THURBER ENGINEERING LTD.

February 4, 2014 File: 17-971-18

Cowichan Valley Regional District
175 Ingram Street
Duncan, BC V9L 1N8

Attention: Emily Doyle-Yamaguchi

NEW MONITORING WELL CONSTRUCTION AND WELL SAMPLING
FISHER ROAD GROUNDWATER INVESTIGATION

Dear Emily:

Thurber Engineering Ltd. (Thurber) is pleased to submit this report summarizing the construction of a new up-gradient monitoring well (MW13-4) and sampling of the new and existing monitoring wells (MW12-1, -2, and -3).

Use of this document is subject to our Statement of Limitations and Conditions, which is included at the end of the text.

1. BACKGROUND AND SCOPE OF WORK

Thurber was retained by the Cowichan Valley Regional District (CVRD) in 2011 to investigate the source of nitrate contamination in groundwater in the area of Fisher Road in Cobble Hill, BC. A series of phased studies were undertaken by Thurber between 2011 and 2013 (i.e. 2011a, 2011b, 2013) which included the drilling and sampling of three groundwater monitoring wells (i.e. MW12-1, MW12-2 and MW12-3, see Drawing 17-971-18-1 in Appendix A) located immediately down-gradient from three suspected sources of groundwater nitrate inputs which included commercial composting operations at 1345 and 1355 Fisher Road and commercial greenhouses at 1360 Fisher Road/1375 Fairfield Road. Our 2013 investigation revealed that MW12-2 contained the highest groundwater nitrate concentrations of the three previously installed wells and the nitrate from the well had a distinct isotopic signature consistent with being sourced from synthetic-based chemical nitrate fertilizers. The nitrate concentrations observed within the other two monitoring wells (i.e. MW12-1 and MW12-3) were lower than those observed at MW12-2 but still exceeded the BC Contaminated Sites Regulation (CSR) Drinking Water (DW) standards. The isotopic signatures of the nitrates within the groundwater at MW12-1 and MW12-3 were similar to each other and consistent with being sourced from decomposing organic material.

One of the recommendations of our April 30, 2013 groundwater investigation report was that a new groundwater monitoring well be installed to the south (i.e. up-gradient) of MW12-2 and the greenhouses at 1360 Fisher Road/1375 Fairfield Road for the purpose of delineating the southward extent of the plume(s).

The original scope of work for this project (letter dated May 14, 2013) included locating and directing the construction of a new up-gradient well (labelled MW13-4), developing and sampling

the new well, and reporting on the results. This scope of work was expanded in November 2013 to include sampling the existing 3 monitoring wells.

This report summarizes the results of new well construction and development and presents the data and interpretations from groundwater sampling and analysis.

2. METHODOLOGY

2.1 New Well Construction and Development

Drilling and construction of MW13-4 was conducted by Drillwell Enterprises Ltd. (Drillwell) on November 26, 2013. The new well is located on the Fairfield Road right-of-way in the general area recommended by Thurber (see Drawing 17-971-18-1). The borehole was advanced through sand to a depth of 41 m below the ground surface using the dual-rotary method of drilling. Saturated conditions were observed below a depth of about 34 m.

The well was constructed using 50 mm-diameter PVC with a 1.5 m long screened section from 69.7 to 68.2 masl (i.e. 39 to 37.5 meters below ground). The top of the slotted section was set at approximately 3.5 m below the water table as measured on November 28, 2013. The depth below the water table of the screened interval at MW13-4 is similar to the other three monitoring wells. Filter sand (i.e. sterile sand with a grain size range of approximately 1 to 2 mm) was placed around the well screen and 15 cm above and below it in accordance with the B.C. Ministry of Environment Technical Guidance Document #8. A 1.8 m thick layer of bentonite was placed immediately above the sand pack followed by alternating layers of pea gravel (6 m thick) and bentonite (0.9 m thick) with a 4.6 m thick bentonite layer at the surface. The well casing is protected at the surface with a locked steel monument that was concreted in place.

The completed well was developed on November 28, 2013 by surging and pumping using a Waterra inertial pump with dedicated tubing and foot valve. Development was considered complete once a sufficient amount of particulate was removed from the well (evidenced by significant clarification of the water).

Details of the MW13-4 lithology and construction are provided in Figure 1 and the original driller's log, which are both located in Appendix B. Table 1 in Appendix B summarizes the construction details for all 4 of the monitoring wells.

2.2 Well Sampling and Water Level Monitoring

All of the monitoring wells (MW12-1 to -3 and MW13-4) were purged and sampled on November 28, 2013 using a Waterra Hydrolift 2 inertial pump with the existing tubing and foot valves dedicated to each well. Before sampling, at least 3 well volumes of water were purged from each well and field parameters (electrical conductivity (EC), pH, and temperature), collected during purging, were observed to stabilize.

Water samples were placed into laboratory-supplied containers specific to each analysis. Where applicable, preservatives were added in the field. Filtration through a 45 µm, in-line filter for

dissolved metals and nitrate isotopes analyses was conducted in the Thurber laboratory on the same day as sampling. The bottles were then stored in a refrigerator before being delivered to Maxxam Analytics in Victoria on November 29, 2013. The samples for isotope analysis were shipped to the University of Calgary Isotope Science Laboratory on December 2, 2013.

The following analyses were conducted on the groundwater samples:

- Routine parameters including major ions, pH, alkalinity, hardness, total dissolved solids, etc.
- Nitrogen species (nitrate, nitrite, ammonia, total nitrogen and total Kjeldahl nitrogen)
- Total and dissolved metals
- Nitrate isotopes (^{15}N and ^{18}O)

During well sampling the existing data-logging transducers were downloaded. The transducers have been continuously measuring water levels in wells MW12-1 to MW12-3 since September 2012. After collecting the data, the transducer from MW12-2 was removed and placed in the new well MW13-4.

3. MONITORING AND SAMPLING RESULTS

Continuous and manual-measured groundwater elevations in the monitoring wells are shown in Figure 2 in Appendix B. As in the past, high frequency, small-scale fluctuations in groundwater elevations (on the order of 0.5 m) are evident. These are thought to result from the delayed transfer of barometric fluctuations through the thick unsaturated sands that overlie the aquifer (Thurber, 2013). The relative gradients between wells MW12-1 to -3 observed since January 2013 (the previous download date) are similar to those from September 2012. This is consistent with our previous interpretation that the flow gradient in this area of the aquifer does not change significantly over time. Now that over a year of data are available, a larger scale, seasonal trend (on the order of 0.2 to 0.4 m) in the water levels is apparent. As is typical in this climatic region, the highest groundwater elevations in the aquifer occur in the late spring-early summer and are the lowest in the fall.

The groundwater flow gradient based on manual water level measurements taken on November 28, 2013 is also consistent with previous estimates, trending toward the north-northwest at a magnitude of approximately 0.004. The measured flow directions obtained from groundwater level measurements collected from three separate occasions are shown on Drawing 17-971-18-1 as dashed-line arrows.

Table 2 in Appendix C summarizes the sampling results and compares them to applicable Canadian Drinking Water Quality Guideline (CDWQG) values and to BC CSR Schedule 6 Generic Numerical Standards for Drinking Water (DW). Concentrations that exceed the CDWQG are highlighted yellow, those that exceed the CSR standards are shaded tan, and numbers that

exceed both standards are shaded red. Note that the CSR standards apply to dissolved metals while the CDWQG apply to total metals. Laboratory data sheets are also included in Appendix C.

All sampled parameters in MW13-4 were below the respective GCDWQ and CSR guideline values with the exception of total iron and manganese (12.9 and 0.988 mg/L respectively) which exceeded the GCDWQ guideline aesthetic objectives (0.3 and 0.05 mg/L). These metals are commonly found in abundance in regional domestic wells, and are present above the Guideline values in all the monitoring wells on all sampling dates. Total iron and manganese are therefore thought to be naturally occurring in the aquifer at this location.

Concentrations of major ions and dissolved/total metals in the samples from MW12-1 to -3 were generally consistent with those of historic sampling, including the previously-described notable differences in chemistry between wells such as: elevated total dissolved solids (TDS) at MW12-2 (780 mg/L compared to 293, 591, and 314 in MW12-1, -3, and MW13-4 respectively) and higher chloride at MW12-3 (180 mg/L versus 26, 38, and 23 mg/L).

The nitrate and nitrate isotope concentrations in the previously sampled monitoring wells were also similar to historic values. Nitrate was 23.2 mg/L at MW12-1, 91.7 mg/L at MW12-2, and 16.9 mg/L at MW12-3, which all exceeded the CDWQG and CSR DW criterion value of 10 mg/L. The nitrate concentration in the new up-gradient well was 0.252 mg/L, which is significantly lower than the nitrate concentrations observed in the other wells.

Nitrate isotope (^{15}N and ^{18}O) results for the recent sampling have been plotted with the previous results on Figure 3 in Appendix C. As can be seen on the figure, the isotope ratios obtained from the most recent sampling of monitoring wells MW12-1 to -3 plot in similar locations to previous ones. Our interpretation continues to be that the groundwater at MW12-2 has a different, synthetic fertilizer-based nitrate isotope signature than that of MW12-1 and -3, which is indicative of organic material-sourced nitrates (Thurber, 2013). The nitrate isotope ratios for the new up-gradient monitoring well MW13-4 plot in a distinctly different area from those of the other monitoring wells suggesting a different nitrate source.

4. CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the recent up-gradient monitoring well drilling, existing and new well sampling and groundwater level monitoring, we conclude the following:

- Water level measurements confirm that the horizontal flow gradient in the area is toward the north-northwest. This flow direction is consistent with previously determined results. The consistency in the relative groundwater elevations over the 14 month period of continuous monitoring indicate that significant changes to the seasonal groundwater flow direction do not occur within the aquifer in the Fisher Road area.

- The results of the most-recent sample analysis from MW12-1, MW12-2 and MW12-3 are consistent with previous results. Additional sampling will be required to determine if temporal trends in total or dissolved groundwater chemistry are occurring.

- The low nitrate concentration detected in the up-gradient well indicates that a source of groundwater nitrate contamination exists between the MW13-4 and MW12-2 well locations.

- The low groundwater nitrate concentration (and its distinctive isotopic signature) at the up-gradient well may suggest a natural source of nitrate indicative of un-impacted groundwater conditions in the aquifer.

- The conceptual model of the aquifer remains unchanged. There appears to be a minimum of two distinct plumes of nitrate contamination in the area including a synthetic fertilizer-based plume originating from the area of 1360 Fisher Road and one or more organic-material sourced nitrate plumes originating from the area of 1345 and 1355 Fisher Road.

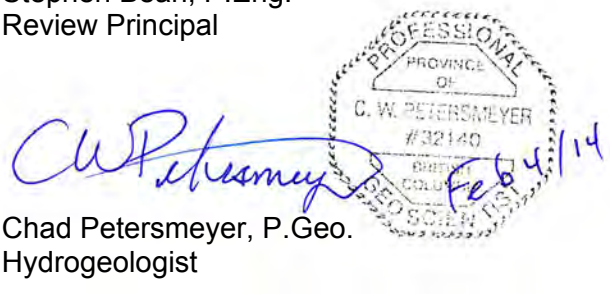
On-going annual monitoring and sampling of the 4 monitoring wells is recommended to assess trends in nitrate concentrations and water levels over time. A plan and cost for this work was submitted to the CVRD on December 5, 2013.

As stated previously (Thurber, 2013), additional monitoring wells to the north, east, and west of MW12-1, MW12-3, and the composting operations would be required to further delineate the nitrate plume(s) in this area.

5. CLOSURE

We trust the above provides the information you require at this time. If you have any questions regarding this document, please contact the undersigned at your earliest convenience.

Yours truly,
Thurber Engineering Ltd.
Stephen Bean, P.Eng.
Review Principal



Chad Petersmeyer, P.Geo.
Hydrogeologist

Attachments

6. REFERENCES

Thurber Engineering Ltd., Fisher Road Groundwater Investigation, Cobble Hill, B.C., report submitted to the CVRD, April 30, 2013.

Thurber Engineering Ltd., Preliminary Environmental Assessment, 1355 Fisher Road, Cobble Hill, B.C., report submitted to the CVRD, December 5, 2011a.

Thurber Engineering Ltd., 1355 Fisher Road, Cobble Hill, BC, Groundwater Flow Assessment, report submitted to the CVRD, May 16, 2011b.

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STATEMENT OF LIMITATIONS AND CONDITIONS

1. STANDARD OF CARE

This study and Report have been prepared in accordance with generally accepted engineering or environmental consulting practices in this area. No other warranty, expressed or implied, is made.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report which is of a summary nature and is not intended to stand alone without reference to the instructions given to us by the Client, communications between us and the Client, and to any other reports, writings, proposals or documents prepared by us for the Client relative to the specific site described herein, all of which constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. WE CANNOT BE RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3. BASIS OF REPORT

The Report has been prepared for the specific site, development, design objectives and purposes that were described to us by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the document, subject to the limitations provided herein, are only valid to the extent that this Report expressly addresses proposed development, design objectives and purposes, and then only to the extent there has been no material alteration to or variation from any of the said descriptions provided to us unless we are specifically requested by the Client to review and revise the Report in light of such alteration or variation or to consider such representations, information and instructions.

4. USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT OUR WRITTEN CONSENT AND SUCH USE SHALL BE ON SUCH TERMS AND CONDITIONS AS WE MAY EXPRESSLY APPROVE. The contents of the Report remain our copyright property. The Client may not give, lend or, sell the Report, or otherwise make the Report, or any portion thereof, available to any person without our prior written permission. Any use which a third party makes of the Report, are the sole responsibility of such third parties. Unless expressly permitted by us, no person other than the Client is entitled to rely on this Report. We accept no responsibility whatsoever for damages suffered by any third party resulting from use of the Report without our express written permission.

5. INTERPRETATION OF THE REPORT

a) Nature and Exactness of Soil and Contaminant Description: Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature. Comprehensive sampling and testing programs implemented with the appropriate equipment by experienced personnel, may fail to locate some conditions. All investigations utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and the Client and all other persons making use of such documents or records with our express written consent should be aware of this risk and this report is delivered on the express condition that such risk is accepted by the Client and such other persons. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. Where special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

b) Reliance on Provided Information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to us. We have relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, we cannot accept responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other persons providing information relied on by us. We are entitled to rely on such representations, information and instructions and are not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.

(see over …)

c) Design Services: The Report may form part of the design and construction documents for information purposes even though it may have been issued prior to the final design being completed. We should be retained to review the final design, project plans and documents prior to construction to confirm that they are consistent with the intent of the Report. Any differences that may exist between the report recommendations and the final design detailed in the contract documents should be reported to us immediately so that we can address potential conflicts.

d) Construction Services: During construction we must be retained to provide field reviews. Field reviews consist of performing sufficient and timely observations of encountered conditions to confirm and document that the site conditions do not materially differ from those interpreted conditions considered in the preparation of the report. Adequate field reviews are necessary for Thurber to provide letters of assurance, in accordance with the requirements of many regulatory authorities.

6. RISK LIMITATION

Geotechnical engineering and environmental consulting projects often have the potential to encounter pollutants or hazardous substances and the potential to cause an accidental release of those substances. In consideration of the provision of the services by us, which are for the Client's benefit, the Client agrees to hold harmless and to indemnify and defend us and our directors, officers, servants, agents, employees, workmen and contractors (hereinafter referred to as the "Company") from and against any and all claims, losses, damages, demands, disputes, liability and legal investigative costs of defence, whether for personal injury including death, or any other loss whatsoever, regardless of any action or omission on the part of the Company, that result from an accidental release of pollutants or hazardous substances occurring as a result of carrying out this Project. This indemnification shall extend to all Claims brought or threatened against the Company under any federal or provincial statute as a result of conducting work on this Project. In addition to the above indemnification, the Client further agrees not to bring any claims against the Company in connection with any of the aforementioned causes.

7. SERVICES OF SUBCONSULTANTS AND CONTRACTORS

The conduct of engineering and environmental studies frequently requires hiring the services of individuals and companies with special expertise and/or services which we do not provide. We may arrange the hiring of these services as a convenience to our Clients. As these services are for the Client's benefit, the Client agrees to hold the Company harmless and to indemnify and defend us from and against all claims arising through such hirings to the extent that the Client would incur had he hired those services directly. This includes responsibility for payment for services rendered and pursuit of damages for errors, omissions or negligence by those parties in carrying out their work. In particular, these conditions apply to the use of drilling, excavation and laboratory testing services.

8. CONTROL OF WORK AND JOBSITE SAFETY

We are responsible only for the activities of our employees on the jobsite. The presence of our personnel on the site shall not be construed in any way to relieve the Client or any contractors on site from their responsibilities for site safety. The Client acknowledges that he, his representatives, contractors or others retain control of the site and that we never occupy a position of control of the site. The Client undertakes to inform us of all hazardous conditions, or other relevant conditions of which the Client is aware. The Client also recognizes that our activities may uncover previously unknown hazardous conditions or materials and that such a discovery may result in the necessity to undertake emergency procedures to protect our employees as well as the public at large and the environment in general. These procedures may well involve additional costs outside of any budgets previously agreed to. The Client agrees to pay us for any expenses incurred as the result of such discoveries and to compensate us through payment of additional fees and expenses for time spent by us to deal with the consequences of such discoveries. The Client also acknowledges that in some cases the discovery of hazardous conditions and materials will require that certain regulatory bodies be informed and the Client agrees that notification to such bodies by us will not be a cause of action or dispute.

9. INDEPENDENT JUDGEMENTS OF CLIENT

The information, interpretations and conclusions in the Report are based on our interpretation of conditions revealed through limited investigation conducted within a defined scope of services. We cannot accept responsibility for independent conclusions, interpretations, interpolations and/or decisions of the Client, or others who may come into possession of the Report, or any part thereof, which may be based on information contained in the Report. This restriction of liability includes but is not limited to decisions made to develop, purchase or sell land.

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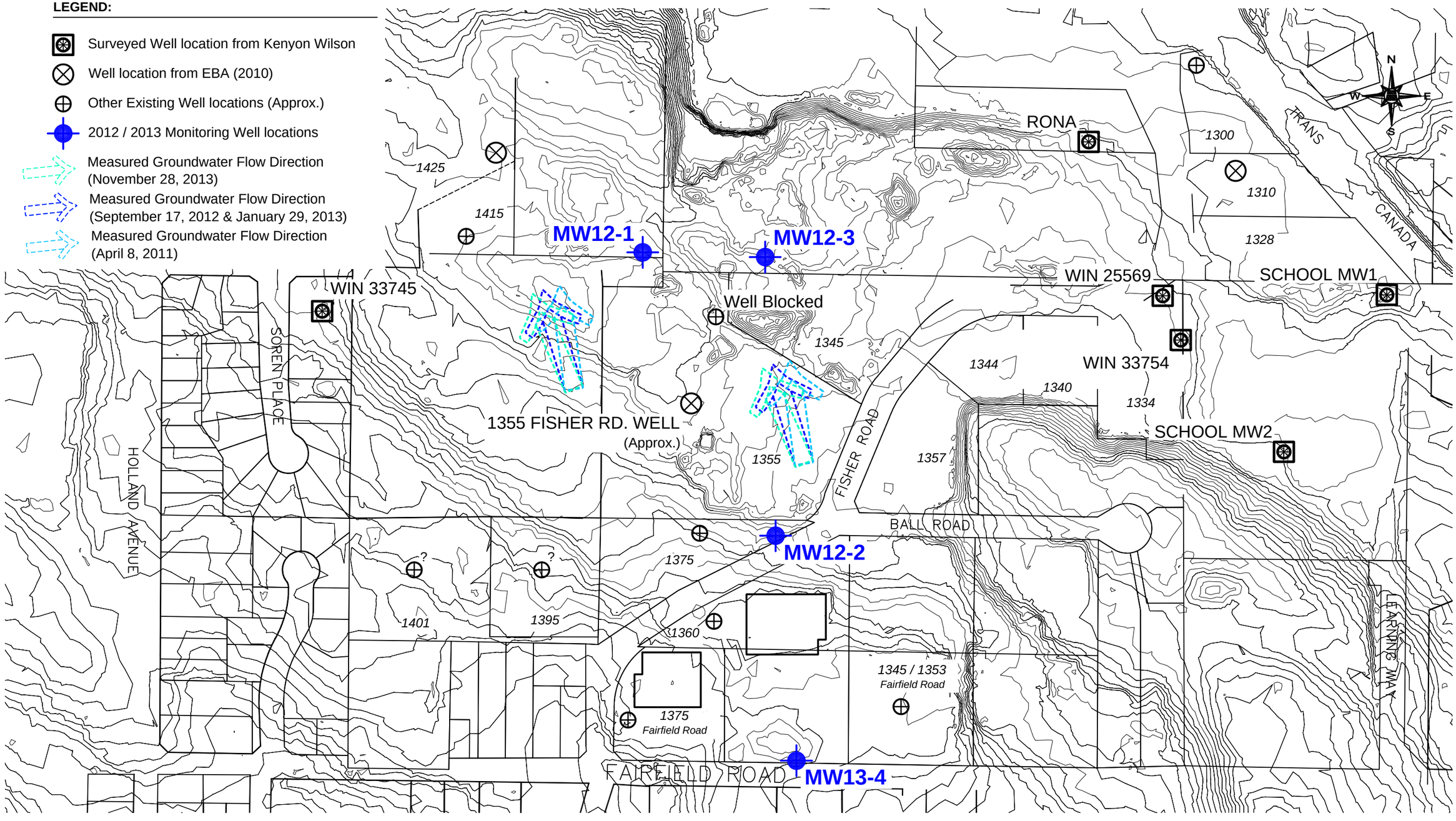
FEBRUARY 6, 2014

LEGEND:

- Surveyed Well location from Kenyon Wilson
- Well location from EBA (2010)
- Other Existing Well locations (Approx.)
- 2012 / 2013 Monitoring Well locations
- Measured Groundwater Flow Direction (November 28, 2013)
- Measured Groundwater Flow Direction (September 17, 2012 & January 29, 2013)
- Measured Groundwater Flow Direction (April 8, 2011)



NOTES:

1. Digital base plan provided by Kenyon Wilson, Land Surveyors.
2. Contours from C.V.R.D.; 1 m contour intervals.

0 25 50 75 100 150 200 m

SCALE 1:3000

DESIGNED	CWP / PJW
DRAWN	RRS
DATE	DECEMBER 10, 2013
APPROVED	PJW
SCALE	1:3000

COWICHAN VALLEY REGIONAL DISTRICT

FISHER ROAD AREA WELL LOCATIONS

FISHER ROAD GROUNDWATER MONITORING COBBLE HILL, B.C.

THURBER

DWG. NO. 17-971-18-1

TED04267.DWG

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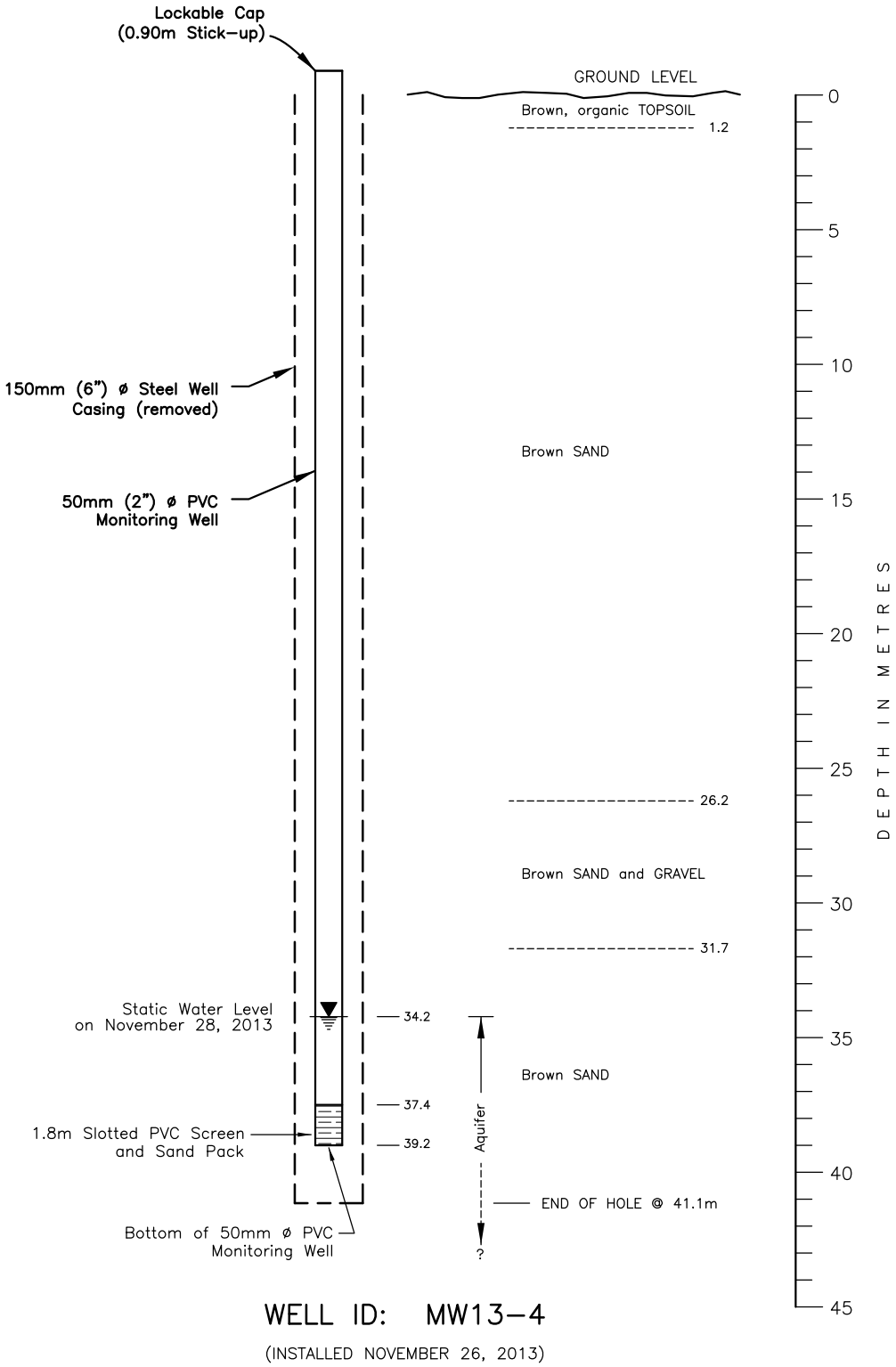
MONITORING WELL 13-4
WELL CONSTRUCTION & LITHOLOGY LOG

Not to Scale



WELL ID: MW13-4

(INSTALLED NOVEMBER 26, 2013)

FIGURE 1

Client: Cowichan Valley Regional District
File No.: 17-971-18
E-File: TED04266.dwg

Date: December 10, 2013

BRITISH COLUMBIA
Ministry of Environment

☒ Well Construction Report
☐ Well Closure Report
☐ Well Alteration Report

MW13-4

DRILLWELL ENTERPRISES LTD.
4994 Polkey Road
Duncan, B.C. V9L 6W3
Phone: 250-746-5268

Ministry Well ID Plate Number:
Ministry Well Tag Number:
☐ Confirmation/alternative specs. attached
☐ Original well construction report attached

Red lettering indicates minimum mandatory information. See reverse for notes & definitions of abbreviations.

Owner name: Cowichan Valley Regional Dist. CVRD MW13-4
Mailing address: 175 Ingram St. Town Duncan Prov. BC Postal Code V9L 1N8
Well Location: Address: Street no. Street name Fairfield Rd. Town Cobble Hill
(or) **Legal description:** Lot Plan D.L. Block Sec. Twp. Rg. Land District Shawnigan
(or) **PID:** (and) **Description of well location** (attach sketch, if nec.): North side of Fairfield Rd. on road Allowance west of 1353 Fairfield MW13-4
NAD 83: Zone: 10 (see note 2) (and) **UTM Northing:** 5393180 N m (or) **Latitude (see note 3):**
UTM Easting: 456178 E m **Longitude:**
Method of drilling: ☒ air rotary ☐ cable tool ☐ mud rotary ☐ auger ☐ driving ☐ jetting ☐ excavating ☐ other (specify):
Orientation of well: ☒ vertical ☐ horizontal Ground elevation: ft (asl) Method (see note 4): GPS
Class of well (see note 5): Monitoring **Sub-class of well:** Permanent.
Water supply wells: indicate intended water use: ☐ private domestic ☐ water supply system ☐ irrigation ☐ commercial or industrial ☐ other (specify):

Lithologic description (see notes 7-14) or closure description (see notes 15 and 16)

From ft (bgl)	To ft (bgl)	Relative Hardness	Colour	Material Description (Use recommended terms on reverse. List in order of decreasing amount, if applicable)	Water-bearing Estimated Flow (USgpm)	Observations (e.g., fractured, weathered, well sorted, silty wash), closure details
0	4	S	Brn	Topsoil		
4	86	S	Brn	Sand		
86	104	M	Brn	Sand & Gravel		
104	135	S	Brn	Sand. fine to med.		Water bearing at 125
15'	116'	→		Layered Pea gravel & bentonite chips: 20' grav, 3 ft bent. Drilled with 6" Threaded Casing		
Installed well at 128'. 5ft pvc screen from 123 to 128' Sand pack from 122'-6" to 128'-6": 6ft bentonite to 116'						

Casing details

From ft (bgl)	To ft (bgl)	Dia in	Casing Material / Open Hole	Wall Thickness in	Drive Shoe
0	135	6"	steel - Pulled out		
0	2				
0	128	2"	PVC sched 40.		

Screen details

From ft (bgl)	To ft (bgl)	Dia in	Type (see note 18)	Slot Size
0	123	2"	PVC Blank pipe Sched 40	
123	128	2"	PVC screen	0.010 10 thou.

Surface seal: Type: Bentonite Chips Depth: 15 ft
Method of installation: ☒ Poured ☐ Pumped Thickness: in
Backfill: Type: Depth: ft
Liner: ☐ PVC ☐ Other (specify):
Diameter: in Thickness: in
From: ft (bgl) To: ft (bgl) Perforated: From: ft (bgl) To: ft (bgl)

Intake: ☒ Screen ☐ Open bottom ☐ Uncased hole
Screen type: ☐ Telescope ☒ Pipe size
Screen material: ☐ Stainless steel ☒ Plastic ☐ Other (specify):
Screen opening: ☐ Continuous slot ☒ Slotted ☐ Perforated pipe
Screen bottom: ☐ Bail ☒ Plug ☐ Plate ☐ Other (specify):
Filter pack: From: 123 ft To: 128 ft Thickness: 2 in
Type and size of material: Target: 10/20 Filter Sand.

Developed by: N/a: Monitoring well

☐ Air lifting ☐ Surging ☐ Jetting ☐ Pumping ☐ Bailing
☐ Other (specify): Total duration: hrs
Notes:

Well yield estimated by:

☐ Pumping ☐ Air lifting ☐ Bailing ☐ Other (specify):
Rate: USgpm Duration: hrs
SWL before test: ft (btoc) Pumping water level: ft (btoc)

Obvious water quality characteristics:

☐ Fresh ☐ Salty ☐ Clear ☐ Cloudy ☐ Sediment ☐ Gas
Colour/odour: Water sample collected: ☐

Final well completion data:

Total depth drilled: 135 ft Finished well depth: 128 ft (bgl)
Final stick up: 24 in Depth to bedrock: N/A ft (bgl)
SWL: 113 ft (btoc) Estimated well yield: USgpm
Artesian flow: USgpm, or Artesian pressure: ft
Type of well cap: Locking Monument Well disinfected: ☐ Yes ☒ No
Where well ID plate is attached: Not

Well closure information:

Reason for closure:
Method of closure: ☐ Poured ☐ Pumped
Sealant material: Backfill material:
Details of closure (see note 17):

Well driller (print clearly):

Name (first, last) (see note 19): Shawn Slade
Registration no. (see note 20): WD 04121404
Consultant (if applicable; name and company): C. Petersmyre Thurber

Date of work (YYYY/MM/DD):
Started: 2013/11/25 Completed: 2013/11/26
Comments:

DECLARATION: Well construction, well alteration or well closure, as the case may be, has been done in accordance with the requirements in the *Water Act* and the Ground Water Protection Regulation.

Signature of Driller Responsible

PLEASE NOTE: The information recorded in this well report describes the works and hydrogeologic conditions at the time of construction, alteration or closure, as the case may be. Well yield, well performance and water quality are not guaranteed as they are influenced by a number of factors, including natural variability, human activities and condition of the works, which may change over time.

white: Customer copy
canary: Driller copy
pink: Ministry copy

Sheet ____ of ____

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TABLE 1: FISHER ROAD GROUNDWATER MONITORING WELL SUMMARY TABLE

Well ID	MW12-1	MW12-2	MW12-3	MW13-4
General Location	North of 1355 Fisher Road East of Galliers Road	South of 1355 Fisher Road West of Ball Road Intersection	North of 1345 Fisher Road	Fairfield Road
UTM Easting	456052.8	456159.7	456151.3	456176.5
UTM Northing	5393596.6	5393368.4	5393592.8	5393187.2
Installation Date	June 18, 2012	July 31, 2012	July 26, 2012	November 26, 2013
Installation Method	Dual Air Rotary	Dual Air Rotary	Dual Air Rotary	Dual Air Rotary
Ground Elevation (masl)	126.3	117.7	122.3	107.2
Top of Casing Elevation (masl)	126.86	118.26	123.07	108.17
Screen Length (m)	1.5	1.5	1.5	1.5
Screen Interval (masl)	66.3 to 67.8	68.0 to 69.6	66.4 to 67.9	68.2 to 69.7
Sand Pack	0.3 m above top of screen capped with a 1.2 m long bentonite plug	0.3 m above top of screen capped with a 1.2 m long bentonite plug	0.3 m above top of screen capped with a 1.2 m long bentonite plug	0.15 m above top and below bottom of screen capped with a 1.8 m long bentonite plug
Well Backfill	gravel + bentonite with 6 m bentonite seal at surface	pea gravel with 4.6 m bentonite seal at surface	pea gravel with 4.9 m bentonite seal at surface	pea gravel with 4.6 m bentonite seal at surface
Monitoring Date	**Water Level Elevation (masl)**			
September 17, 2012	71.21	72.35	71.37	-
January 29, 2013	70.99	72.08	71.15	-
February 18, 2013	-	72.25	71.3	-
November 28, 2013	70.97	72.12	71.18	73.05

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COWICHAN VALLEY REGIONAL DISTRICT
FISHER ROAD REGIONAL GROUNDWATER INVESTIGATION - GROUNDWATER LEVELS

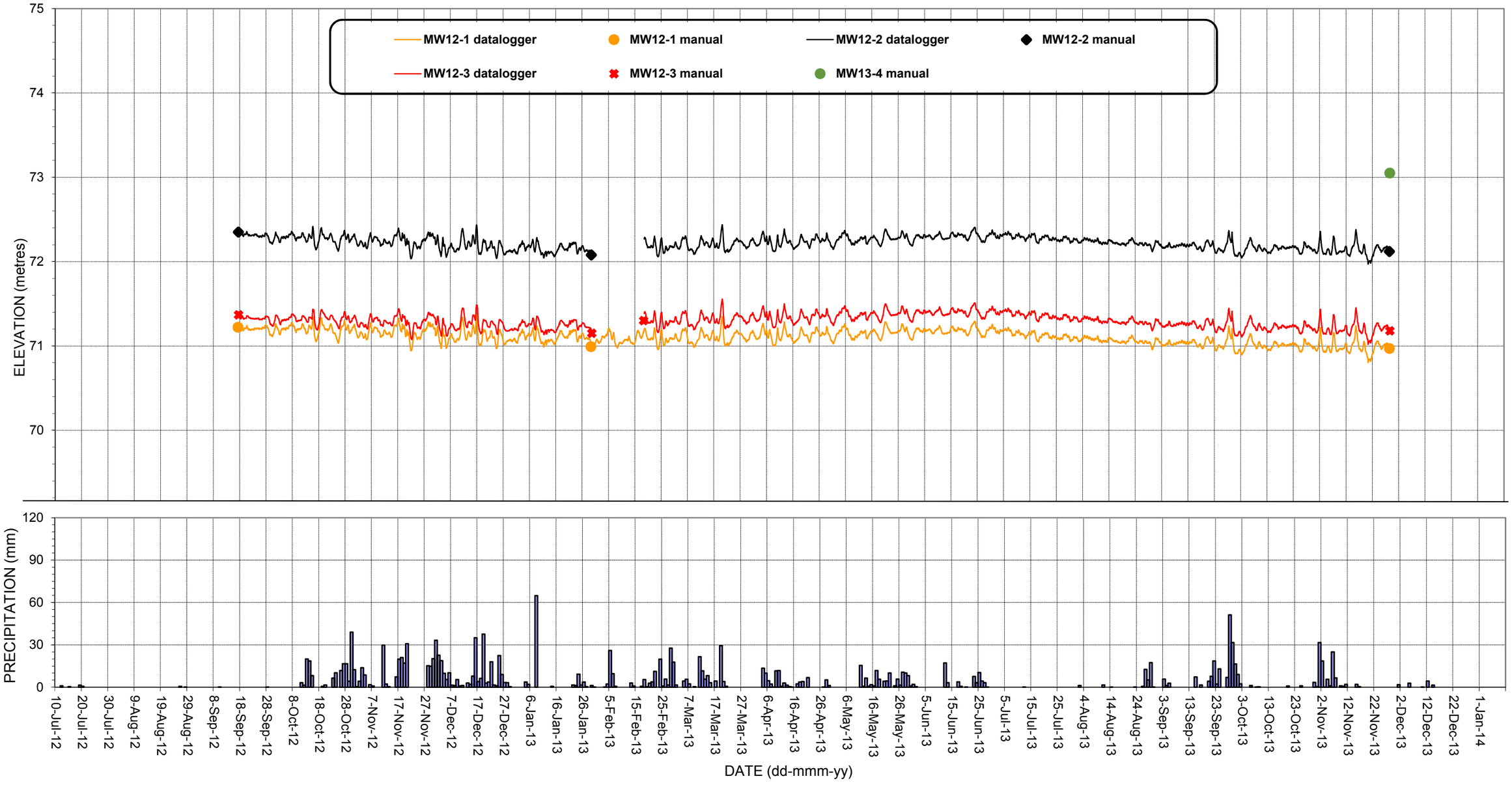

FIGURE 2

Client: Cowichan Valley Regional District
File No.: 17-971-18
E-File: cwp_17-971-18_tbl_2012-9(Sept)-17 to 2013-11(Nov)-28 Precip and WLs.xls

Date: January 24, 2014

THURBER

THURBER

TABLE 2: FISHER ROAD MONITORING WELL SAMPLING DATA

SAMPLE ID (Well)	MW12-1						MW12-2						MW12-3						MW13-4		Guidelines for Canadian Drinking Water Quality (GCDWQ)	British Columbia Contaminated Sites Regulation Numerical Standards (CSR)
SAMPLE DATE	September 17, 2012		January 29, 2013		November 28, 2013		September 17, 2012		January 29, 2013		November 28, 2013		September 17, 2012		February 18, 2013		November 28, 2013		November 28, 2013			
WELL PREPARATION	Purged		Purged		Purged		Purged		Purged		Purged		Purged		Purged		Purged		Purged			
LABORATORY	Maxxam		AGAT		Maxxam		Maxxam		AGAT		Maxxam		Maxxam		AGAT		Maxxam		Maxxam			
SAMPLED BY	PJW / CWP		CWP/RDM		CWP/TJS		PJW / CWP		CWP/RDM		CWP/TJS		PJW / CWP		CWP/RDM		CWP/TJS		CWP/TJS			Drinking Water
SAMPLE PREP.	TOTAL	DISS	TOTAL	DISS	TOTAL	DISS	TOTAL	DISS	TOTAL	DISS	TOTAL	DISS	TOTAL	DISS	TOTAL	DISS	TOTAL	DISS	TOTAL	DISS		
pH, Field	6.95		7.28		7.57		6.67		6.78		7.03		6.9		6.97		6.95		7.14		6.5-8.5	
pH, Laboratory	7.5		7.6		7.7		7.2		7.35		7.7		7.6		7.15		7.7		7.5		6.5-8.5	
Conductivity, Field	258		428		447		1024		1073		1135		639		713		909		599			
Conductivity, Laboratory	459		445		445		1100		1140		1140		681		712		939		435			
True Colour	9				5		9				<5		7				7		5		$\leq 15^{H}$	
Turbidity	6000				2000		1200				110		1300					60.0	600		$\leq 1^{**}$	
Hardness $CaCO_3$ (mg/L) ↓		183		172	254	183		480		482	492	497		257		280	385	405	119	80.1		
Total Dissolved Solids		318		173		293		**814**		444		**780**		457		329		**591**		314	500^{H}	
Total Alkalinity $CaCO_3$	61.9		63			70.6	77		80		79.2		92.6		106		82.8		66.5			
Bicarbonate Alkalinity HCO_3	75.5		63			86.1	93.9		80		96.6		113		106		101		81.2			
Carbonate Alkalinity CO_3	<0.5		<1			<0.5	<0.5		<1		<0.5		<0.5		<1		<0.5		<0.5			
Hydroxide Alkalinity OH	<0.5		<1			<0.5	<0.5		<1		<0.5		<0.5		<1		<0.5		<0.5			
Fluoride F (dissolved)		0.1		0.07		0.055		0.067		0.03		0.033		0.084		0.13		0.039		0.140	1.5^{H}	1.5
Chloride Cl (dissolved)		31.5		29.2		26		36		35		38		69.5		114		180		23	$\leq 250^{H}$	250
Sulphate SO_4 (dissolved)		17.9		12.3		19.3		93.7		89.4		93.0		47.9		22.6		28.2		109	$\leq 500^{H}$	500
Biological Oxygen Demand			<4						<4													
Caffeine (ug/L)																						
Caffeine	<1						<1						<1									
Nitrogen (mg/L)																						
Ammonia	0.11		<0.01		0.053		0.041		<0.01		0.019		0.057		0.02		0.028		0.039			
Total Kjeldahl Nitrogen	5		4		<1.0		<2		<1		<2.0		<2		2.5		<0.40		0.211			
Nitrate (as N)		**28**		**23.7**		**23.2**		**98.1**		**92.5**		**91.7**		**15.3**		**16.3**		**16.9**		0.252	10	10
Nitrite (as N)		0.075		<0.005		0.0060		0.33		0.04		0.0211		<0.1		<0.005		0.0101		0.0331	1	3.2
Nitrate plus Nitrite (as N)		**28**		**23.7**		**23.2**		**98.5**		**92.5**		**91.7**		**15.3**		**16.3**		**16.9**		0.285	10	10
Total Nitrogen	33.1		26		22.8		92.4		99.4			84.7	13.9		17.9			17.0	0.495			
Nitrate Isotopes ($^{0}/_{00}$)																						
^{15}N	9.0 / 9.2		7.8		8.4		4.7 / 4.4		4.3		4.9		10.6 / 10.9		13.0		12.3		3.3			
^{18}O	3.6 / 4.2		4.2		5.9		20.3		22		23.7		3.2		-1.0		3.7		4.6			
Metals (ug/L)																						
Aluminum Al	**22200******	8.7	**21200******	78	**17400******	21.7	**33600******	11	**24100******	<1	**1590******	11.5	**4350******	25.1	**17400******	7	**916******	12.7	**5250******	14.8	200***	9,500
Antimony Sb	<0.50	<0.50	<0.05	<0.05	<0.50	<0.50	<0.50	<0.50	<0.05	<0.05	<0.50	<0.50	<0.50	<0.50	0.24	0.05	<0.50	<0.50	<0.50	<0.50	6	6
Arsenic As	4.28	0.4	8.2	0.4	3.02	0.32	3.64	0.19	7.2	0.2	1.16	0.21	3.49	0.48	9.2	0.4	1.11	0.33	1.71	0.24	10	10
Barium Ba	580	22.1	159	15.2	277	13.3	479	36.8	199	29.4	51.7	30.7	223	49.9	289	36.9	51.2	40.8	115	16.8	1,000	1,000
Beryllium Be	1.06	<0.10	0.96	0.01	1.23	<0.10	1.04	<0.10	0.65	<0.01	<0.10	<0.10	1	<0.10	2.06	<0.01	0.13	<0.10	1.09	<0.10		
Bismuth Bi	<1.0	<1.0			<1.0	<1.0	<1.0	<1.0			<1.0	<1.0	<1.0	<1.0			<1.0	<1.0	<1.0	<1.0		
Boron B	<50	<50	2	2	<50	<50	<50	<50	29	29	<50	<50	<50	<50	21	6	<50	<50	<50	<50	5,000	5,000
Cadmium Cd	1.24	0.166	0.06	<0.01	0.530	0.219	1.2	0.419	0.48	0.4	0.368	0.389	1.05	0.148	1.14	0.15	0.272	0.161	0.294	0.209	5	5
Chromium Cr	**143******	<1.0	**63******	1.2	**79.4******	<1.0	**95.9******	<1.0	**59.1******	0.7	13.1	<1.0	30.8	<1.0	**56.8******	0.9	5.8	1.1	17.8	<1.0	50 (Cr VI)	50
Cobalt Co	90.6	2.49	27.2	0.92	45.7	0.84	67.7	5.4	28.2	3.9	5.90	3.29	30	2.9	59.8	0.58	2.79	<0.50	17.8	3.10		
Copper Cu	127	10.8	53.8	6.6	76.6	3.62	147	31.4	78.5	34.9	37.4	35.4	30.6	5.95	54.6	5.5	4.43	2.10	24.5	2.48	$1,000^{HH}$	1,000
Iron Fe	**57600******	22.8	**47900******	16	**33600******	27.9	**57200******	120	**42400******	90	**4180******	101	**11600******	61.5	**29500******	20	**1720******	<5.0	**12900******	8.6	300^{H}	6,500
Lead Pb	**11.4******	0.26	6.48	0.79	11.7	<0.20	**12.1******	<0.20	4.7	0.02	1.04	<0.20	8.52	<0.20	14.9	0.13	1.07	<0.20	7.70	<0.20	10	10
Lithium Li						<5.0						<5.0						<5.0		<5.0	50^{H}	550
Manganese Mn	**1760******	344	**704******	43	**919******	19.6	**1990******	**554**	**696******	94	**84.7******	16.4	**754******	185	**1150******	22	**57.6******	3.2	**988******	409	50^{H}	550
Mercury Hg	<0.050	<0.050	0.059	0.007	<0.010		<0.050	<0.050	0.127	0.011	<0.010		<0.050	<0.050	0.15	0.033	<0.010		<0.010		1	1
Molybdenum Mo	10.6	16.3	4.5	1.47	2.3	1.8	5.2	6	<0.1	0.91	<1.0	<1.0	3.8	3.9	5.9	1.31	<1.0	<1.0	7.9	11.2	250	250
Nickel Ni	114	7.8	54.5	3.7	57.4	2.1	196	80.7	126	73.6	80.3	77.4	46.3	14.1	80.4	5	9.3	3.7	28.2	7.0		
Selenium Se	0.35	0.31	1.9	0.4	0.11	<0.10	0.33	0.21	2.4	0.6	0.16	0.18	0.36	0.5	1.4	0.1	<0.10	0.13	0.31	0.29	10	10
Silicon SiO_2	31200	11400			33700	11900	45800	13200			17300	13300	16600	12400			15200	12600	18500	9910		
Silver Ag	0.113	<0.020	0.05	<0.01	0.046	<0.020	0.099	<0.020	0.05	<0.01	<0.020	<0.020	<0.020	<0.020	<0.01	<0.01	<0.020	<0.020	0.023	<0.020		
Strontium Sr	291	158			264	159	645	466			513	491	333	290			361	361	163	108		
Thallium Tl	0.204	<0.050	<0.01	<0.002	0.126	<0.050	0.099	<0.050	<0.01	<0.002	<0.050	<0.050	0.128	<0.050	0.26	0.025	0.051	<0.050	0.063	<0.050		
Tin Sn	<5.0	<5.0			<5.0	<5.0	<5.0	<5.0			<5.0	<5.0	<5.0	<5.0			<5.0	<5.0	<5.0	<5.0		
Titanium Ti	45	<5.0	1010	51.6	54.4	<5.0	159	<5.0	1700	153	76.4	<5.0	29.2	<5.0	478	82.3	39.1	<5.0	42.5	<5.0		
Uranium U	2.33	0.45	1.3	0.31	3.22	0.47	1.89	0.46	0.78	0.17	0.24	0.15	3.67	1.76	3.45	0.84	0.45	0.25	1.65	0.46	20	20
Vanadium V	102	<5.0	73	1.2	75.1	<5.0	135	<5.0	98.8	0.9	12.7	<5.0	31.3	<5.0	59.8	0.8	<5.0	<5.0	24.1	<5.0		
Zinc Zn	1650	17	179	47	278	13.1	189	8.1	72	8	11.4	8.4	41.8	7.1	374	16	8.9	6.9	34.6	5.6	$5,000^{H}$	5,000
Zirconium Zr	<0.50	<0.50			<0.50	<0.50	1.88	<0.50			1.27	<0.50	<0.50	<0.50			<0.50	<0.50	0.73	<0.50		
Calcium Ca (mg/L) ↓	58	41.5	50.2	36.9	51.3	39.4	136	114	125	112	115	116	67.4	59.1	91.4	65.1	87.7	89.6	30.2	21.4		
Magnesium Mg	32.3	19.3	33.2	19.4	30.5	20.5	64.2	47.2	61.3	49.2	49.9	50.1	29.5	26.7	42	28.5	40.4	44.0	10.5	6.45		100
Potassium K	2.58	1.52		1.04	1.82	1.06	3.48	2.13		1.67	1.63	1.62	1.93	1.64		1.44	1.47	1.45	1.61	1.19		
Sodium Na	14.6	14.1	14.3	12.1	11.6	11.5	18.5	18.8	17.8	15.9	16.2	16.8	25.9	26.9	20.1	17.7	14.7	16.0	55.5	47.4	200*** ^{H}	200
Sulphur S	3.1	5.4			6.2	6.7	25	30.5			28.1	30.0	14.5	15.5			10.1	10.1	37.1	28.6		

See following page for the table legend and explanatory notes.

THURBER

TABLE 2: EXPLANATORY NOTES

	All results expressed as milligrams per litre (mg/L)(ppm) or micrograms per litre (ug/L)(ppb) as noted except pH which is in pH units, conductivity which is in µS/cm (microsiemens per centimetre), and turbidity which is in NTU (nephelometric turbidity units). Isotopes are measured in $^{0}/_{00}$, which is per mille (per thousand).
	The GCDWQ for organic and inorganic parameters are expressed as total concentrations, while the BC CSR standards are expressed as dissolved concentrations for inorganic parameters and total concentrations for organic parameters.
<	Less than the detection limit (shown or various).
*	Limit is for dissolved aluminum or magnesium
**	GCDWQ standard inapplicable to untreated groundwater as they are intended to be applied to treated or municipal water supplied water.
***	Alert level of 20 mg/L for persons on sodium restricted diet.
****	It is suspected that the total metals results shown were impacted by the leaching of naturally occuring, silt-derived metals and are not representative of the actual groundwater conditions or indicative of concentrations anticipated to be found within a drinking water well.
H	Aesthetic objective.
7.32	Bold underline yellow indicates exceeds the federal Guidelines for Canadian Drinking Water Quality (total concentrations)
7.32	Bold underline tan indicates exceeds the B.C. Contaminated Sites Regulation Schedule 6 Numercial Water Standards (dissolved)
7.32	Bold underline rose indicates level exceeds both the GCDWQ and CSR

THURBER

FISHER RD NO_3 ISOTOPE DATA

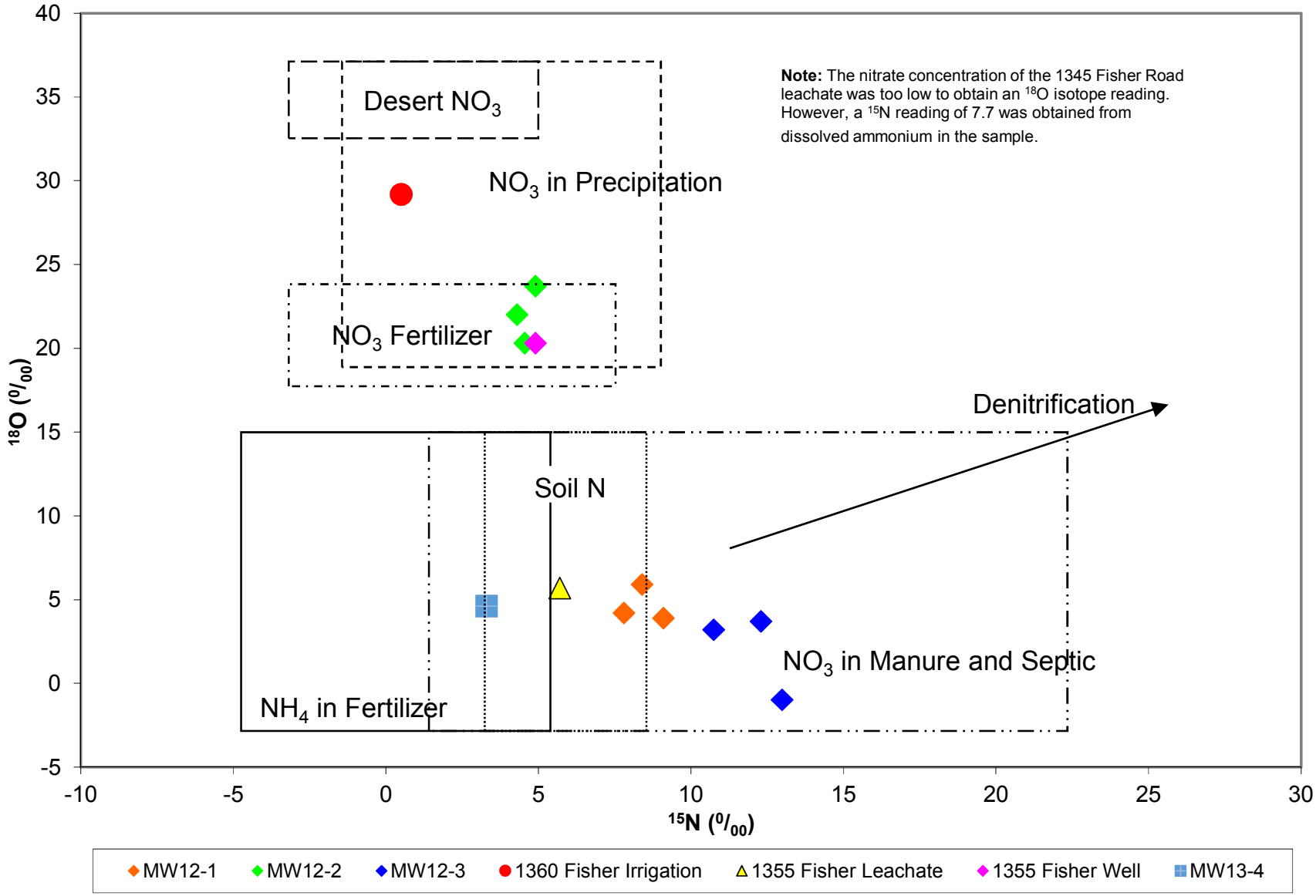

FIGURE 3

Client: Cowichan Valley Regional District
E-File: cwp_17-971-18_tab_Fisher Road GW Monitoring Well Data.xls

Date: December 10, 2013

Maxxam

Success Through Science®

Your Project #: 17-971-18 FISHER RD. GW MONITO
Site Location: COBBLE HILL
Your C.O.C. #: V010812

Attention: Chad Petersmeyer
Thurber Engineering Ltd.
100-4396 West Saanich
Victoria, BC
Canada V8Z 3E9

Report Date: 2013/12/06

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B3B0786
Received: 2013/11/29, 09:25

Sample Matrix: Water
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity - Water (1)	4	2013/12/03	2013/12/03	BBY6SOP-00026	SM2320B
Chloride by Automated Colourimetry	1	N/A	2013/11/30	BBY6SOP-00011	SM-4500-Cl-
Chloride by Automated Colourimetry	3	N/A	2013/12/02	BBY6SOP-00011	SM-4500-Cl-
Colour (True) (1)	4	N/A	2013/11/29	VIC SOP-00010	Based on SM-2120B
Conductance - water (1)	4	N/A	2013/12/03	BBY6SOP-00026	SM-2510B
Fluoride	4	N/A	2013/12/02	BBY6SOP-00012	SM - 4500 F C
Hardness Total (calculated as CaCO3)	4	N/A	2013/12/05	BBY7SOP-00002	EPA 6020A
Hardness (calculated as CaCO3)	4	N/A	2013/12/04	BBY7SOP-00002	EPA 6020A
Mercury (Dissolved) by CVAF	4	N/A	2013/12/05	BBY7SOP-00015	EPA 245.7
Mercury (Total) by CVAF	4	2013/12/05	2013/12/05	BBY7SOP-00015	EPA 245.7
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	4	N/A	2013/12/04	BBY7SOP-00002	EPA 6020A
Elements by CRC ICPMS (dissolved)	4	N/A	2013/12/03	BBY7SOP-00002	EPA 6020A
Na, K, Ca, Mg, S by CRC ICPMS (total)	4	N/A	2013/12/05	BBY7SOP-00002	EPA 6020A
Elements by CRC ICPMS (total)	4	N/A	2013/12/05	BBY7SOP-00002	EPA 6020A
Nitrogen (Total)	4	2013/12/02	2013/12/02	BBY6SOP-00016	SM-4500N C
Ammonia-N (Preserved)	4	N/A	2013/12/02	BBY6SOP-00009	SM-4500NH3G
Nitrate + Nitrite (N)	4	N/A	2013/11/30	BBY6SOP-00010	SM 4500NO3-I
Nitrite (N) by CFA	4	N/A	2013/11/30	BBY6SOP-00010	EPA 353.2
Nitrogen - Nitrate (as N)	4	N/A	2013/11/30	BBY6SOP-00010	SM 4500NO3-I
Filter and HNO3 Preserve for Metals	4	N/A	2013/11/29	BBY6WI-00001	EPA 200.2
pH Water (1,2)	4	N/A	2013/12/04	BBY6SOP-00026	SM-4500H+B
Sulphate by Automated Colourimetry	2	N/A	2013/11/30	BBY6SOP-00017	SM4500-SO42- E
Sulphate by Automated Colourimetry	2	N/A	2013/12/02	BBY6SOP-00017	SM4500-SO42- E
Total Dissolved Solids (Filt. Residue) (1)	3	N/A	2013/11/29	VIC SOP-00008	Based on SM 2540C
Total Dissolved Solids (Filt. Residue) (1)	1	N/A	2013/12/05	VIC SOP-00008	Based on SM 2540C
TKN (Calc. TN, N/N) total	4	N/A	2013/12/03	BBY6SOP-00022	SM 4500N-C
Turbidity (1)	3	N/A	2013/12/03	VIC SOP-00011	Based on SM - 2130
Turbidity (1)	1	N/A	2013/12/05	VIC SOP-00011	Based on SM - 2130

* Results relate only to the items tested.

(1) This test was performed by Maxxam Victoria
(2) The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.

Maxxam Job #: B3B0786
Report Date: 2013/12/06

Thurber Engineering Ltd.
Client Project #: 17-971-18 FISHER RD. GW MONITO
Site Location: COBBLE HILL
Sampler Initials: WP

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Debbie Nordbruget, Project Manager
Email: DNordbruget@maxxam.ca
Phone# (250) 385-6112

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 2

Maxxam Job #: B3B0786
Report Date: 2013/12/06

Thurber Engineering Ltd.
Client Project #: 17-971-18 FISHER RD. GW MONITO
Site Location: COBBLE HILL
Sampler Initials: WP

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID			IF1749		
Sampling Date			2013/11/28 10:20		
	UNITS	**Criteria A**	**MW13-4**	**RDL**	**QC Batch**
ANIONS					
Nitrite (N)	mg/L		0.0331	0.0050	7304360
Calculated Parameters					
Filter and HNO3 Preservation	N/A		FIELD	N/A	ONSITE
Total Hardness (CaCO3)	mg/L		119	0.50	7301891
Nitrate (N)	mg/L		0.252	0.020	7301810
Misc. Inorganics					
Fluoride (F)	mg/L		0.140	0.010	7305979
Alkalinity (Total as CaCO3)	mg/L		66.5	0.5	7305978
Alkalinity (PP as CaCO3)	mg/L		<0.5	0.5	7305978
Bicarbonate (HCO3)	mg/L		81.2	0.5	7305978
Carbonate (CO3)	mg/L		<0.5	0.5	7305978
Hydroxide (OH)	mg/L		<0.5	0.5	7305978
Anions					
Dissolved Sulphate (SO4)	mg/L	**500**	109	0.50	7305834
Dissolved Chloride (Cl)	mg/L	**250**	23	0.50	7305833
MISCELLANEOUS					
True Colour	Col. Unit	**15**	5	5	7306560
Nutrients					
Ammonia (N)	mg/L		0.039	0.0050	7305003
Total Total Kjeldahl Nitrogen (Calc)	mg/L		0.211	0.020	7301893
Nitrate plus Nitrite (N)	mg/L		0.285	0.020	7304359
Total Nitrogen (N)	mg/L		0.495	0.020	7305135
Physical Properties					
Conductivity	uS/cm		435	1	7305976
pH	pH Units	**6.5:8.5**	7.5		7305910
Physical Properties					
Total Dissolved Solids	mg/L	**500**	314	10	7302224
Turbidity	NTU		600	0.1	7309536

N/A = Not Applicable
RDL = Reportable Detection Limit
Criteria A: Guidelines for Canadian Drinking Water Quality - Aesthetic Objective.

Maxxam Job #: B3B0786
Report Date: 2013/12/06

Thurber Engineering Ltd.
Client Project #: 17-971-18 FISHER RD. GW MONITO
Site Location: COBBLE HILL
Sampler Initials: WP

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID			IF1750			IF1751		
Sampling Date			2013/11/28 13:00			2013/11/28 14:40		
	UNITS	**Criteria A**	**MW12-2**	**RDL**	**QC Batch**	**MW12-1**	**RDL**	**QC Batch**
ANIONS								
Nitrite (N)	mg/L		0.0211	0.0050	7304360	0.0060	0.0050	7304360
Calculated Parameters								
Filter and HNO3 Preservation	N/A		FIELD	N/A	ONSITE	FIELD	N/A	ONSITE
Total Hardness (CaCO3)	mg/L		492	0.50	7301891	254	0.50	7301891
Nitrate (N)	mg/L		91.7	2.0	7301810	23.2	0.40	7301810
Misc. Inorganics								
Fluoride (F)	mg/L		0.033	0.010	7305979	0.055	0.010	7305979
Alkalinity (Total as CaCO3)	mg/L		79.2	0.5	7305978	70.6	0.5	7305978
Alkalinity (PP as CaCO3)	mg/L		<0.5	0.5	7305978	<0.5	0.5	7305978
Bicarbonate (HCO3)	mg/L		96.6	0.5	7305978	86.1	0.5	7305978
Carbonate (CO3)	mg/L		<0.5	0.5	7305978	<0.5	0.5	7305978
Hydroxide (OH)	mg/L		<0.5	0.5	7305978	<0.5	0.5	7305978
Anions								
Dissolved Sulphate (SO4)	mg/L	**500**	93.0	0.50	7304313	19.3	0.50	7304313
Dissolved Chloride (Cl)	mg/L	**250**	38	0.50	7304312	26	0.50	7305833
MISCELLANEOUS								
True Colour	Col. Unit	**15**	<5	5	7306560	5	5	7306560
Nutrients								
Ammonia (N)	mg/L		0.019	0.0050	7305003	0.053	0.0050	7305003
Total Total Kjeldahl Nitrogen (Calc)	mg/L		<2.0	2.0	7301893	<1.0	1.0	7301893
Nitrate plus Nitrite (N)	mg/L		91.7	2.0	7304359	23.2	0.40	7304359
Total Nitrogen (N)	mg/L		84.7	2.0	7305135	22.8	1.0	7305135
Physical Properties								
Conductivity	uS/cm		1140	1	7305976	445	1	7305976
pH	pH Units	**6.5:8.5**	7.7		7305910	7.7		7305910
Physical Properties								
Total Dissolved Solids	mg/L	**500**	**780**	10	7302224	293	10	7302224
Turbidity	NTU		110	0.1	7306766	2000	1	7306766

N/A = Not Applicable
RDL = Reportable Detection Limit
Criteria A: Guidelines for Canadian Drinking Water Quality - Aesthetic Objective.

Maxxam Job #: B3B0786
Report Date: 2013/12/06

Thurber Engineering Ltd.
Client Project #: 17-971-18 FISHER RD. GW MONITO
Site Location: COBBLE HILL
Sampler Initials: WP

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID			IF1752		
Sampling Date			2013/11/28 16:20		
	UNITS	**Criteria A**	**MW12-3**	**RDL**	**QC Batch**
ANIONS					
Nitrite (N)	mg/L		0.0101	0.0050	7304360
Calculated Parameters					
Filter and HNO3 Preservation	N/A		FIELD	N/A	ONSITE
Total Hardness (CaCO3)	mg/L		385	0.50	7301891
Nitrate (N)	mg/L		16.9	0.40	7301810
Misc. Inorganics					
Fluoride (F)	mg/L		0.039	0.010	7305979
Alkalinity (Total as CaCO3)	mg/L		82.8	0.5	7305978
Alkalinity (PP as CaCO3)	mg/L		<0.5	0.5	7305978
Bicarbonate (HCO3)	mg/L		101	0.5	7305978
Carbonate (CO3)	mg/L		<0.5	0.5	7305978
Hydroxide (OH)	mg/L		<0.5	0.5	7305978
Anions					
Dissolved Sulphate (SO4)	mg/L	**500**	28.2	0.50	7305834
Dissolved Chloride (Cl)	mg/L	**250**	180	0.50	7305833
MISCELLANEOUS					
True Colour	Col. Unit	**15**	7	5	7306560
Nutrients					
Ammonia (N)	mg/L		0.028	0.0050	7305003
Total Total Kjeldahl Nitrogen (Calc)	mg/L		<0.40	0.40	7301893
Nitrate plus Nitrite (N)	mg/L		16.9	0.40	7304359
Total Nitrogen (N)	mg/L		17.0	0.20	7305135
Physical Properties					
Conductivity	uS/cm		939	1	7305976
pH	pH Units	**6.5:8.5**	7.7		7305910
Physical Properties					
Total Dissolved Solids	mg/L	**500**	**591**	10	7308914
Turbidity	NTU		60.0	0.1	7306766

N/A = Not Applicable
RDL = Reportable Detection Limit
Criteria A: Guidelines for Canadian Drinking Water Quality - Aesthetic Objective.

Maxxam Job #: B3B0786
Report Date: 2013/12/06

Thurber Engineering Ltd.
Client Project #: 17-971-18 FISHER RD. GW MONITO
Site Location: COBBLE HILL
Sampler Initials: WP

MERCURY BY COLD VAPOR (WATER)

Maxxam ID		IF1749	IF1750	IF1751	IF1752		
Sampling Date		2013/11/28 10:20	2013/11/28 13:00	2013/11/28 14:40	2013/11/28 16:20		
	UNITS	**MW13-4**	**MW12-2**	**MW12-1**	**MW12-3**	**RDL**	**QC Batch**
Elements							
Total Mercury (Hg)	ug/L	<0.010	<0.010	<0.010	<0.010	0.010	7309228

RDL = Reportable Detection Limit

Maxxam Job #: B3B0786
Report Date: 2013/12/06

Thurber Engineering Ltd.
Client Project #: 17-971-18 FISHER RD. GW MONITO
Site Location: COBBLE HILL
Sampler Initials: WP

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID			IF1749	IF1750	IF1751	IF1752		
Sampling Date			2013/11/28 10:20	2013/11/28 13:00	2013/11/28 14:40	2013/11/28 16:20		
	UNITS	**Criteria A**	**MW13-4**	**MW12-2**	**MW12-1**	**MW12-3**	**RDL**	**QC Batch**
Total Metals by ICPMS								
Total Aluminum (Al)	ug/L		5250	1590	17400	916	3.0	7308597
Total Antimony (Sb)	ug/L		<0.50	<0.50	<0.50	<0.50	0.50	7308597
Total Arsenic (As)	ug/L		1.71	1.16	3.02	1.11	0.10	7308597
Total Barium (Ba)	ug/L		115	51.7	277	51.2	1.0	7308597
Total Beryllium (Be)	ug/L		1.09	<0.10	1.23	0.13	0.10	7308597
Total Bismuth (Bi)	ug/L		<1.0	<1.0	<1.0	<1.0	1.0	7308597
Total Boron (B)	ug/L		<50	<50	<50	<50	50	7308597
Total Cadmium (Cd)	ug/L		0.294	0.368	0.530	0.272	0.010	7308597
Total Chromium (Cr)	ug/L		17.8	13.1	79.4	5.8	1.0	7308597
Total Cobalt (Co)	ug/L		17.8	5.90	45.7	2.79	0.50	7308597
Total Copper (Cu)	ug/L	**1000**	24.5	37.4	76.6	4.43	0.20	7308597
Total Iron (Fe)	ug/L	**300**	**12900**	**4180**	**33600**	**1720**	5.0	7308597
Total Lead (Pb)	ug/L		7.70	1.04	11.7	1.07	0.20	7308597
Total Manganese (Mn)	ug/L	**50**	**988**	**84.7**	**919**	**57.6**	1.0	7308597
Total Molybdenum (Mo)	ug/L		7.9	<1.0	2.3	<1.0	1.0	7308597
Total Nickel (Ni)	ug/L		28.2	80.3	57.4	9.3	1.0	7308597
Total Selenium (Se)	ug/L		0.31	0.16	0.11	<0.10	0.10	7308597
Total Silicon (Si)	ug/L		18500	17300	33700	15200	100	7308597
Total Silver (Ag)	ug/L		0.023	<0.020	0.046	<0.020	0.020	7308597
Total Strontium (Sr)	ug/L		163	513	264	361	1.0	7308597
Total Thallium (Tl)	ug/L		0.063	<0.050	0.126	0.051	0.050	7308597
Total Tin (Sn)	ug/L		<5.0	<5.0	<5.0	<5.0	5.0	7308597
Total Titanium (Ti)	ug/L		42.5	76.4	54.4	39.1	5.0	7308597
Total Uranium (U)	ug/L		1.65	0.24	3.22	0.45	0.10	7308597
Total Vanadium (V)	ug/L		24.1	12.7	75.1	<5.0	5.0	7308597
Total Zinc (Zn)	ug/L	**5000**	34.6	11.4	278	8.9	5.0	7308597
Total Zirconium (Zr)	ug/L		0.73	1.27	<0.50	<0.50	0.50	7308597
Total Calcium (Ca)	mg/L		30.2	115	51.3	87.7	0.050	7302765
Total Magnesium (Mg)	mg/L		10.5	49.9	30.5	40.4	0.050	7302765
Total Potassium (K)	mg/L		1.61	1.63	1.82	1.47	0.050	7302765
Total Sodium (Na)	mg/L	**200**	55.5	16.2	11.6	14.7	0.050	7302765
Total Sulphur (S)	mg/L		37.1	28.1	6.2	10.1	3.0	7302765

RDL = Reportable Detection Limit
Criteria A: Guidelines for Canadian Drinking Water Quality - Aesthetic Objective.

Maxxam Job #: B3B0786
Report Date: 2013/12/06

Thurber Engineering Ltd.
Client Project #: 17-971-18 FISHER RD. GW MONITO
Site Location: COBBLE HILL
Sampler Initials: WP

CSR DISSOLVED METALS IN WATER WITH CV HG (WATER)

Maxxam ID			IF1749	IF1750	IF1751	IF1752		
Sampling Date			2013/11/28 10:20	2013/11/28 13:00	2013/11/28 14:40	2013/11/28 16:20		
	UNITS	**Criteria A**	**MW13-4**	**MW12-2**	**MW12-1**	**MW12-3**	**RDL**	**QC Batch**
Misc. Inorganics								
Dissolved Hardness (CaCO3)	mg/L		80.1	497	183	405	0.50	7301807
Elements								
Dissolved Mercury (Hg)	ug/L		<0.010	<0.010	<0.010	<0.010	0.010	7308740

RDL = Reportable Detection Limit
Criteria A: Guidelines for Canadian Drinking Water Quality - Aesthetic Objective.

Maxxam Job #: B3B0786
Report Date: 2013/12/06

Thurber Engineering Ltd.
Client Project #: 17-971-18 FISHER RD. GW MONITO
Site Location: COBBLE HILL
Sampler Initials: WP

CSR DISSOLVED METALS IN WATER WITH CV HG (WATER)

Maxxam ID			IF1749	IF1750	IF1751	IF1752		
Sampling Date			2013/11/28 10:20	2013/11/28 13:00	2013/11/28 14:40	2013/11/28 16:20		
	UNITS	**Criteria A**	**MW13-4**	**MW12-2**	**MW12-1**	**MW12-3**	**RDL**	**QC Batch**
Dissolved Metals by ICPMS								
Dissolved Aluminum (Al)	ug/L		14.8	11.5	21.7	12.7	3.0	7306784
Dissolved Antimony (Sb)	ug/L		<0.50	<0.50	<0.50	<0.50	0.50	7306784
Dissolved Arsenic (As)	ug/L		0.24	0.21	0.32	0.33	0.10	7306784
Dissolved Barium (Ba)	ug/L		16.8	30.7	13.3	40.8	1.0	7306784
Dissolved Beryllium (Be)	ug/L		<0.10	<0.10	<0.10	<0.10	0.10	7306784
Dissolved Bismuth (Bi)	ug/L		<1.0	<1.0	<1.0	<1.0	1.0	7306784
Dissolved Boron (B)	ug/L		<50	<50	<50	<50	50	7306784
Dissolved Cadmium (Cd)	ug/L		0.209	0.389	0.219	0.161	0.010	7306784
Dissolved Chromium (Cr)	ug/L		<1.0	<1.0	<1.0	1.1	1.0	7306784
Dissolved Cobalt (Co)	ug/L		3.10	3.29	0.84	<0.50	0.50	7306784
Dissolved Copper (Cu)	ug/L	**1000**	2.48	35.4	3.62	2.10	0.20	7306784
Dissolved Iron (Fe)	ug/L	**300**	8.6	101	27.9	<5.0	5.0	7306784
Dissolved Lead (Pb)	ug/L		<0.20	<0.20	<0.20	<0.20	0.20	7306784
Dissolved Lithium (Li)	ug/L		<5.0	<5.0	<5.0	<5.0	5.0	7306784
Dissolved Manganese (Mn)	ug/L	**50**	**409**	16.4	19.6	3.2	1.0	7306784
Dissolved Molybdenum (Mo)	ug/L		11.2 (1)	<1.0	1.8	<1.0	1.0	7306784
Dissolved Nickel (Ni)	ug/L		7.0	77.4	2.1	3.7	1.0	7306784
Dissolved Selenium (Se)	ug/L		0.29	0.18	<0.10	0.13	0.10	7306784
Dissolved Silicon (Si)	ug/L		9910	13300	11900	12600	100	7306784
Dissolved Silver (Ag)	ug/L		<0.020	<0.020	<0.020	<0.020	0.020	7306784
Dissolved Strontium (Sr)	ug/L		108	491	159	361	1.0	7306784
Dissolved Thallium (Tl)	ug/L		<0.050	<0.050	<0.050	<0.050	0.050	7306784
Dissolved Tin (Sn)	ug/L		<5.0	<5.0	<5.0	<5.0	5.0	7306784
Dissolved Titanium (Ti)	ug/L		<5.0	<5.0	<5.0	<5.0	5.0	7306784
Dissolved Uranium (U)	ug/L		0.46	0.15	0.47	0.25	0.10	7306784
Dissolved Vanadium (V)	ug/L		<5.0	<5.0	<5.0	<5.0	5.0	7306784
Dissolved Zinc (Zn)	ug/L	**5000**	5.6	8.4	13.1	6.9	5.0	7306784
Dissolved Zirconium (Zr)	ug/L		<0.50	<0.50	<0.50	<0.50	0.50	7306784
Dissolved Calcium (Ca)	mg/L		21.4	116	39.4	89.6	0.050	7301809
Dissolved Magnesium (Mg)	mg/L		6.45	50.1	20.5	44.0	0.050	7301809
Dissolved Potassium (K)	mg/L		1.19	1.62	1.06	1.45	0.050	7301809
Dissolved Sodium (Na)	mg/L	**200**	47.4	16.8	11.5	16.0	0.050	7301809
Dissolved Sulphur (S)	mg/L		28.6	30.0	6.7	10.1	3.0	7301809

RDL = Reportable Detection Limit
Criteria A: Guidelines for Canadian Drinking Water Quality - Aesthetic Objective.
(1) - Dissolved greater than total. Reanalysis yields similar results.

Maxxam Job #: B3B0786
Report Date: 2013/12/06

Thurber Engineering Ltd.
Client Project #: 17-971-18 FISHER RD. GW MONITO
Site Location: COBBLE HILL
Sampler Initials: WP

Package 1	6.7°C

Each temperature is the average of up to three cooler temperatures taken at receipt

General Comments

Maxxam Job #: B3B0786
Report Date: 2013/12/06

Thurber Engineering Ltd.
Client Project #: 17-971-18 FISHER RD. GW MONITO
Site Location: COBBLE HILL
Sampler Initials: WP

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7302224	Total Dissolved Solids	2013/11/29			108	80 - 120	<10	mg/L	0.5	20
7304312	Dissolved Chloride (Cl)	2013/11/30	NC	80 - 120	107	80 - 120	<0.50	mg/L	2.5	20
7304313	Dissolved Sulphate (SO4)	2013/11/30	NC	80 - 120	107	80 - 120	0.55, RDL=0.50	mg/L	0.5	20
7304359	Nitrate plus Nitrite (N)	2013/11/30	108	80 - 120	105	80 - 120	<0.020	mg/L	2.1	25
7304360	Nitrite (N)	2013/11/30	104	80 - 120	99	80 - 120	<0.0050	mg/L	3.4	20
7305003	Ammonia (N)	2013/12/02	NC	80 - 120	99	80 - 120	<0.0050	mg/L	5.1	20
7305135	Total Nitrogen (N)	2013/12/02	NC	80 - 120	104	80 - 120	<0.020	mg/L	0.04	20
7305833	Dissolved Chloride (Cl)	2013/12/02	NC	80 - 120	102	80 - 120	<0.50	mg/L	1.4	20
7305834	Dissolved Sulphate (SO4)	2013/12/02	NC	80 - 120	101	80 - 120	0.68, RDL=0.50	mg/L	0.9	20
7305976	Conductivity	2013/12/03			105 (1)	96 - 104	<1	uS/cm		
7305978	Alkalinity (Total as CaCO3)	2013/12/03			106	80 - 120	<0.5	mg/L		
7305978	Alkalinity (PP as CaCO3)	2013/12/03					<0.5	mg/L		
7305978	Bicarbonate (HCO3)	2013/12/03					<0.5	mg/L		
7305978	Carbonate (CO3)	2013/12/03					<0.5	mg/L		
7305978	Hydroxide (OH)	2013/12/03					<0.5	mg/L		
7305979	Fluoride (F)	2013/12/02	92	80 - 120	92	80 - 120	0.019, RDL=0.010	mg/L	7.1	20
7306560	True Colour	2013/11/29			100	94 - 106	<5	Col. Unit	NC	10
7306766	Turbidity	2013/12/03			100	80 - 120	<0.1	NTU	0	20
7306784	Dissolved Aluminum (Al)	2013/12/03	118	80 - 120	107	80 - 120	<3.0	ug/L	NC	20
7306784	Dissolved Antimony (Sb)	2013/12/03	110	80 - 120	102	80 - 120	<0.50	ug/L	NC	20
7306784	Dissolved Arsenic (As)	2013/12/03	NC	80 - 120	103	80 - 120	<0.10	ug/L	3.0	20
7306784	Dissolved Barium (Ba)	2013/12/03	NC	80 - 120	97	80 - 120	<1.0	ug/L	1.9	20
7306784	Dissolved Beryllium (Be)	2013/12/03	108	80 - 120	98	80 - 120	<0.10	ug/L	NC	20
7306784	Dissolved Bismuth (Bi)	2013/12/03	103	80 - 120	94	80 - 120	<1.0	ug/L	NC	20
7306784	Dissolved Cadmium (Cd)	2013/12/03	102	80 - 120	99	80 - 120	<0.010	ug/L	NC	20
7306784	Dissolved Chromium (Cr)	2013/12/03	100	80 - 120	95	80 - 120	<1.0	ug/L	NC	20
7306784	Dissolved Cobalt (Co)	2013/12/03	100	80 - 120	100	80 - 120	<0.50	ug/L	NC	20
7306784	Dissolved Copper (Cu)	2013/12/03	95	80 - 120	99	80 - 120	<0.20	ug/L	NC	20
7306784	Dissolved Iron (Fe)	2013/12/03	NC	80 - 120	107	80 - 120	<5.0	ug/L	1.2	20
7306784	Dissolved Lead (Pb)	2013/12/03	100	80 - 120	94	80 - 120	<0.20	ug/L	NC	20
7306784	Dissolved Lithium (Li)	2013/12/03	NC	80 - 120	103	80 - 120	<5.0	ug/L	1.1	20
7306784	Dissolved Manganese (Mn)	2013/12/03	NC	80 - 120	98	80 - 120	<1.0	ug/L	1.3	20
7306784	Dissolved Molybdenum (Mo)	2013/12/03	NC	80 - 120	95	80 - 120	<1.0	ug/L	1.9	20
7306784	Dissolved Nickel (Ni)	2013/12/03	97	80 - 120	101	80 - 120	<1.0	ug/L	NC	20
7306784	Dissolved Selenium (Se)	2013/12/03	113	80 - 120	102	80 - 120	<0.10	ug/L	NC	20
7306784	Dissolved Silver (Ag)	2013/12/03	106	80 - 120	87	80 - 120	<0.020	ug/L	NC	20
7306784	Dissolved Strontium (Sr)	2013/12/03	NC	80 - 120	96	80 - 120	<1.0	ug/L	0.3	20
7306784	Dissolved Thallium (Tl)	2013/12/03	103	80 - 120	97	80 - 120	<0.050	ug/L	NC	20
7306784	Dissolved Tin (Sn)	2013/12/03	110	80 - 120	95	80 - 120	<5.0	ug/L	NC	20
7306784	Dissolved Titanium (Ti)	2013/12/03	108	80 - 120	99	80 - 120	<5.0	ug/L	NC	20

Maxxam Job #: B3B0786
Report Date: 2013/12/06

Thurber Engineering Ltd.
Client Project #: 17-971-18 FISHER RD. GW MONITO
Site Location: COBBLE HILL
Sampler Initials: WP

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7306784	Dissolved Uranium (U)	2013/12/03	101	80 - 120	94	80 - 120	<0.10	ug/L	NC	20
7306784	Dissolved Vanadium (V)	2013/12/03	104	80 - 120	97	80 - 120	<5.0	ug/L	NC	20
7306784	Dissolved Zinc (Zn)	2013/12/03	96	80 - 120	102	80 - 120	<5.0	ug/L	NC	20
7306784	Dissolved Boron (B)	2013/12/03					<50	ug/L	3.9	20
7306784	Dissolved Silicon (Si)	2013/12/03					<100	ug/L	0.8	20
7306784	Dissolved Zirconium (Zr)	2013/12/03					<0.50	ug/L	NC	20
7308597	Total Aluminum (Al)	2013/12/05	99	80 - 120	106	80 - 120	<3.0	ug/L	NC	20
7308597	Total Antimony (Sb)	2013/12/05	98	80 - 120	103	80 - 120	<0.50	ug/L	NC	20
7308597	Total Arsenic (As)	2013/12/05	99	80 - 120	102	80 - 120	<0.10	ug/L	NC	20
7308597	Total Barium (Ba)	2013/12/05	93	80 - 120	102	80 - 120	<1.0	ug/L	NC	20
7308597	Total Beryllium (Be)	2013/12/05	102	80 - 120	103	80 - 120	<0.10	ug/L	NC	20
7308597	Total Bismuth (Bi)	2013/12/05	100	80 - 120	99	80 - 120	<1.0	ug/L	NC	20
7308597	Total Cadmium (Cd)	2013/12/05	101	80 - 120	101	80 - 120	<0.010	ug/L	NC	20
7308597	Total Chromium (Cr)	2013/12/05	96	80 - 120	101	80 - 120	<1.0	ug/L	NC	20
7308597	Total Cobalt (Co)	2013/12/05	97	80 - 120	100	80 - 120	<0.50	ug/L	NC	20
7308597	Total Copper (Cu)	2013/12/05	NC	80 - 120	100	80 - 120	<0.20	ug/L	0.1	20
7308597	Total Iron (Fe)	2013/12/05	NC	80 - 120	106	80 - 120	<5.0	ug/L	2.6	20
7308597	Total Lead (Pb)	2013/12/05	97	80 - 120	100	80 - 120	<0.20	ug/L	1.3	20
7308597	Total Manganese (Mn)	2013/12/05	NC	80 - 120	102	80 - 120	<1.0	ug/L	2.2	20
7308597	Total Molybdenum (Mo)	2013/12/05	108	80 - 120	105	80 - 120	<1.0	ug/L	NC	20
7308597	Total Nickel (Ni)	2013/12/05	99	80 - 120	101	80 - 120	<1.0	ug/L	NC	20
7308597	Total Selenium (Se)	2013/12/05	101	80 - 120	102	80 - 120	<0.10	ug/L	NC	20
7308597	Total Silver (Ag)	2013/12/05	102	80 - 120	99	80 - 120	<0.020	ug/L	NC	20
7308597	Total Strontium (Sr)	2013/12/05	NC	80 - 120	102	80 - 120	<1.0	ug/L	3.0	20
7308597	Total Thallium (Tl)	2013/12/05	97	80 - 120	103	80 - 120	<0.050	ug/L	NC	20
7308597	Total Tin (Sn)	2013/12/05	NC	80 - 120	100	80 - 120	<5.0	ug/L	NC	20
7308597	Total Titanium (Ti)	2013/12/05	94	80 - 120	104	80 - 120	<5.0	ug/L	NC	20
7308597	Total Uranium (U)	2013/12/05	96	80 - 120	97	80 - 120	<0.10	ug/L	NC	20
7308597	Total Vanadium (V)	2013/12/05	94	80 - 120	96	80 - 120	<5.0	ug/L	NC	20
7308597	Total Zinc (Zn)	2013/12/05	NC	80 - 120	105	80 - 120	<5.0	ug/L	4.0	20
7308597	Total Boron (B)	2013/12/05					<50	ug/L	NC	20
7308597	Total Silicon (Si)	2013/12/05					<100	ug/L	0.2	20
7308597	Total Zirconium (Zr)	2013/12/05					<0.50	ug/L	NC	20
7308740	Dissolved Mercury (Hg)	2013/12/05	91	80 - 120	97	80 - 120	<0.010	ug/L	NC	20
7308914	Total Dissolved Solids	2013/12/05			102	80 - 120	<10	mg/L	6.8	20

Maxxam Job #: B3B0786
Report Date: 2013/12/06

Thurber Engineering Ltd.
Client Project #: 17-971-18 FISHER RD. GW MONITO
Site Location: COBBLE HILL
Sampler Initials: WP

QUALITY ASSURANCE REPORT

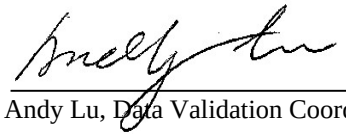
			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7309228	Total Mercury (Hg)	2013/12/05	92	80 - 120	90	80 - 120	<0.010	ug/L	NC	20
7309536	Turbidity	2013/12/05			101	80 - 120	<0.1	NTU	0	20

N/A = Not Applicable
RDL = Reportable Detection Limit
RPD = Relative Percent Difference
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 spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) - Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

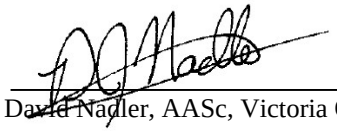
Validation Signature Page

Maxxam Job #: B3B0786

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Andy Lu, Data Validation Coordinator



David Nadler, AASc, Victoria Operations Manager

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam

Suite 1104, SouthWing 4464 Markham Street, Victoria, B.C. V8Z 7X8 Ph: 250-385-6112 Toll Free: 1-800-385-6112 Fax: 250-382-6364

CHAIN OF CUSTODY RECORD

Page: 1 of 1

V010812

Maxxam Job#: B3B0786

Invoice To: Require Report? Yes [X] No [ ]

Company Name: Thurber Engineering Ltd
Contact Name: Chad Petersmeyer
Address: 100, 4396 West Saanich Rd
Victoria PC: V8Z 3E9
Phone / Fax#: Ph: 250 727-2201 Fax: 250 727-3710
E-mail: cpetersmeyer@thurber.ca

Report To:

Company Name:
Contact Name:
Address: SAME
PC:
Phone / Fax#: Ph: Fax:
E-mail

PO #:	
Quotation #:	
Project #:	17-971-18
Proj. Name:	Fisher Rd. GW Monitoring
Location:	Cobble Hill
Sampled By:	CWP/TJS

REGULATORY REQUIREMENTS SERVICE REQUESTED:

- [X] CSR
- [ ] CCME
- [ ] BC Water Quality
- [ ] Other
- [X] DRINKING WATER

- [X] Regular Turn Around Time (TAT) (5 days for most tests)
- [ ] RUSH (Please contact the lab)
- [ ] 1 Day [ ] 2 Day [ ] 3 Day
- Date Required: ____

Special Instructions:

Return Cooler [ ] **Ship Sample Bottles (please specify)** [ ]

ANALYSIS REQUESTED

#	Sample Identification	Lab Identification	Sample Type	Date/Time Sampled	BTEX/VPH (MTBE)	VOC/VPH	EPH (TEH)	PAH (LEPH/HEPH)	CCME-PHC (Fractions 1-4 Plus BTEX)	CCME-PHC (Fractions 2-4)	CCME BTEX (Fraction 1 Plus BTEX)	PCB	Phenols by 4AAP / Phenols by GCMS	TOG / MOG / SVOG	Dissolved Metals (Field Filtered? Y [X])	(Field Acidified? Y [X])	Total Metals Field Acidified? (Y [X])	Nitrate [X] / Nitrite [X] / Ammonia [X]	Chloride / Fluoride / Sulphate	Total Suspended Solids-TSS / TDS	pH / Conductivity / Alkalinity	BOD	COD	Coliform, Total & E.coli / Fecal	Asbestos	Routine	TKN	T-N	HOLD	No. of Bottles Submitted
1	MW13-4	1F1749	GW	Nov 28/13 @ 10:20											X		X	X								X	X	X		6
2	MW12-2	1F1750	↓	Nov 28/13 @ 13:00											X		X	X								X	X	X		6
3	MW12-1	1F1751	↓	Nov 28/13 @ 14:40											X		X	X								X	X	X		6
4	MW12-3	1F1752	↓	Nov 28/13 @ 16:20											X		X	X								X	X	X		6
5																														
6																														
7																														
8																														
9																														
10																														
11																														
12																														

Samples are from a Drinking Water Source? YES [ ] NO [X]

Does source supply multiple households? YES [ ] NO [ ]

Laboratory Use Only

*Relinquished by:	Date (YY/MM/DD):	Time:	Received by:	Date (YY/MM/DD):	Time:	Time Sensitive	Temperature on Receipt (°C)	Custody Seal Intact on Cooler?
CWPetersmeyer	13/11/29		Allison Gaudreau / A. Gaudreau	2013 Nov 29	09:25	[ ]	6, 7, 7	Yes / No: NA

*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.

White: Maxxam Yellow: Client

COC-1019 (03/11)

Maxxam International Corporation o/a Maxxam Analytics

ISOTOPE SCIENCE LABORATORY
Dept of Geoscience
University of Calgary, Room ES-513
2500 University Dr. NW, Calgary, Alta.
T2N-1N4

Name: Chad Petersmeyer
Affiliate: Thurber Engineering
Address: 100, 4396 West Saanich Road
Victoria, BC
Canada
V8Z 3E9

Results

Contact : S. Taylor
Tel. : (403) 210-6003
Fax : (403) 220 7773
e-mail steve.taylor@ucalgary.ca

IN December 5, 2013
OUT December 13, 2013

phone: 250-727-2201
fax: 250-727-3710
email: cpetersmeyer@thurber.ca

PO# :

#	LIMs ID	SAMPLE ID	[N] (mg/L)	[NO3] (mg/L)	$\delta^{15}N_{nitrate}$	$\delta^{18}O_{nitrate}$	Comments	subsequents ubmission date
1	N-5101	MW12-1	23.2	102.7	**8.4**	**5.9**		
2	N-5102	MW12-2	91.7	406.1	**4.9**	**23.7**		
3	N-5103	MW12-3	16.9	74.8	**12.3**	**3.7**		
4	N-5104	MW13-4	0.252	1.1	**3.3**	**4.6**		

δ^{15}N-N2 and δ^{18}O-SMOW of dissolved nitrate (denitrifier technique - Delta+XL)

All results reported in the usual permil notation relative to IAEA stds

IAEA values used to normalize data

		^{15}N	^{18}O
IAEA N1	IAEA N1	0.4 ± 0.2	
IAEA N2	IAEA N2	20.3 ± 0.2	
IAEA NO3	IAEA NO3	4.7 ± 0.2	25.6 ± 0.4
USGS 32	USGS 32	180 ± 1.0	25.7 ± 0.4
USGS 34	USGS 34	-1.8 ± 0.2	-27.9 ± 0.6
USGS 35	USGS 35	2.7 ± 0.2	57.5 ± 0.6

Precision and accuracy as 1 sigma of (n=10) lab stds are: 0.5 for δ^{15}N
1.0 for δ^{18}O