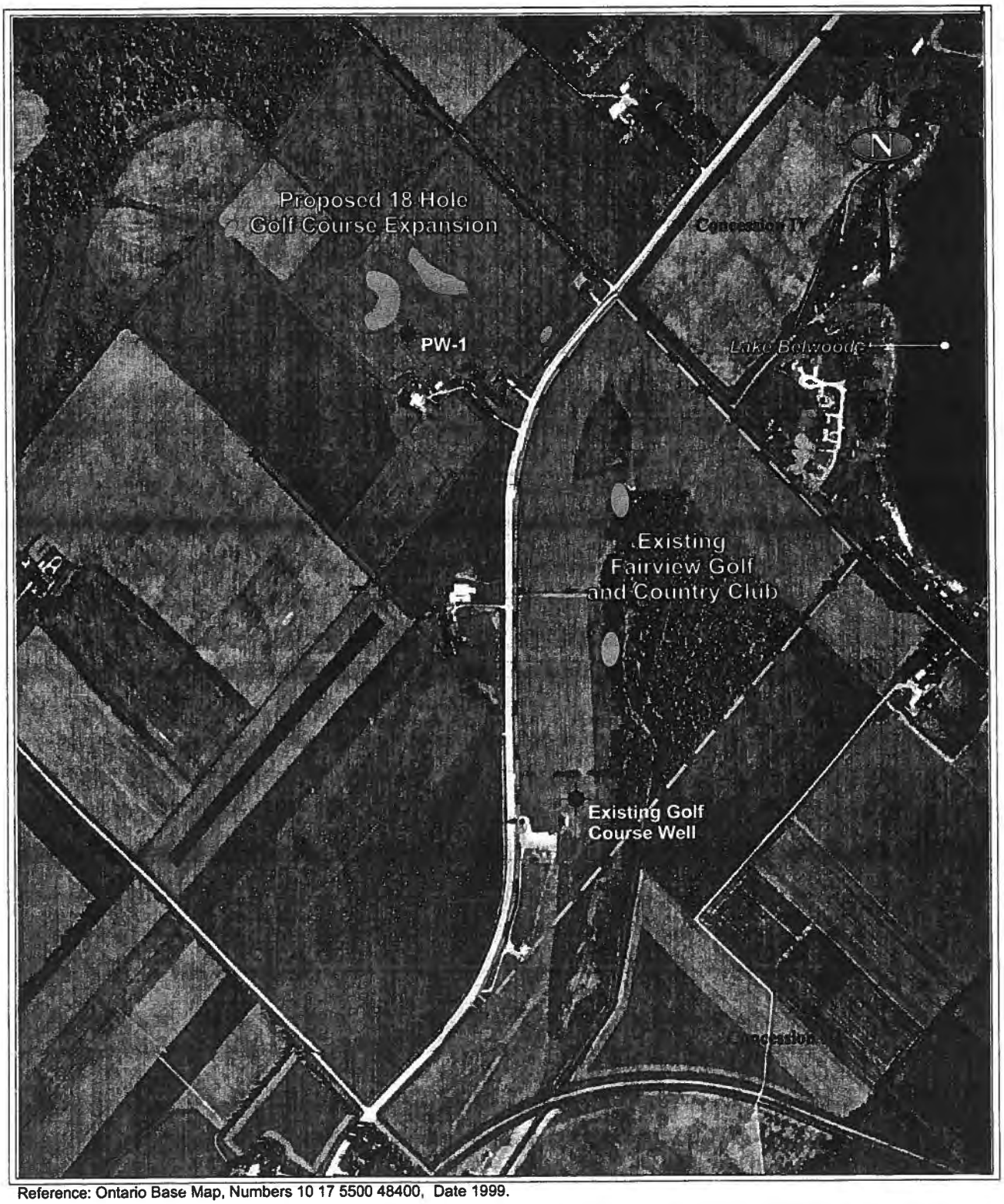
Fairview Golf and Country Club

Lot 11, Con. 3, Township of West Garafraxa, Wellington County

TOPOGRAPHIC LOCATION PLAN

For Gordon Phillips

June 1999	149-991	**FIGURE 1**



Reference: Ontario Base Map, Numbers 10 17 5500 48400, Date 1999.

LEGEND

— — — - SUBJECT PROPERTY LINE

✦ - PUMPING WELL

Scale 1:10,000

100 0 100 200 300 400 500 Metres

Morrison Environmental Limited

Groundwater Experts

Well Testing Program

Fairview Golf and Country Club

Lot 11, Con. 3, Township of West Garafraxa, Wellington County

TOPOGRAPHIC LOCATION PLAN

For Gordon Phillips

June 1999	149-991	**FIGURE 2**

4.0 GEOLOGY

The geology of the general area consists of glacial till and glacial sediments overlying a limestone/dolostone bedrock.

4.1 Overburden

It is interpreted from the report on the Quaternary Geology of the Orangeville Area of Southern Ontario by W. R. Cowan, that a silt to clayey silt till, referred to as the Tavistock Till, overlies the northern half of the study site. Within the southern portion of the holding, a sandy silt till known as the Port Stanley Till is interpreted to outcrop at surface. Surficial deposits of glaciofluvial outwash sand have been mapped to the immediate east of County Road 19 surrounding Lake Belwood. Extensive deposits of outwash gravel and gravelly sand, frequently overlain by several feet of sand or silt has been mapped about 600 m (2000 feet) northeast of the study site.

Gravel and sand intervals exists within the overburden based on local water well records. Overburden thickness varies from 29.6 to 36.6 m (97 to 120 feet) in the immediate vicinity.

4.2 Bedrock

The bedrock which subcrops beneath the overburden sequence in the area is not known to outcrop in the vicinity of the site. Water well logs in the immediate area, and geologic reports suggest that a buff coloured crystalline dolostone of the Guelph Formation underlies the glacial

overburden. The water bearing unit extends to at least 86 m (282 feet) below grade at the PW-1 site. The lower part of the water bearing formation is the grey Amabel Formation of Silurian Age.

5.0 HYDROGEOLOGY

5.1 Surface Water

Other than the previously mentioned four dug ponds, no other water bodies, perennial streams or creek were noted on the golf course expansion property. A water-filled municipal ditch was noted along the western property boundary.

5.2 Overburden

Water bearing horizons exist locally in the more permeable granular sand and gravel intervals which occur within the glacial overburden deposits. Water well records on file with the MoE, such as for the on-site well (MoE #67-2915), indicate that such granular aquifers exist either immediately overlying or close to the overburden/bedrock contact. Around Lake Belwood, east of the site, a number of shallow dug and drilled wells were completed into water bearing sand and gravels to supply the seasonal cottages.

5.3 Bedrock

Water bearing aquifers exist within the bedrock. These aquifers yield water from fractures and fissures within the dolostone/limestone bedrock. The productivity of a well intercepting such a water bearing interval depends on the number, size and interconnection of the rock fractures and the number of fractures intercepted by the well.

At the study site, three water bearing horizons were encountered in the limestone/dolostone. Although the upper fracture at 44.2 m (145 feet) in PW-1 may be related to the productive fracture zones in neighbouring bedrock drilled wells, the lower two zones may also be hydraulically connected to the upper one. Consequently, all three zones have been interpreted to act as a single bedrock aquifer unit.

Groundwater movement within the dolomite bedrock is interpreted to occur toward the Grand River in a general southerly direction (Major Aquifer in Ontario, Guelph – Amabel Aquifer, Hamilton to Orangeville, Hydrogeologic Map 78-3, MoE, Water Resources Brand, M.E. Turner, 1978).

6.0 PUMPING AND OBSERVATION WELLS

6.1 Proposed Irrigation Well PW-1 Completion

The well drilling of PW-1 was performed by Hanlon Well Drilling Limited of Guelph, Ontario using an air rotary drilling rig. Formation samples were taken during drilling to monitor changing

stratigraphic conditions. Once the overburden had been fully penetrated, a 150 mm (6 inch) diameter steel casing equipped with a casing drive shoe was lowered into the hole and socketed into the limestone bedrock at a depth of 32 m (105 feet) below ground surface.

Drilling then proceeded through the underlying bedrock using a tri-cone bit and air to remove the drilling cuttings. The air rotary method allowed the location of water bearing formation to be detected and the groundwater inflow estimated. Three water bearing horizons were identified during the bedrock drilling at depths of 44.2, 79.2 and 85.9 m (145, 260 and 282 feet) below grade. Drilling was terminated at a total depth of 85.9 m or 282 feet.

Initial well development involved air lift surging to clean and develop the water bearing fractures. The upper 6 m or 20 feet of the annulus around the casing was sealed with Benseal to prevent the migration of surface water by that avenue.

Wellhead completion entailed the installation of a tiled pit with a floor about 1.5 m (5.0 feet) below grade. The casing was cut below grade and sealed with a sanitary well seal. Figure 3 shows the contractor copy of the water well record. Figure 4 presents a schematic diagram of the water well stratigraphy and completion log based on the water well record. The well is equipped with an electric submersible pump set at 150 feet (45 m) below ground surface. The pump details are unknown, although the owner indicated that it was manufactured by GSW equipped with a 5 HP Franklin Electric motor. The pump capacity should be permanently restricted to 2.3 L/s (30 Igpm).

Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark or an X, as applicable.

County or District: WELLINGTON | Township, Borough, City, Town, Village: WEST GARAFRAXA | Con: 3 | Block, tract, survey, etc.: | Lot: 11

Owner's full name: Fairview Golf & Country Club | Last name: | First name: | Address: R.R.#3 Fergus Ont N1M 2W4 | Date completed: 05 06 98 (day mo yr)

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
Brown	Clay	Sand + Gravel		0	25
Grey	Clay	Sand + Gravel		25	95
Grey	Clay	Gravel + Limestone	Broken	95	105
Light Brown	Limestone			105	125
Med Brown	Limestone			125	155
Light Brown	Limestone			155	235
Light Grey	Limestone			235	250
Med Grey	Limestone			250	260
Light Grey/Brown	Limestone			260	282
			TOTAL = 282 FT.		
6" Casing Drive Shoe					

WATER RECORD

Water found at – feet	Kind of water	
145	☐ Fresh ☐ Salty	☐ Sulphur ☐ Minerals ☐ Gas
282	☐ Fresh ☐ Salty	☐ Sulphur ☐ Minerals ☐ Gas
	☐ Fresh ☐ Salty	☐ Sulphur ☐ Minerals ☐ Gas
	☐ Fresh ☐ Salty	☐ Sulphur ☐ Minerals ☐ Gas

CASING & OPEN HOLE RECORD

Inside diam. inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
6"	☐ Steel ☐ Galvanized ☐ Concrete ☐ Open hole ☐ Plastic	.188	+2	105
6"	☐ Steel ☐ Galvanized ☐ Concrete ☐ Open hole ☐ Plastic		105	282
	☐ Steel ☐ Galvanized ☐ Concrete ☐ Open hole ☐ Plastic			

SCREEN

Slots of opening (Slot No.)	Diameter inches	Length feet
Material and type	Depth at top of screen feet	

GROUTING & SEALING RECORD

☐ Annular space ☐ Abandonment

Depth set at – feet From	To	Material and type (Cement grout, bentonite, etc.)
0	21	BENSEAL

PUMPING TEST

Pumping test method: ☐ Pump ☐ Bailer | Pumping rate: 30 GPM | Duration of pumping: ..... Hours ..... Mins

Static level: 28'6" feet | Water level end of pumping: 66'6" feet | Water levels during: ☐ Pumping ☐ Recovery

10 minutes	20 minutes	45 minutes	60 minutes
87' feet	68' feet	66'6 feet	66'6 feet

If flowing give rate: GPM | Pump intake set at: feet | Water at end of test: ☐ Clear ☐ Cloudy

Recommended pump type: ☐ Shallow ☐ Deep | Recommended pump setting: 100 feet | Recommended pump rate: 30 GPM

FINAL STATUS OF WELL

☐ Water supply ☐ Observation well ☐ Test hole ☐ Recharge well
☐ Abandoned, insufficient supply ☐ Abandoned, poor quality ☐ Abandoned (Other) ☐ Dewatering
☐ Unfinished ☐ Replacement well

WATER USE

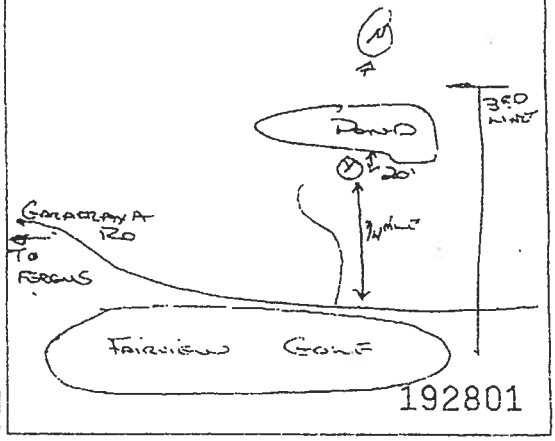
☐ Domestic ☐ Stock ☐ Irrigation ☐ Industrial
☐ Commercial ☐ Municipal ☐ Public supply ☐ Cooling & air conditioning
☐ Not used ☐ Other

METHOD OF CONSTRUCTION

☐ Cable tool ☐ Rotary (conventional) ☐ Rotary (reverse) ☐ Rotary (air)
☐ Air percussion ☐ Boring ☐ Diamond ☐ Jetting
☐ Driving ☐ Digging ☐ Other

LOCATION OF WELL

In diagram below show distances of well from road and lot line.
Indicate north by arrow.



192801

Name of Well Contractor: Bowen Well Drilling Ltd. | Well Contractor's Licence No: 2663

Address: R.R.#5 Elora Ont. N0B 1S2

Name of Well Technician: Steven R. Bowen | Well Technician's Licence No: T-0590

Signature of Technician and/or Contractor: | Submission date: 01 day 06 mo 98 yr

MINISTRY USE ONLY

0066 (07/94) Front Form 9

CONTRACTOR'S COPY

FIGURE 3

WATER WELL RECORD (PW-1)

Fairview Golf and Country Club
Lot 11, Con. 3, Township of West Garafraxa, Wellington County

Morrison Environmental Limited
Groundwater Experts

Water Well Stratigraphy and Completion Log

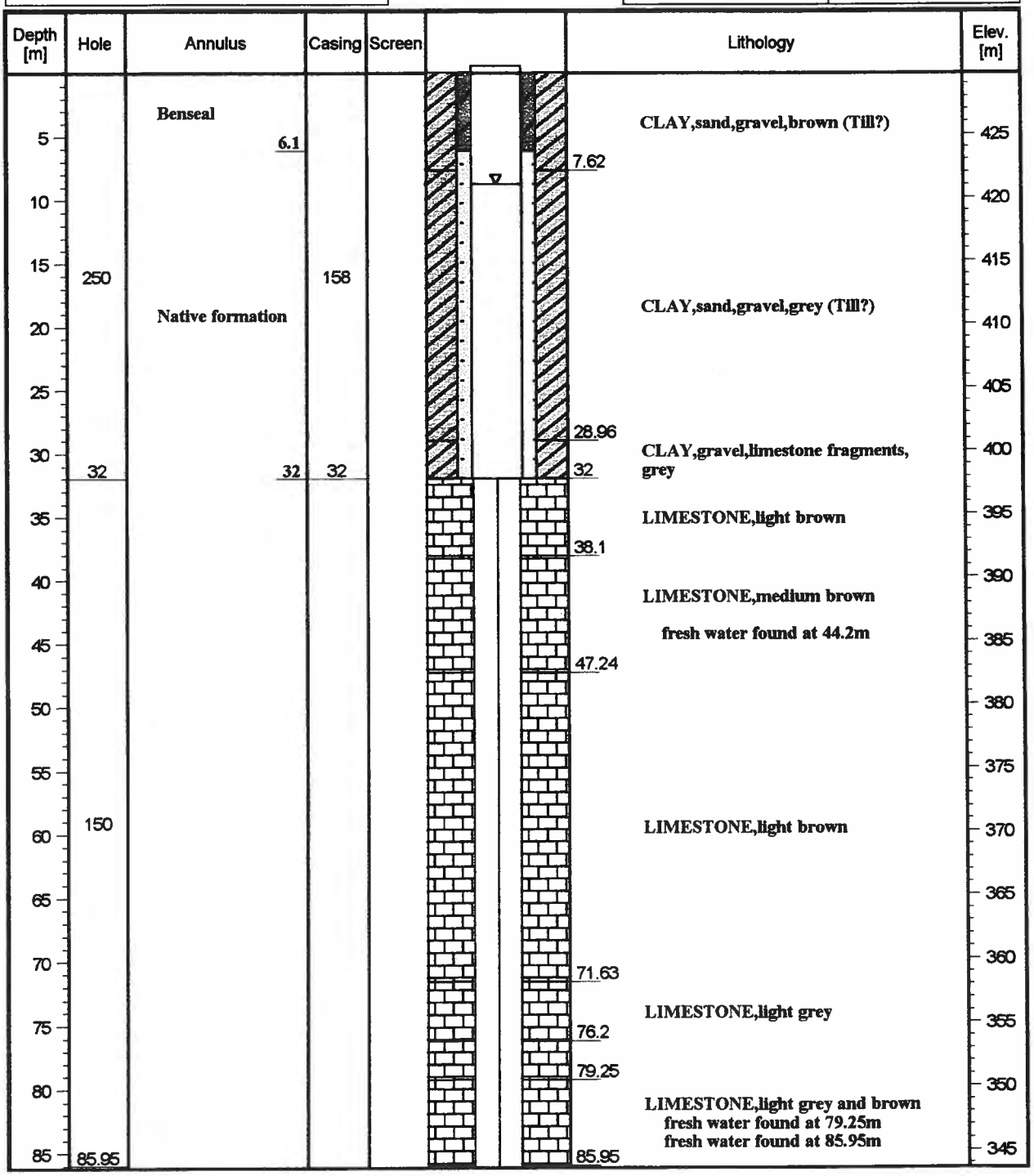
Well Ident	Name
192801	Irrigation Well PW-1, Fairview Golf and Club, Lot 11, Conc 3, W. Garafraxa

Drill. Method	Air Rotary	Drill. Dates	June 5, 1998

X	5511175	Y	4944590	Z	429.77	Meas. Pt. Elev.	430.37

Depths and elevations are in metres with diameters in millimetres. *Scales (1: xxx)*

Water Level (AMSL)	Vertical	Horizontal
421.05	485.0	20.0



Morrison Environmental Limited
Mississauga, Ontario

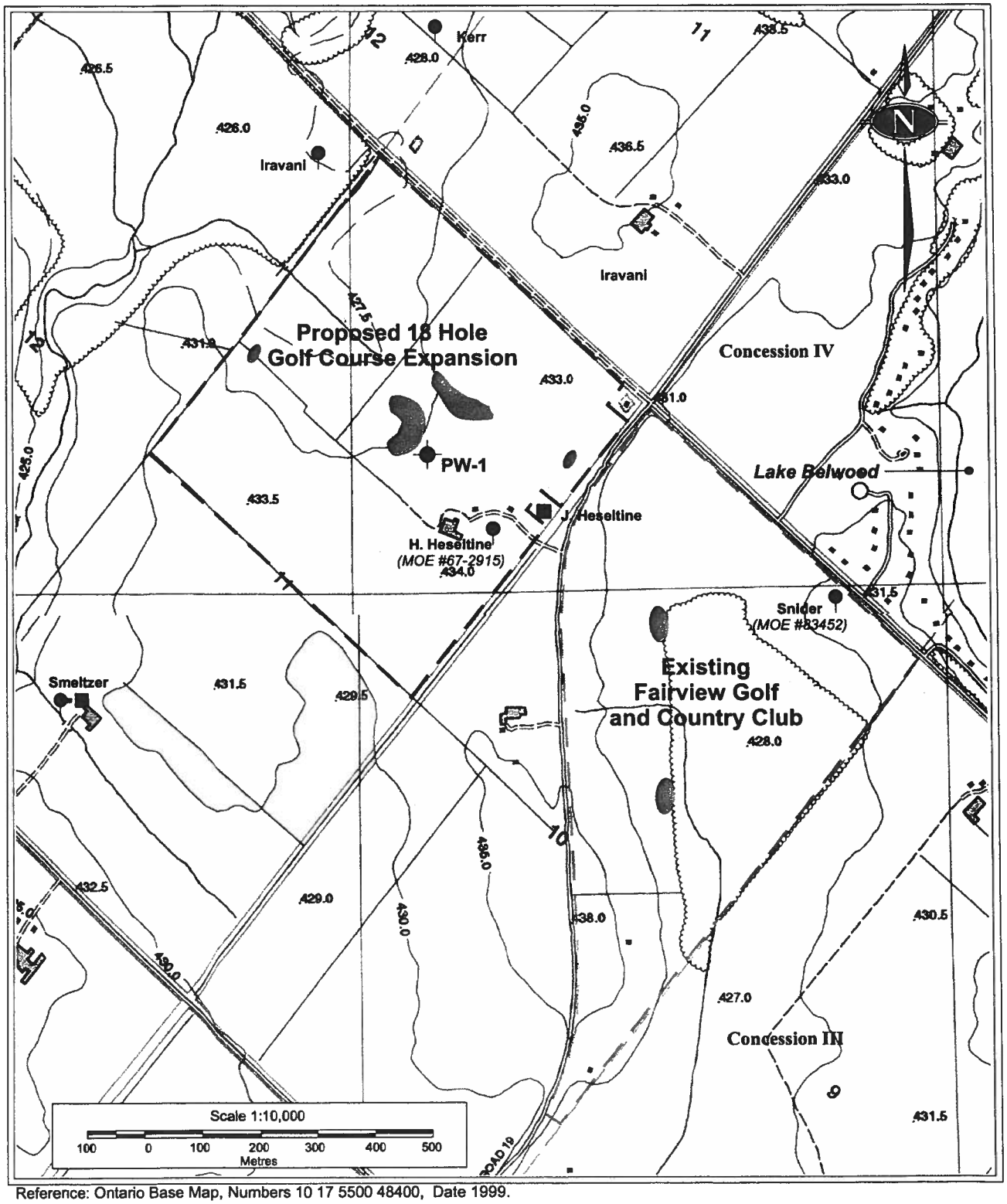
Figure 4

6.2 Observation Wells

Seven observation wells comprising drilled and dug/bored wells were monitored during the pumping test, one on the study site and six at off-site locations. Figure 5 shows an observation well location plan.

The drilled well on the golf course property is known as the H. Heseltine drilled well (MoE record 62-2915) is located within a well pit. The neighbouring property, owned by Mr. Jim Heseltine, receives domestic potable water from this source via a private connection made in the basement of the former H. Heseltine golf course house. Mr. Jim Heseltine does not use his existing dug well due to previous water shortages. The Jim Heseltine residence is located about 80 m due east of the H. Heseltine bedrock well (see Figure 5). Due to water accumulation above the well seal, the well's vent pipe allowed water level measurement to be taken using an electric thin-line probe. Figure 6 presents a schematic diagram of the lithology and well completion for the bedrock well. Figure 7 shows two photographs of the wellhead with the missing concrete cap and the accumulated pit water. In order to protect the integrity of the well structure, the well lid should be replaced and any storm drainage should be redirected away from the wellhead.

Two bored/dug wells were monitored, one at the J. Heseltine residence with the other at the rented "Smeltzer" residence. We understand from both property owners that the wells no longer serve as domestic water supply sources. Their water supplies are now derived from other drilled wells.



Reference: Ontario Base Map, Numbers 10 17 5500 48400, Date 1999.

LEGEND

— — — - SUBJECT PROPERTY LINE

- PUMPING WELL

■ - DRILLED/BORED WELL

● - DRILLED BEDROCK WELL

Morrison Environmental Limited
Groundwater Experts

Well Testing Program

Fairview Golf and Country Club
Lot 11, Con. 3, Township of West Garafraxa, Wellington County

OBSERVATION WELL LOCATION PLAN

For Gordon Phillips

June 1999	149-991	FIGURE 5

Water Well Stratigraphy and Completion Log

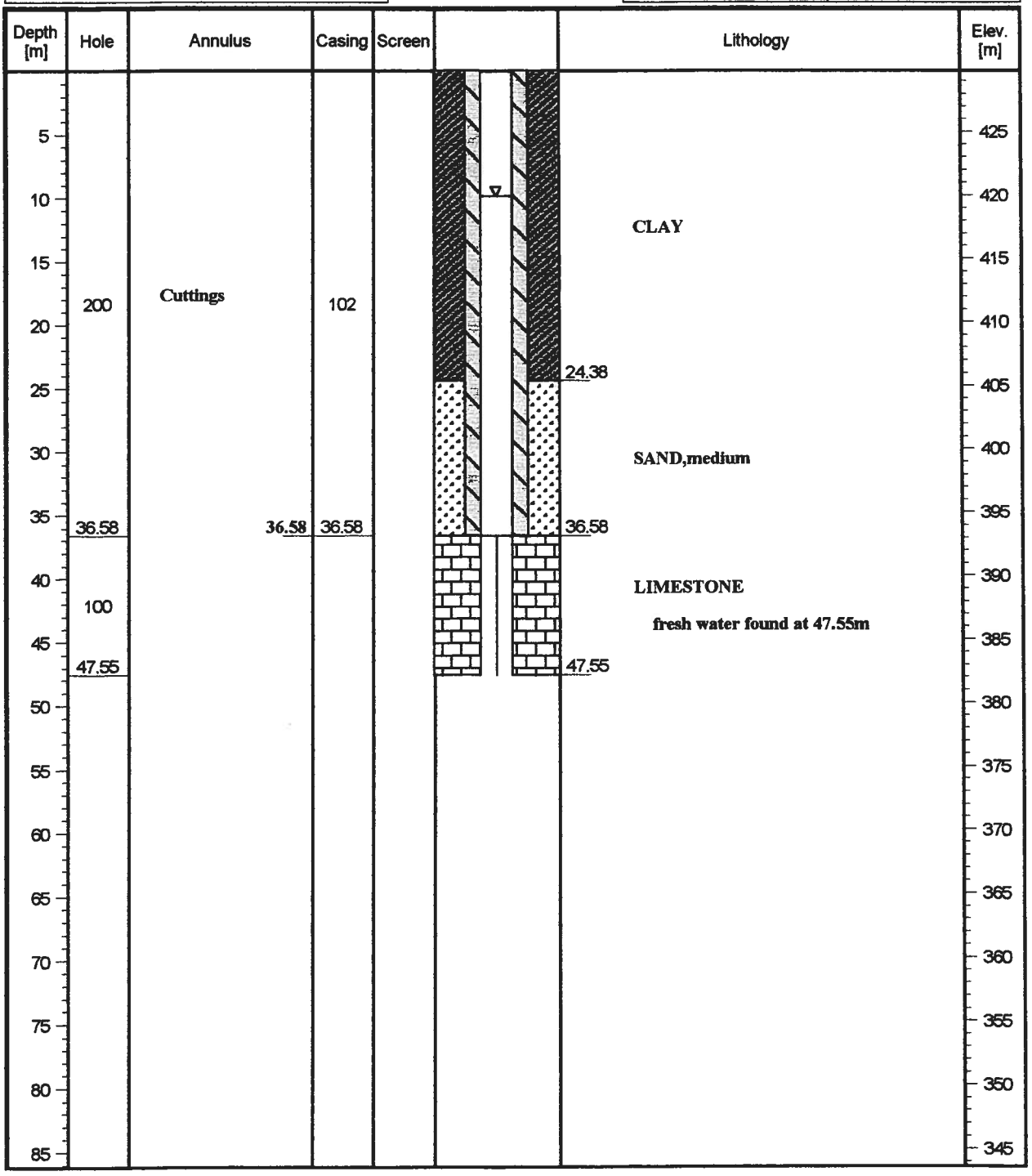
Well Ident	Name
67-2915	H. Heseltine, Lot 11, Concession 3, West Garafraxa Township

Drill. Method	Unknown	Drill. Dates	January 1951

X	551147	Y	4844157	Z	429.77	Meas. Pt. Elev.	429.77

Depths and elevations are in metres with diameters in millimetres. *Scales (1: xxx)*

Water Level (AMSL)	Vertical	Horizontal
419.97	485.0	20.0



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Mississauga, Ontario

Figure 6



Plate 1. J. Heseltine drilled observation well (MOE #67-2915). Note low lying cut leading to open well tile.

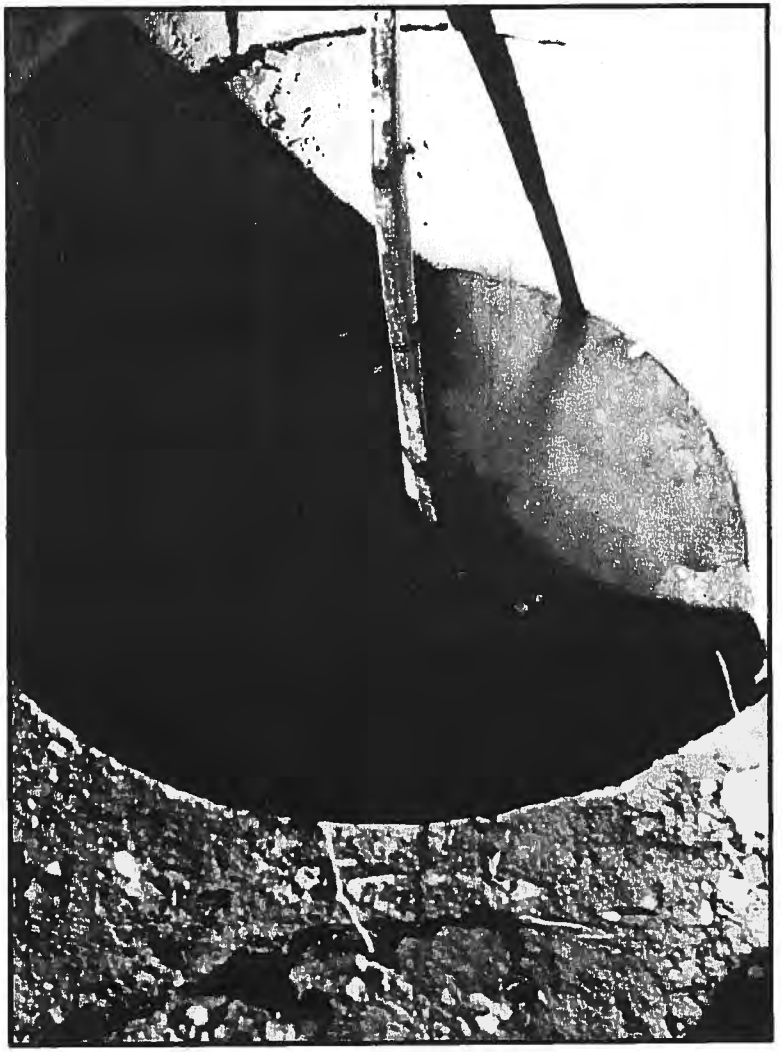


Plate 2. Water accumulated in unsealed well pit. Note water level measurements taken through black well breather pipe.

FIGURE 7

NOTE: Photos Taken on May 18 & 19, 1999.

SITE PHOTOGRAPHS

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Four accessible drilled wells were also monitored at the Kerr, Iravani and "Smeltzer" residences plus the "Snider" well, an observation well located within the northeast corner of the existing golf course. Figure 8 shows the MoE water well record #83452 for the "Snider" well. The Iravani well is believed to be about 46 m (150 feet) deep and completed into bedrock. The Kerr well is about 40.2 m (132 feet) deep and similarly completed in bedrock. The "Smeltzer" drilled well is about 55 m (180 feet) deep and also completed into the underlying limestone aquifer. No additional information has been found regarding the lithology or water bearing horizons for these wells to date.

Although two additional drilled wells exist east and south of PW-1 (J. Dyble, MoE 67-6528; J. I. Black, MoE 67-2914, respectively) both were inaccessible for water level monitoring during the aquifer performance pumping test.

7.0 HYDRAULIC TESTING

Two pumping tests were conducted at the subject site on irrigation well PW-1. A step drawdown pumping test was performed to assess well efficiency while an aquifer performance pumping test was undertaken to assess aquifer hydraulic characteristics and potential interference effects.

7.1 Step-Drawdown Pumping Test

A three-step Mogg-type step-drawdown pumping test was conducted on the irrigation well PW-1 on May 18, 1999 at rates of 1.51, 2.27 and 3.0 L/s (20, 30 and 40 Igpm). Flow adjustment was

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

COUNTY OR DISTRICT: Wellington | TOWNSHIP, BOROUGH, CITY, TOWN OR VILLAGE: West Garafraxa | CON: 23 | LOT: 1/2 9+10

OWNER (SURNAME FIRST): Snider M. | ADDRESS: R.R.#3 Fergus N1M 2W4 | DATE COMPLETED: 27 06 90

LOG OF OVERBURDEN AND BEDROCK MATERIALS

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH FROM	DEPTH TO
	Top Soil			0	1
	Sand			1	15
	Clay		Hard Pan	15	80
	Boulders/Gravel			80	95
Grey	Limestone			95	130
Brown	Limestone			130	166
			TOTAL		166
			6" Casing Stick		

WATER RECORD

WATER FOUND AT FEET	KIND OF WATER	
166	X FRESH	SULPHUR
	SALTY	MINERAL GAS
	FRESH SALTY	SULPHUR MINERAL GAS
	FRESH SALTY	SULPHUR MINERAL GAS
	FRESH SALTY	SULPHUR MINERAL GAS
	FRESH SALTY	SULPHUR MINERAL GAS

CASING & OPEN HOLE RECORD

INSIDE DIAM. (INCHES)	MATERIAL	WALL THICKNESS (INCHES)	DEPTH FEET FROM	DEPTH FEET TO
6"	X STEEL, GALVANIZED, CONCRETE, OPEN HOLE, PLASTIC	.188	0	95½
6"	STEEL, GALVANIZED, CONCRETE, X OPEN HOLE, PLASTIC		95½	166
	STEEL, GALVANIZED, CONCRETE, OPEN HOLE, PLASTIC			

SCREEN

MATERIAL AND TYPE | DIAMETER | SLOTS | DEPTH TO TOP OF SCREEN

PLUGGING & SEALING RECORD

DEPTH SET AT FEET | MATERIAL AND TYPE | CEMENT GROUT USED BEFORE FEET

PUMPING TEST

PUMPING TEST METHOD: X PUMP / BAILER | PUMPING RATE: 15 GPM | DURATION OF PUMPING: 1 HOURS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING	10 MINUTES	20 MINUTES	30 MINUTES	40 MINUTES
40 FEET		X PUMPING / RECOVERY	40 FEET	40 FEET	40 FEET	40 FEET

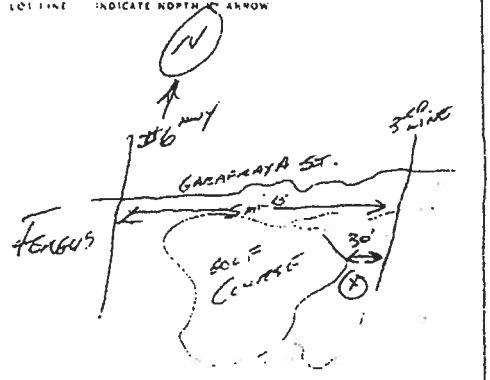
IF FLOWING GIVE RATE: GPM | WATER AT END OF TEST: X CLEAR / CLOUDY

RECOMMENDED PUMP TYPE: SHALLOW / X DEEP | RECOMMENDED PUMP SETTING: 146 FEET | RECOMMENDED PUMPING RATE: 15 GPM

FINAL STATUS OF WELL	X WATER SUPPLY; OBSERVATION WELL; TEST HOLE; RECHARGE WELL; ABANDONED, INSUFFICIENT SUPPLY; ABANDONED, POOR QUALITY; UNFINISHED; DEWATERING
WATER USE	X DOMESTIC; STOCK; IRRIGATION; INDUSTRIAL; COMMERCIAL; MUNICIPAL; PUBLIC SUPPLY; COOLING OR AIR CONDITIONING; OTHER; NOT USED
METHOD OF CONSTRUCTION	CABLE TOOL; X ROTARY (CONVENTIONAL); ROTARY (REVERSE); X ROTARY (AIR); AIR PERCUSSION; BORING; DIAMOND; JETTING; DRIVING; DIGGING; OTHER

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



83452

CONTRACTOR

NAME OF WELL CONTRACTOR: Hanlon Well Drilling | WELL CONTRACTOR'S LICENCE NUMBER: 1663

ADDRESS: R.R.#5 Guelph Ont. N1H 6J2

NAME OF WELL TECHNICIAN: Henry Hanlon | WELL TECHNICIAN'S LICENCE NUMBER: T-0550

SIGNATURE OF TECHNICIAN/CONTRACTOR | SUBMISSION DATE: 08 07 90

CONTRACTOR'S COPY

OFFICE USE ONLY

FORM NO. 0506 (11/80) FORM 9

FIGURE 8

WATER WELL RECORD (Snider)

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performed using a ball valve while flow measurements were obtained by timed discharge into a calibrated container.

Depth-to-water level measurements were obtained using an electric depth probe at regular time increments for 15 minutes at each flow rate. Water levels were allowed to recover to original static level before commencing the next step at a higher flow rate. Figure 9 shows the semi-logarithmic plot of drawdown versus time for the acquired data. Figure 10 presents the arithmetic plot of pumping rate versus drawdown after 15 minutes.

7.2 Aquifer Performance Pumping Test

A 24 hour constant rate aquifer performance pumping test was performed on irrigation well PW-1 starting during the late afternoon of May 18, 1999 at a discharge rate of 2.27 L/s (30 Igpm). Technical problems delayed the actual pump shutdown for an additional 40 minutes beyond the normal 1440 minute pumping phase of the test. Flow adjustments were made using a ball valve with flow rate measurements obtained by timed discharge into a calibrated container.

Depth-to-water level measurements were obtained using an electric depth probe at specific time increments during both pumping and non-pumping phases of this test. Water level recovery measurements were taken for 480 minutes following pump shut-down. Figure 11 presents the semi-logarithmic plot of drawdown/recovery versus time for the PW-1 acquired data.

Water level measurements were taken at both the on-site and off-site observation wells prior to, during and subsequent to the pumping phase of the testing. Recording of water level

STEP DRAWDOWN PUMPING TEST
SEMI-LOGARITHMIC PLOT - DRAWDOWN versus TIME

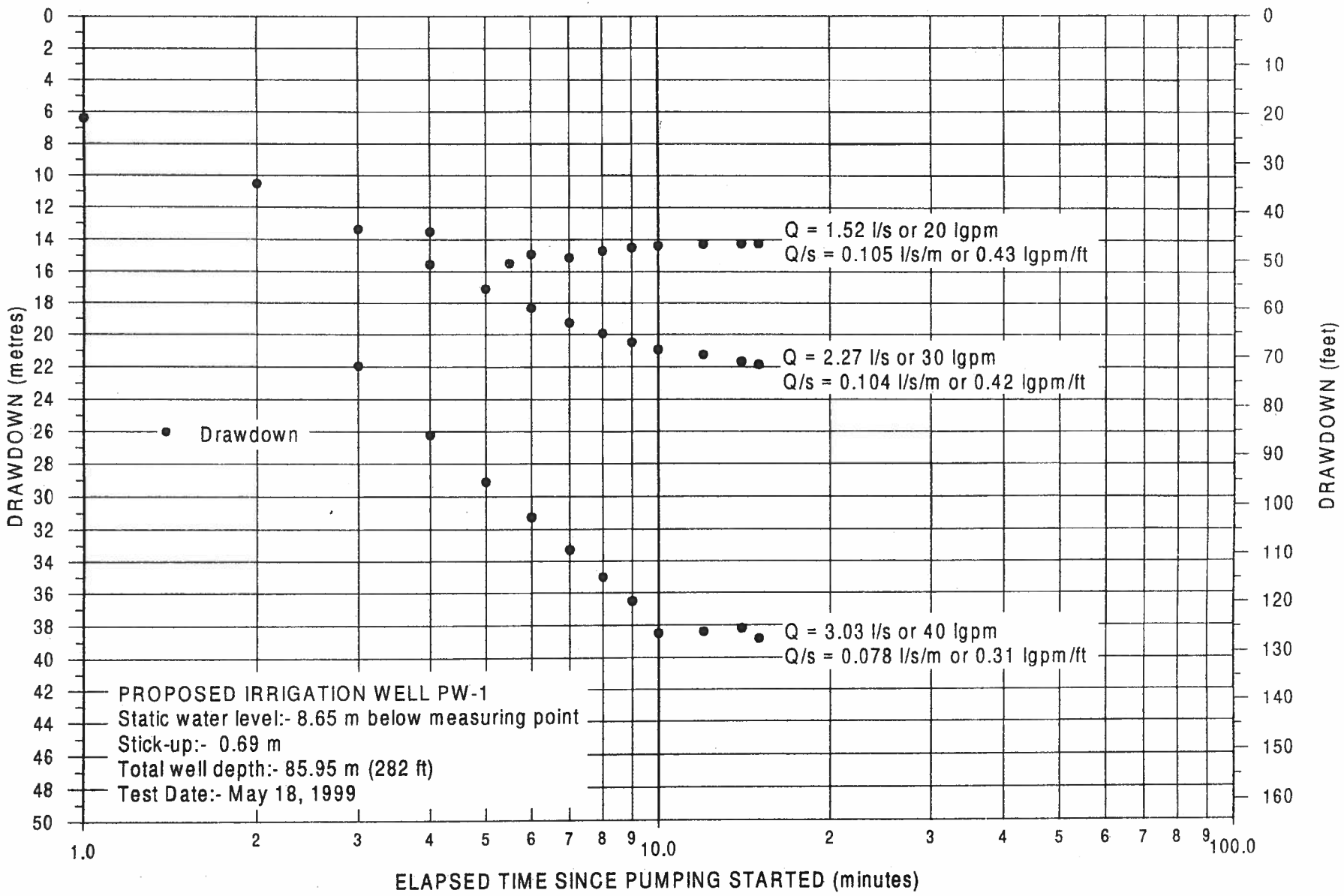


FIGURE 9

WELL TESTING PROGRAM (PW1)

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STEP DRAWDOWN PUMPING TEST
ARITHMETIC PLOT - DRAWDOWN versus PUMPING RATE

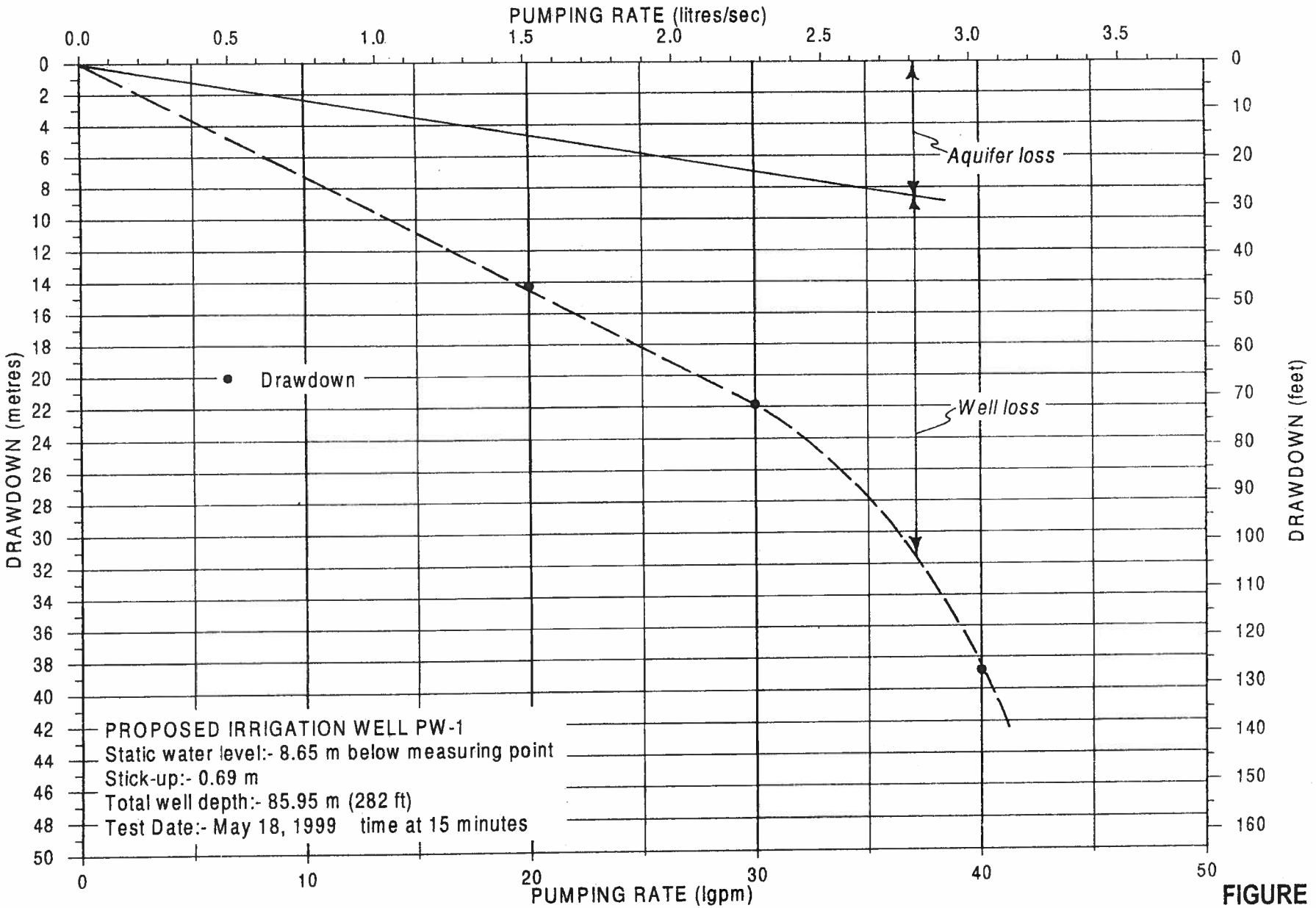


FIGURE 10

WELL TESTING PROGRAM (PW1)

Fairview Golf and Country Club

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AQUIFER PERFORMANCE PUMPING TEST
SEMI-LOGARITHMIC PLOT - DRAWDOWN versus TIME

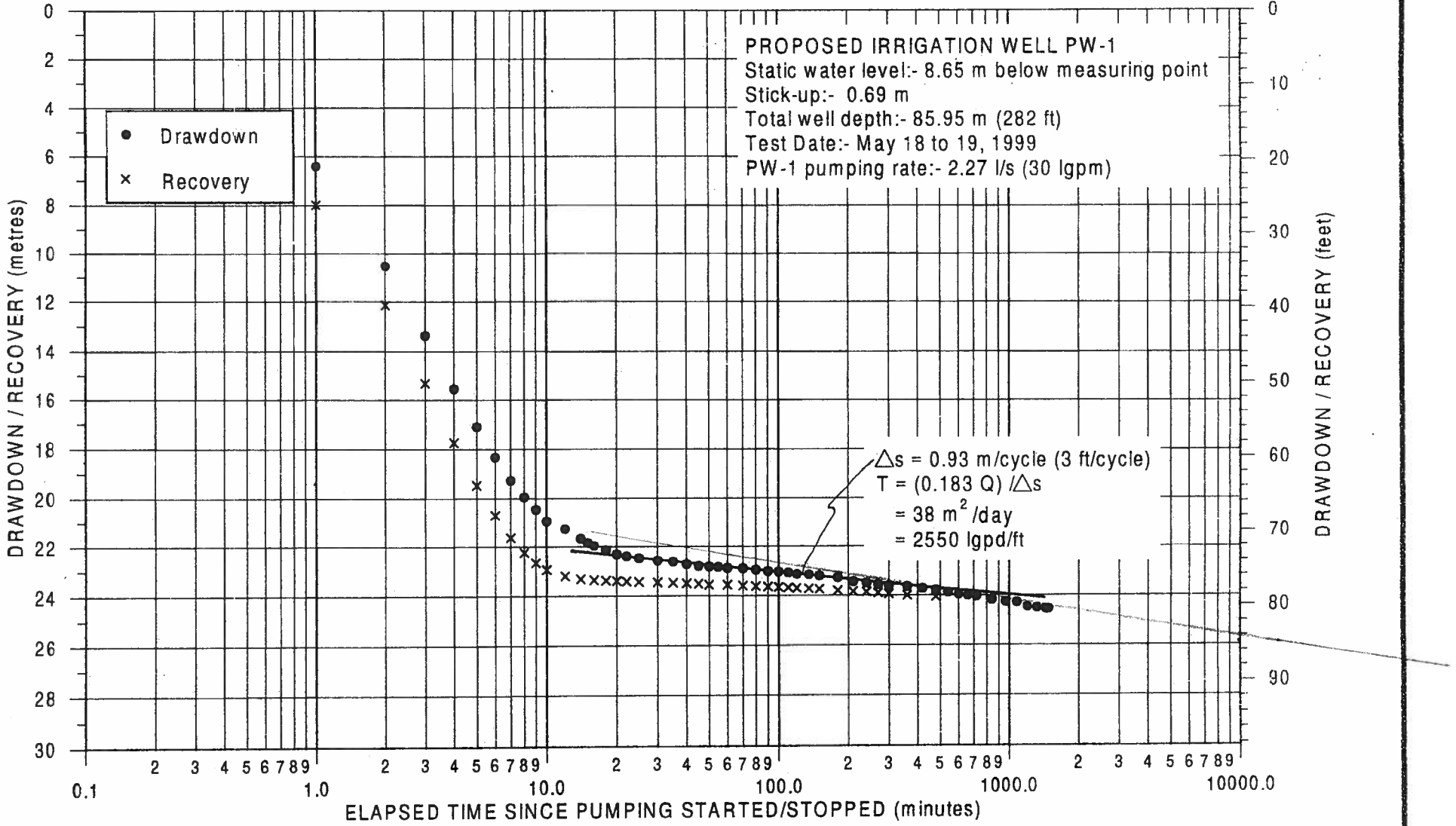


FIGURE 11

WELL TESTING PROGRAM (PW1)

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measurements were discontinued at the "Smeltzer" well following a request by the property owner prior to the PW-1 pump shutdown. Figures 12 through 18 inclusively present the semi-logarithmic plots of drawdown versus time for the seven observation wells.

Figure 19 depicts the semi-logarithmic plot of drawdown versus distance after 1480 minutes of pumping at 2.27 L/s (30 Igpm).

7.3 Discussion of Results

7.3.1 Step-Drawdown Pumping Test

The arithmetic plot of drawdown versus pumping rate (Figure 10) indicates a near linear trend of constant specific capacity (slightly in excess of 0.10 L/s/m or 0.4 Igpm/ft) with increasing pumping rate until about 2.27 L/s or 30 Igpm. (Specific capacity is the ratio of constant pumping rate divided by drawdown). Above that rate, the specific capacity rapidly decreases to about 0.078 L/s/m (0.31 Igpm/ft) at a flow rate of 3.03 L/s/m (40 Igpm).

Water level drawdown at a pumping well is due to hydraulic head reduction occurring as a combination of firstly, aquifer response, and secondly, head loss caused by damage to fractures from well construction. Well loss, in this case, results from turbulent flow into the open borehole from the bedrock fractures and fissures. The line depicting the interface between aquifer response and well loss, indicates that at 2.27 L/sec (30 Igpm), approximately 30% of drawdown occurs within the aquifer while about 70% occurs due to well loss. The linear relationship

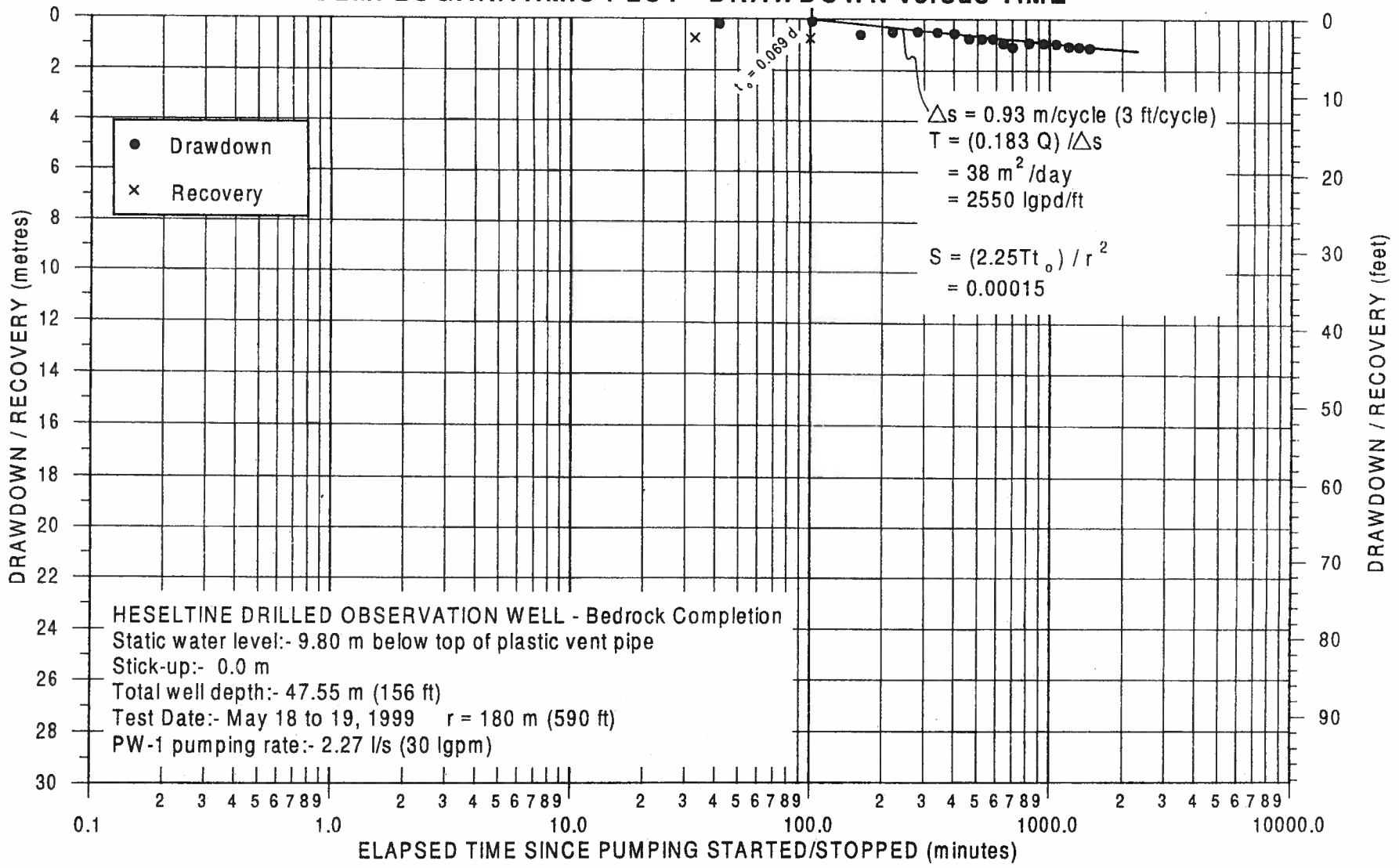


FIGURE 12

WELL TESTING PROGRAM (PW1)

Fairview Golf and Country Club
Lot 11, Con. 3, Township of West Garafraxa, Wellington County

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AQUIFER PERFORMANCE PUMPING TEST
SEMI-LOGARITHMIC PLOT - DRAWDOWN versus TIME

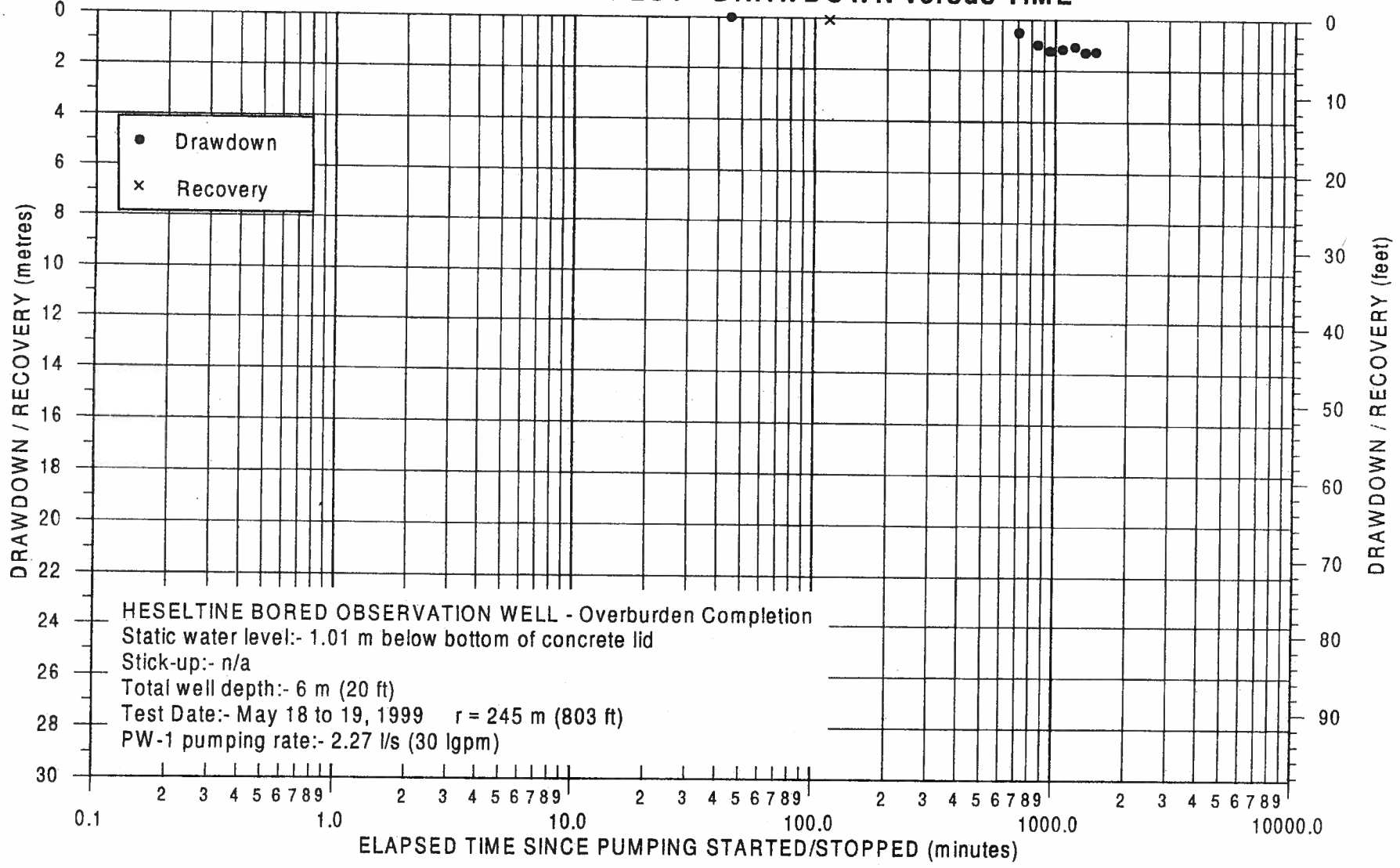


FIGURE 13

WELL TESTING PROGRAM (PW1)

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Lot 11, Con. 3, Township of West Garafraxa, Wellington County

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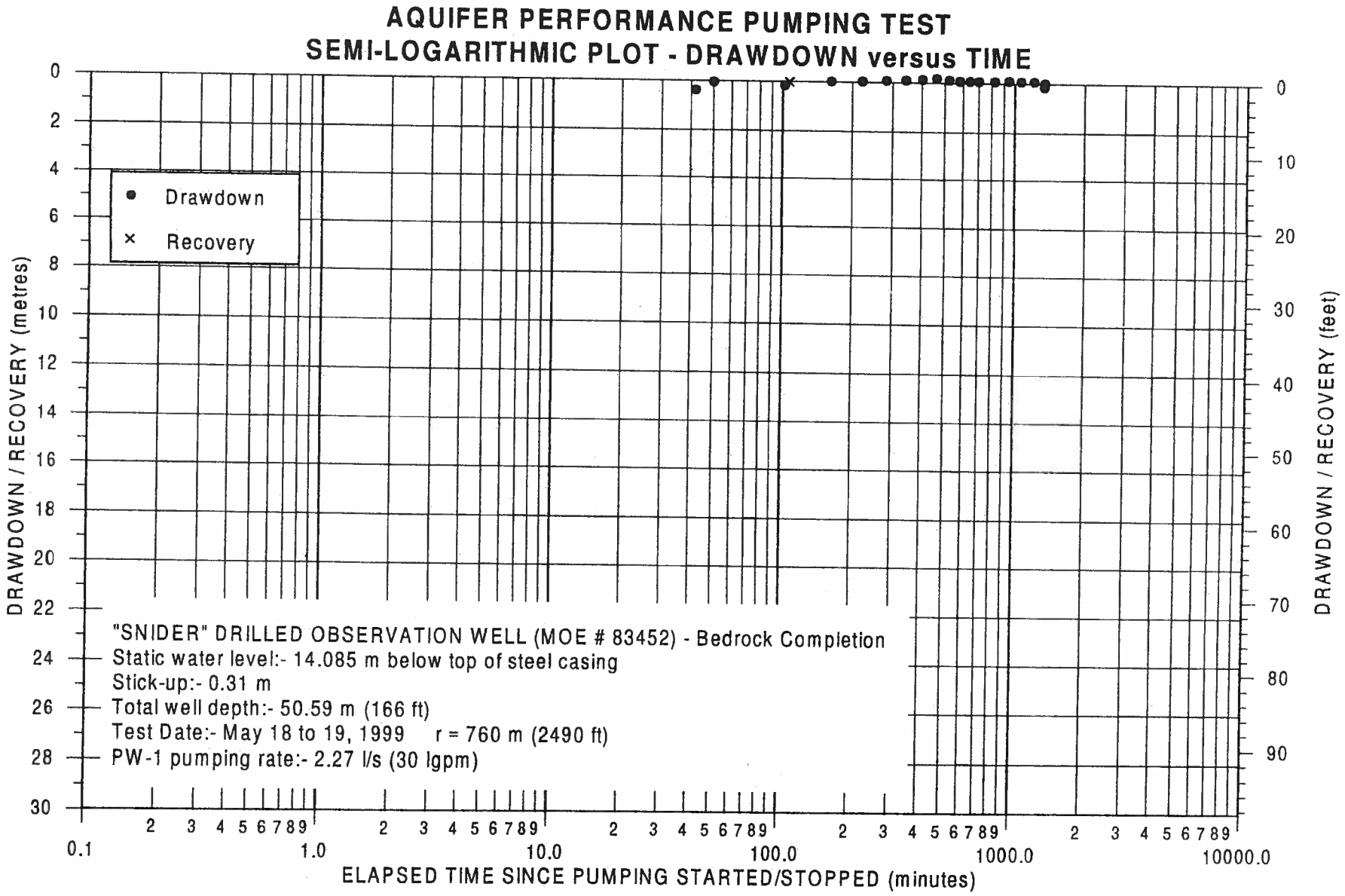


FIGURE 14

WELL TESTING PROGRAM (PW1)

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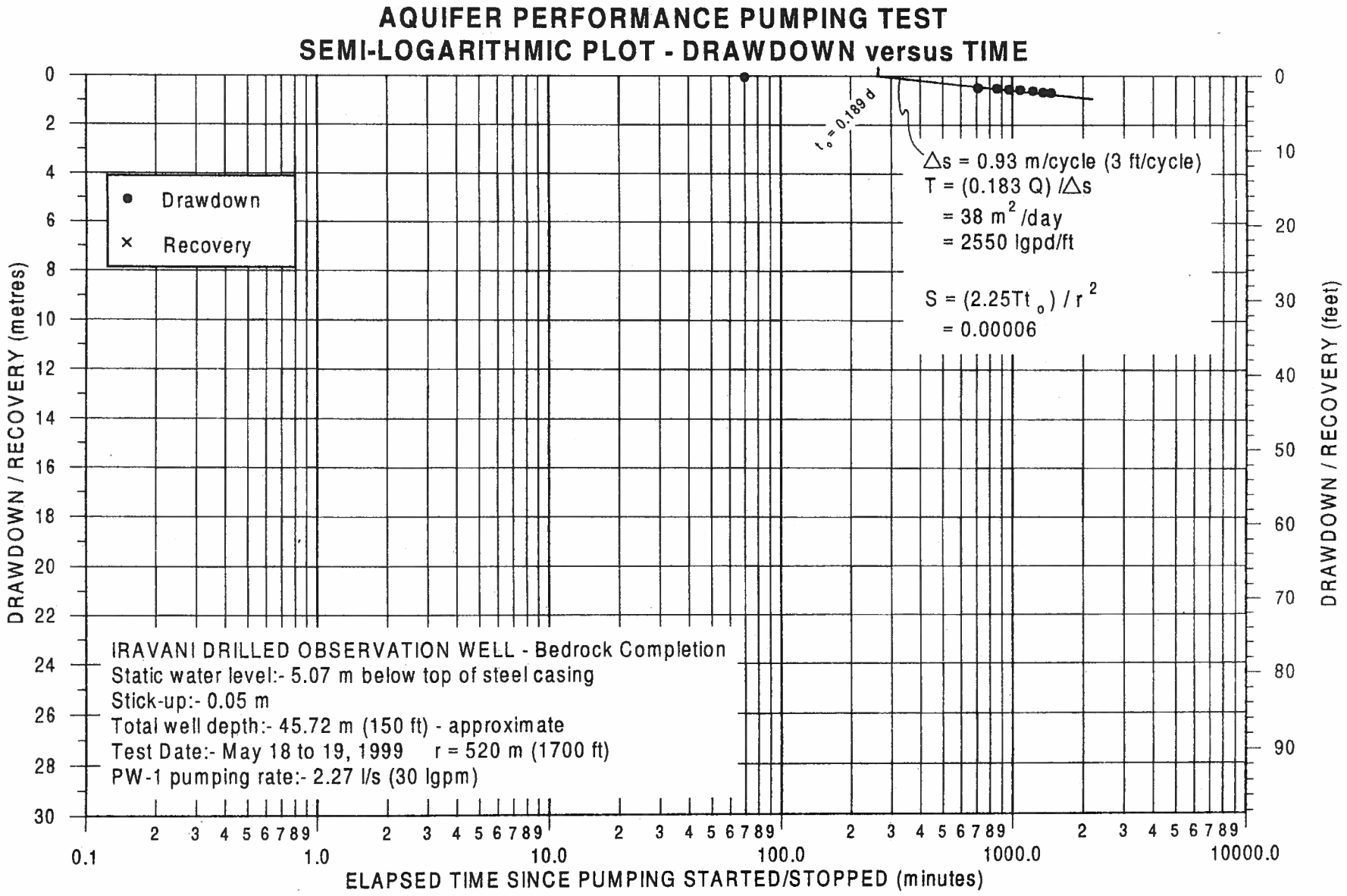


FIGURE 15

WELL TESTING PROGRAM (PW1)

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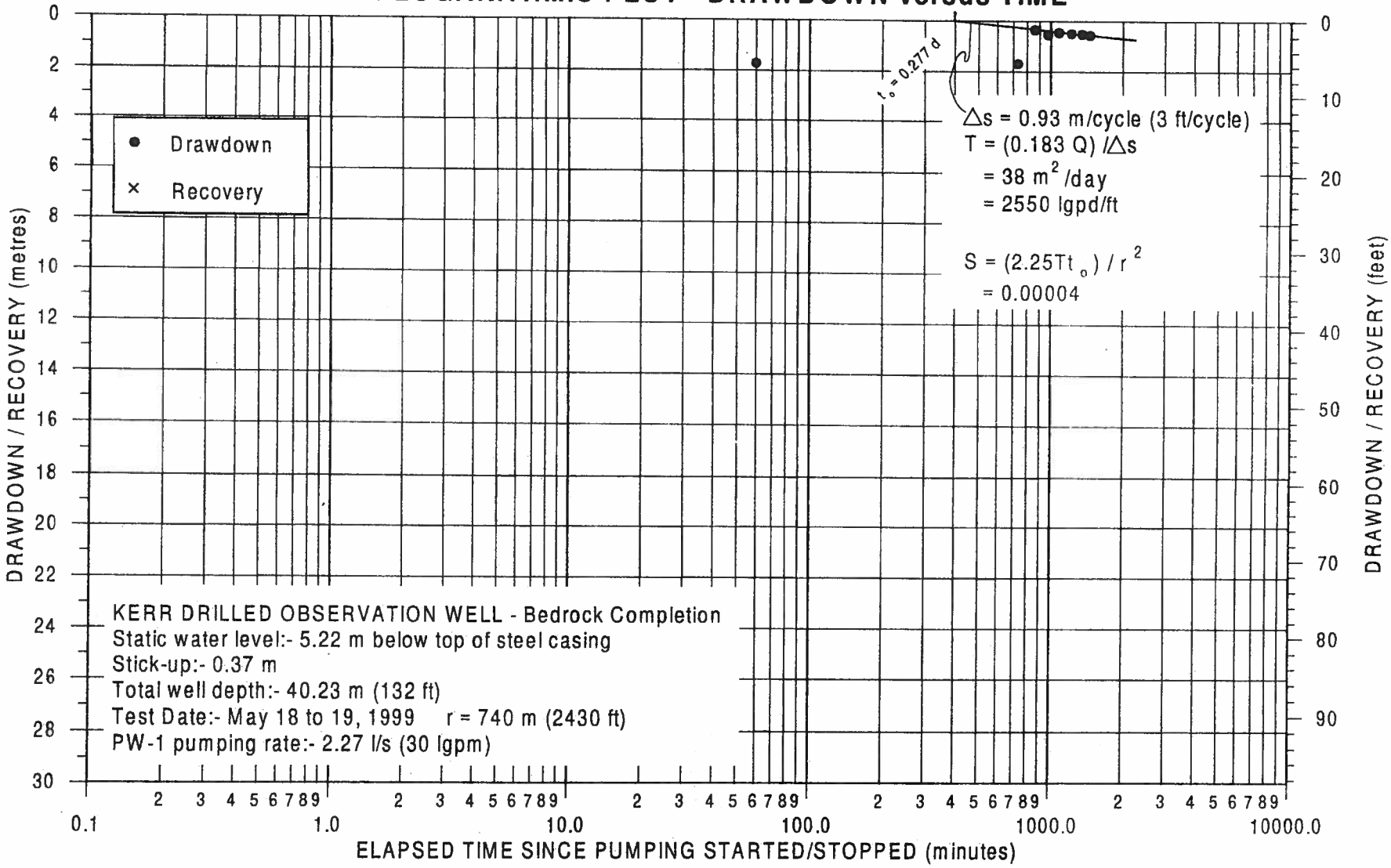


FIGURE 16

WELL TESTING PROGRAM (PW1)

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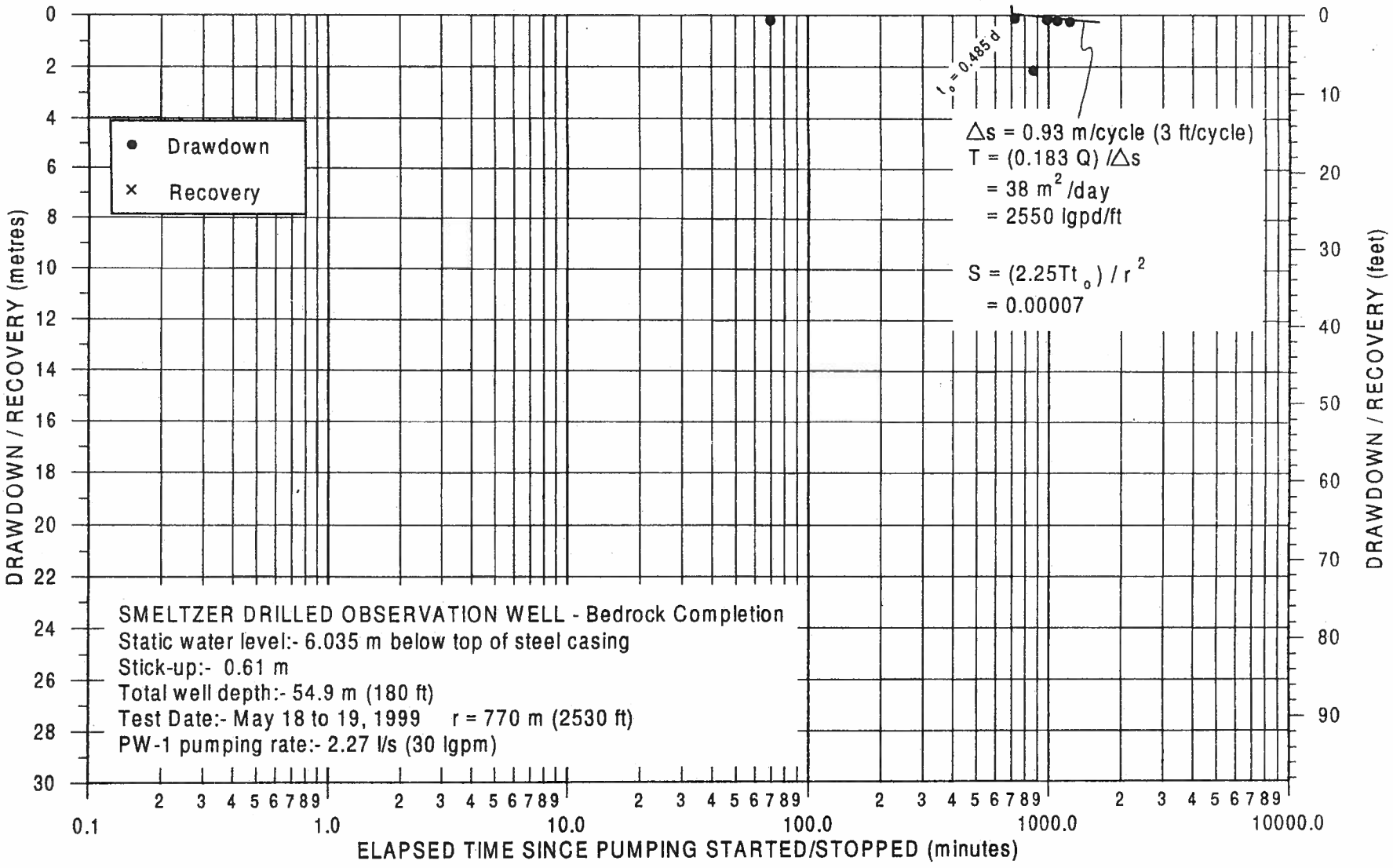


FIGURE 17

WELL TESTING PROGRAM (PW1)

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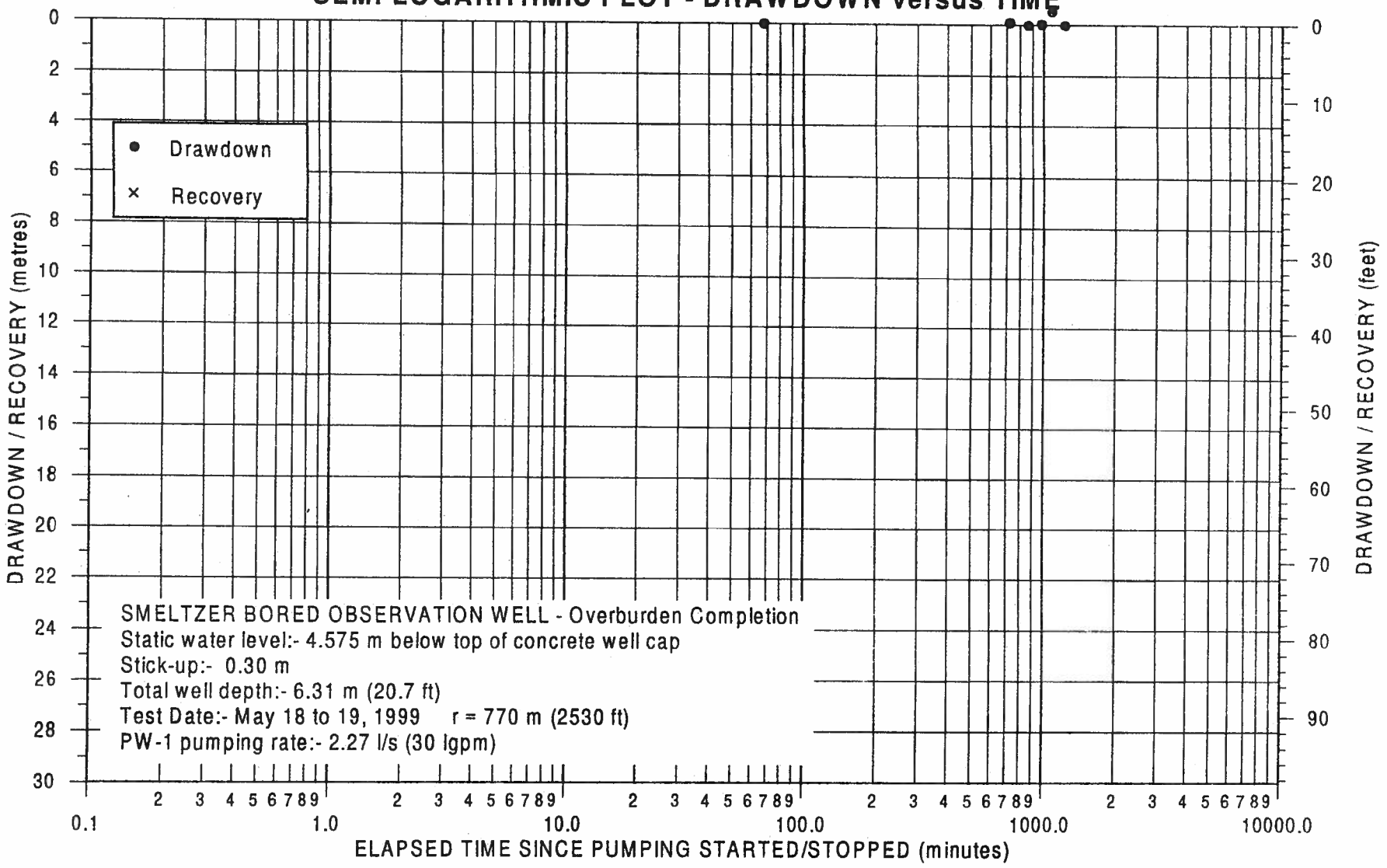
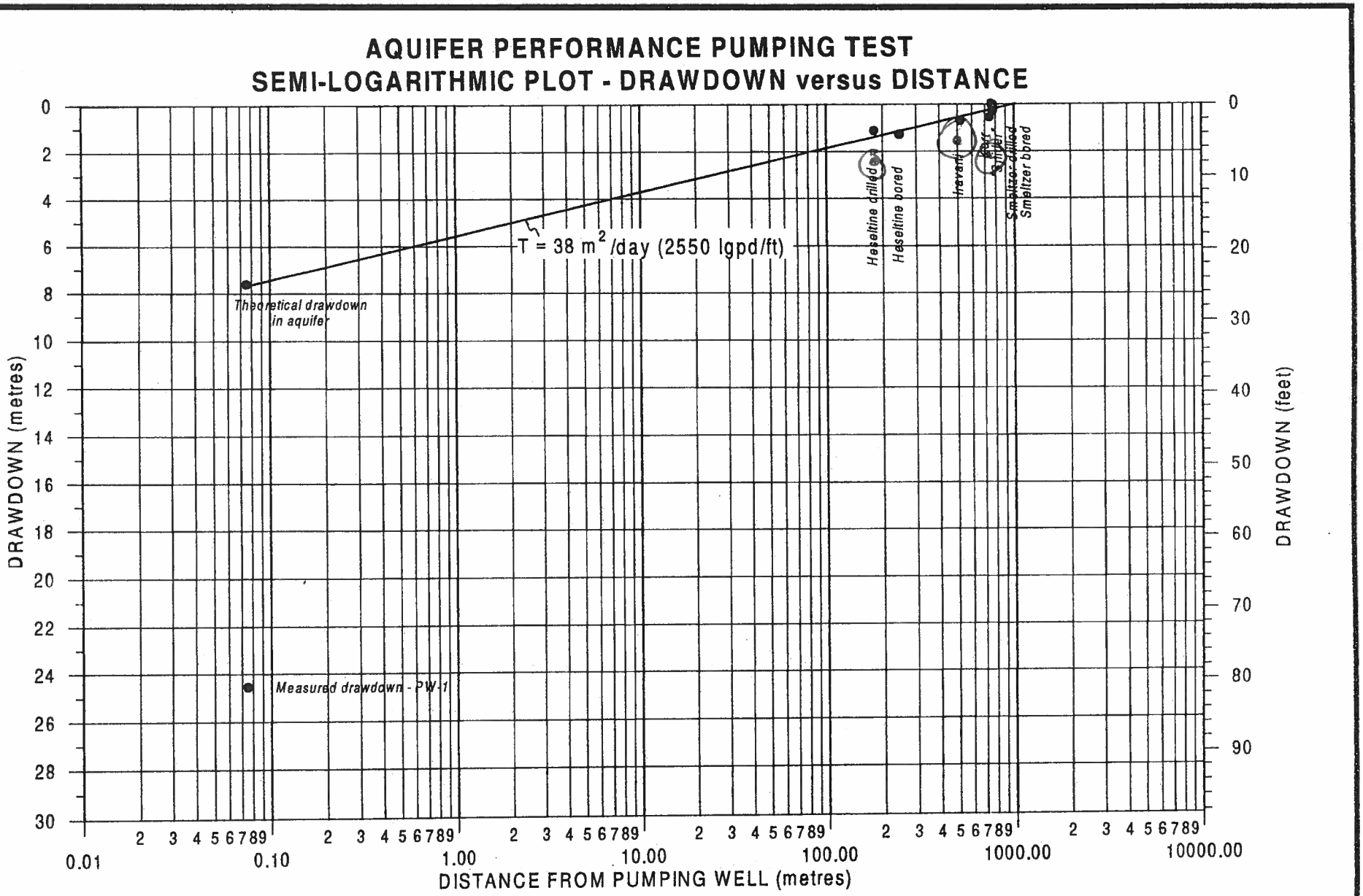


FIGURE 18

WELL TESTING PROGRAM (PW1)

Fairview Golf and Country Club
Lot 11, Con. 3, Township of West Garafraxa, Wellington County

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PROPOSED IRRIGATION WELL PW-1

• Water levels after 1470 minutes of pumping at 2.27 l/s (30 Igpm)

⊙ " " " 8500 " " " " " "

FIGURE 19

WELL TESTING PROGRAM (PW1)

Fairview Golf and Country Club

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represents an interpolation based on data from the distance-drawdown and the observation well drawdown versus time plots generated from the aquifer performance pumping test.

Based on an irrigation flow requirement of 2.27 L/s (30 lgpm), the well efficiency is estimated at about 30% from the step-drawdown pumping test conducted at the proposed irrigation well PW-1. This suggests a relatively inefficient well.

7.3.2 Aquifer Performance Pumping Test

The initial decline in water levels at PW-1 as presented in Figure 11 for the first 42 minutes of drawdown data represents casing storage effects. Transmissivity of about 38 m^2/day (2550 lgpd/ft) was calculated for the segment following the cessation of casing storage effects until a slight steepening of the curve at about 700 minutes of pumping. The slight increase in drawdown decline at PW-1 was interpreted to result in well response to an increasing barometric air pressure recorded until cessation of the pumping phase at 19:20 on May 19, 1999.

Although recovery led drawdown measurement, as presented in Figure 11, water levels had recovered about 98% within 8 hours of pump shutdown.

Transmissivity values for the bedrock aquifer were also derived from the semi-logarithmic plot of drawdown versus time plots at the Heseltine, Iravani, Kerr and "Smeltzer" drilled observation wells as shown in Figures 12, 15, 16 and 17 respectively. Transmissivity was calculated using the following Modified Non-Equilibrium Formula:

$$T = \frac{0.183Q}{\Delta s}$$

where:

T	=	transmissivity (m^2/d)
Q	=	pumping rate (m^3/d)
Δs	=	slope of time-drawdown graph (m/log cycle)

Consequently, the straight line plots on the above four observation wells have a calculated transmissivity of 38 m^2/d (2550 lgpd/ft).

The storage coefficient was similarly determined from the above observation well data using the following formula:

$$S = \frac{2.25\ Tto}{r^2}$$

where:

S	=	storage coefficient (dimensionless)
T	=	transmissivity (m^2/d)
t_o	=	intercept of the straight line at zero drawdown (days)
r	=	distance between pumping and observation well (m)

The calculated Storage Coefficient varies from 0.00015 at the Heseltine to 0.00004 at the Kerr drilled wells. This range of values, representing confined or artesian conditions, occurs in fractured media due to the variation in fracture sizing.

No interpreted drawdown impacts were generated at the "Snider" bedrock drilled observation well, adjacent to the residential development bordering Lake Belwood.

Two shallow overburden wells were monitored during the aquifer performance pumping test, the Heseltine and "Smeltzer" private wells. Both were not being used for domestic purposes. Both have total depths of about 6 m (20 feet) below grade. No interpreted interference effects were produced at the "Smeltzer" well during the period that water level measurements were permitted at the installation.

Although water level declines were recorded at the J. Heseltine Bored Observation well during the test, well logs at nearby installations (Black 67-2914, Heseltine 67-2915, Dyble 67-6526 and the PW-1 log) indicate a reported clayey overburden with a thickness of at least 29.6 m (97 feet) in the general area of the site. Irrigation well PW-1 is situated about 6 m (20 feet) from the main storage pond (which according to the owner is 5.2 m or 17 feet deep) and about 245 m (803 feet) from the J. Heseltine bored well. The magnitude of water level change at the end of the pumping phase at the J. Heseltine overburden bored well was greater than the H. Heseltine bedrock well (1.265 versus 1.10 m) although the bedrock well was closer to PW-1 than the bored installation. Given the proximity of PW-1 to the recently constructed irrigation pond, the overburden thickness of about 5 times the J. Heseltine bored well depth, and the reported clayey overburden material, it is suspected, but not verified, that a connection exists in the J. Heseltine well to the bedrock.

The drawdown distance plot as displayed in Figure 19, represents the interpreted drawdown cone after 1480 minutes of pumping at the test flow rate. The drawdown curve suggests that the radius of the cones' zone of influence at that time was about 1000 m (3280 feet) from the proposed irrigation well PW-1. The estimated transmissivity based on that curve amounts to 38 m^2/d (2550 lgpd/ft).

8.0 INTERFERENCE EFFECTS

Interference effects occur as decreasing drawdown with increasing radial distance from the pumping well for given pumping rates and duration. For the pumping of 29,500 m^3 (6,480,000 Igal) continuously over 150 days, interference effects were calculated using the following equation:

$$s = \frac{0.183Q}{T} \log \frac{2.25\,Tt}{r^2S}$$

Where:

s	=	drawdown in metres at radius "r"
Q	=	pumping rate (m^3/d)
T	=	transmissivity (m^2/d)
t	=	time since pumping started (days)
r	=	radial distance from pumped well (m)
S	=	coefficient of storage (dimensionless)

for a well 180 m (590 feet) from the proposed irrigation well PW-1, such as the Heseltine drilled well (MoE #67-2915). Assuming no recharge, the estimated drawdown after 150 days at a constant flow rate of 2.27 L/s (30 Igpm) at the on-site Heseltine drilled well amounts to 3.2 m or 10.6 feet. This represents about 8.8% of total available drawdown of this well. Table 1 presents a summary of the calculated interference effects at other neighbouring wells completed into the limestone bedrock aquifer.

Table 1

Interference Effects Pumping of Proposed Irrigation Well PW-1
For 150 days at 2.27 L/s

Well	Calculated Interference	% of Available Drawdown
Iravani	2.74 m (9 feet)	7%
Kerr	2.61 m (8.58 feet)	7.6%
"Smeltzer"	2.35 m (7.7 feet)	4.8%
J. Dyble (MoE 67-6526)	2.92 m (9.6 feet)	6.3%
J. I. Black (MoE 67-2914)	2.31 m (7.6 feet)	5.7%

These calculated interference effects are not considered significant.

9.0 SAFE PERENNIAL WELL YIELD

The safe perennial well yield represents the quantity of water that the well will yield when pumped continuously for one year while using 60% of the total available drawdown. The 60% factor allows for seasonal water level fluctuations and interference effects from other possible extraction wells in the same aquifer complex.

In regard to the proposed irrigation well PW-1, the total available drawdown of 36.2 m (119 feet) represents the water column between the current static water level and the first reported water bearing horizon at 44.2 m (145 feet) below ground surface in the limestone bedrock. Other water bearing horizons exist at lower depths within this well. Sixty percent (60%) available drawdown amounts to 21.7 m or 71.3 feet.

Based on the projected drawdown after one year of pumping using the aquifer performance pumping test results and specific capacity proportionately, the safe perennial well yield has been calculated at 1.74 L/s or 23 Igpm.

However, due to the low well efficiency (30%), the well will sustain a slightly higher flow rate of 2.27 L/s (30 Igpm) for a shorter timeframe, 150 days.

10.0 RECHARGE

Recharge occurs through that portion of precipitation that migrates vertically through the surface soils, past the vegetative root zone to replenish water bearing intervals. Infiltrating precipitation replenishes both the overburden and bedrock aquifers.

The bedrock aquifer especially the deeper water bearing horizons at the study site is connected to the regionally extensive Guelph-Amabel Aquifer. Ample recharge is available from infiltrating precipitation and groundwater flow within the regionally extensive bedrock aquifer.

11.0 WATER QUALITY TESTING

Water samples were obtained from the pump discharge line during the pumping tests to determine background chemical and bacteriological water quality.

11.1 Chemical Water Quality

A water sample was collected during the aquifer performance pumping test prior to pump shutdown (at 19:07 on May 19). This sample was submitted to Fine Analysis Laboratories Limited of Hamilton for a 35 parameter general water quality (SWAP) analysis. Figure B1 in Appendix B presents the laboratory Certificate of Analysis for the above water sample.

As indicated by the owners, the groundwater from well PW-1 is to be used for eventual turf (greens and tees) irrigation purposes only. The Maximum Acceptable Concentration values listed on the laboratory report refers to the Ministry of the Environment Ontario Drinking Water Objectives applicable to drinking water supplies. These maximum acceptable values do not generally apply to irrigation supplies, but do provide an overview of general water quality.

The chemical water quality indicates high hardness when compared to drinking water objectives. For irrigation water, the sodium adsorption ratio (SAR) of 0.58 is less than 4 which will not create toxicity problems for foliar adsorption (MoE document entitled "Water Management, Goals, Practices, Objectives and Implementation Procedures, revised May, 1984).

11.2 Bacteriological Water Quality

Two water samples were collected, one at the beginning of the aquifer performance pumping test at 19:10 on May 18 with the second acquired just before pump shutdown at 19:08 on May 19. These samples were submitted to the laboratory Services of the Ministry of Health in Rexdale, Ontario for both Total and E-coliform analysis. Figures B2 and B3 in Appendix B show the laboratory test results for the first and second samples respectively.

While the first analysis showed significant evidence of bacterial contamination (14 total coliform per 100 mL of water), the second sample showed no significant evidence of bacterial contamination.

12.0 CONCLUSIONS

From the above discussion, we conclude that:

1. The Irrigation Well PW-1 can supply the continuous 2.27 L/s (30 Igpm) demand over a 150 day timeframe.

2. Water level response to pumping was evident at the H. Heseltine, Iravani, Kerr and Smeltzer domestic bedrock wells. Localized water level response to pumping is suspected at the J. Heseltine overburden bored well.

3. Calculated interference effects ranging from about 5 to 9% of total available drawdown were calculated to occur at the H. Heseltine, Iravani, Kerr and Smeltzer private wells. This interference is not considered significant.

4. Chemical water quality indicates mineralized groundwater with high hardness. The initial bacteriological water quality indicated a coliform bacterial presence but cleared up by the end of the aquifer performance pumping test.

13.0 RECOMMENDATIONS

From the above, we recommend:

1. An application be made to the Ministry of the Environment for a Permit to Take Water at a rate of 2.27 L/s (30 Igpm) for a seasonal water taking covering 150 days a year.

2. A flow meter or totalizer be added to the discharge line prior to any piping branches and to be recorded daily throughout the 1999 and 2000 irrigation seasons. Thereafter, the frequency may be reduced to a weekly schedule.

3. Water levels (static or pumping) be recorded at Irrigation Well PW-1 on a daily basis throughout the 1999 and 2000 irrigation seasons. Thereafter, the frequency may be reduced to a weekly basis.

4. Monitoring and recording of on-site water levels (Heseltine MoE #67-2915 and "Snider" MoE #83452 observation wells) be performed on a weekly basis.

5. The owners remove any free-standing water from the H. Heseltine drilled bedrock well pit and maintain dry pit floor conditions. At a minimum, the missing concrete cap should be replaced and the area around the well tiles be reprofiled to redirect surface water away from the wellhead and the well pit.

6. The ground surface around the irrigation well PW-1 be reprofiled to divert surface water away from the wellhead and to minimize any surrounding soil erosion.

Respectfully Submitted,

MORRISON ENVIRONMENTAL LIMITED

A. W. Taylor

A. W. Taylor, B.Sc.

W. D. Morrison, P.Eng.

APPENDIX A

MOE WATER WELL RECORD – SUMMARIES

MUNICIPALITY CONCESSION ETC	LOT	WELL NO	UTM EASTING NORTHING	ELEV FEET	DATE	DRILLER	CSG DIA INS	KIND OF WATER	WATER FOUND FEET	STAT LVL FEET	PUMP LVL FEET	TEST RATE GPM	TEST TIME HR/MN	WATER USE	OWNER/LOG/SCREEN DEPTHS IN FEET TO WHICH FORMATIONS EXTEND
ST GARAFRAXA TOWNSHIP (CONTINUED....)															
CON	2	8	67- 551150 7270 4841150	1400	04/80	5477	5	FR FR	130 230	89	90	6	2/00	DO	JHONSTON B BRWN SAND 0012 BRWN CLAY 0031 GREY CLAY 0085
CON	2	9	67- 550700 7137 4841900	1410	11/79	2336	5	FR FR	245 230	88		3	1/00	ST	HPAN LYRO 0096 GREY LMSN 0249 LINSEY P BRWN TPSL 0001 BRWN CLAY STNS 0020 GREY CLAY STNS GRVL 0097 BRWN STNS 0238
CON	2	9	67- 550720 5396 4842050	1405	12/74	1804	5	FR	85	30	30	8	1/30	DO	WEHERS T RED SAND FILL 0010 RED CLAY 0075 GRVL 0085
CON	2	9	67- 551121 2896 4842982	1402	03/59	1659	4	FR	177	35	60	9	4/30	DO	SCHOOL NO 2 CLAY MSND 0015 CLAY STNS 0040 BLUE CLAY 0077 GREY LMSN 0177
CON	2	10	67- 551100 7227 4842850	1410	01/80	5477	30	FR	6	6	6	3		DO	SMITH W BRWN TPSL 0001 BRWN CLAY 0010 BRWN SAND 0012 BRWN CLAY 0030
CON	2	11	67- 549650 5252 4842520	1405	09/74	3740	4	FR	300	12	65	10	1/00	DO	REID JANE BLCK TPSL 0001 BRWN CLAY STNS 0062 GREY HPAN BLDR 0078 GREY LMSN 0120 BRWN LMSN 0300
CON	2	11	67- 550350 5071 4843430	1425	05/74	2336	5	FR	215	30	60	20	1/00	DO	ECCLESTONE H TPSL 0001 BRWN CLAY STNS 0010 GREY CLAY STNS 0119 GREY ROCK 0148 BRWN ROCK 0215
CON	2	13	67- 548970 2898 4843357	1397	06/65	2406	5	FR	244	FLW	125	3	12/00	ST DO	CRUDEN W AND J TPSL 0001 BRWN CLAY 0025 GREY CLAY 0090 BRWN LMSN 0115 GREY LMSN 0125 BRWN LMSN 0295
CON	2	13	67- 549039 2397 4843236	1395	07/47	2411	4	FR		FLW	70	4	4/00	ST DO	CRUDEN W TPSL 0004 FSND 0010 HPAN BLDR MSND 0090 LMSN 0244
CON	2	13	67- 549700 6829 4844200	1410	09/78	3740	4	FR	225	27	65	7	1/00	DO	SMITH F BLCK TPSL 0001 BRWN CLAY STNS 0025 GREY HPAN BLDR 0135 GREY LMSN 0210 BRWN LMSN 0225
CON	2	14	67- 548250 6716 4844000	1405	06/78	3740	5	FR	165	4	55	8	1/00	DO	ECCLESTONES H BRWN CLAY 0022 GREY CLAY BLDR 0090 BRWN LMSN 0105 GREY LMSN 0165
CON	2	14	67- 548450 6001 4844000	1400	05/76	2336	5	FR	160	20	75	10	1/00	DO	ECCLESTONE G E T BRWN TPSL 0001 BRWN CLAY STNS 0018 GREY CLAY STNS 0078 GREY CLAY ROCK FCRD 0104 BRWN ROCK 0125 GREY ROCK 0177
CON	2	14	67- 548723 2899 4844095	1490	01/49	2411	6	FR FR	90 150	FLW	10	10	4/00	ST DO	ECCELSTONE G CLAY 0070 HPAN 0090 GRVL 0096 LMSN 0150
CON	2	15	67- 549100 3717 4844950	1375	07/70	2406	5	FR	65	FLW		10	1/00	DO	DRUMM CLARENCE L PROG 0015 BLUE CLAY STNS 0062 GREY GRVL 0065
CON	2	16	67- 547788 2900 4844926	1375	03/63	1804	5	FR FR	63 70	FLW				ST DO	RETTIE J C TPSL 0002 CLAY BLDR 0030 GRVL BLDR 0055 GRVL 0070
CON	2	16	67- 548030 3274 4845380	1400	10/68	1804	4	FR	70	2	16	20	2/00	ST DO	STEWART ARNOLD TPSL 0001 BLDR CLAY 0024 CLAY STNS 0045 MSND 0055 CLAY STNS 0070 GRVL 0075
CON	2	16	67- 548150 5672 4845710	1430	08/75	2336	4	FR	142	62	80	10	1/00	DO	STEWART ARNOLD BRWN TPSL 0001 BRWN CLAY STNS 0015 GREY CLAY STNS 0098 BRWN ROCK 0110 GREY ROCK 0115 BRWN ROCK 0120 GREY ROCK 0142
CON	2	17	67- 546825 4588 4845300	1450	04/73	2406	4	FR FR	150 160	30	45	10	1/30	DO	WOODS GEORGE BRWN CLAY SAND STNS 0045 BRWN CLAY SAND GRVL 0095 BRWN ROCK 0105 GREY ROCK 0160
CON	2	17	67- 547270 4762 4845270	1450	08/73	2406	4	FR	155	35	45	8	1/00	DO	HUNTER C S PROG 0019 BRWN CLAY SAND STNS 0030 BRWN CLAY SAND GRVL 0110 BRWN ROCK 0130 GREY ROCK 0150 GREY GRVL SAND 0180
CON	2	21	67- 545250 4300 4847100	1525	09/73	3737	4	FR FR	174 184	50	80	8	2/30	ST DO	CHRISTENSEN BENT BLCK TPSL 0001 GREY CLAY STNS 0078 BLUE CLAY 0140 BRWN GRVL 0166 BRWN LMSN 0185

FIGURE A1

MOE WATER WELL RECORD

Fairview Golf and Country Club

Lot 11, Con. 3, Township of West Garafraxa, Wellington County

Morrison Environmental Limited

Groundwater Experts

WELLINGTON COUNTY 67

MUNICIPALITY CONCESSION ETC	LOT	WELL NO	UTM EASTING NORTHING	ELEV FEET	DATE	DRILLER	CSG DIA INS	KIND OF WATER	WATER FOUND FEET	STAT LVL FEET	PUMP LVL FEET	TEST RATE GPM	TEST TIME HR/MN	WATER USE	OWNER/LOG/SCREEN DEPTHS IN FEET TO WHICH FORMATIONS EXTEND
ST GARAFRAXA TOWNSHIP (CONTINUED....)															
CON	3	5	67-6864	553000 4841250	1350	11/78	2336	5	FR FR	32 43	17	26	8	1/00 DO	CIVIERO CONST BRWN CLAY STNS 0008 BRWN STNS FCRD 0014 GREY STNS 0043
CON	3	5	67-6886	553050 4841300	1350	04/78	3740	5	FR	70	FLW	18	9	1/00 DO	POST JOHN BRWN CLAY SAND 0006 BRWN GRVL CLAY 0009 GREY LMSN 0070
CON	3	5	67-7719	553150 4841300	1375	04/83	1906	5	FR	115	33	100	10	2/00 DO	VERBAKEL BRWN CLAY STNS GRVL 0026 GREY STNS 0060 BRWN STNS 0105 WHIT LMSN STNS 0115
CON	3	5	67-4643	553230 4841520	1375	06/73	3737	5	FR	208	35	75	8	1/00 DO	DYKSTRA KORNELIS BLCK TPSL 0001 BRWN CLAY 0015 BRWN HPAN 0059 GREY LMSN 0202 WHIT LMSN 0210
CON	3	5	67-6312	553400 4841700	1405	12/76	1906	5	FR	138	45	60	10	2/00 DO	FRED BLACK TPSL 0001 CLAY STNS 0050 GRVL 0055 HPAN STNS 0065 BLUE ROCK 0140
CON	3	6	67-5576	552330 4841650	1325	08/75	2336	5	FR	175	38	75	10	1/00 DO	CLOIE D BRWN CLAY STNS 0050 GREY CLAY STNS 0070 GREY ROCK 0125 BRWN ROCK 0175
CON	3	6	67-2910	552928 4841283	1338	08/56	1648	4	FR	105	22	60	7	5/30 DO	MUIR D CLAY STNS 0025 CLAY MSND 0047 LMSN 0105
CON	3	6	67-2909	552995 4841392	1340	07/54	2411	4	FR	90	10	12	10	2/00 DO	CLARKE F SLOR GRVL 0013 LMSN 0092
CON	3	6	67-2911	553000 4841392	1340	01/59	1659	4	FR	67	18	20	10	1/00 DO	WALKER F CLAY STNS 0068 GREY LMSN 0067
CON	3	6	67-2909	553097 4841496	1350	06/54	2521	4	FR	76	18	18	10	/30 DO	WATKINS A GRVL TPSL 0003 GRVL STNS 0020 GREY LMSN 0076
CON	3	6	67-3777	553370 4841800	1400	07/70	1659	4	FR	108	32	35		6/00 DO	MACQUEEN DUNCAN PRDG 0031 HPAN 0040 CLAY MSND 0059 GREY LMSN 0108
CON	3	6	67-2913	553455 4841937	1400	10/65	1659	4	FR	95	32	60	10	3/00 DO	CAUDLE E R CLAY STNS 0057 GREY LMSN 0095
CON	3	6	67-2912	553639 4842140	1400	06/63	2406	4	FR	134	24	60	10	2/00 DO	DEBOER W BRWN CLAY 0004 CLAY SLDR 0070 BLUE LMSN 0132 BRWN LMSN 0138
CON	3	6	67-7029	553650 4842100	1405	07/79	1669	4	FR	80	35	50	5	2/00 DO	VAN DEB MEULEN P BLCK TPSL 0002 BRWN SAND 0010 YLLW CLAY 0020 BRWN HPAN 0035 GREY LMSN 0080
CON	3	6	67-7763	553700 4842200	1400	09/82	1669	4		112	32	50	5	4/00 DO	KELLY V BLCK TPSL 0002 BRWN CLAY 0010 BRWN HPAN 0030 BRWN CLAY STNS 0060 GREY LMSN 0112
CON	3	8	67-5700	551600 4842500	1410	09/75	4320	4	FR	207	54		12	1/00 DO	SMINGLER DAVID BRWN CLAY BLDR 0036 GREY CLAY BLDR 0072 LMSN CLAY 0104 GREY LMSN HARD 0155 BRWN DLMT 0207
CON	3	9	67-6640	551400 4842750	1405	06/77	2332	4	FR	195	33	47	7	3/00 DO	BLOOMFIELD B BRWN CSND 0015 GREY CLAY STNS 0074 GREY ROCK 0215
CON	3	9	67-7095	552350 4843550	1400	07/79	1669	4	FR	135	36	60	5	3/00 DO	ROBINSON L BLCK TPSL 0002 YLLW CLAY 0010 YLLW CLAY STNS 0030 BRWN HPAN 0060 BRWN HPAN SAND 0080 BRWN CLAY 0086 BRWN LMSN 0135
CON	3	10	67-2914	551205 4843794	1423	12/67	2406	5	FR	175	40	60	10	1/30 ST DO	BLACK J I TPSL 0002 BRWN CLAY STNS 0084 BRWN CLAY GRVL 0097 BRWN LMSN 0180
CON	3	10	67-6408	551500 4843600	1410	05/77	1906	5	FR	356	65	85	15	5/00 DG	FAIRVIEW CNTRY CLUB BRWN CLAY STNS 0259 GREY STNS 0356
CON	3	11	67-2915	551147 4844157	1410	01/51	2521	4	FR	156	23	30	10	/30 ST DO	HESELTINE H CLAY 0080 MSND 0120 LMSN 0156

FIGURE A2

MOE WATER WELL RECORD

Fairview Golf and Country Club

Lot 11, Con. 3, Township of West Garafraxa, Wellington County

Morrison Environmental Limited

Groundwater Experts

WELLINGTON COUNTY 67

MUNICIPALITY CONCESSION ETC	LOT	WELL NO	UTM EASTING NORTHING	ELEV FEET	DATE	DRILLER	CSG DIA INS	KIND OF WATER	WATER FOUND FEET	STAT LVL FEET	PUMP LVL FEET	TEST RATE GPM	TEST TIME HR/MN	WATER USE	OWNER/LOG/SCREEN DEPTHS IN FEET TO WHICH FORMATIONS EXTEND
ST GARAFRAXA TOWNSHIP (CONTINUED....)															
ON	3	11	67- 0528	551500 4844200	1410	09/77	3740	4	FR	180	27	75	9	1/00	DO OYDLE JOHN BRWN CLAY SANJ 0034 GREY HPAN STNS 0050 BRWN SAND 0076 GREY CLAY 0100 GREY LMSN 0180
ON	3	13	67- 7274	549600 4844600	1400	05/80	2336	5	FR	116	23	50	20	1/00	DO LEE P BRWN CLAY STNS 0015 GREY CLAY STNS 0112 GREY STNS LTCL 0116
ON	3	13	67- 6427	549750 4844350	1410	07/77	5469	5	FR	132	23	70	8	1/00	DO FERGUSON A BRWN CLAY 0018 GREY CLAY 0123 GREY LMSN 0132
ON	3	13	67- 2916	549758 4844394	1410	09/64	1659	4	FR	174	38	60	6	4/00	DO RAMAGE J CLAY MSND 0020 CLAY STNS 0130 GREY LMSN 0175
ON	3	16	67- 2917	548525 4845909	1430	08/49	2411	4	FR FR	92 102	20	40	8	4/00	ST DO FLETCHER L PRDG 0020 BLDR GRVL 0070 MSND GRVL 0092 LMSN 0150
ON	3	18	67- 7220	547550 4846450	1475	07/79	4544	5	FR	116	20	90	5	9/00	DO ROBINSON D BLCK TPSL 0001 RED CLAY 0056 BLUE CLAY 0111 BLUE FSND VERY 0119 (S 0116 03)
ON	3	18	67- 7670	547600 4846400	1475	05/82	3740	4	FR FR	310 320	37	60	20	3/00	DO ROBINSON D BRWN CLAY 0006 GREY CLAY STNS 0047 BRWN SAND SILT 0077 GREY CLAY SILT BLDR 0160 GREY HPAN GRVL BLDR 0226 BRWN SHLE SOFT 0234 BRWN LMSN HARD 0300 WHIT LMSN 0320
ON	3	18	67- 2918	547449 4847252	1505	11/59	1705	4	FR	245	70	82	12	6/00	ST DO WILSON K PRDG 0005 RED CLAY 0016 CLAY STNS 0028 MSND 0038 GSND 0106 BRWN CLAY 0162 CLAY GRVL 0198 BRWN SHLE 0204 BRWN LMSN 0224 GREY LMSN 0238 BRWN LMSN 0245
ON	3	19	67- 7934	547100 4847000	1500	12/63	4643	5	FR	180	32	180	25	1/30	DO DACLLAUER D BLCK TPSL 0001 RED CLAY 0140 BRWN GRVL 0180 BRWN LMSN 0185
I	3	20	67- 7045	546350 4847600	1510	07/79	3740	4	FR	300	33	90	6	1/00	DO VAN BEEK G BRWN CLAY DNSE 0027 GREY CLAY 0075 GREY HPAN BLDR 0165 BRWN LMSN 0300
I	3	21	67- 2919	546504 4848744	1495	08/65	1804	4	FR FR	140 142	1	5	15	3/00	ST DO FREIHAUT J TPSL 0002 BRWN CLAY STNS 0120 MSND 0138 GRVL 0142
I	3	23	67- 7215	545050 4848300	1525	01/80	3317	4	FR	165 195	15	31	10	3/00	DO BULTENA H BRWN CLAY STNS 0030 SAND CLAY 0055 CLAY STNS 0142 GREY LMSN 0196
	3	24	67- 2920	544881 4849199	1525	04/61	1705	4	FR	178	23	35	12	5/00	ST DO MCDOUGAL R CLAY 0006 MSND 0008 CLAY 0036 MSND 0060 HPAN 0087 MSND 0115 HPAN 0135 SHLE 0152 GREY LMSN 0178
	3	25	67- 5426	544773 4850634	1525	09/74	4856	4	FR	156	15	30	25	1/00	DO MCDOUGAL DOUG BLCK TPSL 0001 BRWN CLAY 0036 GREY HPAN CLAY STNS 0142 BRWN GRVL SAND 0150 LMSN SHLE LTCL 0160

FIGURE A3

MOE WATER WELL RECORD

Fairview Golf and Country Club

Lot 11, Con. 3, Township of West Garafraxa, Wellington County

Morrison Environmental Limited

Groundwater Experts

WELLINGTON COUNTY 67

PRINCIPALITY CONCESSION ETC	LOT	WELL NO	UTM EASTING NORTHING	ELEV FEET	DATE	DRILLER	CSG DIA INS	KIND OF WATER	WATER FOUND FEET	STAT LVL FEET	PUMP LVL FEET	TEST RATE GPM	TEST TIME HR/MN	WATER USE	OWNER/LOG/SCREEN DEPTHS IN FEET TO WHICH FORMATIONS EXTEND
ST GARAFRAXA TOWNSHIP (CONTINUED....)															
ON	4	10	67-2937	551947 4844373	1400	07/67	1905	5	FR	85	18	26	3	16/00	DO	WILLIAMSON J TPSL 0001 GREY CLAY STNS 0067 SHLE 0098
ON	4	10	67-6784	551950 4844150	1400	08/78	5469	30	FR FR	9 26	9				DO	ZISTEK J TPSL 0001 BRWN CLAY SNDY 0009 GREY CLAY STNS 0026 BRWN SAND 0026 GREY CLAY STNS 0040
ON	4	10	67-6396	551950 4844350	1395	05/77	2519	24	FR	12	11				DO	MCLELLAND E BLCK TPSL 0001 BRWN CLAY BLDR 0012 BRWN SAND 0013 BRWN CLAY BLDR 0022
ON	4	10	67-6753	551950 4844400	1400	08/78	5469	30	FR	7	10	30	5	1/00	DO	HORNE D BRWN SAND 0010 GREY CLAY 0030
ON	4	10	67-7739	551950 4844450	1400	06/82	3317	4	FR	176	16	24	11	12/00	DO	ST PIERRE H CLAY GRVL 0006 CLAY STNS 0055 GREY CLAY 0070 CLAY STNS 0105 CLAY SOFT SNDY 0172 STNS 0176 UNKN 0177
ON	4	10	67-2935	551965 4844142	1400	11/66	2519	30	FR	17	5	29	2		DO	SELBY E H TPSL 0001 BRWN CLAY 0005 MSND 0005 BLUE HPAN 0017 MSND 0020 HPAN STNS 0030
ON	4	10	67-2928	551984 4844258	1400	11/65	5001	36	FR	25	25				DO	CRAIG W TPSL 0002 TPSL MSND 0010 CLAY STNS 0033 CLAY GRVL 0035
ON	4	10	67-7096	552000 4844050	1400	09/79	5477	30	FR FR FR FR	4 10 16 33	4	40	4		DO	FLETCHER K BRWN SAND GRVL 0004 GREY CLAY 0010 GREY MARL SAND 0012 GREY CLAY 0016 GRVL 0017 GREY CLAY 0030 GREY MARL SAND 0033 GREY CLAY 0040
ON	4	10	67-6535	552000 4844900	1430	06/77	3317	5	FR	305	35	83	11	3/00	PS	EVANG BAPTIST CAMP SAND 0028 GREY CLAY STNS 0121 GREY LMSN 0165 BRWN LMSN 0300 BRWN ROCK 0320
ON	4	10	67-2936	552111 4844476	1395	03/67	1906	4	FR FR	107 110	8	20	15	5/00	DO	LYND D CLAY STNS 0025 CLAY 0070 CLAY STNS 0089 BLUE LMSN 0109 GRVL 0110
ON	4	10	67-2934	552146 4844546	1395	10/66	1906	4	FR FR	110 125	22	40	10	4/00	DO	BASSETT C CLAY MSND STNS 0010 BLUE CLAY STNS 0080 CLAY MSND 0094 GREY LMSN 0105 LMSN 0126
ON	4	10	67-2933	552345 4844639	1395	07/65	2519	30	FR	10	10				DO	SPADONI M BRWN CLAY 0016 CLAY BLDR 0017
ON	4	10	67-2932	552366 4844614	1395	07/65	2519	30	FR	14	15				ST	MARTIN W MSND 0017
ON	4	10	67-2931	552479 4844736	1395	07/65	2519	30	FR	22	20				DO	WUNDER W W BLDR CLAY 0022 MSND 0023 BRWN CLAY 0028
ON	4	10	67-6552	552500 4844900	1425	10/79	1669	4	FR	128	18	20	10	2/00	DO	STAFFORD D BLCK TPSL 0002 YLLW CLAY 0010 BRWN STNS CLAY 0020 BRWN HPAN 0040 BRWN STNS 0060 BRWN HPAN STNS 0080 GREY LMSN 0128
ON	4	10	67-2930	552524 4844752	1395	07/65	2519	30	FR	20	15	20			DO	WORTON H CLAY 0015 BLDR 0022
CON	4	10	67-6987	552550 4844950	1400	06/79	4005	6	FR	69	40	65	4	1/00	DO	KIEFHABER H BRWN CLAY GRVL LOOS 0035 BRWN CLAY SNDY LOOS 0045 BRWN CGVL LOOS 0055 GREY CLAY GRVL LOOS 0067 GREY LMSN MARL

FIGURE A4

MOE WATER WELL RECORD

Fairview Golf and Country Club

Lot 11, Con. 3, Township of West Garafraxa, Wellington County

Morrison Environmental Limited

Groundwater Experts

WELLINGTON COUNTY 67

MUNICIPALITY / CONCESSION ETC	LOT	WELL NO	UTM EASTING NORTHING	ELEV FEET	DATE	DRILLER	CSG DIA INS	KIND OF WATER	WATER FOUND FEET	STAT LVL FEET	PUMP LVL FEET	TEST RATE GPM	TEST TIME HR/MN	WATER USE	OWNER/LOG/SCREEN DEPTHS IN FEET TO WHICH FORMATIONS EXTEND
ST GARAFRAXA TOWNSHIP (CONTINUED....)															
CON	4	10	67- 2929	552559 4844793	1395	07/65	2519	30	FR	7	7			DO	MCELROY N W BRWN CLAY 0007 FSND 0008 YLLW CLAY 0028
CON	4	10	67- 6733	552600 4844900	1400	07/78	5469	30	FR FR	9 34	9	40	2		DO	CRENNG M BLCK TPSL 0001 BRWN CLAY STNS 0009 GREY CLAY STNS 0034 SAND GRVL 0035 GREY CLAY 0040
CON	4	10	67- 7458	552600 4845050	1400	06/81	1906	5	FR	127	17	35	20	2/00	DO	KING E BLCK TPSL 0001 BRWN HPAN STNS 0091 BLDR STNS 0128
CON	4	10	67- 7028	552650 4845050	1425	07/79	2904	6	FR FR	147 170	40	170	4	2/30	DO	MAJAS G BRWN CLAY STNS BLDR 0022 GREY CLAY STNS PCKD 0080 GREY CLAY BLDR SAND 0102 GREY CLAY SAND HARD 0109 GREY LMSN HARD 0113 BRWN LMSN HARD MGRD 0136 BRWN LMSN HARD LYRD 0145 BRWN LMSN SNDS SOFT 0172 SLIGHT MAX
CON	4	13	67- 5290	551063 4846458	1425	09/74	2336	5	FR	116	12	60	12	1/00	DO	TPSL 0001 BRWN FSND 0023 BRWN CLAY GRVL 0030 GREY CLAY GRVL 0105 GREY ROCK 0117
CON	4	14	67- 4277	549300 4846080	1410	07/72	2519	30	FR	9	8	25			DO	HALL B BLCK TPSL 0002 BRWN CLAY SAND STNS 0009 BRWN SAND 0010 GREY CLAY STNS 0025
CON	4	14	67- 5348	550732 4846757	1425	10/74	3740	4	FR	150	12	40	10	1/00	DO	RANDALL OLIVER BLCK TPSL 0001 BRWN SAND CLAY 0025 GREY HPAN GRVL 0110 GREY LMSN 0150
CON	4	15	67- 6076	549450 4846680	1460	06/76	2336	4	FR	148	25	60	12	1/00	DO	WEAVER ARTHUR BRWN TPSL 0001 BRWN CLAY STNS 0040 GREY CLAY STNS 0125 BRWN ROCK 0150
CON	4	15	67- 6361	549950 4847300	1500	04/77	5469	5	FR	170	55	64	10	1/00	DO	KOOPS H BRWN CLAY 0022 BRWN SAND 0065 GREY CLAY STNS 0155 HPAN 0166 GREY LMSN 0180
CON	4	16	67- 2938	549171 4846691	1460	10/60	2414	4	FR	147	24	50	15	4/00	DO	LOGEL E CLAY MSND STNS 0010 FSND BLDR 0028 CLAY STNS 0075 GREY CLAY MSND 0105 BLDR HPAN 0115 BRWN MSND STNS 0136 LMSN 0147 GRVL 0148
CON	4	17	67- 2940	546737 4847187	1500	07/65	2406	4	FR	290	65	75	10	1/00	ST DO	ECCLESTONE R TPSL 0001 BRWN CLAY STNS 0035 BRWN MSND 0065 GREY CLAY GRVL 0192 BRWN LMSN 0290
CON	4	17	67- 2939	548763 4847147	1500	07/48	1723	4	FR	216	59	99	9		ST DO	FLETCHER A b CLAY 0007 MSND 0095 CLAY 0110 CLAY MSND STNS 0165 GRVL 0169 GREY LMSN 0230 BRWN LMSN 0252
CON	4	18	67- 5022	543940 4848460	1500	03/74	5417	6	FR	210	29	60	20	2/20	DO	ALDERSLEY D BRWN CLAY 0020 BRWN SAND 0045 GREY SAND 0065 GREY CLAY SAND SILT 0135 GREY CLAY GRVL SAND 0175 BRWN LMSN 0212
CON	4	19	67- 2941	547831 4848175	1508	12/65	3316	4	FR	208	22	45	10	2/00	ST DO	MACDONALD J CLAY 0015 MSND 0088 CLAY STNS 0168 LMSN 0210
CON	4	20	67- 3876	547850 4849580	1488	12/70	2519	30	FR	22	16	30			DO	HOWITT R W BRWN CLAY 0016 GREY CLAY 0022 GREY MSND 0028 GREY CLAY 0030
CON	4	20	67- 7733	543050 4849300	1500	07/83	3740	4	FR FR	175 203	FLW	50	4	1/00	DO	BRANT P BRWN CLAY 0006 GREY CLAY DNSE 0070 GREY HPAN STNS 0148 GREY LMSN 0205
CON	4	21	67- 4799	547775 4849620	1490	10/73	3737	4	FR	176			20	2/00	DO	ROSS CHARLES BLCK TPSL 0001 GREY CLAY 0045 BRWN GRVL BLDR 0051 GREY CLAY HPAN 0150 GREY LMSN 0178

FIGURE A5

MOE WATER WELL RECORD

Fairview Golf and Country Club

Lot 11, Con. 3, Township of West Garafraxa, Wellington County

Morrison Environmental Limited

Groundwater Experts

APPENDIX B

LABORATORY WATER QUALITY RESULTS

Fine Analysis Laboratories Ltd.

A FINE LABORATORIES LIMITED COMPANY

236 Pritchard Road, Hamilton, Ontario Canada L8W 3P7 Tel: (905) 574-4977 Fax: (905) 574-4766

CLIENT:	Morrison Environmental Ltd. 1087 Meyerside Dr., Unit 1 Mississauga, Ontario L5T 1M3	Phone: Fax:	905-564-8944 905-564-8952
ATTENTION:	Mr. Andrew Taylor/Bill Morrison		
DATE RECEIVED:	May 20/99		
DATE COMPLETED:	May 28/99		
PROJECT NUMBER:	149-991 Fairview Golf & Country PW-1 Irrigation		
SAMPLE TYPE:	Water		
REPORT NO.:	FA696BQ-1		

Notes:

- All results are blank corrected
- np = test not performed
- Solids results are based on dry weight

Methods used by Fine Analysis Laboratories Ltd are based upon those found in "Standard Methods for the Examination of Water and Wastewater", Seventeenth Edition, Published by the American Public Health Association, 1015 Fifteenth Street, NW, Washington, DC 20005 Other methods are based on the principles of MISA or EPA Methodologies

Results: See attached sheet.

Yana L'Pris, M.Sc. C. Chem.
Chemist
FINE ANALYSIS LABORATORIES

Shahid Abdullah, M. Sc.
Senior Chemist
FINE ANALYSIS LABORATORIES

Fine Analysis Laboratories employs a strict QA/QC program at all stages of analysis in order to maintain the principles of good laboratory practices Valid methodologies are used to the best of our abilities, however, our liabilities are limited solely to the analytical cost of sample submitted

THANK YOU FOR CONSIDERING FINE ANALYSIS LABORATORIES FOR ANALYTICAL SERVICES

FIGURE B1

WATER QUALITY ANALYSIS RESULTS
Fairview Golf and Country Club
Lot 11, Con. 3, Township of West Garafraxa, Wellington County

Morrison Environmental Limited
Groundwater Experts

Fine Analysis Laboratories Ltd.

A FINE LABORATORIES LIMITED COMPANY

236 Pritchard Road, Hamilton, Ontario Canada L8W 3P7 Tel: (905) 574-4977 Fax: (905) 574-4766

Report No.: FA696BQ-1

>>>> CERTIFICATE OF ANALYSIS <<<<

Sample ID		149-991 Fairview Golf & Country PW-1 Irrigation	@ Maximum Acceptable Concentration
Lab Number		FA696BQ-1	
Parameters:	**MDL****		
1 Calcium	0.005 mg/L	85.670	200
2. Sodium	0.5 mg/L	24.7	200
3. Copper	0.01 mg/L	<0.01	1
4 Manganese	0.01 mg/L	0.02	0.05
5. Magnesium	0.001 mg/L	31.790	150
6 Potassium	0.1 mg/L	1.3	.
7 Iron	0.02 mg/L	0.03	0.3
8. Zinc	0.01 mg/L	0.04	5
9 Aluminum	0.03 mg/L	<0.03	0.1
10.Lead	0.01 mg/L	<0.01	0.01
11.Sulphate	1.0 mg/L	231.0	500
12.Chloride	1.0 mg/L	0.6	250
13.Nitrate & Nitrite-N	0.05 mg/L	<0.05	10
14.Carbonate	1.00 mg/L	<1.00	.
15.Bicarbonate	1.0 mg/L	131.9	.
16.Ortho Phosphate	0.01 mg/L	<0.01	0.2
17.Fluoride	0.01 mg/L	<0.01	2.4
18.Alkalinity	1.0 mg/L	132.8	30-500
19.Ammonia-N	0.05 mg/L	0.13	0.5
20.pH	0.01	7.86	6.5-8.5
21.Hardness	0.05 mg/L	346.61	80-100
22.Turbidity	0.1 N.T.U	0.3	1
23.Conductivity	0.1 umhos/cm	878.0	.
24.Cation Sum	0.01 meq/L	8.05	.
25.Anion Sum	0.01 meq/L	7 49	.
26.Ion Ratio	0.01	1.08	.
% Difference	0.10%	3.62	.
27.Silica	0.5 mg/L	8.2	.
28.Saturation pH (4 deg. C)	0.01	8.30	.
29.Colour	0.5 T.C.U	4.2	5
30.T.D.S.	0 1 mg/L	468.0	500
31.Redox Potential	0.1 mV	230 0	.
32.Sodium Adsorption Ratio		0.58	.
33.Theoretical Cond.	0.1 umhos/cm	873.0	
34.T.D.S. Theoretical	0.1 mg/L	462.8	500
35.Langelier Index (4 deg. C)	0.01	-0.44	.

** Method Detection Limit

T.D.S.: Total Dissolved Solids

@ Ontario Drinking Water Guidelines

FIGURE B2

WATER QUALITY ANALYSIS RESULTS

Fairview Golf and Country Club

Lot 11, Con. 3, Township of West Garafraxa, Wellington County

Morrison Environmental Limited

Groundwater Experts

B3

Ministry of Health / Ministère de la Santé — Laboratory Services Branch / Direction des Services de Laboratoire

Ontario

Affix lettermail postage / Affranchissement poste-lettre

Date collected / Date du prélèvement	Location of supply (Lot, Con., Twp) / Lieu de prélèvement (Lot, Concession, Canton)	
May 19 99	Lot 11 Conc 3. W. Garafraxa	☑ I will pick up report from laboratory. Je passeral prendre le rapport du laboratoire.

REPORTS NOT PICKED UP WITHIN 3 MONTHS WILL BE DESTROYED.
LES RAPPORTS NON RECLAMÉS EN TROIS MOIS SERONT DÉTRUITS.

Fairview Golf & Country Club % Morrison Environmental
Name/Nom

1087 Meyerside Drive Unit #1
Street, R.R., Box No./Rue, R.R., Casier Postal

Mississauga
City, Town/Ville

ONTARIO L5T 1M5
Postal Code/Code Postal

Your name and return address

Votre nom et adresse de retour

Date Received/Date Reçue	Lab. No./No. du Lab.
MAY 21 1999	

INTERPRETATION FOR THIS WATER SAMPLE/POUR CETTE BOUTEILLE D'EAU

The water sample was tested for the presence of both Total Coliform and E. coli bacterial indicators of contamination.

☑ No significant evidence of bacterial contamination (3 consecutive samples with this designation are needed to determine the stability of the water supply).
Aucune preuve signifative de contamination bacterienne (3 échantillons consecutif avec cette designation peuvent d'établir la stabilité de la source de l'eau).

☐ Significant evidence of bacterial contamination. May be unsafe to drink. Consult local health inspector for information as soon as possible.
Preuve de contamination bacterienne significative. Peut être non-potable. (Consultez un inspecteur-hygiéniste local pour l'information le plus tôt possible).

☐ **UNSAFE TO DRINK** Evidence of sewage contamination. Consult local health inspector for appropriate action as soon as possible.
EAU NON-POTABLE Preuve des contamination des égouts. Consultez un inspecteur-hygiéniste local pour de plus amples renseignements sur les mesures à prendre.

Frances Jamieson

FRANCES JAMIESON, M.D., F.R.C.P.C.
MEDICAL MICROBIOLOGIST
CLINICAL & ENVIRONMENTAL MICROBIOLOGY DEPT
CENTRAL PUBLIC HEALTH LABORATORY

FOR INQUIRIES REGARDING THE SIGNIFICANCE OF THIS RESULT, PLEASE CALL YOUR LOCAL HEALTH UNIT

Total Coliform per 100ml / Total des colibacilles par 100 ml	E. coli per/par 100 ml
0	0

Date	Checked by/Vérifié par
99/5/21	JR 2B

Results are unreliable if this sample took more than 48 hours to reach the laboratory.
Les resultats ne sont pas valides si cet échantillon a pris plus de 48 heures pour arriver au laboratoire.

FIGURE B3

BACTERIOLOGICAL WATER QUALITY RESULTS
Fairview Golf and Country Club
Lot 11, Con. 3, Township of West Garafraxa, Wellington County

Morrison Environmental Limited
Groundwater Experts

Ontario

Date collected / Date du prélèvement	Location of supply (Lot, Con., Twp) / Lieu de prélèvement (Lot, Concession, Canton)	
May 18, 1999 19:10	Lot 11, Conc 3, W. Garafraxa	☑ I will pick up report from laboratory. Je passeral prendre le rapport du laboratoire.

REPORTS NOT PICKED UP WITHIN 3 MONTHS WILL BE DESTROYED.
LES RAPPORTS NON RECLAMÉS EN TROIS MOIS SERONT DÉTRUITS.

Name/Nom: Fairview Golf & Country Club c/o Morrison Environmental

Street, R.R., Box No./Rue, R.R., Casier Postal: 1087 Meyerside Drive Unit #1

City, Town/Ville: Mississauga

ONTARIO L5T 1M5
Postal Code/Code Postal

Your name and return address

Votre nom et adresse de retour

Date Received/Date Reçue	Lab. No./No. du Lab.

INTERPRETATION FOR THIS WATER SAMPLE/POUR CETTE BOUTEILLE D'EAU

The water sample was tested for the presence of both Total Coliform and E. coli bacterial indicators of contamination.

☐ No significant evidence of bacterial contamination (3 consecutive samples with this designation are needed to determine the stability of the water supply).
Aucune preuve signifative de contamination bacterienne (3 échantillons consecutif avec cette designation peuvent d'établir la stabilité de la source de l'eau).

☑ Significant evidence of bacterial contamination. May be unsafe to drink. Consult local health inspector for information as soon as possible.
Preuve de contamination bacterienne significative. Peut être non-potable. (Consultez un inspecteur-hygiéniste local pour l'information le plus tôt possible).

☐ UNSAFE TO DRINK Evidence of sewage contamination. Consult local health inspector for appropriate action as soon as possible.
EAU NON-POTABLE Preuve des contamination des égouts. Consultez un inspecteur-hygiéniste local pour de plus amples renseignements sur les mesures à prendre.

Frances Jamieson

FRANCES JAMIESON, M.D., F.R.C.P.C
MEDICAL MICROBIOLOGIST
CLINICAL & ENVIRONMENTAL MICROBIOLOGY DEPT
CENTRAL PUBLIC HEALTH LABORATORY

FOR INQUIRIES REGARDING THE SIGNIFICANCE OF THIS RESULT, PLEASE CALL YOUR LOCAL HEALTH UNIT

Total Coliform per 100ml / Total des colibacilles par 100 ml	E. coli per/par 100 ml
14	0

Date	Checked by/Vérifié par
99/5/21	JR JB

Results are unreliable if this sample took more than 48 hours to reach the laboratory.
Les resultats ne sont pas valides si cet échantillon a pris plus de 48 heures pour arriver au laboratoire.

FIGURE B4

BACTERIOLOGICAL WATER QUALITY RESULTS
Fairview Golf and Country Club
Lot 11, Con. 3, Township of West Garafraxa, Wellington County

Morrison Environmental Limited
Groundwater Experts

APPENDIX C

PERMIT TO TAKE WATER

Ministry of the Environment and Energy

Ontario

Application for Permit to Take Water

Information requested by this form is collected under the authority of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40 (OWRA) and the Environmental Bill of Rights, Statutes of Ontario, 1993, Chapter 28 (EBR). The purpose of the Permit is to regulate water takings in order to promote efficient development and equitable use of surface and ground waters.

■ New Permit ☐ Permit Renewal ☐ Permit Amendment	Existing Permit No.

Name of Applicant	Telephone No.
883890 Ontario Limited, Division of GolfNorth Properties Inc.	519-658-5951
Address	**Postal Code**
Rural Route #32 Kossuth Road, Cambridge, Ontario	N3H 4R7

Application Particulars

Please read instructions on the Guide for Approval of Permit to Take Water ("Guide") and ensure that all sections of the application are completed in full, especially the section on Request Amount of Taking from each Source and project/application description for purposes of EBR registry. Submit a diagram of the area of this water taking. Diagram, instructions and example are shown in the "Guide". If the taking is from a groundwater source, then a diagram indicating any wells within 500 metres of the taking must be submitted.
If there are any questions concerning the application, please contact the corresponding Ministry of Environment Regional Office listed in the

A Source of Water

1 Well(s): How many? 1 Spring(s): How many?	2 Lake, Stream or River Name(s)
3 Pond(s): How many? Type: ☐ Dugout ☐ By-Pass ☐ On-Stream ☐ Pit or Quarry	
4 Other: Type of Source	
5 Construction date of Source: June 5, 1998	6 Date of installation of Water Taking Equipment: Second Half 1998

B Location of Taking

Lot, Concession, Township or former Township and County or Region or District, or City, Town or Village with name of street and number

North Half Lot 11, Concession 3, Township of West Garafraxa, County of Wellington

Are the proposed works located in an area of development control as defined by the Niagara Escarpment Planning and Development Act (NEPDA)

☐ Yes ■ No (If Yes, attach copy of NEPDA permit)

C Location of Water Use

■ Same as B or

Lot, Concession, Township or former Township and County or Region or District, or City, Town or Village with name of street and number

D Purpose of Taking

■ Irrigation ☐ Commercial ☐ Industrial ☐ Municipal ☐ Public Supply ☐ Recreation

☐ Drinking Water ☐ Other (please describe)

E Period of Water Taking (complete either Section 1 or 2 below)

1 Taking to commence on _____ and to extend for a period of _____ ☐ days ☐ weeks ☐ months ☐ years

2 Seasonal taking to extend from May 1 to October 1 each year for Indefinite (number of years)

Ce formulaire est disponible en francais

F Request Amount of Taking from each Source (If the taking involves the taking of water into storage, please state the amount of water taken into storage as well as the amount of water withdrawn from storage).

Source number	Name of source or description	Maximum amount taken per minute	Maximum amount taken per day	Number of hours of taking per day - maximum	Number of hours taken per day - average	Maximum number of days taking per year
PW-1	Irrigation Well PW-1	30	43200	24	18	150

Indicate unit of measure ☐ Litres ■ Imperial Gallons ☐ US Gallons

G Project/application description for purposes of EBR registry (brief description of proposal)

Application for Permit to Take Water on a seasonal basis for the topping-up of a turf irrigation pond on Part of Lot 11, Concession 3, Township of West Garafraxa, Wellington County. The pumping rate of Irrigation Well PW-1 will be 2.27 litres Per second (30 Igpm) on a maximum 24 hour basis per day for 150 days per year.

H Environmental Bill of Rights Requirements

Is this a proposal for a Prescribed Instrument under EBR?	■ Yes	☐ No
If "Yes", is it excepted from public notification?	☐ Yes	■ No
If it is excepted from public notification, provide reason	☐ Equivalent Public Participation	☐ Emergency
	☐ Environmentally Insignificant amendment or revocation	☐ EAA or Tribunal Decision

Documentation in support of the above noted exception must be provided (refer to "Guide").

I Supporting Information Checklist: This is a list of all supporting information attached to this application and is subject to the Freedom of Information and Protection of Privacy Act (FOIPOPA) and the Environmental Bill of Rights (EBR).

SUPPORTING INFORMATION	ATTACHED?	REFERENCE	CAN BE DISCLOSED
Pre-application consultation with MoE	☐ Yes ☐ No		
Documentation provided			
Description of the proposed works	☐ Yes ☐ No		☐ Yes ☐ No
Environmental Study Report (ESR)	☐ Yes ☐ No		☐ Yes ☐ No
Preliminary Report	☐ Yes ☐ No		☐ Yes ☐ No
Design Report/Brief	☐ Yes ☐ No		☐ Yes ☐ No
Hydraulic and Process Calculations	☐ Yes ☐ No		☐ Yes ☐ No
Final Plans and Specifications	☐ Yes ☐ No		☐ Yes ☐ No
Water Supply and Treatment			
Raw Water Quality Analysis	☐ Yes ☐ No		☐ Yes ☐ No
Hydrogeological Report	■ Yes ☐ No	Morrison Environmental Limited	☐ Yes ☐ No
Other Attached Information	☐ Yes ☐ No		☐ Yes ☐ No
	☐ Yes ☐ No		☐ Yes ☐ No

Gentlemen Statement of Applicant

I, the undersigned hereby declare that to the best of my knowledge, the Information contained herein and the information submitted in support of this application is complete and accurate in every way. The applicant agrees to indemnify and save harmless the Crown in right of the Province of Ontario and the officers, employees, agents and contractors from and against all damages, loss, costs, claims, suits, injuries, demands, actions and proceedings resulting from or in any manner connected with act or omission of the applicant or any of hits officers, employees, agents or contractors relating to the Application and any Permit, Renewal Permit or terms and conditions of a Permit issued in response to this Application. I understand that it is the policy of the Director in issuing a Permit to Take Water to impose the General Terms and Conditions appearing on the Guide for Applying for Permit to Take Water.

Name of Applicant or Agent/Official of Applicant (please print)	Signature of Applicant or Agent of Applicant	Date

Diagram of Location of Water Taking

BURNSIDE

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Appendix D

Long Term Test of PW-1

(Burnside, 2000)

Burnside Golf Services

A Division of R. J. Burnside & Associates Limited
15 Townline, Orangeville, Ontario L9W 3R4
Telephone: 519-941-5331 Fax: 519-941-8120
email: info@rjburnside.com

February 2, 2000

Township of Centre Wellington
1 MacDonald Square
P.O. Box 10
Fergus, ON
N0B 1S0

Attention: **Mr. Brett Salmon**

Re: **Long Term Test of PW1**
Fairview Golf Course Expansion
Fergus, Ontario
BE File: PO-99092

Dear Mr. Salmon,

PW1 is a 150 mm diameter irrigation well that was installed in 1998 to provide irrigation water to the Fairview Golf Course expansion. Testing completed in May 1999 and documented in the Morrison Environmental Report dated June 1999, revealed that PW1 had a capacity of 2.3 L/s (30 imperial gallons per minute) and that pumping resulted in measurable impacts on surrounding domestic wells. Review of the June, 1999 report completed for the Township of Centre Wellington by Blackport Hydrogeology Inc. identified lack of data related to the long term response of the surrounding domestic wells and the capability of the aquifer to supply the irrigation demand. A longer term test and aquifer recharge analysis was proposed by Blackport Hydrogeology Inc. Burnside Golf Services was retained to complete the required testing.

The long term test of PW1 at a flow rate of 2.3 L/s (30 Igpm) was completed from December 17 to December 23, 1999. This test was designed to obtain long-term water level data in the nearby domestic wells. In particular, the Dyble, Smeltzer and Bayer domestic wells were visited to obtain access to monitor water levels that were not included in the May 1999 test. The Dyble well was buried and required excavation and plumbing work to provide access to the 125 mm diameter well, whose well head was submerged in a flooded well pit. The Smeltzer domestic well was easily accessible through a pitless adapter. The Bayer domestic well could not be accessed for water levels as it is a 125 mm diameter well with a double line jet pump that makes water level measurement

impossible. The wells monitored during the May 1999 pumping tests were also monitored, including a new 6 inch well called the South Fairview well, which is located on the existing Fairview Golf Club property, southeast of PW1. The water well record for this well is appended. The numbered wells are located on the attached map.

The results of the pumping test are summarized in the appended Table 1. This data reveals a consistent trend of drawdown in the bedrock wells in the area surrounding the proposed golf course expansion. The wells in the area of the existing golf course appear to respond to a lesser degree possibly due to a change in geologic conditions in the bedrock aquifer. This may be related to the buried bedrock valley that is known to exist in this area and encountered in the Fairview Golf course Clubhouse well.

The semi-logarithmic plot of water levels measured in the Iravani and Heseltine wells versus time are appended. These graphs reveal steady draw down of approximately 1.2 m - 1.4 m per logarithmic cycle for the last four days of the pumping test. As a worst case scenario, we assumed that this trend of drawdown will continue to six months.

The appended Table 1 reveals the general capability of each of the domestic wells to maintain the domestic water supply based on water level observations made during domestic well operation and review of the water well records (specific capacity) for applicable wells. The wells considered susceptible to interference from PW1 are the Dyble, Smeltzer, and Bayer domestic wells located northeast of PW1. The water levels in these wells fluctuate in excess of 10 m due to their own domestic well operation at a rate of 0.4 - 0.8 L/s (5 - 10 Igpm). As a result, the predicted drawdown of 3 to 4 m after six months of pumping PW1 could affect the wells' abilities to maintain their domestic supplies.

Golf North Properties has entered into written agreements with Mr. Dyble and Ms. Bayer that state it will be the responsibility of Golf North Properties to provide a new water supply if the operation of PW1 for irrigation purposes impacts their water supply. Golf North Properties intends to discuss a similar arrangement with the water supply issues with Mr. Smeltzer.

A monitoring program is proposed to confirm the predicted response due to pumping of PW1. Water levels will be monitored in the Smeltzer domestic well and the Heseltine domestic well for the first season of operation of PW1.

The long term recharge required to maintain a 2.3 L/s (30 Igpm) constant pumping rate for 180 days was evaluated. An approximate analysis based on an infiltration rate of 10 percent to the bedrock aquifer is used.

Volume of water pumped = 35,770 m^3/year
Infiltration = 10 percent = 0.1 m/year
Area required to recharge aquifer = 357,700 m^2
Radius of a circular area = 337 m^2 around PW1

If recharge to the bedrock aquifer is 100 mm per year an area with a circular radius of 337 m would be required to sustain the proposed pumping rate of 2.3 L/s. This area for recharge may not occur locally, but gives a general impression of the groundwater available to the aquifer. Further analysis at this relatively low pumping rate is not warranted.

We trust this letter suitably addresses the hydrogeologic issues of the proposed new irrigation well PW1. If you have any questions, please do not hesitate to call.

Yours truly,

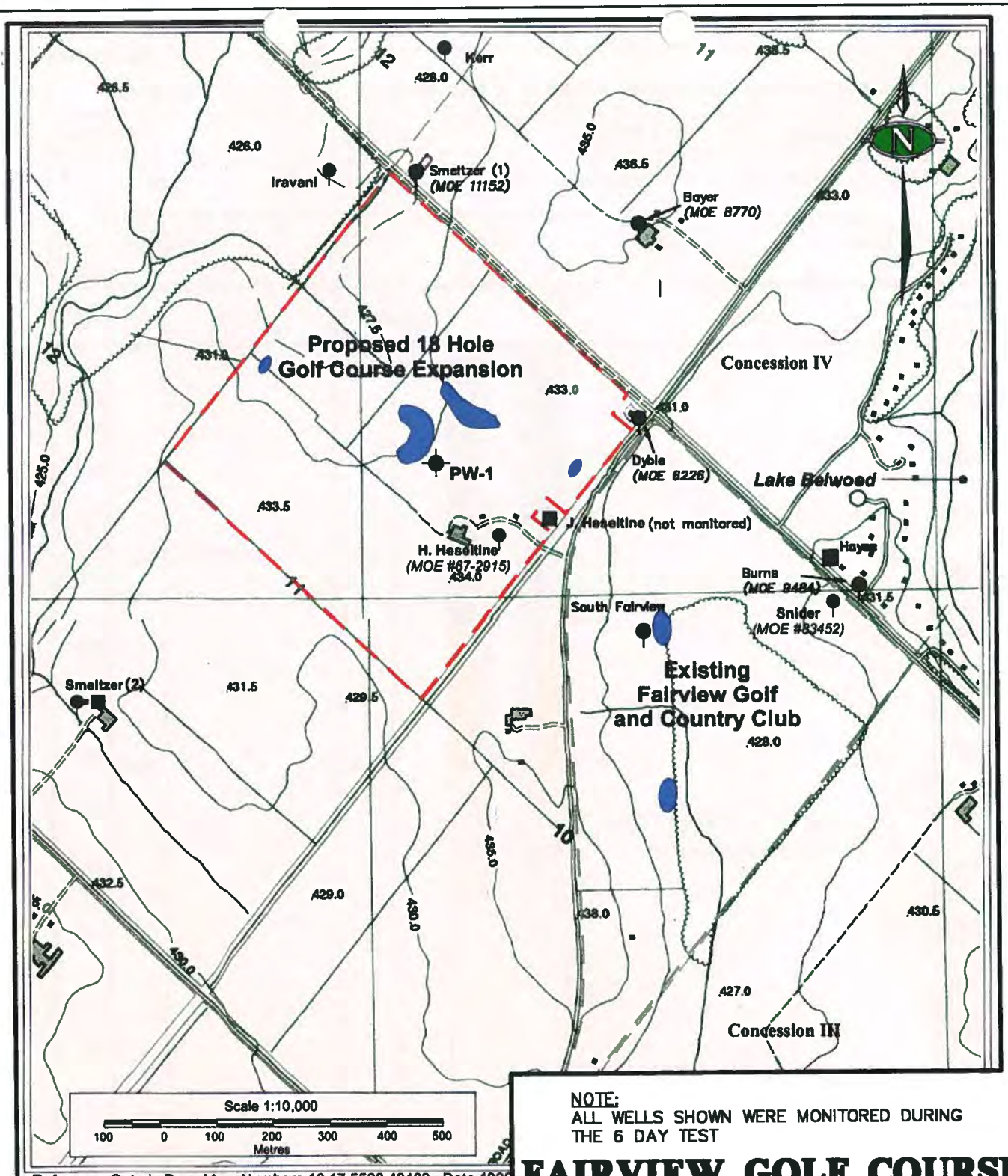
Burnside Golf Services

Jim Baxter, P. Eng.
Groundwater Resource Engineer
JB/rb

Attachment

cc: Dale Murray, Triton Engineering Services Ltd.
Ray Blackport, Blackport Hydrogeology Inc.

J:\2000\P\PO\99092\0209salm.wpd



Reference: Ontario Base Map, Numbers 10 17 5500 48400, Date 1995

LEGEND

- SUBJECT PROPERTY LINE
- PUMPING WELL
- DRILLED/BORED WELL
- DRILLED BEDROCK WELL

NOTE:
ALL WELLS SHOWN WERE MONITORED DURING THE 6 DAY TEST

FAIRVIEW GOLF COURSE
Fergus, Ontario

SIX DAY TEST OF PW-1
SITE LOCATION MAP

BURNSIDE GOLF SERVICES
A DIVISION OF R.J. BURNSIDE & ASSOCIATES LIMITED
ENGINEERS – HYDROGEOLOGISTS – ENVIRONMENTAL CONSULTANTS
15 TOWNLINE, ORANGEVILLE, ONTARIO L9W 3R4
TELEPHONE: 519-941-5331 FAX: 519-941-8120

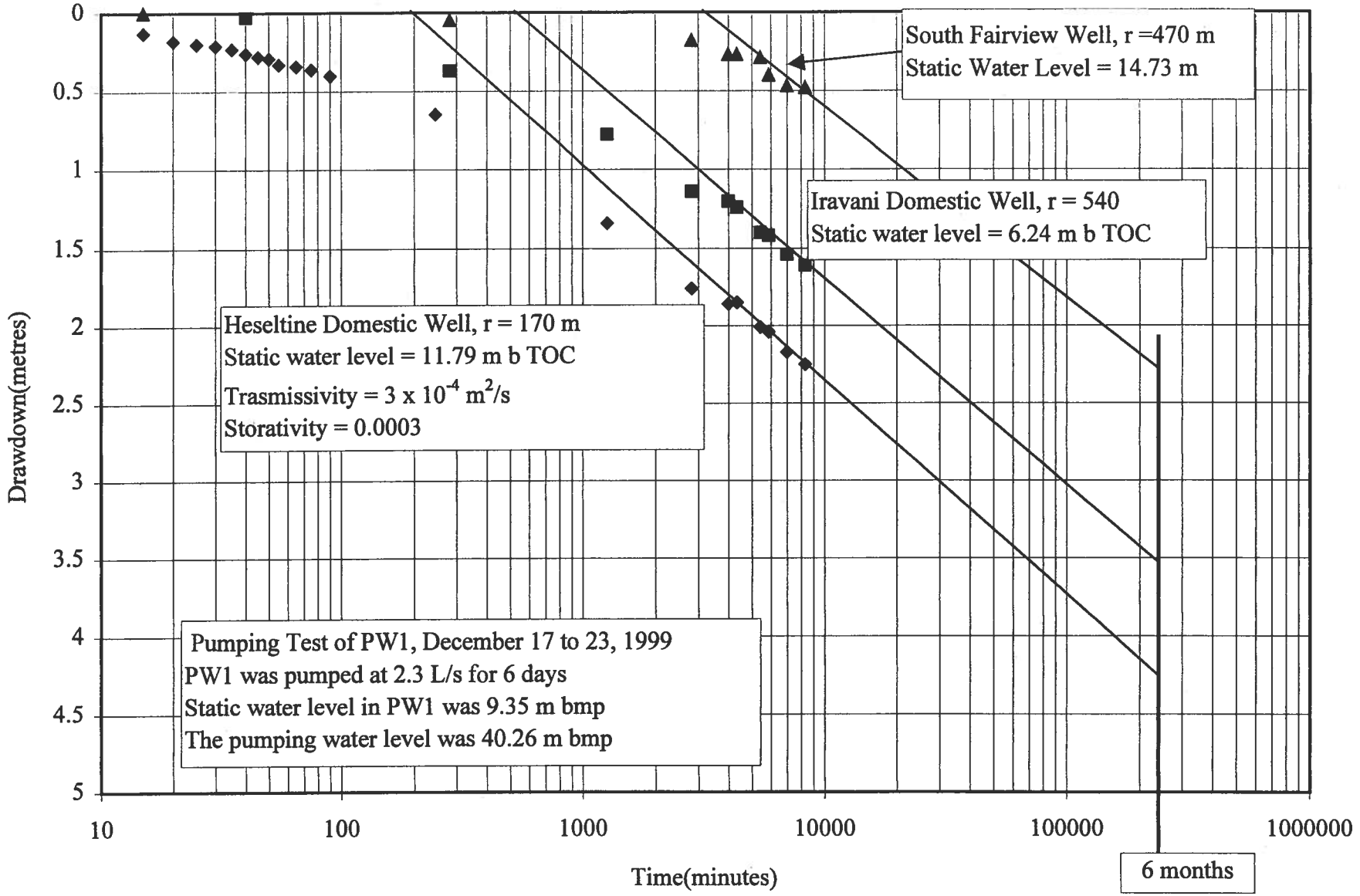
DATE: FEB/00 SCALE: 1:10,000 PROJECT No.: PO-99092

XREF PO99092 PW1 TEST.TIF PO99092 PW1 TEST.DWG

po99092/fairviewsemilog

Fairview Golf Course Expansion

Six Day Test of PW1



fairviewsumm

Fairview Golf Course Expansion

Six day Test of PW-1

Monitor	Distance	Static Level	Pumping Level	Drawdown	Depth	Sp.Capacity	Interference
	(m)	(m bmp)	(m bmp)	(m)	(m)	(L/s/m)	(m)
PW1	0.1	9.35	40.26	30.91	86	0.1	-
Heseltine	170	11.8	14.04	2.24	48		4.24
Dyble	360	11.3	13.16	1.86	55	0.05	3.86
Smeltzer	510	6.7	8.81	2.11	50	0.03	4.11
Kerr	660	6.35	8.46	2.11	?	?/note 1	4.11
Irivani	540	6.24	7.85	1.61	?	?/note 1	3.61
Hayes(shallow well)	650	1.47	1.63	0.16	4	n/a	2.16
Burns	790	16.9	17.83	0.93	39	0.09	2.93
Snider (old 9)	790	16.95	17.53	0.58	51	n/a	2.58
Draper	850	16.9	17.58	0.68	?	?	2.68
Smeltzer (dug)	790	4.75	4.76	0.01	4	n/a	2.01
Smeltzer (drilled)	790	7.2	8.24	1.04	56	0.3	3.04
South Fairview Well	470	14.73	15.29	0.56	109	-	2.56
Bayer	560	NO MONITORING ...NO ACCESS		-	39	0.03	3.7

Test from December 17 to 23, 1999

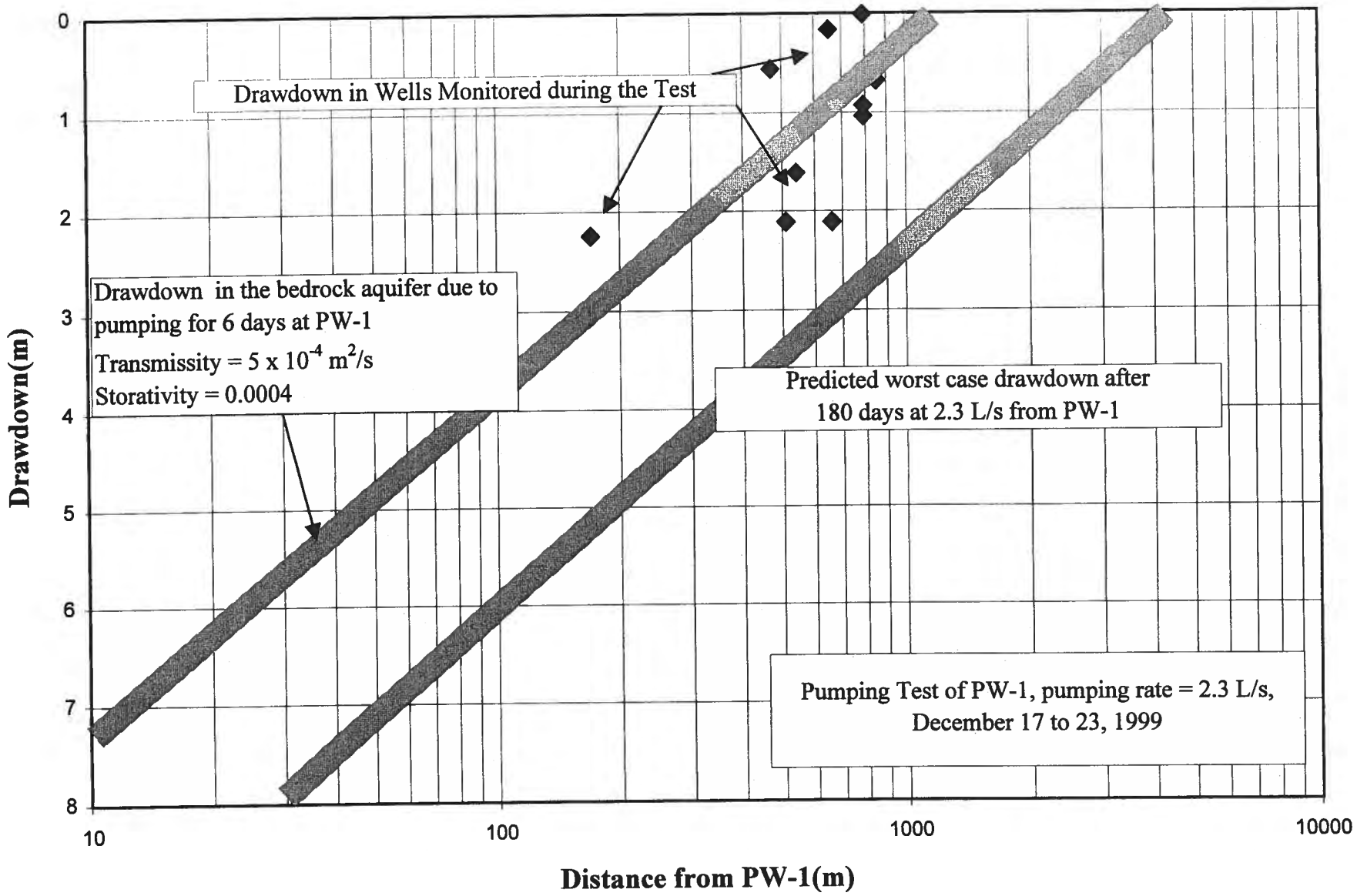
Notes 1. These wells appear to have very little water level fluctation (<3 m) due to domestic use, adverse impacts are unlikely

2. Dyble, Smeltzer and Bayer wells may experience >3 metres of drawdown after 180 days and due to relatively low specific capacities may be adversely impacted due to pumping

3. Interference is based on drawdown after 6 days extrapolated to 180 days which adds 2 metres of additional drawdown

Fairview Golf Course Expansion

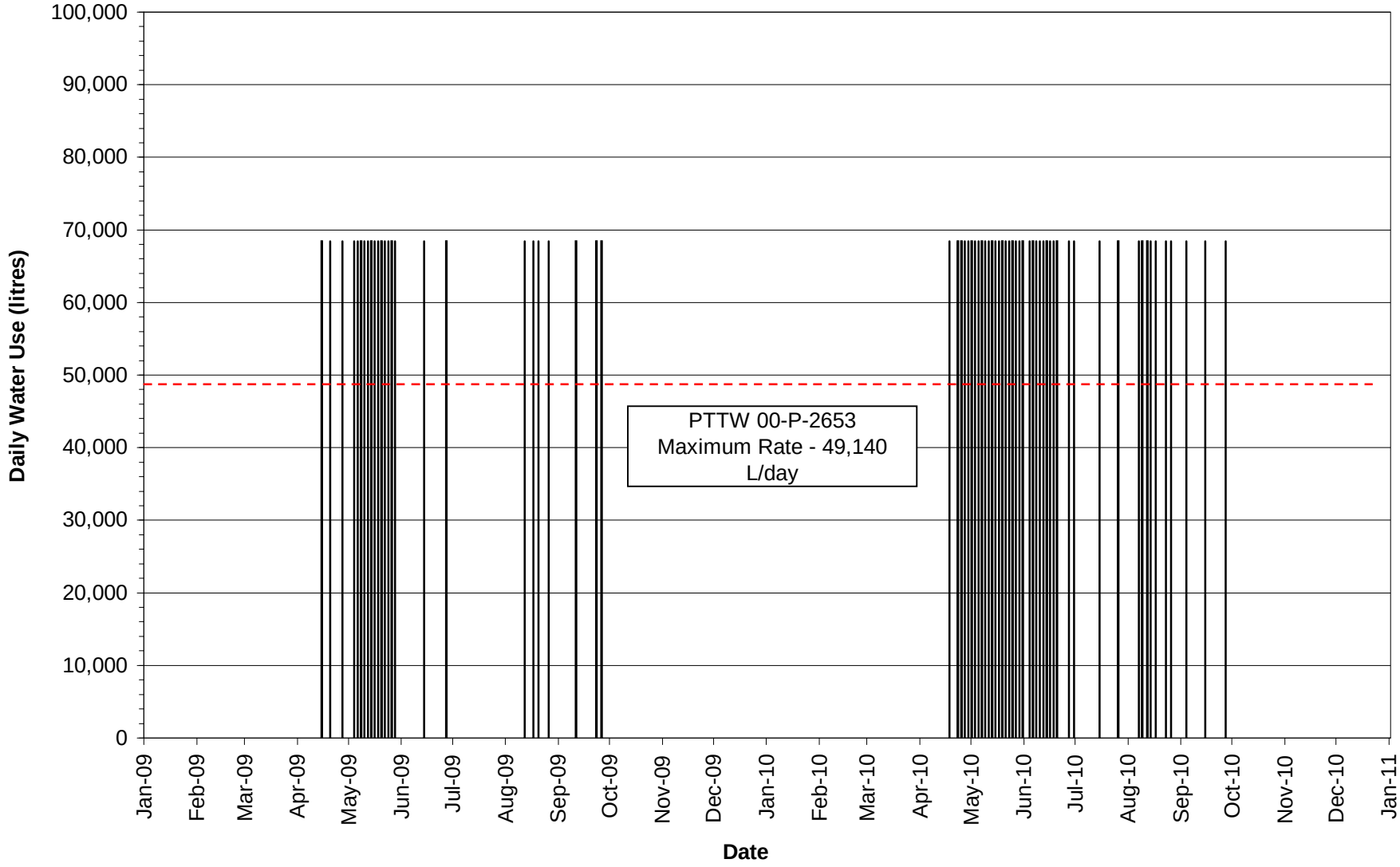
Six Day Test of PW-1



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Appendix E
Monitoring Data *(Graph)*

Figure E-1
Water Taking Records - Irrigation Ponds to Course (2009 - 2010)



R.J. Burnside & Associates Limited
Prepared By: S.C.
Printed On: 4/28/11
File: 019883_Intake Data PTTW.xls

Fergus Golf Club
PTTW Application
PGD 019883

GOLDER
MEMBER OF WSP

REPORT

Water Supply Investigation

Proposed Residential Development, Fergus Golf Club, 8243 and 8282 Wellington Road 19, Fergus, Ontario

Submitted to:

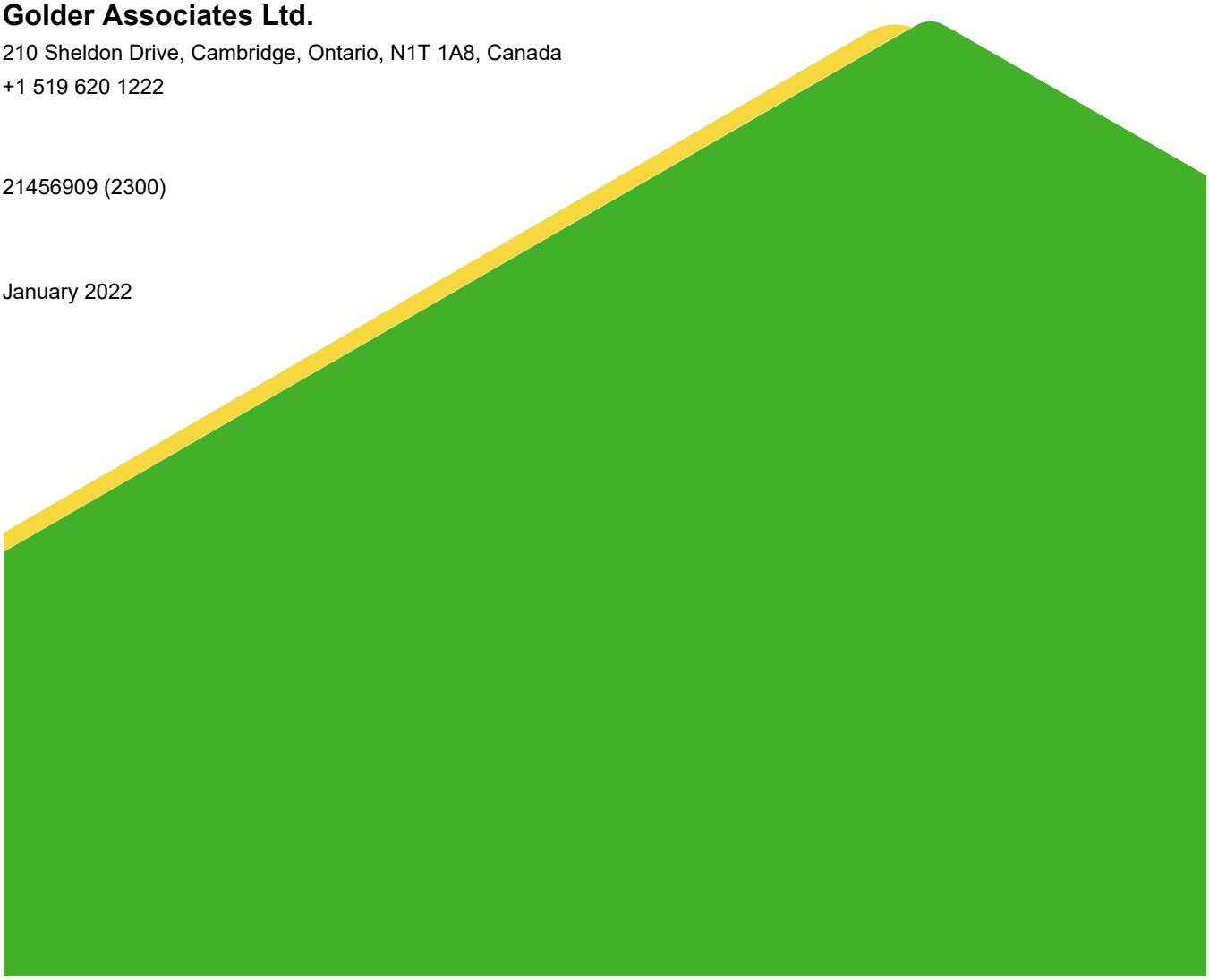
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Table of Contents

1.0 INTRODUCTION 1

1.1 Scope of Work 1

1.2 Water Supply Feasibility Assessment Approach 2

1.3 Existing Land Use 2

1.4 Proposed Development 3

1.5 Site Selection 3

2.0 FIELD PROGRAM OVERVIEW 3

2.1 Test Well Drilling and Monitoring Well Construction 3

2.2 Aquifer Testing 4

2.3 Water Quality Testing 5

3.0 SITE SETTING 5

3.1 Topography 5

3.2 Drainage 5

3.3 Physiography 5

3.4 Geology 6

3.4.1 Overburden Geology 6

3.4.2 Bedrock Geology 6

3.5 Hydrostratigraphy 6

3.6 Local Water Users 7

3.7 Permitted Water Users 7

4.0 WATER SUPPLY POTENTIAL 8

4.1 Stepped Rate Pumping Test 8

4.2 Constant Rate Pumping Test 8

4.2.1 Estimate of Aquifer Parameters 10

4.3 Water Quality 11

4.3.1 General Chemistry Trends During Pumping Test 11

4.3.2 Ontario Drinking Water Quality Standards 11
4.3.3 Micro Particulate Analysis 11
5.0 WATER SUPPLY POTENTIAL 11
5.1 Aquifer Presence 11
5.2 Water Quantity 12
5.3 Water Quality 12
5.4 GUDI Assessment 12
5.5 Source Water Protection 13
6.0 CONCLUSIONS AND RECOMMENDATIONS 14
7.0 REPORT LIMITATIONS 15
7.1 General Limitations 15
8.0 CLOSURE 15
9.0 REFERENCES 16

TABLES

Table 1: Permits To Take Water 8
Table 2: Stepped Rate Pumping Test Summary 8
Table 3: Drawdown Observed at the End of the Pumping Test 9
Table 4: GUDI Assessment Based on MOE 2001 Terms of Reference 12

FIGURES

Figure 1 – Site Location Plan
Figure 2 – Monitoring Locations
Figure 3 – Physiography and Drainage
Figure 4 – Quaternary Geology
Figure 5 – Ministry Recorded Wells
Figure 6 – Area Section A-A’
Figure 7 – Area Section B-B’
Figure 8 – Area Section C-C’
Figure 9 – Wellhead Protection Areas

APPENDICES

APPENDIX A
As-Built Drawings

APPENDIX B
Water Well Records

APPENDIX C
Stepped Rate Pumping Test Graphs

APPENDIX D
Constant Rate Pumping Test Graphs

APPENDIX E
Water Quality Summary

1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by 883890 Ontario Limited c/o Fergus Development Inc. to carry out a water supply exploration investigation for a proposed residential development at 8243 and 8282 Wellington Road 19, the Township of Centre Wellington, Ontario (Figure 1). The purpose of this investigation is to assess the feasibility of a water supply for the proposed subdivision.

1.1 Scope of Work

The objective of the work was to evaluate a potential source of potable water supply for the proposed residential land development in Centre Wellington. This assessment includes a desktop study and field investigation. The scope of work included:

- Desktop background study;
- Identify locations for drilling;
- Conduct preliminary potential contaminant source identification;
- Conduct service locates;
- Drill and install monitoring wells (MW101, MW102 and MW103);
- Install mini-piezometers (MP-1, MP-2) and staff gauges (SG-1, SG-2);
- Construct a municipal grade test well (PW21-1);
- Conduct a variable rate step test and 72-hour constant rate pumping test;
- Conduct a water quality assessment at the test well;
- Prepare a hydrogeological assessment and feasibility assessment of the groundwater resource; and
- Delineate the zone of influence.

Key reports and data included in the study are listed as follows:

- Quaternary geology, bedrock geology, topography and physiography mapping;
- Ministry of the Environment, Conservation and Parks (MECP) Water Well Records;
- MECP Permits to Take Water (PTTW);
- Aerial photography;
- Source Water Protection Assessment Report;
- Source Protection Plan;
- Centre Wellington Tier 3 Water Budget Study and Risk Assessment;
- Fairview Golf Club Hydrogeological Investigation (Franklin Geotechnical Limited, 1990);

- Fairview Golf and Country Club Well Testing Program (Morrison Environmental Limited, 1999); and
- Fergus Golf Club Hydrogeological Report in Support of Permit to Take Water Application (R.J. Burnside & Associates Limited, 2011).

1.2 Water Supply Feasibility Assessment Approach

The feasibility of water servicing using a groundwater supply considers the following factors:

- **Aquifer Presence:** The likelihood of aquifer(s) being present across the entire proposed development area must be evaluated on the basis of on- and off-Site data. Provided that aquifer(s) are likely to be present, then the following must also be evaluated.
- **Water Quantity:** The probability of obtaining adequate quantities of potable water for a water supply must be evaluated based on existing water supplies in the area and field testing. In addition, consideration must be given to whether such a taking would cause adverse interference at other nearby wells or environmental features.
- **Water Quality:** As the water will be intended for human consumption it should not contain any disease-causing organisms or unacceptable concentrations of certain chemical parameters. Aesthetic considerations also provide a basis for drinking water objectives since the water should be pleasant to drink. Specifically, the water supply aquifer's ability to meet Ontario Drinking Water Quality Standards, Objectives and Guidelines (ODWQS) (either via raw water or through acceptable treatment technologies) must be considered. In addition, the water supply must be evaluated to determine if it is groundwater under the direct influence of surface water (GUDI), an assessment of whether pumping of the aquifer will induce the flow of water from a surface water body into the aquifer.
- **Source Water Protection:** Determine if the proposed water taking is located within existing wellhead protection areas (WHPA) delineated for municipal water supplies (i.e., Township of Centre Wellington) Under the Clean Water Act (2006) and whether or not this water supply would be identified as a threat.

1.3 Existing Land Use

The existing golf course (the "Site") consists of two parcels; the northwest parcel (the "NW Site") is situated on the northwest side of Wellington Road 19, and the southeast parcel (the "SE Site") is situated on the southeast side of Wellington Road 19, referred to as the Lake Belwood Golf Club (NW Site) and the Fairview Golf Club (SE Site), as shown on Figure 1. The NW Site is located on Part of Lots 10 and 11, Concession 3, Township of Centre Wellington (former Township of Garafraxa) and the SE Site is located on Part of Lots 9 and 10, Concession 3, Township of Centre Wellington (former Township of Garafraxa). The SE Site is being proposed for residential redevelopment while the NW Site will remain as a golf course and will incorporate the communal servicing infrastructure required to service both the golf course and proposed development.

The Site is located approximately 2 km northeast of the Town of Fergus and adjacent to Lake Belwood, a reservoir on the Grand River. The NW Site area totals approximately 42.35 ha and the SE Site area totals approximately 39.85 ha. Both sites are active golf courses (18 holes at NW Site and 9 holes at SE Site) with fairways, greens, wooded areas, wetlands and ponds, and the club house located on the NW Site. The surrounding land is mainly agricultural and rural residential. An existing residential development and seasonal cottages are present between the east side of the SE Site and Lake Belwood.

1.4 Proposed Development

Fergus Development Inc. has provided a proposed residential redevelopment layout consisting of 118 freehold lots (0.5+ acres) proposed for the SE Site. The redevelopment of the SE Site will also include open space, stormwater management pond, and natural features. Private communal water and wastewater will occur on the NW Site.

The Municipal Infrastructure Group Ltd. (TMIG) has estimated the required average day water taking to be approximately 128 m^3/d (1.48 L/s) and the maximum day water taking to be 435 m^3/d (5.03 L/s) for the proposed redevelopment (TMIG, 2022). A test well referred to as PW21-1 has been constructed on the NW Site that has the potential to provide the required water supply (as described in this report). Testing of the well is required to assess the water quantity, water quality and potential impacts to surrounding features (e.g., natural environment and private wells).

1.5 Site Selection

A summary of the findings from the background review is presented in Section 3.0. Based on that review it was determined that a well in the bedrock aquifer was the most feasible source for a water supply. The location selected for testing was chosen to maximize distance from private wells, maximize distance from Lake Belwood, be outside of existing WHPAs and be away from potential contaminant sources. To achieve these objectives, a site in the northwest corner of the NW Site was selected for drilling a test well (referred to as PW21-1). Details on the drilling and testing are included in the sections below.

2.0 FIELD PROGRAM OVERVIEW

2.1 Test Well Drilling and Monitoring Well Construction

The new supply test well (PW21-1) was constructed on the NW Site (Figure 2) in May 2021. The as-built log for PW21-1 is included in Appendix A. The well is completed to a depth of approximately 91.4 m within the bedrock aquifer. The bedrock is overlain by approximately 29.9 m of sandy to gravelly silt till. The well is completed with a 168 mm outside diameter (OD) steel casing set through the overburden to a depth of 32.9 m below ground surface (bgs) and an open 152 mm diameter hole through the bedrock. The bottom of the hole was sealed with bentonite and capped with cement to a depth of 84.1 m bgs to reduce the potential for poor water quality from the deeper bedrock, which was noted in some surrounding wells.

Three bedrock monitoring wells were also constructed on the NW Site to characterize the geology and allow for groundwater level monitoring. The monitoring well (MW101 through MW103) locations are shown on Figure 2 and as completed logs included in Appendix A. The monitoring wells were constructed with a nominal 152 mm diameter casing through the overburden (silt till) and a nominal 152 mm diameter open hole through the bedrock to a depth of 61.0 m.

All of the well drilling was completed by Well Initiatives using conventional rotary drilling equipment. The wells are constructed to Ontario Regulation 903 standards.

In addition, a number of shallow overburden monitoring wells have also been constructed on the NW Site as part of other investigations.

In August 2021, a mini-piezometer and staff gauge were installed in the pond east of PW21-1 (MP-1, SG-1) and the pond north of the North Irrigation Well (MP-2, SG-2), as shown on Figure 2.

2.2 Aquifer Testing

The aquifer testing at PW21-1 was conducted by Well Initiatives. Testing at PW21-1 consisted of a variable stepped rate pumping test completed on August 30, 2021 using three pumping steps of one hour each at 3.2 L/s, 6.3 L/s and 9.5 L/s. Following the step pumping test, a constant rate pumping test of 72 hours duration was completed from August 31, 2021 to September 3, 2021 at a rate of 8.8 L/s. The pumping rate was monitored by a flow meter on the discharge line. The pumping test was conducted at a higher rate than the required 5.03 L/s as an earlier development proposal contemplated more lots.

The pumping test was registered under the Environmental Activity and Sector Registry under Registration Number R-011-4136628634.

A notification letter was delivered to the private well owners within approximately 500 m to 1000 m of PW21-1 one week prior to the pumping test.

Pumped groundwater from PW21-1 was discharged to the on-Site pond beside the North Irrigation Well approximately 300 m southeast of PW21-1. The water was discharged using appropriate flow dissipation measures to prevent erosion or scouring. The water pumped into the pond was similar to the groundwater currently pumped into the pond from the North Irrigation Well.

Continuous groundwater level monitoring (i.e., monitoring by dataloggers, supplemented by manual water level readings) was carried out in a network of monitoring wells (as shown on Figure 2) prior to, during and following the test. Recovery was measured until one week post-test. The monitoring network included:

Bedrock Wells

- PW21-1 (pumping well);
- MW101, MW102 and MW103 (dedicated monitoring wells); and
- Clubhouse Well, South Irrigation Well and Old Clubhouse Well.

Overburden Wells

- BH21-10, BH21-13 and BH21-14.

Surface Water

- On-Site pond near PW21-1 (MP-1, SG-1); and
- On-Site pond near North Irrigation Well (MP-2, SG-2).

The North Irrigation Well was not accessible for monitoring and a pressure transducer datalogger could not be installed in the Clubhouse Well.

Additional monitoring included:

- Continuous monitoring of discharge quantity;
- Daily visual monitoring of the discharge for suspended sediment in the groundwater; and
- Daily visual monitoring of the discharge point to the on-Site pond for erosion.

The following mitigation measures were also in place during the testing, however they were not required.

- In the unlikely event that the aquifer test negatively impacts any nearby private wells, the pumping rate would be reduced or a temporary water supply would be provided to the impacted parties for the duration of the test; and
- In the event that erosion or scouring was observed at the discharge point, the flow dissipation system would be modified and the affected area rehabilitated.

2.3 Water Quality Testing

Water quality samples were obtained from PW21-1 periodically during the 72-hour test (at hours 1, 24 and 72) and analyzed for general chemistry parameters and bacteria. A sample was also collected at the end of the test to undergo a comprehensive analytical suite designed to assess the ODWQS parameters. The water samples were collected in laboratory prepared bottles and submitted to Bureau Veritas Laboratories.

Water quality samples were also collected for microscopic particulate analysis (MPA) from PW21-1 at the end of the constant rate test and submitted for analysis at Hyperion Research Limited to aid in the GUDI assessment.

3.0 SITE SETTING

3.1 Topography

The ground surface at the Site is gently undulating, with elevations ranging from approximately 424 metres above sea level (masl) to 437 masl (Figure 3) (Grand River Conservation Authority, 2021a). The ground surface at the NW Site generally slopes to the north from a high elevation of 433 masl near the southwestern part of the NW Site to a low elevation of 424 masl along a tributary to Irvine Creek at the north side of the NW Site. There is a high ground elevation of 437 masl in the southern part of the SE Site. The SE Site is like a trough with ground elevations around 430 masl on the east and west side of the SE Site and a low along the middle of the SE Site at 426 masl.

3.2 Drainage

The Site is located within the Grand River Watershed. The Grand River flows in a southwest direction in the area flowing through the Lake Belwood reservoir located approximately 1.2 km southeast of PW21-1.

Locally the NW Site and the majority of the SE Site is within the Irvine Creek Subwatershed. Irvine Creek and its tributaries generally flow in a southwest direction and discharge into the Grand River in Elora. At its closest point, Irvine Creek is located approximately 250 m from PW21-1 (Figure 3). The NW Site is drained by a tributary of Irvine Creek and the SE Site is drained by Black Drain. The Black Drain flows in a southwest direction through the low portion of the SE Site (Figure 3) and discharges into Irvine Creek approximately 2.5 km west of the SE Site.

3.3 Physiography

The Site is situated within the physiographic region described as the Guelph Drumlin Field (Chapman and Putnam, 1984). Chapman and Putnam (1984) describe the general landform pattern consisting of drumlins, or groups of drumlins, fringed by gravel terraces and separated by swampy valleys in which flow tributaries of the Grand River. Locally Irvine Creek and Black Drain are situated within spillways separated by a drumlinized till plain (Figure 3).

3.4 Geology

3.4.1 Overburden Geology

The surficial soils mapped in the area by the Ontario Geological Survey (OGS-GSC, 2020) are shown on Figure 4. The surficial soils in the area of PW21-1 consist of ablation till with surrounding surficial soils including fine-grained till, outwash sand and gravel and glaciofluvial outwash sand. The ablation till is a sandy silt till referred to as the Port Stanley Till and the fine-grained till is a silt till to clayey silt till referred to as the Tavistock Till, which likely form an aquitard in the area.

Three hydrostratigraphic cross-sections are provided on Figures 6, 7 and 8, with the alignments of the sections shown on Figure 5. The overburden is approximately 23 m to 33 m thick at the Site and surrounding area and is predominately characterized by a mix of fine-grained till with occasional discontinuous layers of sand (usually found directly above bedrock surface). Based on the MECP water well records, a bedrock valley is interpreted to exist across the SE Site. The valley is estimated to trend in a northeast-southwest direction. Based on water well record 6706408 the valley is at least 79 m deep and appears to be filled with till.

3.4.2 Bedrock Geology

The bedrock surface elevation is generally around 400 masl and consists of limestone, dolostone and shale. The bedrock that subcrops beneath the overburden does not outcrop at the Site. The bedrock formations underlying the Site comprise one of the most extensive bedrock aquifers in Ontario and are the main source of drinking water supplies for a number of nearby municipalities. The Ontario Geological Survey (OGS) has mapped the Silurian carbonate strata along the Niagara Escarpment region and has revised the framework for stratigraphy of this area. Based on the revised stratigraphic framework described by the OGS (Brunton, 2008, 2009), a brief description of the bedrock formations estimated to be present is provided below (from oldest to youngest).

- **Gasport Formation:** The Gasport Formation is a cross-bedded crinoidal grainstone-packstone with sequences of reef mound and coquina (shell bed) lithofacies (Brunton, 2008, 2009). This unit has commonly been referred to as the Amabel Formation in previous studies in the area;
- **Goat Island Formation:** The Goat Island Formation consists of two members; the lower Niagara Falls Member and the upper Ancaster Member. The Niagara Falls Member is a finely crystalline and cross laminated crinoidal grainstone with small reef mounds while the Ancaster Member is a chert rich, finely crystalline dolostone that is medium to ash grey in colour;
- **Eramosa Formation:** The Eramosa Formation consists of three members including, from oldest to youngest, the Vinemount Member, the Reformatory Quarry Member and the Stone Road Member. It is unknown whether all of the members of the Eramosa Formation are present at the Site; and
- **Guelph Formation:** The Guelph Formation consists of medium to thickly bedded crinoidal grainstones and wackestones and reefal complexes (Brunton, 2008, 2009). The Guelph Formation is cream coloured and is the uppermost bedrock unit.

3.5 Hydrostratigraphy

The conceptual model for the Site includes an approximately 30 m thick overburden (till) aquitard overlying a bedrock aquifer. Within the upper overburden aquitard there are confined and laterally discontinuous layers of sand or water bearing horizons that exist locally. Overlying the till are unconfined and laterally discontinuous outwash deposits north of the NW Site and within the SE Site. There are also some more permeable layers near

the bedrock contact throughout the area. These shallow and deep overburden units are sometimes used for individual private water supplies.

The bedrock is considered an aquifer (formerly referred to as the Guelph-Amabel Aquifer) with zones of varying permeability depending on the rock properties and rock features. Bedrock aquifers typically yield water from water producing features such as fractures and fissures within the bedrock. The production of water depends on the number of fractures, size of the fractures and interconnectivity of the fractures.

Groundwater flow in the bedrock aquifer is interpreted to be in a southerly to southwesterly direction toward the Grand River.

There is an existing pumping well on the NW Site that is used for golf course irrigation purposes (Figure 1). Testing of the well by others in 1999 indicated a bedrock transmissivity of 38 m^2/d and a storage coefficient ranging from 0.00015 to 0.00004 (Morrison, 1999).

3.6 Local Water Users

A review of the MECP Water Well Records database indicates that there are 30 well records nominally within 1 km of PW21-1 (as shown on Figure 5). A table summarizing the water well records is included in Appendix B. Of the 30 well records, 29 have water supply (e.g., domestic or stock watering) as their designated use. The remaining well has an unknown use listed. Of the 29 water supply wells, 28 (97%) are completed in the bedrock and 1 (3%) is completed in the deep overburden.

Analysis of the well records indicates that bedrock well use dominates around the Site with most well completions occurring between elevations 375 masl and 400 masl as shown on Figures 6, 7 and 8.

Based on the recorded information, private water wells generally utilize three zones around the Site as follows:

i) shallow overburden water wells (dug wells not included in MECP Well Record database) – shallow overburden wells are inferred to utilize various shallow, thin coarse-textured units or the glacial till unit for water supply. The coarse-textured units are inferred to be laterally discontinuous;

ii) upper bedrock aquifer – most of the private water supply wells are completed in the upper bedrock with well completions occurring between elevations 375 masl and 400 masl as shown on Figures 6, 7 and 8; and

iii) lower bedrock aquifer – some private wells are completed in the bedrock below elevation 375 masl. Most of the wells completed in this aquifer are open across both the upper and lower aquifers.

The presence of fresh water was reported on the well records.

There are four existing bedrock wells on the NW Site and SE Site that are used by Fergus Golf Club as shown on Figure 1. The North Irrigation Well (MOE#6712549) and Clubhouse Well (MOE#6714026) are located on the NW Site and completed in the bedrock to depths of 86.0 m and 74.7 m, respectively. The South Irrigation Well (MOE#6713016) and Old Clubhouse Well (possibly MOE#6706408) are located on the SE Site and completed in the bedrock to depths of 94.5 m and 108.5 m, respectively

3.7 Permitted Water Users

A PTTW is required for water takings greater than 50,000 L/d. A review of the MECP PTTW database identified the following PTTWs within 3 km of the Site (including two permits issued to Fergus Golf Club). A summary of the permits is included in Table 1, below. PTTW 4856-9KBH5A was issued to the Township of Centre Wellington for

municipal water supply in Elora and Fergus. The permit allows for a groundwater taking from nine wells. The closest municipal wells to the Site are F4 and F6 which are located approximately 2.8 km southwest of the Site. A PTTW was also issued to Highland Pines Campground to allow for a groundwater taking from six wells. The Highland Pines Campground is located approximately 2 km northeast of the Site.

Table 1: Permits To Take Water

Permit Number	Permit Owner	Source	Use
5817-8JQN3B	Fergus Golf Club	Groundwater (1 well) and Surface Water (1 pond)	Golf Course Irrigation
2633-9XARF2	Fergus Golf Club	Groundwater (1 well) and Surface Water (1 pond)	Golf course Irrigation
4856-9KBH5A	The Corporation of the Township of Centre Wellington	Groundwater (9 wells)	Municipal (closest wells are F4 and F6)
3657-BSEJSA	Highland Pines Campground Limited	Groundwater (6 wells)	Campground

4.0 WATER SUPPLY POTENTIAL

The water supply potential has been assessed with test well construction, monitoring well construction and aquifer testing at the Site. The drilling at PW21-1 identified fractured dolostone capable of producing high well yields. Preliminary estimates of flow during drilling indicated the well could pump at a rate of approximately 7.5 L/s or more.

4.1 Stepped Rate Pumping Test

The results of the stepped rate pumping test are shown in Table 2 and presented graphically in Appendix C. Prior to the testing the static water level in the well was measured at 9.5 m bgs. The specific capacity ranged from 0.8 L/s/m to 1.3 L/s/m and declined as the pumping rate increased due to well losses.

Table 2: Stepped Rate Pumping Test Summary

Pumping Rate (L/s)	Drawdown at PW21-1 (m)	Specific Capacity (L/s/m)
3.2	2.40	1.3
6.3	5.65	1.1
9.5	11.57	0.8

4.2 Constant Rate Pumping Test

The pumping test was carried out to pump the well at a rate with the pumping water level remaining above the overburden/bedrock contact at 29.9 m bgs. Based on the results of the step pumping test, a pumping rate greater than 9.5 L/s was possible, however, it was found that the well was pumping some sand at 9.5 L/s. This could potentially be from within fractures connected to the overburden. The test at PW21-1 was therefore conducted at a rate of 8.8 L/s for 72 hours to avoid pumping sand, to estimate the long-term potential production rate from the

well and to investigate potential environmental impacts. This testing rate is higher than the estimated rate of 5.03 L/s required for the proposed redevelopment.

Hydrographs for the monitoring wells screened in the bedrock, the overburden and surface water are shown on Figures D1, D2 and D3 in Appendix D, respectively and a table of observed drawdown is included in Table 3. The hydrographs show the water level measured in the well along with the pumping rate at PW21-1 and daily precipitation. Figure D4 presents the drawdown versus elapsed time for these same key bedrock wells and a graph of observed drawdown versus distance from the pumping well is included on Figure D5.

Table 3: Drawdown Observed at the End of the Pumping Test

Monitoring Location	Distance from PW21-1 (m)	Open Interval (m below ground surface)	Drawdown (m)
PW21-1	0	32.9 – 84.1	12.8
MW101	640	33.8 – 61.0	1.9
MW102	562	30.6 – 61.0	2.5
MW103	413	30.8 -61.0	2.8
Clubhouse Well	487	32.9 – 74.7	1.3
South Irrigation Well	821	28.0 – 94.5	0.4
Old Clubhouse Well	1,095	79.2 – 108.5	0.3
BH21-10	497	3.0 – 6.1	less than 0.1
BH21-13	261	5.8 – 7.3	0.2 (may be natural fluctuation)
BH21-14	257	1.5 – 3.0	less than 0.1
MP-1	144	0.1 – 0.8	less than 0.1
SG-1	143	N/A	less than 0.1
MP-2	319	0.6 – 1.2	less than 0.1
SG-2	321	N/A	less than 0.1

The following summarizes the observed water level responses from the 72-hour pumping test:

PW21-1 Response

- Drawdown occurred rapidly at the start of the test;
- The total drawdown at the end of the test was 12.8 m; and
- At the end of the test, the water level was declining approximately 2.2 m per log cycle.

Bedrock Aquifer Response

- A definitive response to pumping was observed in the monitoring wells within 700 m of PW21-1;
- Drawdown in the bedrock monitoring wells ranged from 0.3 m (Old Clubhouse Well) to 2.8 m (MW103); and

- The drawdown cone in the bedrock is estimated to extend approximately 1 km from PW21-1 with approximately 0.4 m of drawdown estimated at that distance (Figure D5 and Figure 9).

Overburden Response

- A clear response to pumping was not observed in the overburden monitoring wells; and
- The water level in BH21-13 declined approximately 0.2 m during the test but did not recover at the end of the test. The changes in water level may be due to natural fluctuation within the till.

Surface Water Response

- Water levels at MP-1 and SG-1 remained constant during the test and were not influenced by pumping at PW21-1;
- Water levels at MP-2 and SG-2 increased during the test due to the discharge into the pond from PW21-1; and
- The vertical gradients at both locations did not change during the test.

4.2.1 Estimate of Aquifer Parameters

As shown on Figure D6 in Appendix D, the hydrographs of most monitoring wells and the pumping well located within the bedrock aquifer plot along a similar slope on the semi-log plot. Based on the slope of this line (approximately of 2.22 m per log cycle t/r^2), the bulk transmissivity of the bedrock aquifer can be estimated using the Cooper-Jacob (1946) approximation as follows:

$$T = \left(\frac{2.303}{4\pi}\right) \times \left(\frac{Q}{\Delta S}\right)$$

Where: Q = pumping rate (m^3/day)

ΔS = slope of the observed drawdown hydrograph per log cycle

Using an average pumping rate of 763 m^3/day (8.8 L/s) based on a fit to the drawdown data while PW21-1 was pumping at this rate, the average bulk transmissivity of the bedrock aquifer is interpreted to be approximately 63 m^2/day.

Based on the slope of the hydrographs in the composite plot, the storativity (S) of the bedrock aquifer can be estimated as follows:

$$S = 2.2459T\left(\frac{t}{r^2}\right)$$

Where T = transmissivity

t/r^2 = time/radius^2 value when observed drawdown = 0 m

Based on this calculation, the storativity of the bedrock aquifer is estimated to be approximately 9 x 10^{-3}.

4.3 Water Quality

4.3.1 General Chemistry Trends During Pumping Test

During the pumping test, water samples were collected for general chemistry analysis after 1 hour, 24 hours and 72 hours of pumping to analyze for water quality trends with extended pumping. A summary of the water quality results is included in Table E1 of Appendix E. Laboratory certificates of analysis are included in Appendix E. For the parameters tested, aluminum, iron and manganese exceeded the ODWQS in the sample collected after 1 hour of pumping and the total dissolved solids (TDS) exceeded the ODWQS in the samples collected after 24 and 72 hours of pumping. Hardness exceeded the ODWQS in all three samples.

Chloride and nitrate concentrations were either low or not detected. These parameters are indicators of potential surface contamination (road salt or agricultural operations). The low concentrations indicate a low potential for surface contamination entering the bedrock aquifer. There were also no detections of total coliforms or Escherichia coli, which are also indicators of potential surface contamination.

Conductivity, TDS and some inorganics (sulphate, chloride) concentrations increased with pumping duration while some metals (aluminum, copper, iron, lead, manganese, nickel, silicon, sodium, titanium, vanadium, zinc) concentrations decreased with pumping duration.

4.3.2 Ontario Drinking Water Quality Standards

A sample collected at the end of the test underwent a comprehensive analytical suite designed to assess the ODWQS parameters. A summary of the water quality results for the ODWQS is included in Table E2 of Appendix E. Laboratory certificates of analysis are included in Appendix E. With the exception of TDS and hardness, all of the concentrations of the parameters were below the ODWQS limits. TDS was measured at 550 mg/L (aesthetic objective is 500 mg/L) and hardness was measured at 380 mg/L (operational guideline is 80-100 mg/L). The Technical Support Document (MOE, 2006) indicates that total dissolved solids refers to the inorganic substances dissolved in water (principal constituents include chloride, sulphates, calcium, magnesium and bicarbonates). Elevated TDS can create highly mineralized water with excessive hardness, taste and mineral deposition. Water supplies with a hardness greater than 200 mg/L are considered poor but tolerable and hardness in excess of 500 mg/L is unacceptable for most domestic purposes.

4.3.3 Micro Particulate Analysis

The results of the microscopic particulate analysis (MPA) from PW21-1 at the end of the test are included in Appendix E. There were no detections of diatoms, algae, insect/larvae, rotifers, plant debris, nematodes, pollen, crustacea, spores, giardia or cryptosporidium in the groundwater sampled from PW21-1. For comparison, analysis of a sample from the nearby pond indicates the detection of spores (2,700 CFU/100 mL), rotifers, diatoms, blue green algae and other photosynthetic pigment bearing organisms. Based on this sample, the risk of surface water contamination is low.

5.0 WATER SUPPLY POTENTIAL

5.1 Aquifer Presence

The overburden is mainly glacial till, which is not suitable for a municipal water supply. Any coarse-grained layers within the overburden may be suitable for individual water supplies but do not appear to be laterally continuous and are not suitable for a municipal water supply. The buried bedrock valley at the Site appears to be infilled with glacial till and as such is not considered to be a viable water supply target.

The majority of private wells in the area are completed in the bedrock. It is inferred that the bedrock underlying the Site is part of a regional bedrock aquifer that should be considered the target aquifer for a large capacity water supply well. The drilling and testing at the Site has confirmed that the bedrock aquifer is suitable for a water supply well.

5.2 Water Quantity

Water quantity from a well in a bedrock aquifer is often dependant on the number and size of fractures intercepted by the well. PW21-1 has demonstrated the ability to yield 8.8 L/s for a period of 72 hours while recording drawdown within the well of 12.8 m. The available drawdown (to the top of the bedrock) is approximately 20.4 m.

At the proposed rate of 5.03 L/s, it is estimated that the drawdown in PW21-1 would decrease to approximately 7.3 m or 36% of the available drawdown after 72 hours of pumping. Extrapolation of the drawdown versus time for PW21-1 indicates that there is a suitable water supply at this location considering the proposed rate will be 5.03 L/s.

At the anticipated 5.03 L/s, the drawdown at the private wells would be minor (<1 m).

There are no anticipated impacts to surface water features from the use of PW21-1 due to the thick low-permeability overburden (glacial till).

5.3 Water Quality

Water quality testing indicates that with the exception of TDS and hardness, all of the parameters meet the ODWQS. If required, water treatment will be designed by another consultant.

5.4 GUDI Assessment

The following provide an assessment to determine the GUDI status of the well.

Under the MOE 2001 Terms of Reference, communal wells are “flagged” as potentially GUDI if a number of conditions are met. The following table summarizes the status of PW21-1 in relation to these conditions.

Table 4: GUDI Assessment Based on MOE 2001 Terms of Reference

Condition	Summary of Condition	PW21-1 Status
i	*Regularly contain Total Coliforms and/or periodically contain E. coli; or*	Four samples were collected during a 72-hour pumping test at PW21-1; neither total coliforms nor E. coli were detected during sampling.
ii	*are located within approximately 50 days horizontal saturated travel time from surface water or are within 100 m (overburden wells) or 500 m (bedrock wells) of surface water (whichever is greater) and meet one or more of the following criteria:*	On-Site ponds and Irvine Creek are located within 500 m of PW21-1 (Figure 1).

Condition	Summary of Condition	PW21-1 Status
ii a)	*Wells may be drawing water from an unconfined aquifer;*	The regional hydrogeologic system consists of a bedrock aquifer overlain by a silt till aquitard. PW21-1 draws water from the bedrock aquifer. In the vicinity of the PW21-1, the bedrock aquifer is encountered at a depth of approximately 30 m. PW21-1 does not draw water from an unconfined aquifer.
ii b)	*Wells may be drawing water from formations within approximately 15 m of surface;*	The well casing of PW21-1 extends to a depth of 32.9 m below ground surface. Water from this well is therefore drawn from formations deeper than 15 m of surface.
ii c)	*Wells are part of an enhanced recharge/infiltration project;*	No recharge/infiltration project exists at the site.
ii d)	*When the well is pumped, water levels in surface water rapidly change or hydraulic gradients beside the surface water significantly increase in a downward direction;*	Gradients beside surface water did not change during the pumping test at PW21-1.
ii e)	*Chemical water quality parameters (such as temperature, conductivity, turbidity, total dissolved solids, pH, colour, oxygen) are more consistent with nearby surface water than local groundwater and/or if they fluctuate significantly and rapidly in response to climatological or surface water conditions.*	The samples analyzed for water quality during the 72-hour pumping test at PW21-1 are consistent with groundwater from a bedrock aquifer.

In summary, based on the above conditions, PW21-1 should not be “flagged” as potentially GUDI under the MOE 2001 Terms of Reference.

Under the Draft Terms of Reference for Determination of Minimum Treatment for Municipal Residential Drinking Water Systems Using Subsurface Raw Water Supplies (MOE, 2019) the need for disinfection of protozoan pathogens is based on the presence of Giardia, Cryptosporidium and fecal contamination. There were no detections of Giardia, Cryptosporidium, E. coli or total coliforms in samples collected during the pumping test.

5.5 Source Water Protection

Under the Clean Water Act (2006) WHPAs were developed and included in the Assessment Reports to identify the time-of-travel capture zones for municipal water supplies. These WHPAs form part of the Source Protection Plans that are used to protect sources of municipal drinking water. The Site is within the Grand River Source Protection Area within the Lake Erie Source Protection Region (LESPR). To support the development of these plans, the horizontal movement of groundwater to the municipal wells is categorized into groundwater time-of-travel zones delineated around each well or group of wells including WHPA-A (100 m radius), WHPA-B (2 year time-of-travel), WHPA-C (5 year time-of-travel) and WHPA-D (25 year time-of-travel).

The WHPA for the Fergus municipal wells (Lake Erie Region Source Protection Committee, 2021a) extends through the Site as shown on Figure 9. PW21-1 lies within WHPA-D (25-year time-of-travel) of the capture zone.

In addition to the delineation of the WHPAs, the vulnerability of municipal wells and intakes to contamination from surrounding land-use activities is also assessed. This is assessed using the intrinsic vulnerability, which is based on an evaluation of the geologic and hydrogeological characteristics of the sediments overlying the aquifer of interest. The intrinsic vulnerability is ranked as high, medium or low, with low providing the most protection to an aquifer. PW21-1 lies within a low vulnerability zone (see Figure 9). There is some medium vulnerability by Lake Belwood, which is due to the higher permeable sediments at surface and thinning of the overburden toward Lake Belwood.

The WHPAs are combined with the intrinsic vulnerability to determine a WHPA vulnerability, which is the basis for the threat analysis. WHPA vulnerability ranges from 2 to 10 with 10 being the most vulnerable. Where the WHPAs are present at the Site, the WHPA vulnerability is 2 with the exception of the small portion by Lake Belwood where the WHPA vulnerability is 4 (i.e., the area where the intrinsic vulnerability is shown as medium on Figure 9). Significant groundwater recharge areas (SGRA) are also evaluated and, in the area of the Site, the vulnerability is 2 (for the SE Site and part of the NW Site). Based on the Source Protection Plan (Lake Erie Region Source Protection Committee, 2021b) there are no significant threats identified at the Site.

The Site does not fall within an Issue Contributing Area and therefore there are no threats related to specific issues.

To protect sources of municipal drinking water with respect to water quantity, draft Wellhead Protection Area Quantity zones (WHPA-Q) were delineated by Matrix Solutions for the Lake Erie Source Protection Region (Grand River Conservation Authority, 2021b) for Elora and Fergus. The WHPA-Q zone is included on the GRCA Grand River Information Network (GRIN) mapping but is considered draft. The WHPA-Q in the area of the Site is shown on Figure 9 and extends through a small portion of the western edge of the NW Site and the SE Site. PW21-1 is located outside of the WHPA-Q zone.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The hydrogeological assessment provided herein concludes that a water supply is considered to be feasible at the Site. The following conclusions are provided:

- The bedrock aquifer is the primary target for water supply development;
- PW21-1 was constructed in the bedrock aquifer for testing as potential water supply;
- PW21-1 had a tested yield of 8.8 L/s and can meet the maximum day demand of 5.03 L/s;
- Groundwater quality at PW21-1 met the ODWQS with the exceptions of hardness and TDS; and
- PW21-1 is not considered a GUDI well.

The following recommendation is provided.

- A second well should be constructed to provide a back-up water supply. The back-up water supply should be situated at least 100 m away from agricultural land and dispersal beds, and approximately 200 m away from private water supplies. One such location is shown on Figure 9 northeast of PW21-1.

7.0 REPORT LIMITATIONS

7.1 General Limitations

This hydrogeological assessment was prepared for 883890 Ontario Limited c/o Fergus Development Inc., and their agents to confirm a water supply feasibility for the proposed redevelopment at the existing Fergus Golf Club. The factual information, descriptions, interpretations, comments, recommendations and electronic files contained herein are specific to the project described in this report and do not apply to any other project or site. This report is based on borehole drilling, pumping tests and water quality analyses collected during this investigation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the sole responsibilities of such third parties. Under no circumstances may this information be used for any other purposes than those specified in the scope of work unless explicitly stipulated in the text of this report or formally authorized by Golder. This report must be read in its entirety as some sections could be falsely interpreted when taken individually or out-of-context. As well, the final version of this report and its content supersedes any other text, opinion or preliminary version produced by Golder.

Golder shall not be held responsible for damages resulting from unpredictable or unknown underground conditions, from erroneous information provided by and/or obtained from other sources than Golder, and from ulterior changes in the Site conditions unless Golder has been notified by the client of any occurrence, activity, information or discovery, past or future, susceptible of modifying the underground conditions described herein, and have had the opportunity of revising its interpretations, comments and recommendations. Furthermore, Golder shall not be held responsible for damages resulting from any future modification to the applicable regulations, standards and criteria, for any use of this report and its content by a third party, and/or for its use for other purposes than those intended. Golder shall not be held responsible for any decrease, real or perceived, of a property's value or any failure to complete a transaction, as a consequence of this report.

8.0 CLOSURE

We trust this report meets your current requirements. Should you have any questions please do not hesitate to contact the undersigned.

9.0 REFERENCES

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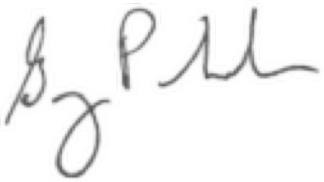
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Signature Page

Yours truly,

Golder Associates Ltd.



Greg Padusenko, M.Sc., P.Eng., P.Geo.
Sr. Hydrogeologist



John Piersol, M.Sc., P.Geo.
Associate, Sr. Hydrogeologist

GRP/JAP/sv/ll

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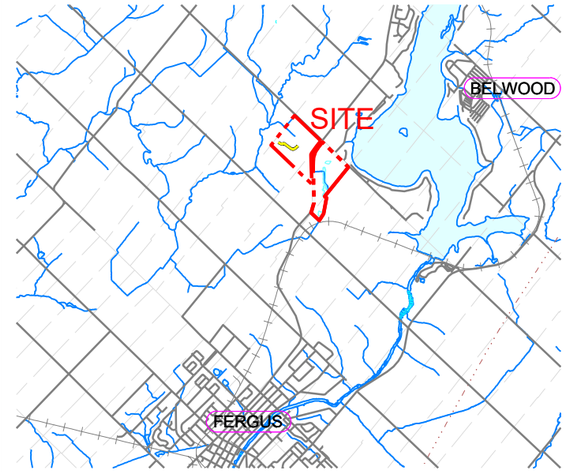
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FIGURES

Figure 1 – Site Location Plan
Figure 2 – Monitoring Locations
Figure 3 – Physiography and Drainage
Figure 4 – Quaternary Geology
Figure 5 – Ministry Recorded Wells
Figure 6 – Area Section A-A’
Figure 7 – Area Section B-B’
Figure 8 – Area Section C-C’
Figure 9 – Wellhead Protection Areas



REGIONAL KEY PLAN 1:100,000



PLAN LEGEND

- PROPERTY BOUNDARY
- EXISTING PRODUCTION WELL
- BEDROCK TEST WELL

REFERENCES & DISCLAIMERS

BASE IMAGERY - SOURCE: ESRI, MAXAR, GEOEYE; GIS USER COMMUNITY.

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883890 ONTARIO LIMITED
C/O FERGUS DEVELOPMENT INC.

PROJECT
FERGUS GOLF CLUB
WATER SUPPLY INVESTIGATION

TITLE
SITE LOCATION PLAN

CONSULTANT
GOLDER

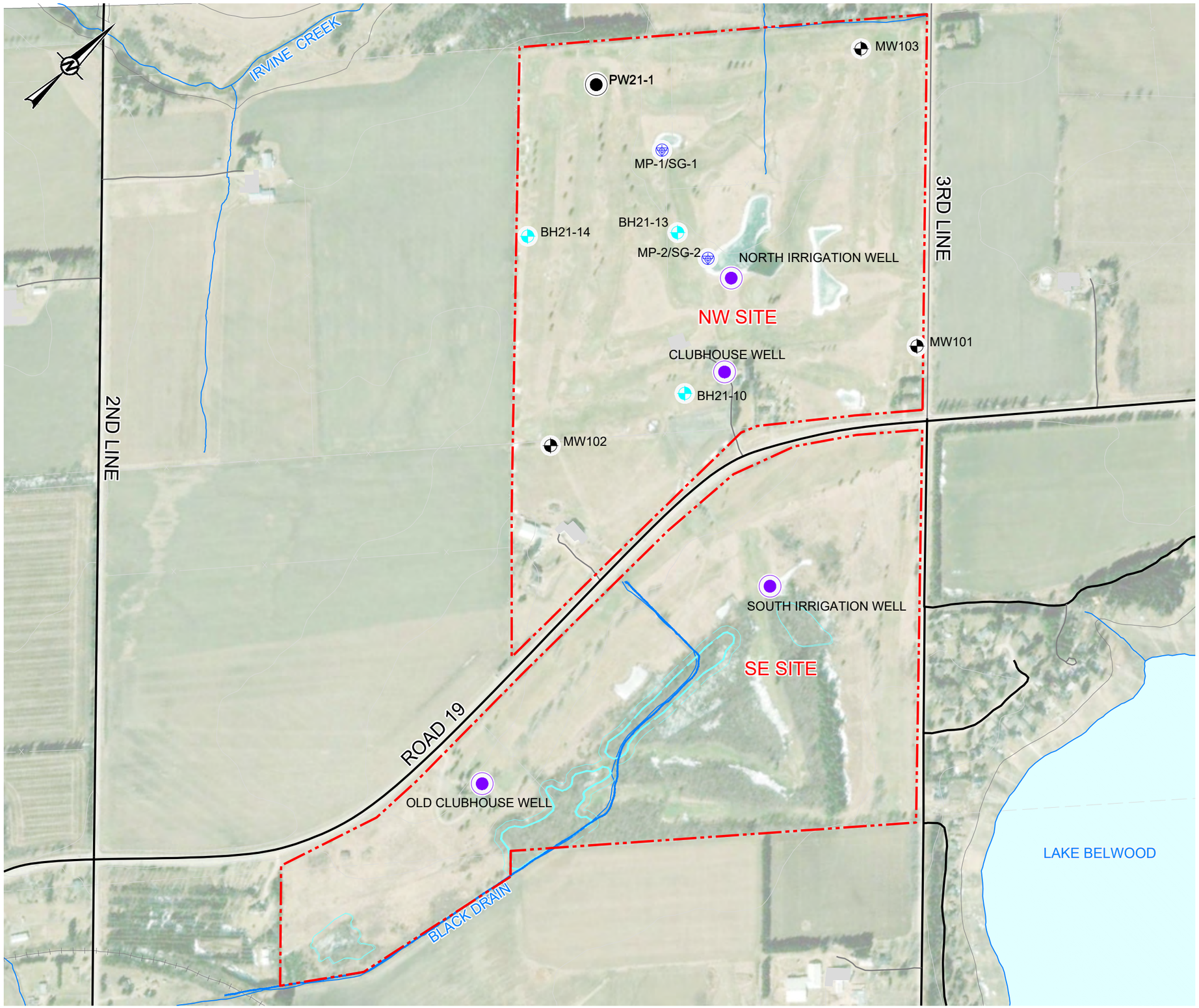
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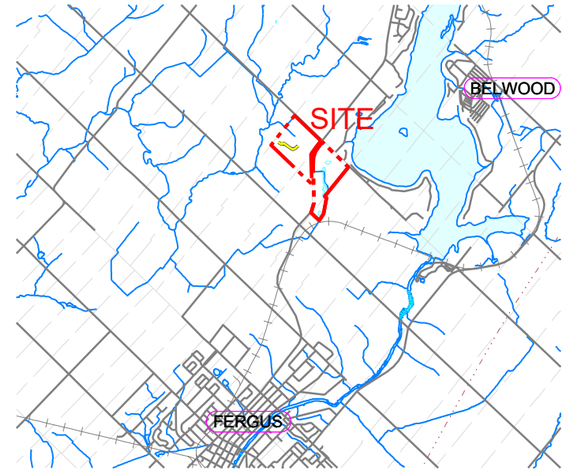
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REGIONAL KEY PLAN 1:100,000



PLAN LEGEND

- PROPERTY BOUNDARY
- EXISTING PRODUCTION WELL
- BEDROCK TEST WELL
- BEDROCK MONITORING WELL
- OVERBURDEN MONITORING WELL
- MINI-PIEZOMETER / STAFF GAUGE

REFERENCES & DISCLAIMERS

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883890 ONTARIO LIMITED
C/O FERGUS DEVELOPMENT INC.

PROJECT
FERGUS GOLF CLUB
WATER SUPPLY INVESTIGATION

TITLE
MONITORING LOCATIONS

CONSULTANT
GOLDER

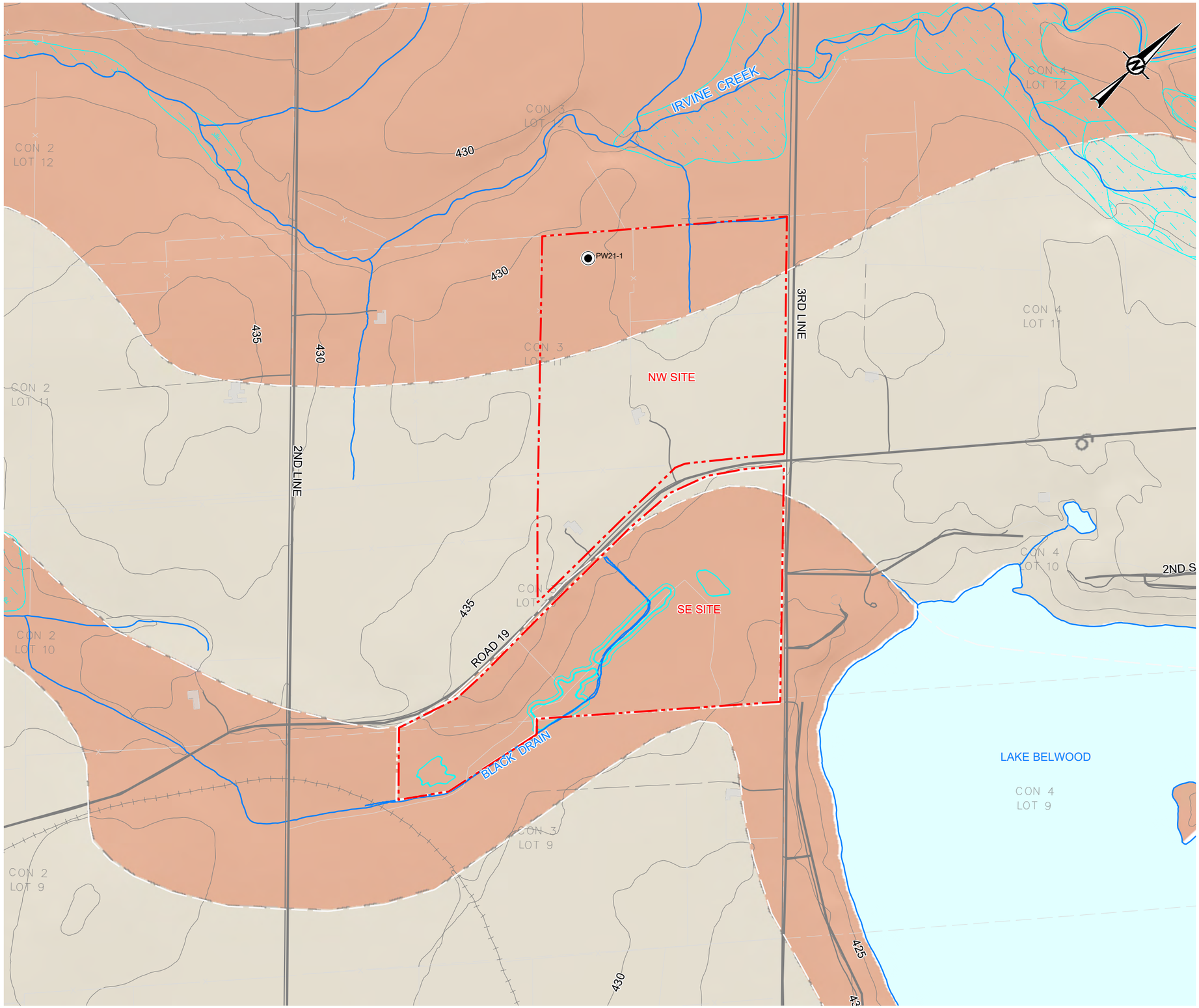
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SPILLWAY

DRUMLINIZED TILL PLAIN

WETLAND

MNR MAPPED WETLAND

PLAN LEGEND

PROPERTY BOUNDARY

BEDROCK TEST WELL

REFERENCES & DISCLAIMERS

QUATERNARY MAPPING ONTARIO GEOLOGICAL SURVEY, QUEEN'S PRINTER 2006

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CLIENT

883890 ONTARIO LIMITED
C/O FERGUS DEVELOPMENT INC.

PROJECT

FERGUS GOLF CLUB
WATER SUPPLY INVESTIGATION

TITLE

PHYSIOGRAPHY AND DRAINAGE

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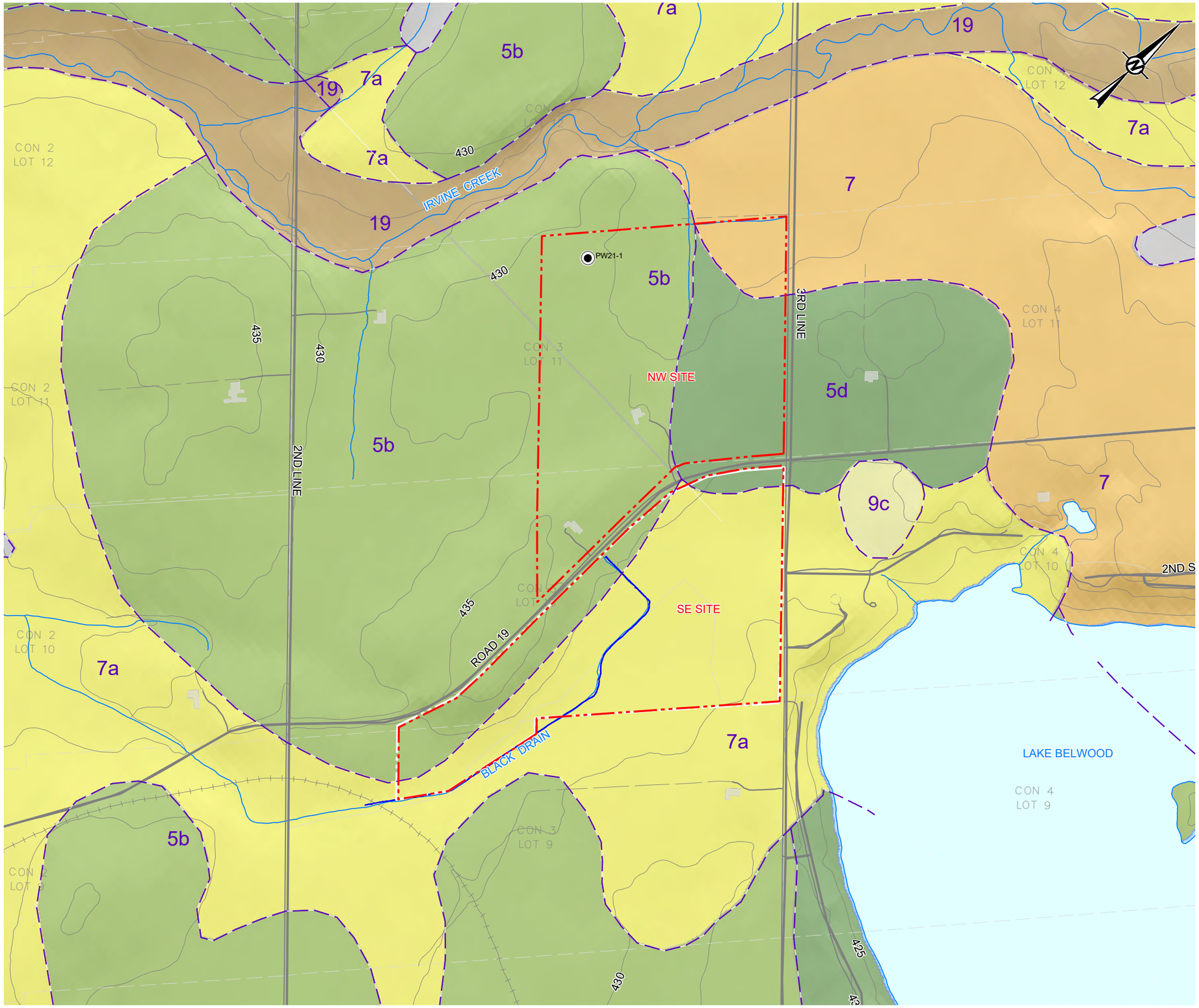
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	20	ORGANIC DEPOSITS
	19	FLUVIAL SILT, SAND, GRAVEL
	9c	GLACIOLACUSTRINE SILT & SAND DEPOSITS
	7	GLACIOFLUVIAL OUTWASH SAND & GRAVEL
	7a	DISTAL SAND & GRAVEL
	5d	FINE GRAINED TILL
	5b	ABLATION TILL

PLAN LEGEND

PROPERTY BOUNDARY

BEDROCK TEST WELL

REFERENCES & DISCLAIMERS

QUATERNARY MAPPING ONTARIO GEOLOGICAL SURVEY, QUEEN'S PRINTER 2016

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C/O FERGUS DEVELOPMENT INC.

PROJECT
FERGUS GOLF CLUB
WATER SUPPLY INVESTIGATION

TITLE
QUATERNARY GEOLOGY MAP

CONSULTANT

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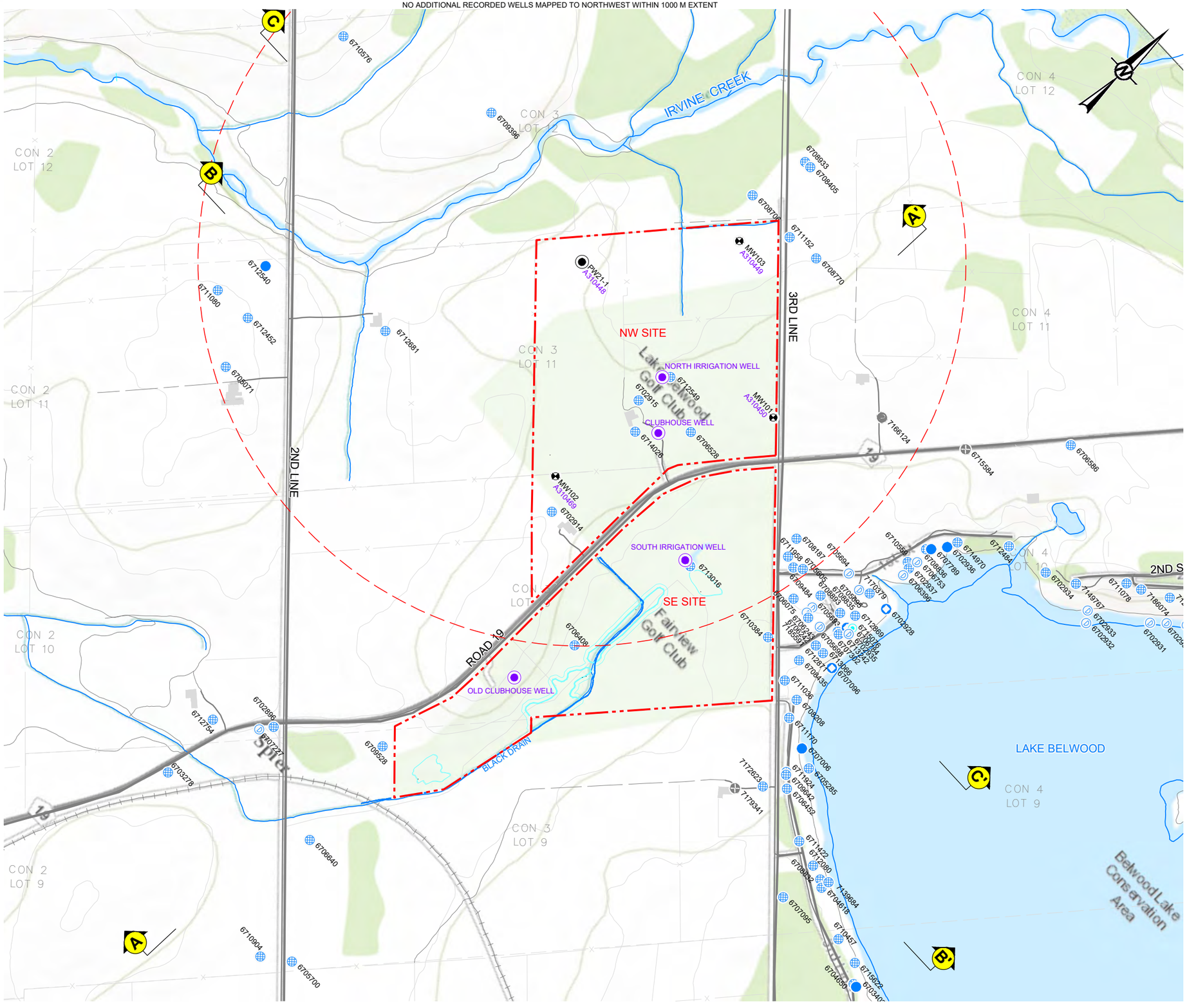
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NO ADDITIONAL RECORDED WELLS MAPPED TO NORTHWEST WITHIN 1000 M EXTENT



PLAN LEGEND

- PROPERTY BOUNDARY
- EXISTING PRODUCTION WELL
- BEDROCK TEST WELL WITH 1000 M OFFSET
- BEDROCK MONITORING WELL
- WETLAND
- MNR MAPPED WETLAND
- LINE OF SECTION

RECORDED MINISTRY WATER WELL WITH RECORD ID / TAG NUMBER

- SHALLOW DUG OR BORED <10 M
- DEEP BORED WELL >10 M
- DRILLED OVERBURDEN WELL
- TEST OR OBSERVATION WELL
- DRILLED BEDROCK WELL
- RECORD OF ABANDONMENT
- INFORMATION UNRECORDED
- TEMPORARY DEWATERING WELL

REFERENCES & DISCLAIMERS

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CLIENT
883890 ONTARIO LIMITED
C/O FERGUS DEVELOPMENT INC.

PROJECT
FERGUS GOLF CLUB
WATER SUPPLY INVESTIGATION

TITLE
MINISTRY RECORDED WELLS

CONSULTANT
GOLDER

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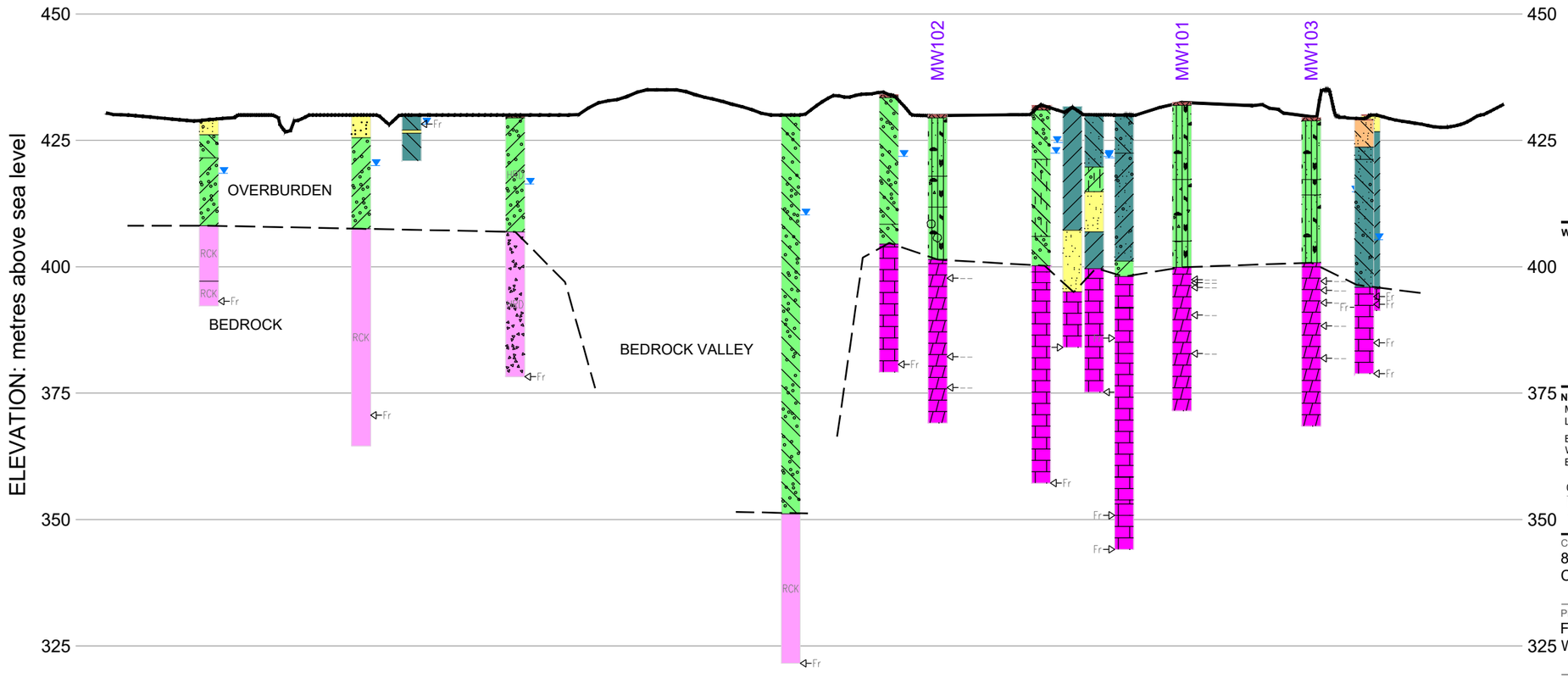
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PLAN LEGEND

- SHALLOW DUG OR BORED <10 M
- DEEP BORED WELL >10 M
- DRILLED OVERBURDEN WELL
- TEST OR OBSERVATION WELL
- DRILLED BEDROCK WELL
- BEDROCK TEST WELL
- EXISTING PRODUCTION WELL
- BEDROCK MONITORING WELL

SOIL PATTERN LEGEND AND GENERIC SHADING

- UNOXIDIZED CLAY BLUE, GREY WHITE, OR UNDEFINED
- OXIDIZED CLAY BROWN, RED, YELLOW
- SILT
- SAND
- GRAVEL
- STONES, PEBBLES
- BOULDER
- TILL
- LIMESTONE
- SHALE
- UNKNOWN
- PEAT/LOAM
- SANDS & GRAVELS
- GRANULAR TILL
- SILT
- SILT CLAYEY
- CLAY
- TILL
- LIMESTONES
- SHALES
- UNDIFFERENTIATED

WELL SYMBOLS

- 23453 MOE RECORDED PRIVATE WELL
- RECORDED STATIC WATER LEVEL
- WATER PRODUCING ZONE
- SCREEN

NOTES

MINISTRY OF ENVIRONMENT WATER WELL INFORMATION SYSTEM, QUEEN'S PRINTER. LOCATION AND ELEVATIONS OF FIELD VERIFIED WELLS ARE SUBJECT TO REVISION.

BOUNDARIES BETWEEN SOIL STRATA HAVE BEEN DETERMINED ONLY AT WELL AND TEST WELL LOCATIONS. BETWEEN THE WELLS AND TEST WELLS, BOUNDARIES ARE NOT PROVEN BUT ARE ASSUMED FROM GEOLOGICAL EVIDENCE.

0 200 400 600 m
1:10000

CLIENT
883890 ONTARIO LIMITED
C/O FERGUS DEVELOPMENT INC.

PROJECT
FERGUS GOLF CLUB
WATER SUPPLY INVESTIGATION

TITLE
AREA SECTION A - A'

CONSULTANT
GOLDER

YYYY-MM-DD	2022-01-13
DESIGNED	
PREPARED	JPR
REVIEWED	GP
APPROVED	JAP

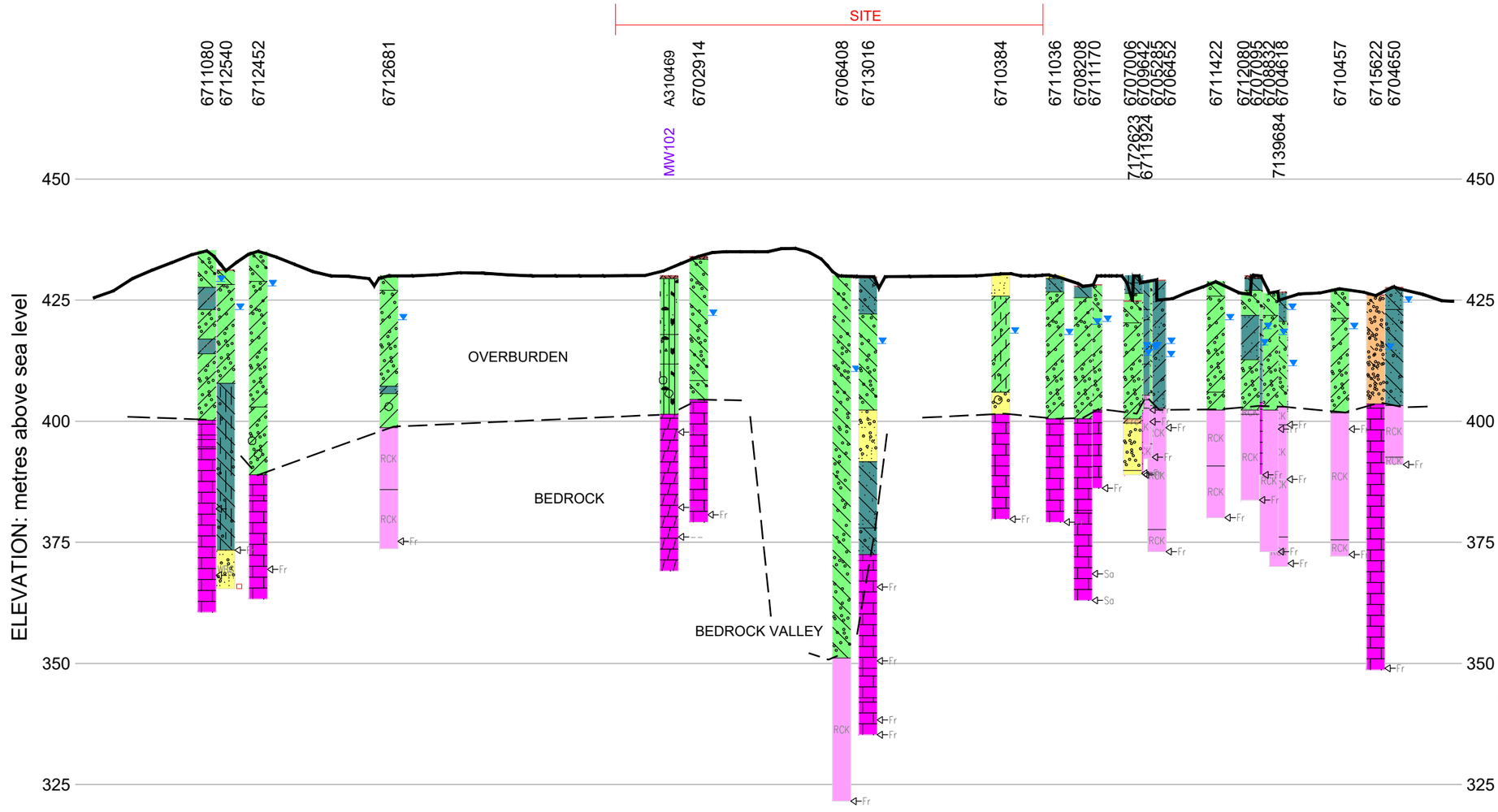
PROJECT NO.	CONTROL	REV.	FIGURE
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

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PLAN LEGEND

- SHALLOW DUG OR BORED <10 M
- DEEP BORED WELL >10 M
- DRILLED OVERBURDEN WELL
- TEST OR OBSERVATION WELL
- DRILLED BEDROCK WELL
- BEDROCK TEST WELL
- EXISTING PRODUCTION WELL
- BEDROCK MONITORING WELL

SOIL PATTERN LEGEND AND GENERIC SHADING

- UNOXIDIZED CLAY BLUE, GREY WHITE, OR UNDEFINED
- OXIDIZED CLAY BROWN, RED, YELLOW
- SILT
- SAND
- GRAVEL
- STONES, PEBBLES
- BOULDER
- TILL
- LIMESTONE
- SHALE
- UNKNOWN
- PEAT/LOAM
- SANDS & GRAVELS
- GRANULAR TILL
- SILT
- SILT CLAYEY
- CLAY
- TILL
- LIMESTONES
- SHALES
- UNDIFFERENTIATED

WELL SYMBOLS

- 23453 MOE RECORDED PRIVATE WELL
- RECORDED STATIC WATER LEVEL
- WATER PRODUCING ZONE
- SCREEN

NOTES

MINISTRY OF ENVIRONMENT WATER WELL INFORMATION SYSTEM, QUEEN'S PRINTER. LOCATION AND ELEVATIONS OF FIELD VERIFIED WELLS ARE SUBJECT TO REVISION.

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0 200 400 600 m

1:10000

CLIENT
883890 ONTARIO LIMITED
C/O FERGUS DEVELOPMENT INC.

PROJECT
FERGUS GOLF CLUB
WATER SUPPLY INVESTIGATION

TITLE
AREA SECTION B - B

CONSULTANT
GOLDER

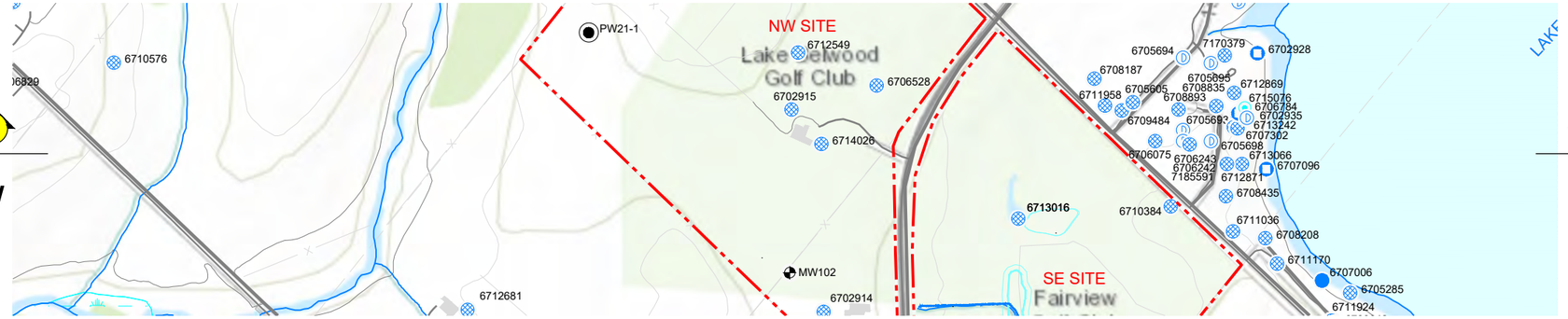
YYYY-MM-DD	2022-01-13
DESIGNED	
PREPARED	JPR
REVIEWED	GP
APPROVED	JAP

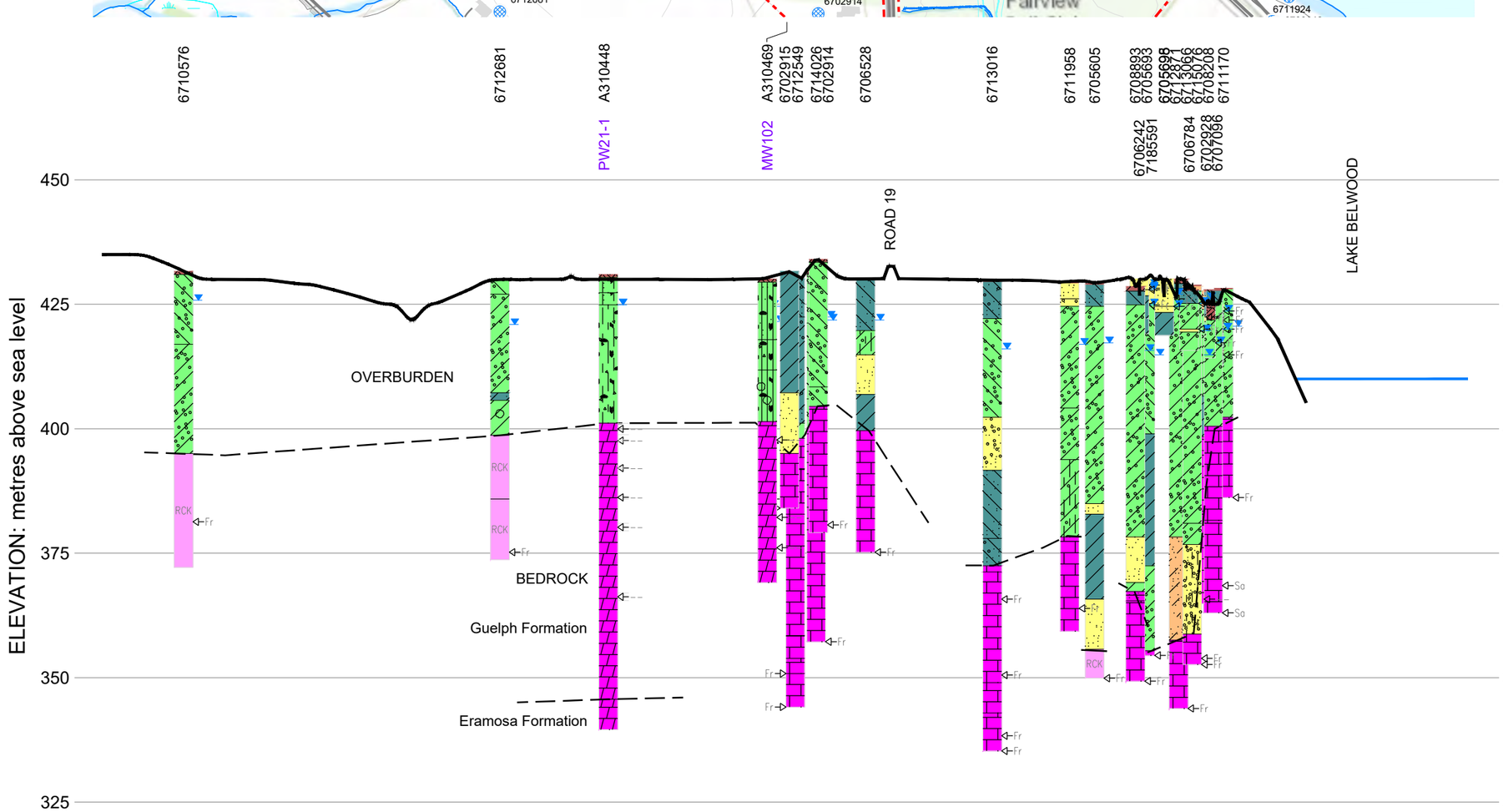
PROJECT NO.	CONTROL	REV.	FIGURE
21456909	0010	----	7

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25 mm

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PLAN LEGEND

- SHALLOW DUG OR BORED <10 M
- DEEP BORED WELL >10 M
- DRILLED OVERBURDEN WELL
- TEST OR OBSERVATION WELL
- DRILLED BEDROCK WELL
- BEDROCK TEST WELL
- EXISTING PRODUCTION WELL
- BEDROCK MONITORING WELL

SOIL PATTERN LEGEND AND GENERIC SHADING

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- OXIDIZED CLAY BROWN, RED, YELLOW
- SILT
- SAND
- GRAVEL
- STONES, PEBBLES
- BOULDER
- TILL
- SHALE
- LIMESTONE
- CRYSTALLINE ROCK
- UNKNOWN
- PEAT/LOAM
- SANDS & GRAVELS
- GRANULAR TILL
- SILT
- SILT CLAYEY
- CLAY
- TILL
- LIMESTONES
- SHALES
- PRECAMBRIAN

23453 MOE RECORDED PRIVATE WELL

RECORDED STATIC WATER LEVEL — FLOWING WELL

WATER PRODUCING ZONE

SCREEN

NOTES

MINISTRY OF ENVIRONMENT WATER WELL INFORMATION SYSTEM, QUEEN'S PRINTER. LOCATION AND ELEVATIONS OF FIELD VERIFIED WELLS ARE SUBJECT TO REVISION.

BOUNDARIES BETWEEN SOIL STRATA HAVE BEEN DETERMINED ONLY AT WELL AND TEST WELL LOCATIONS. BETWEEN THE WELLS AND TEST WELLS, BOUNDARIES ARE NOT PROVEN BUT ARE ASSUMED FROM GEOLOGICAL EVIDENCE.

0 200 400 600 m

1:10000

CLIENT
883890 ONTARIO LIMITED
C/O FERGUS DEVELOPMENT INC.

PROJECT
FERGUS GOLF CLUB
WATER SUPPLY INVESTIGATION

TITLE
AREA SECTION C - C'

CONSULTANT
GOLDER

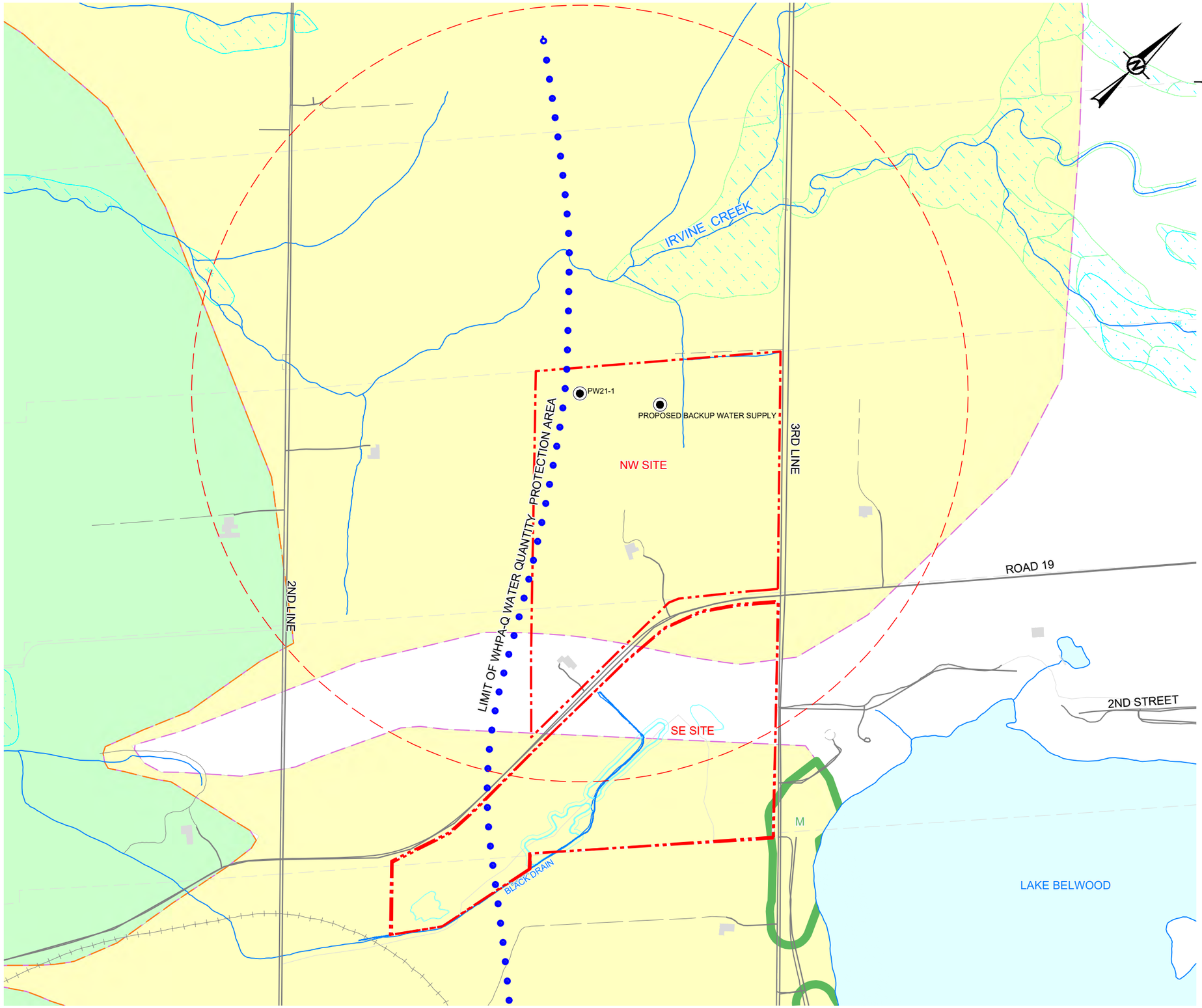
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DESIGNED	
PREPARED	JPR
REVIEWED	GP
APPROVED	JAP

PROJECT NO.	CONTROL	REV.	FIGURE
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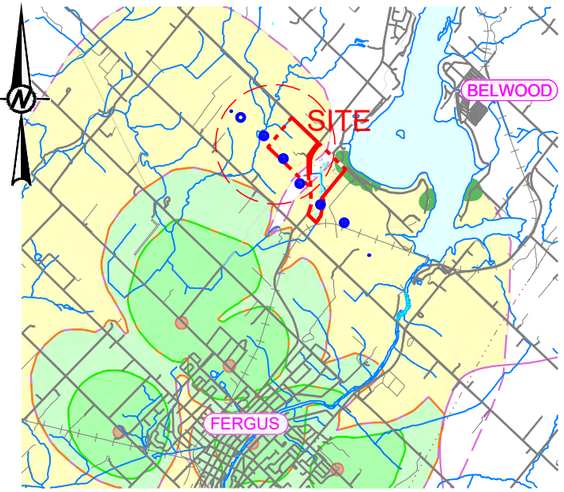
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0 25 mm

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REGIONAL PLAN 1:100,000



PLAN LEGEND

- PROPERTY BOUNDARY WITH 500 m OFFSET
- APPROXIMATE ZONE OF INFLUENCE (PUMPING AT 8.8 l/s)
- WELLHEAD PROTECTION AREA A / MUNICIPAL WELL SITE
- WELLHEAD PROTECTION AREA B
- WELLHEAD PROTECTION AREA C
- WELLHEAD PROTECTION AREA D
- WATER QUANTITY PROECTION LIMIT
- AREA OF MEDIUM AQUIFER INTRINSIC VULNERABILITY (GRCA)

REFERENCES & DISCLAIMERS

WELLHEAD PROTECTION AREAS, GRAND VALLEY CONSERVATION AUTHORITY (GRCA); 2009

AQUIFER INTRINSIC SUSCEPTIBILITY, GRCA. AREAS OUTSIDE MAPPED MEDIUM VULNERABILITY LOCAL TO THE SITE PLAN AREA EXTENT ARE MAPPED LOW ISI OTHERWISE.

MAPPED FEATURES ARE APPROXIMATE AND NOT TO SCALE.

0 200 400 600 m

1:10000

PLOTTED 11X17" TABLOID PROJECTION IS UTM NAD 83 ZONE 17

CLIENT
883890 ONTARIO LIMITED
C/O FERGUS DEVELOPMENT INC.

PROJECT
FERGUS GOLF CLUB
WATER SUPPLY INVESTIGATION

TITLE
WELLHEAD PROTECTION AREAS

CONSULTANT
GOLDER

YYYY-MM-DD	2022-01-13
DESIGNED	
PREPARED	JPR
REVIEWED	GP
APPROVED	JAP

PROJECT NO.	CONTROL	REV.	FIGURE
21456909	0010	----	9

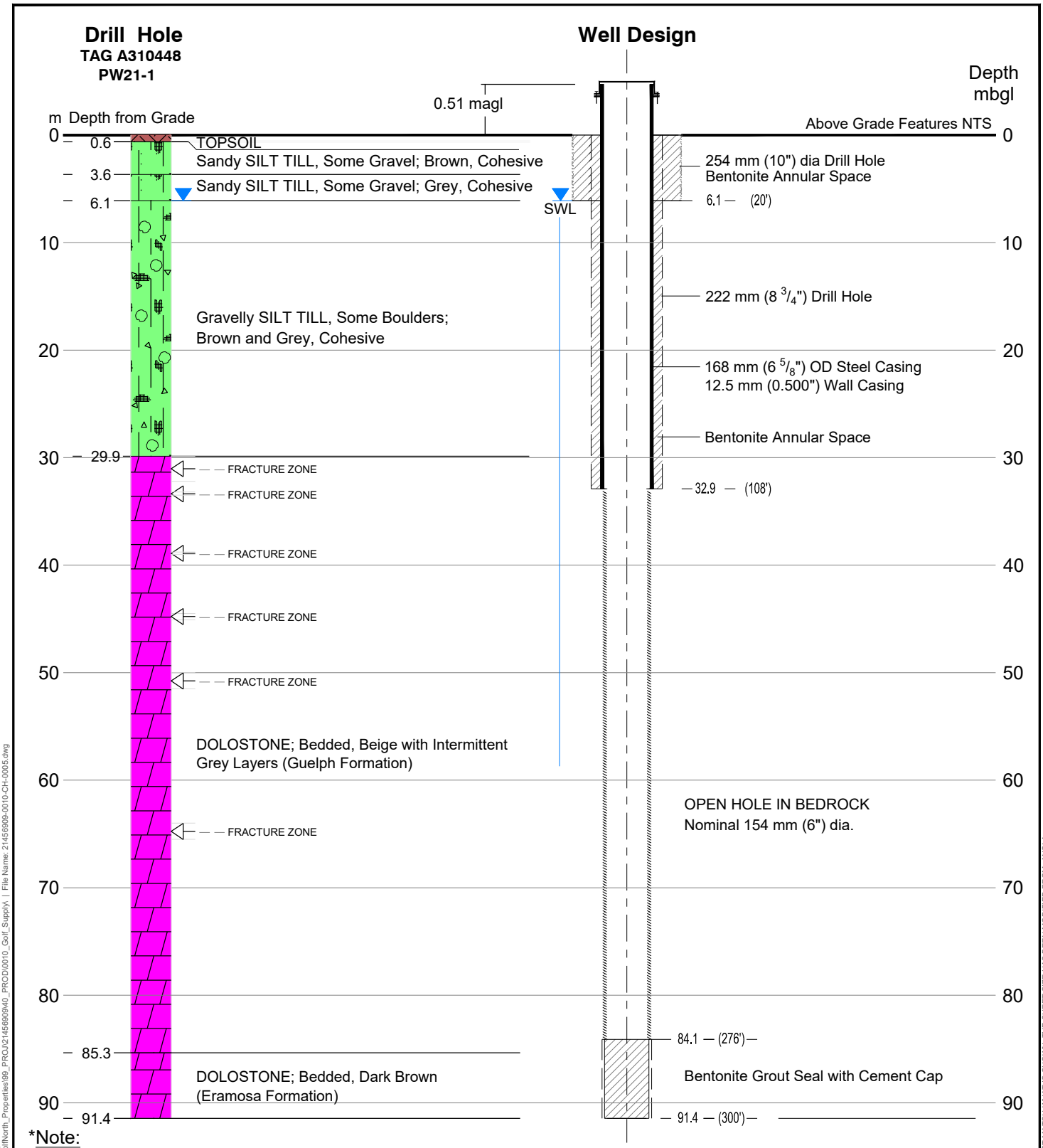
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25 mm

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APPENDIX A

As-Built Drawings



*Note:

Converted depths to feet nominal 1 foot integrals
Drilled by Well Initiatives Limited
Constructed 6th-12th May 2021
Constructed by Rotary Drill Methods

CLIENT
883890 ONTARIO LIMITED
C/O FERGUS DEVELOPMENT INC.

PROJECT
FERGUS GOLF CLUB
WATER SUPPLY INVESTIGATION

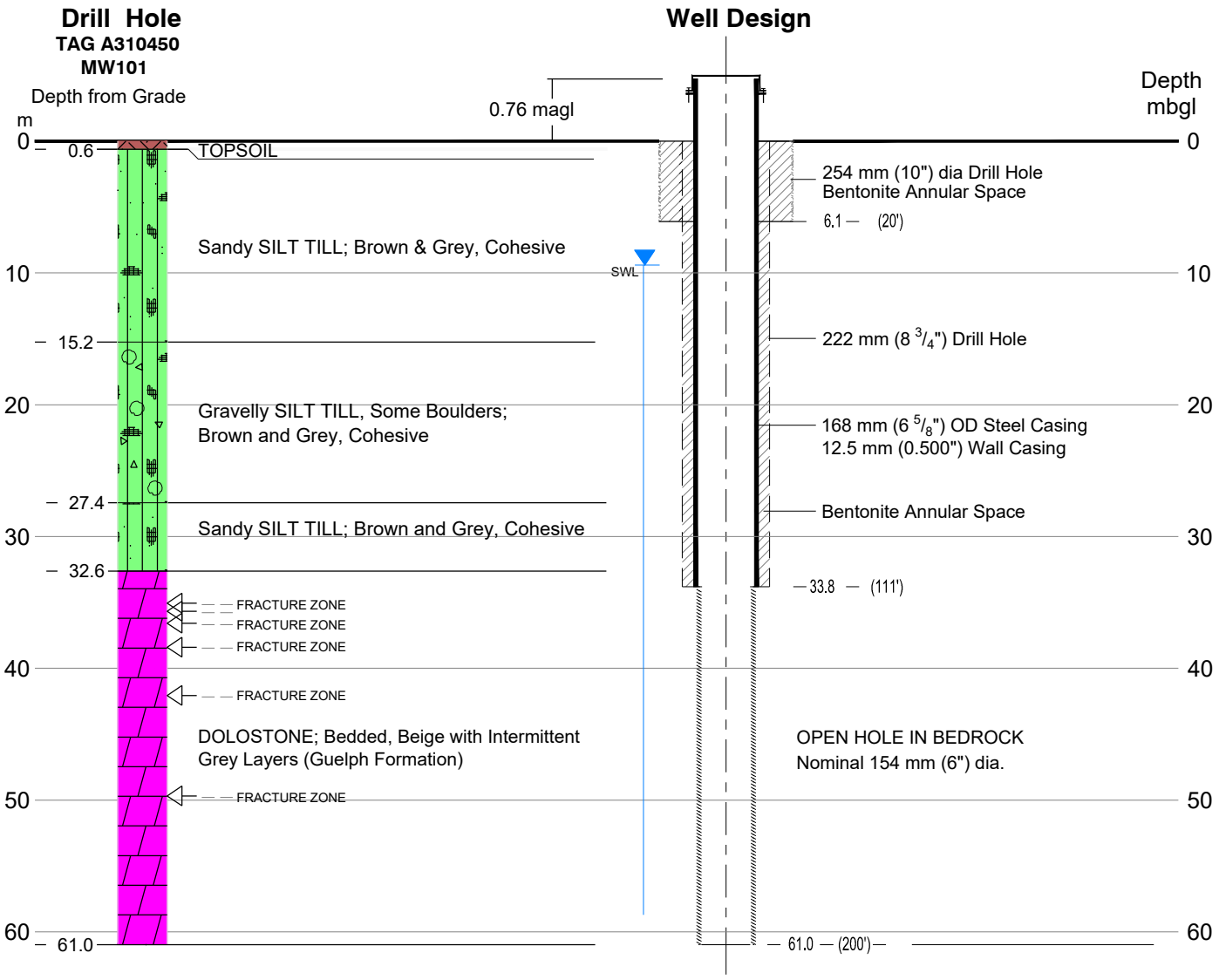
CONSULTANT
GOLDER

YYYY-MM-DD	2022-01-13
DESIGNED	
PREPARED	JPR
REVIEWED	GP
APPROVED	JAP

TITLE
PW21-1 AS-BUILT

PROJECT NO.	CONTROL	REV.	FIGURE
21456909	0010	----	A1

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
25 mm
0



*Note:

Converted depths to feet nominal 1 foot integrals
Drilled by Well Initiatives Limited
Constructed 17th-18th May 2021
Constructed by Rotary Drill Methods

CLIENT
883890 ONTARIO LIMITED
C/O FERGUS DEVELOPMENT INC.

PROJECT
FERGUS GOLF CLUB
WATER SUPPLY INVESTIGATION

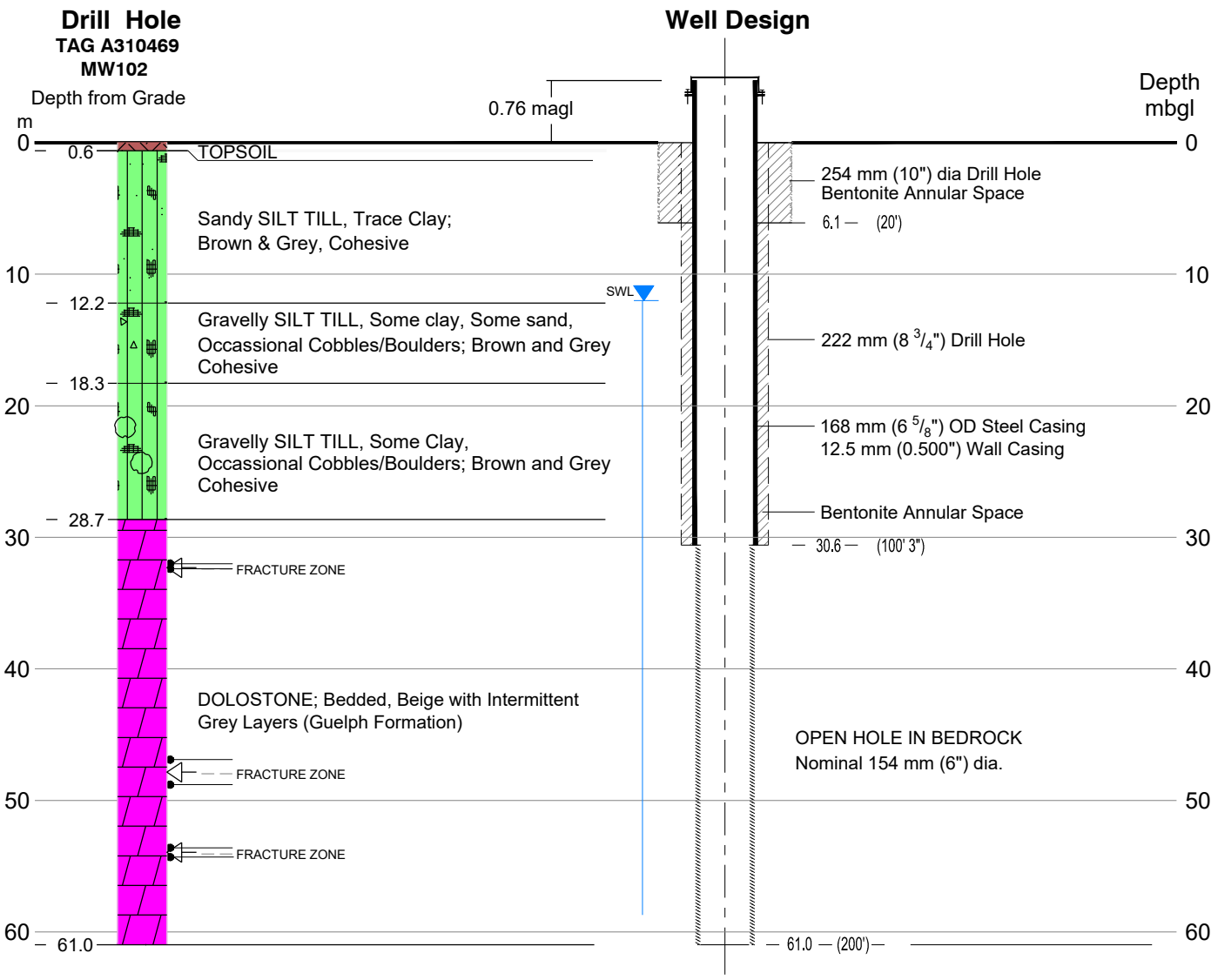
CONSULTANT
GOLDER

YYYY-MM-DD	2022-01-13
DESIGNED	
PREPARED	JPR
REVIEWED	GP
APPROVED	JAP

TITLE
MW101 AS-BUILT

PROJECT NO.	CONTROL	REV.	FIGURE
21456909	0010	----	A2

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
25 mm
0



*Note:

Converted depths to feet nominal 1 foot integrals
Drilled by Well Initiatives Limited
Constructed 25th-26th May 2021
Constructed by Rotary Drill Methods

CLIENT
883890 ONTARIO LIMITED
C/O FERGUS DEVELOPMENT INC.

PROJECT
FERGUS GOLF CLUB
WATER SUPPLY INVESTIGATION

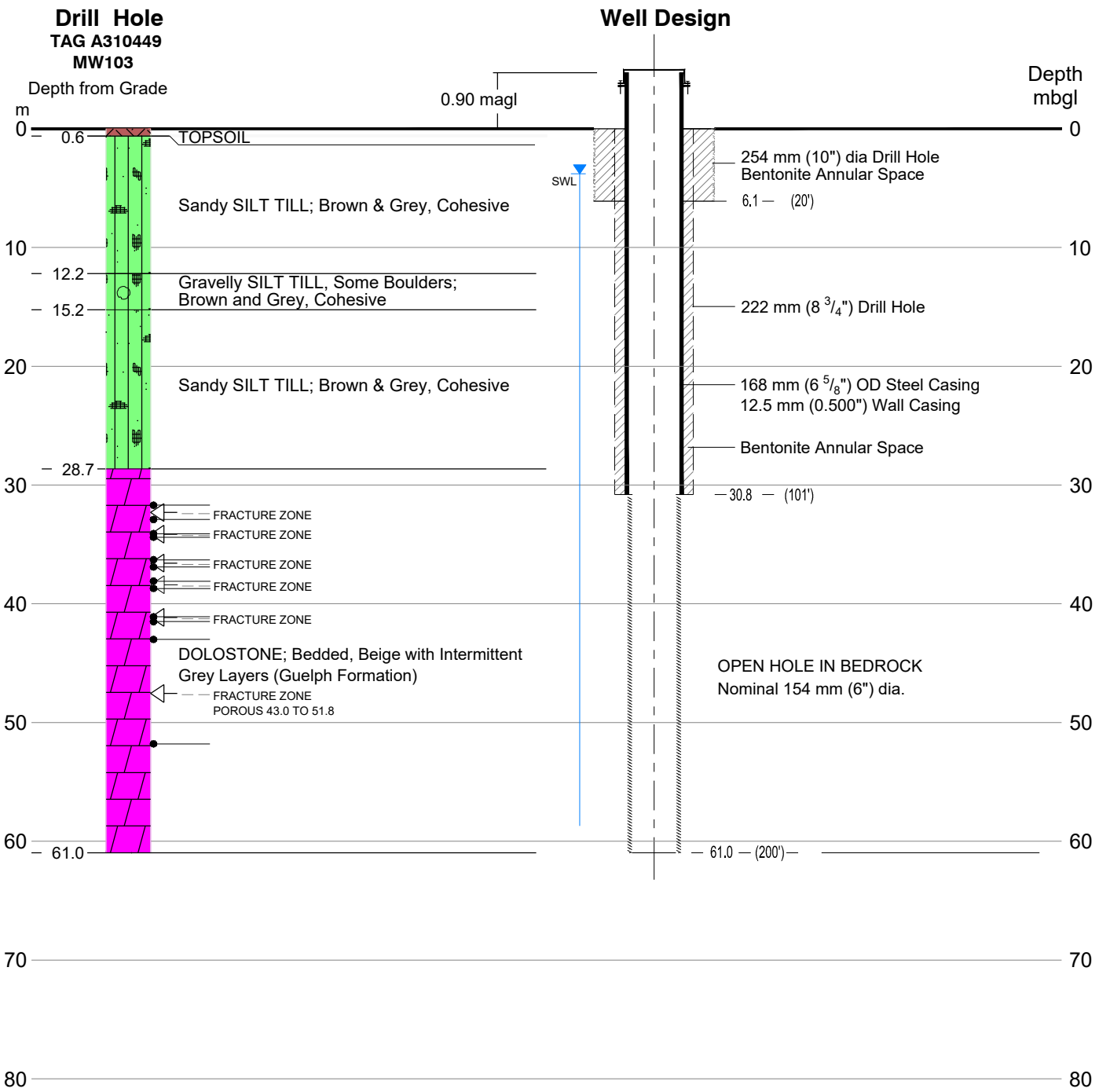
CONSULTANT
GOLDER

YYYY-MM-DD	2022-01-13
DESIGNED	
PREPARED	JPR
REVIEWED	GP
APPROVED	JAP

TITLE
MW102 AS-BUILT

PROJECT NO.	CONTROL	REV.	FIGURE
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
25 mm
0



*Note:

Converted depths to feet nominal 1 foot integrals
Drilled by Well Initiatives Limited
Constructed 12th - 15th May 2021
Constructed by Rotary Drill Methods

CLIENT
883890 ONTARIO LIMITED
C/O FERGUS DEVELOPMENT INC.

PROJECT
FERGUS GOLF CLUB
WATER SUPPLY INVESTIGATION

CONSULTANT
GOLDER

YYYY-MM-DD	2022-01-13
DESIGNED	
PREPARED	JPR
REVIEWED	GP
APPROVED	JAP

TITLE
MW103 AS-BUILT

PROJECT NO.	CONTROL	REV.	FIGURE
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
25 mm
0

APPENDIX B

Water Well Records

LABEL	CON LOT	DATE mmm-yr	EASTING NORTHING	ELEV masl	WTR mbgl	FND Qu	SCR TOP mbgl	LEN m	SWL mbgl	RATE L/min	TIME min	PL mbgl	DRILLER METHOD	TYPE STAT	WELL NAME DESCRIPTION OF MATERIALS
6702914	3 10	Dec-67	551217 4844015	433.7	53.3	Fr			12.2	45	90	18.3	2406 CT	WS ST	**MOE# 6702914** 0.0 TPSL 0.6 BRWN CLAY STNS 25.6 BRWN CLAY GRVL 29.6 BRWN LMSN 54.9
6702915	3 11	Dec-51	551159 4844378	429.8	47.5	Fr			7.0	45	30	9.1	2521 CT	WS ST	**MOE# 6702915** 0.0 CLAY 24.4 MSND 36.6 LMSN 47.5
6702916	3 13	Apr-64	549770 4844615	431.6	53.0	Fr			11.6	36	240	18.3	1659 CT	WS DO	**MOE# 6702916** 0.0 CLAY MSND 6.1 CLAY STNS 39.6 GREY LMSN 53.3
6705071	2 11	Oct-74	550362 4843651	434.3	65.5	Fr			9.1	91	60	18.3	2336 RC	WS DO	**MOE# 6705071** 0.0 TPSL 0.3 BRWN CLAY STNS 3.0 GREY CLAY STNS 36.3 GREY ROCK 45.1 BRWN ROCK 65.5
6705605	4 10	Jul-75	551772 4844391	428.2	79.2	Fr			11.9	45	60	19.8	2336 RC	WS DO	**MOE# 6705605** 0.0 TPSL 0.3 BRWN CLAY SAND 4.6 GREY CLAY STNS 44.2 GREY SAND 46.3 GREY CLAY 63.4 BRWN SAND 73.5 BRWN ROCK 79.2
6706075	4 10	Jun-76	551812 4844321	428.2	57.9	Fr			10.7	45	60	22.9	2336 RC	WS DO	**MOE# 6706075** 0.0 BRWN SAND 3.7 GREY CLAY GRVL 29.6 GREY ROCK 38.7 BRWN ROCK 61.3
6706408	3 10	May-77	551512 4843821	429.8	108.5	Fr			19.8	68	300	25.9	1906 RC	WS DO	**MOE# 6706408** 0.0 BRWN CLAY STNS 78.9 GREY STNS 108.5
6706427	3 13	May-77	549762 4844571	432.5	40.2	Fr			7.0	36	60	21.3	5469 RC	WS DO	**MOE# 6706427** 0.0 BRWN CLAY 5.5 GREY CLAY 37.5 GREY LMSN 40.2
6706528	3 11	Jan-77	551312 4844421	429.8	54.9	Fr			8.2	41	60	22.9	3740 RA	WS DO	**MOE# 6706528** 0.0 BRWN CLAY SAND 10.4 GREY HPAN STNS 15.2 BRWN SAND 23.2 GREY CLAY 30.5 GREY LMSN 54.9
6708187	4 10	Jun-84	551703 4844433	426.1	38.1	Fr			7.0	36	120	19.8	5317 RC	WS DO	**MOE# 6708187** 0.0 CLAY STNS 28.7 LMSN 42.7
6708208	4 9	Aug-85	552010 4844147	427.0	64.9 59.4	Sa Sa			7.9	41	90	25.9	3740 RC	WS DO	**MOE# 6708208** 0.0 BLCK TPSL 0.3 BRWN CLAY 2.4 GREY CLAY STNS 27.4 GREY LMSN 46.3 BRWN LMSN 64.9
6708405	4 12	Mar-86	551020 4845119	427.9	50.3 47.9	Fr Fr			12.8	45	60	17.7	3740 RC	WS DO	**MOE# 6708405** 0.0 BLCK TPSL 0.3 BRWN CLAY SAND 3.7 GREY CLAY STNS 29.0 GREY LMSN SHLE 51.5
6708706	3 12	May-86	550971 4844959	427.0	50.3 45.7	Fr Fr			2.1	91		6.1	2564 CT	WS DO	**MOE# 6708706** 0.0 GRVL 3.0 CLAY 30.5 SAND 33.5 LMSN 50.3
6708770	4 11	May-87	551204 4844968	428.9	38.1	Fr			15.2	23	60	30.5	4643 RC	WS DO	**MOE# 6708770** 0.0 BLCK TPSL 0.3 BRWN SAND 3.4 BLUE CLAY 34.4 GREY LMSN 38.7
6708893	4 10	Jun-87	551854 4844378	428.9	79.2	Fr			12.8	41	60	20.7	3740 RC	WS DO	**MOE# 6708893** 0.0 BRWN FILL 0.9 BRWN CLAY 3.7 GREY CLAY STNS 50.3 GREY SAND 59.4 GREY CLAY STNS 61.3 BRWN SNDS SHLE 63.1 BRWN LMSN 79.2
6708933	4 12	Jan-87	551001 4845118	427.0	41.1	Fr			4.6	91	60	24.4	2336 RC	WS DO	**MOE# 6708933** 0.0 BRWN CLAY GRVL STNS 5.5 GREY CLAY 36.9 GREY ROCK 41.1
6709396	3 12	Jul-88	550350 4844608	431.9	56.1	Fr			5.2	45	180	29.0	1906 RC	WS DO	**MOE# 6709396** 0.0 BRWN CLAY STNS 36.0 BLUE ROCK 37.5 GREY ROCK 42.7 LMSN 56.4
6709484	4 10	Sep-88	551752 4844376	427.9	39.3	Fr			15.8	32	60	21.3	3740 RC	WS DO	**MOE# 6709484** 0.0 BLCK TPSL 0.3 BRWN SAND CLAY 3.7 BRWN CLAY STNS 10.4 GREY CLAY STNS 30.5 GREY LMSN 39.3

LABEL	CON LOT	DATE mmm-yr	EASTING NORTHING	ELEV masl	WTR mbgl	FND Qu	SCR TOP mbgl	LEN m	SWL mbgl	RATE L/min	TIME min	PL mbgl	DRILLER METHOD	TYPE STAT	WELL NAME DESCRIPTION OF MATERIALS
6710384	3 10	Jun-90	551840 4844204	431.0	50.6	Fr			12.2	68	60		2663 RA	WS DO	**MOE# 6710384** 0.0 TPSL 0.3 SAND 4.6 CLAY HPAN 24.4 BLDR GRVL 29.0 GREY LMSN 39.6 BRWN LMSN 50.6
6710576	3 12	Aug-90	549942 4844462	431.6	50.3	Fr			5.8	45	90	16.8	2332 RC	WS DO	MOE# 6710576 0.0 BLCK TPSL 0.6 BRWN CLAY STNS 14.6 GREY CLAY STNS 36.6 BRWN ROCK 59.4
6711080	2 11	Jun-92	550202 4843772	435.3	67.1 53.3	Fr Fr			6.4	45	90	22.9	3317 RC	WS DO	MOE# 6711080 0.0 BRWN CLAY STNS 7.6 GREY CLAY STKY 12.2 GREY CLAY STNS 18.3 GREY CLAY STKY 21.3 GREY CLAY STNS 35.1 GREY LMSN 38.1 BRWN LMSN 39.0 GREY LMSN 40.5 BRWN LMSN 74.7
6711152	4 11	Dec-93	551117 4844955	428.9	50.3 44.2 36.6 36.6	Fr Fr Fr Fr			23.8	41	60	27.4	2663 RA	WS DO	**MOE# 6711152** 0.0 TPSL 0.3 BRWN SAND CLAY 5.5 BRWN CLAY SAND HPAN 7.9 BRWN CLAY SAND GRVL 33.2 GREY LMSN 50.3
6711958	4 10	Sep-96	551722 4844385	427.9	65.5	Fr			12.5	91	60	15.2	6865 RC	WS DO	**MOE# 6711958** 0.0 TPSL 0.3 BRWN SAND 3.4 BRWN GRVL SAND 4.9 GREY CLAY STNS 25.3 GREY CLAY GRVL 35.7 GREY CLAY SILT STNS 51.2 GREY LMSN 70.1
6712452	2 12	Aug-97	550308 4843780	434.9	65.5	Fr			7.0	91	90	22.9	3317 RC	WS DO	**MOE# 6712452** 0.0 BRWN CLAY STNS 6.1 GREY CLAY STNS 32.0 GREY CLAY STNS BLDR 46.0 GREY LMSN 50.3 GREY LMSN 71.6
6712540	2 13	Jun-98	550241 4843906	431.3	57.9	Fr	64.9	-0.9	8.2	91	90		2576 RA	WS DO	**MOE# 6712540** 0.0 TPSL 0.3 BRWN CLAY GRVL 3.0 GREY CLAY GRVL 23.5 BRWN CLAY SLTY GRVL 57.9 GREY SAND GRVL WBRG 65.8
6712549	3 11	Jun-98	551171 4844480	430.1	86.0 79.2 44.2 44.2 44.2 44.2	Fr Fr Fr Fr Fr Fr			8.5	136	60	26.8	2663 RA	WS DO	**MOE# 6712549** 0.0 BRWN CLAY SAND GRVL 7.6 GREY CLAY SAND GRVL 29.0 GREY CLAY GRVL LMSN 32.0 BRWN LMSN LTCL 38.1 BRWN LMSN 47.2 BRWN LMSN LTCL 71.6 GREY LMSN LTCL 76.2 GREY LMSN 79.2 GREY LMSN LTCL 86.0
6712681	3 11	Sep-98	550577 4844018	430.1	54.9	Fr			9.1	136	60	16.8	2336 RA	WS DO	**MOE# 6712681** 0.0 BRWN CLAY STNS 3.0 GREY CLAY STNS 22.9 GREY CLAY SAND GRVL 24.4 GREY CLAY BLDR 31.4 GREY ROCK 44.2 BRWN ROCK 56.4
6713016	3 11	Jun-99	551566 4844182	430.1	94.5 91.4 79.2 79.2 79.2 79.2	Fr Fr Fr Fr Fr Fr			13.7	136	60	33.5	2663 RA	WS DO	**MOE# 6713016** 0.0 TPSL 0.3 BRWN CLAY SAND STNS 7.6 BRWN CLAY GRVL 27.4 GREY SAND GRVL 38.1 BRWN CLAY SAND 51.8 BRWN CLAY SAND GRVL 57.3 BRWN LMSN FCRD 58.5 BRWN LMSN 80.8 GREY LMSN 86.9 GREY LMSN 94.5
6714026	3 11	Mar-02	551213 4844316	430.1	74.7	Fr			9.4	68	60	36.3	2663 RA	WS DO	**MOE# 6714026** 0.0 BLCK TPSL 0.9 BRWN CLAY STNS 10.7 BRWN CLAY HPAN 25.9 BRWN CLAY GRVL 31.7 GREY LMSN FCRD 32.9 GREY LMSN 35.1 BLUE LMSN 74.7
7166124	4 11	NR	551624 4844811	432.5					NR				6475 -	- -	**MOE# 7166124 TAG#A103263** 0.0
7185591	4 9	Jul-12	551874 4844315	430.1	75.6	Fr			15.2	55	720	15.8	7154 RC	WS DO	**MOE# 7185591 TAG#A125533** 0.0 BRWN SAND 4.9 BRWN CLAY STNS 31.1 GREY CLAY 57.6 GREY CLAY STNS 74.7 GREY LMSN 75.6

LABEL	CON LOT	DATE mmm-yr	EASTING NORTHING	ELEV masl	WTR mbgl	FND Qu	SCR TOP mbgl	LEN m	SWL mbgl	RATE L/min	TIME min	PL mbgl	DRILLER METHOD	TYPE STAT	WELL NAME DESCRIPTION OF MATERIALS

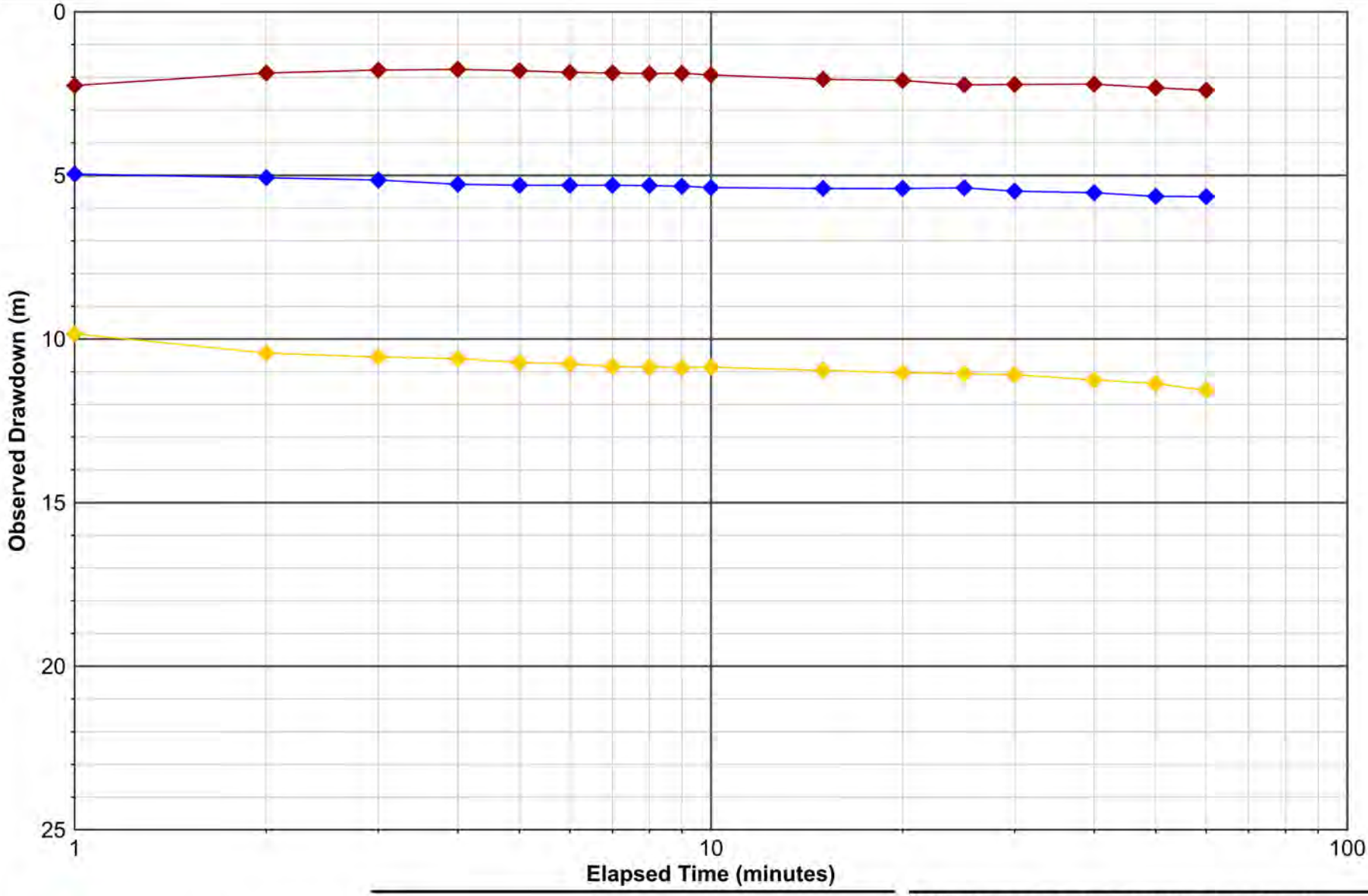
QUALITY:		TYPE:		USE:				METHOD :	
Fr	Fresh	WS	Water Supply	CO	Comercial	NU	Not Used	CT	Cable Tool
Mn	Mineral	AQ	Abandoned Quality	DO	Domestic	IR	Irrigation	JT	Jetting
Sa	Salty	AS	Abandoned Supply	MU	Municipal	AL	Alteration	RC	Rotary Conventional
Su	Sulphur	AB	Abandonment Record	PU	Public	MO	Monitoring	RA	Rotary Air
--	Unrecorded	TH	Test Hole or Observation	ST	Stock	-	Not Recorded	BR	Boring

Easting and Northings UTM NAD 83 Zone 17, Translated from Recorded UTM NAD, subject to Field Verified Location or Improved Location Accuracy.

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APPENDIX C

Stepped Rate Pumping Test Graphs



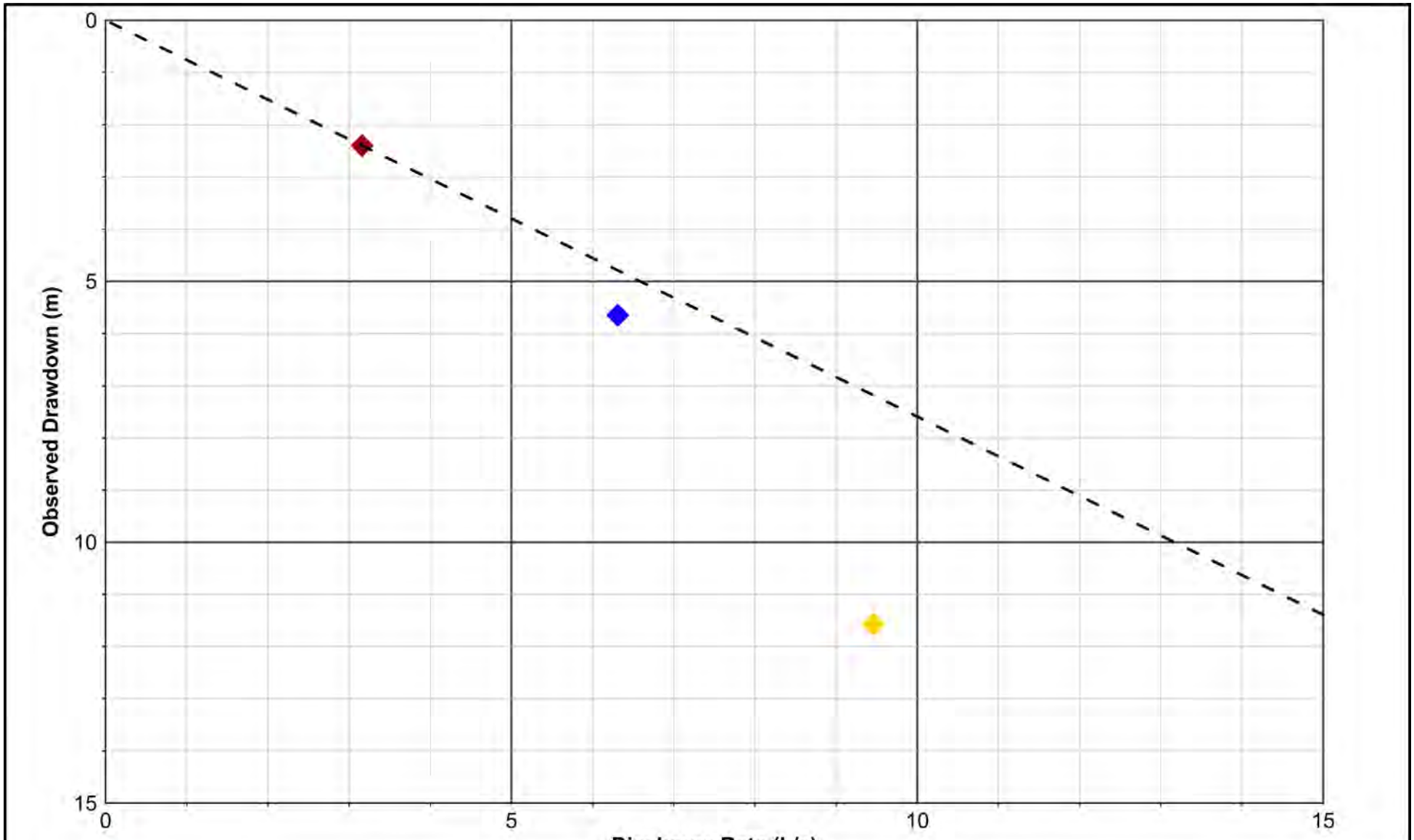
GOLDER

DATE	October 2021
DESIGN	VRP
REVIEW	GRP
APPROVED	GRP

PROJECT **WATER SUPPLY INVESTIGATION**
FERGUS GOLF CLUB

TITLE **STEP TEST**
DRAWDOWN VERSUS ELAPSED TIME

PROJECT NO.	REV	FIGURE
21456909	A	C1



GOLDER

DATE	October 2021
DESIGN	VRP
REVIEW	GRP
APPROVED	GRP

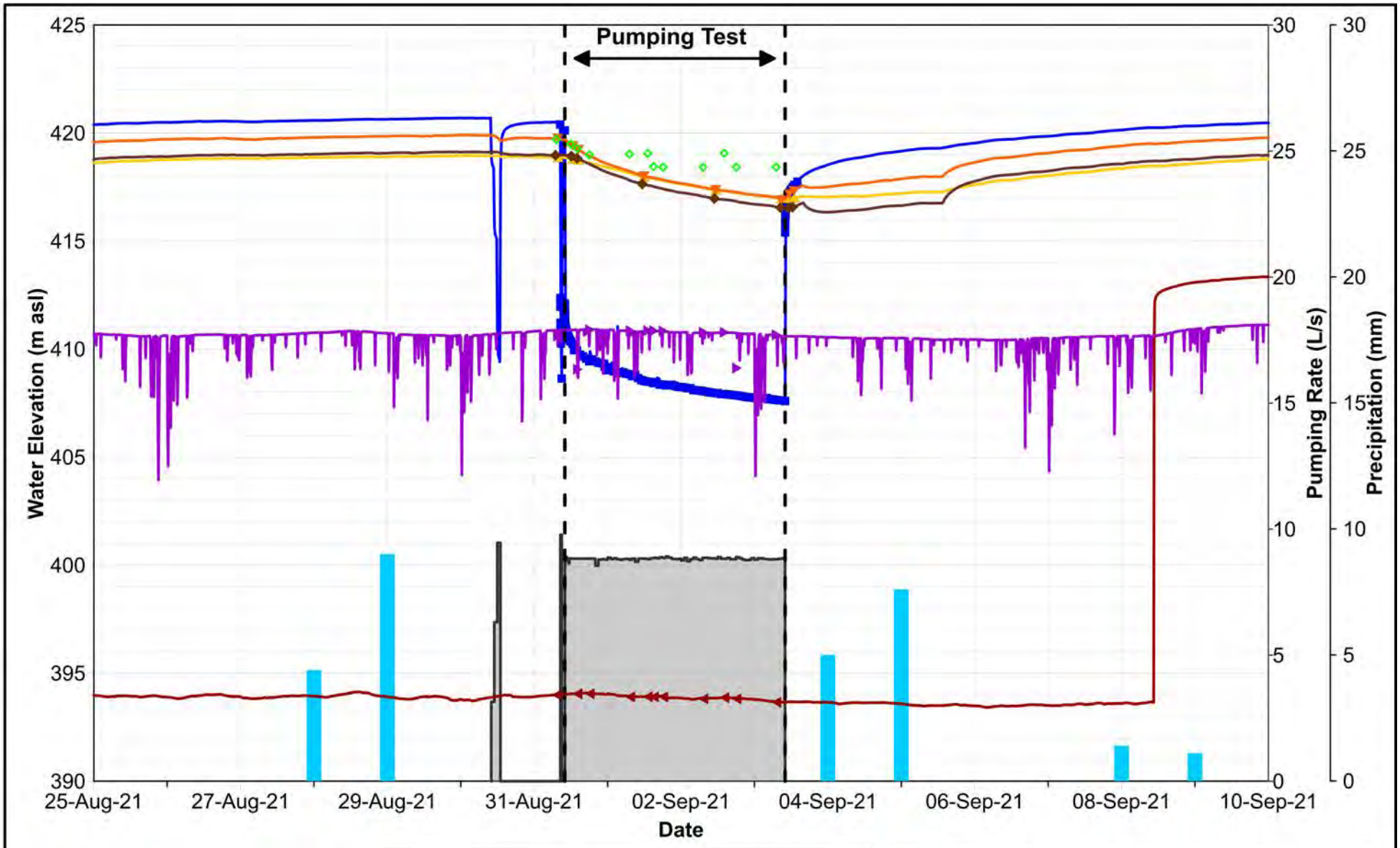
PROJECT **WATER SUPPLY INVESTIGATION**
FERGUS GOLF CLUB

TITLE **STEP TEST**
DRAWDOWN VERSUS DISCHARGE RATE

PROJECT NO.	REV	FIGURE
21456909	A	C2

APPENDIX D

Constant Rate Pumping Test Graphs



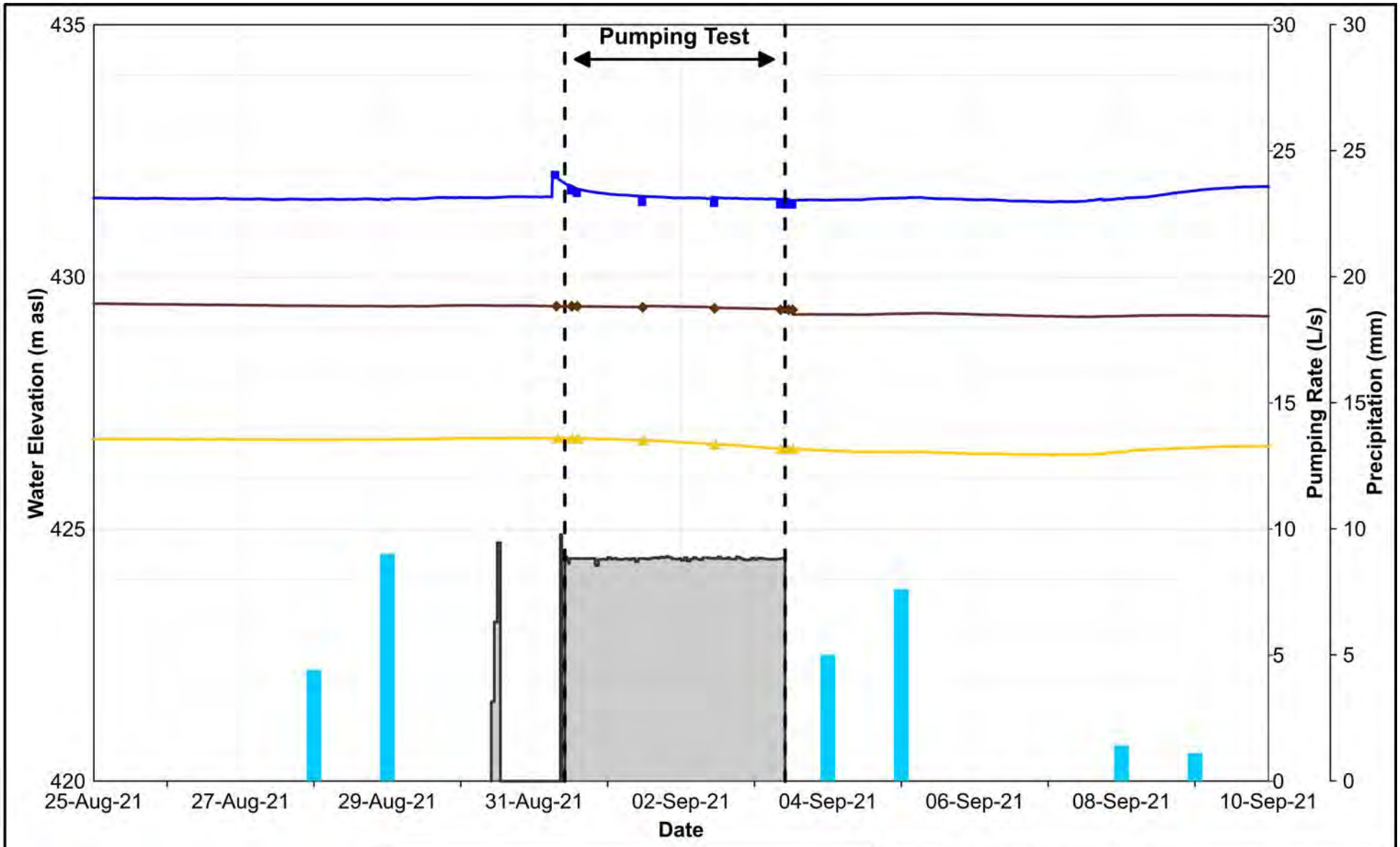
GOLDER

DATE	October 2021
DESIGN	VRP
REVIEW	GRP
APPROVED	GRP

PROJECT: **WATER SUPPLY INVESTIGATION**
FERGUS GOLF CLUB

TITLE: **GROUNDWATER ELEVATION MONITORING - BEDROCK WELLS**

PROJECT NO.	REV	FIGURE
21456909	A	D1



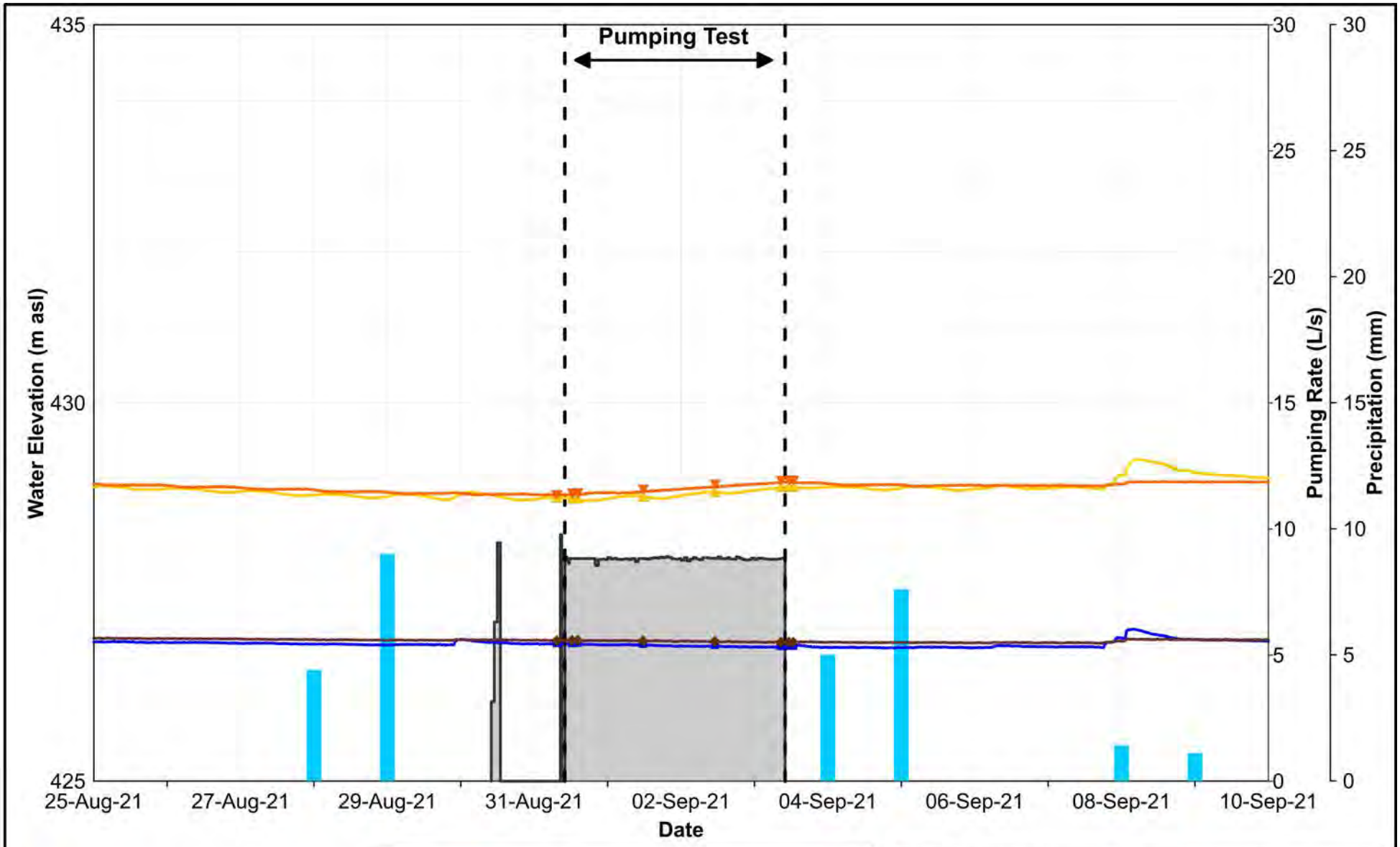
PROJECT: WATER SUPPLY INVESTIGATION
FERGUS GOLF CLUB

TITLE: GROUNDWATER ELEVATION
MONITORING - OVERBURDEN WELLS

GOLDER

DATE	October 2021
DESIGN	VRP
REVIEW	GRP
APPROVED	GRP

PROJECT NO.	REV	FIGURE
21456909	A	D2



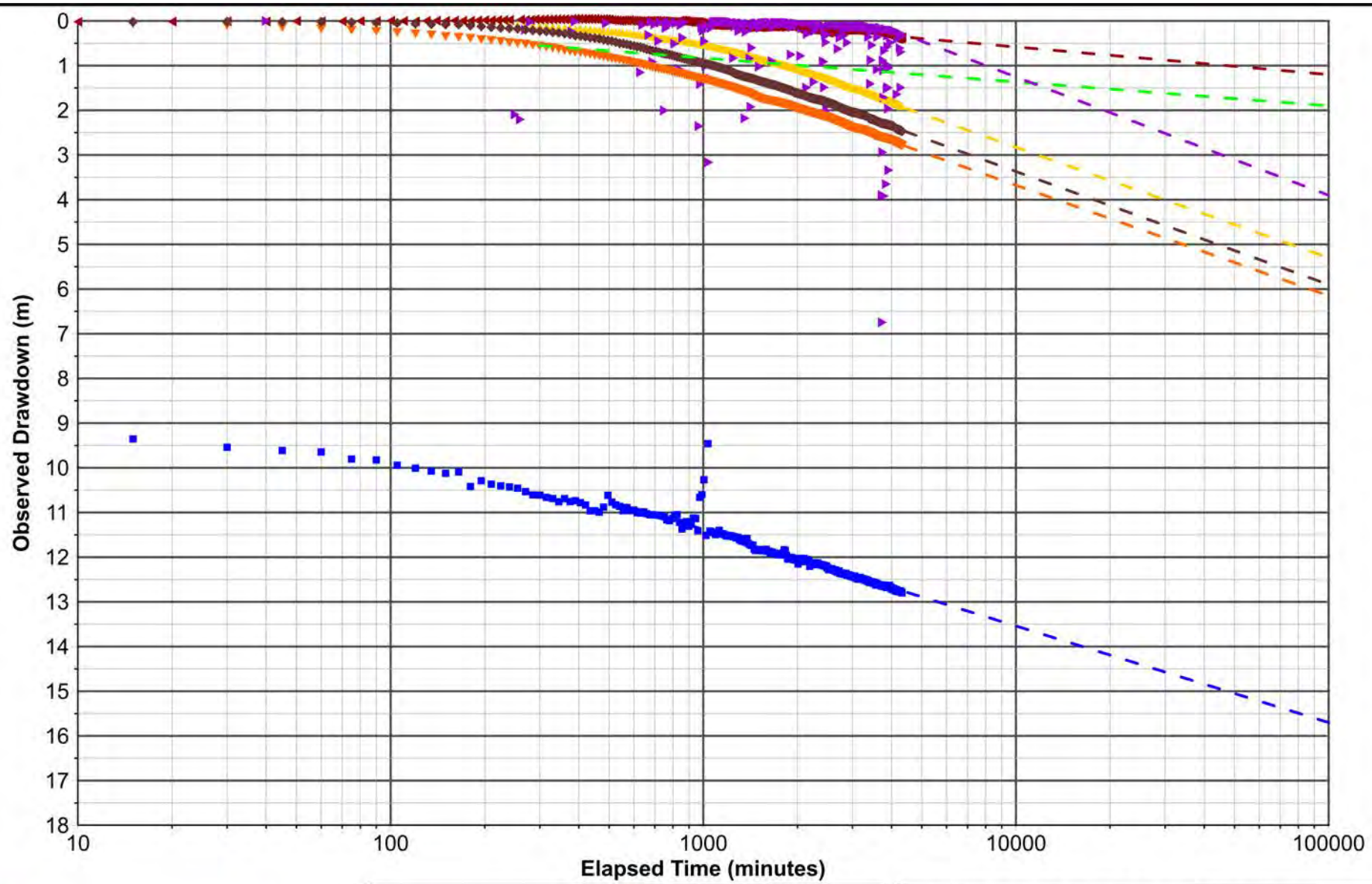
GOLDER

DATE	October 2021
DESIGN	VRP
REVIEW	GRP
APPROVED	GRP

PROJECT: WATER SUPPLY INVESTIGATION
FERGUS GOLF CLUB

TITLE: GROUNDWATER ELEVATION MONITORING - SURFACE WATER

PROJECT NO.	REV	FIGURE
21456909	A	D3



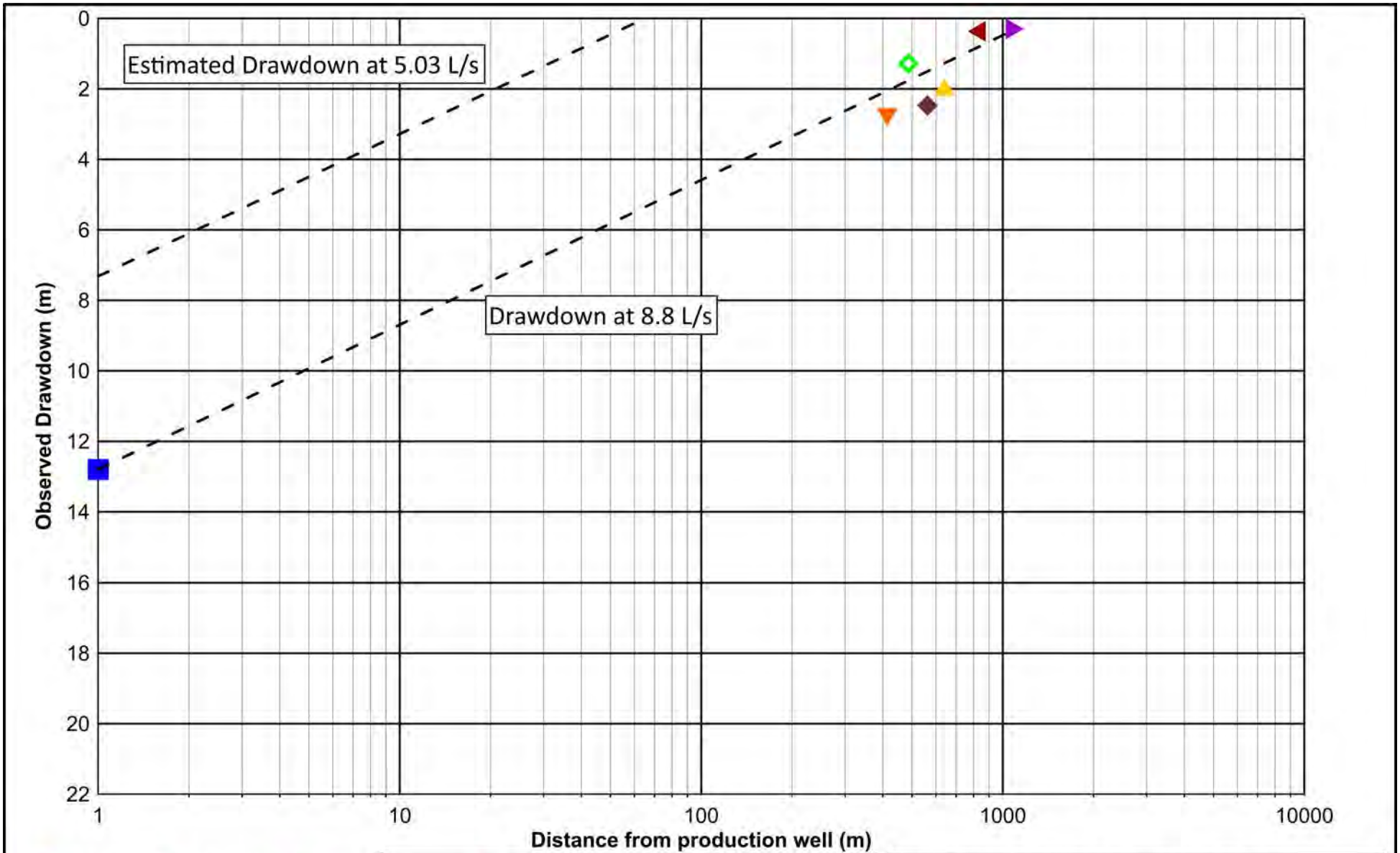
GOLDER

DATE	October 2021
DESIGN	VRP
REVIEW	GRP
APPROVED	GRP

PROJECT: **WATER SUPPLY INVESTIGATION**
FERGUS GOLF CLUB

TITLE: **CONSTANT RATE TEST**
DRAWDOWN VERSUS LOG TIME
BEDROCK WELLS

PROJECT NO.	REV	FIGURE
21456909	A	D4



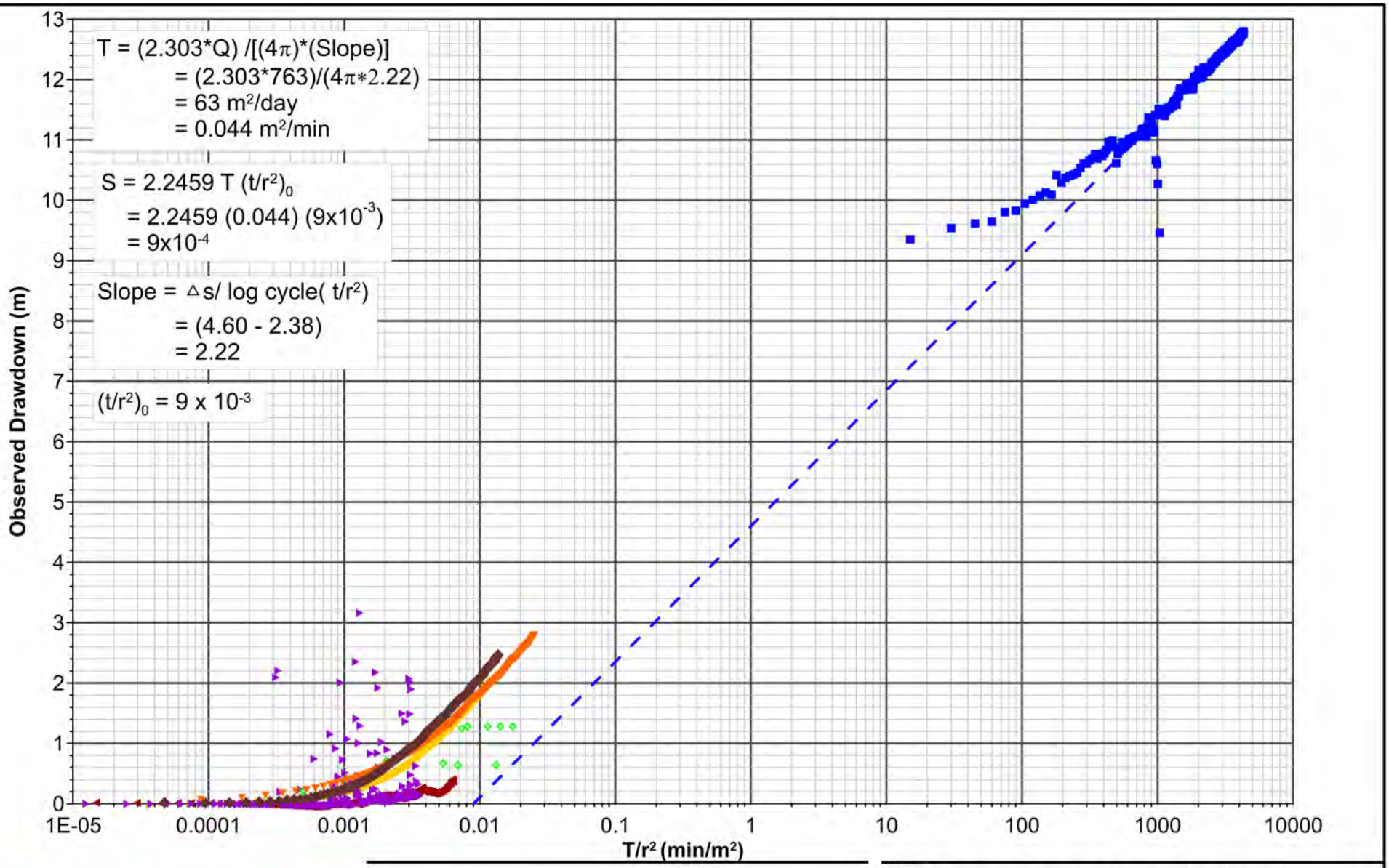
GOLDER

DATE	October 2021
DESIGN	VRP
REVIEW	GRP
APPROVED	GRP

PROJECT **WATER SUPPLY INVESTIGATION**
FERGUS GOLF CLUB

TITLE **CONSTANT RATE TEST**
DRAWDOWN VERSUS DISTANCE

PROJECT NO.	REV	FIGURE
21456909	A	D5



PROJECT: WATER SUPPLY INVESTIGATION
FERGUS GOLF CLUB

TITLE: CONSTANT RATE TEST
DRAWDOWN VERSUS T/R²

GOLDER

DATE	October 2021
DESIGN	VRP
REVIEW	GRP
APPROVED	GRP

PROJECT NO.	REV	FIGURE
21456909	A	D6

APPENDIX E

Water Quality Summary

Water Quality Results

		Ontario Drinking Water Standards, Objectives and Guidelines	PW21-1 at 1 hour pumping	PW21-1 at 24 hours pumping	PW21-1 at 72 hours pumping
			2021-08-31 11:00	2021-09-01 10:00	2021-09-03 10:15
Inorganics					
Total Ammonia-N	mg/L		0.18	0.19	0.21
Conductivity	umho/cm		720	770	790
Dissolved Organic Carbon	mg/L	5 (AO)	0.49	<0.40	0.49
Orthophosphate (P)	mg/L		<0.010	<0.010	<0.010
pH	pH units	6.5-8.5 (OG)	8.00	7.93	8.12
Dissolved Sulphate (SO_4)	mg/L	500 (AO)	190	220	250
Alkalinity (Total as $CaCO_3$)	mg/L	30-500 (OG)	180	180	180
Dissolved Chloride (Cl)	mg/L	250 (AO)	8.5	9.1	10
Nitrite (N)	mg/L	1 (STD)	<0.010	<0.010	<0.010
Nitrate (N)	mg/L	10 (STD)	<0.10	<0.10	<0.10
Metals					
Aluminum (Al)	ug/L	100 (OG)	350	77	<4.9
Antimony (Sb)	ug/L	6 (STD)	<0.50	<0.50	<0.50
Arsenic (As)	ug/L	10 (STD)	1.8	1.4	1.5
Barium (Ba)	ug/L	1000 (STD)	24	21	21
Beryllium (Be)	ug/L		<0.40	<0.40	<0.40
Boron (B)	ug/L	5000 (STD)	70	71	70
Cadmium (Cd)	ug/L	5 (STD)	<0.090	<0.090	<0.090
Calcium (Ca)	ug/L		89000	86000	96000
Chromium (Cr)	ug/L	50 (STD)	<5.0	<5.0	<5.0
Cobalt (Co)	ug/L		<0.50	<0.50	<0.50
Copper (Cu)	ug/L	1000 (AO)	6.0	0.92	<0.90
Iron (Fe)	ug/L	300 (AO)	610	240	120
Lead (Pb)	ug/L	10 (STD)	2.7	0.67	<0.50
Lithium (Li)	ug/L		5.8	5.8	5.6
Magnesium (Mg)	ug/L		33000	34000	34000
Manganese (Mn)	ug/L	50 (AO)	58	25	19
Molybdenum (Mo)	ug/L		2.7	3.1	3.2
Nickel (Ni)	ug/L		1.1	<1.0	<1.0
Phosphorus (P)	ug/L		<100	<100	<100
Potassium (K)	ug/L		1200	1100	1100
Selenium (Se)	ug/L	50 (STD)	<2.0	<2.0	<2.0
Silicon (Si)	ug/L		6400	5900	5800
Silver (Ag)	ug/L		<0.090	<0.090	<0.090
Sodium (Na)	ug/L	200000 (AO)	29000	28000	27000
Strontium (Sr)	ug/L		3500	3600	3800
Thallium (Tl)	ug/L		<0.050	<0.050	<0.050
Titanium (Ti)	ug/L		9.6	<5.0	<5.0
Uranium (U)	ug/L	20 (STD)	0.21	0.17	0.21
Vanadium (V)	ug/L		0.79	<0.50	<0.50
Zinc (Zn)	ug/L	5000 (AO)	8.0	<5.0	<5.0

Water Quality Results

		Ontario Drinking Water Standards, Objectives and Guidelines	**PW21-1 at 1 hour pumping**	**PW21-1 at 24 hours pumping**	**PW21-1 at 72 hours pumping**
			2021-08-31 11:00	2021-09-01 10:00	2021-09-03 10:15
Calculated Parameters	Units				
Anion Sum	me/L		7.86	8.58	9.13
Bicarb. Alkalinity (calc. as $CaCO_3$)	mg/L		180	180	180
Calculated TDS	mg/L	500 (AO)	480	510	540
Carb. Alkalinity (calc. as $CaCO_3$)	mg/L		1.7	1.4	2.2
Cation Sum	me/L		8.57	8.39	8.82
Hardness ($CaCO_3$)	mg/L	80-100 (OG)	360	360	380
Ion Balance (% Difference)	%		4.29	1.10	1.75
Langelier Index (@ 20C)	-		0.758	0.654	0.883
Langelier Index (@ 4C)	-		0.510	0.406	0.635
Saturation pH (@ 20C)	pH units		7.25	7.27	7.23
Saturation pH (@ 4C)	pH units		7.50	7.52	7.48
Microbiological					
Background	CFU/100 mL		0	0	0
Total Coliforms	CFU/100 mL	0 (STD)	0	0	0
Escherichia Coli	CFU/100 mL	0 (STD)	0	0	0

Notes

-	No units
ug/L	micrograms per litre
mg/L	milligrams per litre
me/L	milliequilvants per litre
umho/cm	micro mho per litre
NTU	Nephelometric turbidity units
STD	Chemical Standards
OG	Operational Guidelines
AO	Aesthetic Objectives
red highlight	Ontario Drinking Water Standard, Objective or Guideline Exceedance

Ontario Drinking Water Quality Standards Water Quality Results

	UNITS	Ontario Drinking Water Standard	Aesthetic Objective or Operational Guideline	PW21-1
				2021-09-03 10:00
Calculated Parameters				
Calculated TDS	mg/L	-	500	550
Hardness (CaCO3)	mg/L	-	80:100	380
Total Organic Nitrogen	mg/L	-	0.15	<0.10
Inorganics				
Total Ammonia-N	mg/L	-	-	0.21
Colour	TCU	-	5	<2
Fluoride (F-)	mg/L	**1.5**	-	0.62
Total Kjeldahl Nitrogen (TKN)	mg/L	-	-	0.23
Microcystin	ug/L	-	-	<0.10
Dissolved Organic Carbon	mg/L	-	5	0.48
pH	pH	-	6.5:8.5	8.02
Dissolved Sulphate (SO4)	mg/L	-	500	270
Sulphide	mg/L	-	0.05	<0.020
Turbidity	NTU	-	5	0.7
WAD Cyanide (Free)	mg/L	**0.2**	-	<0.0010
Alkalinity (Total as CaCO3)	mg/L	-	30:500	180
Dissolved Chloride (Cl-)	mg/L	-	250	9.6
Nitrite (N)	mg/L	**1**	-	<0.010
Nitrate (N)	mg/L	**10**	-	<0.10
Nitrate + Nitrite (N)	mg/L	**10**	-	<0.10
Metals				
Mercury (Hg)	mg/L	**0.001**	-	<0.00010
Aluminum (Al)	ug/L	-	100	<4.9
Antimony (Sb)	ug/L	**6**	-	<0.50
Arsenic (As)	ug/L	**10**	-	1.5
Barium (Ba)	ug/L	**1000**	-	21
Boron (B)	ug/L	**5000**	-	74
Cadmium (Cd)	ug/L	**5**	-	<0.090
Calcium (Ca)	ug/L	-	-	93000
Chromium (Cr)	ug/L	**50**	-	<5.0
Copper (Cu)	ug/L	-	1000	<0.90
Iron (Fe)	ug/L	-	300	130
Lead (Pb)	ug/L	**10**	-	<0.50
Magnesium (Mg)	ug/L	-	-	36000
Manganese (Mn)	ug/L	-	50	20
Potassium (K)	ug/L	-	-	1100
Selenium (Se)	ug/L	**50**	-	<2.0
Sodium (Na)	ug/L	-	200000	28000
Uranium (U)	ug/L	**20**	-	0.16
Zinc (Zn)	ug/L	-	5000	<5.0

Ontario Drinking Water Quality Standards Water Quality Results

	UNITS	Ontario Drinking Water Standard	Aesthetic Objective or Operational Guideline	PW21-1
				2021-09-03 10:00
Fixed Gases				
Methane	L/m3		3	0.019
Miscellaneous Parameters				
NTA	mg/L	**0.4**	-	<0.050
Bromate	mg/L	**0.01**	-	<0.005
Semivolatile Organics				
2,3,4,6-Tetrachlorophenol	ug/L	**100**	1	<0.50
2,4,5-T	ug/L	**280**	-	<1.0
2,4,6-Trichlorophenol	ug/L	**5**	2	<0.50
2,4-D	ug/L	**100**	-	<1.0
2,4-Dichlorophenol	ug/L	**900**	0.3	<0.25
Alachlor	ug/L	**5**	-	<0.50
Aldicarb	ug/L	**-**	-	<5.0
Atrazine	ug/L	**-**	-	<0.50
Des-ethyl atrazine	ug/L	**-**	-	<0.50
Atrazine + Desethyl-atrazine	ug/L	**5**	-	<1.0
Bendiocarb	ug/L	**-**	-	<2.0
Bromoxynil	ug/L	**5**	-	<0.50
Carbaryl	ug/L	**90**	-	<5.0
Carbofuran	ug/L	**90**	-	<5.0
Chlorpyrifos (Dursban)	ug/L	**90**	-	<1.0
Cyanazine (Bladex)	ug/L	**-**	-	<1.0
Diazinon	ug/L	**20**	-	<1.0
Dicamba	ug/L	**120**	-	<1.0
Diclofop-methyl	ug/L	**9**	-	<0.90
Dimethoate	ug/L	**20**	-	<2.5
Dinoseb	ug/L	**10**	-	<1.0
Malathion	ug/L	**190**	-	<5.0
Metolachlor	ug/L	**50**	-	<0.50
Metribuzin (Sencor)	ug/L	**80**	-	<5.0
Ethyl Parathion	ug/L	**50**	-	<1.0
Pentachlorophenol	ug/L	**60**	30	<0.50
Phorate	ug/L	**2**	-	<0.50
Picloram	ug/L	**190**	-	<5.0
Prometryne	ug/L	**1**	-	<0.25
Simazine	ug/L	**10**	-	<1.0
Terbufos	ug/L	**1**	-	<0.50
Triallate	ug/L	**230**	-	<1.0
Trifluralin	ug/L	**45**	-	<1.0
Benzo(a)pyrene	ug/L	**0.01**	-	<0.0050
Methyl parathion	ug/L	**-**	-	<1.0
N-Nitrosodimethylamine	ug/L	**0.009**	-	<0.0009

Ontario Drinking Water Quality Standards Water Quality Results

	UNITS	Ontario Drinking Water Standard	Aesthetic Objective or Operational Guideline	PW21-1
				2021-09-03 10:00
Volatile Organics				
1,1-Dichloroethylene	ug/L	**14**	-	<0.10
1,2-Dichlorobenzene	ug/L	**200**	3	<0.20
1,2-Dichloroethane	ug/L	**5**	-	<0.20
1,4-Dichlorobenzene	ug/L	**5**	1	<0.20
Benzene	ug/L	**1**	-	<0.10
Bromodichloromethane	ug/L	**-**	-	<0.10
Bromoform	ug/L	**-**	-	<0.20
Carbon Tetrachloride	ug/L	**2**	-	<0.10
Chlorobenzene	ug/L	**80**	30	<0.10
Chloroform	ug/L	**-**	-	<0.10
Dibromochloromethane	ug/L	**-**	-	<0.20
Methylene Chloride(Dichloromethane)	ug/L	**50**	-	<0.50
Ethylbenzene	ug/L	**140**	1.6	<0.10
Tetrachloroethylene	ug/L	**10**	-	<0.10
Toluene	ug/L	**60**	24	<0.20
Trichloroethylene	ug/L	**5**	-	<0.10
Vinyl Chloride	ug/L	**1**	-	<0.20
o-Xylene	ug/L	**-**	-	<0.10
p+m-Xylene	ug/L	**-**	-	<0.10
Total Xylenes	ug/L	**90**	20	<0.10
Total Trihalomethanes	ug/L	**-**	-	<0.20
Pesticides & Herbicides				
Glyphosate	ug/L	**280**	-	<10
Diquat	ug/L	**70**	-	<7.0
Diuron	ug/L	**150**	-	<10
Guthion (Azinphos-methyl)	ug/L	**20**	-	<2.0
Paraquat	ug/L	**10**	-	<1.0
Temephos	ug/L	**-**	-	<10
Lindane	ug/L	**4**	-	<0.0060
Heptachlor	ug/L	**-**	-	<0.0060
Aldrin	ug/L	**-**	-	<0.0060
Heptachlor epoxide	ug/L	**-**	-	<0.0060
Oxychlordane	ug/L	**-**	-	<0.0060
g-Chlordane	ug/L	**-**	-	<0.0060
a-Chlordane	ug/L	**-**	-	<0.0060
Dieldrin	ug/L	**-**	-	<0.0060
o,p-DDE	ug/L	**-**	-	<0.0060
p,p-DDE	ug/L	**-**	-	<0.0060
o,p-DDD	ug/L	**-**	-	<0.0060
p,p-DDD	ug/L	**-**	-	<0.0060
o,p-DDT	ug/L	**-**	-	<0.0060

Ontario Drinking Water Quality Standards Water Quality Results

	UNITS	Ontario Drinking Water Standard	Aesthetic Objective or Operational Guideline	PW21-1
				2021-09-03 10:00
p,p-DDT	ug/L	-	-	<0.0060
Methoxychlor	ug/L	**900**	-	<0.024
Aroclor 1016	ug/L	-	-	<0.050
Aroclor 1221	ug/L	-	-	<0.050
Aroclor 1232	ug/L	-	-	<0.050
Aroclor 1242	ug/L	-	-	<0.050
Aroclor 1248	ug/L	-	-	<0.050
Aroclor 1254	ug/L	-	-	<0.050
Aroclor 1260	ug/L	-	-	<0.050
Pesticide Calculated Parameters				
Aldrin + Dieldrin	ug/L	**0.7**	-	<0.006
Chlordane (Total)	ug/L	**7**	-	<0.006
DDT+ Metabolites	ug/L	**30**	-	<0.006
Heptachlor + Heptachlor epoxide	ug/L	**3**	-	<0.006
Total PCB	ug/L	**3**	-	<0.05
Dioxin and Furan				
2,3,7,8-Tetra CDD *	pg/L	**15**		<0.973
1,2,3,7,8-Penta CDD *	pg/L	**15**		<0.830
1,2,3,4,7,8-Hexa CDD *	pg/L	**15**		<0.875
1,2,3,6,7,8-Hexa CDD *	pg/L	**15**		<0.778
1,2,3,7,8,9-Hexa CDD *	pg/L	**15**		<0.798
1,2,3,4,6,7,8-Hepta CDD *	pg/L	**15**		<0.760
Octa CDD *	pg/L	**15**		<0.666
Total Tetra CDD *	pg/L	**15**		<0.973
Total Penta CDD *	pg/L	**15**		<0.830
Total Hexa CDD *	pg/L	**15**		<0.814
Total Hepta CDD *	pg/L	**15**		<0.760
2,3,7,8-Tetra CDF **	pg/L	**15**		<0.671
1,2,3,7,8-Penta CDF **	pg/L	**15**		<0.843
2,3,4,7,8-Penta CDF **	pg/L	**15**		<0.715
1,2,3,4,7,8-Hexa CDF **	pg/L	**15**		<0.384
1,2,3,6,7,8-Hexa CDF **	pg/L	**15**		<0.332
2,3,4,6,7,8-Hexa CDF **	pg/L	**15**		<0.349
1,2,3,7,8,9-Hexa CDF **	pg/L	**15**		<0.371
1,2,3,4,6,7,8-Hepta CDF **	pg/L	**15**		<0.313
1,2,3,4,7,8,9-Hepta CDF **	pg/L	**15**		<0.349
Octa CDF **	pg/L	**15**		<0.982
Total Tetra CDF **	pg/L	**15**		<0.671
Total Penta CDF **	pg/L	**15**		<0.775
Total Hexa CDF **	pg/L	**15**		<0.358
Total Hepta CDF **	pg/L	**15**		<0.330

Ontario Drinking Water Quality Standards Water Quality Results

	UNITS	Ontario Drinking Water Standard	Aesthetic Objective or Operational Guideline	PW21-1
				2021-09-03 10:00
Microbiological				
Heterotrophic plate count	CFU/mL	-	-	0
Background	CFU/100mL	-	-	0
Total Coliforms	CFU/100mL	**0**	-	0
Escherichia coli	CFU/100mL	**0**	-	0

Notes

-	No units
pg/L	picograms per litre
ug/L	micrograms per litre
mg/L	milligrams per litre
me/L	milliequilvants per litre
umho/cm	micro mho per litre
NTU	Nephelometric turbidity units
red highlight	Ontario Drinking Water Standard, Objective or Guideline Exceedance

Hyperion Research Ltd.

1008 Allowance Ave. SE, Medicine Hat, AB T1A 3G8
Telephone (888) 529-0847 Fax (403) 5290852 hyperion@telusplanet.net
www.hyperionlab.ca

CALA Testing Accreditation No. A3538

To: **Paul Menkveld**
Golder Associates
210 Sheldon Drive
Cambridge ON
N1T 1A8
519 620-8182
Paul_Menkveld@golder.com

Sample Date:	02-Sep-21
Sample Type:	Raw
LIMS:	
Volume Filtered (L):	389
Rec'd within 96h?:	yes
Temp on arrival <20 °C?:	yes
Conductivity (uS/cm):	779

Project #:	CX21479897
Upload to DB?:	
Field pH:	7.58
Field Temp °C:	9.7
Field Turb (NTU)	
Location:	PW21-1

The methodology used to produce this report conforms to USEPA Method 1623 and/or the USEPA Consensus Method for the Microscopic Particulate Analysis. Based on the validation data, the method is fit for its intended use Hyperion Research Ltd. is accredited for this analysis by CALA under the ISO/IEC 17025 standard.

Raw Data

Primary Particulates	Total Count	#/380L (100 US gal)	Relative Risk Factor
Diatoms	0	0.0	0
Other Algae	0	0.0	0
Insect/larvae	0	0.0	0
Rotifers	0	0.0	0
Plant Debris	0	0.0	0
Giardia/Crypto	0	0.0	0

Sum of Relative Risk Factors = **0**

From the EPA Consensus Method:
Risk of Surface Water Contamination based on sum of Relative Risk Factors

0 to 9	Low Risk
10 to 19	Moderate Risk
20+	High Risk

Secondary Particulates	Total Count	#/380L (100 US gal)	
Nematodes	0	0.0	These particulates are sometimes found in groundwater and are not considered to add risk
Pollen	0	0.0	
Crustacea	0	0.0	
Unknown	0	0.0	

Minerals Observed: silica, clay, iron, other carbonate minerals

Processing Data

Date/Time Rec'd:	03-Sep-21 12:22:00 PM
Sample Temp:	14
Lab ID:	61550
Filter Type	Filta-Max
Date/Time Conc:	03-Sep-21 1:30:00 PM
Eluted By	CW
IMS System	Dynabeads
IMS Lot No:	01039465
Pellet Vol (mL):	0.2
Resusp Vol (uL):	100.0
MAb Conjugate:	EasyStainCY3
MAb Lot No:	C104G203
Control G:	4
Control C:	4
Date/Time Stained:	07-Sep-21 11:30:00 AM
Stained By:	CW
Read By:	PW
Vol Used (uL):	100.0
Sample Equivalent Vol (L)	389

Recovery efficiencies for particles are known to be low by the Consensus method. Minimum recovery was measured to be 6.5 +/-1.2% for Giardia cysts, 0.5 +/-0.2% for Cryptosporidium oocysts and 4.2+/2.3% for Euglena (algae). The average recovery using the MPA-1623 Method is 69.0+/-6.9 for Giardia, 62.7+/-2.9 for Cryptosporidium and 23.1+/-6.5% for Diatoms.

***Giardia cysts/100L* 0** ***Cryptosporidium oocysts/100L* 0**

Spore Count Surface Water CFU/L: 2700
Spore Count Well Water CFU/L: 0

Comments:
Surface water contained a variety of diatoms, blue green algae and other photosynthetic pigment bearing organisms. Rotifers also observed.

Analyst:

Peter M. Wallis, Ph.D.

Conclusion: Based on this sample, the risk of surface water contamination is judged to be: **Low**

Your Project #: 21456909
Your C.O.C. #: 842982-01-01

Attention: Gregory Padusenko

Golder Associates Ltd
210 Sheldon Drive
Cambridge, ON
CANADA N1T 1A8

Report Date: 2021/09/07
Report #: R6799650
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1O9389
Received: 2021/08/31, 15:39

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	1	N/A	2021/09/02	CAM SOP-00448	SM 23 2320 B m
Carbonate, Bicarbonate and Hydroxide	1	N/A	2021/09/03	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	1	N/A	2021/09/01	CAM SOP-00463	SM 23 4500-Cl E m
Conductivity	1	N/A	2021/09/02	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	1	N/A	2021/09/02	CAM SOP-00446	SM 23 5310 B m
Hardness (calculated as CaCO3)	1	N/A	2021/09/03	CAM SOP 00102/00408/00447	SM 2340 B
Metals Analysis by ICPMS (as received) (2)	1	N/A	2021/09/02	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	1	N/A	2021/09/03		
Anion and Cation Sum	1	N/A	2021/09/03		
Total Coliforms/ E. coli, CFU/100mL	1	N/A	2021/08/31	CAM SOP-00551	MOE E3407
Total Ammonia-N	1	N/A	2021/09/03	CAM SOP-00441	USGS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (3)	1	N/A	2021/09/04	CAM SOP-00440	SM 23 4500-NO3I/NO2B
pH	1	2021/09/01	2021/09/02	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	1	N/A	2021/09/01	CAM SOP-00461	EPA 365.1 m
Sat. pH and Langelier Index (@ 20C)	1	N/A	2021/09/03		Auto Calc
Sat. pH and Langelier Index (@ 4C)	1	N/A	2021/09/03		Auto Calc
Sulphate by Automated Colourimetry	1	N/A	2021/09/01	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids (TDS calc)	1	N/A	2021/09/03		Auto Calc

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report.

Your Project #: 21456909
Your C.O.C. #: 842982-01-01

Attention: Gregory Padusenko

Golder Associates Ltd
210 Sheldon Drive
Cambridge, ON
CANADA N1T 1A8

Report Date: 2021/09/07
Report #: R6799650
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1O9389
Received: 2021/08/31, 15:39

Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Metals analysis was performed on the sample 'as received'.
(3) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: emese.gitej@bureauveritas.com
Phone# (905)817-5829
==========
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

BV Labs Job #: C1O9389
Report Date: 2021/09/07

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PGM

RCAP - COMPREHENSIVE (DRINKING WATER)

BV Labs ID		QNK225		
Sampling Date		2021/08/31 11:00		
COC Number		842982-01-01		
	UNITS	PW21-1-1H	RDL	QC Batch
Calculated Parameters				
Anion Sum	me/L	7.86	N/A	7551574
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	180	1.0	7551572
Calculated TDS	mg/L	480	1.0	7551581
Carb. Alkalinity (calc. as CaCO3)	mg/L	1.7	1.0	7551572
Cation Sum	me/L	8.57	N/A	7551574
Hardness (CaCO3)	mg/L	360	1.0	7551575
Ion Balance (% Difference)	%	4.29	N/A	7551573
Langelier Index (@ 20C)	N/A	0.758		7551576
Langelier Index (@ 4C)	N/A	0.510		7551577
Saturation pH (@ 20C)	N/A	7.25		7551576
Saturation pH (@ 4C)	N/A	7.50		7551577
Inorganics				
Total Ammonia-N	mg/L	0.18	0.050	7556775
Conductivity	umho/cm	720	1.0	7554995
Dissolved Organic Carbon	mg/L	0.49	0.40	7554317
Orthophosphate (P)	mg/L	<0.010	0.010	7553950
pH	pH	8.00		7554984
Dissolved Sulphate (SO4)	mg/L	190	1.0	7553936
Alkalinity (Total as CaCO3)	mg/L	180	1.0	7554993
Dissolved Chloride (Cl-)	mg/L	8.5	1.0	7553932
Nitrite (N)	mg/L	<0.010	0.010	7554359
Nitrate (N)	mg/L	<0.10	0.10	7554359
Metals				
Aluminum (Al)	ug/L	350	4.9	7554226
Antimony (Sb)	ug/L	<0.50	0.50	7554226
Arsenic (As)	ug/L	1.8	1.0	7554226
Barium (Ba)	ug/L	24	2.0	7554226
Beryllium (Be)	ug/L	<0.40	0.40	7554226
Boron (B)	ug/L	70	10	7554226
Cadmium (Cd)	ug/L	<0.090	0.090	7554226
Calcium (Ca)	ug/L	89000	200	7554226

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

RCAP - COMPREHENSIVE (DRINKING WATER)

BV Labs ID		QNK225		
Sampling Date		2021/08/31 11:00		
COC Number		842982-01-01		
	UNITS	PW21-1-1H	RDL	QC Batch
Chromium (Cr)	ug/L	<5.0	5.0	7554226
Cobalt (Co)	ug/L	<0.50	0.50	7554226
Copper (Cu)	ug/L	6.0	0.90	7554226
Iron (Fe)	ug/L	610	100	7554226
Lead (Pb)	ug/L	2.7	0.50	7554226
Lithium (Li)	ug/L	5.8	5.0	7554226
Magnesium (Mg)	ug/L	33000	50	7554226
Manganese (Mn)	ug/L	58	2.0	7554226
Molybdenum (Mo)	ug/L	2.7	0.50	7554226
Nickel (Ni)	ug/L	1.1	1.0	7554226
Phosphorus (P)	ug/L	<100	100	7554226
Potassium (K)	ug/L	1200	200	7554226
Selenium (Se)	ug/L	<2.0	2.0	7554226
Silicon (Si)	ug/L	6400	50	7554226
Silver (Ag)	ug/L	<0.090	0.090	7554226
Sodium (Na)	ug/L	29000	100	7554226
Strontium (Sr)	ug/L	3500	1.0	7554226
Thallium (Tl)	ug/L	<0.050	0.050	7554226
Titanium (Ti)	ug/L	9.6	5.0	7554226
Uranium (U)	ug/L	0.21	0.10	7554226
Vanadium (V)	ug/L	0.79	0.50	7554226
Zinc (Zn)	ug/L	8.0	5.0	7554226

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PGM

MICROBIOLOGY (WATER)

BV Labs ID		QNK225	
Sampling Date		2021/08/31 11:00	
COC Number		842982-01-01	
	UNITS	PW21-1-1H	QC Batch
Microbiological			
Background	CFU/100mL	0	7552730
Total Coliforms	CFU/100mL	0	7552730
Escherichia coli	CFU/100mL	0	7552730
QC Batch = Quality Control Batch			

BV Labs Job #: C1O9389
Report Date: 2021/09/07

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PGM

TEST SUMMARY

BV Labs ID: QNK225
Sample ID: PW21-1-1H
Matrix: Water

Collected: 2021/08/31
Shipped:
Received: 2021/08/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7554993	N/A	2021/09/02	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7551572	N/A	2021/09/03	Automated Statchk
Chloride by Automated Colourimetry	KONE	7553932	N/A	2021/09/01	Alina Dobreanu
Conductivity	AT	7554995	N/A	2021/09/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7554317	N/A	2021/09/02	Julianna Castiglione
Hardness (calculated as CaCO3)		7551575	N/A	2021/09/03	Automated Statchk
Metals Analysis by ICPMS (as received)	ICP/MS	7554226	N/A	2021/09/02	Arefa Dabhad
Ion Balance (% Difference)	CALC	7551573	N/A	2021/09/03	Automated Statchk
Anion and Cation Sum	CALC	7551574	N/A	2021/09/03	Automated Statchk
Total Coliforms/ E. coli, CFU/100mL	PL	7552730	N/A	2021/08/31	Soham Patel
Total Ammonia-N	LACH/NH4	7556775	N/A	2021/09/03	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7554359	N/A	2021/09/04	Nimarta Singh
pH	AT	7554984	2021/09/01	2021/09/02	Surinder Rai
Orthophosphate	KONE	7553950	N/A	2021/09/01	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7551576	N/A	2021/09/03	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7551577	N/A	2021/09/03	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7553936	N/A	2021/09/01	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7551581	N/A	2021/09/03	Automated Statchk

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	8.3°C

Results relate only to the items tested.

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

BV Labs Job #: C1O9389
Report Date: 2021/09/07

QUALITY ASSURANCE REPORT

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PGM

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7553932	Dissolved Chloride (Cl-)	2021/09/01	125 (1)	80 - 120	106	80 - 120	<1.0	mg/L	17	20
7553936	Dissolved Sulphate (SO4)	2021/09/01	103	75 - 125	107	80 - 120	<1.0	mg/L	NC	20
7553950	Orthophosphate (P)	2021/09/01	116	75 - 125	98	80 - 120	<0.010	mg/L	NC	25
7554226	Aluminum (Al)	2021/09/02	99	80 - 120	105	80 - 120	<4.9	ug/L	0.91	20
7554226	Antimony (Sb)	2021/09/02	100	80 - 120	101	80 - 120	<0.50	ug/L	NC	20
7554226	Arsenic (As)	2021/09/02	95	80 - 120	98	80 - 120	<1.0	ug/L	NC	20
7554226	Barium (Ba)	2021/09/02	98	80 - 120	98	80 - 120	<2.0	ug/L	0.63	20
7554226	Beryllium (Be)	2021/09/02	92	80 - 120	98	80 - 120	<0.40	ug/L	NC	20
7554226	Boron (B)	2021/09/02	92	80 - 120	93	80 - 120	<10	ug/L	1.4	20
7554226	Cadmium (Cd)	2021/09/02	100	80 - 120	101	80 - 120	<0.090	ug/L	NC	20
7554226	Calcium (Ca)	2021/09/02	NC	80 - 120	101	80 - 120	<200	ug/L	1.6	20
7554226	Chromium (Cr)	2021/09/02	91	80 - 120	96	80 - 120	<5.0	ug/L	NC	20
7554226	Cobalt (Co)	2021/09/02	96	80 - 120	96	80 - 120	<0.50	ug/L	NC	20
7554226	Copper (Cu)	2021/09/02	95	80 - 120	100	80 - 120	<0.90	ug/L	1.1	20
7554226	Iron (Fe)	2021/09/02	98	80 - 120	100	80 - 120	<100	ug/L	NC	20
7554226	Lead (Pb)	2021/09/02	93	80 - 120	99	80 - 120	<0.50	ug/L	NC	20
7554226	Lithium (Li)	2021/09/02	101	80 - 120	105	80 - 120	<5.0	ug/L	NC	20
7554226	Magnesium (Mg)	2021/09/02	93	80 - 120	101	80 - 120	<50	ug/L	1.3	20
7554226	Manganese (Mn)	2021/09/02	95	80 - 120	98	80 - 120	<2.0	ug/L	NC	20
7554226	Molybdenum (Mo)	2021/09/02	96	80 - 120	96	80 - 120	<0.50	ug/L	4.2	20
7554226	Nickel (Ni)	2021/09/02	91	80 - 120	96	80 - 120	<1.0	ug/L	NC	20
7554226	Phosphorus (P)	2021/09/02	NC	80 - 120	105	80 - 120	<100	ug/L	0.12	20
7554226	Potassium (K)	2021/09/02	98	80 - 120	102	80 - 120	<200	ug/L	0.59	20
7554226	Selenium (Se)	2021/09/02	99	80 - 120	101	80 - 120	<2.0	ug/L	NC	20
7554226	Silicon (Si)	2021/09/02	100	80 - 120	104	80 - 120	<50	ug/L	0.68	20
7554226	Silver (Ag)	2021/09/02	97	80 - 120	97	80 - 120	<0.090	ug/L	NC	20
7554226	Sodium (Na)	2021/09/02	96	80 - 120	104	80 - 120	<100	ug/L	2.5	20
7554226	Strontium (Sr)	2021/09/02	92	80 - 120	98	80 - 120	<1.0	ug/L	0.56	20
7554226	Thallium (Tl)	2021/09/02	97	80 - 120	99	80 - 120	<0.050	ug/L	NC	20
7554226	Titanium (Ti)	2021/09/02	96	80 - 120	99	80 - 120	<5.0	ug/L	NC	20
7554226	Uranium (U)	2021/09/02	99	80 - 120	101	80 - 120	<0.10	ug/L	8.9	20

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7554226	Vanadium (V)	2021/09/02	91	80 - 120	93	80 - 120	<0.50	ug/L	NC	20
7554226	Zinc (Zn)	2021/09/02	93	80 - 120	98	80 - 120	<5.0	ug/L	0.33	20
7554317	Dissolved Organic Carbon	2021/09/01	96	80 - 120	97	80 - 120	<0.40	mg/L	3.2	20
7554359	Nitrate (N)	2021/09/04	103	80 - 120	99	80 - 120	<0.10	mg/L	NC	20
7554359	Nitrite (N)	2021/09/04	108	80 - 120	101	80 - 120	<0.010	mg/L	0	20
7554984	pH	2021/09/02			102	98 - 103			0.71	N/A
7554993	Alkalinity (Total as CaCO3)	2021/09/02			95	85 - 115	<1.0	mg/L	2.2	20
7554995	Conductivity	2021/09/02			99	85 - 115	<1.0	umho/cm	0.99	25
7556775	Total Ammonia-N	2021/09/03	98	75 - 125	100	80 - 120	<0.050	mg/L	NC	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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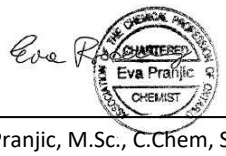
Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

BV Labs Job #: C1O9389
Report Date: 2021/09/07

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PGM

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Soham N Patel

Soham Patel, Analyst 2

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.

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CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#21375 Golder Associates Ltd	Company Name:		Quotation #:	B80683	BV Labs Job #:	Bottle Order #: 842982
Attention:	Accounts Payable	Attention:	Gregory Padusenko	P.O. #:			
Address:	210 Sheldon Drive Cambridge ON N1T 1A8	Address:		Project:	21456909	COC #: C#842982-01-01	Project Manager: Ema Gitej
Tel:	(519) 620-8182 Fax:	Tel:	(519) 620-8182 Ext: 6509 Fax: (519) 620-9878	Project Name:			
Email:	CanadaAccountsPayableInvoices@golder.com	Email:	Gregory_Padusenko@golder.com	Site #:			
				Sampled By:	PGM		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine; ☐ Table 2 ☐ Ind/Comm ☐ Coarse; ☐ Table 3 ☐ Agri/Other ☐ For RSC; ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw; ☐ Reg 558 ☐ Storm Sewer Bylaw; ☐ MISA Municipality ___; ☐ PWQO ☐ Reg 406 Table ___; ☐ Other ___

Special instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	RCAp - Comprehensive	Total Coliforms/ E. coli, CFU/100mL	# of Bottles	Comments
1		PW21-1-1h	21/08/31	11:00	GW		X	X	5	metals "as received"
2										
3										
4										
5										
6										
7										
8										
9										
10										

31-Aug-21 15:39
Ema Gitej
C109389
DSG ENV 028

MICRO

REC'D IN WATERLOO

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Paul McKerrell / Paul McKerrell	21/08/31	15:38	Jasprit Kaur / Jasprit Kaur	2021/08/31	15:39	
			Jasprit Kaur / Jasprit Kaur	2021/08/31	17:32	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal Present	Yes	No
	12 | 8 | 5	Intact		

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

White: BV Labs Yellow: Client

5 5 5

Bureau Veritas Canada (2019) Inc.

BV# 421153

Your Project #: 21456909
Your C.O.C. #: 842982-02-01

Attention: Gregory Padusenko

Golder Associates Ltd
210 Sheldon Drive
Cambridge, ON
CANADA N1T 1A8

Report Date: 2021/09/08
Report #: R6801679
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1P0721
Received: 2021/09/01, 12:47

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	1	N/A	2021/09/02	CAM SOP-00448	SM 23 2320 B m
Carbonate, Bicarbonate and Hydroxide	1	N/A	2021/09/03	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	1	N/A	2021/09/03	CAM SOP-00463	SM 23 4500-Cl E m
Conductivity	1	N/A	2021/09/02	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	1	N/A	2021/09/04	CAM SOP-00446	SM 23 5310 B m
Hardness (calculated as CaCO3)	1	N/A	2021/09/08	CAM SOP 00102/00408/00447	SM 2340 B
Metals Analysis by ICPMS (as received) (2)	1	N/A	2021/09/07	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	1	N/A	2021/09/08		
Anion and Cation Sum	1	N/A	2021/09/08		
Total Coliforms/ E. coli, CFU/100mL	1	N/A	2021/09/01	CAM SOP-00551	MOE E3407
Total Ammonia-N	1	N/A	2021/09/07	CAM SOP-00441	USGS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (3)	1	N/A	2021/09/07	CAM SOP-00440	SM 23 4500-NO3I/NO2B
pH	1	2021/09/02	2021/09/02	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	1	N/A	2021/09/07	CAM SOP-00461	EPA 365.1 m
Sat. pH and Langelier Index (@ 20C)	1	N/A	2021/09/08		Auto Calc
Sat. pH and Langelier Index (@ 4C)	1	N/A	2021/09/08		Auto Calc
Sulphate by Automated Colourimetry	1	N/A	2021/09/03	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids (TDS calc)	1	N/A	2021/09/08		Auto Calc

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report.

Your Project #: 21456909
Your C.O.C. #: 842982-02-01

Attention: Gregory Padusenko

Golder Associates Ltd
210 Sheldon Drive
Cambridge, ON
CANADA N1T 1A8

Report Date: 2021/09/08
Report #: R6801679
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1P0721
Received: 2021/09/01, 12:47

Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Metals analysis was performed on the sample 'as received'.
(3) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: emese.gitej@bureauveritas.com
Phone# (905)817-5829
==========
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

RCAP - COMPREHENSIVE (DRINKING WATER)

BV Labs ID		QNR201		
Sampling Date		2021/09/01 10:00		
COC Number		842982-02-01		
	UNITS	PW21-1-24H	RDL	QC Batch
Calculated Parameters				
Anion Sum	me/L	8.58	N/A	7554531
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	180	1.0	7554527
Calculated TDS	mg/L	510	1.0	7554151
Carb. Alkalinity (calc. as CaCO3)	mg/L	1.4	1.0	7554527
Cation Sum	me/L	8.39	N/A	7554531
Hardness (CaCO3)	mg/L	360	1.0	7553628
Ion Balance (% Difference)	%	1.10	N/A	7554530
Langelier Index (@ 20C)	N/A	0.654		7554532
Langelier Index (@ 4C)	N/A	0.406		7554533
Saturation pH (@ 20C)	N/A	7.27		7554532
Saturation pH (@ 4C)	N/A	7.52		7554533
Inorganics				
Total Ammonia-N	mg/L	0.19	0.050	7559941
Conductivity	umho/cm	770	1.0	7556506
Dissolved Organic Carbon	mg/L	<0.40	0.40	7557669
Orthophosphate (P)	mg/L	<0.010	0.010	7557512
pH	pH	7.93		7556498
Dissolved Sulphate (SO4)	mg/L	220	1.0	7557509
Alkalinity (Total as CaCO3)	mg/L	180	1.0	7556503
Dissolved Chloride (Cl-)	mg/L	9.1	1.0	7557483
Nitrite (N)	mg/L	<0.010	0.010	7556524
Nitrate (N)	mg/L	<0.10	0.10	7556524
Metals				
Aluminum (Al)	ug/L	77	4.9	7556622
Antimony (Sb)	ug/L	<0.50	0.50	7556622
Arsenic (As)	ug/L	1.4	1.0	7556622
Barium (Ba)	ug/L	21	2.0	7556622
Beryllium (Be)	ug/L	<0.40	0.40	7556622
Boron (B)	ug/L	71	10	7556622
Cadmium (Cd)	ug/L	<0.090	0.090	7556622
Calcium (Ca)	ug/L	86000	200	7556622

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

RCAP - COMPREHENSIVE (DRINKING WATER)

BV Labs ID		QNR201		
Sampling Date		2021/09/01 10:00		
COC Number		842982-02-01		
	UNITS	PW21-1-24H	RDL	QC Batch
Chromium (Cr)	ug/L	<5.0	5.0	7556622
Cobalt (Co)	ug/L	<0.50	0.50	7556622
Copper (Cu)	ug/L	0.92	0.90	7556622
Iron (Fe)	ug/L	240	100	7556622
Lead (Pb)	ug/L	0.67	0.50	7556622
Lithium (Li)	ug/L	5.8	5.0	7556622
Magnesium (Mg)	ug/L	34000	50	7556622
Manganese (Mn)	ug/L	25	2.0	7556622
Molybdenum (Mo)	ug/L	3.1	0.50	7556622
Nickel (Ni)	ug/L	<1.0	1.0	7556622
Phosphorus (P)	ug/L	<100	100	7556622
Potassium (K)	ug/L	1100	200	7556622
Selenium (Se)	ug/L	<2.0	2.0	7556622
Silicon (Si)	ug/L	5900	50	7556622
Silver (Ag)	ug/L	<0.090	0.090	7556622
Sodium (Na)	ug/L	28000	100	7556622
Strontium (Sr)	ug/L	3600	1.0	7556622
Thallium (Tl)	ug/L	<0.050	0.050	7556622
Titanium (Ti)	ug/L	<5.0	5.0	7556622
Uranium (U)	ug/L	0.17	0.10	7556622
Vanadium (V)	ug/L	<0.50	0.50	7556622
Zinc (Zn)	ug/L	<5.0	5.0	7556622

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

BV Labs Job #: C1P0721
Report Date: 2021/09/08

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PGM

MICROBIOLOGY (WATER)

BV Labs ID		QNR201	
Sampling Date		2021/09/01 10:00	
COC Number		842982-02-01	
	UNITS	PW21-1-24H	QC Batch
Microbiological			
Background	CFU/100mL	0	7555081
Total Coliforms	CFU/100mL	0	7555081
Escherichia coli	CFU/100mL	0	7555081
QC Batch = Quality Control Batch			

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BV Labs Job #: C1P0721
Report Date: 2021/09/08

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PGM

TEST SUMMARY

BV Labs ID: QNR201
Sample ID: PW21-1-24H
Matrix: Water

Collected: 2021/09/01
Shipped:
Received: 2021/09/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7556503	N/A	2021/09/02	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7554527	N/A	2021/09/03	Automated Statchk
Chloride by Automated Colourimetry	KONE	7557483	N/A	2021/09/03	Alina Dobreanu
Conductivity	AT	7556506	N/A	2021/09/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7557669	N/A	2021/09/04	Nimarta Singh
Hardness (calculated as CaCO3)		7553628	N/A	2021/09/08	Automated Statchk
Metals Analysis by ICPMS (as received)	ICP/MS	7556622	N/A	2021/09/07	Nan Raykha
Ion Balance (% Difference)	CALC	7554530	N/A	2021/09/08	Automated Statchk
Anion and Cation Sum	CALC	7554531	N/A	2021/09/08	Automated Statchk
Total Coliforms/ E. coli, CFU/100mL	PL	7555081	N/A	2021/09/01	Soham Patel
Total Ammonia-N	LACH/NH4	7559941	N/A	2021/09/07	Viorica Rotaru
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7556524	N/A	2021/09/07	Chandra Nandlal
pH	AT	7556498	2021/09/02	2021/09/02	Surinder Rai
Orthophosphate	KONE	7557512	N/A	2021/09/07	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7554532	N/A	2021/09/08	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7554533	N/A	2021/09/08	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7557509	N/A	2021/09/03	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7554151	N/A	2021/09/08	Automated Statchk

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	15.0°C

Results relate only to the items tested.

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

BV Labs Job #: C1P0721
Report Date: 2021/09/08

QUALITY ASSURANCE REPORT

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PGM

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7556498	pH	2021/09/02			102	98 - 103			0.16	N/A
7556503	Alkalinity (Total as CaCO3)	2021/09/02			97	85 - 115	<1.0	mg/L	1.3	20
7556506	Conductivity	2021/09/02			99	85 - 115	<1.0	umho/cm	0.27	25
7556524	Nitrate (N)	2021/09/07	97	80 - 120	100	80 - 120	<0.10	mg/L	NC	20
7556524	Nitrite (N)	2021/09/07	102	80 - 120	102	80 - 120	<0.010	mg/L	NC	20
7556622	Aluminum (Al)	2021/09/07	105	80 - 120	104	80 - 120	<4.9	ug/L	1.9	20
7556622	Antimony (Sb)	2021/09/07	103	80 - 120	103	80 - 120	<0.50	ug/L	NC	20
7556622	Arsenic (As)	2021/09/07	100	80 - 120	99	80 - 120	<1.0	ug/L	NC	20
7556622	Barium (Ba)	2021/09/07	102	80 - 120	100	80 - 120	<2.0	ug/L	1.7	20
7556622	Beryllium (Be)	2021/09/07	101	80 - 120	99	80 - 120	<0.40	ug/L	NC	20
7556622	Boron (B)	2021/09/07	NC	80 - 120	99	80 - 120	<10	ug/L	5.5	20
7556622	Cadmium (Cd)	2021/09/07	99	80 - 120	99	80 - 120	<0.090	ug/L	NC	20
7556622	Calcium (Ca)	2021/09/07	100	80 - 120	98	80 - 120	<200	ug/L	0.79	20
7556622	Chromium (Cr)	2021/09/07	99	80 - 120	101	80 - 120	<5.0	ug/L	NC	20
7556622	Cobalt (Co)	2021/09/07	99	80 - 120	99	80 - 120	<0.50	ug/L	NC	20
7556622	Copper (Cu)	2021/09/07	100	80 - 120	100	80 - 120	<0.90	ug/L	1.4	20
7556622	Iron (Fe)	2021/09/07	99	80 - 120	100	80 - 120	<100	ug/L	NC	20
7556622	Lead (Pb)	2021/09/07	99	80 - 120	98	80 - 120	<0.50	ug/L	1.6	20
7556622	Lithium (Li)	2021/09/07	102	80 - 120	102	80 - 120	<5.0	ug/L	1.2	20
7556622	Magnesium (Mg)	2021/09/07	96	80 - 120	102	80 - 120	<50	ug/L	0.17	20
7556622	Manganese (Mn)	2021/09/07	97	80 - 120	98	80 - 120	<2.0	ug/L	NC	20
7556622	Molybdenum (Mo)	2021/09/07	101	80 - 120	102	80 - 120	<0.50	ug/L	5.2	20
7556622	Nickel (Ni)	2021/09/07	97	80 - 120	97	80 - 120	<1.0	ug/L	2.3	20
7556622	Phosphorus (P)	2021/09/07	110	80 - 120	113	80 - 120	<100	ug/L	1.3	20
7556622	Potassium (K)	2021/09/07	100	80 - 120	101	80 - 120	<200	ug/L	0.42	20
7556622	Selenium (Se)	2021/09/07	99	80 - 120	99	80 - 120	<2.0	ug/L	NC	20
7556622	Silicon (Si)	2021/09/07	107	80 - 120	104	80 - 120	<50	ug/L	1.7	20
7556622	Silver (Ag)	2021/09/07	97	80 - 120	98	80 - 120	<0.090	ug/L	NC	20
7556622	Sodium (Na)	2021/09/07	98	80 - 120	100	80 - 120	<100	ug/L	0.71	20
7556622	Strontium (Sr)	2021/09/07	100	80 - 120	99	80 - 120	<1.0	ug/L	0.80	20
7556622	Thallium (Tl)	2021/09/07	98	80 - 120	97	80 - 120	<0.050	ug/L	NC	20

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7556622	Titanium (Ti)	2021/09/07	103	80 - 120	100	80 - 120	<5.0	ug/L	NC	20
7556622	Uranium (U)	2021/09/07	100	80 - 120	100	80 - 120	<0.10	ug/L	5.8	20
7556622	Vanadium (V)	2021/09/07	97	80 - 120	97	80 - 120	<0.50	ug/L	NC	20
7556622	Zinc (Zn)	2021/09/07	98	80 - 120	97	80 - 120	<5.0	ug/L	4.6	20
7557483	Dissolved Chloride (Cl-)	2021/09/03	123 (1)	80 - 120	107	80 - 120	<1.0	mg/L	9.2	20
7557509	Dissolved Sulphate (SO4)	2021/09/03	128 (1)	75 - 125	99	80 - 120	<1.0	mg/L	NC	20
7557512	Orthophosphate (P)	2021/09/07	126 (1)	75 - 125	100	80 - 120	<0.010	mg/L	NC	25
7557669	Dissolved Organic Carbon	2021/09/04	92	80 - 120	96	80 - 120	<0.40	mg/L	0.35	20
7559941	Total Ammonia-N	2021/09/07	99	75 - 125	100	80 - 120	<0.050	mg/L	NC	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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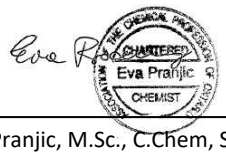
Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

BV Labs Job #: C1P0721
Report Date: 2021/09/08

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PGM

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Soham N Patel

Soham Patel, Analyst 2

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

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CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#21375 Golder Associates Ltd	Company Name:		Quotation #:	B80683	BV Labs Job #:	Bottle Order #: 842982
Attention:	Accounts Payable	Attention:	Gregory Padusenko	P.O. #:			
Address:	210 Sheldon Drive Cambridge ON N1T 1A8	Address:		Project:	21456909	COC #: C#842982-02-01	Project Manager: Ema Gitej
Tel:	(519) 620-8182 Fax:	Tel:	(519) 620-8182 Ext: 6509 Fax: (519) 620-9878	Project Name:			
Email:	CanadaAccountsPayableInvoices@golder.com	Email:	Gregory_Padusenko@golder.com	Site #:			
				Sampled By:	PGM		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___	☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ___ ☐ PWQO ☐ Reg 406 Table ___ ☐ Other ___	

Include Criteria on Certificate of Analysis (Y/N)? ___

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle) Metals / Hg / Cr VI	ANALYSIS REQUESTED (PLEASE BE SPECIFIC): RCAp - Comprehensive	Total Coliforms/ E. coli, CFU/100mL	# of Bottles	Comments
1		PW21-1-24h	21/09/01	10:00	GW		X	X	5	metals as received
2										
3										
4										
5										
6										
7										
8										
9										
10										

REC'D IN WATERLOO

01-Sep-21 12:47
Ema Gitej
C1P0721

on Ice packs

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Paul Mackenzie	21/09/01	12:45	Jaspreet Saini / DIPIKA SINGH	21/09/01 21/09/01	12:47 15:58	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal Present	Yes	No
	4 | 5 | 6	Intact		

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

White: BV Labs Yellow: Client

Bureau Veritas Canada (2019) Inc.

LR# 420404 1/1 2

Your Project #: 21456909
Your C.O.C. #: 842982-03-01

Attention: Gregory Padusenko

Golder Associates Ltd
210 Sheldon Drive
Cambridge, ON
CANADA N1T 1A8

Report Date: 2021/09/09
Report #: R6803629
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1P4142
Received: 2021/09/03, 13:54

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	1	N/A	2021/09/07	CAM SOP-00448	SM 23 2320 B m
Carbonate, Bicarbonate and Hydroxide	1	N/A	2021/09/08	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	1	N/A	2021/09/07	CAM SOP-00463	SM 23 4500-Cl E m
Conductivity	1	N/A	2021/09/07	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	1	N/A	2021/09/08	CAM SOP-00446	SM 23 5310 B m
Hardness (calculated as CaCO3)	1	N/A	2021/09/08	CAM SOP 00102/00408/00447	SM 2340 B
Metals Analysis by ICPMS (as received) (2)	1	N/A	2021/09/08	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	1	N/A	2021/09/08		
Anion and Cation Sum	1	N/A	2021/09/08		
Total Coliforms/ E. coli, CFU/100mL	1	N/A	2021/09/03	CAM SOP-00551	MOE E3407
Total Ammonia-N	1	N/A	2021/09/09	CAM SOP-00441	USGS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (3)	1	N/A	2021/09/07	CAM SOP-00440	SM 23 4500-NO3I/NO2B
pH	1	2021/09/04	2021/09/07	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	1	N/A	2021/09/07	CAM SOP-00461	EPA 365.1 m
Sat. pH and Langelier Index (@ 20C)	1	N/A	2021/09/08		Auto Calc
Sat. pH and Langelier Index (@ 4C)	1	N/A	2021/09/08		Auto Calc
Sulphate by Automated Colourimetry	1	N/A	2021/09/07	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids (TDS calc)	1	N/A	2021/09/08		Auto Calc

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report.

Your Project #: 21456909
Your C.O.C. #: 842982-03-01

Attention: Gregory Padusenko

Golder Associates Ltd
210 Sheldon Drive
Cambridge, ON
CANADA N1T 1A8

Report Date: 2021/09/09
Report #: R6803629
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1P4142
Received: 2021/09/03, 13:54

Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Metals analysis was performed on the sample 'as received'.
(3) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: emese.gitej@bureauveritas.com
Phone# (905)817-5829
==========
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

RCAP - COMPREHENSIVE (DRINKING WATER)

BV Labs ID		QOI301		
Sampling Date		2021/09/03 10:15		
COC Number		842982-03-01		
	UNITS	PW21-1-72H	RDL	QC Batch
Calculated Parameters				
Anion Sum	me/L	9.13	N/A	7559095
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	180	1.0	7559092
Calculated TDS	mg/L	540	1.0	7559099
Carb. Alkalinity (calc. as CaCO3)	mg/L	2.2	1.0	7559092
Cation Sum	me/L	8.82	N/A	7559095
Hardness (CaCO3)	mg/L	380	1.0	7558603
Ion Balance (% Difference)	%	1.75	N/A	7559094
Langelier Index (@ 20C)	N/A	0.883		7559096
Langelier Index (@ 4C)	N/A	0.635		7559098
Saturation pH (@ 20C)	N/A	7.23		7559096
Saturation pH (@ 4C)	N/A	7.48		7559098
Inorganics				
Total Ammonia-N	mg/L	0.21	0.050	7564734
Conductivity	umho/cm	790	1.0	7560958
Dissolved Organic Carbon	mg/L	0.49	0.40	7562606
Orthophosphate (P)	mg/L	<0.010	0.010	7561002
pH	pH	8.12		7560957
Dissolved Sulphate (SO4)	mg/L	250	1.0	7561000
Alkalinity (Total as CaCO3)	mg/L	180	1.0	7560955
Dissolved Chloride (Cl-)	mg/L	10	1.0	7560992
Nitrite (N)	mg/L	<0.010	0.010	7560968
Nitrate (N)	mg/L	<0.10	0.10	7560968
Metals				
Aluminum (Al)	ug/L	<4.9	4.9	7563979
Antimony (Sb)	ug/L	<0.50	0.50	7563979
Arsenic (As)	ug/L	1.5	1.0	7563979
Barium (Ba)	ug/L	21	2.0	7563979
Beryllium (Be)	ug/L	<0.40	0.40	7563979
Boron (B)	ug/L	70	10	7563979
Cadmium (Cd)	ug/L	<0.090	0.090	7563979
Calcium (Ca)	ug/L	96000	200	7563979

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

RCAP - COMPREHENSIVE (DRINKING WATER)

BV Labs ID		QOI301		
Sampling Date		2021/09/03 10:15		
COC Number		842982-03-01		
	UNITS	PW21-1-72H	RDL	QC Batch
Chromium (Cr)	ug/L	<5.0	5.0	7563979
Cobalt (Co)	ug/L	<0.50	0.50	7563979
Copper (Cu)	ug/L	<0.90	0.90	7563979
Iron (Fe)	ug/L	120	100	7563979
Lead (Pb)	ug/L	<0.50	0.50	7563979
Lithium (Li)	ug/L	5.6	5.0	7563979
Magnesium (Mg)	ug/L	34000	50	7563979
Manganese (Mn)	ug/L	19	2.0	7563979
Molybdenum (Mo)	ug/L	3.2	0.50	7563979
Nickel (Ni)	ug/L	<1.0	1.0	7563979
Phosphorus (P)	ug/L	<100	100	7563979
Potassium (K)	ug/L	1100	200	7563979
Selenium (Se)	ug/L	<2.0	2.0	7563979
Silicon (Si)	ug/L	5800	50	7563979
Silver (Ag)	ug/L	<0.090	0.090	7563979
Sodium (Na)	ug/L	27000	100	7563979
Strontium (Sr)	ug/L	3800	1.0	7563979
Thallium (Tl)	ug/L	<0.050	0.050	7563979
Titanium (Ti)	ug/L	<5.0	5.0	7563979
Uranium (U)	ug/L	0.21	0.10	7563979
Vanadium (V)	ug/L	<0.50	0.50	7563979
Zinc (Zn)	ug/L	<5.0	5.0	7563979

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

BV Labs Job #: C1P4142
Report Date: 2021/09/09

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PGM

MICROBIOLOGY (WATER)

BV Labs ID		QOI301	
Sampling Date		2021/09/03 10:15	
COC Number		842982-03-01	
	UNITS	PW21-1-72H	QC Batch
Microbiological			
Background	CFU/100mL	0	7560239
Total Coliforms	CFU/100mL	0	7560239
Escherichia coli	CFU/100mL	0	7560239
QC Batch = Quality Control Batch			

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

BV Labs Job #: C1P4142
Report Date: 2021/09/09

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PGM

TEST SUMMARY

BV Labs ID: QOI301
Sample ID: PW21-1-72H
Matrix: Water

Collected: 2021/09/03
Shipped:
Received: 2021/09/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7560955	N/A	2021/09/07	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	7559092	N/A	2021/09/08	Automated Statchk
Chloride by Automated Colourimetry	KONE	7560992	N/A	2021/09/07	Alina Dobreanu
Conductivity	AT	7560958	N/A	2021/09/07	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7562606	N/A	2021/09/08	Julianna Castiglione
Hardness (calculated as CaCO3)		7558603	N/A	2021/09/08	Automated Statchk
Metals Analysis by ICPMS (as received)	ICP/MS	7563979	N/A	2021/09/08	Arefa Dabhad
Ion Balance (% Difference)	CALC	7559094	N/A	2021/09/08	Automated Statchk
Anion and Cation Sum	CALC	7559095	N/A	2021/09/08	Automated Statchk
Total Coliforms/ E. coli, CFU/100mL	PL	7560239	N/A	2021/09/03	Soham Patel
Total Ammonia-N	LACH/NH4	7564734	N/A	2021/09/09	Viorica Rotaru
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7560968	N/A	2021/09/07	Chandra Nandlal
pH	AT	7560957	2021/09/04	2021/09/07	Yogesh Patel
Orthophosphate	KONE	7561002	N/A	2021/09/07	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7559096	N/A	2021/09/08	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7559098	N/A	2021/09/08	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7561000	N/A	2021/09/07	Avneet Kour Sudan
Total Dissolved Solids (TDS calc)	CALC	7559099	N/A	2021/09/08	Automated Statchk

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	10.7°C
Package 2	15.0°C

Results relate only to the items tested.

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

BV Labs Job #: C1P4142
Report Date: 2021/09/09

QUALITY ASSURANCE REPORT

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PGM

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7560955	Alkalinity (Total as CaCO3)	2021/09/07			95	85 - 115	<1.0	mg/L	0.40	20
7560957	pH	2021/09/07			101	98 - 103			2.0	N/A
7560958	Conductivity	2021/09/07			100	85 - 115	<1.0	umho/cm	0.35	25
7560968	Nitrate (N)	2021/09/07	99	80 - 120	101	80 - 120	<0.10	mg/L	NC	20
7560968	Nitrite (N)	2021/09/07	104	80 - 120	103	80 - 120	<0.010	mg/L	NC	20
7560992	Dissolved Chloride (Cl-)	2021/09/07	104	80 - 120	103	80 - 120	<1.0	mg/L	4.7	20
7561000	Dissolved Sulphate (SO4)	2021/09/07	115	75 - 125	100	80 - 120	<1.0	mg/L	0.31	20
7561002	Orthophosphate (P)	2021/09/07	NC	75 - 125	100	80 - 120	<0.010	mg/L	13	25
7562606	Dissolved Organic Carbon	2021/09/08	80	80 - 120	96	80 - 120	<0.40	mg/L	0.84	20
7563979	Aluminum (Al)	2021/09/08	101	80 - 120	102	80 - 120	<4.9	ug/L		
7563979	Antimony (Sb)	2021/09/08	112	80 - 120	104	80 - 120	<0.50	ug/L		
7563979	Arsenic (As)	2021/09/08	98	80 - 120	101	80 - 120	<1.0	ug/L		
7563979	Barium (Ba)	2021/09/08	99	80 - 120	101	80 - 120	<2.0	ug/L		
7563979	Beryllium (Be)	2021/09/08	97	80 - 120	100	80 - 120	<0.40	ug/L		
7563979	Boron (B)	2021/09/08	88	80 - 120	94	80 - 120	<10	ug/L		
7563979	Cadmium (Cd)	2021/09/08	101	80 - 120	100	80 - 120	<0.090	ug/L		
7563979	Calcium (Ca)	2021/09/08	NC	80 - 120	103	80 - 120	<200	ug/L		
7563979	Chromium (Cr)	2021/09/08	93	80 - 120	97	80 - 120	<5.0	ug/L		
7563979	Cobalt (Co)	2021/09/08	96	80 - 120	100	80 - 120	<0.50	ug/L		
7563979	Copper (Cu)	2021/09/08	101	80 - 120	102	80 - 120	<0.90	ug/L		
7563979	Iron (Fe)	2021/09/08	94	80 - 120	99	80 - 120	<100	ug/L		
7563979	Lead (Pb)	2021/09/08	97	80 - 120	99	80 - 120	<0.50	ug/L	0.96	20
7563979	Lithium (Li)	2021/09/08	103	80 - 120	109	80 - 120	<5.0	ug/L		
7563979	Magnesium (Mg)	2021/09/08	92	80 - 120	100	80 - 120	<50	ug/L		
7563979	Manganese (Mn)	2021/09/08	95	80 - 120	100	80 - 120	<2.0	ug/L		
7563979	Molybdenum (Mo)	2021/09/08	101	80 - 120	99	80 - 120	<0.50	ug/L		
7563979	Nickel (Ni)	2021/09/08	94	80 - 120	98	80 - 120	<1.0	ug/L		
7563979	Phosphorus (P)	2021/09/08	99	80 - 120	104	80 - 120	<100	ug/L		
7563979	Potassium (K)	2021/09/08	100	80 - 120	101	80 - 120	<200	ug/L		
7563979	Selenium (Se)	2021/09/08	101	80 - 120	101	80 - 120	<2.0	ug/L		
7563979	Silicon (Si)	2021/09/08	103	80 - 120	104	80 - 120	<50	ug/L		

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7563979	Silver (Ag)	2021/09/08	98	80 - 120	97	80 - 120	<0.090	ug/L		
7563979	Sodium (Na)	2021/09/08	94	80 - 120	98	80 - 120	<100	ug/L		
7563979	Strontium (Sr)	2021/09/08	94	80 - 120	101	80 - 120	<1.0	ug/L		
7563979	Thallium (Tl)	2021/09/08	100	80 - 120	99	80 - 120	<0.050	ug/L		
7563979	Titanium (Ti)	2021/09/08	98	80 - 120	100	80 - 120	<5.0	ug/L		
7563979	Uranium (U)	2021/09/08	100	80 - 120	96	80 - 120	<0.10	ug/L		
7563979	Vanadium (V)	2021/09/08	93	80 - 120	97	80 - 120	<0.50	ug/L		
7563979	Zinc (Zn)	2021/09/08	95	80 - 120	101	80 - 120	<5.0	ug/L		
7564734	Total Ammonia-N	2021/09/09	101	75 - 125	99	80 - 120	<0.050	mg/L	15	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

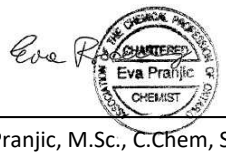
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Soham N Patel

Soham Patel, Analyst 2

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.

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Page 1 of 1

CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#21375 Golder Associates Ltd	Company Name:		Quotation #:	B80683	BV Labs Job #:	Bottle Order #: 842982
Attention:	Accounts Payable	Attention:	Gregory Padusenko	P.O. #:			
Address:	210 Sheldon Drive Cambridge ON N1T 1A8	Address:		Project:	21456909	COC #: C#842982-03-01	Project Manager: Ema Gitej
Tel:	(519) 620-8182 Fax:	Tel:	(519) 620-8182 Ext: 6509 Fax: (519) 620-9878	Project Name:			
Email:	CanadaAccountsPayableInvoices@golder.com	Email:	Gregory_Padusenko@golder.com	Site #:			
				Sampled By:	PGM		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine; ☐ Table 2 ☐ Ind/Comm ☐ Coarse; ☐ Table 3 ☐ Agri/Other ☐ For RSC; ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw; ☐ Reg 558 ☐ Storm Sewer Bylaw; ☐ MISA Municipality ___; ☐ PWQO ☐ Reg 406 Table ___; ☐ Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	RCAp - Comprehensive	Total Coliforms/ E. coli, CFU/100mL	# of Bottles	Comments
1		PW21-1-72A	21/09/03	10:15	GW		X	X	5	-metals as received -disregard labelled date
2										
3										
4										
5										
6										
7										
8										
9										
10										

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

MICRO

REC'D IN WATERLOO
03-Sep-21 13:54
Ema Gitej
C1P4142
YTH ENV-1270
On Ice Packs

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
PP MW / Paul Markvd	21/09/03	13:55	Jasprit Dave	2021/09/03	13:54	
			By Mossey	21/09/03	18:05	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei				Custody Seal Present	Yes	No
	9.1	12	15	15	Intact		

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

White: BV Labs Yellow: Client

Bureau Veritas Canada (2019) Inc.

WTF 421156 7/7/4 9/4/6 & 9/9/9

Your Project #: 21456909
Your C.O.C. #: 842984-01-01

Attention: Gregory Padusenko

Golder Associates Ltd
210 Sheldon Drive
Cambridge, ON
CANADA N1T 1A8

Report Date: 2021/10/06
Report #: R6842011
Version: 4 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1P4129
Received: 2021/09/03, 13:54

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	1	N/A	2021/09/07	CAM SOP-00448	SM 23 2320 B m
Chloride by Automated Colourimetry	1	N/A	2021/09/07	CAM SOP-00463	SM 23 4500-Cl E m
Colour	1	N/A	2021/09/09	CAM SOP-00412	SM 23 2120C m
Free (WAD) Cyanide	1	N/A	2021/09/10	CAM SOP-00457	OMOE E3015 m
Dioxins/Furans in Water (1613B) (1)	1	2021/10/01	2021/10/04	BRL SOP-00410	EPA 1613B m
Diuron, Guthion, Temephos	1	2021/09/10	2021/09/10	CAM SOP-00306	EPA 532 m
Dissolved Organic Carbon (DOC) (2)	1	N/A	2021/09/08	CAM SOP-00446	SM 23 5310 B m
Diquat / Paraquat	1	2021/09/07	2021/09/09	CAM SOP-00327	EPA 549.2 m
Fluoride	1	2021/09/04	2021/09/07	CAM SOP-00449	SM 23 4500-F C m
Glyphosate	1	2021/09/09	2021/09/09	CAM SOP-00305	HPLC in-house method
Hardness (calculated as CaCO3)	1	N/A	2021/09/08	CAM SOP 00102/00408/00447	SM 2340 B
Mercury in Water by CVAA	1	2021/09/07	2021/09/07	CAM SOP-00453	EPA 7470A m
Metals Analysis by ICPMS (as received) (3)	1	N/A	2021/09/07	CAM SOP-00447	EPA 6020B m
Total Coliforms/ E. coli, CFU/100mL	1	N/A	2021/09/03	CAM SOP-00551	MOE E3407
Dissolved Methane in Water	1	N/A	2021/09/08	CAM SOP-00219 Modified Combustible Gas Indicator Method	RSKSOP-175 m
Heterotrophic plate count, (CFU/mL)	1	N/A	2021/09/03	CAM SOP-00512	SM 9215B
Microcystin	1	N/A	2021/09/08	CAM SOP-00476	OMECC-LSB E3469
NDMA in Drinking Water (MSABN-3291Amod)	1	2021/09/09	2021/09/14	BRL SOP-00012	MOE Method E3388
Total Ammonia-N	1	N/A	2021/09/09	CAM SOP-00441	USGS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (4)	1	N/A	2021/09/07	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Nitrilotriacetic Acid (NTA) (5)	1	2021/09/07	2021/09/07	CAM SOP-00411	EPA 430.1 m
OC Pesticides (Selected) & PCB (6)	1	2021/09/08	2021/09/10	CAM SOP-00307	EPA 8081A/ 8082B m
OC Pesticides Summed Parameters	1	N/A	2021/09/04	CAM SOP-00307	EPA 8081A/8082B m
ODWS - Semi-Volatiles	1	2021/09/09	2021/09/10	CAM SOP-00301	EPA 8270 m
Organic Nitrogen	1	N/A	2021/09/10	Auto Calc.	
pH	1	2021/09/04	2021/09/07	CAM SOP-00413	SM 4500H+ B m
Sulphate by Automated Colourimetry	1	N/A	2021/09/07	CAM SOP-00464	EPA 375.4 m
Sulphide	1	N/A	2021/09/07	CAM SOP-00455	SM 23 4500-S G m

Your Project #: 21456909
Your C.O.C. #: 842984-01-01

Attention: Gregory Padusenko

Golder Associates Ltd
210 Sheldon Drive
Cambridge, ON
CANADA N1T 1A8

Report Date: 2021/10/06
Report #: R6842011
Version: 4 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1P4129
Received: 2021/09/03, 13:54

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Dissolved Solids (TDS calc)	1	N/A	2021/09/08		Auto Calc
Total Kjeldahl Nitrogen in Water	1	2021/09/07	2021/09/09	CAM SOP-00938	OMOE E3516 m
Turbidity	1	N/A	2021/09/07	CAM SOP-00417	SM 23 2130 B m
VOCs (Drinking Water)	1	N/A	2021/09/07	CAM SOP-00226	EPA 8260C m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Confirmatory runs for 2,3,7,8-TCDF are performed only if the primary result is greater than the RDL.
(2) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(3) Metals analysis was performed on the sample 'as received'.
(4) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.
(5) Bureau Veritas Laboratories attempt to commence NTA analysis as soon as possible in accordance with the reference method. However, rapid analysis may not be practically achievable, particularly for samples from remote locations. Extended delay in analysis times may increase the uncertainty of the test results, but does not necessarily imply that the results are compromised.
(6) Chlordane (Total) = Alpha Chlordane + Gamma Chlordane

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Your Project #: 21456909
Your C.O.C. #: 842984-01-01

Attention: Gregory Padusenko

Golder Associates Ltd
210 Sheldon Drive
Cambridge, ON
CANADA N1T 1A8

Report Date: 2021/10/06
Report #: R6842011
Version: 4 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1P4129
Received: 2021/09/03, 13:54

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: emese.gitej@bureauveritas.com
Phone# (905)817-5829
==========
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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ODWQSOG TABLES 1, 2 AND 4 (WATER)

BV Labs ID		QOI268						
Sampling Date		2021/09/03 10:00						
COC Number		842984-01-01			TOXIC EQUIVALENCY		# of	
	UNITS	PW21-1	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Calculated Parameters								
Calculated TDS	mg/L	550	N/A	1.0				7559099
Hardness (CaCO3)	mg/L	380	N/A	1.0				7558603
Total Organic Nitrogen	mg/L	<0.10	N/A	0.10				7560118
Inorganics								
Total Ammonia-N	mg/L	0.21	N/A	0.050				7564744
Colour	TCU	<2	N/A	2				7563603
Fluoride (F-)	mg/L	0.62	N/A	0.10				7560960
Total Kjeldahl Nitrogen (TKN)	mg/L	0.23	N/A	0.10				7563005
Microcystin	ug/L	<0.10	N/A	0.10				7564587
Dissolved Organic Carbon	mg/L	0.48	N/A	0.40				7562606
pH	pH	8.02						7560966
Dissolved Sulphate (SO4)	mg/L	270	N/A	1.0				7560983
Sulphide	mg/L	<0.020	N/A	0.020				7562455
Turbidity	NTU	0.7	N/A	0.1				7560716
WAD Cyanide (Free)	mg/L	<0.0010	N/A	0.0010				7567661
Alkalinity (Total as CaCO3)	mg/L	180	N/A	1.0				7560961
Dissolved Chloride (Cl-)	mg/L	9.6	N/A	1.0				7560985
Nitrite (N)	mg/L	<0.010	N/A	0.010				7560968
Nitrate (N)	mg/L	<0.10	N/A	0.10				7560968
Nitrate + Nitrite (N)	mg/L	<0.10	N/A	0.10				7560968
Miscellaneous Parameters								
NTA	mg/L	<0.050	N/A	0.050				7561547
Fixed Gases								
Methane	L/m3	0.019	N/A	0.005				7565203
Metals								
Mercury (Hg)	mg/L	<0.00010	N/A	0.00010				7562014

EDL = Estimated Detection Limit
RDL = Reportable Detection Limit
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch
N/A = Not Applicable

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ODWQSOG TABLES 1, 2 AND 4 (WATER)

BV Labs ID		QOI268						
Sampling Date		2021/09/03 10:00						
COC Number		842984-01-01			TOXIC EQUIVALENCY		# of	
	UNITS	PW21-1	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Aluminum (Al)	ug/L	<4.9	N/A	4.9				7561948
Antimony (Sb)	ug/L	<0.50	N/A	0.50				7561948
Arsenic (As)	ug/L	1.5	N/A	1.0				7561948
Barium (Ba)	ug/L	21	N/A	2.0				7561948
Boron (B)	ug/L	74	N/A	10				7561948
Cadmium (Cd)	ug/L	<0.090	N/A	0.090				7561948
Calcium (Ca)	ug/L	93000	N/A	200				7561948
Chromium (Cr)	ug/L	<5.0	N/A	5.0				7561948
Copper (Cu)	ug/L	<0.90	N/A	0.90				7561948
Iron (Fe)	ug/L	130	N/A	100				7561948
Lead (Pb)	ug/L	<0.50	N/A	0.50				7561948
Magnesium (Mg)	ug/L	36000	N/A	50				7561948
Manganese (Mn)	ug/L	20	N/A	2.0				7561948
Potassium (K)	ug/L	1100	N/A	200				7561948
Selenium (Se)	ug/L	<2.0	N/A	2.0				7561948
Sodium (Na)	ug/L	28000	N/A	100				7561948
Uranium (U)	ug/L	0.16	N/A	0.10				7561948
Zinc (Zn)	ug/L	<5.0	N/A	5.0				7561948
Semivolatile Organics								
2,3,4,6-Tetrachlorophenol	ug/L	<0.50	N/A	0.50				7566501
2,4,5-T	ug/L	<1.0	N/A	1.0				7566501
2,4,6-Trichlorophenol	ug/L	<0.50	N/A	0.50				7566501
2,4-D	ug/L	<1.0	N/A	1.0				7566501
2,4-Dichlorophenol	ug/L	<0.25	N/A	0.25				7566501
Alachlor	ug/L	<0.50	N/A	0.50				7566501
Aldicarb	ug/L	<5.0	N/A	5.0				7566501
Atrazine	ug/L	<0.50	N/A	0.50				7566501

EDL = Estimated Detection Limit
RDL = Reportable Detection Limit
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch
N/A = Not Applicable

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ODWQSOG TABLES 1, 2 AND 4 (WATER)

BV Labs ID		QOI268						
Sampling Date		2021/09/03 10:00						
COC Number		842984-01-01			TOXIC EQUIVALENCY		# of	
	UNITS	PW21-1	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Des-ethyl atrazine	ug/L	<0.50	N/A	0.50				7566501
Atrazine + Desethyl-atrazine	ug/L	<1.0	N/A	1.0				7566501
Bendiocarb	ug/L	<2.0	N/A	2.0				7566501
Bromoxynil	ug/L	<0.50	N/A	0.50				7566501
Carbaryl	ug/L	<5.0	N/A	5.0				7566501
Carbofuran	ug/L	<5.0	N/A	5.0				7566501
Chlorpyrifos (Dursban)	ug/L	<1.0	N/A	1.0				7566501
Cyanazine (Bladex)	ug/L	<1.0	N/A	1.0				7566501
Diazinon	ug/L	<1.0	N/A	1.0				7566501
Dicamba	ug/L	<1.0	N/A	1.0				7566501
Diclofop-methyl	ug/L	<0.90	N/A	0.90				7566501
Dimethoate	ug/L	<2.5	N/A	2.5				7566501
Dinoseb	ug/L	<1.0	N/A	1.0				7566501
Malathion	ug/L	<5.0	N/A	5.0				7566501
Metolachlor	ug/L	<0.50	N/A	0.50				7566501
Metribuzin (Sencor)	ug/L	<5.0	N/A	5.0				7566501
Ethyl Parathion	ug/L	<1.0	N/A	1.0				7566501
Pentachlorophenol	ug/L	<0.50	N/A	0.50				7566501
Phorate	ug/L	<0.50	N/A	0.50				7566501
Picloram	ug/L	<5.0	N/A	5.0				7566501
Prometryne	ug/L	<0.25	N/A	0.25				7566501
Simazine	ug/L	<1.0	N/A	1.0				7566501
Terbufos	ug/L	<0.50	N/A	0.50				7566501
Triallate	ug/L	<1.0	N/A	1.0				7566501
Trifluralin	ug/L	<1.0	N/A	1.0				7566501
Benzo(a)pyrene	ug/L	<0.0050	N/A	0.0050				7566501
Methyl parathion	ug/L	<1.0	N/A	1.0				7566501

EDL = Estimated Detection Limit
RDL = Reportable Detection Limit
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
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QC Batch = Quality Control Batch
N/A = Not Applicable

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ODWQSOG TABLES 1, 2 AND 4 (WATER)

BV Labs ID		QOI268						
Sampling Date		2021/09/03 10:00						
COC Number		842984-01-01			TOXIC EQUIVALENCY		# of	
	UNITS	PW21-1	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Volatile Organics								
1,1-Dichloroethylene	ug/L	<0.10	N/A	0.10				7559332
1,2-Dichlorobenzene	ug/L	<0.20	N/A	0.20				7559332
1,2-Dichloroethane	ug/L	<0.20	N/A	0.20				7559332
1,4-Dichlorobenzene	ug/L	<0.20	N/A	0.20				7559332
Benzene	ug/L	<0.10	N/A	0.10				7559332
Bromodichloromethane	ug/L	<0.10	N/A	0.10				7559332
Bromoform	ug/L	<0.20	N/A	0.20				7559332
Carbon Tetrachloride	ug/L	<0.10	N/A	0.10				7559332
Chlorobenzene	ug/L	<0.10	N/A	0.10				7559332
Chloroform	ug/L	<0.10	N/A	0.10				7559332
Dibromochloromethane	ug/L	<0.20	N/A	0.20				7559332
Methylene Chloride(Dichloromethane)	ug/L	<0.50	N/A	0.50				7559332
Ethylbenzene	ug/L	<0.10	N/A	0.10				7559332
Tetrachloroethylene	ug/L	<0.10	N/A	0.10				7559332
Toluene	ug/L	<0.20	N/A	0.20				7559332
Trichloroethylene	ug/L	<0.10	N/A	0.10				7559332
Vinyl Chloride	ug/L	<0.20	N/A	0.20				7559332
o-Xylene	ug/L	<0.10	N/A	0.10				7559332
p+m-Xylene	ug/L	<0.10	N/A	0.10				7559332
Total Xylenes	ug/L	<0.10	N/A	0.10				7559332
Total Trihalomethanes	ug/L	<0.20	N/A	0.20				7559332
Pesticides & Herbicides								
Glyphosate	ug/L	<10	N/A	10				7567026
Diquat	ug/L	<7.0	N/A	7.0				7561822
Diuron	ug/L	<10	N/A	10				7569961
Guthion (Azinphos-methyl)	ug/L	<2.0	N/A	2.0				7569961

EDL = Estimated Detection Limit
RDL = Reportable Detection Limit
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
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ODWQSOG TABLES 1, 2 AND 4 (WATER)

BV Labs ID		QOI268						
Sampling Date		2021/09/03 10:00						
COC Number		842984-01-01			TOXIC EQUIVALENCY		# of	
	UNITS	PW21-1	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Paraquat	ug/L	<1.0	N/A	1.0				7561822
Temephos	ug/L	<10	N/A	10				7569961
Calculated Parameters								
Aldrin + Dieldrin	ug/L	<0.006	N/A	0.006				7558226
Chlordane (Total)	ug/L	<0.006	N/A	0.006				7558226
DDT+ Metabolites	ug/L	<0.006	N/A	0.006				7558226
Heptachlor + Heptachlor epoxide	ug/L	<0.006	N/A	0.006				7558226
Total PCB	ug/L	<0.05	N/A	0.05				7558226
Pesticides & Herbicides								
Lindane	ug/L	<0.0060	N/A	0.0060				7565829
Heptachlor	ug/L	<0.0060	N/A	0.0060				7565829
Aldrin	ug/L	<0.0060	N/A	0.0060				7565829
Heptachlor epoxide	ug/L	<0.0060	N/A	0.0060				7565829
Oxychlordane	ug/L	<0.0060	N/A	0.0060				7565829
g-Chlordane	ug/L	<0.0060	N/A	0.0060				7565829
a-Chlordane	ug/L	<0.0060	N/A	0.0060				7565829
Dieldrin	ug/L	<0.0060	N/A	0.0060				7565829
o,p-DDE	ug/L	<0.0060	N/A	0.0060				7565829
p,p-DDE	ug/L	<0.0060	N/A	0.0060				7565829
o,p-DDD	ug/L	<0.0060	N/A	0.0060				7565829
p,p-DDD	ug/L	<0.0060	N/A	0.0060				7565829
o,p-DDT	ug/L	<0.0060	N/A	0.0060				7565829
p,p-DDT	ug/L	<0.0060	N/A	0.0060				7565829
Methoxychlor	ug/L	<0.024	N/A	0.024				7565829
Aroclor 1016	ug/L	<0.050	N/A	0.050				7565829
Aroclor 1221	ug/L	<0.050	N/A	0.050				7565829
Aroclor 1232	ug/L	<0.050	N/A	0.050				7565829

EDL = Estimated Detection Limit
RDL = Reportable Detection Limit
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
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N/A = Not Applicable

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ODWQSOG TABLES 1, 2 AND 4 (WATER)

BV Labs ID		QOI268						
Sampling Date		2021/09/03 10:00						
COC Number		842984-01-01			TOXIC EQUIVALENCY		# of	
	UNITS	PW21-1	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Aroclor 1242	ug/L	<0.050	N/A	0.050				7565829
Aroclor 1248	ug/L	<0.050	N/A	0.050				7565829
Aroclor 1254	ug/L	<0.050	N/A	0.050				7565829
Aroclor 1260	ug/L	<0.050	N/A	0.050				7565829
Dioxins & Furans								
2,3,7,8-Tetra CDD *	pg/L	<0.973	0.973	10.0	1.00	0.973	0	7615543
1,2,3,7,8-Penta CDD *	pg/L	<0.830	0.830	50.0	1.00	0.830	0	7615543
1,2,3,4,7,8-Hexa CDD *	pg/L	<0.875	0.875	50.0	0.100	0.0875	0	7615543
1,2,3,6,7,8-Hexa CDD *	pg/L	<0.778	0.778	50.0	0.100	0.0778	0	7615543
1,2,3,7,8,9-Hexa CDD *	pg/L	<0.798	0.798	50.0	0.100	0.0798	0	7615543
1,2,3,4,6,7,8-Hepta CDD *	pg/L	<0.760	0.760	50.0	0.0100	0.00760	0	7615543
Octa CDD *	pg/L	<0.666	0.666	100	0.000300	0.000200	0	7615543
Total Tetra CDD *	pg/L	<0.973	0.973	10.0			0	7615543
Total Penta CDD *	pg/L	<0.830	0.830	50.0			0	7615543
Total Hexa CDD *	pg/L	<0.814	0.814	50.0			0	7615543
Total Hepta CDD *	pg/L	<0.760	0.760	50.0			0	7615543
2,3,7,8-Tetra CDF **	pg/L	<0.671	0.671	10.0	0.100	0.0671	0	7615543
1,2,3,7,8-Penta CDF **	pg/L	<0.843	0.843	50.0	0.0300	0.0253	0	7615543
2,3,4,7,8-Penta CDF **	pg/L	<0.715	0.715	50.0	0.300	0.215	0	7615543
1,2,3,4,7,8-Hexa CDF **	pg/L	<0.384	0.384	50.0	0.100	0.0384	0	7615543
1,2,3,6,7,8-Hexa CDF **	pg/L	<0.332	0.332	50.0	0.100	0.0332	0	7615543
2,3,4,6,7,8-Hexa CDF **	pg/L	<0.349	0.349	50.0	0.100	0.0349	0	7615543
1,2,3,7,8,9-Hexa CDF **	pg/L	<0.371	0.371	50.0	0.100	0.0371	0	7615543
1,2,3,4,6,7,8-Hepta CDF **	pg/L	<0.313	0.313	50.0	0.0100	0.00313	0	7615543
1,2,3,4,7,8,9-Hepta CDF **	pg/L	<0.349	0.349	50.0	0.0100	0.00349	0	7615543

EDL = Estimated Detection Limit
RDL = Reportable Detection Limit
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WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch
N/A = Not Applicable
* CDD = Chloro Dibenzo-p-Dioxin
** CDF = Chloro Dibenzo-p-Furan

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ODWQSOG TABLES 1, 2 AND 4 (WATER)

BV Labs ID		QOI268						
Sampling Date		2021/09/03 10:00						
COC Number		842984-01-01			TOXIC EQUIVALENCY		# of	
	UNITS	PW21-1	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Octa CDF **	pg/L	<0.982	0.982	100	0.000300	0.000295	0	7615543
Total Tetra CDF **	pg/L	<0.671	0.671	10.0			0	7615543
Total Penta CDF **	pg/L	<0.775	0.775	50.0			0	7615543
Total Hexa CDF **	pg/L	<0.358	0.358	50.0			0	7615543
Total Hepta CDF **	pg/L	<0.330	0.330	50.0			0	7615543
Semivolatile Organics								
N-Nitrosodimethylamine	ug/L	<0.0009	N/A	0.0009				7566404
Microbiological								
Heterotrophic plate count	CFU/mL	0	N/A	N/A				7560282
Background	CFU/100mL	0	N/A	N/A				7560239
Total Coliforms	CFU/100mL	0	N/A	N/A				7560239
Escherichia coli	CFU/100mL	0	N/A	N/A				7560239
TOTAL TOXIC EQUIVALENCY	pg/L					2.5		
Surrogate Recovery (%)								
37CL4 2378 Tetra CDD *	%	70						7615543
C13-1234678 HeptaCDD *	%	120						7615543
C13-1234678 HeptaCDF **	%	111						7615543
C13-123478 HexaCDD *	%	96						7615543
C13-123478 HexaCDF **	%	92						7615543
C13-1234789 HeptaCDF **	%	121						7615543
C13-123678 HexaCDD *	%	97						7615543
C13-123678 HexaCDF **	%	97						7615543
C13-12378 PentaCDD *	%	78						7615543
C13-12378 PentaCDF **	%	74						7615543
C13-123789 HexaCDF **	%	105						7615543

EDL = Estimated Detection Limit
RDL = Reportable Detection Limit
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
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QC Batch = Quality Control Batch
** CDF = Chloro Dibenzo-p-Furan
N/A = Not Applicable
* CDD = Chloro Dibenzo-p-Dioxin

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ODWQSOG TABLES 1, 2 AND 4 (WATER)

BV Labs ID		QOI268						
Sampling Date		2021/09/03 10:00						
COC Number		842984-01-01			TOXIC EQUIVALENCY		# of	
	UNITS	PW21-1	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-234678 HexaCDF **	%	99						7615543
C13-23478 PentaCDF **	%	82						7615543
C13-2378 TetraCDD *	%	63						7615543
C13-2378 TetraCDF **	%	61						7615543
C13-OCDD *	%	115						7615543
D6-N-Nitrosodimethylamine	%	39						7566404
2,4,5,6-Tetrachloro-m-xylene	%	50						7565829
Decachlorobiphenyl	%	104						7565829
2,4,6-Tribromophenol	%	78						7566501
2,4-Dichlorophenyl Acetic Acid	%	79						7566501
2-Fluorobiphenyl	%	69						7566501
D14-Terphenyl (FS)	%	83						7566501
D5-Nitrobenzene	%	83						7566501
4-Bromofluorobenzene	%	96						7559332
D4-1,2-Dichloroethane	%	96						7559332
D8-Toluene	%	106						7559332

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RDL = Reportable Detection Limit
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ODWQSOG TABLES 1, 2 AND 4 (WATER)

BV Labs ID		QOI268					
Sampling Date		2021/09/03 10:00					
COC Number		842984-01-01		TOXIC EQUIVALENCY		# of	
	UNITS	PW21-1 Lab-Dup	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Inorganics							
Fluoride (F-)	mg/L	0.62	0.10				7560960
pH	pH	8.05					7560966
Alkalinity (Total as CaCO3)	mg/L	180	1.0				7560961
Nitrite (N)	mg/L	<0.010	0.010				7560968
Nitrate (N)	mg/L	<0.10	0.10				7560968
Nitrate + Nitrite (N)	mg/L	<0.10	0.10				7560968
Metals							
Mercury (Hg)	mg/L	<0.00010	0.00010				7562014
Volatile Organics							
1,1-Dichloroethylene	ug/L	<0.10	0.10				7559332
1,2-Dichlorobenzene	ug/L	<0.20	0.20				7559332
1,2-Dichloroethane	ug/L	<0.20	0.20				7559332
1,4-Dichlorobenzene	ug/L	<0.20	0.20				7559332
Benzene	ug/L	<0.10	0.10				7559332
Bromodichloromethane	ug/L	<0.10	0.10				7559332
Bromoform	ug/L	<0.20	0.20				7559332
Carbon Tetrachloride	ug/L	<0.10	0.10				7559332
Chlorobenzene	ug/L	<0.10	0.10				7559332
Chloroform	ug/L	<0.10	0.10				7559332
Dibromochloromethane	ug/L	<0.20	0.20				7559332
Methylene Chloride(Dichloromethane)	ug/L	<0.50	0.50				7559332
Ethylbenzene	ug/L	<0.10	0.10				7559332

RDL = Reportable Detection Limit
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
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Lab-Dup = Laboratory Initiated Duplicate

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ODWQSOG TABLES 1, 2 AND 4 (WATER)

BV Labs ID		QOI268					
Sampling Date		2021/09/03 10:00					
COC Number		842984-01-01		TOXIC EQUIVALENCY		# of	
	UNITS	PW21-1 Lab-Dup	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Tetrachloroethylene	ug/L	<0.10	0.10				7559332
Toluene	ug/L	<0.20	0.20				7559332
Trichloroethylene	ug/L	<0.10	0.10				7559332
Vinyl Chloride	ug/L	<0.20	0.20				7559332
o-Xylene	ug/L	<0.10	0.10				7559332
p+m-Xylene	ug/L	<0.10	0.10				7559332
Total Xylenes	ug/L	<0.10	0.10				7559332
Total Trihalomethanes	ug/L	<0.20	0.20				7559332
Pesticides & Herbicides							
Diuron	ug/L	<10	10				7569961
Guthion (Azinphos-methyl)	ug/L	<2.0	2.0				7569961
Temephos	ug/L	<10	10				7569961
TOTAL TOXIC EQUIVALENCY	pg/L				0		
Surrogate Recovery (%)							
4-Bromofluorobenzene	%	96					7559332
D4-1,2-Dichloroethane	%	98					7559332
D8-Toluene	%	104					7559332

RDL = Reportable Detection Limit
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
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BV Labs Job #: C1P4129
Report Date: 2021/10/06

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PM

TEST SUMMARY

BV Labs ID: QOI268
Sample ID: PW21-1
Matrix: Water

Collected: 2021/09/03
Shipped:
Received: 2021/09/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7560961	N/A	2021/09/07	Yogesh Patel
Chloride by Automated Colourimetry	KONE	7560985	N/A	2021/09/07	Alina Dobreanu
Colour	SPEC	7563603	N/A	2021/09/09	Viorica Rotaru
Free (WAD) Cyanide	SKAL/CN	7567661	N/A	2021/09/10	Aditiben Patel
Dioxins/Furans in Water (1613B)	HRMS/MS	7615543	2021/10/01	2021/10/04	Cathy Xu
Diuron, Guthion, Temephos	LC/UV	7569961	2021/09/10	2021/09/10	Kimberley Linde
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7562606	N/A	2021/09/08	Julianna Castiglione
Diquat / Paraquat	LC/UV	7561822	2021/09/07	2021/09/09	James Lee
Fluoride	ISE	7560960	2021/09/04	2021/09/07	Yogesh Patel
Glyphosate	LC/FLU	7567026	2021/09/09	2021/09/09	Furneesh Kumar
Hardness (calculated as CaCO3)		7558603	N/A	2021/09/08	Automated Statchk
Mercury in Water by CVAA	CV/AA	7562014	2021/09/07	2021/09/07	Gagandeep Rai
Metals Analysis by ICPMS (as received)	ICP/MS	7561948	N/A	2021/09/07	Azita Fazaeli
Total Coliforms/ E. coli, CFU/100mL	PL	7560239	N/A	2021/09/03	Soham Patel
Dissolved Methane in Water	GC/FID	7565203	N/A	2021/09/08	Shilpa Kataria
Heterotrophic plate count, (CFU/mL)	PL	7560282	N/A	2021/09/03	Farhana Rahman
Microcystin	ELIS	7564587	N/A	2021/09/08	Chris Li
NDMA in Drinking Water (MSABN-3291Amod)	GCTQ/MS	7566404	2021/09/09	2021/09/14	Wenhui (Susie) Shi
Total Ammonia-N	LACH/NH4	7564744	N/A	2021/09/09	Viorica Rotaru
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7560968	N/A	2021/09/07	Chandra Nandlal
Nitrilotriacetic Acid (NTA)	SPEC	7561547	2021/09/07	2021/09/07	Viorica Rotaru
OC Pesticides (Selected) & PCB	GC/ECD	7565829	2021/09/08	2021/09/10	Joy Zhang
OC Pesticides Summed Parameters	CALC	7558226	N/A	2021/09/04	Automated Statchk
ODWS - Semi-Volatiles	GC/MS	7566501	2021/09/09	2021/09/10	Wendy Zhao
Organic Nitrogen	CALC	7560118	N/A	2021/09/10	Automated Statchk
pH	AT	7560966	2021/09/04	2021/09/07	Yogesh Patel
Sulphate by Automated Colourimetry	KONE	7560983	N/A	2021/09/07	Alina Dobreanu
Sulphide	ISE/S	7562455	N/A	2021/09/07	Neil Dassanayake
Total Dissolved Solids (TDS calc)	CALC	7559099	N/A	2021/09/08	Automated Statchk
Total Kjeldahl Nitrogen in Water	SKAL	7563005	2021/09/07	2021/09/09	Rajni Tyagi
Turbidity	AT	7560716	N/A	2021/09/07	Neil Dassanayake
VOCs (Drinking Water)	P&T/MS	7559332	N/A	2021/09/07	Dina Wang

BV Labs ID: QOI268 Dup
Sample ID: PW21-1
Matrix: Water

Collected: 2021/09/03
Shipped:
Received: 2021/09/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7560961	N/A	2021/09/07	Yogesh Patel
Diuron, Guthion, Temephos	LC/UV	7569961	2021/09/10	2021/09/10	Kimberley Linde
Fluoride	ISE	7560960	2021/09/04	2021/09/07	Yogesh Patel
Mercury in Water by CVAA	CV/AA	7562014	2021/09/07	2021/09/07	Gagandeep Rai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7560968	N/A	2021/09/07	Chandra Nandlal
pH	AT	7560966	2021/09/04	2021/09/07	Yogesh Patel
VOCs (Drinking Water)	P&T/MS	7559332	N/A	2021/09/07	Dina Wang

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	10.7°C
Package 2	15.0°C

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7559332	4-Bromofluorobenzene	2021/09/07	98	70 - 130	97	70 - 130	94	%				
7559332	D4-1,2-Dichloroethane	2021/09/07	91	70 - 130	95	70 - 130	98	%				
7559332	D8-Toluene	2021/09/07	105	70 - 130	103	70 - 130	105	%				
7565829	2,4,5,6-Tetrachloro-m-xylene	2021/09/09	58	30 - 130	57	30 - 130	58	%				
7565829	Decachlorobiphenyl	2021/09/09	108	30 - 130	95	30 - 130	98	%				
7566404	D6-N-Nitrosodimethylamine	2021/09/14			39	10 - 85	40	%				
7566501	2,4,6-Tribromophenol	2021/09/09	77	30 - 130	76	30 - 130	82	%				
7566501	2,4-Dichlorophenyl Acetic Acid	2021/09/09	75	30 - 130	71	30 - 130	77	%				
7566501	2-Fluorobiphenyl	2021/09/09	63	30 - 130	65	30 - 130	67	%				
7566501	D14-Terphenyl (FS)	2021/09/09	81	30 - 130	81	30 - 130	87	%				
7566501	D5-Nitrobenzene	2021/09/09	75	30 - 130	77	30 - 130	85	%				
7615543	37CL4 2378 Tetra CDD	2021/10/03			77	35 - 197	84	%				
7615543	C13-1234678 HeptaCDD	2021/10/03			119	23 - 140	111	%				
7615543	C13-1234678 HeptaCDF	2021/10/03			110	28 - 143	105	%				
7615543	C13-123478 HexaCDD	2021/10/03			97	32 - 141	88	%				
7615543	C13-123478 HexaCDF	2021/10/03			93	26 - 152	96	%				
7615543	C13-1234789 HeptaCDF	2021/10/03			121	28 - 138	111	%				
7615543	C13-123678 HexaCDD	2021/10/03			95	28 - 130	103	%				
7615543	C13-123678 HexaCDF	2021/10/03			98	26 - 123	96	%				
7615543	C13-12378 PentaCDD	2021/10/03			77	25 - 181	72	%				
7615543	C13-12378 PentaCDF	2021/10/03			75	24 - 185	73	%				
7615543	C13-123789 HexaCDF	2021/10/03			104	29 - 147	102	%				
7615543	C13-234678 HexaCDF	2021/10/03			98	28 - 136	96	%				
7615543	C13-23478 PentaCDF	2021/10/03			81	21 - 178	78	%				
7615543	C13-2378 TetraCDD	2021/10/03			66	25 - 164	75	%				
7615543	C13-2378 TetraCDF	2021/10/03			63	24 - 169	75	%				
7615543	C13-OCDD	2021/10/03			114	17 - 157	100	%				
7559332	1,1-Dichloroethylene	2021/09/07	93	70 - 130	92	70 - 130	<0.10	ug/L	NC	30		
7559332	1,2-Dichlorobenzene	2021/09/07	88	70 - 130	90	70 - 130	<0.20	ug/L	NC	30		
7559332	1,2-Dichloroethane	2021/09/07	78	70 - 130	83	70 - 130	<0.20	ug/L	NC	30		
7559332	1,4-Dichlorobenzene	2021/09/07	105	70 - 130	105	70 - 130	<0.20	ug/L	NC	30		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7559332	Benzene	2021/09/07	81	70 - 130	84	70 - 130	<0.10	ug/L	NC	30		
7559332	Bromodichloromethane	2021/09/07	NC	70 - 130	88	70 - 130	<0.10	ug/L	NC	30		
7559332	Bromoform	2021/09/07	82	70 - 130	87	70 - 130	<0.20	ug/L	NC	30		
7559332	Carbon Tetrachloride	2021/09/07	88	70 - 130	88	70 - 130	<0.10	ug/L	NC	30		
7559332	Chlorobenzene	2021/09/07	90	70 - 130	90	70 - 130	<0.10	ug/L	NC	30		
7559332	Chloroform	2021/09/07	NC	70 - 130	89	70 - 130	<0.10	ug/L	NC	30		
7559332	Dibromochloromethane	2021/09/07	82	70 - 130	87	70 - 130	<0.20	ug/L	NC	30		
7559332	Ethylbenzene	2021/09/07	88	70 - 130	86	70 - 130	<0.10	ug/L	NC	30		
7559332	Methylene Chloride(Dichloromethane)	2021/09/07	85	70 - 130	86	70 - 130	<0.50	ug/L	NC	30		
7559332	o-Xylene	2021/09/07	87	70 - 130	86	70 - 130	<0.10	ug/L	NC	30		
7559332	p+m-Xylene	2021/09/07	95	70 - 130	90	70 - 130	<0.10	ug/L	NC	30		
7559332	Tetrachloroethylene	2021/09/07	85	70 - 130	83	70 - 130	<0.10	ug/L	NC	30		
7559332	Toluene	2021/09/07	88	70 - 130	88	70 - 130	<0.20	ug/L	NC	30		
7559332	Total Trihalomethanes	2021/09/07					<0.20	ug/L	NC	30		
7559332	Total Xylenes	2021/09/07					<0.10	ug/L	NC	30		
7559332	Trichloroethylene	2021/09/07	92	70 - 130	91	70 - 130	<0.10	ug/L	NC	30		
7559332	Vinyl Chloride	2021/09/07	92	70 - 130	88	70 - 130	<0.20	ug/L	NC	30		
7560716	Turbidity	2021/09/07			99	85 - 115	<0.1	NTU	5.2	20		
7560960	Fluoride (F-)	2021/09/07	101	80 - 120	96	80 - 120	<0.10	mg/L	1.4	20		
7560961	Alkalinity (Total as CaCO3)	2021/09/07			96	85 - 115	<1.0	mg/L	0.48	20		
7560966	pH	2021/09/07			101	98 - 103			0.36	N/A		
7560968	Nitrate (N)	2021/09/07	99	80 - 120	101	80 - 120	<0.10	mg/L	NC	20		
7560968	Nitrite (N)	2021/09/07	104	80 - 120	103	80 - 120	<0.010	mg/L	NC	20		
7560983	Dissolved Sulphate (SO4)	2021/09/07	NC	75 - 125	103	80 - 120	<1.0	mg/L	0.25	20		
7560985	Dissolved Chloride (Cl-)	2021/09/07	NC	80 - 120	104	80 - 120	<1.0	mg/L	1.3	20		
7561547	NTA	2021/09/07	83	80 - 120	93	80 - 120	<0.050	mg/L	NC	20		
7561822	Diquat	2021/09/09	83	50 - 130	95	50 - 130	<7.0	ug/L	4.2	40		
7561822	Paraquat	2021/09/09	62	50 - 130	101	50 - 130	<1.0	ug/L	7.7	40		
7561948	Aluminum (Al)	2021/09/07	101	80 - 120	101	80 - 120	<4.9	ug/L	NC	20		
7561948	Antimony (Sb)	2021/09/07	103	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
7561948	Arsenic (As)	2021/09/07	100	80 - 120	97	80 - 120	<1.0	ug/L	0.41	20		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7561948	Barium (Ba)	2021/09/07	97	80 - 120	98	80 - 120	<2.0	ug/L	1.4	20		
7561948	Boron (B)	2021/09/07	97	80 - 120	97	80 - 120	<10	ug/L	2.0	20		
7561948	Cadmium (Cd)	2021/09/07	100	80 - 120	100	80 - 120	<0.090	ug/L	NC	20		
7561948	Calcium (Ca)	2021/09/07	NC	80 - 120	99	80 - 120	<200	ug/L	2.1	20		
7561948	Chromium (Cr)	2021/09/07	100	80 - 120	99	80 - 120	<5.0	ug/L	NC	20		
7561948	Copper (Cu)	2021/09/07	98	80 - 120	98	80 - 120	<0.90	ug/L	11	20		
7561948	Iron (Fe)	2021/09/07	98	80 - 120	97	80 - 120	<100	ug/L	1.1	20		
7561948	Lead (Pb)	2021/09/07	96	80 - 120	98	80 - 120	<0.50	ug/L	NC	20		
7561948	Magnesium (Mg)	2021/09/07	NC	80 - 120	97	80 - 120	<50	ug/L	1.4	20		
7561948	Manganese (Mn)	2021/09/07	98	80 - 120	99	80 - 120	<2.0	ug/L	1.0	20		
7561948	Potassium (K)	2021/09/07	98	80 - 120	96	80 - 120	<200	ug/L	1.9	20		
7561948	Selenium (Se)	2021/09/07	103	80 - 120	102	80 - 120	<2.0	ug/L	NC	20		
7561948	Sodium (Na)	2021/09/07	97	80 - 120	98	80 - 120	<100	ug/L	1.2	20		
7561948	Uranium (U)	2021/09/07	100	80 - 120	104	80 - 120	<0.10	ug/L	3.0	20		
7561948	Zinc (Zn)	2021/09/07	98	80 - 120	98	80 - 120	<5.0	ug/L	NC	20		
7562014	Mercury (Hg)	2021/09/07	95	75 - 125	97	80 - 120	<0.00010	mg/L	NC	20		
7562455	Sulphide	2021/09/07	103	80 - 120	103	80 - 120	<0.020	mg/L	NC	20		
7562606	Dissolved Organic Carbon	2021/09/08	80	80 - 120	96	80 - 120	<0.40	mg/L	0.84	20		
7563005	Total Kjeldahl Nitrogen (TKN)	2021/09/09	NC	80 - 120	95	80 - 120	<0.10	mg/L			96	80 - 120
7563603	Colour	2021/09/09			99	80 - 120	<2	TCU	NC	25		
7564587	Microcystin	2021/09/08	96	60 - 140	94	60 - 140	<0.10	ug/L	NC	20		
7564744	Total Ammonia-N	2021/09/09	100	75 - 125	97	80 - 120	<0.050	mg/L	2.8	20		
7565203	Methane	2021/09/09					<0.005	L/m3	6.1	20		
7565829	a-Chlordane	2021/09/09	89	30 - 130	85	30 - 130	<0.0060	ug/L	6.5	40		
7565829	Aldrin	2021/09/09	78	30 - 130	71	30 - 130	<0.0060	ug/L	5.0	40		
7565829	Aroclor 1016	2021/09/09					<0.050	ug/L				
7565829	Aroclor 1221	2021/09/09					<0.050	ug/L				
7565829	Aroclor 1232	2021/09/09					<0.050	ug/L				
7565829	Aroclor 1242	2021/09/09					<0.050	ug/L				
7565829	Aroclor 1248	2021/09/09					<0.050	ug/L				
7565829	Aroclor 1254	2021/09/09					<0.050	ug/L				

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7565829	Aroclor 1260	2021/09/09					<0.050	ug/L				
7565829	Dieldrin	2021/09/09	105	30 - 130	99	30 - 130	<0.0060	ug/L	5.2	40		
7565829	g-Chlordane	2021/09/09	94	30 - 130	85	30 - 130	<0.0060	ug/L	5.6	40		
7565829	Heptachlor epoxide	2021/09/09	100	30 - 130	89	30 - 130	<0.0060	ug/L	3.4	40		
7565829	Heptachlor	2021/09/09	83	30 - 130	75	30 - 130	<0.0060	ug/L	6.1	40		
7565829	Lindane	2021/09/09	97	30 - 130	88	30 - 130	<0.0060	ug/L	3.7	40		
7565829	Methoxychlor	2021/09/09	110	30 - 130	100	30 - 130	<0.024	ug/L	6.6	40		
7565829	o,p-DDD	2021/09/09	105	30 - 130	102	30 - 130	<0.0060	ug/L	6.0	40		
7565829	o,p-DDE	2021/09/09	114	30 - 130	94	30 - 130	<0.0060	ug/L	4.5	40		
7565829	o,p-DDT	2021/09/09	104	30 - 130	90	30 - 130	<0.0060	ug/L	7.6	40		
7565829	Oxychlordane	2021/09/09	91	30 - 130	84	30 - 130	<0.0060	ug/L	5.0	40		
7565829	p,p-DDD	2021/09/09	101	30 - 130	93	30 - 130	<0.0060	ug/L	6.0	40		
7565829	p,p-DDE	2021/09/09	82	30 - 130	74	30 - 130	<0.0060	ug/L	6.8	40		
7565829	p,p-DDT	2021/09/09	107	30 - 130	91	30 - 130	<0.0060	ug/L	9.9	40		
7566404	N-Nitrosodimethylamine	2021/09/14			102	65 - 135	<0.0009	ug/L	1.5	25		
7566501	2,3,4,6-Tetrachlorophenol	2021/09/09	83	30 - 130	82	30 - 130	<0.50	ug/L	1.7	40		
7566501	2,4,5-T	2021/09/09	82	30 - 130	80	30 - 130	<1.0	ug/L	4.9	40		
7566501	2,4,6-Trichlorophenol	2021/09/09	77	30 - 130	78	30 - 130	<0.50	ug/L	2.4	40		
7566501	2,4-D	2021/09/09	74	30 - 130	70	30 - 130	<1.0	ug/L	3.3	40		
7566501	2,4-Dichlorophenol	2021/09/09	68	30 - 130	69	30 - 130	<0.25	ug/L	0.99	40		
7566501	Alachlor	2021/09/09	108	40 - 130	108	40 - 130	<0.50	ug/L	2.0	40		
7566501	Aldicarb	2021/09/09	89	70 - 130	90	70 - 130	<5.0	ug/L	3.4	40		
7566501	Atrazine + Desethyl-atrazine	2021/09/09	64	30 - 130	62	30 - 130	<1.0	ug/L	0.36	40		
7566501	Atrazine	2021/09/09	86	30 - 130	84	30 - 130	<0.50	ug/L	0.95	40		
7566501	Bendiocarb	2021/09/09	89	40 - 130	90	40 - 130	<2.0	ug/L	2.4	40		
7566501	Benzo(a)pyrene	2021/09/09	101	30 - 130	96	30 - 130	<0.0050	ug/L	3.3	40		
7566501	Bromoxynil	2021/09/09	87	40 - 130	85	40 - 130	<0.50	ug/L	1.3	40		
7566501	Carbaryl	2021/09/09	91	40 - 130	91	40 - 130	<5.0	ug/L	0.80	40		
7566501	Carbofuran	2021/09/09	92	40 - 130	90	40 - 130	<5.0	ug/L	0.47	40		
7566501	Chlorpyrifos (Dursban)	2021/09/09	86	40 - 130	86	40 - 130	<1.0	ug/L	3.0	40		
7566501	Cyanazine (Bladex)	2021/09/09	80	40 - 130	76	40 - 130	<1.0	ug/L	1.9	40		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7566501	Des-ethyl atrazine	2021/09/09	42	30 - 130	40	30 - 130	<0.50	ug/L	3.1	40		
7566501	Diazinon	2021/09/09	77	40 - 130	78	40 - 130	<1.0	ug/L	2.4	40		
7566501	Dicamba	2021/09/09	75	30 - 130	73	30 - 130	<1.0	ug/L	2.8	40		
7566501	Diclofop-methyl	2021/09/09	89	40 - 130	87	40 - 130	<0.90	ug/L	1.2	40		
7566501	Dimethoate	2021/09/09	76	40 - 130	74	40 - 130	<2.5	ug/L	1.9	40		
7566501	Dinoseb	2021/09/09	84	40 - 130	82	40 - 130	<1.0	ug/L	1.3	40		
7566501	Ethyl Parathion	2021/09/09	80	40 - 130	78	40 - 130	<1.0	ug/L	0.67	40		
7566501	Malathion	2021/09/09	86	40 - 130	85	40 - 130	<5.0	ug/L	0.19	40		
7566501	Methyl parathion	2021/09/09	81	30 - 130	79	30 - 130	<1.0	ug/L	0.14	40		
7566501	Metolachlor	2021/09/09	77	40 - 130	77	40 - 130	<0.50	ug/L	0.72	40		
7566501	Metribuzin (Sencor)	2021/09/09	107	40 - 130	105	40 - 130	<5.0	ug/L	0.63	40		
7566501	Pentachlorophenol	2021/09/09	80	25 - 130	79	25 - 130	<0.50	ug/L	0.13	40		
7566501	Phorate	2021/09/09	74	40 - 130	74	40 - 130	<0.50	ug/L	2.5	40		
7566501	Picloram	2021/09/09	41	10 - 130	38	10 - 130	<5.0	ug/L	13	40		
7566501	Prometryne	2021/09/09	85	30 - 130	81	30 - 130	<0.25	ug/L	4.9	40		
7566501	Simazine	2021/09/09	80	40 - 130	78	40 - 130	<1.0	ug/L	0.038	40		
7566501	Terbufos	2021/09/09	79	40 - 130	79	40 - 130	<0.50	ug/L	1.3	40		
7566501	Triallate	2021/09/09	84	40 - 130	83	40 - 130	<1.0	ug/L	1.2	40		
7566501	Trifluralin	2021/09/09	94	40 - 130	91	40 - 130	<1.0	ug/L	3.6	40		
7567026	Glyphosate	2021/09/09	106	50 - 130	108	50 - 130	<10	ug/L	NC	40		
7567661	WAD Cyanide (Free)	2021/09/10	97	80 - 120	98	80 - 120	<0.0010	mg/L	NC	20		
7569961	Diuron	2021/09/10	88	40 - 130	85	40 - 130	<10	ug/L	NC	40		
7569961	Guthion (Azinphos-methyl)	2021/09/10	102	40 - 130	98	40 - 130	<2.0	ug/L	NC	40		
7569961	Temephos	2021/09/10	70	40 - 130	65	40 - 130	<10	ug/L	NC	40		
7615543	1,2,3,4,6,7,8-Hepta CDD	2021/10/03			105	70 - 140	<1.02, EDL=1.02	pg/L	2.8	25		
7615543	1,2,3,4,6,7,8-Hepta CDF	2021/10/03			99	82 - 122	<1.20, EDL=1.20	pg/L	3.0	25		
7615543	1,2,3,4,7,8,9-Hepta CDF	2021/10/03			99	78 - 138	<1.38, EDL=1.38	pg/L	2.0	25		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7615543	1,2,3,4,7,8-Hexa CDD	2021/10/03			104	70 - 164	<1.19, EDL=1.19	pg/L	8.3	25		
7615543	1,2,3,4,7,8-Hexa CDF	2021/10/03			103	72 - 134	<1.32, EDL=1.32	pg/L	1.9	25		
7615543	1,2,3,6,7,8-Hexa CDD	2021/10/03			114	76 - 134	<0.906, EDL=0.906	pg/L	0.88	25		
7615543	1,2,3,6,7,8-Hexa CDF	2021/10/03			103	84 - 130	<1.21, EDL=1.21	pg/L	2.9	25		
7615543	1,2,3,7,8,9-Hexa CDD	2021/10/03			111	64 - 162	<0.995, EDL=0.995	pg/L	4.4	25		
7615543	1,2,3,7,8,9-Hexa CDF	2021/10/03			103	78 - 130	<1.37, EDL=1.37	pg/L	0.97	25		
7615543	1,2,3,7,8-Penta CDD	2021/10/03			110	25 - 181	<1.03, EDL=1.03	pg/L	1.8	25		
7615543	1,2,3,7,8-Penta CDF	2021/10/03			107	80 - 134	<1.47, EDL=1.47	pg/L	3.7	25		
7615543	2,3,4,6,7,8-Hexa CDF	2021/10/03			108	70 - 156	<1.29, EDL=1.29	pg/L	1.8	25		
7615543	2,3,4,7,8-Penta CDF	2021/10/03			111	68 - 160	<1.27, EDL=1.27	pg/L	3.5	25		
7615543	2,3,7,8-Tetra CDD	2021/10/03			99	67 - 158	<1.33, EDL=1.33	pg/L	2.0	25		
7615543	2,3,7,8-Tetra CDF	2021/10/03			102	75 - 158	<1.06, EDL=1.06	pg/L	1.9	25		
7615543	Octa CDD	2021/10/03			112	78 - 144	<1.14, EDL=1.14	pg/L	2.6	25		
7615543	Octa CDF	2021/10/03			116	63 - 170	1.31, EDL=1.24	pg/L	3.4	25		
7615543	Total Hepta CDD	2021/10/03					<1.02, EDL=1.02	pg/L				
7615543	Total Hepta CDF	2021/10/03					<1.28, EDL=1.28	pg/L				

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7615543	Total Hexa CDD	2021/10/03					<1.02, EDL=1.02	pg/L				
7615543	Total Hexa CDF	2021/10/03					<1.30, EDL=1.30	pg/L				
7615543	Total Penta CDD	2021/10/03					<1.03, EDL=1.03	pg/L				
7615543	Total Penta CDF	2021/10/03					<1.36, EDL=1.36	pg/L				
7615543	Total Tetra CDD	2021/10/03					<1.33, EDL=1.33	pg/L				
7615543	Total Tetra CDF	2021/10/03					<1.06, EDL=1.06	pg/L				

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Brad Newman, B.Sc., C.Chem., Scientific Service Specialist

Cathy Xu, Scientific Specialist, Ultra Trace Analysis, HRMS

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Farhana Rahman, Senior Analyst

Melissa DiGrazia, Operations Manager, HRMS Department

Soham Patel, Analyst 2

Tom Mitchell, B.Sc, Supervisor, Compressed Gases

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VALIDATION SIGNATURE PAGE(CONT'D)

The analytical data and all QC contained in this report were reviewed and validated by:

For Service Group specific validation please refer to the Validation Signature Page.

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CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#21375 Golder Associates Ltd	Company Name:		Quotation #:	B80683	BV Labs Job #:	Bottle Order #: 842984
Attention:	Accounts Payable	Attention:	Gregory Padusenko	P.O. #:			
Address:	210 Sheldon Drive Cambridge ON N1T 1A8	Address:		Project:	21456909	COC #: C#842984-01-01	Project Manager: Ema Gitej
Tel:	(519) 620-8182 Fax:	Tel:	(519) 620-8182 Ext: 6509 Fax: (519) 620-9878	Project Name:			
Email:	CanadaAccountsPayableInvoices@golder.com	Email:	Gregory_Padusenko@golder.com	Site #:			
				Sampled By:	PEM		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ☐ PWQO ☐ Reg 406 Table ☐ Other

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ____

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle) Metals / Hg / Cr VI	ODWSOG Tables 1, 2 and 4	# of Bottles	Comments
1		PW21-1	21/09/03	10:00	GW		X	27	disregard date on label
2									
3									
4									
5									
6									
7									
8									
9									
10									

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ____ Time Required: ____ ☐
Rush Confirmation Number: ____ *(call lab for #)*

REC'D IN WATERLOO
03-Sep-21 13:54
Ema Gitej
C1P4129
YTH ENV-1270
On Ice Packs

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Rec'd	Custody Seal Present	Yes	No
Paul McKell	21/09/03	13:59	Inspect Courier Rep + Return	2021/09/03	13:54			9/1/12 15/15/15	Intact		

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

White: BV Labs Yellow: Client

Bureau Veritas Canada (2019) Inc.

BV#421154 ONSCE 7174 9/4/6 9/9/9 Submitted as 2 coolers

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Works #: 210000568-NR

22-September-2021

Bureau Veritas Canada - Mississauga
Attn : Subcontract Coordinator

6740 Campobello Road
Mississauga, ON
L5N 2L8, Canada

Phone: 905-817-5798
Fax:

Date Rec. : 07 September 2021
LR Report: **CA15208-SEP21**
Reference: Job#: C1P4129

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Sample ID	Sample Date & Time	Temperature Upon Receipt °C	Bromate mg/L
1: Analysis Start Date		---	16-Sep-21
2: Analysis Start Time		---	13:01
3: Analysis Completed Date		---	22-Sep-21
4: Analysis Completed Time		---	11:40
5: MAC		---	0.01
6: MDL		---	0.005
7: QC - Blank		---	< 0.005
8: QC - STD % Recovery		---	98%
9: QC - DUP % RPD		---	ND
10: NR PW21-1	03-Sep-21 10:00	14.0	< 0.005

MAC - Maximum Acceptable Concentration
MDL - SGS Method Detection Limit
NR - Not regulated / reportable under applicable Provincial drinking water regulations as per client.
ND - Not Detected

Method Descriptions

Parameter	Description	SGS Method Code
Bromate	Bromate by Ion Chromatograph	ME-CA-[ENV]IC-LAK-AN-006

Kimberley Didsbury
Project Specialist,
Environment, Health & Safety

OnLine LIMS

0002649470

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Test method information available upon request. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples. SGS Canada Inc. Environment-Health & Safety statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.



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