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Minimum Requirements Checklist

Minimum Requirements (OAR 690-310-0040, OAR 690-310-0050 & ORS 537.615)

Include this checklist with the application

Check that each of the following items is included. The application will be returned if all required items are not included. If you have questions, please call the Water Rights Customer Service Group at (503) 986-0900.

- ☐ SECTION 1: applicant information and signature
- ☐ SECTION 2: property ownership
- ☑ SECTION 3: well development
- ☑ SECTION 4: water use
- ☑ SECTION 5: water management
- ☐ SECTION 6: storage of groundwater in a reservoir
- ☐ SECTION 7: use of stored groundwater from the reservoir
- ☑ SECTION 8: project schedule
- ☐ SECTION 9: within a district
- ☑ SECTION 10: remarks

Attachments:

- ☐ Land Use Information Form with approval and signature (*must be an original*) or signed receipt
- ☐ Provide the legal description of: (1) the property from which the water is to be diverted, (2) any property crossed by the proposed ditch, canal or other work, and (3) any property on which the water is to be used as depicted on the map.
- ☑ Fees - Amount enclosed: $500-
  See the Department's Fee Schedule at www.oregon.gov/owrd or call (503) 986-0900.

Provide a map and check that each of the following items is included:

- ☑ Permanent quality and drawn in ink
- ☑ Even map scale not less than 4" = 1 mile (example: 1" = 400 ft, 1" = 1320 ft, etc.)
- ☑ North Directional Symbol
- ☑ Township, Range, Section, Quarter/Quarter, Tax Lots
- ☑ Reference corner on map
- ☑ Location of each well, and/or dam if applicable, by reference to a recognized public land survey corner (distances north/south and east/west). Each well must be identified by a unique name and/or number.
- ☑ Indicate the area of use by Quarter/Quarter and tax lot clearly identified
- ☑ Number of acres per Quarter/Quarter and hatching to indicate area of use if for primary irrigation, supplemental irrigation, or nursery
- ☐ Location of main canals, ditches, pipelines or flumes (if well is outside of the area of use)
- ☐ Other _____

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SECTION 2: PROPERTY OWNERSHIP

Please indicate if you own all the lands associated with the project from which the water is to be diverted, conveyed, and used.

☐ Yes
- ☐ There are no encumbrances.
- ☐ This land is encumbered by easements, rights of way, roads or other encumbrances.

☐ No
- ☐ I have a recorded easement or written authorization permitting access.
- ☐ I do not currently have written authorization or easement permitting access.
- ☐ Written authorization or an easement is not necessary, because the only affected lands I do not own are state-owned submersible lands, and this application is for irrigation and/or domestic use only (ORS 274.040).
- ☐ Water is to be diverted, conveyed, and/or used only on federal lands.

List the names and mailing addresses of all affected landowners *(attach additional sheets if necessary)*.

SECTION 3: WELL DEVELOPMENT

		IF LESS THAN 1 MILE:	
WELL NO.	NAME OF NEAREST SURFACE WATER	DISTANCE TO NEAREST SURFACE WATER	ELEVATION CHANGE BETWEEN NEAREST SURFACE WATER AND WELL HEAD
NZ 2	Willow Creek	280'	12'
NZ 3	Willow Creek	2600'	35'

Please provide any information for your existing or proposed well(s) that you believe may be helpful in evaluating your application. For existing wells, describe any previous alteration(s) or repair(s) not documented in the attached well log or other materials *(attach additional sheets if necessary)*.

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SECTION 3: WELL DEVELOPMENT, CONTINUED

Source (aquifer), if known: _____

Total maximum rate requested: 2 cfs (each well will be evaluated at the maximum rate unless you indicate well-specific rates and annual volumes in the table below).

Complete the table below. If this is an existing well, the following information may be found on the applicable well log. *(If a well log is available, please submit it in addition to completing the table.)* If this is a proposed well, or well-modification, consider consulting with a licensed well driller, geologist, or certified water right examiner.

										PROPOSED USE			
OWNER'S WELL NAME OR NO.	PROPOSED	EXISTING	WELL ID (WELL TAG) NO.* OR WELL LOG ID**	FLOWING ARTESIAN	CASING DIAMETER	CASING INTERVALS (IN FEET)	PERFORATED OR SCREENED INTERVALS (IN FEET)	SEAL INTERVALS (IN FEET)	MOST RECENT STATIC WATER LEVEL & DATE (IN FEET)	SOURCE AQUIFER***	TOTAL WELL DEPTH	WELL-SPECIFIC RATE (GPM)	ANNUAL VOLUME (ACRE-FEET)
NZ 2	☑	☐		☐	12"								
NZ 3	☑	☐		☐	12"								
	☐	☐		☐									
	☐	☐		☐									
	☐	☐		☐									
	☐	☐		☐									
	☐	☐		☐									
	☐	☐		☐									

* Licensed drillers are required to attach a Department-supplied Well Tag, with a unique Well ID or Well Tag Number to all new or newly altered wells. Landowners can request a Well ID for existing wells that do not have one. The Well ID is intended to serve as a unique identification number for each well.

** A well log ID (e.g. MARI 1234) is assigned by the Department to each log in the agency's well log database. A separate well log is required for each subsequent alteration of the well.

*** Source aquifer examples: Troutdale Formation, gravel and sand, alluvium, basalt, bedrock, etc.

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SECTION 4: WATER USE

USE	PERIOD OF USE	ANNUAL VOLUME (ACRE-FEET)
Irrigation	April 1st - October 1st	550.5 acre ft.

Exempt Uses: Please note that 15,000 gallons per day for single or group **domestic** purposes and 5,000 gallons per day for a single **industrial or commercial** purpose are exempt from permitting requirements.

For irrigation use only:
Please indicate the number of primary and supplemental acres to be irrigated (*must match map*).

Primary: 127.4 Acres Supplemental: 52.8 Acres

List the Permit or Certificate number of the underlying primary water right(s): Cert 50392 & 55002

Indicate the maximum total number of acre-feet you expect to use in an irrigation season: 550.5 acre ft.

- If the use is **municipal or quasi-municipal**, attach **Form M**
- If the use is **domestic**, indicate the number of households: _____
- If the use is **mining**, describe what is being mined and the method(s) of extraction: _____

SECTION 5: WATER MANAGEMENT

A. Diversion and Conveyance
What equipment will you use to pump water from your well(s)?

☑ Pump (give horsepower and type): Not known

☐ Other means (describe): _____

Provide a description of the proposed means of diversion, construction, and operation of the diversion works and conveyance of water.

B. Application Method
What equipment and method of application will be used? (e.g., drip, wheel line, high-pressure sprinkler)

C. Conservation
Please describe why the amount of water requested is needed and measures you propose to: prevent waste; measure the amount of water diverted; prevent damage to aquatic life and riparian habitat; prevent the discharge of contaminated water to a surface stream; prevent adverse impact to public uses of affected surface waters.

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SECTION 6: STORAGE OF GROUND WATER IN A RESERVOIR

If you would like to store ground water in a reservoir, complete this section *(if more than one reservoir, reproduce this section for each reservoir).*

Reservoir name: _____ Acreage inundated by reservoir: _____

Use(s): _____

Volume of Reservoir (acre-feet): _____ Dam height (feet, if excavated, write "zero"): _____

***Note:** If the dam height is greater than or equal to 10.0' above land surface **AND** the reservoir will store 9.2 acre feet or more, engineered plans and specifications must be approved prior to storage of water.*

SECTION 7: USE OF STORED GROUND WATER FROM THE RESERVOIR

If you would like to use stored ground water from the reservoir, complete this section *(if more than one reservoir, reproduce this section for each reservoir).*

Annual volume (acre-feet): _____

USE OF STORED GROUND WATER	PERIOD OF USE

SECTION 8: PROJECT SCHEDULE

Date construction will begin: 15 April 2013

Date construction will be completed: 1 June 2013

Date beneficial water use will begin: 1 June 2013

SECTION 9: WITHIN A DISTRICT

☐ Check here if the point of diversion or place of use are located within or served by an irrigation or other water district.

Irrigation District Name	Address	
City	State	Zip

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SECTION 10: REMARKS

Use this space to clarify any information you have provided in the application *(attach additional sheets if necessary).*

The proposed wells will be 400 ft. Wells NZ 2 & NZ 3 will be cased into solid rock or clay. Further information was submitted with the mital application. Included is the seismoelectric survey.

Date _____

(For staff use only)

Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, Oregon 97301-1266
(503) 986-0900
www.wrd.state.or.us

WE ARE RETURNING YOUR APPLICATION FOR THE FOLLOWING REASON(S):

- ☐ SECTION 1: _____
- ☐ SECTION 2: _____
- ☐ SECTION 3: _____
- ☐ SECTION 4: _____
- ☐ SECTION 5: _____
- ☐ SECTION 6: _____
- ☐ SECTION 7: _____
- ☐ SECTION 8: _____
- ☐ SECTION 9: _____
- ☐ SECTION 10: _____
- ☐ Land Use Information Form _____
- ☐ Provide the legal description of: (1) the property from which the water is to be diverted, (2) any property crossed by the proposed ditch, canal or other work, and (3) any property on which the water is to be used as depicted on the map.
- ☐ Fees _____

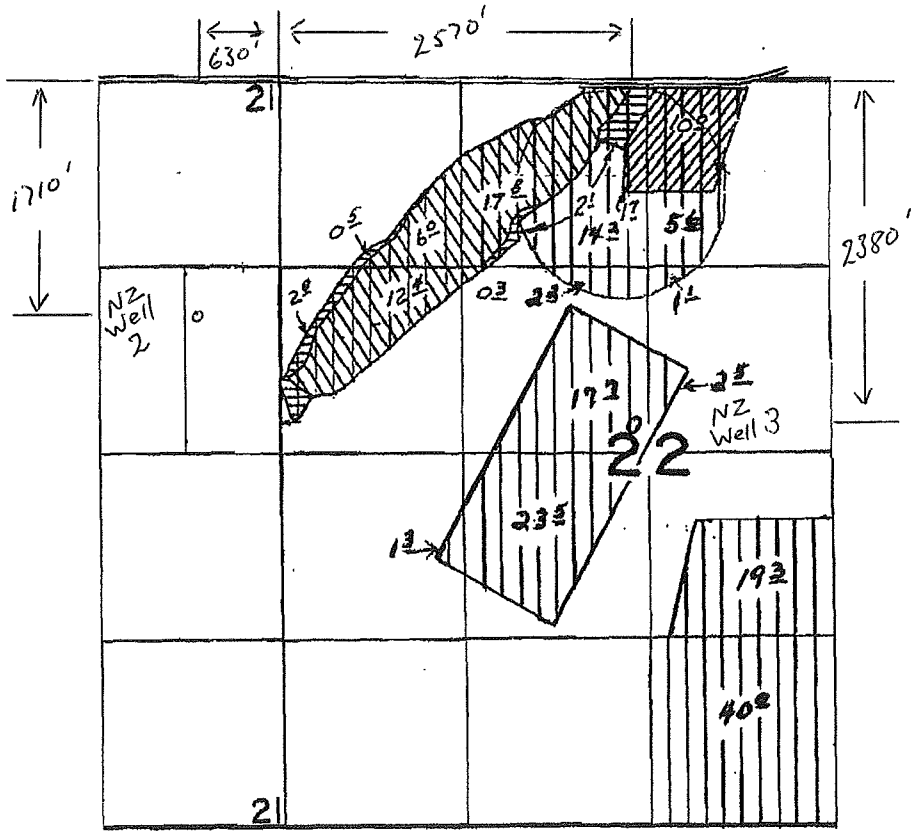
MAP

- ☐ Permanent quality and drawn in ink
- ☐ Even map scale not less than 4" = 1 mile (example: 1" = 400 ft, 1" = 1320 ft, etc.)
- ☐ North Directional Symbol
- ☐ Township, Range, Section, Quarter/Quarter, Tax Lots
- ☐ Reference corner on map
- ☐ Location of each well, and/or dam if applicable, by reference to a recognized public land survey corner (distances north/south and east/west). Each well must be identified by a unique name and/or number.
- ☐ Indicate the area of use by Quarter/Quarter and tax lot clearly identified
- ☐ Number of acres per Quarter/Quarter and hatching to indicate area of use if for primary irrigation, supplemental irrigation, or nursery
- ☐ Location of main canals, ditches, pipelines or flumes (if well is outside of the area of use)
- ☐ Other:

T.14S. R.39E. W.M.

Tax Lot No 3701

Scale 1" = 1320'



Primary for Certificate 50392 — Supp'l. — Primary Cert 55002

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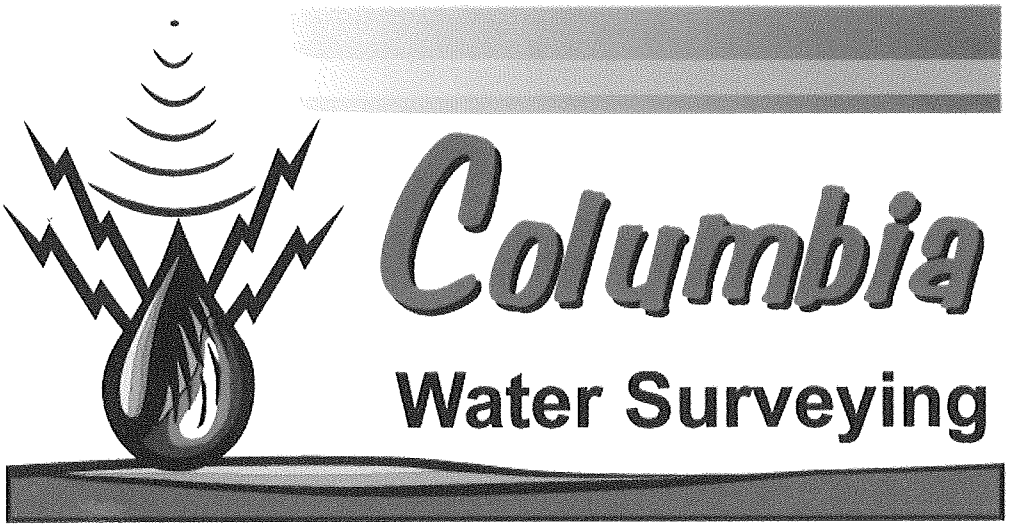
SEISMOELECTRIC SURVEY

Survey Service Agreement Number: 12159

FINAL REPORT

Client:

Bob Scott
5065 Willow Creek Rd.
Ironside OR 97908
Phone: 1. 541.446.3602



Columbia Water Surveying
2450 Wallula Av
Walla Walla WA 99362
Phone: 1.509.301.9350

April 1, 2013

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1. SUMMARY

2. INTRODUCTION

3. GEOLOGY

4. DATA ACQUISITION AND PROCESSING

5. RESULTS and INTERPRETATION

6. CONCLUSIONS

7. RECOMMENDATIONS

APPENDIX A The Seismoelectric Survey Method.

FIGURES

Figure 1. Two photographs showing the site conditions

Figure 2. Site location and sounding locations

Figure 3. Selected results from the seismoelectric soundings

1. SUMMARY

A Geophysical survey was conducted March 16, 2013 at 5065 Willow Creek Rd., near Ironside OR. The survey consisted of fifteen soundings in three profiles.

For profile A the site that showed the greatest potential was a5bs. At this site the estimated depth to the base of the aquifer was 230 feet below ground surface (bgs) and the estimated yield from a well drilled into the aquifer at this site is the mid-range of Category O [450-850 gallon/minute (gpm)].

For profile B the site that showed the greatest potential was b9bs. At this site the estimated depth to the base of the aquifer was 245 feet below ground surface (bgs) and the estimated yield from a well drilled into the aquifer at this site is of Category N [300-550 gallon/minute (gpm)].

Refer to the complete report below for specific details on the survey.

2. INTRODUCTION

Client: Bob Scott

Location of Survey: 5065 Willow Creek Rd., approximately one mile north of Ironside OR (Malheur County). Township 14S, Range 39E, Section 21 and 22.

Description of Property: The survey property was a parcel. It was situated on the valley floor of the Willow Creek valley and adjacent foothills to the east. The surface conditions on the property were cleared agricultural fields. Figure 1 shows two photos of the site conditions.

Purpose: The purpose of the survey was to determine the predominant location, depth to the base of, and potential yield of aquifers on the property. If located, one or more wells are proposed to provide an agricultural water supply.

3. BACKGROUND

General Geology: The geology in this area, which was taken from well reports and local geologic maps, consists of upper unconsolidated layers of topsoil and clay over deep clay layer with gravel strata. All of the geologic information used in this report is taken from geologic maps provided by the United States Geological Survey (USGS) and/or local well logs obtained from the State of Oregon, Water Resources Department. These are used to provide the geologic information relevant to this survey and in particular the rock types, from which velocity information is used to assist in the interpretation of the data recorded in this survey.

Existing Well Information: Table 1 shows the results of research conducted prior to the field survey on existing well in the area. It shows recorded well logs from 7 wells within the area around the survey site. The well logs indicate that the depth of wells in this area range from 220 to 860 feet bgs. Reported yields from these wells range from 30 to 800 gpm. Static levels at the wells range from 4 to 36 feet bgs. These well logs do not represent all of the logs from wells drilled in this area since we were unable to locate the well logs for known wells near the survey site.

Owner	Depth	SL	Yield	Twn S	Range E	Sec	Qtr	Qtr-Qtr	Date
A E NICHOLS	860			14	39	15	SW	SW	12/31/51
RALPH DUNCAN	220	6	30	14	39	15	SE	SW	11/25/61
JOHN MOLTHAN	374	31		14	39	21	SW	SE	9/20/88
MARY J MOLTHAN	320	33	800	14	39	21	SE	SW	8/6/51
RALPH DUNCAN	734	8	700	14	39	21	SW	SE	11/6/61
RESERVOIR LAND	420	3.5	700	14	39	14	SW	NW	10/1/93
MARVIN COILITE	220	36	225	14	39	21	NE	SE	5/11/63

Table 1: Known nearby existing wells

4. DATA ACQUISITION and PROCESSING

Testing Methodology: The survey was conducted using the seismoelectric method. This technique has the potential to provide the approximate depth and yield of subsurface water bearing formations. The technique works because electrical signals are often produced when seismic compression waves encounter water-saturated rocks. In order to record the electrical signals four copper plated steel electrodes are inserted into the ground and connected to the receiver. The data was acquired using a Groundflow™ 2500 Seismoelectric Survey System. This method is sometimes referred to as the Electro-Kinetic Survey (EKS) method. The data were processed using software that is proprietary to the Groundflow ™ Seismoelectric System. More details of this system and the basic theory of the seismoelectric method are provided in Appendix A.

Calibration Wells: A calibration well was used to assist with processing the data recorded during the survey. The calibration well was located approximately 600 feet southeast of profile A, on the client's property. The reported information from the well was: depth 220 feet bgs, static level 36 feet bgs, yield 225 gpm. The geology reported from the well indicated: topsoil and clays 0-10 feet bgs, clay with gravel strata 10-220 feet bgs. Water bearing layers were indicated at 180-220 feet bgs.

Survey Layout: A total of fifteen soundings were taken at three separate profile locations as shown in Figure 1. Profile A was a detailed profile consisting of eight soundings. Profile B was a detailed profile consisting of five soundings. Profile C was a sample profile consisting of two soundings. The locations of the sites were chosen based on the client's request, but were predominantly located near the proposed location of the well. Global Positioning Satellite (GPS) coordinates for the specific soundings are presented in Table 2. Site locations are marked with numbered flags corresponding to the numbers in this report. At most of the sounding sites, several discrete soundings were recorded so as to verify the integrity of the Seismoelectric signals.

Site #	Latitude	Longitude	Site #	Latitude	Longitude
a1bs	N44.337345	W117.933585	b9bs	N44.335850	W117.922089
a2bs	N44.337167	W117.933342	b10bs	N44.335743	W117.921893
a3bs	N44.336967	W117.933184	b13bs	N44.335924	W117.924598
a4bs	N44.337498	W117.933775	b14bs	N44.335794	W117.924432
a5bs	N44.337674	W117.933957	b15bs	N44.335998	W117.922304
a6bs	N44.337875	W117.934074	c11bs	N44.335846	W117.922316
a7bs	N44.337714	W117.933689	c12bs	N44.335721	W117.922097
a8bs	N44.337485	W117.933994			

Table 2: GPS Coordinates of Test Sites
(Based on the WGS 84 map datum.)

Testing Conditions: Test conditions at some of the sites were impacted by very soft subsurface conditions that precluded repeat soundings. However, by using mitigating techniques, no major complications that adversely influenced the data acquisition were encountered.

Test Analysis Method: Although it is possible to interpret the depth to the top of the aquifer, the following results present only the interpreted depth to the bottom. This is because the interpreted yields assume that the full thickness of the aquifer is used to produce water, and that presenting the depth to the top only would not provide a realistic estimate of the actual drill depth required in order to obtain the interpreted yield. Another reason for presenting the depth to the bottom of an aquifer is that the depth to the top of an aquifer can vary depending on the time of year and longer term weather conditions, as well as other wells drawing water from the same aquifer. Thus, because the depth to the top of an aquifer may change due to the conditions described above, a well that is drilled only a short distance into an aquifer may have a yield that is more susceptible to these changes. An additional factor is that a cone of depression may occur around a well as it is pumped, further reducing the yield of a well that is only drilled for a short distance into an aquifer. The cone of depression may be more pronounced for wells drilled into low permeability formations.

The seismoelectric method does not have the resolving power to generally predict the depth within an aquifer where the best yield may occur. If however, a sufficient yield is obtained before the interpreted bottom of the aquifer is reached, then it may be reasonable to stop drilling before this depth is reached.

It should be noted that the depth estimates provided in this report rely on estimates of the seismic velocity of the rocks under the sounding site. Even for a well-defined rock type, such as Granite, or Sandstone, seismic velocities can vary considerably depending on many factors, including the degree of weathering of the rock, fracturing and, for sedimentary rocks, degree of consolidation. Rock velocities can also vary with the geologic age of the rock, with older rocks generally having higher velocities. The velocities used in order to calculate

the depth estimates are, in general, averages of the velocity of the particular rock types suspected to exist at each sounding location.

Because many factors influence the interpreted yield, including the method used to drill a well, and in order to present the interpreted yields with accuracy that is realistic, the yield interpretation for each sounding is presented as one of a range of yields and is assigned an alphabetic label (category), as defined in Table 3.

Interpreted Yield (in gpm)	Category
0 – 3	A
2 – 6	B
5 – 10	C
8 – 15	D
12 – 25	E
18 – 35	F
25 – 50	G
35 – 65	H
50 – 95	I
70 – 130	J
100 – 180	K
140 – 250	L
200 – 350	M
300 – 550	N
450 – 850	O
650-1100	P

Table 3: Yield Categories

Figure 3 represents a selection of typical seismoelectric data (individual soundings) recorded during this survey. The interpreted yields were primarily obtained by using the proprietary software. They are based, in part, on assumptions regarding the static water level. In this area, this level is estimated to vary between 30 and 40 feet bgs. This is an important variable for yield estimates. The yield assumes that the full thickness of the aquifer is used down to the base of the aquifer specified at each test site. At this site the values obtained are based primarily on research using the local well logs provided by the State, but which were somewhat limited.

5. RESULTS and INTERPRETATION

The following provides the results interpretation of the data from each seismoelectric sounding. Based on past statistics, all of the following interpreted depths may vary by ± 15%, or sometimes more. Yield estimates are based on a sixteen-inch diameter well, and will increase or decrease for larger or smaller diameters respectively.

Profile A was located near the west boundary of the property, on the valley floor.

Site a6bs is located at the northwest end of the profile and indicates that the base of the aquifer is at a depth of approximately 165 feet bgs and has an estimated yield of category N (300 to 550 gpm).

Site a5bs is located 85 feet southeast of a6bs profile and indicates that the base of the aquifer is at a depth of approximately 230 feet bgs and has an estimated yield of category O (450 to 850 gpm).

Site a4bs is located 85 feet southeast of a5bs profile and indicates that the base of the aquifer is at a depth of approximately 180 feet bgs and has an estimated yield of the mid-range of category N (300 to 550 gpm).

Site a1bs is located 85 feet southeast of a4bs profile and indicates that the base of the aquifer is at a depth of approximately 180 feet bgs and has an estimated yield of category M (200 to 350 gpm).

Site a2bs is located 100 feet southeast of a1bs profile and indicates that the base of the aquifer is at a depth of approximately 215 feet bgs and has an estimated yield of category N (300 to 550 gpm).

Site a3bs is located 85 feet southeast of a2bs profile and indicates that the base of the aquifer is at a depth of approximately 150 feet bgs and has an estimated yield of category L (140 to 250 gpm).

Site a7bs is located 75 feet east of a5bs profile and indicates that the base of the aquifer is at a depth of approximately 215 feet bgs and has an estimated yield of category N (300 to 550 gpm).

Site a8bs is located 75 feet south of a5bs profile and indicates that the base of the aquifer is at a depth of approximately 195 feet bgs and has an estimated yield of category N (300 to 550 gpm).

Profile B was located 2800 feet east of profile A, in a shallow valley in the foothills.

Site b13bs is located at the northwest end of the profile and indicates that the base of the aquifer is at a depth of approximately 230 feet bgs and has an estimated yield of category M (200 to 350 gpm).

Site b9bs is located 85 feet southeast of ab13bs profile and indicates that the base of the aquifer is at a depth of approximately 245 feet bgs and has an estimated yield of category N (300 to 550 gpm).

Site b10bs is located 85 feet southeast of b9bs profile and indicates that the base of the aquifer is at a depth of approximately 245 feet bgs and has an estimated yield of category M (200 to 350 gpm).

Site b14bs is located 75 feet south of b13bs profile and indicates that the base of the aquifer is at a depth of approximately 295 feet bgs and has an estimated yield of category M (200 to 350 gpm).

Site b15bs is located 85 feet southeast of b14bs profile and indicates that the base of the aquifer is at a depth of approximately 295 feet bgs and has an estimated yield of category M (200 to 350 gpm).

Profile C was located approximately 600 feet west of profile B on the opposite side of the valley.

Site c11bs is located at the northwest end of the profile and indicates that the base of the aquifer is at a depth of approximately 310 feet bgs.

Site c12bs is located 85 feet southeast of c11bs and indicates that the base of the aquifer is at a depth of approximately 195 feet bgs.

A preliminary analysis of this sample is that there would be somewhat less than profile B.

The estimated yields are partially based on the calibration data collected at the calibration well, which is discussed earlier in this report.

6. CONCLUSIONS

The interpretation of the data indicates that groundwater is observed at all fifteen of the sites.

For Profile A the estimated depth to the base of the aquifer was from 150 to 230 feet bgs, with estimated yields from category L (140 to 250 gpm) to the mid-range of category O (450 to 850 gpm).

For Profile B the estimated depth to the base of the aquifer was from 230 to 295 feet bgs, with estimated yields from category M (200 to 350 gpm) to category N (300 to 550 gpm).

For Profile C the estimated depth to the base of the aquifer was 195 to 310 feet bgs. A preliminary analysis of this sample is that there would be somewhat less than profile B.

It should be noted that the estimated yields made by the Groundflow equipment involves many assumptions and should only be used as a guide for selecting drilling locations. Previous yield interpretations have been nearly exact in some instances but have also been lower, and higher, than that which was obtained after drilling had been completed. However, the values presented are only estimates based on the interpretation of the seismoelectric data.

7. RECOMMENDATIONS

The choice of which site to drill depends on many factors. It will be primarily decided by the client. However, the depth to the base of the aquifer and estimated yield are two important factors.

For profile A, the site with the highest estimated yield (mid-range of category O) was a5bs. The depth to the base of the aquifer was 230 ft bgs. It may be the best location.

For profile B, the sites with the highest estimated yield (category N) was b9bs. The depth to the base of the aquifer was approximately 245 ft bgs. It may be the best location.

The survey at profile C was a preliminary evaluation of this location. Additional soundings will be required to confirm or dispel the preliminary results, refine the depth estimations and provide sufficient data to fully analyze the potential yield of the aquifer.

Columbia Water Surveying does not recommend drilling in an area with an estimated yield of less than 6 gpm. The drilling process can, at times, significantly and detrimentally affect the final yield of a low yield aquifer.

Since the aquifer conditions may be changing with time, it is possible that these changes could adversely affect its yield. We, therefore, suggest that if the client chooses to drill a well at any of the surveyed locations, the well should be drilled within 90 days of the survey completion date.

Prior to drilling it should be ascertained that the drill operator has substantial experience with the drilling equipment that he, or she, operates the equipment correctly. In addition, the property owner should be present when drilling is done. It should be noted that drilling always causes some damage to the aquifer local to the drill site and this should be considered prior to drilling to an aquifer that has an estimated low yield. This report should be used as a guide, along with the driller's experience with drilling in the area.

If a well is drilled at this location, part of its development should include a long flow test (often 4 to 12 hours in length) in an attempt to remove all of the sediment and air that may have been introduced into the surrounding rock formation (aquifer) by the drilling process. These may restrict the flow of water into the well and therefore the subsequent yield. The flow test may need to be longer for less productive water bearing zones.

As stated earlier in this report, the estimated depths in this report should be generally used as a maximum depth to drill. If the estimated yield is obtained at a shallower depth than that provided by the interpretation, drilling to greater depths is not necessarily recommended.

All of the data recording, analysis, interpretations and conclusions in this report has been prepared by persons who have had a rigorous training in the acquisition and analysis of seismoelectric data.

A minimum of 100 feet must be maintained between a domestic well and any septic field or designated future septic field. The area immediately adjacent to a domestic well should be fenced off from any livestock.

Figure 1. Two photographs showing the site conditions.

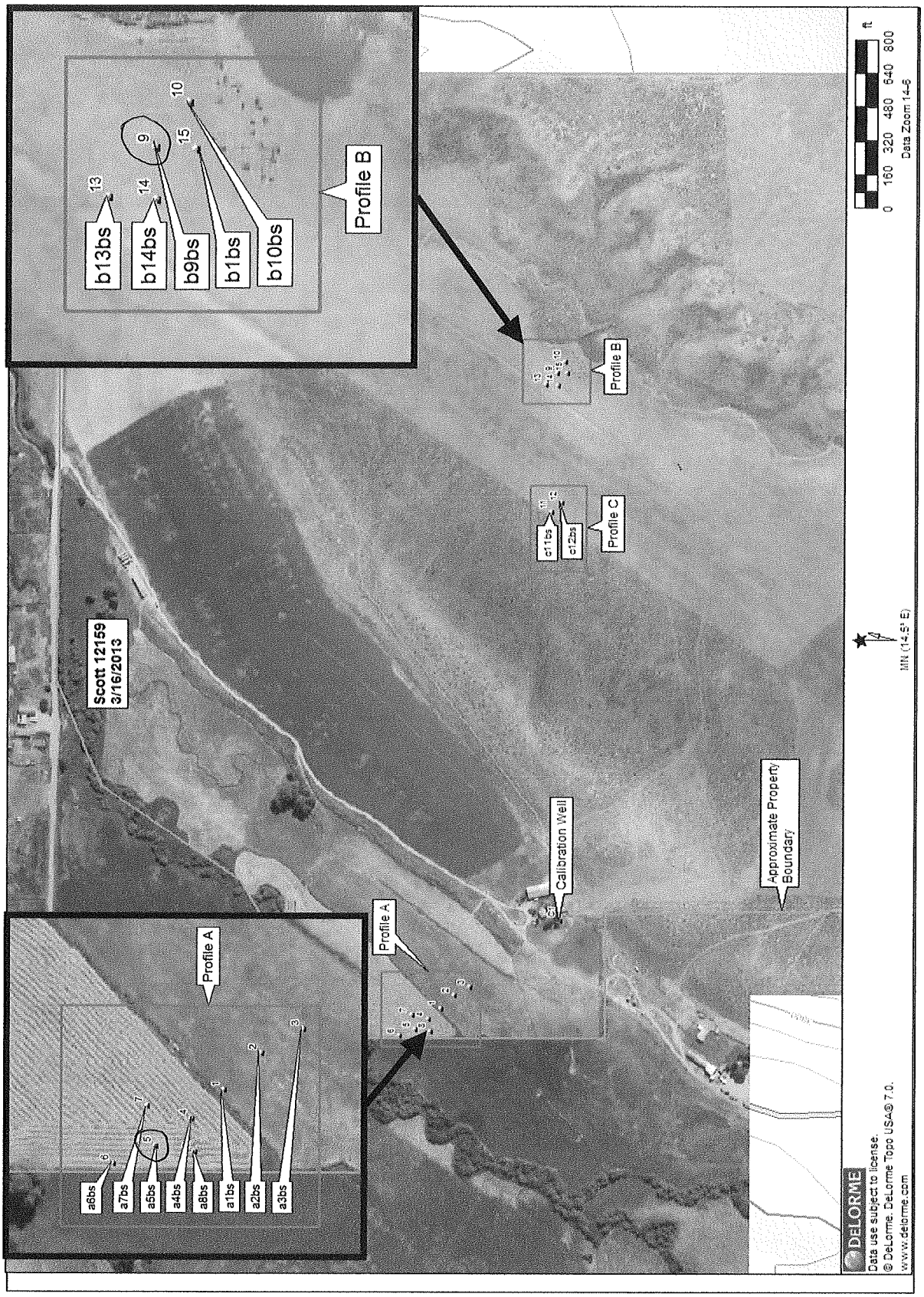

Figure 2. Survey location and sounding locations

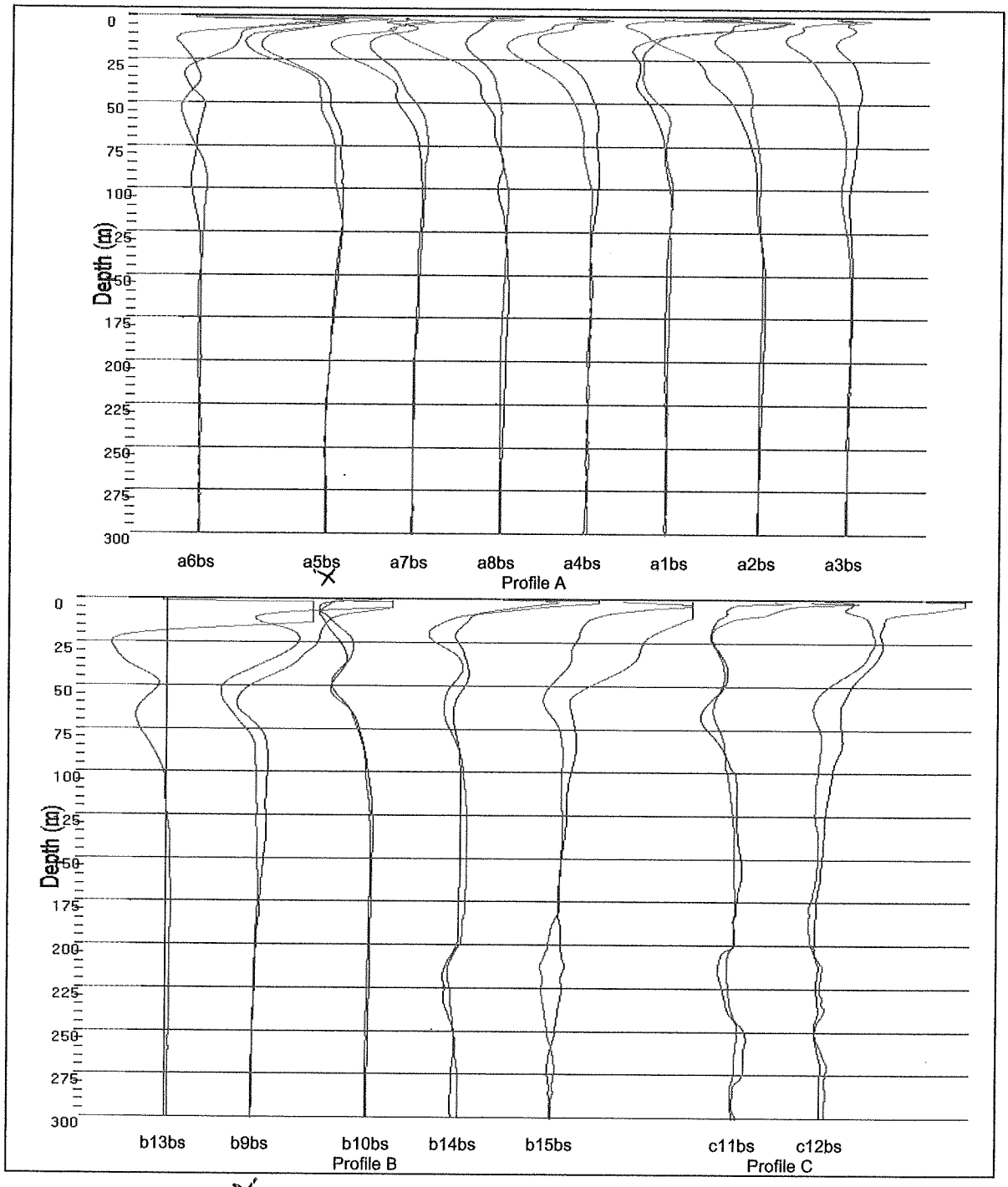

Figure 3. Selected results from the seismoelectric soundings.

The images above are a representation of the data collected at each test site. Accurate interpretation of this data requires training and experience and access to the proprietary software not available to the general public at this time. The inclusion of these images in the report is only intended to provide a basic illustration of the data collected at each test site.