



Application for a State Waste Discharge Permit to Discharge Industrial Wastewater to Ground Water by Land Treatment or Application

This application is for a state waste discharge permit as required by Chapter 90.48 RCW and Chapter 173-216 WAC. Permit applications provide Ecology with information on pollutants in the waste stream, materials that may enter the waste stream, the flow characteristics of the discharge, and the site characteristics at the point of discharge.

Ecology may request additional information to clarify the conditions of this discharge. The applicant should reference information previously submitted to Ecology that applies to this application in the appropriate section.

SECTION A. GENERAL INFORMATION

1. Applicant name: REC Solar Grade Silicon, Inc.
2. Facility name: same
(if different from applicant)
3. Applicant mail address: 3322 Road "N" NE
Street
Moses Lake, WA 98837
City/State Zip
4. Facility location address: same
(if different from above) Street
5. UBI No. 602-313-434
City/State Zip
Sometimes called a registration, tax, "C," or resale number, the Unified Business Identifier (UBI) number is a nine-digit number used to identify persons engaging in business activities. The number is assigned when a person completes a [Master Business Application](#) to register with or obtain a license from state agencies. The Departments of Revenue, Licensing, Employment Security, Labor and Industries, and the Corporations Division of the Secretary of State are among the state agencies participating in the UBI program.
6. Latitude/longitude of the processing facility as decimal degrees (NAD83/WGS84):
47.135556 °N / 119.200000 °W

FOR ECOLOGY USE ONLY

Check One

New/Renewal ☐

Modification ☐

Date application received

Application/Permit no.

Date application accepted

Date fee paid

<u>Paul Stenhouse</u>	<u>Environmental Engineer</u>
Name	Title
<u>(509) 793-9165</u>	<u>(509) 766-9615</u>
Telephone number	Fax number

☒ **Permit renewal** (including renewal of temporary permits authorized by RCW 90.48.200)

Does this application request a greater amount of wastewater discharge, a greater amount of pollutant discharge, or a discharge of different pollutants than specified in the last permit application for this facility? ☐ YES ☒ NO

For permit renewals, the current permit is an attachment, by reference, to this application.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and/or imprisonment for knowing violations.

*Applications must be signed as follows: Corporations, by a principal executive officer of at least the level of vice-president; partnership, by a general partner; sole proprietorship, by the proprietor. If these titles do not apply to your organization, the person who makes budget decisions for this facility must sign the application.

Signature of delegated employee	Date	Title or function at the facility
Printed name		

SECTION B. PRODUCT INFORMATION

- Briefly describe all manufacturing processes and products, and/or commercial activities at this facility. Provide the applicable Standard Industrial Category (SIC) and the North American Industry Classification System (NAICS) Code(s) for each activity (see *North American Industrial Classification System*, 2007 ed.). You can find the 1997 NAICS codes and the corresponding 1987 Standard Industry Category (SIC) codes at (<http://www.census.gov/epcd/naics/frames3.htm>).

Description: REC owns and operates a high purity polysilicon and silane plant in Moses Lake. REC sells polysilicon for use mainly in the photovoltaic industry while it uses silane gas as a raw material for polysilicon production. The facility discharges low chloride wastewater to the City of Moses Lake, Sand Dunes Treatment Plant; high chloride and high sodium, high silicate wastewaters to a series of lined evaporation ponds; and non-contact cooling water to a 60 million gallon lined storage pond and 125 acre land application site. Applicable Codes - 2012 NAICS Codes (Silane Gas: 325180 - Other Basic Inorganic Chemical Manufacturing; Solar Grade Polysilicon: 331410 - Nonferrous Metal (Except Aluminum) Smelting and Refining). 1987 SIC Codes - (Silane Gas: 2819; Solar Grade Polysilicon: 3339).

- List raw materials and products:

Type	RAW MATERIALS	Quantity
<i>Potatoes (Example)</i>		<i>20 million tons per year</i>
See Attachment 1 - Material Imports		
Type	PRODUCTS	Quantity
<i>French fries (Example)</i>		<i>10 million pounds per year</i>
Solar Grade Silicon		Quantities are business confidential
Silane Gas		Quantities are business confidential
Calcium Chloride		750,000 pounds per year

SECTION C. PLANT OPERATIONAL CHARACTERISTICS

- For each process listed in B.1 that generates wastewater, list the process, assign the waste stream a name and ID #, and describe whether it is a batch or continuous flow.

Process	Waste Stream Name	Waste Stream ID#	Batch (B) or Continuous (C) Process
<i>Receiving raw potatoes (Example)</i>	<i>Mud Water</i>	<i>1</i>	<i>C</i>
Various	Low Chloride System	001	Batch
Various	High Chloride and High Sodium High Silicate Systems	004	Batch
Noncontact Cooling	Land Application	003	Batch

- On a separate sheet, produce a schematic drawing showing production processes and water flow through the facility and wastewater treatment devices (*label as attachment C2*). The drawing should indicate the source of intake water and the operations contributing wastewater to the effluent and should label the treatment units. Construct the water balance by showing average flows between intakes, operations, treatment units, and points of discharge to land. If a water balance cannot be determined (*e.g., for certain mining activities*), provide a description of the nature and amount of any sources of water and any collection or treatment measures.
- What is the highest daily discharge flow from the processing facility:
(Specify the time period for the value given)

What is the highest daily discharge flow to the sprayfields/infiltration basin:
(Specify the time period for the value given)

What is the highest average monthly discharge flow (daily flows averaged over a month) from the processing facility:
(Specify the time period for the value given)

What is the highest average monthly discharge flow to the sprayfields:
(Specify the time period for the value given)

4/25/13: 824,691 gallons per day

inches/acre/month OR

4/25/13: 824,691 gallons per day

6/2013: 499,454 gallons/day?

inches/acre/month OR

6/2013: 499,454 gallons per day
- Describe any planned wastewater treatment or sprayfield/infiltration improvements and the schedule for the improvements or changes. (*Use additional sheets, if necessary and label as attachment C4.*)

5. If production processes are subject to seasonal variations, provide the following information. List discharge for each wastestream in gallons or million gallons per month. The combined value for each month should equal the estimated total monthly flow. Please indicate the proper unit by checking one of the following boxes:

☐ gallons per day ☐ gallons per month ☒ million gallons per month

Waste Stream ID#	MONTHS											
	J	F	M	A	M	J	J	A	S	O	N	D
#1 (Example)	1000	1000	1000	1000	6000	2000	2000	2000	1000	1000	5000	4000
Irrigated Wastewater	0	0.89	2.06	6.04	5.00	14.98	14.10	7.98	0	3.52	0	0
Estimated total gallons												

6. If this is a discharge from the processing facility to a storage or evaporative lagoon, what is the size of the lagoon (give square footage for the bottom of the lagoon and the total volume of the lagoon at full operating depth). 10,000 square feet; 10 million gallons (Example)

7. Check the applicable box. Is this a discharge to a sprayfield ☒ or an infiltration bed ☐? Provide the average gallons per acre per day proposed for each month in the following table.

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept.	Oct	Nov	Dec
Estimated gallons per acre per day	0	255	531	1612	1290	3996	3639	2060	0	909		

8. How many hours a day does this facility typically operate? 24
 How many days a week does this facility typically operate? 7
 How many weeks per year does this facility typically operate? 52
9. List all incidental materials such as oil, paint, grease, solvents, and cleaners that are used or stored on site (list only those with quantities greater than 10 gallons for liquids and 50 pound quantities for solids). For solvents and solvent-based cleaners, include a copy of the material safety data sheet for each material and estimate the quantity used. *Use additional sheets, if necessary and label as attachment C.7.)*

Materials/Quantity Stored: There will not be any new oils, paints, greases, solvents or cleaners introduced to the facility beyond what is currently stored onsite. Quantities for some of the chemicals may be increased in accordance with all applicable federal, state, and local laws and regulations. Material safety data sheets for all chemicals stored onsite were provided during the 2007 permit modification.

- | | | | |
|-----|---|-------------------------------------|-------------------------------------|
| 10. | Some types of facilities are required to have spill or waste control plans. Does this facility have: | Yes | No |
| a. | A spill prevention, control, and countermeasure plan (40 CFR 112)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b. | An Oil Spill Contingency Plan (chapter 173-182 WAC)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c. | An emergency response plan (per WAC 173-303-350)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| d. | A runoff, spillage, or leak control plan (per WAC 173-216-110(f))? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| e. | Any spill or pollution prevention plan required by local, state or federal authorities? If yes specify: <u>SPCC Plan per 40CFR112</u> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| f. | A solid waste control plan? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

SECTION D. WATER CONSUMPTION AND WATER LOSS

1. Potable water source(s):

☒ ☐ Public system (Specify name) City of Moses Lake
☐ ☐ Private well ☐ Surface water (Specify name of water body) _____

a. Water right permit number: City of Moses Lake

b. Legal description of water source:

_____ $\frac{1}{4}$ S, _____ $\frac{1}{4}$ S, _____, Section, _____ TWN, _____ R

2. Potable water use

a. Indicate total water use: Gallons per day (average) 400,000
Gallons per day (maximum) 1,300,000

b. Is water metered? ☒ YES ☐ NO

3. Supplemental Irrigation water source(s):

☐ ☐ Public system or Irrigation District (Specify name) _____
☒ ☐ Private well ☐ Surface water (Specify name of water body) _____

a. Water right permit number: 4614

b. Legal description of water source:

_____ $\frac{1}{4}$ S, NW $\frac{1}{4}$ S, 17, Section, 19N TWN, 29 E R

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SECTION E. WASTEWATER INFORMATION

1. How are the water intake and effluent flows measured?

Intake: not metered

Effluent meter

2. Describe the collection method for the samples analyzed below. (*i.e.*, grab, 24-hour composite). Applicants must collect grab samples (not composites) for analysis of pH, temperature, cyanide, total phenols, residual chlorine, oil and grease, fecal coliform (including *E. coli*), and Enterococci (previously known as fecal streptococcus at § 122.26 (d)(2)(iii)(A)(3)), or volatile organics.

See Attachment 2 - Parameter Monitoring per State Waste Discharge Permit Number ST 8121 for a summary of collection methods by parameter. Results of parameters in addition to those specified in question E.4 below are reported in the monthly Discharge Monitoring Reports (DMRs). Results in E.4 are from August-December DMRs.

3. Has the effluent been analyzed for any other parameters than those identified in question E.4.? ☒ YES ☐ NO
If yes, attach results and label as attachment E.4. This data must clearly show the date, method and location of sampling. (*Note: Ecology may require additional testing.*)

4. Provide measurements or range of measurements for treated wastewater prior to discharge to the POTW for the parameters with an “X” in the left column. If you obtain the application from the internet, contact Ecology’s regional office to see if testing for a subset of these parameters is permissible. All analyses (except pH) must be conducted by a laboratory registered or accredited by Ecology (WAC 173-216-125). If this is an application for permit renewal, provide data for the last year for those parameters that are routinely measured. For parameters measured only for this application, place the values under “Maximum.” Report the values with units as specified in the parameter name or in the detection level.

The Permittee must use the specified analytical methods, detection limits (DLs) and quantitation levels (QLs) in the following table unless Ecology approves an alternate method **or the method used produces measurable results in the sample and EPA has listed it as an EPA approved method in 40 CFR Part 136. If the Permittee uses an alternative method as allowed above, it must report the test method, DL, and QL on the discharge monitoring report or in the required report.**

X	Parameter	Measurement Values			Number of Analyses	Analytical Method Std. Methods 19 th , 20 th edition or EPA	Detection Limit/Quantitation Level
		Minimum	Maximum	Average			
	BOD (5 day)					SM 5210 B	/2 mg/l
	COD					SM 5220 D	/10 mg/l
	Total suspended solids					SM 2540 D	/5 mg/l
	Fixed Dissolved Solids					SM 2540 E	
X	Total dissolved solids	338	542	433	18	SM 2540 C	
	Conductivity (micromhos/cm)					SM 2510 B	
X	Ammonia-N as N	0.1	1.4	0.15	18	SM 4500-NH ₃ C	/0.3 mg/L
X	pH	8.6	9.7	8.9	18	SM 4500-H	0.1 standard units
	Fecal coliform (organisms/100 mL)					SM 9221 E or 9222 D	
	Total coliform (organisms/100 mL)					SM 9221 B or 9222 B	
	Dissolved oxygen					SM 4500-O C/G	
X	Nitrate + nitrite-N as N	100	400	150	18	SM 4500-NO ₃ E	100 µg/L
	Total kjeldahl N as N					SM 4500-N _{org} C/E/FG	300 µg/l
	Ortho-phosphate-P as P					SM 4500-P E/F	10 µg/l
X	Total-phosphorous-P as P	1,000	1,500	1,100	18	SM 4500-P E/P/F	10 µg/l
	Total Oil & grease					EPA 1664A	1.4/5 mg/l
	NWTPH - Dx					Ecology NWTPH Dx	250/250 µg/l
	NWTPH - Gx					Ecology NWTPH Gx	250/250 µg/l
X	Calcium	8,100	11,400	9,600	18	EPA 200.7	10 µg/l
X	Chloride	28,100	35,100	30,600	18	SM 4500-Cl C	0.15 µg/l
X	Fluoride	3.1	3.8	3.5	18	SM 4500-F E	.025/0.1 mg/l

X	Parameter	Measurement Values			Number of Analyses	Analytical Method Std. Methods 19 th , 20 th edition or EPA	Detection Limit/Quantitation Level
		Minimum	Maximum	Average			
X	Magnesium	3,300	4,300	3,900	18	EPA 200.7	10/50 µg/l
X	Potassium	10,400	13,000	11,700	18	EPA 200.7	700/ µg/l
X	Sodium	94,800	159,100	126,000	18	EPA 200.7	29/ µg/l
X	Sulfate	101,600	132,100	109,000	18	SM 4500-SO ₄ C/D	/200 µg/l
X	Alkalinity as CaCO ₃	121	188	163	18	SM 2320 B	/5 mg/L as CaCO ₃
	Arsenic(total)					EPA 200.8	0.1/0.5 µg/l
	Barium (total)					EPA 200.8	0.5/2 µg/l
	Cadmium (total)					EPA 200.8	.05/.25 µg/l
	Chromium (total)					EPA 200.8	0.2/1 µg/l
X	Copper (total)	19.2	100	43.1	18	EPA 200.8	0.4/2 µg/l
	Iron (total)					EPA 200.7	12.5/50 µg/l
	Lead (total)					EPA 200.8	0.1/.5 µg/l
X	Manganese (total)	3,800	25,100	10,600	18	EPA 200.8	0.1/0.5 µg/l
	Mercury (total) pg/L					EPA 1631E	0.2/0.5 pg/l
	Molybdenum(total)					EPA 200.8	0.1/0.5 µg/l
	Nickel(total)					EPA 200.8	0.1/0.5 µg/l
	Selenium (total)					EPA 200.8	1/1 µg/l
	Silver (total)					EPA 200.8	.04/.2 µg/l
	Zinc (total)					EPA 200.8	0.5/2.5 µg/l

Detection level (DL) or detection limit means the minimum concentration of an analyte (substance) that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero as determined by the procedure given in 40 CFR part 136, Appendix B.

Quantitation Level (QL) also known as Minimum Level of Quantitation (ML) – The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that the lab has used all method-specified sample weights, volumes, and cleanup procedures. The QL is calculated by multiplying the MDL by 3.18 and rounding the result to the number nearest to (1, 2, or 5) x 10ⁿ, where n is an integer. (64 FR 30417).

ALSO GIVEN AS:

The smallest detectable concentration of analyte greater than the Detection Limit (DL) where the accuracy (precision & bias) achieves the objectives of the intended purpose. (Report of the Federal Advisory Committee on Detection and Quantitation Approaches and Uses in Clean Water Act Programs Submitted to the US Environmental Protection Agency December 2007).

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5. Does this facility use any of the following chemicals as raw materials in production, produce them as part of the manufacturing process, or are they present in the wastewater? (*The number following the chemical name is the Chemical Abstract Service (CAS) reference number to aid in identifying the compound.*) ☐ YES ☒ NO

If yes, specify how the chemical is used and the quantity used or produced (*Use additional sheets, if necessary and label as attachment E5.*):

Acrylamide/79-06-1
Acrylonitrile/107-13-1
Aldrin/309-00-2
Aniline/62-53-3
Aramite/140-57-8
Arsenic/7440-38-2
Azobenzene/103-33-3
Benzene/71-43-2
Benzidine/92-87-5
Benzo(a)pyrene/50-32-8
Benzotrichloride/98-07-7
Benzyl chloride/100-44-7
Bis(chloroethyl)ether/111-44-4
Bis(chloromethyl)ether/542-88-1
Bis(2-ethylhexyl) phthalate/ 117-81-7
Bromodichloromethane/75-27-4
Bromoform/75-25-2
Carbazole/86-74-8
Carbon tetrachloride/56-23-5
Chlordane/57-74-9
Chlorodibromomethane/124-48-1
Chloroform/67-66-3
Chlorthalonil/1897-45-6
2,4-D/94-75-7
DDT/50-29-3
Diallate/2303-16-4
1,2 Dibromoethane/106-93-4
1,4 Dichlorobenzene/106-46-7
3,3' Dichlorobenzidine/91-94-1
1,1 Dichloroethane/75-34-3
1,2 Dichloroethane/107-06-2

Nitrofurazone/59-87-0
N-nitrosodiethanolamine/ 1116-54-7
N-nitrosodiethylamine/55-18-5
N-nitrosodimethylamine/62-75-9
N-nitrosodiphenylamine/86-30-6
N-nitroso-di-n-propylamine/ 621-64-7
N-nitrosopyrrolidine/930-55-2
N-nitroso-di-n-butylamine/ 924-16-3
N-nitroso-n-methylethylamine/
10595-95-6
PAH/NA
PBBs/NA
PCBs/1336-36-3
1,2 Dichloropropane/78-87-5
1,3 Dichloropropene/542-75-6
Dichlorvos/62-73-7
Dieldrin/60-57-1
3,3' Dimethoxybenzidine/119-90-4
3,3 Dimethylbenzidine/119-93-7
1,2 Dimethylhydrazine/540-73-8
2,4 Dinitrotoluene/121-14-2
2,6 Dinitrotoluene/606-20-2
1,4 Dioxane/123-91-1
1,2 Diphenylhydrazine/122-66-7
Endrin/72-20-8
Epichlorohydrin/106-89-8
Ethyl acrylate/140-88-5
Ethylene dibromide/106-93-4
Ethylene thiourea/96-45-7
Folpet/133-07-3
Furmecyclo/60568-05-0

Heptachlor/76-44-8
Heptachlor epoxide/1024-57-3
Hexachlorobenzene/118-74-1
Hexachlorocyclohexane (alpha)/
319-84-6
Hexachlorocyclohexane (tech.)/
608-73-1
Hexachlorodibenzo-p-dioxin,
mix/19408-74-3
Hydrazine/hydrazine sulfate/ 302-01-2
Lindane/58-89-9
2 Methylaniline/100-61-8
2 Methylaniline hydrochloride/
636-21-5
4,4' Methylene bis(N,N-
dimethyl)aniline/101-61-1
Methylene chloride
(dichloromethane)/75-09-2
Mirex/2385-85-5
O-phenylenediamine/106-50-3
Propylene oxide/75-56-9
2,3,7,8-Tetrachlorodibenzo-p-dioxin/
1746-01-6
Tetrachloroethylene/127-18-4
2,4 Toluenediamine/95-80-7
o-Toluidine/95-53-4
Toxaphene/8001-35-2
Trichloroethylene/79-01-6
2,4,6-Trichlorophenol/88-06-2
Trimethyl phosphate/512-56-1
Vinyl chloride/75-01-4

6. Are any other pesticides, herbicides, or fungicides used at this facility? ☒ YES ☐ NO

If yes, specify the material and quantity used.

Minimal quantites of zinc phosphide for rodent control, applications of Roundup, Banvel, 2,4-D Amine, and Surflan AS. Sodium hypochlorite to prevent microbial growth in cooling towers.

7. Are there other pollutants that you know of or believe to be present? ☐ YES ☒ NO

If yes, specify the pollutants and their concentration if known
(attach laboratory analyses if available).

☐ DON'T KNOW

SECTION F. GROUNDWATER INFORMATION

Provide available data measurements or range of measurements from monitoring wells or supply wells in the area of discharge. Provide the analytical method and detection limit, if known. Provide the location of each well on the map required in G.3 below. Well logs are included in Attachments G3 and G5. Copy this page as necessary for each well. Provide the latitude and longitude in decimal format.

Ecology Well Tag ID # BAL 816

Well ID # MW-2

Latitude: 47.1347482

Longitude: -119.2057185

Well Elevation (to the nearest 0.01 feet) 1195.87 Check the appropriate box: The elevation measurement is relative to: the NAVD88 standard ☒ mean sea level ☐

Parameter	Units	Range of Measurements	Number of Analyses	Analytical Method	Detection Limit
BOD (5 day)	mg/L				
COD	mg/L				
Total organic carbon	mg/L				
Total dissolved solids	mg/L				
Dissolved Fixed Solids	mg/L				
pH	Standard units	7.80 to 8.90	5	SM 4500-H+ B	N/A
Conductivity	(micromhos/cm)	353 to 507	5	SM 2510 B	1.0 µmhos/cm
Alkalinity	mg/L as CaCO ₃				
Total hardness	mg/L				
Fecal coliform	organisms/100mL				
Total coliform	organisms/100mL				
Dissolved oxygen	mg/L				
Ammonia-N	mg/L				
Nitrate + nitrate-N, nitrate	mg/L				
Total kjeldahl N	mg/L				
Ortho-phosphate-P	mg/L				
Total-phosphate-P	mg/L				
Total Oil and Grease	mg/L				
Total petroleum hydrocarbon	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Calcium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Chloride	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Fluoride	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Magnesium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Potassium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Sodium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Sulfate	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Bicarbonate	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Barium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Cadmium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Chromium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Copper	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Iron	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Lead	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Manganese	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Mercury	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Selenium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Silver	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Zinc	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Depth to Water level (to the nearest 0.01 feet)		1168.90 to 1170.60	5	N/A	N/A

SECTION F. GROUNDWATER INFORMATION

Provide available data measurements or range of measurements from monitoring wells or supply wells in the area of discharge. Provide the analytical method and detection limit, if known. Provide the location of each well on the map required in G.3 below. Well logs are included in Attachments G3 and G5. Copy this page as necessary for each well. Provide the latitude and longitude in decimal format.

Ecology Well Tag ID # BAL 814

Well ID # MW-3

Latitude: 47.1357965

Longitude: -119.1942208

Well Elevation (to the nearest 0.01 feet) 1221.25 Check the appropriate box: The elevation measurement is relative to: the NAVD88 standard ☒ mean sea level ☐

Parameter	Units	Range of Measurements	Number of Analyses	Analytical Method	Detection Limit
BOD (5 day)	mg/L				
COD	mg/L				
Total organic carbon	mg/L				
Total dissolved solids	mg/L				
Dissolved Fixed Solids	mg/L				
pH	Standard units	8.20 to 8.80	5	SM 4500-H+ B	N/A
Conductivity	(micromhos/cm)	690 to 768	5	SM 2510B	1.0 µmhos/cm
Alkalinity	mg/L as CaCO ₃				
Total hardness	mg/L				
Fecal coliform	organisms/100mL				
Total coliform	organisms/100mL				
Dissolved oxygen	mg/L				
Ammonia-N	mg/L				
Nitrate + nitrate-N, nitrate	mg/L				
Total kjeldahl N	mg/L				
Ortho-phosphate-P	mg/L				
Total-phosphate-P	mg/L				
Total Oil and Grease	mg/L				
Total petroleum hydrocarbon	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Calcium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Chloride	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Fluoride	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Magnesium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Potassium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Sodium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Sulfate	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Bicarbonate	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Barium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Cadmium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Chromium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Copper	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Iron	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Lead	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Manganese	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Mercury	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Selenium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Silver	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Zinc	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Depth to Water level (to the nearest 0.01 feet)		1187.90 to 1189.00	5	N/A	N/A

SECTION F. GROUNDWATER INFORMATION

Provide available data measurements or range of measurements from monitoring wells or supply wells in the area of discharge. Provide the analytical method and detection limit, if known. Provide the location of each well on the map required in G.3 below. Well logs are included in Attachments G3 and G5. Copy this page as necessary for each well. Provide the latitude and longitude in decimal format.

Ecology Well Tag ID # BAL 813

Well ID # MW-4

Latitude: 47.1353666

Longitude: 119.1949195

Well Elevation (to the nearest 0.01 feet) 1217.6 Check the appropriate box: The elevation measurement is relative to: the NAVD88 standard ☒ mean sea level ☐

Parameter	Units	Range of Measurements	Number of Analyses	Analytical Method	Detection Limit
BOD (5 day)	mg/L				
COD	mg/L				
Total organic carbon	mg/L				
Total dissolved solids	mg/L				
Dissolved Fixed Solids	mg/L				
pH	Standard units	7.90 to 8.10	5	SM 4500-H+ B	N/A
Conductivity	(micromhos/cm)	471 to 904	5	SM 2510B	1.0 µmhos/cm
Alkalinity	mg/L as CaCO ₃				
Total hardness	mg/L				
Fecal coliform	organisms/100mL				
Total coliform	organisms/100mL				
Dissolved oxygen	mg/L				
Ammonia-N	mg/L				
Nitrate + nitrate-N, nitrate	mg/L				
Total kjeldahl N	mg/L				
Ortho-phosphate-P	mg/L				
Total-phosphate-P	mg/L				
Total Oil and Grease	mg/L				
Total petroleum hydrocarbon	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Calcium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Chloride	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Fluoride	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Magnesium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Potassium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Sodium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Sulfate	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Bicarbonate	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Barium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Cadmium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Chromium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Copper	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Iron	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Lead	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Manganese	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Mercury	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Selenium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Silver	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Zinc	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Depth to Water level (to the nearest 0.01 feet)		1196.50 to 1202.20	5	N/A	N/A

SECTION F. GROUNDWATER INFORMATION

Provide available data measurements or range of measurements from monitoring wells or supply wells in the area of discharge. Provide the analytical method and detection limit, if known. Provide the location of each well on the map required in G.3 below. Well logs are included in Attachments G3 and G5. Copy this page as necessary for each well. Provide the latitude and longitude in decimal format.

Ecology Well Tag ID # N/A

Well ID # MW-6

Latitude: 47.1373127

Longitude: -119.199701

Well Elevation (to the nearest 0.01 feet) 1206.68 Check the appropriate box: The elevation measurement is relative to: the NAVD88 standard ☒ mean sea level ☐

Parameter	Units	Range of Measurements	Number of Analyses	Analytical Method	Detection Limit
BOD (5 day)	mg/L				
COD	mg/L				
Total organic carbon	mg/L				
Total dissolved solids	mg/L				
Dissolved Fixed Solids	mg/L				
pH	Standard units	8.40 to 9.20	5	SM 4500-H+ B	N/A
Conductivity	(micromhos/cm)	308 to 322	5	SM 2510B	1.0 µmhos/cm
Alkalinity	mg/L as CaCO ₃				
Total hardness	mg/L				
Fecal coliform	organisms/100mL				
Total coliform	organisms/100mL				
Dissolved oxygen	mg/L				
Ammonia-N	mg/L				
Nitrate + nitrate-N, nitrate	mg/L				
Total kjeldahl N	mg/L				
Ortho-phosphate-P	mg/L				
Total-phosphate-P	mg/L				
Total Oil and Grease	mg/L				
Total petroleum hydrocarbon	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Calcium	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Chloride	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Fluoride	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Magnesium	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Potassium	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Sodium	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Sulfate	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Bicarbonate	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Barium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Cadmium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Chromium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Copper	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Iron	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Lead	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Manganese	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Mercury	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Selenium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Silver	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Zinc	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Depth to Water level (to the nearest 0.01 feet)		1185.00 to 1186.40	5	N/A	N/A

SECTION F. GROUNDWATER INFORMATION

Provide available data measurements or range of measurements from monitoring wells or supply wells in the area of discharge. Provide the analytical method and detection limit, if known. Provide the location of each well on the map required in G.3 below. Well logs are included in Attachments G3 and G5. Copy this page as necessary for each well. Provide the latitude and longitude in decimal format.

Ecology Well Tag ID # N/A

Well ID # MW-11

Latitude: 47.1381123

Longitude: -119.2044002

Well Elevation (to the nearest 0.01 feet) 1196.71 Check the appropriate box: The elevation measurement is relative to: the NAVD88 standard ☒ mean sea level ☐

Parameter	Units	Range of Measurements	Number of Analyses	Analytical Method	Detection Limit
BOD (5 day)	mg/L				
COD	mg/L				
Total organic carbon	mg/L	1.0 to 1.3	5	SM 5310 B	1.0 mg/L
Total dissolved solids	mg/L	182 to 288	5	SM 2540 C	20.0 mg/L
Dissolved Fixed Solids	mg/L				
pH	Standard units	8.00 to 8.40	5	SM 4500-H+ B	N/A
Conductivity	(micromhos/cm)	503 to 570	5	SM 2510 B	1.0 µmhos/cm
Alkalinity	mg/L as CaCO ₃	174 to 188	5	SM 2320 B	5 mg/L as CaCO ₃
Total hardness	mg/L				
Fecal coliform	organisms/100mL				
Total coliform	organisms/100mL				
Dissolved oxygen	mg/L				
Ammonia-N	mg/L				
Nitrate + nitrate-N, nitrate	mg/L	6.6 to 7.3	5	SM 4500-NO ₃ E	100 ug/L
Total kjeldahl N	mg/L				
Ortho-phosphate-P	mg/L				
Total-phosphate-P	mg/L				
Total Oil and Grease	mg/L				
Total petroleum hydrocarbon	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Calcium	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	48.7 to 57.0	5	EPA 200.7	0.2 mg/L
Chloride	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	18.3 to 34.6	5	SM 4500-Cl C	50 ug/L
Fluoride	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Magnesium	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	20.1 to 26.3	5	EPA 200.8	50 ug/L
Potassium	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	1.8 to 2.9	5	EPA 200.7	50 ug/L
Sodium	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	23.6 to 28.3	5	EPA 200.7	50 ug/L
Sulfate	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	22.0 to 23.7	5	4500-SO ₄ C	2000 ug/L
Bicarbonate	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Barium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Cadmium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Chromium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Copper	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Iron	<input type="checkbox"/> mg/L <input checked="" type="checkbox"/> µg/l	550 to 17200	5	EPA 200.7	50 ug/L
Lead	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Manganese	<input type="checkbox"/> mg/L <input checked="" type="checkbox"/> µg/l	18 to 372	5	EPA 200.7	0.5 ug/L
Mercury	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Selenium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Silver	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Zinc	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Depth to Water level (to the nearest 0.01 feet)		1163.30 to 1164.20	5	N/A	N/A

SECTION F. GROUNDWATER INFORMATION

Provide available data measurements or range of measurements from monitoring wells or supply wells in the area of discharge. Provide the analytical method and detection limit, if known. Provide the location of each well on the map required in G.3 below. Well logs are included in Attachments G3 and G5. Copy this page as necessary for each well. Provide the latitude and longitude in decimal format.

Ecology Well Tag ID # N/A

Well ID # MW-12

Latitude: 47.13510224

Longitude: 119.2069587

Well Elevation (to the nearest 0.01 feet) 1189.96 Check the appropriate box: The elevation measurement is relative to: the NAVD88 standard ☒ mean sea level ☐

Parameter	Units	Range of Measurements	Number of Analyses	Analytical Method	Detection Limit
BOD (5 day)	mg/L				
COD	mg/L				
Total organic carbon	mg/L	1.0 to 1.2	5	SM 5310 B	1.0 mg/L
Total dissolved solids	mg/L	22 to 252	5	SM 2540 C	20.0 mg/L
Dissolved Fixed Solids	mg/L				
pH	Standard units	7.80 to 9.00	5	SM 4500-H+ B	N/A
Conductivity	(micromhos/cm)	264 to 902	5	SM 2510 B	1.0 µmhos/cm
Alkalinity	mg/L as CaCO ₃	73 to 170	5	SM 2320 B	5 mg/L as CaCO ₃
Total hardness	mg/L				
Fecal coliform	organisms/100mL				
Total coliform	organisms/100mL				
Dissolved oxygen	mg/L				
Ammonia-N	mg/L				
Nitrate + nitrate-N, nitrate	mg/L	0.0 to 3.7	5	SM 4500-NO ₃ E	100 ug/L
Total kjeldahl N	mg/L				
Ortho-phosphate-P	mg/L				
Total-phosphate-P	mg/L				
Total Oil and Grease	mg/L				
Total petroleum hydrocarbon	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Calcium	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	5.4 to 43.0	5	EPA 200.7	0.2 mg/L
Chloride	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	18.7 to 23.2	5	SM 4500-Cl C	50 ug/L
Fluoride	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Magnesium	<input type="checkbox"/> mg/L <input checked="" type="checkbox"/> µg/l	2.7 to 16.6	5	EPA 200.8	50 ug/L
Potassium	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	1.8 to 3.3	5	EPA 200.7	50 ug/L
Sodium	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	28.8 to 45.7	5	EPA 200.7	50 ug/L
Sulfate	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	8.7 to 25.9	5	4500-SO ₄ C	2000 ug/L
Bicarbonate	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Barium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Cadmium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Chromium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Copper	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Iron	<input type="checkbox"/> mg/L <input checked="" type="checkbox"/> µg/l	530 to 5600	5	EPA 200.7	50 ug/L
Lead	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Manganese	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	57 to 178	5	EPA 200.7	0.5 ug/L
Mercury	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Selenium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Silver	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Zinc	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Depth to Water level (to the nearest 0.01 feet)		1166.30 to 1174.20	5	N/A	N/A

SECTION F. GROUNDWATER INFORMATION

Provide available data measurements or range of measurements from monitoring wells or supply wells in the area of discharge. Provide the analytical method and detection limit, if known. Provide the location of each well on the map required in G.3 below. Well logs are included in Attachments G3 and G5. Copy this page as necessary for each well. Provide the latitude and longitude in decimal format.

Ecology Well Tag ID # BEC 162

Well ID # MW-13

Latitude: 47.1381608

Longitude: -119.211172

Well Elevation (to the nearest 0.01 feet) 1204.12 Check the appropriate box: The elevation measurement is relative to: the NAVD88 standard ☒ mean sea level ☐

Parameter	Units	Range of Measurements	Number of Analyses	Analytical Method	Detection Limit
BOD (5 day)	mg/L				
COD	mg/L				
Total organic carbon	mg/L	1.0 to 1.2	5	SM 5310 B	1.0 mg/L
Total dissolved solids	mg/L	728 to 1282	5	SM 2540 C	20.0 mg/L
Dissolved Fixed Solids	mg/L				
pH	Standard units	7.90 to 8.30	5	SM 4500-H+ B	N/A
Conductivity	(micromhos/cm)	1324 to 1437	5	SM 2510 B	1.0 µmhos/cm
Alkalinity	mg/L as CaCO ₃	170 to 182	5	SM 2320 B	5 mg/L as CaCO ₃
Total hardness	mg/L				
Fecal coliform	organisms/100mL				
Total coliform	organisms/100mL				
Dissolved oxygen	mg/L				
Ammonia-N	mg/L				
Nitrate + nitrate-N, nitrate	mg/L	6.0 to 6.6	5	SM 4500-NO ₃ E	100 ug/L
Total kjeldahl N	mg/L				
Ortho-phosphate-P	mg/L				
Total-phosphate-P	mg/L				
Total Oil and Grease	mg/L				
Total petroleum hydrocarbon	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Calcium	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	105 to 119.0	5	EPA 200.7	0.2 mg/L
Chloride	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	250.6 to 299.5	5	SM 4500-Cl C	50 ug/L
Fluoride	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Magnesium	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	66 to 73.5	5	EPA 200.8	50 ug/L
Potassium	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	3.9 to 4.1	5	EPA 200.7	50 ug/L
Sodium	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	33.1 to 38.3	5	EPA 200.7	50 ug/L
Sulfate	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	44.8 to 46.7	5	4500-SO ₄ C	2000 ug/L
Bicarbonate	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Barium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Cadmium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Chromium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Copper	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Iron	<input type="checkbox"/> mg/L <input checked="" type="checkbox"/> µg/l	10 to 1300	5	EPA 200.7	50 ug/L
Lead	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Manganese	<input type="checkbox"/> mg/L <input checked="" type="checkbox"/> µg/l	1 to 27	5	EPA 200.7	0.5 ug/L
Mercury	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Selenium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Silver	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Zinc	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Depth to Water level (to the nearest 0.01 feet)		1164.30 to 1167.00	5	N/A	N/A

SECTION F. GROUNDWATER INFORMATION

Provide available data measurements or range of measurements from monitoring wells or supply wells in the area of discharge. Provide the analytical method and detection limit, if known. Provide the location of each well on the map required in G.3 below. Well logs are included in Attachments G3 and G5. Copy this page as necessary for each well. Provide the latitude and longitude in decimal format.

Ecology Well Tag ID # BEC 161

Well ID # MW-14

Latitude: 47.1452209

Longitude: -119.2067898

Well Elevation (to the nearest 0.01 feet) 1221.6 Check the appropriate box: The elevation measurement is relative to: the NAVD88 standard ☒ mean sea level ☐

Parameter	Units	Range of Measurements	Number of Analyses	Analytical Method	Detection Limit
BOD (5 day)	mg/L				
COD	mg/L				
Total organic carbon	mg/L	1.3 to 1.6	5	SM 5310 B	1.0 mg/L
Total dissolved solids	mg/L	138 to 250	5	SM 2540 C	20.0 mg/L
Dissolved Fixed Solids	mg/L				
pH	Standard units	8.20 to 8.60	5	SM 4500-H+ B	N/A
Conductivity	(micromhos/cm)	420 to 494	5	SM 2510 B	1.0 µmhos/cm
Alkalinity	mg/L as CaCO ₃	188 to 212	5	SM 2320 B	5 mg/L as CaCO ₃
Total hardness	mg/L				
Fecal coliform	organisms/100mL				
Total coliform	organisms/100mL				
Dissolved oxygen	mg/L				
Ammonia-N	mg/L				
Nitrate + nitrate-N, nitrate	mg/L	1.5 to 1.8	5	SM 4500-NO ₃ E	100 ug/L
Total kjeldahl N	mg/L				
Ortho-phosphate-P	mg/L				
Total-phosphate-P	mg/L				
Total Oil and Grease	mg/L				
Total petroleum hydrocarbon	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Calcium	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	33 to 39.0	5	EPA 200.7	0.2 mg/L
Chloride	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	3.1 to 6.4	5	SM 4500-Cl C	50 ug/L
Fluoride	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Magnesium	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	23.4 to 27.3	5	EPA 200.8	50 ug/L
Potassium	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	2.0 to 2.2	5	EPA 200.7	50 ug/L
Sodium	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	19.6 to 22.9	5	EPA 200.7	50 ug/L
Sulfate	<input checked="" type="checkbox"/> mg/L <input type="checkbox"/> µg/l	18.6 to 17.6	5	4500-SO ₄ C	2000 ug/L
Bicarbonate	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Barium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Cadmium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Chromium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Copper	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Iron	<input type="checkbox"/> mg/L <input checked="" type="checkbox"/> µg/l	10 to 128	5	EPA 200.7	50 ug/L
Lead	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Manganese	<input type="checkbox"/> mg/L <input checked="" type="checkbox"/> µg/l	1 to 5	5	EPA 200.7	0.5 ug/L
Mercury	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Selenium	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Silver	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Zinc	<input type="checkbox"/> mg/L <input type="checkbox"/> µg/l				
Depth to Water level (to the nearest 0.01 feet)		1171.60 to 1175.80	5	N/A	N/A

SECTION G. SITE ASSESSMENT

The local library and local city or county planning offices may be helpful in providing the information required in this section. You may consult the Department of Ecology Water Resources Program to help identify wells within one mile of your site.

1. Land Application Sites: Provide the information below for each land application site. Provide the latitude/longitude (approximate center of the site; NAD83/WGS84 reference datum.) Attach a copy of the contract(s) authorizing use of any private land(s) used for each treatment site. Add table rows as necessary.

Legal Description (section/township/range) NW 1/4 of Section 17 T19N, R29E			
47° 08' 30" N	119° 12' 34" W	125 acres	REC Silicon
Latitude	Longitude	Acreage	Owner
Legal Description (section/township/range)			
Latitude	Longitude	Acreage	Owner
Legal Description (section/township/range)			
Latitude	Longitude	Acreage	Owner
Legal Description (section/township/range)			
Latitude	Longitude	Acreage	Owner

2. If this is a new discharge, list all environmental control permits or approvals needed for this project; for example, SEPA review, engineering reports, hydrogeologic reports, , , or air emissions permits.

3. Attach an original United States Geological Survey (USGS) 7.5 minute topographic map and aerial photograph(s) from an internet mapping site that shows the processing facility and sprayfield site(s). **USGS topographical maps are available from the Department of Natural Resources (360 902-1234), Metsker Maps (206 588-5222), some local bookstores, and internet sites.** Show the following on this map:
 - a. Location and name of internal and adjacent streets.
 - b. Surface water drainage systems within ¼ mile of the site.
 - c. All wells within 1 mile of the site.
 - d. Wastewater discharge points.
 - e. Land uses and zoning adjacent to the wastewater application site.
 - f. Groundwater gradient.
4. Describe the soils on the site using information from local soil survey reports. **Soils information is available from your local County Conservation District or from information contained in the sites hydrogeologic report.** *(Submit on separate sheet and label as attachment G.4.)*
5. Describe the local geology and hydrogeology within one mile of the site. Include any groundwater quality data. **The local library or local Soil Conservation Service may have this information.** *(Submit on separate sheet and label as attachment G.5.)*
6. List the names and addresses of contractors or consultants who provided information and cite sources of information by title and author.

Application prepared with assistance from:

Bernard Kronschnabel - Cascade Earth Sciences

12720 E Nora Ave, Ste A, Spokane, WA 99216

(509) 921-0290

SECTION H. STORMWATER

1. Do you have coverage under the Washington State Industrial Stormwater NPDES General permit? ☐ YES ☒ NO
If yes, please list the permit number here. _____

If no, have you applied for coverage under the Washington State Industrial Stormwater NPDES general permit? ☐ YES ☒ NO

Note: If you answered "no" to both questions above, complete the following questions 2 through 8.

2. Describe the size of the stormwater collection area.
- a. Unpaved area 3,100,000 sq.ft.
 - b. Paved area 6,000,000 sq.ft.
 - c. Other collection areas (roofs) 75,000 sq.ft.
3. Does your facility's stormwater discharge to: (*Check all that apply*)
- ☐ Storm sewer system; name of storm sewer system (*operator*):
 - ☐ ☐ Sanitary sewer
 - ☐ Directly to surface waters of Washington State (*e.g., river, lake, creek, estuary, ocean*).
Specify waterbody name _____
 - ☐ Indirectly to surface waters of Washington State (*i.e., flows over adjacent properties first*).
 - ☒ Directly to ground waters of Washington State via:
 - ☐ ☐ Dry well
 - ☐ Drainfield
 - ☒ Other
4. Areas with industrial activities at facility: (*check all that apply*)
- ☒ ☐ Manufacturing building
 - ☒ ☐ Material handling
 - ☒ ☐ Material storage
 - ☐ ☐ Hazardous waste treatment, storage, or disposal (*refers to RCRA, Subtitle C facilities only*)
 - ☒ ☐ Waste treatment, storage, or disposal
 - ☒ ☐ Application or disposal of wastewaters
 - ☒ ☐ Storage and maintenance of material handling equipment
 - ☐ ☐ Vehicle maintenance
 - ☐ ☐ Areas where significant materials remain

☒ ☐ Access roads and rail lines for shipping and receiving

☐ ☐ Other _____

5. Material handling/management practices

a. Types of materials handled and/or stored outdoors: *(check all that apply)*

☒ ☐ Solvents

☒ ☐ Hazardous wastes

☒ ☐ Scrap metal

☒ ☐ Acids or alkalies

☒ ☐ Petroleum or petrochemical products

☐ ☐ Paints/coatings

☐ ☐ Plating products

☐ ☐ Woodtreating products

☐ ☐ Pesticides

☐ ☐ Other *(please list)*: _____

b. Identify existing management practices employed to reduce pollutants in industrial storm water discharges: *(check all that apply)*

☒ ☐ Oil/water separator

☒ ☐ Detention facilities

☒ ☐ Containment

☒ ☐ Infiltration basins

☒ ☐ Spill prevention

☒ ☐ Operational BMPs

☐ ☐ Surface leachate collection

☒ ☐ Vegetation management

☒ ☐ Overhead coverage

☐ ☐ Other *(please list)*: _____

6. Attach a map showing stormwater drainage/collection areas, disposal areas and discharge points. This may be a hand drawn map if no other site map is available. Label this as attachment H.8.

SECTION I. OTHER INFORMATION

1. Describe liquid or solid wastes generated that are not disposed of in the waste stream(s) and describe the method of disposal. For each type of waste, provide type of waste, name, address, and phone number of hauler.

Calcium carbonate, calcium hydroxide, silicon powder, and grit are the major components from four wastewater treatment systems. All four wastewater treatment systems utilize neutralization, precipitation, and solids dewatering prior to disposal. Additionally, neutralized dryer solids (primarily consisting of silicon and sodium sesquicarbonate) are transferred for disposal. All solids are transported to the Grant County Landfill via Consolidated Disposal Service 2370 Basin St SW, Ephrata, WA 98823 (509-754-2468).

2. Describe any storage areas used for raw materials, products, and wastes.

Materials stored outside are typically in curbed, concrete containment areas consisting of at least 110% of the largest vessel volume. Containment areas are inspected monthly for integrity and precipitation capacity. Sampling and analysis of contents is conducted prior to removal of containment area liquids to determine correct treatment/disposal option. This facility has an up-to-date SPCC Plan on site that details storage locations and quantities of material regulated by 40CFR112.

Summary of attachments that may be required for this application:

(Please check those attachments that are included)

- ☒ C.2. Production schematic flow diagram and water balance
- ☐ C.4. Wastewater treatment improvements
- ☐ C.7. Additional incidental materials
- ☒ E.4. Additional results of effluent testing (CD-ROM)
- ☐ G.1. Copies of land use contracts
- ☒ G.3. USGS topographical map (CD-ROM)
- ☒ G.4. Soils description
- ☒ G.5. Local geology and hydrology (CD-ROM)
- ☒ H.8. Stormwater drainage map

If you need this document in a format for the visually impaired, call the Water Quality Program at 360-407-6600. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

Attachment 1. Material Imports

Material	Annual Consumption	Units
Lime	5,017,553	pounds
Trona	2,628,000	pounds
Magnesium Oxide	66,300	pounds
Sodium Hydroxide (25%)	1,326,965	gallons
Sulfuric Acid (98%)	5,466	gallons
Flocculant	1,367	gallons
Coagulant	28,242	gallons
Hydrochloric Acid (38%)	34,164	gallons
Antiscalants	1,367	gallons
Boiler Chemicals	683	gallons
Oxygen Scavenger (Boiler)	683	gallons
Surfactant	142,122	gallons
Antifoam	570,539	gallons
Silicon Tetrachloride	3,440,800	pounds
Metallurgical Grade Silicon	44,300,021	pounds
Cuprous Chloride	106,088	pounds
Carbon Dioxide	215,671	pounds

Attachment 2 - Discharge Monitoring per Permit ST 8121

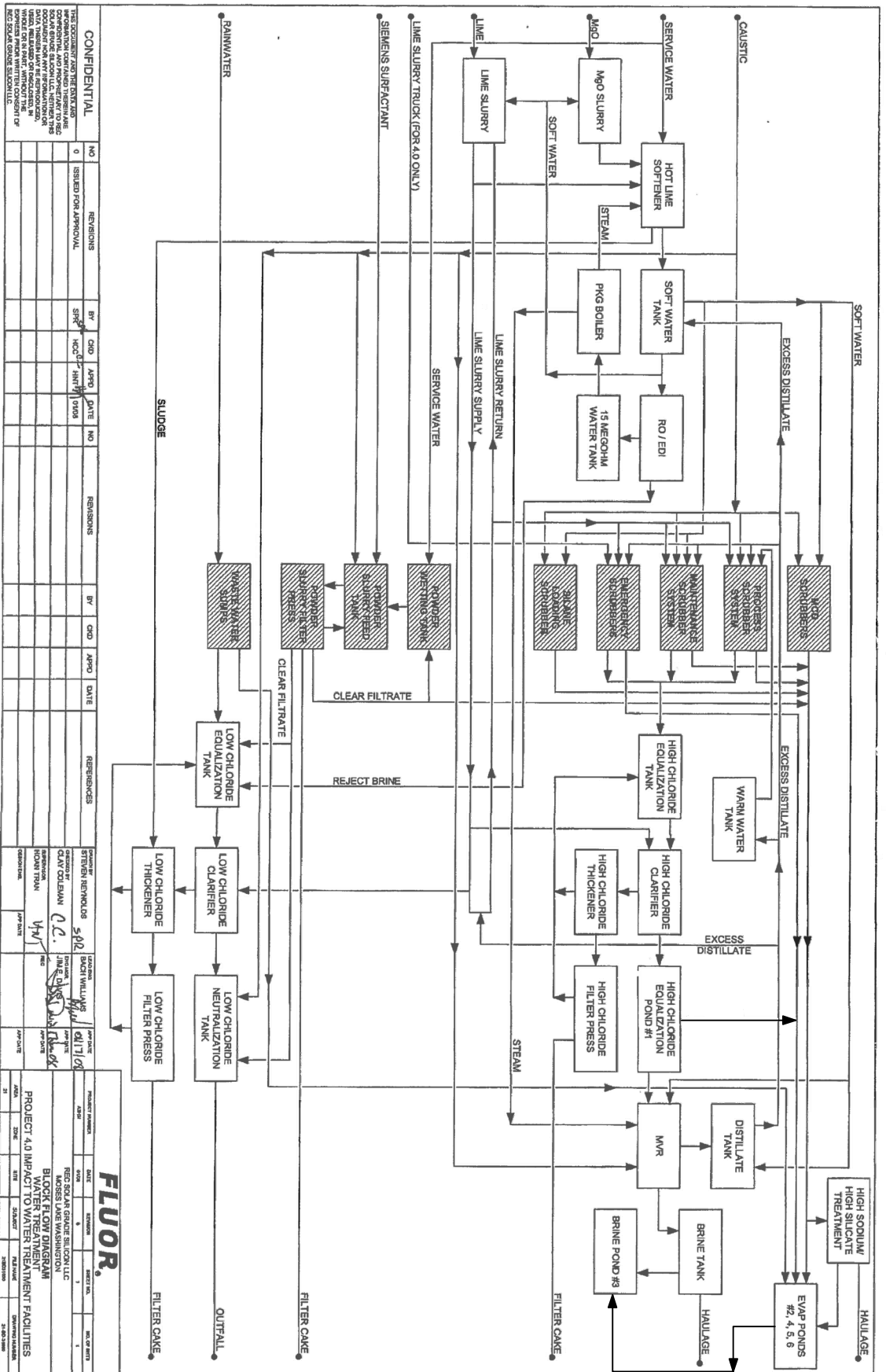
Parameter	Units	Sampling Frequency	Sample Type
TDS	mg/L	2/month	grab
pH	standard units	2/month	grab
Sodium	mg/L	2/month	grab
Chloride	mg/L	2/month	grab
Fluoride	mg/L	2/month	grab
Magnesium	mg/L	2/month	grab
Potassium	mg/L	2/month	grab
Manganese	mg/L	2/month	grab
Calcium	mg/L	2/month	grab
Alkalinity	mg/L	2/month	grab
NO ₃ -N	mg/L	2/month	grab
NH ₃ -N	mg/L	2/month	grab
Total P	mg/L	2/month	grab

Notes:

Abbreviations: TDS = total dissolved solids, mg/L = milligrams per liter,

NO₃-N = nitrate as nitrogen, NH₃-N = ammonia as nitrogen, P = phosphorus.

Attachment C.2 Process Flow Diagram





Permit Number: ST0008121

Permittee: REC Solar Grade Silicon

Facility County: Grant

Receiving Waterbody:

Monitoring Period: 08/01/2013 - 08/31/2013

Outfall: 001 - DISCHARGE TO CITY OF MOSES LAKE
POTW, DUNES TREATMENT PLANT

Version: 1

Week	Monitoring Point	Flow Gallons/Day (gpd) Continuous Metered/Recorded	pH Daily Min Standard Units Continuous Metered/Recorded	pH Daily Max Standard Units Continuous Metered/Recorded	Conductivity (Specific Conductance) Micromhos/cm Continuous Metered/Recorded	Conductivity (Specific Conductance) Micromhos/cm Continuous Metered/Recorded	Temperature Measured Degrees F Continuous Metered/Recorded	Total BOD5 Total Milligrams/L (mg/L) Weekly Composite Sample (24 HR Time Proportional comp)	Oil & Grease Total recoverable, FOG, HEM Milligrams/L (mg/L) Weekly Grab	Total Suspended Solids (TSS) Total suspended (TSS) Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Total Dissolved Solids Total Dissolved Solids (TDS) Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Total Dissolved Solids Total Dissolved Solids (TDS) Lbs/Day 5/Week Composite Sample (24 HR Time Proportional comp)
1-Th	8/1/13	48365	7.2	8.1	1514.0	2215.0	88.0			12.5	1436.0	579.2
1-F	8/2/13	65759	6.7	8.9	1391.0	2209.0	83.0			42.5	902.0	494.7
1-Sa	8/3/13	58671	6.9	7.9	1680.0	2023.0	80.0					
2-Su	8/4/13	140	7.7	8.1	1715.0	2075.0	80.0					
2-M	8/5/13	27052	7.7	8.8	259.0	2056.0	82.0			2.3	240.0	54.1
2-T	8/6/13	10206	7.5	8.7	314.0	1241.0	82.0			29.9	692.0	58.9
2-W	8/7/13	76377	6.9	7.6	1201.0	1396.0	86.0	22.5	1.4	32.1	580.0	369.5
2-Th	8/8/13	27398	6.3	7.8	161.0	1317.0	86.0			31.9	760.0	173.7
2-F	8/9/13	37345	6.9	8.7	163.0	1452.0	84.0			26.4	642.0	200.0
2-Sa	8/10/13	28038	6.1	6.9	1166.0	2947.0	90.0					
3-Su	8/11/13	299	6.3	6.9	2655.0	2863.0	88.0					
3-M	8/12/13	30381	6.1	8.4	1463.0	2655.0	88.0			7.2	210.0	53.3
3-T	8/13/13	35854	7.5	8.7	1638.0	2080.0	90.0			27.0	434.0	129.8
3-W	8/14/13	71014	6.9	8.1	1653.0	1810.0	85.0	5.0	1.4	12.9	326.0	193.0
3-Th	8/15/13	30197	7.2	8.7	1478.0	1813.0	84.0			30.5	662.0	166.7
3-F	8/16/13	25931	7.3	8.1	1552.0	1686.0	86.0			74.5	1118.0	241.8
3-Sa	8/17/13	25958	8.1	8.9	1561.0	1788.0	88.0					
4-Su	8/18/13	24441	8.3	8.6	1396.0	1663.0	86.0					
4-M	8/19/13	52112	8.1	8.6	1393.0	1658.0	84.0			47.8	742.0	322.4
4-T	8/20/13	64099	8.0	8.2	1346.0	1420.0	86.0			36.7	794.0	424.4
4-W	8/21/13	28723	7.6	8.1	1241.0	1419.0	82.0	11.0	1.4	5.7	450.0	107.8
4-Th	8/22/13	12985	8.0	8.3	1402.0	1547.0	84.0			1.4	294.0	31.8
4-F	8/23/13	26217	7.4	8.2	1188.0	1523.0	88.0			96.4	734.0	160.5
4-Sa	8/24/13	25882	7.5	8.0	1275.0	1384.0	82.0					
5-Su	8/25/13	32633	7.9	8.0	1289.0	1387.0	85.0					
5-M	8/26/13	50069	7.7	8.2	1258.0	1463.0	84.0			29.7	864.0	360.8
5-T	8/27/13	53555	7.1	7.7	1261.0	1389.0	84.0			18.1	910.0	406.4
5-W	8/28/13	34438	7.0	8.1	1155.0	1666.0	84.0	25.2	1.4	52.8	850.0	244.1
5-Th	8/29/13	2006	7.0	8.0	1580.0	1762.0	85.0			41.2	984.0	16.4
5-F	8/30/13	28997	7.0	8.1	1449.0	1787.0	85.0			21.5	1218.0	294.6
5-Sa	8/31/13	258	7.5	8.2	1650.0	1787.0	80.0					
Minimum			6.1		161							
			>= 6.0		Report Only							
Average		33400					84.8065	15.925	1.4	30.9545	720.091	231.086
		<= 210000					Report Only	Report Only	Report Only	<= 350	Report Only	<= 3240
Maximum		76377		8.9	2655	2947	90	25.2	1.4	96.4	1436	579.2
		<= 300000		<= 11.0	Report Only	Report Only	Report Only	<= 300	<= 100	Report Only	Report Only	<= 4560



Week	Monitoring Point	Sodium Total Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Sodium Total Lbs/Day 5/Week Composite Sample (24 HR Time Proportional comp)	Chloride Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Chloride Lbs/Day 5/Week Composite Sample (24 HR Time Proportional comp)	Fluoride Total Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Fluoride Total Lbs/Day 5/Week Composite Sample (24 HR Time Proportional comp)	Sulfate Total Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Sulfate Total Lbs/Day 5/Week Composite Sample (24 HR Time Proportional comp)	Nitrate Total Milligrams/L (mg/L) Weekly Composite Sample (24 HR Time Proportional comp)	Alkalinity Total Monthly Composite Sample (24 HR Time Proportional comp)	Calcium Total Monthly Composite Sample (24 HR Time Proportional comp)
001	001	001	001	001	001	001	001	001	001	001	001	001
1-Th	8/1/13	131.0	52.9	50.3	20.3	11.6	4.6	442.1	178.3			
1-F	8/2/13	111.0	60.9	33.1	18.2	9.9	5.4	199.4	109.3			
1-Sa	8/3/13											
2-Su	8/4/13											
2-M	8/5/13	76.9	17.3	17.7	4.0	2.3	0.5	2.5	0.6			
2-T	8/6/13	137.9	11.8	44.9	3.8	7.4	0.6	269.8	22.9			
2-W	8/7/13	133.5	85.0	48.1	30.7	8.2	5.2	323.0	205.8	18.9	63.8	97.5
2-Th	8/8/13	133.3	30.4	43.2	9.9	7.1	1.6	335.2	76.6			
2-F	8/9/13	100.6	31.4	34.2	10.7	8.8	2.7	211.7	66.0			
2-Sa	8/10/13											
3-Su	8/11/13											
3-M	8/12/13	81.7	20.7	19.2	4.9	2.8	0.7	30.0	7.6			
3-T	8/13/13	96.5	28.9	23.9	7.1	4.5	1.4	75.2	22.4			
3-W	8/14/13	88.5	52.4	20.9	12.4	3.7	2.2	55.3	32.8	12.2		
3-Th	8/15/13	97.1	24.4	31.0	7.8	5.4	1.4	175.3	44.1			
3-F	8/16/13	120.3	26.1	45.2	9.8	7.6	1.7	277.9	60.1			
3-Sa	8/17/13											
4-Su	8/18/13											
4-M	8/19/13	130.8	56.9	49.8	21.6	7.0	3.0	232.5	101.0			
4-T	8/20/13	124.3	66.5	45.9	24.6	5.5	3.0	265.6	142.0			
4-W	8/21/13	91.7	22.0	23.3	5.5	3.8	0.9	121.5	29.2	8.1		
4-Th	8/22/13	76.1	8.2	18.5	2.0	2.9	0.3	47.5	5.1			
4-F	8/23/13	109.2	23.9	41.7	9.2	9.3	2.0	272.9	59.7			
4-Sa	8/24/13											
5-Su	8/25/13											
5-M	8/26/13	158.4	66.1	46.7	19.5	15.4	6.4	282.7	118.1			
5-T	8/27/13	126.6	56.5	45.1	20.2	11.5	5.1	328.2	146.6			
5-W	8/28/13	134.0	38.5	43.3	12.4	11.8	3.4	297.5	85.5	42.2		
5-Th	8/29/13	145.8	2.4	43.9	0.7	11.9	0.2	304.1	5.1			
5-F	8/30/13	124.6	30.1	47.7	11.5	10.8	2.6	307.4	74.3			
5-Sa	8/31/13											
Minimum												
Average		114.991	36.9682	37.1636	12.1273	7.69091	2.49545	220.786	72.4136	20.35		
	Report Only	<= 558	Report Only	<= 63	Report Only	<= 28	Report Only	Report Only	Report Only			
Maximum		158.4	85	50.3	30.7	15.4	6.4	442.1	205.8	42.2	63.8	97.5
	Report Only	<= 796	Report Only	<= 90	Report Only	<= 46	Report Only	Report Only	Report Only	Report Only	Report Only	Report Only



Week	Monitoring Point	Magnesium Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Manganese Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Ammonia Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Phosphorus Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Potassium Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Total Dissolved Solids Total Dissolved Solids (TDS) Milligrams/L (mg/L) 2/Month Grab	Flow Gallons/Day (gpd) Continuous Metered/Recorded	pH Standard Units 2/Month Grab	Total Dissolved Solids Total Dissolved Solids (TDS) Milligrams/L (mg/L) 2/Month Grab	Sodium Total Milligrams/L (mg/L) 2/Month Grab	Chloride Milligrams/L (mg/L) 2/Month Grab
1-Th	8/1/13							C				
1-F	8/2/13							C				
1-Sa	8/3/13							C				
2-Su	8/4/13							C				
2-M	8/5/13							C				
2-T	8/6/13							C				
2-W	8/7/13	3.4	41.6	8.7	0.1	9.6	252.0	C	9.2	354.0	119.6	33.2
2-Th	8/8/13							C				
2-F	8/9/13							C				
2-Sa	8/10/13							C				
3-Su	8/11/13							C				
3-M	8/12/13							C				
3-T	8/13/13							C				
3-W	8/14/13							C				
3-Th	8/15/13							531982				
3-F	8/16/13							781779				
3-Sa	8/17/13							757478				
4-Su	8/18/13							762608				
4-M	8/19/13							750454				
4-T	8/20/13							777196				
4-W	8/21/13						322.0	765828	9.6	462.0	122.5	31.1
4-Th	8/22/13							770414				
4-F	8/23/13							763503				
4-Sa	8/24/13							748361				
5-Su	8/25/13							574895				
5-M	8/26/13							C				
5-T	8/27/13							C				
5-W	8/28/13							C				
5-Th	8/29/13							C				
5-F	8/30/13							C				
5-Sa	8/31/13							C				
Minimum									9.2			
									Report Only			
Average							287	725863		408	121.05	32.15
							Report Only	Report Only		Report Only	Report Only	Report Only
Maximum		3.4	41.6	8.7	0.1	9.6	322	781779	9.6	462	122.5	33.2
		Report Only	Report Only	Report Only	Report Only	Report Only	<= 2500	Report Only	Report Only	Report Only	Report Only	Report Only

[illegible]

[illegible]

[illegible]

[illegible]



Reporting Codes Used: C - No Discharge

Overall DMR Notes/Comment

Total flow for process 001 = 1,035,400gallons.
Sanitary flow meter down from Aug, 13th - 20th. Flow was calculated by multiplying 45 gpm (Pump is rated for 40-45gpm) times number of minutes discharged.
Max flow for sanitary - 47gpm
003 Outfall August 7th total copper = 34.4 ug/L
003 Outfall August 21st total copper = 100.0 ug/L

Outfall: 001 - DISCHARGE TO CITY OF MOSES LAKE POTW, DUNES TREATMENT PLANT

Monitoring Point	Parameter	Sample Date/ Statistical Base	Value	Notes/Comment
HSHS	All Parameters		C	
HCEP	All Parameters		C	

I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Paul Stenhouse

9/12/2013 9:44:13 AM

Signature

Date



Permit Number: ST0008121

Permittee: REC Solar Grade Silicon

Facility County: Grant

Receiving Waterbody:

Monitoring Period: 09/01/2013 - 09/30/2013

Outfall: 001 - DISCHARGE TO CITY OF MOSES LAKE
POTW, DUNES TREATMENT PLANT

Version: 1

Week	Monitoring Point	Flow Gallons/Day (gpd) Continuous Metered/Recorded	pH Daily Min Standard Units Continuous Metered/Recorded	pH Daily Max Standard Units Continuous Metered/Recorded	Conductivity (Specific Conductance) Micromhos/cm Continuous Metered/Recorded	Conductivity (Specific Conductance) Micromhos/cm Continuous Metered/Recorded	Temperature Measured Degrees F Continuous Metered/Recorded	Total BOD5 Total Milligrams/L (mg/L) Weekly Composite Sample (24 HR Time Proportional comp)	Oil & Grease Total recoverable, FOG, HEM Milligrams/L (mg/L) Weekly Grab	Total Suspended Solids (TSS) Total suspended (TSS) Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Total Dissolved Solids Total Dissolved Solids (TDS) Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Total Dissolved Solids Total Dissolved Solids (TDS) Lbs/Day 5/Week Composite Sample (24 HR Time Proportional comp)
		001	001	001	001	001	001	001	001	001	001	001
1-Su	9/1/13	32806	6.8	9.8	1732.0	2376.0	82.0					
1-M	9/2/13	54633	7.0	7.4	1877.0	2337.0	86.0			68.3	1872.0	853.0
1-T	9/3/13	38124	6.9	8.1	1681.0	1877.0	88.0			39.1	1410.0	448.3
1-W	9/4/13	25899	7.1	8.0	1542.0	1710.0	87.0	60.0	1.4	28.6	1318.0	284.7
1-Th	9/5/13	35668	7.2	7.6	1738.0	1838.0	88.0			115.4	1306.0	388.5
1-F	9/6/13	46880	6.4	9.6	193.0	3095.0	84.0			52.3	2604.0	1018.1
1-Sa	9/7/13	61969	6.3	8.0	1904.0	3121.0	86.0					
2-Su	9/8/13	57549	7.0	7.5	1753.0	2141.0	87.0					
2-M	9/9/13	19291	7.4	7.6	1792.0	1942.0	85.0			23.0	1552.0	249.7
2-T	9/10/13	24203	7.3	7.7	1336.0	1932.0	80.0			14.9	910.0	183.7
2-W	9/11/13	22728	7.3	7.7	1241.0	1442.0	83.0	18.6	3.2	4.4	502.0	95.2
2-Th	9/12/13	10753	7.3	8.3	1318.0	1603.0	88.0			26.5	452.0	40.5
2-F	9/13/13	54391	7.6	8.3	1526.0	1701.0	88.0			24.6	930.0	421.9
2-Sa	9/14/13	62928	7.4	8.3	1503.0	1709.0	86.0					
3-Su	9/15/13	23902	7.5	8.0	1450.0	1685.0	83.0					
3-M	9/16/13	3102	7.8	8.1	1452.0	1682.0	88.0			77.3	182.0	4.7
3-T	9/17/13	35712	7.8	8.3	1467.0	1623.0	80.0			212.7	614.0	182.8
3-W	9/18/13	17432	7.3	8.6	1103.0	1596.0	74.0	33.0	2.7	25.2	866.0	125.9
3-Th	9/19/13	2588	7.5	8.5	997.0	1597.0	78.0			0.3	224.0	4.8
3-F	9/20/13	58154	6.8	7.9	1180.0	1833.0	78.0			105.8	1116.0	541.3
3-Sa	9/21/13	63578	6.6	7.3	1600.0	1825.0	81.0					
4-Su	9/22/13	29316	6.8	7.4	1461.0	1642.0	75.0					
4-M	9/23/13	245	6.8	7.5	1442.0	1564.0	80.0			15.8	1092.0	2.2
4-T	9/24/13	53264	7.1	7.4	1256.0	1522.0	84.0			8.6	616.0	273.6
4-W	9/25/13	11699	7.2	7.7	1366.0	1490.0	80.0	8.0	1.8	99.7	476.0	46.4
4-Th	9/26/13	42017	6.9	7.7	1335.0	1489.0	67.0			25.5	924.0	323.8
4-F	9/27/13	72464	6.3	7.6	1105.0	1414.0	76.0			21.2	876.0	529.4
4-Sa	9/28/13	222	6.8	8.2	122.0	1104.0	74.0					
5-Su	9/29/13	27276	7.0	8.2	124.0	1308.0	78.0			1.3	274.0	62.3
5-M	9/30/13	237	7.1	7.7	1308.0	1370.0	78.0					
Minimum			6.3		122							
			>= 6.0		Report Only							
Average		32967.7					81.7333	29.9	2.275	47.1667	957.905	289.562
		<= 210000					Report Only	Report Only	Report Only	<= 350	Report Only	<= 3240
Maximum		72464		9.8		3121	88	60	3.2	212.7	2604	1018.1
		<= 300000		<= 11.0		Report Only	Report Only	<= 300	<= 100	Report Only	Report Only	<= 4560



Week	Monitoring Point	Magnesium Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Manganese Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Ammonia Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Phosphorus Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Potassium Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Total Dissolved Solids Total Dissolved Solids (TDS) Milligrams/L (mg/L) 2/Month Grab	Flow Gallons/Day (gpd) Continuous Metered/Recorded	pH Standard Units 2/Month Grab	Total Dissolved Solids Total Dissolved Solids (TDS) Milligrams/L (mg/L) 2/Month Grab	Sodium Total Milligrams/L (mg/L) 2/Month Grab	Chloride Total Milligrams/L (mg/L) 2/Month Grab
1-Su	9/1/13							C				
1-M	9/2/13							C				
1-T	9/3/13							C				
1-W	9/4/13	7.6	78.0	1.5	0.1	9.5	338.0	C	9.7	398.0	128.7	30.0
1-Th	9/5/13							C				
1-F	9/6/13							C				
1-Sa	9/7/13							C				
2-Su	9/8/13							C				
2-M	9/9/13							C				
2-T	9/10/13							C				
2-W	9/11/13							C				
2-Th	9/12/13							C				
2-F	9/13/13							C				
2-Sa	9/14/13							C				
3-Su	9/15/13							C				
3-M	9/16/13							C				
3-T	9/17/13							C				
3-W	9/18/13						340.0	C	9.1	460.0	116.7	31.2
3-Th	9/19/13							C				
3-F	9/20/13							C				
3-Sa	9/21/13							C				
4-Su	9/22/13							C				
4-M	9/23/13							C				
4-T	9/24/13							C				
4-W	9/25/13							C				
4-Th	9/26/13							C				
4-F	9/27/13							C				
4-Sa	9/28/13							C				
5-Su	9/29/13							C				
5-M	9/30/13							C				
Minimum									9.1			
									Report Only			
Average							339	C		429	122.7	30.6
							Report Only	Report Only		Report Only	Report Only	Report Only
Maximum		7.6	78	1.5	0.1	9.5	340	C	9.7	460	128.7	31.2
		Report Only	Report Only	Report Only	Report Only	Report Only	<= 2500	Report Only	Report Only	Report Only	Report Only	Report Only

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Reporting Codes Used: C - No Discharge

Overall DMR Notes/Comment

Wastewater DMR Summary – September 2013

General Notes

- pH & conductivity readings exclude extreme, off-scale data spikes caused from IE calibrations, flow cutoffs, keyed mikes, flow startups, etc

Process Effluent

- Total flow for September is 989,030 gallons.

No Sample on Sept. 30th (no flow) so Sunday's sample (9-29-13) was used.

- No exceedences.

Sanitary Sewer

- No exceedences.
- Maximum flow 55 gpm

Monitor Wells

- No comments.

Outfall 004

- No Comments.

003 Outfall - Irrigation Outfall and Firewater Pond

- 003 Outfall September 4th total copper = 42.6 ug/L
- 003 Outfall September 18th total copper = 33.2 ug/L.

Outfall: 001 - DISCHARGE TO CITY OF MOSES LAKE POTW, DUNES TREATMENT PLANT

Monitoring Point	Parameter	Sample Date/ Statistical Base	Value	Notes/Comment
HSHS	All Parameters		C	No discharge for the month.
HCEP	All Parameters		C	No water applied for dust control.

I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Paul Stenhouse

Signature

10/14/2013 2:52:03 PM

Date



Permit Number: ST0008121

Permittee: REC Solar Grade Silicon

Facility County: Grant

Receiving Waterbody:

Monitoring Period: 10/01/2013 - 10/31/2013

Outfall: 001 - DISCHARGE TO CITY OF MOSES LAKE
POTW, DUNES TREATMENT PLANT

Version: 1

Week	Monitoring Point	Flow Gallons/Day (gpd) Continuous Metered/Recorded	pH Daily Min Standard Units Continuous Metered/Recorded	pH Daily Max Standard Units Continuous Metered/Recorded	Conductivity (Specific Conductance) Micromhos/cm Continuous Metered/Recorded	Conductivity (Specific Conductance) Micromhos/cm Continuous Metered/Recorded	Temperature Measured Degrees F Continuous Metered/Recorded	Total BOD5 Total Milligrams/L (mg/L) Weekly Composite Sample (24 HR Time Proportional comp)	Oil & Grease Total recoverable, FOG, HEM Milligrams/L (mg/L) Weekly Grab	Total Suspended Solids (TSS) Total suspended (TSS) Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Total Dissolved Solids Total Dissolved Solids (TDS) Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Total Dissolved Solids Total Dissolved Solids (TDS) Lbs/Day 5/Week Composite Sample (24 HR Time Proportional comp)
1-T	10/1/13	29672	6.9	7.8	1203.0	1338.0	78.0			19.4	718.0	177.7
1-W	10/2/13	26049	7.2	7.8	1382.0	1650.0	76.0	34.8	1.4	20.4	678.0	147.3
1-Th	10/3/13	36423	6.8	7.7	1334.0	1538.0	64.0			22.1	646.0	196.3
1-F	10/4/13	56824	6.6	7.1	1304.0	1511.0	76.0			17.6	402.0	190.5
1-Sa	10/5/13	56032	7.1	8.3	1511.0	1650.0	76.0					
2-Su	10/6/13	53468	7.2	8.1	1422.0	1568.0	74.0					
2-M	10/7/13	47358	7.4	8.4	1383.0	1621.0	76.0			12.2	544.0	214.8
2-T	10/8/13	69053	7.5	8.0	1073.0	1493.0	74.0			16.9	484.0	278.7
2-W	10/9/13	50690	7.1	7.8	991.0	1252.0	74.0	26.1	1.7	15.8	446.0	188.5
2-Th	10/10/13	14384	7.8	8.4	1252.0	1517.0	72.0			3.8	312.0	37.4
2-F	10/11/13	62614	6.9	8.5	1120.0	1524.0	72.0			45.7	520.0	271.5
2-Sa	10/12/13	52899	6.6	7.0	1183.0	1428.0	73.0					
3-Su	10/13/13	28889	6.7	7.5	1369.0	1447.0	70.0					
3-M	10/14/13	26142	6.8	7.7	1314.0	1513.0	69.0			35.0	662.0	144.3
3-T	10/15/13	5395	7.0	7.5	1396.0	1525.0	72.0			56.0	462.0	20.8
3-W	10/16/13	21670	7.1	7.5	1424.0	1491.0	70.0	13.2	2.6	3.0	426.0	77.0
3-Th	10/17/13	24554	6.8	7.5	1420.0	1593.0	72.0			6.0	356.0	72.9
3-F	10/18/13	49342	6.4	8.7	583.0	1882.0	72.0			30.0	880.0	362.1
3-Sa	10/19/13	49052	6.6	9.1	868.0	3644.0	72.0					
4-Su	10/20/13	23729	8.2	9.0	3333.0	3608.0	73.0					
4-M	10/21/13	8985	8.0	8.7	2941.0	3435.0	65.0			223.0	1330.0	99.7
4-T	10/22/13	24037	7.7	8.2	2808.0	3087.0	68.0			914.4	852.0	170.8
4-W	10/23/13	22591	7.4	8.4	2019.0	2787.0	72.0	62.0	3.3	94.8	1088.0	204.9
4-Th	10/24/13	69644	7.2	8.1	1802.0	2540.0	72.0			57.5	880.0	511.1
4-F	10/25/13	26533	7.0	8.4	1681.0	1831.0	70.0			32.9	620.0	137.2
4-Sa	10/26/13	43362	6.8	8.0	1682.0	1859.0	72.0					
5-Su	10/27/13	419	6.9	7.1	448.0	1725.0	70.0					
5-M	10/28/13	25010	6.9	8.4	792.0	2079.0	72.0			32.3	886.0	184.9
5-T	10/29/13	221	6.3	8.3	859.0	3326.0	69.0			189.8	896.0	1.7
5-W	10/30/13	21344	7.0	8.2	968.0	2074.0	60.0	7.1	1.4	17.4	370.0	65.9
5-Th	10/31/13	22047	7.6	8.9	842.0	2041.0	65.0					
Minimum			6.3		448							
			>= 6.0		Report Only							
Average		33820.4					71.2903	28.64	2.08	84.8182	657.182	170.727
		<= 210000					Report Only	Report Only	Report Only	<= 350	Report Only	<= 3240
Maximum		69644		9.1		3644	78	62	3.3	914.4	1330	511.1
		<= 300000		<= 11.0		Report Only	Report Only	<= 300	<= 100	Report Only	Report Only	<= 4560



Week	Monitoring Point	Sodium Total Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Sodium Total Lbs/Day 5/Week Composite Sample (24 HR Time Proportional comp)	Chloride Total Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Chloride Lbs/Day 5/Week Composite Sample (24 HR Time Proportional comp)	Fluoride Total Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Fluoride Total Lbs/Day 5/Week Composite Sample (24 HR Time Proportional comp)	Sulfate Total Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Sulfate Total Lbs/Day 5/Week Composite Sample (24 HR Time Proportional comp)	Nitrate Total Milligrams/L (mg/L) Weekly Composite Sample (24 HR Time Proportional comp)	Alkalinity Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Calcium Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)
1-T	10/1/13	99.2	24.5	40.6	10.1	6.2	1.5	243.4	60.2			
1-W	10/2/13	95.9	20.8	41.2	9.0	7.3	1.6	224.6	48.8	26.5	55.8	86.0
1-Th	10/3/13	102.7	31.2	38.9	11.8	8.1	2.5	210.8	64.0			
1-F	10/4/13	104.0	49.3	38.1	18.1	8.3	4.0	202.0	95.8			
1-Sa	10/5/13											
2-Su	10/6/13											
2-M	10/7/13	105.9	41.8	44.3	17.5	5.8	2.3	237.6	93.8			
2-T	10/8/13	97.7	56.3	38.8	22.4	5.1	3.0	182.8	105.3			
2-W	10/9/13	79.9	33.8	37.0	15.7	4.2	1.8	134.7	57.0	4.5		
2-Th	10/10/13	66.6	8.0	17.9	2.1	2.6	0.3	35.3	4.2			
2-F	10/11/13	100.9	52.7	38.9	20.3	9.2	4.8	108.0	56.4			
2-Sa	10/12/13											
3-Su	10/13/13											
3-M	10/14/13	109.9	24.0	38.0	8.3	6.6	1.4	299.0	65.2			
3-T	10/15/13	91.9	4.1	25.2	1.1	5.1	0.2	135.0	6.1			
3-W	10/16/13	103.9	18.8	23.1	4.2	3.4	0.6	136.0	24.6	2.0		
3-Th	10/17/13	85.4	17.5	20.1	4.1	3.5	0.7	69.1	14.1			
3-F	10/18/13	139.9	57.6	42.6	17.5	15.3	6.3	230.0	94.6			
3-Sa	10/19/13											
4-Su	10/20/13											
4-M	10/21/13	295.0	22.1	39.3	2.9	11.3	0.8	530.0	39.7			
4-T	10/22/13	184.8	37.0	101.2	20.3	11.2	2.2	131.0	26.3			
4-W	10/23/13	204.3	38.5	44.5	8.4	11.7	2.2	348.4	65.6	29.0		
4-Th	10/24/13	165.4	96.0	39.0	22.7	10.4	6.0	310.9	180.6			
4-F	10/25/13	122.3	27.1	28.9	6.4	6.6	1.5	203.6	45.0			
4-Sa	10/26/13											
5-Su	10/27/13											
5-M	10/28/13	158.8	33.1	40.1	8.3	10.2	2.1	366.3	76.4			
5-T	10/29/13	171.6	0.3	86.1	0.2	6.6	0.0	124.8	0.2			
5-W	10/30/13	66.3	11.8	18.9	3.4	2.9	0.5	56.9	10.1	0.5		
5-Th	10/31/13											
Minimum												
Average		125.105	32.1045	40.1227	10.6727	7.34545	2.10455	205.464	56.0909	12.5		
	Report Only	<= 558	Report Only	<= 63	Report Only	<= 28	Report Only	Report Only	Report Only	Report Only		
Maximum		295	96	101.2	22.7	15.3	6.3	530	180.6	29	55.8	86
	Report Only	<= 796	Report Only	<= 90	Report Only	<= 46	Report Only	Report Only	Report Only	Report Only	Report Only	Report Only



Week	Monitoring Point	Magnesium Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Manganese Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Ammonia Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Phosphorus Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Potassium Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Total Dissolved Solids Total Dissolved Solids (TDS) Milligrams/L (mg/L) 2/Month Grab	Flow Gallons/Day (gpd) Continuous Metered/Recorded	pH Standard Units 2/Month Grab	Total Dissolved Solids Total Dissolved Solids (TDS) Milligrams/L (mg/L) 2/Month Grab	Sodium Total Milligrams/L (mg/L) 2/Month Grab	Chloride Total Milligrams/L (mg/L) 2/Month Grab
		001	001	001	001	001	002	003	003	003	003	003
1-T	10/1/13							C				
1-W	10/2/13	4.3	28.2	3.5	0.1	8.4	324.0	C	9.1	456.0	130.7	32.2
1-Th	10/3/13							C				
1-F	10/4/13							C				
1-Sa	10/5/13							296770				
2-Su	10/6/13							754462				
2-M	10/7/13							755585				
2-T	10/8/13							735860				
2-W	10/9/13						414.0	227407	9.7	466.0	94.8	28.1
2-Th	10/10/13							C				
2-F	10/11/13							461900				
2-Sa	10/12/13							291486				
3-Su	10/13/13							C				
3-M	10/14/13							C				
3-T	10/15/13							C				
3-W	10/16/13							C				
3-Th	10/17/13							C				
3-F	10/18/13							C				
3-Sa	10/19/13							C				
4-Su	10/20/13							C				
4-M	10/21/13							C				
4-T	10/22/13							C				
4-W	10/23/13							C				
4-Th	10/24/13							C				
4-F	10/25/13							C				
4-Sa	10/26/13							C				
5-Su	10/27/13							C				
5-M	10/28/13							C				
5-T	10/29/13							C				
5-W	10/30/13							C				
5-Th	10/31/13							C				
Minimum									9.1			
									Report Only			
Average							369	503353		461	112.75	30.15
							Report Only	Report Only		Report Only	Report Only	Report Only
Maximum		4.3	28.2	3.5	0.1	8.4	414	755585	9.7	466	130.7	32.2
		Report Only	Report Only	Report Only	Report Only	Report Only	<= 2500	Report Only	Report Only	Report Only	Report Only	Report Only

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Reporting Codes Used: C - No Discharge

Overall DMR Notes/Comment001 Total flow 1,048,432 gallons.
October 31st no sample.

002 Maximum flow = 56 gpm

003 October 2nd copper = 19.2ug/L
October 9th copper = 35.8 ug/L**Outfall: 001 - DISCHARGE TO CITY OF MOSES LAKE POTW, DUNES TREATMENT PLANT**

Monitoring Point	Parameter	Sample Date/ Statistical Base	Value	Notes/Comment
HSHS	All Parameters		C	No discharge for the month.
HCEP	All Parameters		C	No discharge for the month.

I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Paul Stenhouse

Signature

11/13/2013 1:43:46 PM

Date



Permit Number: ST0008121

Permittee: REC Solar Grade Silicon

Facility County: Grant

Receiving Waterbody:

Monitoring Period: 11/01/2013 - 11/30/2013

Outfall: 001 - DISCHARGE TO CITY OF MOSES LAKE
POTW, DUNES TREATMENT PLANT

Version: 1

Week	Monitoring Point	Flow Gallons/Day (gpd) Continuous Metered/Recorded	pH Daily Min Standard Units Continuous Metered/Recorded	pH Daily Max Standard Units Continuous Metered/Recorded	Conductivity (Specific Conductance) Micromhos/cm Continuous Metered/Recorded	Conductivity (Specific Conductance) Micromhos/cm Continuous Metered/Recorded	Temperature Measured Degrees F Continuous Metered/Recorded	Total BOD5 Total Milligrams/L (mg/L) Weekly Composite Sample (24 HR Time Proportional comp)	Oil & Grease Total recoverable, FOG, HEM Milligrams/L (mg/L) Weekly Grab	Total Suspended Solids (TSS) Total suspended (TSS) Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Total Dissolved Solids Total Dissolved Solids (TDS) Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Total Dissolved Solids Total Dissolved Solids (TDS) Lbs/Day 5/Week Composite Sample (24 HR Time Proportional comp)
1-F	11/1/13	43165	7.8	8.6	903.0	1362.0	70.0			13.8	396.0	142.5
1-Sa	11/2/13	44937	7.1	7.8	1277.0	1369.0	72.0			16.9	608.0	227.9
2-Su	11/3/13	24086	6.7	7.7	1295.0	1539.0	70.0			28.9	596.0	119.7
2-M	11/4/13	470	7.2	8.7	428.0	1655.0	60.0					
2-T	11/5/13	25232	6.9	8.7	513.0	1506.0	68.0			16.3	502.0	105.6
2-W	11/6/13	21975	6.6	7.7	1504.0	1759.0	70.0	5.0	1.4	9.4	512.0	93.8
2-Th	11/7/13	23437	7.1	7.5	1479.0	2518.0	65.0			8.6	398.0	77.8
2-F	11/8/13	24466	6.8	7.3	2234.0	2604.0	71.0			167.8	1200.0	244.9
2-Sa	11/9/13	45675	7.3	7.6	2026.0	2353.0	70.0					
3-Su	11/10/13	59137	7.5	8.8	1763.0	2143.0	70.0					
3-M	11/11/13	18158	7.6	8.2	1658.0	1972.0	68.0			52.6	982.0	148.7
3-T	11/12/13	22607	7.4	7.6	1555.0	1755.0	66.0			30.7	732.0	138.0
3-W	11/13/13	22383	6.9	7.6	1130.0	1781.0	68.0	9.6	1.4	47.4	708.0	132.1
3-Th	11/14/13	33401	7.1	7.9	949.0	1158.0	64.0			29.6	618.0	172.2
3-F	11/15/13	21921	7.5	7.9	946.0	1003.0	60.0			20.2	456.0	83.4
3-Sa	11/16/13	10144	7.0	7.7	991.0	1086.0	60.0					
4-Su	11/17/13	18734	6.6	7.6	944.0	1158.0	66.0			7.1	354.0	55.3
4-M	11/18/13	45040	6.4	7.9	747.0	944.0	70.0			25.7	634.0	238.1
4-T	11/19/13	42847	6.9	7.9	738.0	840.0	69.0			32.8	640.0	228.7
4-W	11/20/13	3810	6.3	7.3	782.0	873.0	62.0	5.1	1.4	480.0	11.4	0.4
4-Th	11/21/13	42145	6.5	8.2	756.0	932.0	66.0			32.4	758.0	266.4
4-F	11/22/13	388	7.0	8.4	840.0	1027.0	62.0					
4-Sa	11/23/13	43808	7.2	9.3	816.0	949.0	68.0					
5-Su	11/24/13	570	6.5	9.5	865.0	1019.0	65.0					
5-M	11/25/13	42235	6.5	9.5	784.0	956.0	62.0	59.2	1.4	86.8	672.0	236.7
5-T	11/26/13	21790	8.8	9.5	809.0	1013.0	65.0			54.9	350.0	63.6
5-W	11/27/13	43724	8.0	9.4	811.0	1012.0	69.0			57.1	552.0	201.3
5-Th	11/28/13	45858	7.5	8.4	863.0	1253.0	68.0			45.0	728.0	278.4
5-F	11/29/13	42915	7.1	8.2	356.0	1449.0	68.0			14.0	912.0	326.4
5-Sa	11/30/13	23110	6.1	7.4	1126.0	1520.0	72.0					
Minimum			6.1		356							
			>= 6.0		Report Only							
Average		28605.6					66.8	19.725	1.4	58.0909	605.427	162.814
		<= 210000					Report Only	Report Only	Report Only	<= 350	Report Only	<= 3240
Maximum		59137		9.5		2604	72	59.2	1.4	480	1200	326.4
		<= 300000		<= 11.0		Report Only	Report Only	<= 300	<= 100	Report Only	Report Only	<= 4560



Week	Monitoring Point	Sodium Total Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Sodium Total Lbs/Day 5/Week Composite Sample (24 HR Time Proportional comp)	Chloride Total Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Chloride Lbs/Day 5/Week Composite Sample (24 HR Time Proportional comp)	Fluoride Total Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Fluoride Total Lbs/Day 5/Week Composite Sample (24 HR Time Proportional comp)	Sulfate Total Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Sulfate Total Lbs/Day 5/Week Composite Sample (24 HR Time Proportional comp)	Nitrate Total Milligrams/L (mg/L) Weekly Composite Sample (24 HR Time Proportional comp)	Alkalinity Total Monthly Composite Sample (24 HR Time Proportional comp)	Calcium Total Monthly Composite Sample (24 HR Time Proportional comp)
1-F	11/1/13	81.1	29.2	23.3	8.4	3.3	1.2	94.1	33.9			
1-Sa	11/2/13	137.9	51.7	35.8	13.4	3.9	1.5	256.8	96.3			
2-Su	11/3/13	133.5	26.8	35.5	7.1	5.3	1.1	224.8	45.1			
2-M	11/4/13											
2-T	11/5/13	91.1	19.2	29.5	6.2	4.5	0.9	170.8	36.0			
2-W	11/6/13	74.4	13.7	22.8	4.2	3.4	0.6	107.4	19.7	10.5	130.0	35.2
2-Th	11/7/13	77.2	15.1	21.5	4.2	3.2	0.6	88.0	17.2			
2-F	11/8/13	165.0	33.6	42.0	8.6	9.4	1.9	308.5	63.0			
2-Sa	11/9/13											
3-Su	11/10/13											
3-M	11/11/13	184.2	27.9	30.6	4.6	5.7	0.9	338.7	51.3			
3-T	11/12/13	124.3	23.5	29.0	5.5	5.4	1.0	185.5	35.0			
3-W	11/13/13	117.6	21.9	29.1	5.4	5.5	1.0	206.4	38.5	27.2		
3-Th	11/14/13	108.8	30.3	31.3	8.7	6.1	1.7	202.9	56.5			
3-F	11/15/13	86.2	15.8	22.1	4.0	3.8	0.7	101.4	18.6			
3-Sa	11/16/13											
4-Su	11/17/13	78.1	12.2	19.4	3.0	3.3	0.5	64.6	10.1			
4-M	11/18/13	109.8	41.3	30.9	11.6	6.3	2.4	191.1	71.8			
4-T	11/19/13	104.3	37.3	32.5	11.7	5.7	2.0	259.2	92.7			
4-W	11/20/13	84.1	2.6	22.5	0.7	3.9	0.1	110.4	3.5	4.4		
4-Th	11/21/13	123.4	43.4	35.1	12.3	4.3	1.5	333.3	117.1			
4-F	11/22/13											
4-Sa	11/23/13											
5-Su	11/24/13											
5-M	11/25/13	126.4	44.5	37.4	13.2	5.0	1.8	253.2	89.2	3.5		
5-T	11/26/13	82.6	15.0	21.7	4.0	2.7	0.5	85.2	15.5			
5-W	11/27/13	99.0	36.1	22.8	8.3	3.7	1.3	113.7	41.5			
5-Th	11/28/13	150.3	57.4	28.2	10.8	6.8	2.6	292.3	111.8			
5-F	11/29/13	145.0	51.9	29.6	10.6	7.2	2.6	335.5	120.1			
5-Sa	11/30/13											
Minimum												
Average		112.923	29.5636	28.7545	7.56818	4.92727	1.29091	196.536	53.8364	11.4		
	Report Only		<= 558	Report Only	<= 63	Report Only	<= 28	Report Only	Report Only	Report Only		
Maximum		184.2	57.4	42	13.4	9.4	2.6	338.7	120.1	27.2	130	35.2
	Report Only		<= 796	Report Only	<= 90	Report Only	<= 46	Report Only	Report Only	Report Only	Report Only	Report Only



Week	Monitoring Point	Magnesium Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Manganese Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Ammonia Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Phosphorus Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Potassium Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Total Dissolved Solids Total Dissolved Solids (TDS) Milligrams/L (mg/L) 2/Month Grab	Flow Gallons/Day (gpd) Continuous Metered/Recorded	pH Standard Units 2/Month Grab	Total Dissolved Solids Total Dissolved Solids (TDS) Milligrams/L (mg/L) 2/Month Grab	Sodium Total Milligrams/L (mg/L) 2/Month Grab	Chloride Total Milligrams/L (mg/L) 2/Month Grab
1-F	11/1/13											
1-Sa	11/2/13											
2-Su	11/3/13											
2-M	11/4/13											
2-T	11/5/13											
2-W	11/6/13	2.9	15.6	0.3	0.2	7.7	378.0					
2-Th	11/7/13											
2-F	11/8/13											
2-Sa	11/9/13											
3-Su	11/10/13											
3-M	11/11/13											
3-T	11/12/13											
3-W	11/13/13											
3-Th	11/14/13											
3-F	11/15/13											
3-Sa	11/16/13											
4-Su	11/17/13											
4-M	11/18/13											
4-T	11/19/13											
4-W	11/20/13						348.0					
4-Th	11/21/13											
4-F	11/22/13											
4-Sa	11/23/13											
5-Su	11/24/13											
5-M	11/25/13											
5-T	11/26/13											
5-W	11/27/13											
5-Th	11/28/13											
5-F	11/29/13											
5-Sa	11/30/13											
Minimum									Report Only			
Average							363					
							Report Only	Report Only		Report Only	Report Only	Report Only
Maximum		2.9	15.6	0.3	0.2	7.7	378					
		Report Only	Report Only	Report Only	Report Only	Report Only	<= 2500	Report Only	Report Only	Report Only	Report Only	Report Only

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Reporting Codes Used: C - No Discharge

Overall DMR Notes/Comment

001 Outfall

Total Flow 858,168 gallons

No sample Nov. 4th so Sunday's sample used (11-3-13)

No sample Nov. 22nd so Sunday's sample used (11-17-13)

No exceedences.

002 Outfall

No exceedences.

Maximum flow 64 gpm.

Monitor wells

No comments

004 Outfall

No comments

003 Irrigation Outfall

No Discharge

Outfall: 001 - DISCHARGE TO CITY OF MOSES LAKE POTW, DUNES TREATMENT PLANT

Monitoring Point	Parameter	Sample Date/ Statistical Base	Value	Notes/Comment
003	All Parameters		C	No discharge
HSHS	All Parameters		C	No discharge
HCEP	All Parameters		C	No discharge

I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Paul Stenhouse

Signature

12/13/2013 9:27:59 AM

Date



Permit Number: ST0008121

Permittee: REC Solar Grade Silicon

Facility County: Grant

Receiving Waterbody:

Monitoring Period: 12/01/2013 - 12/31/2013

Outfall: 001 - DISCHARGE TO CITY OF MOSES LAKE
POTW, DUNES TREATMENT PLANT

Version: 1

Week	Monitoring Point	Flow Gallons/Day (gpd) Continuous Metered/Recorded	pH Daily Min Standard Units Continuous Metered/Recorded	pH Daily Max Standard Units Continuous Metered/Recorded	Conductivity (Specific Conductance) Micromhos/cm Continuous Metered/Recorded	Conductivity (Specific Conductance) Micromhos/cm Continuous Metered/Recorded	Temperature Measured Degrees F Continuous Metered/Recorded	Total BOD5 Total Milligrams/L (mg/L) Weekly Composite Sample (24 HR Time Proportional comp)	Oil & Grease Total recoverable, FOG, HEM Milligrams/L (mg/L) Weekly Grab	Total Suspended Solids (TSS) Total suspended (TSS) Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Total Dissolved Solids Total Dissolved Solids (TDS) Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Total Dissolved Solids Total Dissolved Solids (TDS) Lbs/Day 5/Week Composite Sample (24 HR Time Proportional comp)
1-Su	12/1/13	443	6.4	7.2	1270.0	1441.0	68.0					
1-M	12/2/13	26734	6.1	7.9	1083.0	1443.0	64.0			41.5	540.0	120.4
1-T	12/3/13	21778	7.1	8.3	418.0	1192.0	67.0			29.9	858.0	155.8
1-W	12/4/13	22392	6.7	9.2	173.0	1407.0	64.0	5.0	1.4	6.6	230.0	42.9
1-Th	12/5/13	4614	8.2	9.4	969.0	1328.0	65.0			33.9	756.0	29.1
1-F	12/6/13	43724	8.4	9.4	959.0	1198.0	67.0			42.9	868.0	316.6
1-Sa	12/7/13	52051	7.9	8.5	960.0	1020.0	64.0					
2-Su	12/8/13	39766	7.9	8.8	889.0	991.0	64.0					
2-M	12/9/13	26582	7.7	8.8	890.0	947.0	65.0			17.6	834.0	184.9
2-T	12/10/13	38635	8.1	8.7	892.0	936.0	63.0			13.9	798.0	257.1
2-W	12/11/13	26108	8.3	8.8	869.0	895.0	63.0	11.6	1.4	25.7	866.0	188.6
2-Th	12/12/13	34412	8.3	8.9	816.0	1020.0	66.0			10.0	690.0	198.0
2-F	12/13/13	7886	7.1	8.8	942.0	1099.0	66.0			24.8	720.0	47.4
2-Sa	12/14/13	20873	8.6	8.8	835.0	1012.0	65.0					
3-Su	12/15/13	21435	8.0	8.9	810.0	1050.0	65.0					
3-M	12/16/13	43324	8.0	8.9	878.0	952.0	64.0			21.4	738.0	266.7
3-T	12/17/13	46049	7.5	8.6	952.0	1134.0	68.0			17.0	754.0	289.6
3-W	12/18/13	23240	7.3	8.4	1011.0	1233.0	68.0	5.2	1.4	15.2	940.0	182.2
3-Th	12/19/13	46657	7.9	8.6	898.0	1104.0	68.0			16.5	956.0	372.0
3-F	12/20/13	55495	7.7	8.3	885.0	998.0	65.0			20.3	778.0	360.1
3-Sa	12/21/13	26648	6.9	9.0	815.0	968.0	70.0					
4-Su	12/22/13	20793	8.3	9.1	865.0	998.0	70.0					
4-M	12/23/13	22940	8.2	8.6	958.0	1052.0	70.0			9.2	496.0	94.9
4-T	12/24/13	21396	8.0	8.6	1000.0	1179.0	72.0			6.0	456.0	81.3
4-W	12/25/13	24282	8.0	8.6	1151.0	1599.0	71.0			7.5	684.0	138.5
4-Th	12/26/13	47753	7.6	8.1	1366.0	1683.0	70.0	8.2	2.2	20.6	1232.0	490.7
4-F	12/27/13	22805	7.4	8.0	1183.0	1420.0	72.0			11.6	722.0	137.3
4-Sa	12/28/13	4639	6.6	7.9	1345.0	1548.0	64.0					
5-Su	12/29/13	35216	7.7	8.1	1078.0	1367.0	70.0					
5-M	12/30/13	35926	7.9	8.1	1099.0	1263.0	70.0	27.7	2.8	18.4	866.0	259.5
5-T	12/31/13	40414	7.6	8.1	1077.0	1226.0	70.0			26.6	942.0	317.5
Minimum			6.1		173							
			>= 6.0		Report Only							
Average		29193.9					67.0323	11.54	1.84	19.8682	760.182	205.959
		<= 210000					Report Only	Report Only	Report Only	<= 350	Report Only	<= 3240
Maximum		55495		9.4		1683	72	27.7	2.8	42.9	1232	490.7
		<= 300000		<= 11.0		Report Only	Report Only	<= 300	<= 100	Report Only	Report Only	<= 4560



Week	Monitoring Point	Sodium Total Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Sodium Total Lbs/Day 5/Week Composite Sample (24 HR Time Proportional comp)	Chloride Total Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Chloride Lbs/Day 5/Week Composite Sample (24 HR Time Proportional comp)	Fluoride Total Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Fluoride Total Lbs/Day 5/Week Composite Sample (24 HR Time Proportional comp)	Sulfate Total Milligrams/L (mg/L) 5/Week Composite Sample (24 HR Time Proportional comp)	Sulfate Total Lbs/Day 5/Week Composite Sample (24 HR Time Proportional comp)	Nitrate Total Milligrams/L (mg/L) Weekly Composite Sample (24 HR Time Proportional comp)	Alkalinity Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Calcium Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)
		001	001	001	001	001	001	001	001	001	001	001
1-Su	12/1/13											
1-M	12/2/13	127.4	28.4	29.3	6.5	5.0	1.1	213.8	47.6			
1-T	12/3/13	138.7	25.2	32.0	5.8	6.0	1.1	278.4	50.5			
1-W	12/4/13	87.8	16.4	18.9	3.5	3.0	0.6	74.3	13.9	7.3	156.0	23.2
1-Th	12/5/13	158.7	6.1	30.6	1.2	4.5	0.2	220.5	8.5			
1-F	12/6/13	174.3	63.5	30.6	11.2	4.1	1.5	272.2	99.3			
1-Sa	12/7/13											
2-Su	12/8/13											
2-M	12/9/13	128.4	28.4	28.7	6.4	2.3	0.5	326.5	72.4			
2-T	12/10/13	127.8	41.2	29.0	9.3	2.3	0.7	317.6	102.4			
2-W	12/11/13	139.6	30.4	30.6	6.7	3.9	0.9	296.5	64.5	12.3		
2-Th	12/12/13	119.7	34.3	26.8	7.7	3.3	1.0	224.7	64.5			
2-F	12/13/13	124.7	8.2	29.2	1.9	3.8	0.3	257.0	16.9			
2-Sa	12/14/13											
3-Su	12/15/13											
3-M	12/16/13	119.3	43.1	34.6	12.5	5.1	1.8	216.2	78.1			
3-T	12/17/13	118.5	45.5	34.0	13.1	8.2	3.2	169.5	65.1			
3-W	12/18/13	107.6	20.9	32.9	6.4	13.7	2.6	116.8	22.7	89.1		
3-Th	12/19/13	109.5	42.6	32.3	12.6	13.0	5.0	111.5	43.4			
3-F	12/20/13	121.2	56.1	31.9	14.8	9.6	4.5	128.2	59.4			
3-Sa	12/21/13											
4-Su	12/22/13											
4-M	12/23/13	114.3	21.9	25.2	4.9	4.9	0.9	87.7	16.8			
4-T	12/24/13	95.8	17.1	24.9	4.5	3.9	0.7	64.0	11.4			
4-W	12/25/13	105.7	21.4	26.4	5.4	4.5	0.9	74.8	15.2			
4-Th	12/26/13	147.1	58.6	37.0	14.7	5.8	2.3	119.3	47.5	160.0		
4-F	12/27/13	112.7	21.4	27.4	5.2	3.8	0.7	83.8	15.9			
4-Sa	12/28/13											
5-Su	12/29/13											
5-M	12/30/13	109.3	32.8	33.2	9.9	4.2	1.3	123.6	37.1	94.3		
5-T	12/31/13	126.4	42.6	33.0	11.1	4.7	1.6	136.3	46.0			
Minimum												
Average		123.386	32.0955	29.9318	7.96818	5.43636	1.51818	177.873	45.4136	72.6		
		Report Only	<= 558	Report Only	<= 63	Report Only	<= 28	Report Only	Report Only	Report Only		
Maximum		174.3	63.5	37	14.8	13.7	5	326.5	102.4	160	156	23.2
		Report Only	<= 796	Report Only	<= 90	Report Only	<= 46	Report Only	Report Only	Report Only	Report Only	Report Only



Week	Monitoring Point	Magnesium Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Manganese Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Ammonia Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Phosphorus Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Potassium Total Milligrams/L (mg/L) Monthly Composite Sample (24 HR Time Proportional comp)	Total Dissolved Solids Total Dissolved Solids (TDS) Milligrams/L (mg/L) 2/Month Grab	Flow Gallons/Day (gpd) Continuous Metered/Recorded	pH Standard Units 2/Month Grab	Total Dissolved Solids Total Dissolved Solids (TDS) Milligrams/L (mg/L) 2/Month Grab	Sodium Total Milligrams/L (mg/L) 2/Month Grab	Chloride Total Milligrams/L (mg/L) 2/Month Grab
1-Su	12/1/13											
1-M	12/2/13											
1-T	12/3/13											
1-W	12/4/13	2.9	4.4	0.2	0.2	7.7	274.0					
1-Th	12/5/13											
1-F	12/6/13											
1-Sa	12/7/13											
2-Su	12/8/13											
2-M	12/9/13											
2-T	12/10/13											
2-W	12/11/13											
2-Th	12/12/13											
2-F	12/13/13											
2-Sa	12/14/13											
3-Su	12/15/13											
3-M	12/16/13											
3-T	12/17/13											
3-W	12/18/13						166.0					
3-Th	12/19/13											
3-F	12/20/13											
3-Sa	12/21/13											
4-Su	12/22/13											
4-M	12/23/13											
4-T	12/24/13											
4-W	12/25/13											
4-Th	12/26/13											
4-F	12/27/13											
4-Sa	12/28/13											
5-Su	12/29/13											
5-M	12/30/13											
5-T	12/31/13											
Minimum									Report Only			
Average							220					
							Report Only	Report Only		Report Only	Report Only	Report Only
Maximum		2.9	4.4	0.2	0.2	7.7	274					
		Report Only	Report Only	Report Only	Report Only	Report Only	<= 2500	Report Only	Report Only	Report Only	Report Only	Report Only

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Reporting Codes Used: C - No Discharge

Overall DMR Notes/Comment

Process 001

Total flow 905,010

No Exceedences.

Sanitary Sewer 002

Maximum flow 60gpm

No exceedences.

Groundwater Monitoring

No comment.

Irrigated Effluent 003

No water applied to field.

Outfall 004

No comments.

Outfall: 001 - DISCHARGE TO CITY OF MOSES LAKE POTW, DUNES TREATMENT PLANT

Monitoring Point	Parameter	Sample Date/ Statistical Base	Value	Notes/Comment
003	All Parameters		C	No water applied to field.
HSHS	All Parameters		C	
HCEP	All Parameters		C	

I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Paul Stenhouse

Signature

1/13/2014 7:14:34 AM

Date

Hydrogeologic Study REC Solar Grade Silicon, LLC Moses Lake, Washington

August 2009



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**Hydrogeologic Study
REC Solar Grade Silicon, LLC
Moses Lake, Washington**

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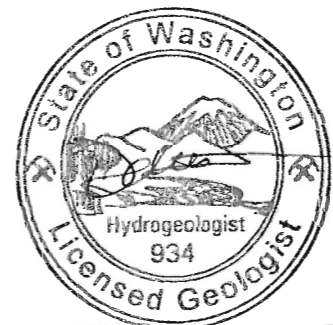
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APPENDIX

Appendix A.	Registered Water Well Reports Within One Mile of the Site
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EXECUTIVE SUMMARY

Renewable Energy Corporation Solar Grade Silicon, LLC (REC) is constructing a lined 60 million gallon storage pond for non-contact cooling water generated from their existing plant. The pond will be used to store water collected during the winter months. The water will be transferred from the pond and irrigated onto 125 acres of agricultural land owned by REC that is located directly north of the pond. Water will be irrigated using one center pivot during the summer months to support crop water needs and crop production. The pond and the land application system occupy a contiguous area (Site).

The City of Moses Lake has determined that the pond will not have a probable significant adverse impact on the environment provided certain mitigation measures are complied within the Mitigated Determination of Non-Significance (MDNS). A requirement of the MDNS states that REC shall prepare an engineering report and hydrogeologic study for pond construction and land application of wastewater per Washington Administrative Codes (WAC) 173-240, Submission of Plans and Reports for Construction of Wastewater Facilities, and 173-200, Water Quality Standards for Ground Waters of the State of Washington. Specifically, per WAC 173-240-130. The Washington Department of Ecology must approve the engineering report and hydrogeologic study prior to placing the pond and land application system into service.

The following conclusions and recommendations are offered.

- There is an unconfined aquifer hosted by alluvium and fractured basalt at the Site.
- The depth to groundwater is expected to range from 21 to 32 feet below ground surface.
- Groundwater is estimated to flow west-southwest.
- Recharge to the unconfined aquifer is primarily from leakage from the canals and to a lesser extent from irrigation and precipitation.
- The unconfined aquifer is not known to be used in the area of the Site, presumably due to poor yields or inconsistent quantity of water.
- There are no wells completed in the alluvial aquifer within one mile downgradient of the Site boundary.
- Confined basalt aquifers occur below the unconfined aquifer. Confining aquitards consist of fine-grained sediments and/or firm, unfractured basalt.
- Groundwater in the confined basalt aquifers is likely to be isolated by aquitards from groundwater in the unconfined aquifer beneath the Site. There are six wells completed in the basalt aquifer within one mile downgradient of the Site boundary. All six wells are cased wells into firm basalt and are not likely to be hydraulically connected with the unconfined alluvial aquifer.

A groundwater monitoring well network with four wells should be installed in the unconfined aquifer at the Site. The monitoring well locations and rationale are listed below.

Well	Hydrogeologic Position	Purpose of Monitoring Point
MW-1	Upgradient of the pond	Monitors groundwater upgradient of the pond
MW-2	Downgradient of the pond	Monitors groundwater downgradient of the pond
MW-3	Downgradient of Site and pivot	Monitors groundwater downgradient of the pivot
MW-4	Upgradient of pivot	Monitors groundwater upgradient of the pivot

1.0 INTRODUCTION

Renewable Energy Corporation Solar Grade Silicon, LLC (REC) produces polysilicon and silane gas at its Moses Lake, Washington facility for solar panels and other uses. The REC facility is located on the east side of Moses Lake (Figure 1). The water REC receives from the City of Moses Lake is used directly in processing the polysilicon and indirectly in cooling the transformers used in the production process (non-contact cooling water).

REC is constructing a lined 60 million gallon (MG) storage pond for non-contact cooling water generated from their existing plant. The pond will be used to store water collected during the winter months. The water will be transferred from the pond and irrigated onto agricultural land owned by REC that is located northwest of the pond (Figure 2). Water will be irrigated using a center pivot during the summer months to support crop water needs and crop production. The pond and the land application system occupy a contiguous area (Site).

The City of Moses Lake has determined that the pond construction as designed does not have a probable significant adverse impact on the environment provided certain mitigation measures are complied with in the Mitigated Determination of Non-Significance (MDNS). A requirement of the MDNS states that REC shall prepare an engineering report and hydrogeologic study for pond construction and land application of wastewater per Washington Administrative Codes (WAC) 173-240, Submission of Plans and Reports for Construction of Wastewater Facilities, and 173-200, Water Quality Standards for Ground Waters of the State of Washington. Specifically, per WAC 173-240-130, “(2) The engineering report shall include the following information together with any other relevant data as requested by the department:...(p) “Where discharge is through land application, including seepage lagoons, irrigation, and subsurface disposal, a geohydrologic evaluation of factors such as:

- (i) Depth to ground water and ground water movement during different times of the year;
- (ii) Water balance analysis of the proposed discharge area;
- (iii) Overall effects of the proposed facility upon the ground water in conjunction with any other land application facilities that may be present...”

2.0 BACKGROUND

2.1 Site Description

The Site is located in Grant County, Washington at an average elevation of about 1,210 feet above mean sea level based on ground elevations shown on the United States Geological Survey (USGS) topographic map for the area around the Site (USGS, 1956). Specifically, the Site is located in Section 17 of Township 19 North, Range 29 East of the Willamette Meridian (USGS, 1956). The physical address is 3322 Road “N” N.E. Moses Lake, Washington.

2.1.1 Process Description

Non-contact cooling water is generated during the manufacture of polysilicon. The cooling water will be conveyed to a 60 MG lined storage pond located west of the facility (Figure 2). During the crop growing season, cooling water from the facility and the storage pond will be irrigated on the Site with a

125-acre center pivot located northwest of the pond to meet crop needs. The pond will typically be drained by the end of June, and then remain empty until refilling begins in the fall.

Design Flow

The pond is designed to accommodate an average daily flow rate of 300,000 gallons per day (gpd). The average flow rate was determined from the average daily flow rate of 254,293 gpd in 2007, plus a 20 percent safety margin (~ 50,000 gpd). The typical duration period for land application watering (irrigating the field) is mid-October to mid-March or 151 days. The capacity of this storage pond is approximately 58,000,000 gallons. The capacity required for 151 days of storage is 45,300,000 gallons. Therefore, an additional of 28% of storage capacity is available based on this watering cycle and the average daily flow rate of 300,000 gpd.

Cooling Water Quality

The cooling water quality was analyzed from five years of data (2003 to 2007) from discharge monitoring reports (DMRs). When constituents were not reported on DMRs, source water data was used. The source water was represented by a water sample collected from the City of Moses Lake well #17 in 2006. When using source water data, constituent concentrations were adjusted to account for 2.5 cycles in the cooling towers and therefore concentrations were increased by 2.5 times.

Water quality parameters with potential to be the most limiting to land application were determined as electrical conductivity (EC), pH, nitrate-nitrogen ($\text{NO}_3\text{-N}$), and the sodium adsorption ratio (SAR). The five-year averages were calculated for EC and pH using the DMR data and source water data was used to determine $\text{NO}_3\text{-N}$ concentrations and calculate SAR. Representative cooling water quality parameters for planning purposes include the following.

- EC - 882 micromhos per centimeter ($\mu\text{mhos/cm}$)
- pH - 8.6 standard units (s.u.)
- $\text{NO}_3\text{-N}$ - 3.8 milligrams per liter (mg/L)
- SAR - 8.2 (unitless)

The EC is a suitable concentration for land application under the right management practices, which means that irrigation water with an EC of 822 $\mu\text{mhos/cm}$ (0.822 dS/m) requires leaching or dilution with supplemental irrigation water (Ayers and Westcot, 1985). The pH is slightly high but acceptable, as 6.5 to 8.5 s.u. is the default range for suitable pH. The $\text{NO}_3\text{-N}$ concentration is acceptable because it will be removed by crop harvest, under conditions of good crop and irrigation management. An irrigation water SAR below 10 is considered to have a low sodium hazard¹ (Fipps, 2003). An SAR of 8.2 is below the threshold of 10, but it is close enough that monitoring the cooling water SAR and soils will be necessary to manage potential water infiltration problems. Overall, based on the information above, the cooling water is suitable for land application.

¹ Sodium hazard represents the potential for decreased water infiltration due to high SAR. $\text{SAR} = (\text{Na meq/L}) / (\text{SQRT} ((\text{Ca meq/L} + \text{Mg meq/L})/2))$. Where Ca = calcium, meq/L = millequivalents per liter, Mg = magnesium, Na = sodium, SQRT = square root.

2.1.2 Climate

Climate at the Site is classified as semi-arid, and is characterized by cool, moist winters and hot, dry summers (USDA/SCS, 1984). Air temperature and precipitation data representative of the Site were reviewed from the Washington State University AgWeatherNet (www.agWeatherNet.com) station for Moses Lake, Washington, which is located approximately seven miles southeast of Moses Lake, Washington. The average annual air temperature is about 50 degrees Fahrenheit (° F) with an average maximum temperature of 86° F in August and an average minimum temperature of 24° F in January and February. The growing season for most crops will typically occur during March through October.

2.1.3 Topography, Drainage and Surface Water

The Site gently slopes to the west-southwest (Figure 1). East of the Site, the topography becomes steeper and drainages more incised.

The East Low Canal, an irrigation canal operated by the East Columbia Basin Irrigation District, is located approximately one mile east-northeast of the Site at a higher elevation. The canal conveys water stored at the Grand Coulee Dam from March through October each year. Seepage from the canal recharges the unconfined shallow aquifer, some of which discharges into creeks.

An irrigation canal that emanates at a point about 1.5 miles northeast of the Site from the East Low Canal flows south along the east side of the pivot, turns southwest and flows along the west side of the pond. Like the East Low Canal, this tributary canal only contains irrigation water during the summer months and likely recharges groundwater. Water land applied at the Site is not likely to drain into the canals.

A perennial drainage flows southwest along the east side of the pond. The perennial drainage emanates from an ephemeral drainage at a point just north of Road 4 NE. The perennial drainage does not contact the land application Site. Surface water flow from this drainage was diverted into buried drainage pipes on REC property and are identified as DE 226 and DE 227 under the direction of the Bureau of Reclamation. The pipes convey water to the southeast corner of Section 17 where it leaves the Site. Several agricultural drains south of the east pivot convey shallow groundwater to these pipes.

2.1.4 Soils

Soil information was reviewed from a United States Department of Agriculture – National Resource Conservation Service (USDA-NRCS) Web Soil Survey². The proposed land application site consists of a 125-acre center pivot irrigated field within a 160-acre parcel of land with shallow silt loam soils. Approximately 73 percent of the parcel consists of Scoon silt loam occurring on 0-5 percent slopes. The typical profile of Scoon series has a restrictive cemented layer (duripan) from 16-26 inches depth that overlies extremely gravelly sand. Approximately 22 percent of the Site consists of soils mapped as Starbuck fine sandy loam occurring on 0-15 percent slopes. The typical profile of Starbuck soil has a restrictive basalt layer at approximately 16 inches. Due to the shallow depths of these soils, the plant available water holding capacities ([amount of water retained by the soil that plants can use](#)) of these soils are very low at 2.5 and 2.6 inches for Scoon and Starbuck, respectively. The remaining 5 percent of the Site consists of Malaga cobbly sandy loam with 0-15 percent slopes. The Malaga

² Soils and topography data are from the Web Soil Survey: <http://websoilsurvey.nrcs.usda.gov/app/>

cobbly sandy loam has a plant available water holding capacity of about 2.0 inches. Moreover, the shallow and/or coarse soils at the Site will require light and frequent irrigation applications to produce viable crops.

3.0 GEOLOGY

The Site lies within the Quincy basin of the Columbia Plateau physiographic province. The Columbia Plateau is comprised of a series of flood basalts that cover most of eastern Washington, northeastern Oregon, and western Idaho occupying approximately 70,000 square miles. An intermountain area, the Columbia Plateau is bounded to the west by the Cascade Range, while the Okanogan Highlands form the northern boundary. The Rocky Mountains form the eastern boundary, with the Blue Mountains serving as the southern boundary (Lane and Whiteman, 1989). The basalt flows of the Columbia Basalt Group are Miocene in age, forming an extensive volcanic plateau (Alt and Hyndman, 1978). The Columbia basalts in area of the Site are overlain by sand and loess derived from sedimentary deposits from the ancestral floods that blanketed the Columbia Basin near the end of the most recent ice age (Alt and Hyndman, 1978). The dominant geologic feature is a thick sequence of basalt flows overlain by, and interbedded with, sedimentary rock. A geologic map of the area surrounding the Site is shown on Figure 3 and a geologic cross section is shown on Figure 4.

3.1 Regional Geology

A sequence of Miocene age basalt flows of the Columbia River Basalt Group covers the region. The basalt flows are generally dark gray, fine-grained, and dense. The numerous basalt flows are subdivided into four formations, starting with oldest to youngest, called the Imnaha Basalt, Grande Ronde Basalt, Wanapum Basalt, and Saddle Mountains Basalt. Of the formations, only the Grande Ronde Basalt and Wanapum Basalt are believed to be present near the Site. The Priest Rapids Member of the Wanapum Basalt Formation is composed of one or two basalt flows and is the bedrock immediately beneath the Site. The basalts at the site dip (slope) gently to the southwest (Grolier and Bingham, 1978).

Sedimentary rocks of the Ellensburg Formation deposited between the Grande Ronde Basalt and Wanapum Basalt inter-finger with the basalts of the plateau. The rocks of this formation consist of fluvial (stream) and lacustrine (lake) sediments and layers of volcaniclastic sediments (volcanic ash). The members of this formation interbed with the basalts along the western fringe of the plateau. The Vantage Member of the Ellensburg Formation crops out near Ephrata. Thickness of the Vantage Member can range from a few feet to a hundred feet and on average 25 feet throughout the plateau (USGS, 1986). Based on water well records, these outcrops do not occur near the Site (Appendix A).

The unconsolidated Pliocene, Pleistocene, and Holocene fluvial, glaciofluvial, and volcaniclastic sediments make up the other major geologic unit of the plateau. The Ringold Formation is the oldest geologic layer overlying the basalt sequence. The Ringold Formation is composed of weakly to moderately cemented silt and sand, with occasional conglomerate layers. This formation is present at depth in the north central portion of the Site based on the geologic map of the Moses Lake Quadrangle (WDNR, 1990) and registered water well reports (Appendix A).

Unconsolidated sediments overlying the basalts and Ringold Formation in the Quincy basin include: extensive deposits of gravels and sands deposited by glacial melt-water, unsorted colluvium deposited north of the Site, and alluvial sand and silt. These deposits presently occupy most of the land surface near the Site. Windblown silt (loess), which occurs throughout much of the Columbia Plateau, is present over the area southwest of the Site near the Potholes Reservoir. This unit generally does not yield water.

3.2 Local Geology

The local geology was evaluated using published literature and well logs obtained for wells constructed within one mile of the Site. Well log details are summarized in Table 1 and copies of the well logs are provided in Appendix A. Well locations are shown on Figure 5.

Five geologic units were identified at the Site including, from youngest to oldest, eolian (Qe), alluvium (Qa), fluvial gravel (Qfg), cemented sand and silt (Qfs), and the Priest Member (MVwpr) of the Columbia River Basalts. Descriptions of these units are provided below.

Alluvium (Qa)

Alluvium (Holocene to Pleistocene – present to 2 million years ago [mya]) – Silt, sand, and gravel in stream beds, floodplains, and terraces; includes stratified sand and gravel in alluvial fans and lacustrine silt and silty peat (WDNR, 1990). This unit is present in Section 17, near the natural drainage between the two pivots and extending southeast of the Site (Figure 3).

Sand and Silt (Qfs)

Sand and silt (Pleistocene – 0.01 to 2 mya) consists of horizontally bedded silt and fine to coarse basaltic sand; includes rhythmically bedded or laminated friable lacustrine fine sand and silt, which contain lenses of basaltic sand and gravel and ice-rafted erratic boulders (Grolier and Bingham, 1978). These sediments were deposited in low-energy slackwater environments created by temporary ponding of glacial outburst floodwaters (WDNR, 1990). Most of the water well reports for the area and geologic logs for borings conducted for a geotechnical investigation at the Site indicated the presence of this unit and a caliche zone within it (Hart Crowser, 2007). The distribution of this unit is shown on Figure 3.

Gravel (Qfg)

Gravel (Pleistocene – 0.01 to 2 mya) consist of fluvial gravel, ranging from boulders to fine sand, chiefly of rounded basalt fragments but locally containing clasts of granitic and metamorphic rocks, Ringold Formation sediments, and caliche (Grolier and Bingham, 1978). Deposited by glacial outburst floodwaters surging into the Quincy basin from the Grand Coulee and upper Crab Creek channels. Include components of glacial outwash derived from the Okanogan lobe of the Cordilleran ice sheet (WDNR, 1990). According to some of the water wells reports and geologic mapping of the area, this unit is present near the center of Section 17 (Figure 3).

Columbia River Basalt – Priest Rapids Member of the Wanapum Basalt (MVwpr)

Wanapum Basalt (Priest Rapids Member [Middle Miocene 14.5 to 15.5 mya]) consists of four flows of grayish black (fresh) to red-brown (weathered), medium to coarse-grained, slightly open-textured thin

flows and minor flow breccia with reversed magnetic polarity. Large columns as much as ten feet in diameter are common, as are platy parting in the basal flow.

The Priest Rapids Member is the uppermost member of the Wanapum Basalt (WDNR, 1990). In the western part of the Quincy basin, the Priest Rapids Member overlies the Quincy diatomite, which attains a maximum thickness of 20 feet. Where the underlying diatomite is absent, a pillow-palagonite bed, as much as ten feet thick, characterizes the base of the Priest Rapids Member. Based upon a review of well logs from the Ecology Water Resources Division (WDOE, 2009), the depth to basalt near the Site ranges from 15 feet to 43 feet, with a median depth of 28 feet. Based on water well records (WDOE, 2009), soil borings conducted at the Site (Hart Crowser, 2007), and geologic mapping (WDOE, 1990), basalt of the Priest Rapids Member is present at all locations below the unconsolidated sediments of the Site. The basalt near the Site dips to the southwest (Drost and Whiteman, 1986).

4.0 HYDROGEOLOGY

Two groundwater systems are present near the Site: deep, basalt aquifers and a shallow, unconfined system that exists in the unconsolidated formations overlying the basalt bedrock. Because the deep basalt aquifers are not expected to be impacted by land application activities, discussion of hydrogeologic properties is primarily limited to the uppermost unconfined aquifer situated primarily in the unconsolidated sediments over the basalt bedrock. The following sections present a conceptual hydrogeologic model for the Site.

4.1 Regional Hydrogeology

Prior to the implementation of irrigated agriculture in the area, groundwater primarily existed only in the basalt formations with relatively scarce resources present in the shallower sedimentary formations. Over the past 50 years, the Columbia Basin Irrigation Project (Williamson and others, 1998) has dramatically changed the hydrogeology of the area. Water level records indicate that the depth to groundwater has risen tens to hundreds of feet within the basin since the project was completed. Canal leakage and irrigation drainage from agricultural fields has recharged the aquifer, often to the point of creating base flow in streams and irrigation wasteways. In many drainages, shallow groundwater created by canal leakage flows down local topographic gradients and discharges into stream drainages. Canals flow with some losses to seepage generally from March 1 through October 31, which causes groundwater to rise and stream flows to increase. Groundwater elevations and stream flows decline after the canals are emptied. Nearly all groundwater for beneficial uses is pumped from deep wells drilled into the confined basalt aquifers.

Rises in groundwater levels have saturated lower portions of sedimentary deposits that were formerly dry. Since these sedimentary deposits fill eroded depressions in the basalt surface, the saturated portions of the deposits may form long and narrow localized aquifers separated by uplifts in the basalt. Where the glaciofluvial sand and gravels are saturated, they form highly conductive zones that can transmit water to, or drain water from, areas of depression along the basalt's surface. In cases where basalt fracturing is present at the top of the basalt, water that drains into or from the depressions can be considered hydraulically connected with shallow basalt aquifer systems.

Due to the rising shallow groundwater levels, base flows have increased or been created in many of the streams and drainageways of the basin. The result is an overall annual increase in stream flow, which appears responsive to surrounding irrigation activities, as well as the occurrence of spring activity along cut banks and upward flow from channel bottoms. Saturated areas and wetlands in the valley bottomlands (common near Moses Lake area) are the result of these phenomena and the Bureau of Reclamation and private landowners have installed subsurface drains to lower the water table and recapture the affected agricultural acreage (refer to Section 2.4.6). Wasteways were constructed by the Bureau of Reclamation to remove return water and excess drainage from the surrounding agricultural developments and to channel this water to the Potholes Reservoir five miles southwest of the Site.

4.2 Local Hydrogeology

Based on the water well reports within Section 17 (Table 1, Appendix A), the uppermost groundwater-bearing geologic materials of the Site consist of 15 to 43 feet of unconsolidated sediments which overly basalt bedrock. The sediments consist predominantly of sand from ground surface to 14 feet below ground surface (bgs) followed by caliche, which is alluvium cemented with calcium carbonate deposits, from 2 to 31 feet bgs, and basalt from 15 to 43 bgs. Groundwater occurs in the unconsolidated sediment varying from 21 to 32 feet bgs. The basalt near the contact with the alluvial unconsolidated sediments is described as soft, rotten, broken, and fractured. Groundwater in the upper basalt of this area is likely in contact with the upper alluvial aquifer. Areas with significant caliche and massive basalt may be effective aquitards that prevent significant downward leakage to deeper groundwater bearing zones within the basalt sequence. Additional details on hydrogeologic properties of the upper alluvial aquifer are described below.

4.2.1 Depth to Groundwater

The depth to groundwater at the Site was estimated by reviewing the water well reports for wells within Section 17 (Table 1, Appendix A). The depth to groundwater for the upper alluvial aquifer is estimated to range from 21 to 32 feet bgs. A geotechnical investigation conducted at the Site indicated groundwater between 25 and 30 feet bgs (Hart Crowser, 2007).

4.2.2 Saturated Thickness

Saturated thickness in an unconfined aquifer is the distance between the water table and the base of the aquifer. An estimate of average saturated thickness of ten feet was obtained from calculating the difference between the water table depth and depth of the firm basalt recorded on geologic logs for the soil borings conducted at the Site (Hart Crowser, 2007).

4.2.3 Groundwater Flow

Groundwater flow is the movement of groundwater in the zone of saturation. Since the East Low Canal is located to the east-northeast at a higher elevation to the Site (Figure 1), groundwater is expected to flow generally to the west-southwest (perpendicular to orientation of canal). When the canals are dry, groundwater beneath most of the Site is expected to continue to flow down the topographic gradient of the basalt surface (Figure 4). The estimated groundwater flow direction is shown on Figure 2.

4.2.4 Seasonal Water Level Variations

Groundwater is expected to rise during the irrigation season (March through October) when the canals are flowing and then decline when the canals are not used from November through February. Because the major source of recharge is canal water, it is probable that areas within the alluvium may dry out when the canals are not being used.

4.2.5 Groundwater Recharge

Groundwater recharge is the process involved in the addition of water to the zone of saturation. Due to the proliferation of seepage from irrigation canals and the dry climate in the area, the primary source of groundwater recharge is canal seepage with minor contributions from deep soil water drainage from sprinkler irrigated fields and precipitation.

4.2.6 Hydraulic Gradient

The hydraulic gradient is the slope of a water table or potentiometric surface. The hydraulic gradient influences the direction and rate of groundwater flow and is generally expressed at feet per foot (ft/ft). It is expected that during the irrigation season, the hydraulic gradients are greatest near the East Low Canal or other areas leaking water to the ground. Hydraulic gradients at the Site can be calculated after monitoring wells are constructed and groundwater elevations can be determined. In the interim, a rough estimate would be generally similar to the slope of the topography and the top of the basalt towards the southwest (Figure 4), from the East Low Canal across the Site, which is approximately 0.004 to 0.006 ft/ft.

4.2.7 Hydraulic Conductivity

Hydraulic conductivity is a measure of a rock or sediment's ability to transmit water in a specified direction. Assuming that the hydraulic conductivity is uniform in all directions, the hydraulic conductivity was estimated for saturated lithologies described on the geologic logs of water wells constructed in Section 17 (Appendix A). Of the wells that are completed in the uppermost portion of the alluvial aquifer, the aquifer formation is generally described as fine sand and silt overlying basalt. The alluvial aquifer formation should have a hydraulic conductivity ranging from 0.003 to 0.28 feet per day (Fetter, 1994).

4.2.8 Specific Yield and Specific Retention

The specific yield is the fractional amount of water that would drain freely from rocks or sediments due to gravity. The volume of the groundwater that is retained either as a film on grains or in small pore spaces after drainage is called specific retention. Specific retention increases with decreasing grain sizes. Based on the geologic logs for monitoring wells, the grain sizes of sediments in the unconfined aquifer are fine sand and silt. Specific yield for the fine sand and silt is expected to range from 0.18 to 0.21 and specific retention for the fine sand and silt is expected to range from 0.14 to 0.32 (Fetter, 1994).

4.2.9 Storage Coefficient or Storativity

The storage coefficient or storativity is the volume of water that a permeable unit will absorb or expel from storage per unit surface area per unit change in head, that quantity is dimensionless. As mentioned above, the aquifer at the Site is unconfined; for an unconfined aquifer, the storativity is

usually taken to be equal to the specific yield (Fetter, 1994). As mentioned previously, the specific yield (and storage coefficient) for the upper unconfined aquifer is estimated to range from 0.18 to 0.21 depending on the aquifer formation material.

4.2.10 Estimated or Effective Porosity

Estimated porosity is the ratio of voids in a rock or sediment to the total volume of material. It is a measure of the amount of groundwater that may be stored in the material. Estimated or effective porosity equals the sum of specific yield and specific retention of the aquifer material. For fine sand and silt, porosity is estimated to range from 0.35 to 0.50 (Fetter, 1994).

4.2.11 Transmissivity

Transmissivity is a measure of the amount of water that can be transmitted horizontally through a unit width by the full saturated thickness of the aquifer under a hydraulic gradient of one (Fetter, 1994). The transmissivity for groundwater at the Site is a product of the hydraulic conductivity and the saturated thickness of the aquifer and is expressed as gallons per day per foot (gal/day/ft). Based on the estimated saturated aquifer thickness of approximately ten feet and an average hydraulic conductivity ranging from 0.003 to 0.28 feet per day, transmissivity is estimated to be 0.03 to 2.8 gal/day/ft.

4.2.12 Calculated Groundwater Flow Velocity

The velocity of groundwater is a measurement of the rate of a volume of water through a cross sectional area of a porous medium. It provides a rough estimate of travel time for dissolved constituents to be transported through groundwater given no other variables (i.e., degradation, dispersion, etc.). For this study, groundwater velocity was calculated using Darcy's velocity equation: $v = (K \cdot i) / n$, where "K" is hydraulic conductivity; "i" is the horizontal hydraulic gradient; and "n" is the effective porosity. It is expressed as feet per day. Using the values above for each of the parameters resulted in an average velocity for the Site ranging from 10^{-5} to 10^{-3} feet per day or 0.015 to 1.5 feet per year.

4.2.13 Beneficial Use of Groundwater

A survey of local water wells was conducted by CES to determine the use of groundwater and evaluate its beneficial use in the vicinity. Records of all registered water wells within a one mile radius of the Site were obtained from the Ecology (Ecology, 2009). For this survey, CES researched Sections 7, 8, 9, 16, 17, 18, 19, 20, and 21 of Township 9 North, Range 29 East of the Willamette Meridian. Table 1 summarizes the water well construction, location, selected hydrogeologic data, and ownership information used for this report.

Figure 5 is a vicinity topographic map showing locations of nearby water wells. The water wells were numbered on Figure 5, Table 1, and on the well logs placed in Appendix A. Wells that could be located to the quarter/quarter section are identified with a circle, wells located only to a quarter section are indicated with a triangle, and wells only located to the section are shown with a square.

The survey identified 80 water wells in the search query. The majority of the wells are listed as domestic. A breakdown of the distribution of wells by type is as follows:

Type of Well	Number of Wells	Percentage of Total
Domestic	37	46%
Not Reported	14	18%
Test	12	15%
Irrigation	5	6%
Industrial	5	6%
Domestic/Irrigation	4	5%
Municipal	3	4%
Total	80	100%

A majority of wells are listed as domestic or “not reported”, meaning that the well report did not contain sufficient information to discern the use. There are 68 wells completed in the basalt aquifer, 6 wells (5 are test wells) completed in the alluvial aquifer, and 6 wells that did not have enough information recorded (not reported) to determine in which aquifer the well was completed. Based on the water well search, it appears that the alluvial aquifer does not serve beneficial uses due to low yields or inconsistent quantity of water.

There are no wells completed in the alluvial aquifer in the estimated downgradient direction (west-southwest) within one mile of the Site boundary. There are six wells completed in the basalt aquifer in the estimated downgradient direction within one mile of the Site boundary. All six wells are cased well into firm basalt and are not likely connected with the alluvial aquifer through soft, rotten, or fractured basalt.

5.0 GROUNDWATER QUALITY

Groundwater quality has not been monitored near the pivot or pond areas of the Site. A monitoring well network is proposed to adequately assess the quality of groundwater in the unconfined aquifer below the Site; details are provided in the section below.

6.0 PROPOSED MONITORING WELL NETWORK

Based on the analysis above, it is apparent that an unconfined aquifer exists at the Site. Groundwater monitoring is recommended to establish background conditions before land application commences. The following network of four groundwater monitoring wells to be installed in the shallow, alluvial aquifer is proposed.

Well	Hydrogeologic Position	Purpose of Monitoring Point
MW-1	Upgradient of the Pond	Monitors groundwater upgradient of the Pond
MW-2	Downgradient of the Pond	Monitors groundwater downgradient of the Pond
MW-3	Downgradient of Site and Pivot	Monitors groundwater downgradient of the Pivot
MW-4	Upgradient of Pivot	Monitors groundwater upgradient of the Pivot

Well locations are shown in Figure 2 are approximate and may vary laterally by 100 feet, depending on Site conditions (surface obstructions, etc.). In addition, based on a groundwater elevation survey, the actual hydrogeologic position and purpose may differ slightly from those proposed in this study. The suggested locations are based on estimated groundwater flow directions that may prove to be inconsistent.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are offered.

- There is an unconfined aquifer hosted by alluvium and fractured basalt at the Site.
- The depth to groundwater is expected to range from 21 to 32 feet bgs.
- Groundwater is estimated to flow west-southwest.
- Recharge to the unconfined aquifer is primarily from leakage from the canals and to a lesser extent from irrigation and precipitation.
- The unconfined aquifer is not known to be used in the area of the Site, presumably due to poor yields or inconsistent quantity of water.
- There are no wells completed in the alluvial aquifer within one mile downgradient of the Site boundary.
- Confined basalt aquifers occur below the unconfined aquifer. Confining aquitards consist of fine-grained sediments and/or firm, unfractured basalt.
- Groundwater in the confined basalt aquifers is likely to be isolated by aquitards from groundwater in the unconfined aquifer beneath the Site.
- There are six wells completed in the basalt aquifer within one mile downgradient of the Site boundary; all six wells are cased well into firm basalt and are not likely to be hydraulically connected with the alluvial aquifer.

A groundwater monitoring well network with four wells should be installed in the unconfined aquifer at the Site. The monitoring well locations and rationale are listed below.

Well	Hydrogeologic Position	Purpose of Monitoring Point
MW-1	Upgradient of the Pond	Monitors groundwater upgradient of the Pond
MW-2	Downgradient of the Pond	Monitors groundwater downgradient of the Pond
MW-3	Downgradient of Site and Pivot	Monitors groundwater downgradient of the Pivot
MW-4	Upgradient of Pivot	Monitors groundwater upgradient of the Pivot

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TABLE

Table 1. **Well Inventory Summary**

Table 1. Well Inventory Summary
REC Silicon, Inc., Moses Lake, Washington

Well Inventory Number ¹	Township, Range, Section Well I.D. Number	Owner	Well Completion Date	Well Location	Use ²	Yield ³	Total Well Depth feet	Casing feet, bgs ⁴	Screened Interval feet, bgs ⁴	Screened Aquifer	Static Water Level feet bgs
T19N R29E Section 7 - USGS 7.5 Minute Quadrangle - Wheeler, Washington, 1956											
1	19N/29E-7 App #4901	Eldon W. Burden Moses Lake, WA	6/29/1958	SE of NE of NE	NR	420 NR Pump	170	0 to 19 (10)	None	Basalt	36
2	19N/29E-7 App #4378	John R. Tregellas Moses Lake, WA	9/22/1956	N of SE of NE	NR	105 NR Pump	176	0 to 176 (8)	None	Basalt	46
3	19N/29E-7	Rocky Terry Grant County, WA	4/22/1992	NE of NW	D	40 NR Air	122	+1 to 23 (6)	None	Basalt	7
4	19N/29E-7	Roy Lewellen Grant County, WA	4/19/1992	NE of NW	D	126 NR Air	302	+1 to 19 (6)	None	Basalt	36
5	19N/29E-7 AGG 289	Paule Timozees PO Box 2321 Moses Lake, WA	9/21/2001	NE of NW	D	31 4 hr Pump	121	+1 to 24 (6)	None	Basalt	27.1
6	19N/29E-7 ACW 286	Scott Wiberg 4200 W Cove Crest Dr Moses Lake, WA	9/4/1998	NE of NW	D	50 2 hr Air	192	+1 to 21 (6)	None	Basalt	105
7	19N/29E-7 App #7513	Marvin L. Bertram 1034 W Oregon St Moses Lake, WA	3/2/1965	NE of SE	D/I	330 7 hr Pump	160	0 to 6 (8)	None	Basalt	44
8	19N/29E-7 App #QB-077 Permit #93-26003	Walter Wilson Rt 2 Box 71-K Moses Lake, WA	3/25/1987	NE of SE	I/R	70 NR Air	125	None	None	Basalt	35-40
9	19N/29E-7	Dave Hussey 522 Crestview Moses Lake, WA	9/28/1992	SE of SE	D	100 NR Air	62	+1 to 29 (6)	None	Basalt	23
10	19N/29E-7 App #7524 Permit #7080	David Craig Hussey Box 419 Star Route Moses Lake, WA	6/15/1965	SE of SE	I	NR	70	0 to 47 (10)	None	Basalt	NR
11	19N/29E-7 Permit #10253A	H.B. Gates 207 Sonny Lane Moses Lake, WA	3/28/1975	SE of SE	D/I	NR	55	NR	NR	NR	NR
12	19N/29E-7	Alton Chapel 4499 Rd L NE Moses Lake, WA	3/26/1990	NW of SW	D	40 NR Air	102	+1 to 83 (6)	None	Basalt	56
13	19N/29E-7 ACK 777	Al Chapel 4499 Rd L NE Moses Lake, WA	5/6/1997	NW of SW	D	40-50 2 hr Air	97	+1 to NR (6)	None	Basalt	NR
T19N R29E Section 8 - USGS 7.5 Minute Quadrangle - Wheeler, Washington, 1956											
14	19N/29E-8 ACK 800	AC Brower 4625 Rd M NE Moses Lake, WA	7/22/1997	E of W	D	50 2 hr Air	175	+1 to 19 (6) +1 to 83 (5 9/16)	70 to 83 Perforations 1/4" x 3"	Basalt	58
15	19N/29E-8 ACK 799	AC Brower 4625 Rd M NE Moses Lake, WA	7/21/1997	E of W	D	50 NR Air	58	+1 to 19 (6) +1 to 83 (5)	70 to 80 Perforations 1/4" x 3"	Basalt	55
16	19N/29E-8	Larry Campbell 4480 Rd N NE Moses Lake, WA	6/1/1993	NE of NE	D	18 0.5 hr Air	85	+1 to 35 (6)	None	Basalt	34
17	19N/29E-8	Rick Klinger 1212 Doolittle Moses Lake, WA	7/9/1983	SE of NE	D	NR	160	+1 to 39 (6)	None	Basalt	50
18	19N/29E-8	Lloyd Peterson	2/1/1988	NE of SE of NW	NR	NR	450	0 to 8 (8)	NR	Basalt	84
19	19N/29E-8 APB 418	Santos Villarreal FU 33 Othello, WA	5/21/2007	SW of NW	D	30-35 4 hr Air	340	+1 to 100 (6)	None	Basalt	95

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20	19N/29E-8	Edward H. Buchman Rt 2 Box 73 Grant County, WA	9/7/1979	SE	D	80 1.5 hr Bailer	70	0 to 38 (6)	None	Basalt	50
21	19N/29E-8	Alan D. Predochl 639 Pioneer Way Moses Lake, WA	2/13/1992	SE of SE	D	50 NR Air	162	+1.5 to 38.5 (6) 10 to 162 (4)	122 to 162 Perforations 1/8" x 12"	Basalt	20
22	19N/29E-8	Lloyd Goehri Moses Lake, WA	3/31/1986	E of SW of SE	D	NR	170	+1 to 19 (6)	None	Basalt	43
23	19N/29E-8 App #8120 Permit #7876	Lloyd Goehri Rte 2 Box 71C Moses Lake, WA	4/19/1967	E of SW	D/I	525 4 hr NR	273	0 to 37 (12)	NR	Basalt	57
24	19N/29E-8 App #10220 Permit #9757	Robert L. Oliver 710 E. Broadway Moses Lake, WA	9/16/1969	W of SW	I	600 4 hr NR	400	0 to 33 (12) 0 to 76 (15)	NR	Basalt	29
25	19N/29E-8 AKO 571	Bruce W. Bailey Moses Lake, WA	12/24/2004	SE of SW	D	80-90 2 hr Air	182	+1 to 19 (6)	None	Basalt	72
26	19N/29E-8	Len Landrie 12723 N Mayfair Spokane, WA	4/19/1984	SW of SW	D	15 NR Air	150	+1 to 19 (6) 5 to 150 (6)	90 to 150 Perforations 1/8" x 7"	Basalt	70
TI9N R29E Section 9 - USGS 7.5 Minute Quadrangle - Wheeler, Washington, 1956											
27	19N/29E-9 GWC 1780-A	Albert Peters Rt 1 Moses Lake, WA	6/28/1950	NR	NR	1200 NR NR	392	0 to 28 (18)	None	Basalt	NR
28	19N/29E-9 ATL 035	4S Land Co LP PO Box 1483 Moses Lake, WA	5/2/2000	SE of NE	I	NR	472	+1 to 35 (16) +1 to 240 (12)	None	Basalt	274
29	19N/29E-9 Permit #10587	Frank P. Shinn Jr.	1/5/1973	SE of NE	D/I	2550 4 hr NR	592	8 to 58 (18)	None	Basalt	167
30	19N/29E-9 GWC 851A	Frank Shinn	6/10/1950	NE of NW	NR	675 NR NR	637	0 to 53 (10)	NR	Basalt	250
31	19N/29E-9 Cert #1485-A	Greenview Water Association Inc. Rt 1 Moses Lake, WA	9/1952	NW of NW of NW	NR	26.5 NR Pump	302	0 to 17 (6)	NR	Basalt	160
32	19N/29E-9	National Food Corp	5/1/1991	SE of SW	R	NR/R	719	+1 to 346.5	None	NR	214
TI9N R29E Section 16 - USGS 7.5 Minute Quadrangle - Wheeler, Washington, 1956											
33	19N/29E-16 Permit #10709	Carnation Company Rt 2 Box 60C Moses Lake, WA	5/1/1969	NR	In	1600 NR Pump	659	0 to 112 (20)	None	Basalt	130
34	19N/29E-16 AIR 294	Joel Delarosa 9126 Rd H NW Ephrata, WA	10/24/2005	NE of NE	D	40 2 hr Air	55	+1 to 40 (6)	None	Alluvial	14
35	19N/29E-16	Dan Korkinen 4075 Rd E NW	8/24/1997	NW of NW	D	50 4 hr Air	190	+1 to 40 (6)	None	Basalt	18
36	19N/29E-16 Cert #2052-A	Wheeler Water Association, Inc. Moses Lake, WA	7/10/1953	SW of NW	NR	113 NR Pump	290	NR (6)	NR	Basalt	55
37	19N/29E-16 AFQ 497	William Walker 14928 4th St NE Moses Lake, WA	4/21/2001	S of SE	D	30 2 hr Air	102	+1 to 43 (6)	None	Basalt	35
38	19N/29E-16 ABM 493	Jose Grajeda 14929 4th Ave Wheeler, WA	6/27/1995	NE of SE	D	70 2 hr Air	66	+2 to 25	None	Basalt	26

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39	19N/29E-16	Nestle USA 14124 Wheeler Rd NE Moses Lake, WA	NR	NW of SE	In	NR	NR	NR	NR	NR	NR
40	19N/29E-16 Cert #569-D	Northern Pacific Railway Smith Tower Seattle, WA	1910	SE of SE	NR	50 NR Pump	NR	0 to 58 (10)	NR	NR	130
41	19N/29E-16 AHJ 863	Domingo Rocha 14873 3rd St Moses Lake, WA	5/7/2004	SE of SE	D	45 2 Air	82	+1 to 52 (6) 47 to 80 (5 5/8)	50 to 80 Perforations 1/4" x 2"	Basalt	38
42	19N/29E-16 ALR 370	Mania Farias Moses Lake, WA	7/13/2005	SE of SE	D	30-40 2 hr Air	80	+ 1 to 33 (6)	None	Basalt	30
43	19N/29E-16 AIL 371	Melecio Cerna Moses Lake, WA	7/14/2005	SW of SE	D	30 2 hr Air	90	+1 to 39 (6) 30 to 90 (5 5/8)	NR	Basalt	26
44	19N/29E-16	Jessie Shannon Rt 2 Box 81 Moses Lake, WA	12/18/1985	SW of SE	D	25 NR Air	75	+ 1 to 27 (6)	None	Basalt	50
45	19N/29E-16	National Frozen Foods Corp 14406 Rd 3 NE Moses Lake, WA	NR	SE of SW	NR	NR	719	346.5 (12)	NR	NR	NR
46	19N/29E-16 Permit #7021	Pronto Foods, Inc. Moses Lake, WA	9/25/1965	SW of SW	In	1400 5 hr NR	670	0 to 75.5 (16)	NR	Basalt	55
47	19N/29E-16 Permit #7827	Western Farms Association Moses Lake, WA	5/26/1967	SW of SW	Mu	1500 2 hr Pump	720	+2 to 79 (16) 502 to 573 (12)	521 to 571 Perforations 1/4" x 4"	Basalt	124.6
48	19N/29E-16 Permit #7829	Terminal Ice & Cold Storage Co. 514 Pittock Block Portland, OR	5/25/1967	SW of SW	In	421 3.5 hr Air Pump	495	0 to 30 (15) 0 to 73.5 (12)	NR	Basalt	116
49	19N/29E-16	Amerigold PO Box 399 Moses Lake, WA	NR	SW of SW	In	NR	NR	NR	NR	NR	NR
<i>T19N R29E Section 17 - USGS 7.5 Minute Quadrangle - Wheeler, Washington, 1956</i>											
50	19N/29E-17	Union Carbide PO Box 1667 Moses Lake, WA	6/18/1990	NR	T	6 1/3 hr Air	40	+2 to 2 (6) +2 to 39 (4)	NR	Basalt	20
51	19N/29E-17	Union Carbide PO Box 1667 Moses Lake, WA	6/18/1990	NR	T	3 1/3 hr Air	41	+2 to 2 (6) +2 to 39 (4)	20 to 39 Perforations 1/8" x 3"	Basalt	30
52	19N/29E-17	Union Carbide PO Box 1667 Moses Lake, WA	6/18/1990	NR	T	10 1/3 hr Air	41	+2.5 to 2 (6) +2 to 41 (4)	NR	Basalt	21
53	19N/29E-17	Union Carbide PO Box 1667 Moses Lake, WA	6/18/1990	NR	T	2 1/3 hr Air	50	+2.5 to 2 (6) +2 to 50 (4)	NR	Basalt	50
54	19N/29E-17 App #4890	Anthony Mandery 6551 50th NE Seattle, WA	10/10/1958	NW	NR	1350 4 hr Pump	417	0 to 7 (12)	NR	Basalt	55
55	19N/29E-17	Gary & Linda Kindopp 4308 Joann Dr Moses Lake, WA	8/20/1992	NE of NE	D	200 NR NR	170	+1 to 35 (8)	None	Basalt	8

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56	19N/29E-17	Megan Fielding 13952 Rd 4 NE Moses Lake, WA	2/14/1992	NE of NE	D	75 NR Air	82	+2.5 to 37.5 (6) 15 to 82 (4)	42 to 82 Perforations 1/8" x 12"	Basalt	16
57	19N/29E-17 ACX 192	ASIMI 3322 Rd N NE Moses Lake, WA	10/30/1997	SE of NE	T	60 1 hr Air	181	+2 to 41 (6)	None	Alluvial	32
58	19N/29E-17 ACX 192	ASIMI 3322 Rd N NE Moses Lake, WA	10/30/1997	SE of NE	T	60 1 hr Air	187	+2 to 43 (6)	None	Basalt	32
59	19N/29E-17	Union Carbide Moses Lake, WA	11/5/1984	SE	T	25 2.5 hr Pump	40	+2 to 20 (4)	NR	Basalt	18
60	19N/29E-17	Union Carbide Moses Lake, WA	11/6/1984	SE	T	5 1 hr Pump	40	+2 to 20 (4)	NR	Basalt	18
61	19N/29E-17 ALT 467	Grant Co #5 Moses Lake, WA	8/18/2007	NE of SE	D	50-60 NR Air	156	+3 to 55 (6)	None	Basalt	31
62	19N/29E-17 APF 060	Moses Lake Silicon Facility 3322 Road N NE Moses Lake, WA	7/23/2007	NE of SE	T	NR	42.5	0 to 31.5 (2)	31.5 to 42.5 2"	Alluvial	NR
63	19N/29E-17 APF 059	Moses Lake Silicon Facility 3322 Road N NE Moses Lake, WA	7/27/2007	NE of SE	T	NR	40	0 to 29 (2)	29 to 40 2"	Alluvial	NR
64	19N/29E-17 BAT 506	Moses Lake Silicon Facility 3322 Road N NE Moses Lake, WA	10/2/2007	NE of SE	T	NR	44	0 to 33 (2)	33 to 44 2"	Alluvial	NR
65	19N/29E-17 BAT 505	Moses Lake Silicon Facility 3322 Road N NE Moses Lake, WA	10/1/2007	NE of SE	T	NR	39	0 to 28 (2)	38 to 39 2"	Alluvial	NR
<i>T19N R29E Section 18 - USGS 7.5 Minute Quadrangle - Wheeler, Washington, 1956</i>											
66	19N/29E-18	Spencer Jones Rt 2 Box 153 Moses Lake, WA	5/13/1978	NE of NW	D	60 1.5 hr Bailer	65	0 to 53 (6)	None	Basalt	30
67	19N/29E-18 SC #6209	Tren Jones Astro Enterprises Rt 2 Box 159A Moses Lake, WA	11/7/1988	NE of NW	D	40 NR Air	95	+1 to 64 (6)	None	Basalt	39
<i>T19N R29E Section 20 - USGS 7.5 Minute Quadrangle - Wheeler, Washington, 1956 and Sieler, Washington 1956 (Photorevised 1978)</i>											
68	19N/29E-20 Permit #2570 Well #1	Utah-Idaho Sugar Co. Salt Lake City, UT	3/19/1953	W of E	NR	1416 NR Pump	1030	0 to 19.42 (26) 0 to 79.33 (20)	NR	Basalt	125
69	19N/29E-20 Permit #2570 Well #3	Utah-Idaho Sugar Co. Salt Lake City, UT	4/12/1954	W of E	NR	900 NR Pump	720	0 to 90 (18)	NR	Basalt	110
70	19N/29E-20 Permit #2570 Well #3	Utah-Idaho Sugar Co. Salt Lake City, UT	9/15/1955	W of E	NR	895 NR Pump	910	0 to 67.33 (24) 0 to 98.75 (18) 591 to 694 (10)	NR	Basalt	107
71	19N/29E-20 ABP 647	Pacifex 13583 Wheeler Rd NE Grant County	11/16/1994	NW of NE	D	25 4 hr Air	220	+1 to 40 (6)	None	Basalt	40
72	19N/29E-20 AAN 874	City of Moses Lake PO Box 579 Moses Lake, WA	12/23/2003	NW of NW	Mu	2200 8 hr Air	525	+1 to 44 (24) +1 to 280 (16)	None	Basalt	51
73	19N/29E-20 AHP 781	Central Leasing of Washington PO Box 850 Moses Lake, WA	11/14/2004	NW of SE	I	300 1 hr Air	584	+1 to 79 (20)	None	Basalt	40

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Well Inventory Number ¹	Township, Range, Section Well I.D. Number	Owner	Well Completion Date	Well Location	Use ²	Yield ³	Total Well Depth feet	Casing feet, bgs ⁴	Screened Interval feet, bgs ⁴	Screened Aquifer	Static Water Level feet bgs
<i>T19N R29E Section 21 - USGS 7.5 Minute Quadrangle - Wheeler, Washington, 1956 and Sieler, Washington 1956 (Photorevised 1978)</i>											
74	19N/29E-21	Eka Nobel, Ron Stevenson 2701 Rd N NE Moses Lake, WA	12/11/1992	NW	D	75 NR Air	43	+1 to 42 (6)	None	Basalt	20
75	19N/29E-21	Merle Hardy Rt 2 280 RD NE Wheeler, WA	7/5/1988	NW of NW	D	40 1 hr Air	100	+1 to 19 (6)	None	Basalt	35
76	19N/29E-21 ALT 402	Glen & Janet McCloud 90 Hendricks Ln Othello, WA	11/17/2005	SW of NW	D	20 2 hr Air	162	+1 to 34 (6)	None	Basalt	6
77	19N/29E-21	Sun Harvest Inc 15250 NE 95th Redmond, WA	6/12/1990	SE of SE	D	70 NR Air	177	+1 to 19 (6)	None	Basalt	17
78	19N/29E-21	George Pollak Rd 2 NE Moses Lake, WA	8/18/1993	SE of SE	D	90 NR Artesian	202	+2 to 38 (6)	None	Basalt	0
79	19N/29E-21 ACU 268	Larry Campbell 4480 Rd N NE Moses Lake, WA	8/27/1998	SW of SE	D	40 2 hr Air	300	+1 to 39 (6)	None	Basalt	239
80	19N/29E-21 726	Moses Lake Moses Lake, WA	2/26/1994	NW of SW	Mu	3000 24 Pump	1240	0 to 44 (20) 0 to 686 (16)	None	Basalt	185

NOTES:

All information based on original Washington Department of Ecology well log data (Ecology, 2009). Field verification of location and current use status were not made.

Abbreviations: App # = application number, ID # = unique well identification number, bgs = below ground surface, NA = not applicable, NR = not reported,

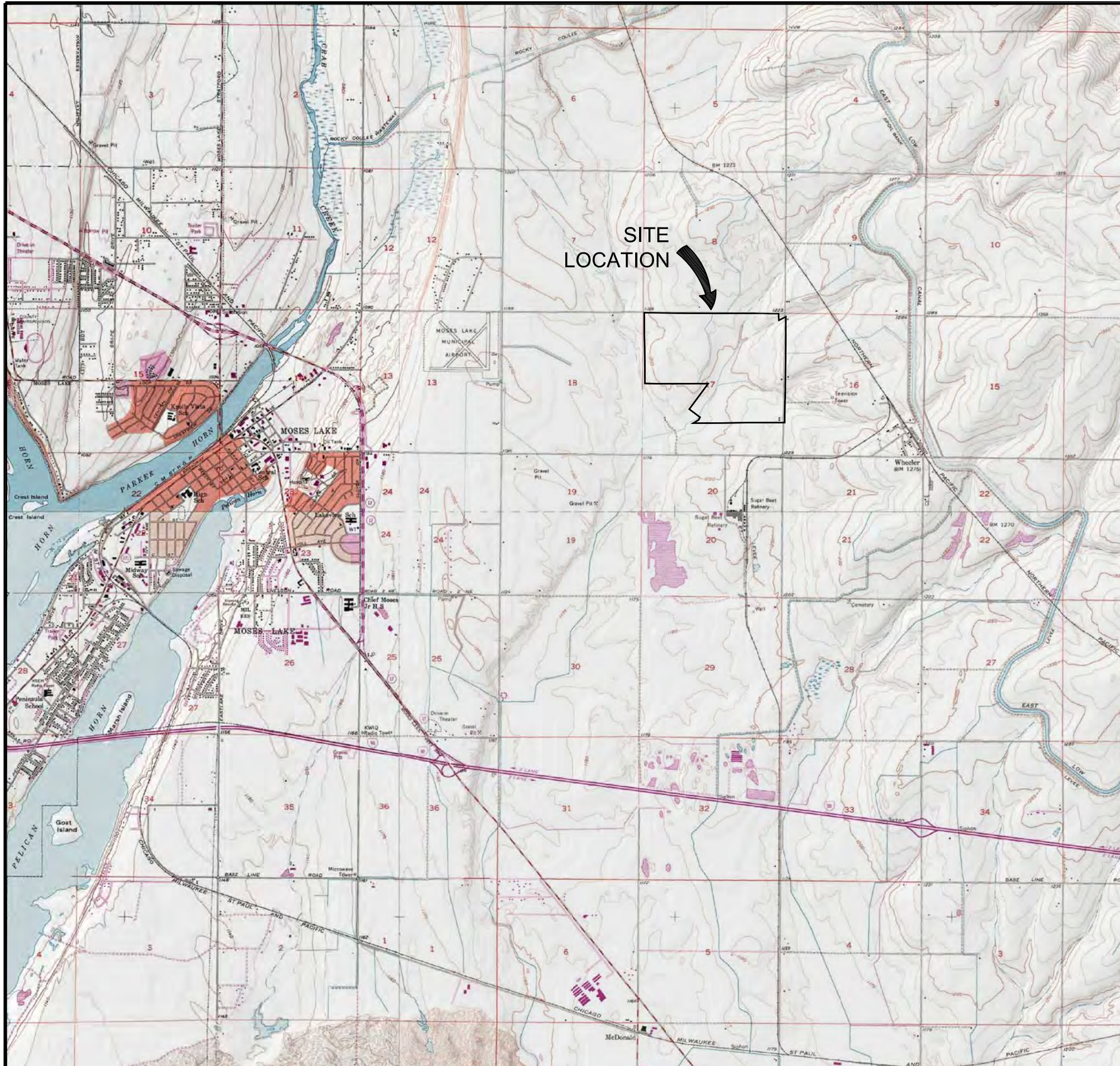
TBD = to be determined.

1 Well inventory numbers assigned for the purpose of this report and correspond to text and or figure references within this report.

2 A = abandoned, D = domestic, I = irrigation, In = industrial, MU = municipal, O = other (stock), R = recondition (e.g., deepening), T = test well.

3 Yield information is presented in sequence as follows: gallons per minute, test duration, and test method (e.g., "Air").

4 Casing length (e.g., "0 to 107") with diameter (e.g., "(2)") reported in inches.



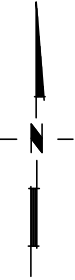
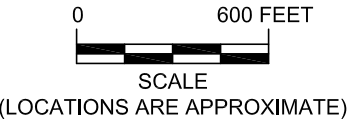
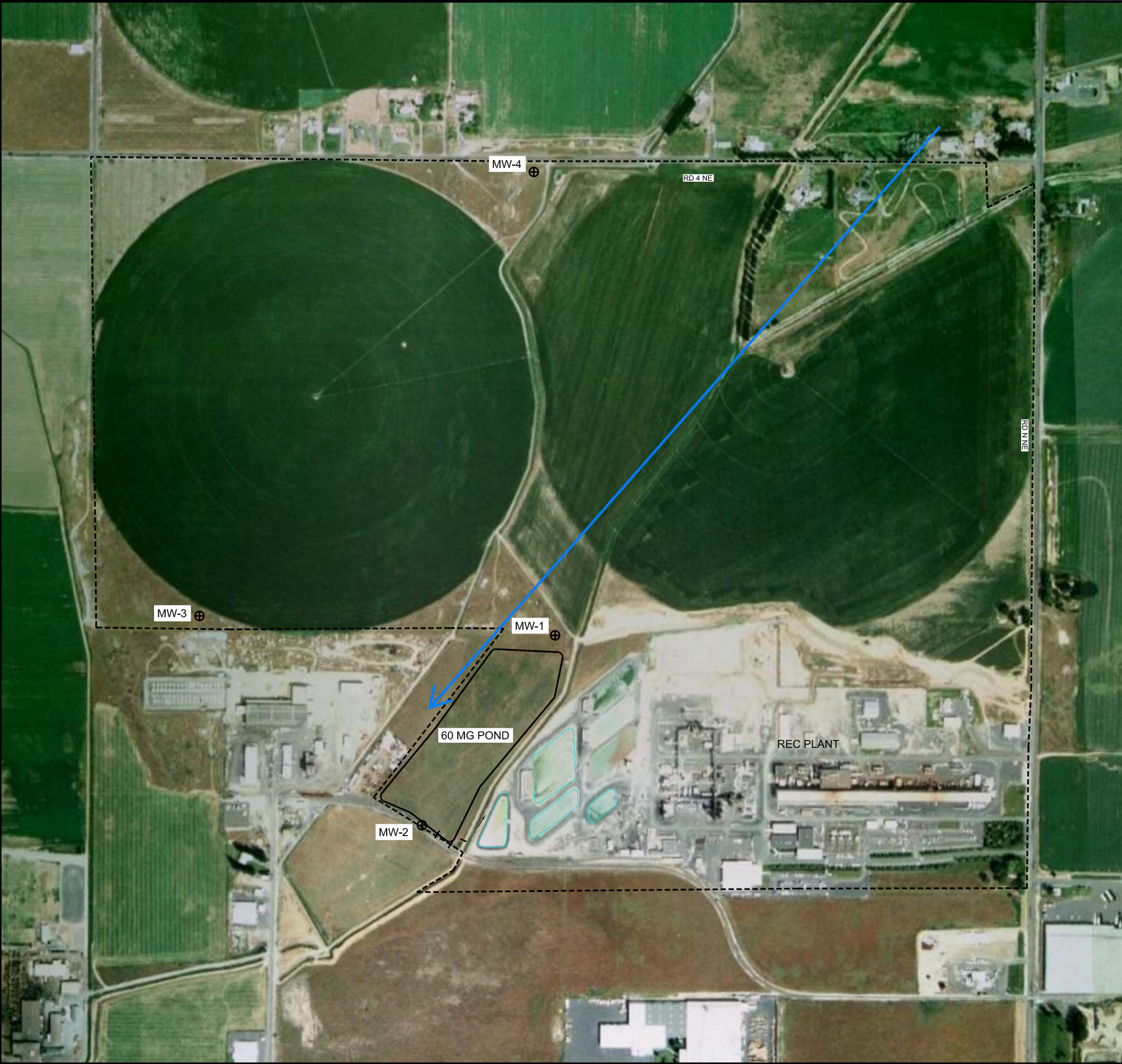
0 4000 FEET
SCALE
(LOCATIONS ARE APPROXIMATE)

(SOURCE: USGS 7.5 Minute Topographic Maps of Oregon on CD-ROM, TOPO! Software ©2006 NGHT, Inc.)



Figure 1. Site Location Map

PROJECT NUMBER: 2922008	REC Solar Grade Silicon, LLC
DATE: 7/28/09	
DWG BY: 3kac	Grant County Moses Lake, Washington T4N, R29E, Section 17
DWG NO: 2922008F1.F2.F5.dwg	
PROJECT MANAGER: 3DRW	CES CASCADE EARTH SCIENCES A Valmont Industries Company
REVISED:	



(SOURCE: Google Earth Pro, Image July 18, 2006
©2008 Google™)

EXPLANATION





-  MW-5 Proposed Monitoring Well Location
-  Estimated Groundwater Flow Direction
-  Site Boundary

Figure 2. Site Detail

PROJECT NUMBER: 2922008		REC Solar Grade Silicon, LLC
DATE: 7/28/09		
DWG BY: 3kac	DWG NO: 2922008F1.F2.F5.dwg	Grant County Moses Lake, Washington T4N, R29E, Section 17
PROJECT MANAGER: 3DRW		
REVISED:		 CASCAD EARTH SCIENCES A Valmont Industries Company

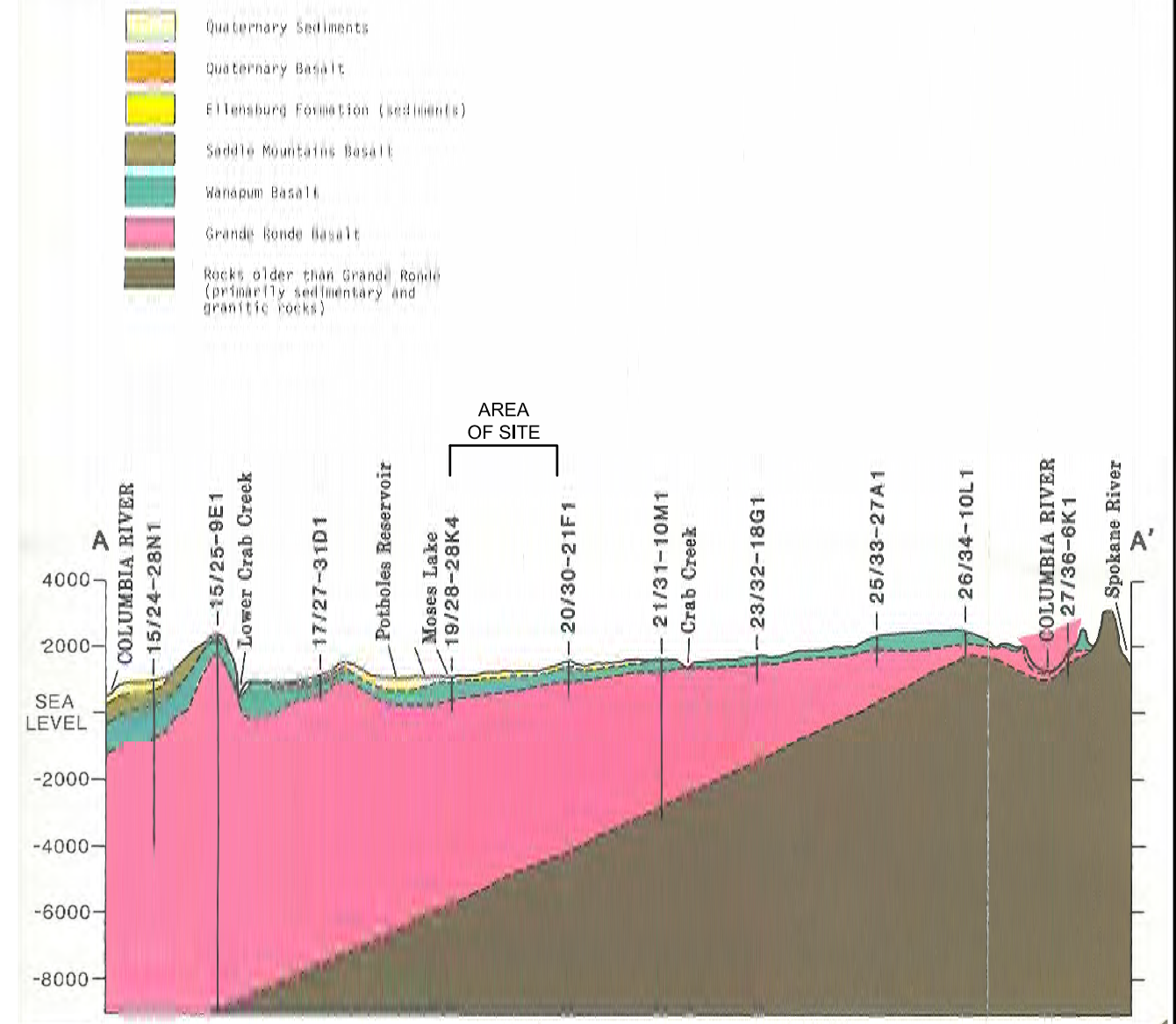
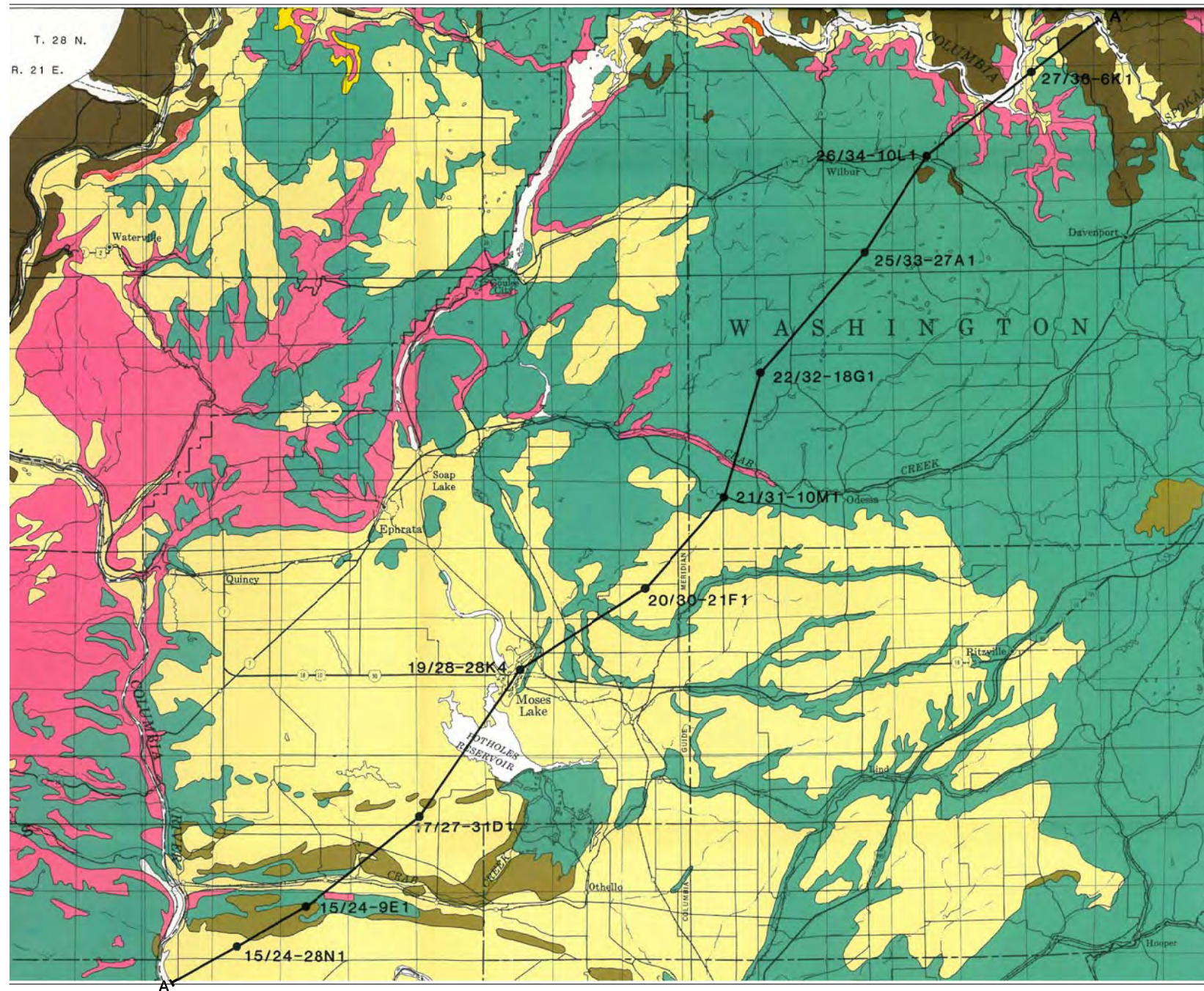



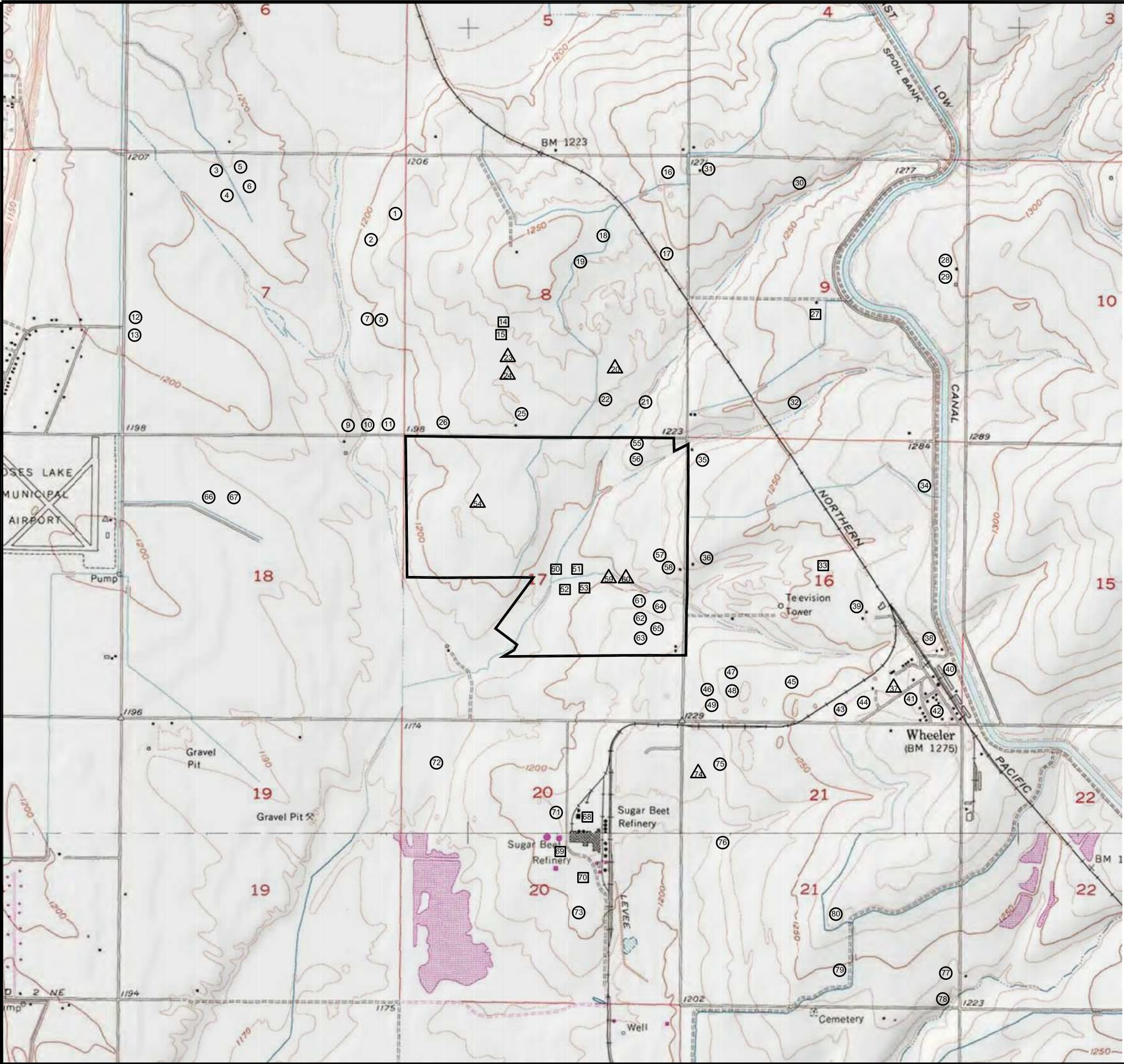
Figure 4. Geologic Cross-Section

0 25 MILES
SCALE
(LOCATIONS ARE APPROXIMATE)



(SOURCE: *Surficial Geology, Structure, and Thickness of Selected Geohydrologic Units in the Columbia Plateau, Washington*; Drost and Whiteman, 1986, State of Washington Department of Ecology, Department of the Interior, United States Geological Survey)

PROJECT NUMBER: 2922008	REC Solar Grade Silicon, LLC
DATE: 7/28/09	
DWG BY: 3kac	Grant County Moses Lake, Washington T4N, R29E, Section 17
PROJECT MANAGER: 3DRW	
REVISED:	 CASCADE EARTH SCIENCES A Valmont Industries Company




0 2000 FEET
SCALE
(LOCATIONS ARE APPROXIMATE)

(SOURCE: USGS 7.5 Minute Topographic Maps of Oregon on CD-ROM, TOPO! Software ©2006 NGHT, Inc.)

EXPLANATION

- Well Location to 1/4 - 1/4 of Section
- Well Location to 1/4 Section
- Well Location to Section
- Site Boundary

Figure 5. Registered Water Wells within 1 Mile of Site

PROJECT NUMBER: 2922008	REC Solar Grade Silicon, LLC
DATE: 7/28/09	
DWG BY: 3kac	Grant County Moses Lake, Washington T4N, R29E, Section 17
PROJECT MANAGER: 3DRW	
REVISED:	 CASCAD EARTH SCIENCES A Valmont Industries Company

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
AND DEVELOPMENT

WELL LOG

No. Appli. #4901

Date 9-28, 1959

Record by well driller

Source driller's record

Location: State of WASHINGTON

County Grant

Area

Map

SE 1/4 NE 1/4 sec 7 T19 N. R. 29 E

Diagram of Section

Drilling Co. Freer Drilling Co.

Address Noses Lake, Wash.

Method of Drilling

Date 6-29, 1958

Owner Eldon W. Burden

Address Noses Lake, Wash.

Land surface, datum 2 ft. above
below

CORRE- LATION	MATERIAL	THICKNESS (feet)	DEPTH (feet)
------------------	----------	---------------------	-----------------

(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)

	Top soil	2	2
	Basalt weathered	17	19
	" black	16	35
	" black porous w/b	6	41
	" black	11	52
	" gray - hard	50	102
	" black	12	114
	" brown-porous with clay seamd w/b	39	153
	" black	17	170
	PUMP TEST:		
	Dim. 170"x10"		
	SWL: 36 ft.		
	Yield: 420 g.p.m.		
	Type & size of pump: Turbine		
	" " " " engine: gas		
	CASING:		
	10" diam. from 0 to 19 ft.		

Turn up

Sheet 1 of 1 sheets

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
AND DEVELOPMENT

WELL LOG

No. Appli. 4378

Date Sep. 22, 1956

Record by well driller

Source driller's record

Location: State of WASHINGTON

County Grant

Area

Map

N 1/2 SE 1/4 NE 1/4 sec. 7 T. 19N. R. 29 E.

Diagram of Section

Drilling Co. W. B. Frear

Address Moses Lake, Wash.

Method of Drilling Date Sept. 1956

Owner John R. Tregellas

Address Moses Lake, Wash.

Land surface, datum 12.2 ft. above
below

CORRE- LATION	MATERIAL	THICKNESS (feet)	DEPTH (feet)
------------------	----------	---------------------	-----------------

(Transcribe driller's terminology literally but paraphrase as necessary. In parentheses, if material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)

Soil	2	2
Lava	75	77
Hard gray basalt	99	176

PUMP TEST:

Diam. 176"x8"

SWL: 46 ft.

DD: 104 ft.

Yield: 105 g.p.m.

CASING: 8" diam. from 0 to 176

77 ft. of 8" casing, 8" shoe

Turn up

Sheet of sheets

File Original and First Copy with
Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. _____

Water Right Permit No. _____

(1) OWNER: Name Rocky Terry Address _____

(2) LOCATION OF WELL: County Grant NE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec 7 T. 19 N. R. 29 W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) _____

(3) PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐
☐ Irrigation ☐ Test Well ☐ Other ☐
☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) _____

Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well _____ inches.
Drilled _____ feet. Depth of completed well _____ ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from 1 ft. to 23 ft.
Welded ☐ " Diam. from _____ ft. to _____ ft.
Liner installed ☐ " Diam. from _____ ft. to _____ ft.
Threaded ☐ " Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒

Type of perforator used _____

Size of perforations _____ in. by _____ in.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____

Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.

Material used in seal Bentonite

Did any strata contain unusable water? Yes ☐ No ☐

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

(7) PUMP: Manufacturer's Name Red Jacket

Type: Sub. H.P. 1

(8) WATER LEVELS: Land-surface elevation above mean sea level 1070 ft.

Static level 7 ft. below top of well Date 4-22-92

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

" " " "

" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time Water Level Time Water Level Time Water Level

40 GPM.

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.

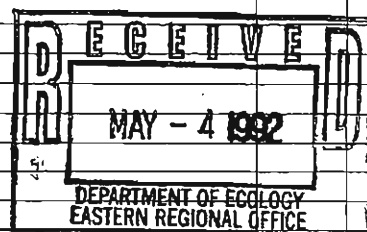
Artesian flow _____ g.p.m. Date _____

Temperature of water 58 Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Dirt & Boulders.	0	8
Basalt soft Brown.	8	16
Basalt Black	16	17
Basalt Brown.	17	23
Basalt Grey	23	39
Basalt Black.	39	47
Basalt Grey	47	101
Basalt Black Green		
Red w yellow shale.	101	120
Basalt Grey	120	122



Work started 4-22-92 Completed 4-22-92

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Jim Shivers (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address MOSES Lake.

(Signed) Jim Shivers License No. 469 (WELL DRILLER)

Contractor's Registration No. JOY DRILLING CO Date 4-22-92, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

File Original and First Copy with
Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 4

Water Right Permit No. _____

(1) OWNER: Name Roy Lowellen Address _____

(2) LOCATION OF WELL: County Grant NE 1/4 NW 1/4 Sec 7 T. 19 N. R. 29 W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) _____

(3) PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐
☐ Irrigation ☐ Test Well ☐ Other ☐
☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
 Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐
 Deepened ☐ Cable ☐ Driven ☐
 Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well _____ inches.
 Drilled _____ feet. Depth of completed well _____ ft.

(6) CONSTRUCTION DETAILS: Shoe
 Casing installed: 6" Diam. from 11 ft. to 19 ft.
 Welded ☐ _____ Diam. from _____ ft. to _____ ft.
 Liner installed ☐ _____ Diam. from _____ ft. to _____ ft.
 Threaded ☐ _____ Diam. from _____ ft. to _____ ft.
 Perforations: Yes ☐ No ☒
 Type of perforator used _____
 SIZE of perforations _____ in. by _____ in.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.
 Screens: Yes ☐ No ☒
 Manufacturer's Name _____
 Type _____ Model No. _____
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.
 Gravel packed: Yes ☐ No ☒ Size of gravel _____
 Gravel placed from _____ ft. to _____ ft.
 Surface seal: Yes ☒ No ☐ To what depth? 19 ft.
 Material used in seal Grout
 Did any strata contain unusable water? Yes ☐ No ☐
 Type of water? _____ Depth of strata _____
 Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
 Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
 Static level 36 ft. below top of well Date 4-21-92
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
 Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
 Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
 " 126 gpm " " "
 " " " " "
 Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

 Date of test _____
 Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
 Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.
 Artesian flow _____ g.p.m. Date _____
 Temperature of water 61 Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION
 Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Dirt & Boulders	0	6
Gravel	6	8
Basalt soft brown.	8	17
Basalt black.	17	32
Basalt soft black.	32	34
Basalt grey	34	90
Basalt brown.	90	101
Basalt black.	101	128
Basalt black & brown.	128	135
Basalt black	135	145
Basalt brown	145	149
Basalt grey hard	149	188
Basalt brown.	188	189
Basalt grey soft	189	238
Basalt grey hard.	238	285
Basalt black H2O	285	288
Basalt grey	288	302

Work started 4-19-92, 19. Completed 4-20-92, 19.

WELL CONSTRUCTOR CERTIFICATION:
 I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Joy Drilling Co (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
 Address Moses Lake wa.
 (Signed) Jim Shaw License No. 469
 Contractor's (WELL DRILLER)
 Registration
 No. Jay DRC 13704 Date 4-21-92, 19.

(USE ADDITIONAL SHEETS IF NECESSARY)

File Original with
Department of Ecology
Second Copy - Owner's Copy
Third Copy - Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Notice of Intent

UNIQUE WELL ID #

Water Right Permit No

(1) OWNER Name Paul Timozes Address Box 2321 Moses Lake WA 988

(2) LOCATION OF WELL County Grant NE 1/4 NW 1/4 Sec 7 T. 19 N R 24 E WM

(2a) STREET ADDRESS OF WELL (or nearest address)

TAX PARCEL NO

(3) PROPOSED USE ☒ Domestic ☐ Industrial ☐ Municipal
☐ Irrigation ☐ Test Well ☐ Other
☐ DeWater

(4) TYPE OF WORK Owner's number of well (if more than one) 1
☒ New Well Method ☐ Dug ☐ Bored
☐ Deepened ☐ Cable ☐ Driven
☐ Reconditioned ☒ Rotary ☐ Jetted
☐ Decommission

(5) DIMENSIONS Diameter of well 6 inches
Drilled 121 feet Depth of completed well 121 ft

CONSTRUCTION DETAILS

Casing Installed

☐ Welded

☐ Liner installed

☐ Threaded

Diam from 11 ft to 24 ft

Diam from _____ ft to _____ ft

Diam from _____ ft to _____ ft

Perforations

☐ Yes ☒ No

Type of perforator used

SIZE of perforations _____ in by _____ in
_____ perforations from _____ ft to _____ ft

Screens

☐ Yes ☒ No ☐ K-Pac Location

Manufacturer's Name

Type _____ Model No _____

Diam _____ Slot Size _____ from _____ ft to _____ ft

Diam _____ Slot Size _____ from _____ ft to _____ ft

Gravel/Filter packed ☐ Yes ☒ No ☐ Size of gravel/sand

Material placed from _____ ft to _____ ft

Surface seal ☒ Yes ☐ No To what depth? 18 ft. ft

Material used in seal Grout

Did any strata contain unusable water? ☒ Yes ☐ No

Type of water? Surface Depth of strata 17-24

Method of sealing strata off Casing & Cement

(7) PUMP Manufacturer's Name Ger motor

Type 5-10 HP 1 1/2

(8) WATER LEVELS Land-surface elevation above mean sea level _____ ft

Static level 27.1 ft below top of well Date _____

Artesian pressure _____ lbs per square inch Date _____

Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS Drawdown is amount water level is lowered below static level

Was a pump test made? ☒ Yes ☐ No If yes, by whom? Joy Drilling

Yield 31 gal/min with 12.2 ft drawdown after 4 hrs

Yield _____ gal/min with _____ ft drawdown after _____ hrs

Yield _____ gal/min with _____ ft drawdown after _____ hrs

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time _____ Water Level _____ Time _____ Water Level _____ Time _____ Water Level _____

Time _____ Water Level _____ Time _____ Water Level _____ Time _____ Water Level _____

Time _____ Water Level _____ Time _____ Water Level _____ Time _____ Water Level _____

Time _____ Water Level _____ Time _____ Water Level _____ Time _____ Water Level _____

Date of test 8-28-01

Bailer test _____ gal/min with _____ ft drawdown after _____ hrs

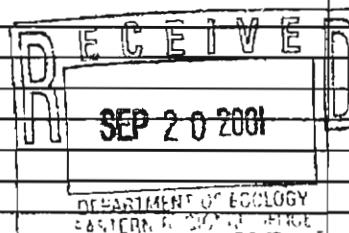
Artesian 75- gal/min with _____ ft drawdown after 2 hrs

Artesian flow _____ gpm Date _____

Temperature of water 60 Was a chemical analysis made? ☒ Yes ☐ No

(10) WELL LOG or DECOMMISSIONING PROCEDURE DESCRIPTION
Formation Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. Indicate all water encountered

MATERIAL	FROM	TO
<u>Drill</u>	<u>0</u>	<u>2</u>
<u>Gravel in Green shale</u>	<u>2</u>	<u>12</u>
<u>Gravel in Sand</u>	<u>12</u>	<u>17</u>
<u>Basalt Brown</u>	<u>17</u>	<u>24</u>
<u>Basalt Gray</u>	<u>24</u>	<u>104</u>
<u>Basalt Brown H2O</u>	<u>104</u>	<u>121</u>



Work Started 9 20 01 Completed 9 21-01

WELL CONSTRUCTION CERTIFICATION

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Type or Print Name Tim Stice License No 0469
(Licensed Driller/Engineer)

Tramee Name _____ License No _____

Drilling Company Joy Drilling Co

(Signed) Tim Stice License No 0469
(Licensed Driller/Engineer)

Address Moses Lake WA

Contractor's

Registration No Joy DR13701 Date 8-28-01

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (360) 407-6600. The TDD number is (360) 407-6006.

File Original and First Copy with
Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No.

UNIQUE WELL I.D. # ACW 286

Water Right Permit No.

OWNER: Name Scott Weberg

Address 4200 W Cove West Dr. Moses Lake

(2) LOCATION OF WELL: County Grant

NE 1/4 19W 1/4 Sec 7 T. 19 N. R. 29E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address)

(3) PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐
☐ Irrigation ☐ Test Well ☐ Other ☐
☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) 1
Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well _____ inches.
Drilled _____ feet. Depth of completed well _____ ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 Diam. from 11 ft. to 21 ft.
Welded ☐ Diam. from _____ ft. to _____ ft.
Liner installed ☐ Threaded ☐ Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒

Type of perforator used _____

Size of perforations _____ in. by _____ in.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____

Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 7.5 ft. ft.

Material used in seal Bertha Cement

Did any strata contain unusable water? Yes ☒ No ☐

Type of water? Surface Depth of strata 10 ft.

Method of sealing strata off Casing cemented

(7) PUMP: Manufacturer's Name Ger motor
Type: Sub H.P. 1/2 hp.

(8) WATER LEVELS: Land surface elevation above mean sea level 1060 ft.

Static level 105 ft. ft. below top of well Date 9-4-98

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____

Yield: 50 gal./min. with _____ ft. drawdown after _____ hrs.

" " " "

" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time Water Level Time Water Level Time Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 50 gal./min. with stem set at 185 ft. for 2 hrs.

Artesian flow _____ g.p.m. Date _____

Temperature of water 60 Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Dirt	0	10
Gravel	10	13
Clay	13	18
Basalt clay	18	21
Basalt Gravel	21	42
Basalt Black	42	61
Basalt Grey	61	106
Basalt Brown	106	111
Basalt Black	111	155
Basalt Brown	155	167
Basalt Grey	167	185
Basalt Black H ₂ O	185	192

SEP 23 1998

Work Started 9-2-98 19. Completed 9-8-98 19

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Joy Drilling Co (PERSON, FIRM OR CORPORATION) (TYPE OR PRINT)

Address Moses Lake WA

(Signed) Jim Steiner License No. 0469 (WELL DRILLER)

Contractor's Registration No. Joy DRG137014 Date 9-5-98 19

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

⑦

Sheet _____ of _____ sheets

File Original and First Copy with
Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No. OB-077Permit No. 93-26003(1) OWNER: Name Walter Wilson Address Route 2, Box 71-K, Moses Lake, WA 98837

LOCATION OF WELL: County GRANT — NE $\frac{1}{4}$ SE $\frac{1}{4}$ Sec 7 T. 19 N. R. 29E W.M.
Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☒ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well
(if more than one) ...
New well ☐ Method: Dug ☐ Bored ☐
Deepened ☒ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 55 ft. Depth of completed well 125 ft.

(6) CONSTRUCTION DETAILS: NONE

Casing installed: " Diam. from " ft. to " ft.
Threaded ☐ " Diam. from " ft. to " ft.
Welded ☐ " Diam. from " ft. to " ft.

Perforations: Yes ☐ No ☒
Type of perforator used ...
SIZE of perforations " in. by " in.
perforations from " ft. to " ft.
perforations from " ft. to " ft.
perforations from " ft. to " ft.

Screens: Yes ☐ No ☒
Manufacturer's Name ...
Type ... Model No ...
Diam. Slot size from " ft. to " ft.
Diam. Slot size from " ft. to " ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: ...
Gravel placed from " ft. to " ft.

Surface seal: Yes ☐ No ☒ To what depth? " ft.
Material used in seal ...
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? ... Depth of strata ...
Method of sealing strata off ...

(7) PUMP: Manufacturer's Name ...
Type: ... H.P.

(8) WATER LEVELS: Land-surface elevation ... ft.
Static level 35-40 ft. below top of well Date 3/25/87
Artesian pressure ... lbs. per square inch Date ...
Artesian water is controlled by ... (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom? ...
Yield: 70 gal./min. with " ft. drawdown after " hrs.
" ESTIMATED AIRLIFT " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test ...
Bailer test ... gal./min. with " ft. drawdown after " hrs.
Artesian flow ... g.p.m. Date ...
Temperature of water ... Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Basalt, black & brown, broken w/tan caliche	70	110

MATERIAL	FROM	TO
Basalt, black, broken w/water	110	125

NO PVC Liner Installed
NO Drive shoe utilized

NOTE: REVISED WELL LOG WITH
PERMIT NUMBER

RECEIVED

MAY 18 1987

Work started 3/24, 1987 Completed 3/25, 1987

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME PONDEROSA DRILLING & DEVELOPMENT INC.
(Person, firm, or corporation) (Type or print)

Address E. 6010 Broadway, Spokane, WA 99212

[Signed] Douglas E. Lane (Well Driller)

License No. 1030 Date 3/25, 1987

(USE ADDITIONAL SHEETS IF NECESSARY)

File Original and First Copy with
Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 9

Water Right Permit No. _____

(1) OWNER: Name Dave Hussey Address 522 Crestview M.L.

(2) LOCATION OF WELL: County Grant SE 1/4 SE 1/4 Sec. 7 T. 19 N., R. 29 W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) _____

(3) PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐
☐ Irrigation ☐ Test Well ☐ Other ☐
☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) 1
Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well _____ inches.
Drilled _____ feet. Depth of completed well _____ ft.

(6) CONSTRUCTION DETAILS: Shoc
Casing installed: 6 " Diam. from +1 ft. to 29 ft.
Welded ☐ " Diam. from _____ ft. to _____ ft.
Liner installed ☐ " Diam. from _____ ft. to _____ ft.
Threaded ☐ " Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 23.5 ft. below top of well Date 9-29-92
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

" " 100 GPM. "
" " " "
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)
Time Water Level Time Water Level

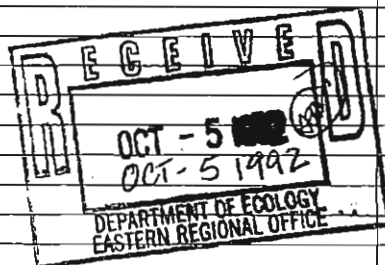
Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water 59 Was a chemical analysis made? Yes ☒ No ☐
Nitrate.

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Dirt & Gravel	0	14
Basalt Brown. Red Bk.	14	18
Clay yellow.	18	20
Clay Grey	20	24
Basalt Black Brown Red yellow	24	60
Basalt Grey	60	62



Work started 9-29-92, 19. Completed 9-29-92, 19.

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Jay Drilling Co (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address MOSES Lake Wa.

(Signed) Tim Slaw License No. 469
(WELL DRILLER)

Contractor's Registration No. JayORC13701A Date 9-29, 1992

(USE ADDITIONAL SHEETS IF NECESSARY)

⑩

Appl.#7524

Permit # 7080

Diagram of Section

County...Grant

Area

Map.

SE ¼ SE ¼ sec. 7 T. 19 N. R. 29 E.

Drilling Co.....Frear Drilling

Address.....Moses Lake, Washington

Method of Drilling Cable Date June 15 19 65

Owner.....David Craig Hussey

Address **Box 419 Star Route Moses Lake, Wash.**

Land surface, datum 105 ft. above

SWL: 35 Date: June 15 1965 Dims: 10" x 70"

(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, etc., etc., etc.)

Turn up Sheet of sheets

The Dep. The Department of Ecology does NOT Warranty the Data and/or the Information on this web site.

File Original and First Copy with
Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 1

Water Right Permit No. _____

(1) OWNER: Name Alton Chapel Address 4499 Rd L NE Moses Lake, Wa.

(2) LOCATION OF WELL: County Grant NW SW NW Sec 7 T19 N. R29 W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 4499 Rd L NE Moses Lake, Wa.

(3) PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐
☐ Irrigation ☐ Test Well ☐ Other ☐
☐ DeWater

(4) TYPE OF WORK: Owner's number of well 1 (if more than one)
 Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐
 Deepened ☐ Cable ☐ Driven ☐
 Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
 Drilled 102 feet. Depth of completed well 102 ft.

(6) CONSTRUCTION DETAILS:
 Casing installed: 6 ft. Diam. from +1 ft. to 83 ft.
 Welded ☒ 6 ft. Diam. from _____ ft. to _____ ft.
 Liner installed ☐ _____ ft. Diam. from _____ ft. to _____ ft.
 Threaded ☐ _____ ft. Diam. from _____ ft. to _____ ft.
 Perforations: Yes ☐ No ☒
 Type of perforator used _____
 SIZE of perforations _____ in. by _____ in.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.
 Screens: Yes ☐ No ☒
 Manufacturer's Name _____
 Type _____ Model No. _____
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.
 Gravel packed: Yes ☐ No ☒ Size of gravel _____
 Gravel placed from _____ ft. to _____ ft.
 Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
 Material used in seal Bentonite
 Did any strata contain unusable water? Yes ☐ No ☒
 Type of water? _____ Depth of strata _____
 Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
 Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
 Static level 56 ft. below top of well Date 3-26-90
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
 Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
 Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
 " Air Lift 40 GPM " " "
 " " " " " " "
 Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

 Date of test _____
 Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
 Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.
 Artesian flow _____ g.p.m. Date _____
 Temperature of water 59 Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION
 Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Soil	0	2
Soil boulders	2	12
Gravel	12	44
Sand black	44	83
Clay brown	63	79
Basalt broken brown	79	83
Basalt black	83	89
Basalt brown (water)	89	99
Basalt black	99	102

Work started 3-23-90, 19. Completed 3-26-90, 19.

WELL CONSTRUCTOR CERTIFICATION:
 I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Joy Drilling Co. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
 Address Moses Lake, Wa.
 (Signed) Jim Stines License No. 469
 (WELL DRILLER)
 Contractor's Registration No. JOYDRC1370H Date 3-27-90, 19.

(USE ADDITIONAL SHEETS IF NECESSARY)

File Original and First Copy with
Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

59902

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 4091486

UNIQUE WELL I.D. # ACK 777

Water Right Permit No. _____

(1) OWNER: Name A1 Chapel Address 4499 Rd L NE Moses Lake.

(2) LOCATION OF WELL: County Grant NW 1/4 SW 1/4 Sec 7 T. 19 N. R. 29 W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 4499 Rd L NE Moses Lake wa.

(3) PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐
☐ Irrigation ☐ Test Well ☐ Other ☐
☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled _____ feet. Depth of completed well _____ ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 Diam. from 4 ft. to _____ ft.
Welded ☐ Diam. from _____ ft. to _____ ft.
Liner installed ☐ Diam. from _____ ft. to _____ ft.
Threaded ☐ Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☐ No ☐ To what depth? _____ ft.
Material used in seal _____
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level _____ ft. below top of well Date _____
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: 40-50 gal./min. with air lift ft. drawdown after 2 hrs.

" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)
Time Water Level Time Water Level

Time Water Level Time Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.

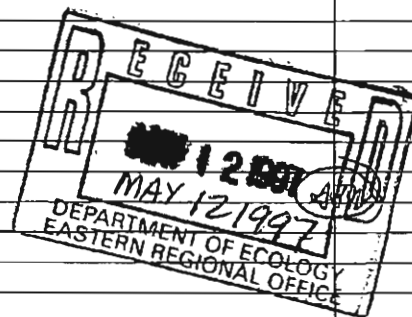
Artesian flow _____ g.p.m. Date _____

Temperature of water 60 Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Dirt	0	2
Dirt + Boulders.	2	12
Sand. some Rock. Gravel	12	18
Gravel + Sand.	18	44
Sand.	44	63
Clay Brown	63	79
Basalt Brown.	79	83
Basalt Black	83	85
Basalt Brown	85	97



Work Started 5-5-97 19. Completed 5-6-97 19

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Joy Drilling Co (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address Moses Lake wa.

(Signed) Jim Shum License No. 0469 (WELL DRILLER)

Contractor's Registration No. Joy DRC 13704 Date 5-6-97 19

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

14

File Original and First Copy with
Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Water Right Permit No.

Start Card No. 4091658UNIQUE WELL I.D. # ACK 800OWNER: Name AC BrownAddress 4625 Rd M NE WML.(2) LOCATION OF WELL: County Graft.E 1/4 W 1/4 Sec 8 T. 19 N. R. 29E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address)

(3) PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐
☐ Irrigation ☐ Test Well ☐ Other ☐
☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
 Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐
 Deepened ☐ Cable ☐ Driven ☐
 Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
 Drilled 175 feet. Depth of completed well 175 ft.

(6) CONSTRUCTION DETAILS:
 Casing installed: 6 Diam. from 41 ft. to 19 ft.
 Welded ☒ 5 3/8 Diam. from 41 ft. to 83 ft.
 Liner installed ☐
 Threaded ☐ Diam. from _____ ft. to _____ ft.

Perforations: Yes ☒ No ☐
 Type of perforator used touch.
 SIZE of perforations 4 x 3 in. by _____
20 perforations from 70 ft. to 83 ft.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒
 Manufacturer's Name _____
 Type _____ Model No. _____
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____
 Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 19 ft ft.
 Material used in seal Butonite
 Did any strata contain unusable water? Yes ☐ No ☒
 Type of water? _____ Depth of strata _____
 Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____ H.P. _____
 Type: _____

(8) WATER LEVELS: Land-surface elevation _____ ft.
 Static level 58 ft ft. below top of well Date 7-23-97
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
 Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
 Yield: 50 gal./min. with air lift drawdown after 2 hrs.
 " " " " " "
 " " " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)
 Time Water Level Time Water Level Time Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airstest _____ gal./min. with stem set at _____ ft. for _____ hrs.

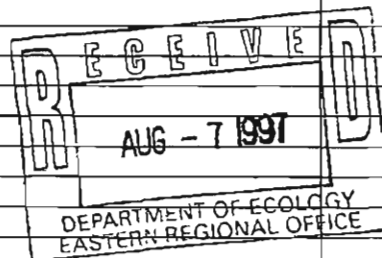
Artesian flow _____ g.p.m. Date _____

Temperature of water 60 Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Dirt	0	2
Caliche	2	7
Basalt Black	7	11
Basalt Brown	11	14
Basalt Black	14	42
Basalt Brown	42	66
Basalt Brown Red yellow	66	82
Basalt Grey	82	154
Basalt Brown Red H2O	154	171
Basalt Grey	171	175

Work Started 7-21-97 Completed 7-22-97 19

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Joy Drilling Co (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)Address Moses Lake WA.(Signed) Jim Stearns License No. 0469 (WELL DRILLER)Contractor's Registration No. Joy DRILLING Co Date 7-23-97 19

(USE ADDITIONAL SHEETS IF NECESSARY)

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File Original and First Copy with
Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Water Right Permit No.

Start Card No. 409 1659UNIQUE WELL I.D. # ACK 799OWNER: Name AC BrowerAddress 4625 Rd M NE ML(2) LOCATION OF WELL: County Graft E 1/4 W 1/4 Sec 8 T. 19 N. R. 29 W.M.

(2a) STREET ADDRESS OF WELL (or nearest address)

(3) PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐
☐ Irrigation ☐ Test Well ☐ Other ☐
☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one)
Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 92 feet. Depth of completed well 92 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 Diam. from 1 ft. to 19 ft.
Welded ☒ Diam. from 1 ft. to 83 ft.
Liner installed ☒
Threaded ☐ Diam. from _____ ft. to _____ ft.

Perforations: Yes ☒ No ☐
Type of perforator used torch
SIZE of perforations 4 x 3 in. by _____ in.
_____ perforations from 20 ft. to 80 ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 19 ft.
Material used in seal Benforte
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____ H.P. _____
Type: _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 55 ft. below top of well Date 7-21-97
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

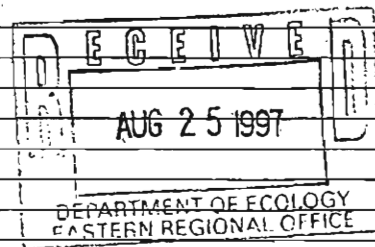
(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: 50 gal./min. with 4.1 ft. ft. drawdown after _____ hrs.
" " " "
" " " "
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)
Time Water Level Time Water Level Time Water Level

Date of test _____
Ballot test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water 59 Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Dirt	0	2
Caliche	2	7
Basalt Black	7	11
Basalt Brown	11	14
Basalt Black	14	42
Basalt Brown	42	66
Basalt Brown Red yellow	66	82
Basalt with H ₂ O	82	92
Basalt Gray	92	156
Basalt Brown	156	158
Basalt Gray	158	181
Basalt Brown H ₂ O	181	198
Basalt Gray	198	202

Work Started 7-19-97 Completed 7-21-97 19

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Jay Drilling Co (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)Address MOSES Lake wa.(Signed) Jim Allen License No. 0469 (WELL DRILLER)Contractor's Registration No. 507 DRC1370 Date 7-23-97 19

(USE ADDITIONAL SHEETS IF NECESSARY)

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File Original and First Copy with
Department of EcologySecond Copy—Owner's Copy
Third Copy—Driller's Copy**WATER WELL REPORT**

STATE OF WASHINGTON

Start of No. _____

UNIQUE WELL I.D. # _____

Water Right Permit No. _____

(1) OWNER: Name Larry Campbell Address 21480 Rd n NE. Marysville(2) LOCATION OF WELL: County Grant NE 1/4 NE 1/4 Sec 8 T. 19 N. R. 29 W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) _____

(3) PROPOSED USE: ☒ Domestic ☐ Irrigation ☐ DeWater ☐ Industrial ☐ Test Well ☐ Municipal ☐ Other ☐(4) TYPE OF WORK: Owner's number of well
(if more than one) _____Abandoned ☐ New well ☒ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ☒ Bored ☐ Driven ☐ Jetted ☐(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 85 feet. Depth of completed well 85 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 * Diam. from 4 ft. to 135 ft.
Welded ☒ * Diam. from _____ ft. to _____ ft.
Liner installed ☐ * Diam. from _____ ft. to _____ ft.
Threaded ☐ * Diam. from _____ ft. to _____ ft.Perforations: Yes ☐ No ☒

Type of perforator used _____

SIZE of perforations _____ in. by _____ in.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____

Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.Material used in seal BentoniteDid any strata contain unusable water? Yes ☐ No ☒

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 34 ft. below top of well Date _____

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (Cap. valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

" " " " " "

" " " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time Water Level Time Water Level Time Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airstest 18 gal./min. with stem set at 80 ft. for 15 hrs.

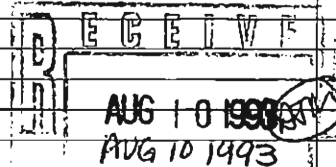
Artesian flow _____ g.p.m. Date _____

Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Silty Brown Sand	0	30
Brown Basalt	30	35
Black Basalt	35	50
Brown Basalt	50	55
Black Basalt	55	80
Brown Basalt	80	85

Work started 6-1, 1993 Completed 6-1, 1993

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME D & F Drilling (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)Address 205 Burke Moss Lake(Signed) Paul G. License No. 0116

(WELL DRILLER)

Contractor's Registration No. DEDr 11806 Date _____, 19____

(USE ADDITIONAL SHEETS IF NECESSARY)



File Original and First Copy with
Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No. _____

Permit No.

(1) OWNER: Name Rick Killinger Address 1213 Doolittle, Moses Lake
LOCATION OF WELL: County Grant - Sec 8 T 19 N. R 29 W.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one).....

New well	<input checked="" type="checkbox"/>	Method: Dug	<input type="checkbox"/>	Bored	<input type="checkbox"/>
Deepened	<input type="checkbox"/>	Cable	<input type="checkbox"/>	Driven	<input type="checkbox"/>
Reconditioned	<input type="checkbox"/>	Rotary	<input checked="" type="checkbox"/>	Jettied	<input type="checkbox"/>

(5) **DIMENSIONS:** Diameter of well 6 inches.
Drilled 160 ft. Depth of completed well 160 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6" Diam. from +1 ft. to 39 ft.
 Threaded ☐ " Diam. from ft. to ft.
 Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒

Type of perforator used.....

SIZE of perforations in. by in.

..... perforations from ft. to ft.

..... perforations from ft. to ft.

..... perforations from ft. to ft.

Screens: Yes ☐ No ☒

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 39 ft
Material used in seal: Cement
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) **PUMP:** Manufacturer's Name _____
Type: _____ HP _____

(8) **WATER LEVELS:** Land-surface elevation 1230 ft.
above mean sea level.
Static level 100 50 ft. below top of well Date 7-9-83
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap. valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☒ If yes, by whom?

Yield: gal./min. with ft. drawdown after hrs

Yield:	gal./min. with	ft. drawdown after	hrs
11	"	"	"
12	"	"	"

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
------	-------------	------	-------------	------	-------------

[illegible][illegible][illegible]

Date of test

Bailer test..... gal./min. with..... ft. drawdown after..... hrs

Artesian flow _____ g.p.m. Date _____

Temperature of water..... Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Brown Silty Sand	0	32
Cleehie	32	35
Brown Basalt	35	38
Black Basalt	38	125
Brown Basalt	125	135
Black Basalt	135	145
Brown Basalt	145	160

RECEIVED

~~AUG 19 1983~~

DEPARTMENT OF ECOLOGY
SPOKANE REGIONAL OFFICE

Work started 7-9 1983 Completed 7-9 1983

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME D & F Drilling
(Person, firm, or corporation) (Type or print)

Address 205 Beale M. L

[Signed] Chris E
(Well Driller)

License No. 046 Date 7-9 198

NE4 SE4 NW4
Sec. 8
T19N
R29E

19/29-8

(1)

(18)

1/29/8

LLOYD PETERSON ^{VIDEO} / SCAN REVIEW

JML
[Signature]

3-8

Casing - No leaks

-21

hard rock, no moisture, smooth walls

-

condensation or seepage begins

0-67

blur - too bright - no picture

0-7

SWC

4-100

rough walls, cavernous, huge breakouts

20-165

hard competent rock, fractured, big vert crack
crooked hole
161 big cracks

65-172

rough broken zone - interflow?

72-186

hard rock - smooth walls

186-197

very rough, big cavern, pillars?, blocky
195 - big cavern

97-230

224 - big crack - good competent rock, smooth
" " " " " "

97-230 234 - big rock - good competent rock, smooth walls - (OK for plug)

-233 interflow?, pillows?, soft matrix, well rounded

233-299 good competent rock, smooth walls

268- 272 big tilted bed

(2)

299-³⁴²~~330~~ slightly rough walls - some soft appearing zones altered flow?

305-345 break out - blocky core zone, highly fractured

345-358 good rock

358-386 big break out, highly fractured, soft, clayey material knocked off walls with camera
381 huge cavern (check for bantage?)
384 crooked ledge No - with + 600'

386-450 competent rock, 441-443 soft zone

450 Total Depth - big chunks at bottom



WATER WELL REPORT

Original & 1st copy - Ecology, 2nd copy - owner, 3rd copy - driller

Construction/Decommission ("x" in circle)

☒ Construction

☐ Decommission ORIGINAL INSTALLATION Notice
of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal
☐ DeWater ☒ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____
☒ New well ☐ Reconditioned Method: ☐ Dug ☐ Bored ☐ Driven
☐ Deepened ☐ Cable ☐ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 340 ft.
Depth of completed well 340 ft.

CONSTRUCTION DETAILS
Casing ☒ Welded 6 " Diam. from +1 ft. to 100 ft.
Installed: ☐ Liner installed _____ Diam. from _____ ft. to _____ ft.
☐ Threaded _____ Diam. from _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No
Type of perforator used _____
SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No ☐ Size of gravel/sand _____
Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 100 ft.
Material used in seal Bentonite
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? _____ Depth of strata xx
Method of sealing strata off _____

PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 95 ft. below top of well Date 5/21/07
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☐ Yes ☐ No If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well
in in water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Artesian 30-35 gal./min. with stem set at _____ ft. for 4 hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? ☒ Yes ☐ No

CURRENT

Notice of Intent No. WE06576

Unique Ecology Well ID Tag No. APB 418

Water Right Permit No. _____

Property Owner Name Santos Villarreal

Well Street Address FU 33

City Othello County Adams

Location SW 1/4-1/4NW 1/4 Sec 8 Twn 19 R 29 ^{NWM} or ^{WWM} circle one

Lat/Long (s, t, r) Lat Deg _____ Lat Min/Sec _____

Still REQUIRED) Long Deg _____ Long Min/Sec _____

Tax Parcel No. 2100490330100

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Gravel/Boulders	0	24
Tan Clay	24	56
grey Clay	56	84
Tan Sandstone	84	91
Med. Brown/Blk Basalt	91	114
Hard Grey Basalt	114	155
Red/ Brown Soft Clay	155	168
Hard Grey	168	185
Brown Soft	185	194
Hard Grey	194	204
Med Black	204	212
Hard Grey	212	290
Med. Blk Honeycomb	290	316
Hard Grey	316	322
Med. Blk H2O	322	340

RECEIVED

OCT 24 2007

DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Start Date 5/14/07

Completed Date 5/21/07

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Leonard Martel

Driller/Engineer/Trainee Signature _____

Driller or trainee License No. 1907

IF TRAINEE,

Driller's License No. _____

Driller's Signature _____

Drilling Company LEMCO DRILLING INC

Address PO BOX 23

City, State, Zip LIND WA 99341

Contractor's

Registration No. LEMCO1101JJ Date 5/25/07

Ecology is an Equal Opportunity Employer.

File Original and First Copy with
Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No.

Permit No.

(1) OWNER: Name EDWARD H BUCHMAN Address RT 2 Box 23
(2) LOCATION OF WELL: County GRANT — 1/4 S, E 1/4 Sec 8 T. 19 N. R. 22 W.M.
Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one)
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 70 ft. Depth of completed well 70 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from 0 ft. to 38 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ 6 " Diam. from 0 ft. to 38 ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
..... perforations from ft. to ft.
..... perforations from ft. to ft.
..... perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 20
Material used in seal Bentonite + Clay Cuttings
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off.

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation 1230
above mean sea level
Static level 50 ft. below top of well Date 9-7-79
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test 80 gal./min. with ? ft. drawdown after 1 1/2 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Dist	0	10
Clay	10	35
Broken Basalt & Strips of Cleatichy	35	60
Hard Basalt	60	70

RECEIVED

OCT 22 1979

DEPARTMENT OF ECOLOGY
SPOKANE REGIONAL OFFICE

Work started 9-7, 1979. Completed 9-7, 1979

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Honey Drilling
(Person, firm, or corporation) (Type or print)

Address 708 180 E Maple

(Signed) Jim Doherrera
(Well Driller)

License No. 0799 Date 9-7, 1979

File Original and First Copy with
Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 21

Water Right Permit No. _____

(1) OWNER: Name Alan D. Predochl Address 639 S. Pioneer Way Moses Lake, WA

(2) LOCATION OF WELL: County Grant SE 1/4 SE 1/4 Sec 8 T. 19 N. R. 29 W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) _____

(3) PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐
☐ Irrigation ☐ Test Well ☐ Other ☐
☐ DeWater

(4) TYPE OF WORK: Owner's number of well
(if more than one) _____

Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6" inches.
Drilled 162 feet. Depth of completed well 162 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6" Diam. from +1 1/2 ft. to 38 1/2 ft.
Welded ☒ 4" Diam. from 10 ft. to 162 ft.
Liner installed ☒
Threaded ☐ Diam. from _____ ft. to _____ ft.

Perforations: Yes ☒ No ☐

Type of perforator used Skill saw
SIZE of perforations 1/8 in. by 12 in.
80 perforations from 122 ft. to 162 ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒

Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 18' ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☒ No ☐
Type of water? Surface Depth of strata 14'
Method of sealing strata off 6" casing - bentonite

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation
above mean sea level _____ ft.
Static level 20' ft. below top of well Date 2-12-92
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom? _____
Yield: 50+ gal./min. with _____ ft. drawdown after _____ hrs.

"Estimated air lift 50+ gal./per min."

Recovery data (time taken as zero when pump turned off) (water level measured
from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.

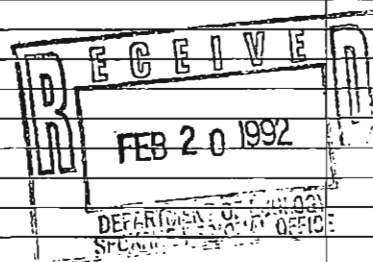
Artesian flow _____ g.p.m. Date _____

Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Top soil	0	3
Clay brown	3	14
Clay brown w/sand 1 GPM	14	16
Clay tan w/basalt gravel	16	35
Basalt gray	35	38
Basalt gray w/water 2GPM	38	42
Basalt gray	42	150
Basalt gray w/water 50+ GPM	150	155
Basalt gray	155	162



6" Drive shoe utilized

Work started 2-12-92, 19. Completed 2-13, 1992

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Ponderosa Drilling & Development, Inc.
(PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address E. 6010 Broadway Spokane, WA 99212

(Signed) Alvin Carris License No. 1869

Contractor's (WELL DRILLER) (Alvin Carris)

Registration No. PO-ND EI*248JE Date 2-17, 1992

(USE ADDITIONAL SHEETS IF NECESSARY)

23

Appli. 8120

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
DIVISION OF WATER RESOURCES

Per. 7876

WELL LOG

Record by... Driller

Source... Driller's Record

Location: State of WASHINGTON

County... Grant

Area...

Map...

E 1/4 SW 1/4 sec. 8 T. 19 N. R. 29 E

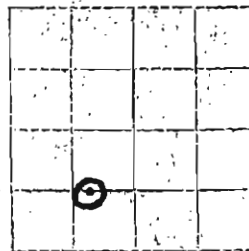


Diagram of Section

Drilling Co. Haney Drilling Co.

Address... 1720 West Crouse St. Moses Lake, Wash.

Method of Drilling... Cable Date... April 19, 1967

Owner... Loyd Goehri

Address... Route 2, Box 71C, Moses Lake, Wash.

Land surface, datum 1220 ft above

SWL: 57' Date... April 22, 1967 Dims. 12"x273'

CORRELATION	MATERIAL	From (feet)	To (feet)
-------------	----------	-------------	-----------

(Transcribe driller's terminology literally but paraphrase as necessary. In parentheses, if material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)

Domestic supply and irrigation			
Top soil		0	7
Caliche		7	12
Clay		12	17
Rock, broken, brown & clay		17	37
Rock, porous, brown		37	58
Basalt, hard, gray		58	104
Basalt, broken w/clay		104	210
Basalt, hard, gray		210	227
Basalt, soft, gray		227	270
Basalt, firm, gray		270	273
Casing: 12" from 0' to 37'			
Yield: 525 gpm with 190' DD after 4 hrs.			
Recovery: time: water level:			
	0	57'	
	10 min.	57'	
	20 min.	57'	

Turn up

Sheet... of... sheets

Appl: 10220
Permit: 9757

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
DIVISION OF WATER RESOURCES

WELL LOG

Record by.....Driller.....

Source.....Driller's Record.....

Location: State of WASHINGTON

County.....Grant.....

Area.....

Map.....

W₂ 1/4 SW 1/4 sec. 8 T. 19 N., R. 29 E. W.

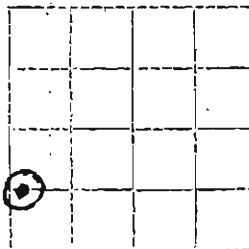


Diagram of Section

Drilling Co.....Frear Drilling.....

Address.....Moses Lake, Washington.....

Method of Drilling.....cable..... Date Sept. 16, 1969.....

Owner.....Robert L. Oliver.....

Address.....710 E. Broadway, Moses Lake, Wn.....

Land surface, datum.....1200 ft. above
below

SWL.....29..... Date Sept. 20, 1969. Dims.: 0' to 400'

CORRELATION	MATERIAL	From (feet)	To (feet)
-------------	----------	-------------	-----------

(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)

IRRIGATION		
Top soil	0	1
Coliche	1	12
Basalt, clay & broken	12	15
Basalt, black, broken	15	32
Basalt, black	32	42
Basalt, black, broken, water	42	48
Basalt, black, firm	48	53
Basalt, grey	53	76
15" well drilled to 76' & 76' of 12" casing cemented in with 20 sacks cement sealing off the water hit at 48'		
Basalt, grey	76	108
Basalt, with/ black, broken	108	115
Chek seams & water Static 45'		
Basalt, black	115	142

Turn up

Sheet.....of.....sheets

No. _____ / _____ - _____

B. F. No. 7400-05-12-00.

Please print, sign and return to the Department of Ecology

161678

25



Water Well Report

Original - Ecology, 1st copy - owner, 2nd copy - driller

Construction/Decommission

☒ Construction☐ Decommission ORIGINAL INSTALLATION Notice of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal
☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other

TYPE OF WORK: Owner's number of well (if more than one) one
☒ New well ☐ Reconditioned Method: ☐ Dig ☐ Bored ☐ Driven
☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 182
 Depth of completed well 182 ft.

CONSTRUCTION DETAILS

Casing ☐ Welded 6 Diam. from 11 ft. to 19 ft.
 Installed: ☐ Liner installed Diam. from _____ ft. to _____ ft.
☐ Threaded _____ Diam. from _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No

Type of perforator used _____
 SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____
 Manufacturer's Name _____

Type _____ Model No. _____
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No ☐ Size of gravel/sand _____
 Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 19 ft.Material used in seal BentoneDid any strata contain unusable water? ☐ Yes ☒ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____
 Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level 1090 ft.Static level 72 ft. below top of well Date 12-24-04

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level).

Time	Water Level	Time	Water Level	Time	Water Level
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 80-90 gal./min. with stem set at 160 ft. for 2 hrs.

Artesian flow _____ g.p.m. Date _____

Temperature of water 62 Was a chemical analysis made? ☐ Yes ☒ No

Current

Notice of Intent No. 179650Unique Ecology Well ID Tag No. AKO 571

Water Right Permit No. _____

Property Owner Name Bruce W. BaileyWell Street Address NO ADDRESSCity MOSES LAKE County GraftLocation SE 1/4-1/4 SW 1/4 Sec 8 Twn 19R 29E ☒ circle one

Lat/Long (s, t, r) Lat Deg _____ Lat Min/Sec _____

still REQUIRED) Long Deg _____ Long Min/Sec _____

Tax Parcel No. 12-0903-520

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information indicate all water encountered. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Dirt	0	2
Gravel	2	16
Basalt Brown	16	19
Basalt Black	19	42
Basalt Brown	42	75
Basalt Grey	75	154
Basalt Red	154	177
Basalt Grey	177	182

RECEIVED

DEC 27 2004

DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICEStart Date 12-23-04 Completed Date 12-24-04

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Driller/Engineer/Trainee Name (Print) Jim StiensDriller/Engineer/Trainee Signature Jim StiensDriller or trainee License No. 0469

IF TRAINEE,

Driller's Licensed No. _____

Driller's Signature _____

Drilling Company JOY DRILLING COAddress 5369 Jarvis Ct.City, State, Zip MOSES LAKE WA 98837Contractor's Registration No. JOYDRC1370H Date 12-24-04

Ecology is an Equal Opportunity Employer. ECV 050-1-20 (Rev 2/03)

File Original and First Copy with
Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No. 26

Permit No. _____

(1) OWNER: Name LEN LANDRIE Address 12723 N MAYFAIR SPOKANE, WA 99218LOCATION OF WELL: County GRANT - SW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 8 T. 19 N. R. 29 E. W. M.

Bearing and distance from section or subdivision corner _____

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐(4) TYPE OF WORK: Owner's number of well (if more than one) _____
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 150 ft. Depth of completed well 150 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from +1 ft. to 19 ft.
Threaded ☐ 4" P.V.C. " Diam. from 5 ft. to 150 ft.
Welded ☐ " Diam. from _____ ft. to _____ ft.Perforations: Yes ☒ No ☐ IN 4" P.V.C. LIVER
Type of perforator used SKILL SAW
SIZE of perforations 1/8 in. by 7 in.
100 perforations from 90 ft. to 150 ft.
perforations from _____ ft. to _____ ft.
perforations from _____ ft. to _____ ft.Screens: Yes ☐ No ☒
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.Gravel packed: Yes ☐ No ☒ Size of gravel: _____
Gravel placed from _____ ft. to _____ ft.Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal BENTONITE
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? _____ Depth of strata _____
Method of sealing strata off _____(7) PUMP: Manufacturer's Name _____
Type: _____ H.P.(8) WATER LEVELS: Land-surface elevation 1200 ft.
Static level 70 ft. below top of well Date 1-19-84
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____
(Cap, valve, etc.)(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom? DRILLER
Yield: 15 gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test: 15 gal./min. with _____ ft. drawdown after _____ hrs.
Artesian flow _____ g.p.m. Date 1-19-84
Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
CLAY OVERBURDEN	0'	2'
HARDPAN	2'	6'
BASALT (BLACK-HARD)	6'	23'
BASALT (BROWN-MED)	23'	49'
BASALT (BLACK-MED)	49'	68'
BASALT (BROWN-BROKEN)	68'	79'
B.G.P.M.		
BASALT (BLACK-HARD)	79'	136'
BASALT (BROWN-SOFT)	136'	143'
SCORIA (BROWN)	143'	150'
7' G.P.M.		

RECEIVED

JUN 22 1984

DEPARTMENT OF ECOLOGY
SPOKANE REGIONAL OFFICEWork started 4-17, 1984. Completed 4-19, 1984

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME ALLBERY DRILLING CORP.
(Person, firm, or corporation) (Type or print)Address 6227 N. CANNON SPOKANE, WA 99205[Signed] Steven L. Allbery
(Well Driller)License No. 4 Date 4-20, 1984

U. S. No. 1254-2-50-2M 24128

RETURN TO
OF HYDRAULICS
RECORD BY WELL DRILLER OR OTHER CONSTRUCTOR OF WORKS
FOR WITHDRAWAL OF GROUND WATER

GWC 1780-A
35C 9-19/29

RECEIVED
MAY 11 1951
DEPARTMENT OF
CONSERVATION

Under Permit No. G. W. 759

(The well driller or other constructor of works for the withdrawal of public ground waters shall be obligated to furnish the permittee a recorded record of the factual information necessary to show compliance with the provisions of this section. See, R. Chap. 260, Laws of 1945.)

1. Albert Peters, Dealer Rt. 1 - Moses Lake, Washington
(Name and address of owner of well or other works for withdrawal of water)
2. Type; name or number of works where water is taken Well
(Well, canal or infiltration system)
3. Date on which work on well or other structure was started October 10, 1948
4. Date on which work was completed June 28, 1950
5. If work on well or other structure was abandoned, give date November 1948 and March 19, 1950
and reason for abandonment Owner did not wish to go deeper

6. DESCRIPTION OF WORKS:

(a) Well: Depth 392 ft. Diameter 18 in. or ft. Dug or drilled drilled

Flowing or pump well Pump Well

If Pump Well: Type and size of pump is Four less Oil Lubricated Turbine # 86833

Type and size of motor or engine is 125 HorsePower - 1760 RPM

Depth from ground surface to water level before pumping 305 feet

After continuous operation four hours, the measured discharge of the pump is

1200 g.p.m., and the drawdown of water level is 305 feet

Recovery data (taken after pump has been shut off) (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level
Recovery of water <u>immediately</u>			

Date of test July 21, 1950

If Flowing Well: Measured discharge g.p.m. on _____ (Date)

Shut-in pressure at ground surface _____ lbs. per sq. in. on _____ (Date)

Water is controlled by _____ (Cap Valve, etc.)

CASING: (Give diameter, commercial specifications and depth below ground surface of each casing size.)

18 in. diameter Standard Pipe from 0 to 28 ft.

_____ in. diameter from _____ to _____ ft.

_____ in. diameter from _____ to _____ ft.

_____ in. diameter from _____ to _____ ft.

Describe and show depth of shoe, plug, adapter, liner or other details:

Long-patterned drive shoe on bottom joint of pipe.

27

GWC 1780-A

Perforated casing or screens:

None	from	to	ft.
(Number per foot and size of perforations, or describe screen)	from	to	ft.
	from	to	ft.
	from	to	ft.
	from	to	ft.

LOG OF WELL OR TUNNEL: (Describe each stratum or formation clearly, indicate if water bearing, and give thickness and depth as indicated.)

MATERIAL	Thickness (Feet)	Depth (Feet)
Top Soil	4	4
Sandy Loam	18	22
Gray Shale	20	42
Broken Basalt (Small amount of water)	73	115
Dark Basalt	51	166
Black Basalt (Intermediate Clay Seams)	49	215
Black Basalt - Hard	95	310
Porous Gray Basalt - Small Amount of Water	19	329
Hard Gray Basalt	42	371
Porous Black Basalt - Water Bearing	21	392
(47 feet - 18" hole - balance of well - 12")		

(b) INFILTRATION TRENCH OR TUNNEL: Type...

Dimensions: (Trench—length, corner and cross-sectional size) (Trench—minimum and maximum depths)
Bottom width ft. Discharge g.p.m. Date of test
Position of water bearing stratum with reference to portal of tunnel

Frank L. Pomeroy
(Signature of driller or other constructor)

Box 465 - Moses Lake, Washington
(Address)

STATE OF WASHINGTON.

County of *Franklin*

I, *Frank L. Pomeroy*, being first duly sworn, do hereby certify that I am the driller or constructor of the aforesaid well or tunnel or trench who furnished the foregoing statement of facts; that I have read said statement and each and all of the items therein contained are true to the best of my knowledge and belief.

Frank L. Pomeroy
(Signature)

Subscribed and sworn to before me this *24* day of *May* 1951

R. B. Hallett
Notary Public



Well Report Change Form

Instructions: Record any change made to the well report record on this form. You must append this form to the well report image. File this form with the original well report. **USE INK PEN ONLY WHEN FILLING OUT THIS FORM.**

(REQUIRED) This Well Report has been changed on (Date) 6 / 10 / 05

(REQUIRED) ☒ Not in NITS ☐ NITS Log ID# _____
Regional Office: ☐ CRO ☒ ERO ☐ NWRO ☐ SWRO

Well Type: ☒ Water Well ☐ Resource Protection Well
Notice of Intent #: _____ Unique Ecy Well ID Tag No: _____

(Required) Original Owner Name: Albert Peters
Well Street Address: _____
City: _____ County: Grant Zip Code: _____

Geographic Location:
(Required) _____ 1/4 of the _____ 1/4 Section 9 Township 19 Range 29 EWM or (circle one) WWM
(Optional) Lat Degrees _____ Lat Time _____ Horizontal collection method code _____
Long Degrees _____ Long Time _____
Tax Parcel No (include all zeros and dashes): _____

Type of Work: ☐ New Well ☐ Reconditioned ☐ Deepened
Well Report Recvd Date: ____/____/____ Well Completed Date: ____/____/____
Well Diameter (in): 14 Well Depth (ft): 392 Other: _____

Driller License No: _____ Trainee License No: _____
Other (Specify): _____

(Required) Person Requesting Change Jaimie Towre

(Required) Reason for Change County data was missing.
Current county data was derived from township,
section, range, and quarter quarter data

(Required) Tracker Signature: Jaimie Towre

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
AND DEVELOPMENT

WELL LOG No. Appl. 1590
Date July 10, 19 50 Cert. 851-A
Record by Earl C. Morrison
Source Driller's Record



Location: State of WASHINGTON
County Grant
Area _____
Map _____
NE 1/4 NW 1/4 sec. 9 T. 19 N., R. 29 E. W.

Drilling Co. Morrison & Morrison
Address Box 260; Harrington
Method of Drilling EDMAN SHANK Date July 11 1950
Owner W. T. McGuire 1700 Broadway
Address P.O. Box 1099; Moses Lake 97457
Land surface, datum 1250 ft. above
below

CORRELATION	MATERIAL	THICKNESS (feet)	DEPTH (feet)
	Yellow clay	47	47
	Black basalt	12	59
	Grey basalt	14	73
	Grey basalt	26	99
	Blue basalt	14	113
	Blue & grey streaked basalt	10	123
	Grey basalt	17	140
	Hard grey basalt	5	145
	Mixture of blue & grey basalt	19	164
	Blue basalt	17	181
	Grey & blue basalt	4	185
	Water bearing rock (water level)	5	190
	Porous rock	14	207
	Blue basalt	17	224
	Blue shale	8	232
	Black basalt	26	258

Turn up (over) Sheet _____ of _____ sheets

(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)

WELL LOG.—Continued

No. /

CON- DITON	MATERIAL	Thickness (feet)	Depth (feet)
	Depth forward	—	
	Gray basalt	21	279
	Hard gray basalt	5	284
	Gray basalt	40	324
	Very hard gray basalt	6	330
	Gray basalt	7	337
	Gravel	4	342
	Black basalt	13	355
	Gray basalt	22	377
	Very hard gray basalt	16	393
	Gray basalt	8	401
	Layers black basalt, & porous rock (more water)	23	424
	Layers of black & gray basalt	12	436
	Black basalt	19	455
	Black basalt & blue clay	17	472
	Black & blue basalt	9	481
	Blue & gray basalt	10	491
	Hard blue basalt	4	495
	Hard gray basalt	3	498
	Gray basalt	17	515
	Blue basalt	15	530
	Gray basalt	13	543
	Black basalt	17	560
	Increase in water at 552 to 557'		
	Black sand & black basalt	8	568
	Black basalt	10	578
	Black & gray basalt some sand	9	587
	Black basalt, blue clay & shale	18	605
	Black basalt	20	625
	Black basalt	12	637
	Pump Test:		
	Dia: 637 x 10" Drilled		
	SWL: 250'		
	DD: 14'		
	Yield: 675 g.p.m.		
	Casing: 10" dia. I.D. from 0 to 53'		
	Perforations: no information		

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Sheet No 1

WELL DRILLING LOG FOR
W.T. MC CLURE
LOS ANGELES, CALIF.

RECEIVED
JAN 22 1951
DEPARTMENT OF
CONSERVATION & DEVELOPMENT

Started drilling 4/4/1950

GWC-851A
SCE 9-19/29

From 0 to 47 feet-- yellow clay
From 47 to 59 feet-- black basalt
From 59 to 72 feet-- grey basalt
From 72 to 99 feet-- grey basalt
From 99 to 113 feet-- blue basalt
From 113 to 123 feet-- fine and grey streaked basalt
From 123 to 140 feet-- grey basalt
From 140 to 145 feet-- hard grey basalt
From 145 to 164 feet-- mixture of blue and grey basalt
From 164 to 181 feet-- blue basalt
From 181 to 186 feet-- grey and blue basalt
From 186 to 190 feet-- water bearing rock and gravel
Hit water approximately 190 feet
From 190 to 207 feet-- porous rock
From 207 to 224 feet-- blue basalt
From 224 to 232 feet-- blue shale
From 232 to 240 feet-- black basalt
From 240 to 279 feet-- grey basalt
From 279 to 294 feet-- hard grey basalt
From 294 to 324 feet-- grey basalt
From 324 to 330 feet-- very hard grey basalt
From 330 to 337 feet-- grey basalt
From 337 to 342 feet-- gravel
From 342 to 353 feet-- black basalt
From 353 to 377 feet-- grey basalt
From 377 to 390 feet-- very hard grey basalt
From 390 to 401 feet-- grey basalt
From 401 to 424 feet-- layers black basalt and porous rock
Increase in water at approximately 424 feet.
From 424 to 436 feet-- black and grey basalt in layers
From 436 to 455 feet-- black basalt
From 455 to 472 feet-- black basalt and blue clay
From 472 to 481 feet-- black and blue basalt
From 481 to 491 feet-- blue and grey basalt
From 491 to 495 feet-- hard blue basalt
From 495 to 505 feet-- hard grey basalt
From 505 to 515 feet-- grey basalt
From 515 to 537 feet-- blue basalt
From 537 to 540 feet-- grey basalt
From 540 to 550 feet-- black basalt
Increase in water at approximately 540 feet to 547 feet.
From 540 to 550 feet-- black sand and black basalt
From 550 to 570 feet-- black basalt
From 570 to 587 feet-- black and grey basalt with
some sand.
From 587 to 605 feet-- black basalt blue clay and shale.
From 605 to 625 feet-- black basalt
Increase in water at approximately 605 feet
From 625 to 637 feet-- black basalt

Completed July 10, 1950

MORRISON & MORRISON (DRILLERS)
BOX 260
PASADENA, CALIF.

WELL LOG

No. Appl. #2971

Date Sept. 19 52

Cert. #1485-A

Record by Frank A. Enzler

Source Driller's Record

Location: State of WASHINGTON

County Grant

Area

Map.

NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 9 T. 19 N., R. 29 E.

DIAGRAM OF SECTION

Drilling Co. Frank Z. Engler

Address Rt. 1, Moses Lake, Washington

Method of Drilling _____ Date **Sept.** 19 **52**

Owner Greenview Water Association, Inc.

Address Rt. 1, Moses Lake, Washington

Land surface, datum _____ ft. above
below

Turn up

Sheet 1 of 1 sheets

File Original and First Copy with
Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. _____

Water Right Permit No. _____

32

OWNER: Name National Food Corp. Address _____

(2) LOCATION OF WELL: County Grant. SE SW $\frac{1}{4}$ Sec 9 T 19 N., R 39 W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) _____

(3) PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal ☐
☐ Irrigation ☐ Test Well ☐ Other ☐
☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one)
Abandoned ☐ New well ☐ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☒ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 16" inches.
Drilled 0 feet. Depth of completed well 719 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 12 " Diam. from 11 ft. to 346 1/2 ft.
Welded ☒ " Diam. from _____ ft. to _____ ft.
Liner installed ☒ " Diam. from _____ ft. to _____ ft.
Threaded ☐ " Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☐ No ☐ To what depth? _____ ft.
Material used in seal _____
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 214 " ft. below top of well Date 4-30-91
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)
Time Water Level Time Water Level Time Water Level

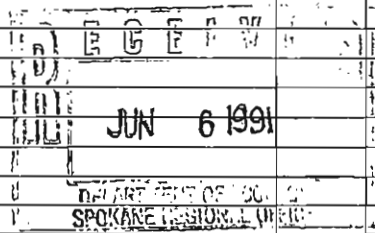
Date of test _____

Ballor test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Set a Bridge at 353 ft.		
Set 346 1/2 ft of 12" liner.		
cemented in with one yard.		
of Neet cement. Drilled out		
then cleaned out the bottom.		
to 719 feet.		



Work started 4-24-91, 19. Completed 5-1-91, 19.

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Joy Drilling Co. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address Moses Lake Wa.

(Signed) _____ License No. 0933
(WELL DRILLER)

Contractor's Registration No. Joy DR 13704 Date 5-4-91, 19.

(USE ADDITIONAL SHEETS IF NECESSARY)

File Original and First Copy with
Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No.

Permit No.

10709

(1) OWNER: Name Carnation Company Address Route 2, Box 60C, Moses Lake, WA. 98837
 LOCATION OF WELL: County Grant County — 1/4 Sec. 16 T19 N. R29E W1/4
 and distance from section or subdivision corner 1090 Ft East & 300 Ft N. from S. W. Corner, Sec 16

(3) PROPOSED USE: Domestic ☐ Industrial ☒ Municipal ☐
 Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well No II
 (if more than one).....
 New well ☒ Method: Dug ☐ Bored ☐
 Deepened ☐ Cable ☒ Driven ☐
 Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 12" to 15" inches
 Drilled 200-220 ft. Depth of completed well 200-220 ft.

(6) CONSTRUCTION DETAILS: Casing installed: 12" Diam. from 0 ft. to 100 ft.
 Threaded ☐ " Diam. from 0 ft. to 100 ft.
 Welded ☒ " Diam. from 0 ft. to 100 ft.

Perforations: Yes ☐ No ☒

Type of perforator used.....

SIZE of perforations in. by in.
 perforations from ft. to ft.
 perforations from ft. to ft.
 perforations from ft. to ft.

Screens: Yes ☐ No ☒

Manufacturer's Name.....

Type..... Model No.....
 Diam. Slot size from ft. to ft.
 Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:.....

Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 112 ft.

Material used in seal.....

Did any strata contain unusable water? Yes ☒ No ☐

Type of water Surface Depth of strata 82'

Method of sealing strata off Concrete Bottom

(7) PUMP: Manufacturer's Name Byron Jackson
 Type: Deep Well 16 Stage HP 200

(8) WATER LEVELS: Land-surface elevation 1242 ft.
 above mean sea level.....

Static level 130 ft. below top of well Date 9/72

Artesian pressure lbs. per square inch

Artesian water is controlled by..... (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level SHINN

Was a pump test made? Yes ☒ No ☐ If yes, by whom SHINN

Yield: gal./min. with ft. drawdown after hrs.

" 1600 " 180 " "

" " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time Water Level Time Water Level Time Water Level

Time Water Level Time Water Level Time Water Level

Time Water Level Time Water Level Time Water Level

Time Water Level Time Water Level Time Water Level

Time Water Level Time Water Level Time Water Level

Time Water Level Time Water Level Time Water Level

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(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Over Burden	0	5
Caliche	5	18
Broken Basalt & Clay S	18	29
Black Broken Basalt	29	42
Broken Black & Brown B	42	82
Basalt Water Bearing	82	114
Black Basalt	114	131
Black & Brown Basalt	131	141
Black Basalt	141	160
Black & Brown Basalt	160	172
Grey Basalt	172	177
Black & Brown Basalt	177	183
Black Basalt	183	216
Black & Brown Basalt	216	237
with Clay Seams	237	258
Black Basalt	258	281
with Clay Seams	281	297
Grey Basalt	297	327
Black & Brown Basalt	327	357
with Clay Seams	357	390
Grey Basalt	390	427
15" to 12" at 392	427	437
Black Basalt Water Bearing	437	462
with Clay Seams	462	477
Black Basalt	477	492
with Clay Seams	492	507
Black Basalt	507	527
with Clay Seams	527	542
Black Basalt	542	557
with Clay Seams	557	572
Black Basalt	572	587
with Clay Seams	587	602
Black Basalt	602	617
with Clay Seams	617	632
Black Basalt	632	647
with Clay Seams	647	662
Black Basalt	662	677
with Clay Seams	677	692
Black Basalt	692	707
with Clay Seams	707	722

Work started 9-8 1968 Completed 5-1 1969

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Fresh Drilling
 (Person, firm, or corporation) (Type or print)

Address Moses Lake Wash

[Signed] Reddy
 (Well Driller)

License No. Date May 29, 1973

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Please print, sign and return to the Department of Ecology



Water Well Report

Original - Ecology, 1st copy - owner, 2nd copy - driller

Construction/Decommission

☒ Construction☐ Decommission ORIGINAL INSTALLATION Notice of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal
☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) 1
☒ New well ☐ Reconditioned ☐ Method: ☐ Dug ☐ Bored ☐ Driven
☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 45 ft.
 Depth of completed well 45 ft.

CONSTRUCTION DETAILS
 Casing: ☒ Welded 6 ft. Diam. from +1 ft. to 40 ft.
 Installed: ☐ Liner installed _____ ft. from _____ ft. to _____ ft.
☐ Threaded _____ ft. from _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No
 Type of perforator used _____
 SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☒ Yes ☐ No ☐ K-Pac Location 40-45
 Manufacturer's Name Johnson
 Type SS Model No. _____
 Diam. 5" Slot size 20 from 40 ft. to 45 ft.
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No ☐ Size of gravel/sand _____
 Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18 ft.
 Material used in seal grout
 Did any strata contain unusable water? ☐ Yes ☒ No
 Type of water? _____ Depth of strata _____
 Method of sealing strata off _____

PUMP: Manufacturer's Name _____
 Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
 Static level 14 ft. below top of well Date 10-24-05
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level
 Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____
 Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
 Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
 Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

 Date of test _____
 Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
 Airstest 40 gal./min. with stem set at 25 ft. for 2 hrs.
 Artesian flow _____ g.p.m. Date _____
 Temperature of water 39.8 Was a chemical analysis made? ☐ Yes ☒ No

Current

Notice of Intent No. 10178980Unique Ecology Well ID Tag No. AIR 294

Water Right Permit No. _____

Property Owner Name Joel DelarosaWell Street Address 9126 Ad H NewCity Quincy County Grant 98837 ²³Location NE 1/4 NE 1/4 Sec 16 Twn 19 R 29 EWM or WWM ☒ circle one

Lat/Long (s, t, r) Lat Deg _____ Lat Min/Sec _____

still REQUIRED) Long Deg _____ Long Min/Sec _____

Tax Parcel No. 151 9090-04

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information indicate all water encountered. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Boulders & Gravel	0	16
Sand Black	16	45
Sandy clay brown	45	55

RECEIVED

JAN 3 2006

DEPARTMENT OF ECOLOGY
 EASTERN REGIONAL OFFICE

Start Date 10-24-05Completed Date 10-24-05

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Driller/Engineer/Trainee Name (Print) Tim Stien S.Driller/Engineer/Trainee Signature Tim Stien S.Driller or trainee License No. 0469

If TRAINEE.

Driller's Licensed No. _____

Driller's Signature _____

Drilling Company Joy Drilling CoAddress 5369 Javel St.City, State, Zip MOSES WA 98837

Contractor's

Registration No. JOY DRC 13704 Date 11-1-05

Ecology is an Equal Opportunity Employer.

ECY 050-1-20 (Rev 2/03)

File Original and First Copy with
Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Water Right Permit No.

Start Card No. W099452

UNIQUE WELL I.D. #

(1) OWNER: Name Don Korkinen Address 4075 Rd E NW
(2) LOCATION OF WELL: County Grant NW 1/4 NW 1/4 Sec 16 T. 19 N. R. 29 W.M.
(2a) STREET ADDRESS OF WELL (or nearest address)

(3) PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐
☐ Irrigation ☐ Test Well ☐ Other ☐
☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one)
Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 190 feet. Depth of completed well 190 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 Diam. from 7-1 ft. to 40 ft.
Welded ☒ Diam. from _____ ft. to _____ ft.
Liner installed ☐ Diam. from _____ ft. to _____ ft.
Threaded ☐ Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 40 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 18 ft. below top of well Date 8-22-97
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)
Time Water Level Time Water Level

Date of test

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airstest 50 gal./min. with stem set at 160 ft. for 4 hrs.

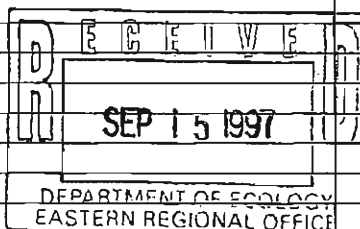
Artesian flow _____ g.p.m. Date _____

Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Top Soil	0	10
Clayshale	10	30
Brown Basalt	30	35
Black Basalt	35	80
Brown Basalt	80	100
Black Basalt	100	170
Brown Basalt	170	190



Work Started 8-22-97 Completed 8-24 1997

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME D & F Drilling (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address 3608 Rd E NE Marysville
(Signed) [Signature] License No. 0116

Contractor's Registration No. DEDRILLR2 Date 8-24 1997

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

36

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
AND DEVELOPMENT

WELL LOG

No. Appl. #3283

Date July 10, 1953

Cert. #2052-A

Record by Sam Palmerton

Source Well Driller's record

Location: State of WASHINGTON

County Grant

Area

Map

SW 1/4 NW 1/4 sec. 16 T. 19 N. R. 29 E.

DIAGRAM OF SECTION

Drilling Co. Wheeler Water Association, Inc.

Address Moss Lake, Wash.

Method of Drilling drilled Date 19

Owner Wheeler Water Association, Inc.

Address Moss Lake, Wash.

Land surface, datum 1221 ft. above
below

CORRELATION	MATERIAL	THICKNESS (feet)	DEPTH (feet)
-------------	----------	------------------	--------------

(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses, if material water-bearing, so state and record static level if reported. Give depths in feet below land surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Follow log of materials. List all casings, perforations, screens, etc.)

	Top soil	20	20
	Gravel	11	31
	Brown basalt	35	66
	Water, 58' to 60'		
	Black basalt	49	115
	Gray basalt	23	138
	Brown porous basalt	20	158
	Black basalt	21	179
	Brown basalt	58	237
	Black basalt	31	268
	Black porous basalt	20	288
	Water 268' to 288'		
	Black basalt	2	290
Pump Test:			
	Dim: 290' x 6"		
	SWL: 55'		

Turn up

(Over)

Sheet of sheets

The Dep. The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

No. _____/_____-_____-_____

REF 7419-48 DEMINGSDP 185-28 28 743-24

File Original with
Department of EcologySecond Copy - Owner's Copy
Third Copy - Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Notice of Intent W130713UNIQUE WELL I.D. # AFQ 497

Water Right Permit No. _____

(1) OWNER: Name William Walker Address 14928 4th St NE Moses Lake(2) LOCATION OF WELL: County Grant S 1/2 1/4 SE 1/4 Sec. 16 T 19 N.R. 29 E W

(2a) STREET ADDRESS OF WELL: (or nearest address) _____

TAX PARCEL NO.: _____

(3) PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal
☐ Irrigation ☐ Test Well ☐ Other
☐ DeWater(4) TYPE OF WORK: Owner's number of well (if more than one) _____
☒ New Well Method: ☐ Dug ☐ Bored
☐ Deepened ☐ Cable ☐ Driven
☐ Reconditioned ☒ Rotary ☐ Jetted
☐ Decommission(5) DIMENSIONS: Diameter of well 6" inches
Drilled 100 feet. Depth of completed well 100 ft.

(6) CONSTRUCTION DETAILS

Casing Installed:

☒ Welded 6" Diam. from 41 ft. to 43 ft.
☐ Liner Installed _____ Diam. from _____ ft. to _____ ft.
☐ Threaded _____ Diam. from _____ ft. to _____ ft.Perforations: ☐ Yes ☒ No

Type of perforator used _____

SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot Size _____ from _____ ft. to _____ ft.

Diam. _____ Slot Size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No ☐ Size of gravel/sand _____

Material placed from _____ ft. to _____ ft.

Surface seal: ☒ Yes ☐ No To what depth? 43 ft. ft.Material used in seal Portland CementDid any strata contain unusable water? ☐ Yes ☒ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 35 ft. ft. below top of well Date 4-21-01

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____
(Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☐ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time Water Level Time Water Level Time Water Level

Date of test _____

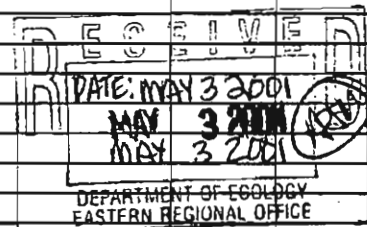
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 30 gal./min. with _____ ft. drawdown after 2 hrs.

Artesian flow _____ g.p.m. Date _____

Temperature of water 66.4 Was a chemical analysis made? ☐ Yes ☒ No(10) WELL LOG or DECOMMISSIONING PROCEDURE DESCRIPTION
Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. Indicate all water encountered.

MATERIAL	FROM	TO
Dirt	0	16
Caliche	16	21
Dry clay	21	34
Basalt brown	34	43
Basalt black	43	47
Basalt black and red	47	99
Basalt grey	99	102

Work Started 4-21-01 Completed 4-21-01

WELL CONSTRUCTION CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Type or Print Name Tim Stevens License No. 0469
(Licensed Driller/Engineer)

Trainee Name _____ License No. _____

Drilling Company Toy Drilling Co(Signed) Tim Stevens License No. 0469
(Licensed Driller/Engineer)Address MOSES LAKE WAContractor's
Registration No. TOY DKE1320K Date 4-22-01

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (360) 407-6500. The TDD number is (360) 407-6005.



WASHINGTON STATE
DEPARTMENT OF
ECOLOGY

Well Tagging Form

m 39

Unique Well Tag No:

AEH 393 -

111743

02

RECORD VERIFICATION (check ☒ one)

- ☐ Well Report available (please attach this form to the well report and submit it to the Ecology Regional Office near you)
- ☐ Verification inconclusive
- ☒ Well Report not available

WELL OWNERSHIP, IF DIFFERENT FROM WELL REPORT

First Name: Nestle USA Last Name: _____

Street Address: 14124 Wheeler Rd NE

City: Moses Lake State: WA

LOCATION OF WELL, IF DIFFERENT FROM WELL REPORT

Well Address: _____

City: _____ County: _____

T. 14 N. R. 29 E W.M. Sec. 16 NW 1/4 of the SE

FOR AGENCY USE ONLY

Latitude 47 07 53 64685 54383 "

Longitude 119 11 19 03063 "

24 39568 W

Elevation at land surface 395 402 feet/meters (circle one)

Additional information, if available:

- ☐ Location marked on topographic map (please attach)
- ☐ Location marked on air photo (please attach)

- ☒ GPS
- ☐ Topographic Map
- ☐ Survey
- ☐ Computer generated
- ☐ Digital Altimeter
- ☐ Topographic Map
- ☒ Other GPS

FOR AGENCY USE ONLY

WELL CHARACTERISTICS

Physical Description of well (size of casing, type of well, housing, etc.)

Location of Well identification Tag:

on outlet pipe behind pump in well house

Was supplemental tag needed for ease of identifying well?

☐

Yes

☒

No

If yes, where was tag placed?

D	C	B	A
E	F	G	H
M	L	K	J
N	P	Q	R

Scale 1:24,000 (1"=2,000')

Indicate the location of the well within the Section by drawing a dot at that point.

SECTION

16

COMMENTS:

FOR ECOLOGY WATER RESOURCES PROGRAM ONLY

Water Right #

Date Issued

Circle One:

Application

Permit

Certificate

Claim

Exempt

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
AND DEVELOPMENT

WELL LOG

No. Decla. #649

Date 1910 19

Cert. #569-D

Record by J. T. Moore

Source G. W. Decla. Claim

Location: State of WASHINGTON

County Grant

Area

Map

SE 1/4 SE 1/4 sec. 16 T. 19 N., R. 29 E.

DIAGRAM OF SECTION

Drilling Co.

Address

Method of Drilling drilled Date 19

Owner Northern Pacific Railway

Address Smith Tower, Seattle

Land surface, datum ft. above
below

CORRELATION	MATERIAL	THICKNESS (feet)	DEPTH (feet)
-------------	----------	------------------	--------------

(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)

	no record		
	1st water vein	300	300
	2nd " "	57	357
Pump Test:			
	Dim: 372' x 10"		
	SW: 130'		
	Dd: not given		
	Yield 50 g.p.m. (Claim)		
	Casing: 10" dia. W.S. pipe from 0'		
	to 58'		
	Pump: Geared pump head, 5 3/4" x 36"		
	cylinder		
	Motor: 15 hp		

Turn up

Sheet 1 of 1 sheets

Please print, sign and return to the Department of Ecology



Water Well Report

Original - Ecology, 1st copy - owner, 2nd copy - driller

Construction/Decommission

☒ Construction☐ Decommission ORIGINAL INSTALLATION Notice of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal
☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____
☒ New well ☐ Reconditioned Method: ☐ Dug ☐ Bored ☐ Driven
☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 80 ft.
 Depth of completed well 80 ft.

CONSTRUCTION DETAILS
 Casing ☒ Welded 6" Diam from +1 ft. to 33 ft.
 Installed: ☐ Liner installed _____ Diam. from _____ ft. to _____ ft.
☐ Threaded _____ Diam. from _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No
 Type of perforator used _____
 SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____
 Manufacturer's Name _____
 Type _____ Model No. _____
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☐ No ☐ Size of gravel/sand _____
 Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 33 ft.
 Material used in seal grout
 Did any strata contain unusable water? ☐ Yes ☒ No
 Type of water? _____ Depth of strata _____
 Method of sealing strata off _____

PUMP: Manufacturer's Name _____ H.P. _____
 Type: _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
 Static level 30 ft. below top of well Date 7-13-05
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level
 Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____
 Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
 Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
 Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
 Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

 Date of test _____
 Bailor test _____ gal./min. with _____ ft. drawdown after _____ hrs.
 Airiest 30-40 gal./min. with stem set at 75 ft. for 2 hrs.
 Artesian flow _____ g.p.m. Date _____
 Temperature of water 51.6 Was a chemical analysis made? ☐ Yes ☒ No

Current

Notice of Intent No. W 185334Unique Ecology Well ID Tag No. AR 370

Water Right Permit No. _____

Property Owner Name Mania PariasWell Street Address NACity Moses Lake County GraftLocation SE 1/4 SE 1/4 Sec 16 Twn 12 R 27 EWM or WWM ☒ circle one

Lat/Long (s, t, r) Lat Deg _____ Lat Min/Sec _____

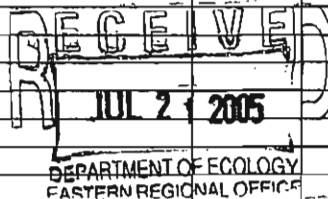
still REQUIRED) Long Deg _____ Long Min/Sec _____

Tax Parcel No. 12-116300

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information indicate all water encountered. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Dirt	0	14
Caliche	14	19
Dirt	19	22
Basalt brown red	22	33
Basalt grey	33	52
Basalt black red	52	80
Brown	420	

Start Date 7-13-05 Completed Date 7-13-05

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Driller/Engineer/Trainee Name (Print) Jim SteensDriller/Engineer/Trainee Signature Jim SteensDriller or trainee License No. 0469Drilling Company Joy Drilling CoAddress 5369 Janel CtCity, State, Zip Moses Lake WA 98837Contractor's Registration No. Joy DR 13704 Date 7-15-05

Ecology is an Equal Opportunity Employer. ECY 050-I-20 (Rev 2/03)

IF TRAINEE.

Driller's Licensed No. _____

Driller's Signature _____

Please print, sign and return to the Department of Ecology



Water Well Report

Original - Ecology, 1st copy - owner, 2nd copy - driller

Construction/Decommission

☒ Construction☐ Decommission ORIGINAL INSTALLATION Notice of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal
☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____
☒ New well ☐ Reconditioned **Method:** ☐ Dug ☐ Bored ☐ Driven
☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 20 ft.
 Depth of completed well 90 ft.

CONSTRUCTION DETAILS
 Casing ☐ Welded 6 " Diam. from 71 ft. to 39 ft.
 Installed: ☒ Liner installed 538 " Diam. from 30 ft. to 90 ft.
☐ Threaded _____ Diam. from _____ ft. to _____ ft.

Perforations: ☐ Yes ☐ No
 Type of perforator used _____
 SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____
 Manufacturer's Name _____
 Type _____ Model No. _____
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☐ No ☐ Size of gravel/sand _____
 Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 40 ft.
 Material used in seal Portland Cement
 Did any strata contain unusable water? ☐ Yes ☒ No
 Type of water? _____ Depth of strata _____
 Method of sealing strata off _____

PUMP: Manufacturer's Name _____ H.P. _____
 Type _____

WATER LEVELS: Land surface elevation above mean sea level _____ ft.
 Static level 26 ft. below top of well Date 7-14-05
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level
 Was a pump test made? ☐ Yes ☐ No If yes, by whom? _____
 Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
 Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
 Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

 Date of test _____
 Bailor test _____ gal./min. with _____ ft. drawdown after _____ hrs.
 Airtest 30 gal./min. with stem set at 80 ft. for 2 hrs
 Artesian flow _____ g.p.m. Date _____
 Temperature of water 59.6 Was a chemical analysis made? ☐ Yes ☒ No

Current

Notice of Intent No. W 185335Unique Ecology Well ID Tag No. A/L 371

Water Right Permit No. _____

Property Owner Name Melecio CernaWell Street Address NaCity Moses Lake County GrantLocation SW 1/4-11SE 1/4 Sec 16 Twn 17 R 7 EWM or WWM ☒ circle one

Lat/Long (s, l, r) Lat Deg _____ Lat Min/Sec _____

still REQUIRED) Long Deg _____ Long Min/Sec _____

Tax Parcel No. 12-16-68-000

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information indicate all water encountered. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Dirt	0	15
Caliche	15	21
Dirt	21	25
Basalt Brown red	25	39
Yellow	39	47
Basalt Grey	47	90
Basalt Red Yellow	90	
Brown white shale H2O		
Basalt Grey		

DATE RECEIVED
 JUL 29 2005
 DEPARTMENT OF ECOLOGY
 EASTERN REGIONAL OFFICE

Start Date 7-14-05 Completed Date 7-14-05

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Driller/Engineer/Trainee Name (Print) Tim StevensDriller/Engineer/Trainee Signature Tim StevensDriller or trainee License No. 0469Drilling Company Joy Drilling CoAddress 5369 Janet CtCity, State, Zip Moses Lake WA

Contractor's

Registration No. Joy PAC13704 Date 7-15-05

Ecology is an Equal Opportunity Employer.

ECY 050-1-20 (Rev 2/03)

IF TRAINEE,

Driller's Licensed No. _____

Driller's Signature _____

File Original and First Copy with
Department of Ecology
Second Copy -- Owner's Copy
Third Copy -- Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No.

Permit No.

(1) OWNER: Name Jessie M. Shannon Address Route 2, Box 81, Moses Lake, WA 98837

LOCATION OF WELL: County GRANT - SW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec 16 T. 29 N. R. 19 E. W.M.

Bearing and distance from section or subdivision corner 19 29

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one)
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6.7 inches.
Drilled 75 ft. Depth of completed well 73 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6" Diam. from +1 ft. to 27 ft.

Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒

Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒

Manufacturer's Name
Type Model No
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:

Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 27 ft.

Material used in seal bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name

Type: H.P.

(8) WATER LEVELS: Land-surface elevation ft.

Static level 50 ft. below top of well Date 12/18/75

Artesian pressure lbs. per square inch Date

Artesian water is controlled by
(Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☒ If yes, by whom?

Yield: 25 gal./min. with ft. drawdown after hrs.

" ESTIMATED AIRLIFT " " "

" " " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test

Bailer test gal./min. with ft. drawdown after hrs.

Artesian flow g.p.m. Date

Temperature of water Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Silt	0	15
Caliche	15	23
Basalt, soft	23	27
Basalt, medium	27	65
Basalt, fractured w/water	65	75

60' of 4" PVC Liner Installed

6" Drive shoe installed

RECEIVED

JAN 8 1986

DEPARTMENT OF ECOLOGY
SPOKANE REGIONAL OFFICE

Work started 12/17, 1985. Completed 12/18, 1985.

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME PONDEROSA DRILLING & DEVELOPMENT INC.
(Person, firm, or corporation) (Type or print)

Address E. 6010 Broadway, Spokane, WA 99212

[Signed] James M. Doyle
James M. Doyle (Well Driller)

License No. 1287 Date 12/18, 1985



45

UNIQUE WELL I.D. NUMBER

A	B	Z	5	0	1
X	Y	Z	1	2	3

WELL TAGGING FORM

Date of Field Visit _____ By _____

RECORD VERIFICATION

- ☒ Well Report available (please attach)
☐ Well Report not available
☐ Verification inconclusive

WELL OWNERSHIP

Name NATIONAL FROZEN FOODS CORPORATION

Street address 14406 ROAD 3 N.E.

City MOSES LAKE State WASHINGTON

LOCATION OF WELL

Well Address 14406 ROAD 3 N.E.

City MOSES LAKE County GRANT

T. 19 N. R. 29 W.M. Sec. 16 $\frac{1}{4}$ SE $\frac{1}{4}$ SW

GPS Location: Latitude _____ ° _____ ' _____ "

Longitude _____ ° _____ ' _____ "

Elevation at land surface _____ feet/meters (circle one)

- ☐ Digital Altimeter
☐ Topographic Map
☐ Other _____

If unable to verify location with GPS equipment:

- ☐ Location marked on topographic map (please attach if available)
☒ Location marked on air photo (please attach if available)

WELL CHARACTERISTICS

Physical Description of Well (size of casing, type of well, housing, etc.): _____

Depth of well is 719'. set a bridge at 352', set 346½' of 12" casing cemented
in with one yard of neat cement

Location of Well Identification Tag: _____

Was Supplemental Tag needed for ease of identifying well?

☐ NO

☐ YES

If yes, where was tag placed? _____

Scale 1:24,000 (1"=2,000')

D	C	B	A
E	F	G	H
M	L	K	J
N	P	Q	R

Indicate the location of the well within the Section
by drawing a dot at that point.

SECTION _____

COMMENTS: _____

FOR ECOLOGY WATER RESOURCES PROGRAM USE ONLY

Water Right # _____

Date Issued _____

Circle one: Application Permit Certificate Claim Exempt

46

STATE OF WASHINGTON.
DEPARTMENT OF CONSERVATION
AND DEVELOPMENT Appli. #7474

WELL LOG No. Permit-#7021

Date Sept. 25, 1965.

Record by Driller

Source Driller's Record

Location: State of WASHINGTON

County Grant

Area 590' E and 300' N of

Map SW section corner.

SW 1/4 SW 1/4 sec. 16 T. 19 N. R. 29 E.

Drilling Co. Frear Drilling

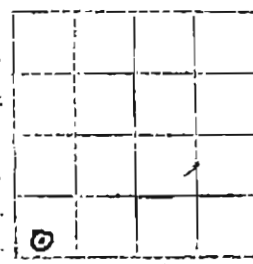
Address Moses Lake, Washington

Method of Drilling Date July 16, 1965

Owner Pronto Foods, Inc.

Address Moses Lake, Washington

Land surface, datum ft above below



CORRELATION	MATERIAL	FROM (feet)	TO (feet)
-------------	----------	-------------	-----------

(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)

Industrial use		
DIMS: 16" x 670'		
Dirt	0	8
Caliche	8	16
Rock, broken	16	75
Basalt, black	75	106
Gray basalt	106	134
Basalt, black	130	241
Clay, broken	241	260
Basalt, black (wtr 275 to 289)	260	320
Basalt, gray	320	360
Basalt, black	360	378
Basalt, gray	378	421
Basalt, black	421	466

Turn up Sheet of sheets

46

WELL LOG--Continued

No. /

COM- LAYER	MATERIAL	DEPTH (feet) FROM	DEPTH (feet) TO
	Depth forward	-----	
	Basalt, black, broken	466	503
	Basalt, gray (water at 572')	503	574
	Basalt, black (wtr at 620-632)	574	664
	Basalt, gray	664	670
	Casing: 16" from 0-754'		
	Surface sealed with cement to depth of 76'		
	SWL: 55' on 7/16/65		
	Yield: 1400 gpm with 106' DD after 5 hrs.		
	RECOVERY DATA: Time Water Level		
	0 135'		
	10 135'		
	15 135'		
	20 135'		
	NOTE: Pump gravel around bowls had to lower pump to free in well.		
	DATE: 8/21/65		
	Temp: 55°		
	Meter H 48.3 1400 gals		
	12/75 509 823		
	12/74 399 170		

WATER WELL REPORT STATE OF WASHINGTON

Original and First Copy with
Division of Water Resources
1 Copy - Owner's Copy
1 Copy - Driller's Copy

Application No. 8463
Permit No. 7827

1) OWNER:

Name WESTERN FARMERS ASSOCIATION
Address MOSES LAKE WASH.

2) LOCATION OF WELL:

County Spokane Owner's number, if any—
51 Section 16 T. 14 R. 29 E W.M.
Bearing and distance from section or subdivision corner
The easterly 1439 feet of the N $\frac{1}{4}$ of Farm Unit
81, Irrigation Block 41 within SW $\frac{1}{4}$ of Sec. 16,
T. 19 N., R. 29 E.W.M.

3) TYPE OF WORK (check):

New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 11.

4) PROPOSED USE (check):

Domestic ☐ Industrial ☒ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(5) TYPE OF WELL:

Rotary ☐ Driven ☐
Cable ☒ Jetted ☐
Dug ☐ Bored ☐

6) CASING INSTALLED:

Threaded ☐ Welded ☐

" Diam. from 2 ft. to 7.9 ft. Gage 375
" Diam. from 5.2 ft. to 5.73 ft. Gage 312
" Diam. from _____ ft. to _____ ft. Gage _____

7) PERFORATIONS:

Perforated? ☒ Yes ☐ No

Type of perforator used TORCH CUT
SIZE of perforations $\frac{1}{4}$ in. by 4 in. 12 holes
perforations from _____ ft. to _____ ft.
600 perforations from 521 ft. to 571 ft.
perforations from _____ ft. to _____ ft.
perforations from _____ ft. to _____ ft.
perforations from _____ ft. to _____ ft.

8) SCREENS:

Well screen installed ☐ Yes ☒ No

Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ Set from _____ ft. to _____ ft.
Diam. _____ Slot size _____ Set from _____ ft. to _____ ft.

9) CONSTRUCTION:

Was well gravel packed? ☐ Yes ☒ No Size of gravel: _____
Gravel placed from _____ ft. to _____ ft.
Was a surface seal provided? ☒ Yes ☐ No To what depth? 79 ft.
Material used in seal— NEAT CEMENT GROUT
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? _____ Depth of strata _____
Depth of sealing strata off _____

10) WATER LEVELS:

Static level 124.6 ft. below land surface Date MAY 24, 67
Artesian pressure _____ lbs. per square inch Date _____
Water is controlled by _____ (Cap, valve, etc.)
OK

(11) WELL TESTS:

Drawdown is amount water level is lowered below static level

Was a pump test made? ☒ Yes ☐ No. If yes, by whom? HOLMAN DRILLING
Yield: 1000 gal./min. with 5.7 ft. drawdown after 2 hrs.
" 1200 " 6.8 " 2 "
" 1500 " 8.3 " 2 "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level
0	132.9	40	126.2
10 sec	127.5	50	126
20	126.5	60 sec	125.9
30	126.3		

Date of test MAY 24 67

Ballor test gal./min with _____ ft. drawdown after _____ hrs.

Artesian flow _____ g.p.m. Date _____

Temperature of water 51° Was a chemical analysis made? ☐ Yes ☒ No

(12) WELL LOG:

Diameter of well 16 inches.

Depth drilled 720 ft. Depth of completed well 720 ft.

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
SANDY CLAY	0	26
BASALT (BRYN SOFT) * CHASD OFF	26	64
BASALT (HARD GRAY)	64	128
BASALT (MED GRAY) *	128	140
BASALT (HARD GRAY)	140	167
BASALT (MED BRYN FRACTURED) *	167	184
BASALT (MED GRAY)	184	342
BASALT (SOFT BRYN + CLAY)	342	346
BASALT (HARD GRAY)	346	517
BASALT (SOFT DARK GRAY) * *	517	569
BASALT (HARD DARK GRAY)	569	583
BASALT (MED BLACK FRACTURED) *	583	607
BASALT (HARD GRAY)	607	664
BASALT (SOFT RED FRACTURED) *	664	695
BASALT (SOFT PURPLE) *	695	714
BASALT (HARD BLACK)	714	720

WATER BEARING * CASING INSTALLED
Work started MARCH 9, 1967 Completed MAY 26, 1967

(13) PUMP:

Manufacturer's Name WORTHINGTON
Type VERTICAL TURBINE HP. 200

Well Driller's Statement:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME HOLMAN DRILLING CORP
(Person, firm, or corporation) (Type or print)

Address E 3710 9TH SPOKANE WASH

[Signed] Arnold E Holman
(Well Driller)

License No. 223 02 4726 Date MAY 29, 1967

STATE OF WASHINGTON.

DEPARTMENT OF CONSERVATION
AND DEVELOPMENTAppli: 8463
Permit: 7827

WELL LOG

No. /

Date October 2, 1967Record by DrillerSource Driller's record

Location: State of WASHINGTON

County Grant

Area

Map

SW 1/4 SW 1/4 sec 16 T. 19 N. R. 29E E.

Diagram of Section

Drilling Co. Holman Drilling Corp.Address East 3410 --9th, Spokane, Wash.Method of Drilling Cable Date May 26, 1967Owner Western Farmers AssociationAddress Moses Lake, WashingtonLand surface, datum 123.0 ft. aboveSWL: 124.6 5-24-67 below Dims: 16" x 720'

CORRELATION	MATERIAL	THICKNESS (feet)	DEPTH (feet)
	Municipal		
	Clay, sandy	0	26
	Basalt, brown, soft	26	64
	Basalt, grey, hard	64	128
	Basalt, grey, med.	128	140
	Basalt, grey, hard	140	167
	Basalt, brown, med., fractured	167	184
	Basalt, grey, med.	184	342
	Basalt, clay, brown, soft	342	346
	Basalt, grey, hard	346	517
	Basalt, dark grey, soft	517	569
	Basalt, dark grey, hard	569	583
	Basalt, med. black, fractured	583	607
	Basalt, grey, hard	607	664
	Basalt, red, soft, fractured	664	695
	Basalt, purple, soft	695	714

Turn up

Sheet of sheets

(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)

No. _____ / _____ - _____

S. F. No. 7445—OS—6-61—2M.

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
DIVISION OF WATER RESOURCES

Appl. #8483

WELL LOG

Permit # 7829

Record by.....Driller.....
Source.....Driller's record.....

Location: State of WASHINGTON

County.....Grant.....

Area.....

Map.....

SW 1/4 SW 1/4 sec. 16 T. 19 N. R. 29 E. WX

Diagram of Section

Drilling Co.....Frear Drilling.....

Address.....Moses Lake, Washington.....

Method of Drilling.....Cable..... Date May 25, 1967

Owner.....Terminal Ice & Cold Storage Co.,.....

Address.....514 Pittock Block Portland, Oregon 97205.....

Land surface, datum.....1240 ft. above.....12"x425"

SWL: 116' Date May 17, 1967 Dims: 8"x495"

CORRELATION	MATERIAL	From (feet)	To (feet)
	Industrial		
	Topsoil	0	8
	Coliche	8	16
	Basalt, black and brown, broken with clay seams	16	60
	Basalt, black	60	73 1/2
	Basalt, black	73 1/2	116
	Basalt, gray	116	149
	Basalt, black	149	166
	Basalt, gray	166	194
	Basalt, black	194	215
	Basalt, gray	215	234
	Basalt, black	234	287
	Basalt, gray	287	347
	Basalt, black, water-bearing	347	357
	Basalt, gray	357	424

Turn up

Sheet.....of.....sheets

No. 1 / -

S. F. No. 1449-OS-12-68.

File Original and First Copy with the Department of Ecology Resources
Second Copy - Owner's Copy
Third Copy - Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No. 111

Permit No. 7227

(1) OWNER: Name Terminal Ice Cold Storage Address 5716 N. Oregon
(2) LOCATION OF WELL: County Grant - Sec. 16, T. 19 N., R. 29 E.
Bearing and distance from section or subdivision corner N 44° E 1650 ft from SW corner of Sec. 16

(3) PROPOSED USE: Domestic ☐ Industrial ☒ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 12" to 4.25"
Drilled _____ ft. Depth of completed well 149.5 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 15" Diam. from 0 ft. to 30 ft.
Threaded ☐ 12" Diam. from 0 ft. to 73 1/2 ft.
Welded ☒ _____ " Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒

Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒

Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: _____

Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? _____ ft.

Material used in seal Cement
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Surface Depth of strata 100 ft.
Method of sealing strata 50.5 gal/min. 2" x 23 1/2 ft.

(7) PUMP: Manufacturer's Name Loynne Pumps Inc.
Type: VERT. TURBINE HP 40

(8) WATER LEVELS: Land-surface elevation 1240 ft. above mean sea level.
Static level 116 ft. below top of well Date 5-17-67

Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☒ No ☐ If yes, by whom? Loynne Pumps
Yield: 458 gal./min. with 104 ft. drawdown after 1 1/2 hrs.
" 421 " 86 " 3 1/2 "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
<u>1 1/2 min.</u>	<u>140</u>				

Date of test 5-17-67

Artesian flow _____ gal./min. with _____ ft. drawdown after _____ hrs.

Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Top soil	0	8
Caliche	8	16
Black & Brown Basalt		
Broken with clay veins	16	60
Water at 57 ft		
Water table 57 ft		
Black Basalt	60	73 1/2
Set 73 1/2 ft 12" casing		
Black Basalt	73 1/2	116
Gray Basalt	116	149
Black Basalt	149	166
Gray Basalt	166	194
Black Basalt	194	215
Gray Basalt	215	234
Black Basalt	234	287
13 gal. water per min.		
12" casing cemented to		
rock at 287 ft.		
surface water		
Gray Basalt	287	347
Black Basalt	347	357
Water bearing		
Gray Basalt	357	424
Black shale	424	427
Black Basalt	427	488
Water bearing		
Gray Basalt	488	495

in the casing at 450 ft.

Work started Feb 28, 1967. Completed May 25, 1967

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Freen Drilling
(Person, firm, or corporation) (Type or print)

Address Moses Lake Wash.

[Signed] Red Corp.
(Well Driller)

License No. 223-024467 Date May 31, 1967

49 m



WASHINGTON STATE
DEPARTMENT OF
ECOLOGY

Well Tagging Form

Unique Well Tag No:

87510L 01

ABR 083

RECORD VERIFICATION (check ☒ one)

- ☐ Well Report available (please attach this form to the well report and submit it to the Ecology Regional Office near you)
- ☐ Verification inconclusive
- ☒ Well Report not available

WELL OWNERSHIP, IF DIFFERENT FROM WELL REPORT

First Name: Americola Last Name: _____

Street Address: Po Box 399

City: Moses Lake State: WA

LOCATION OF WELL, IF DIFFERENT FROM WELL REPORT

Well Address: _____

City: _____ County: _____

T. 19 N. R. 29 E W.M. Sec. 16 SW 1/4 of the SW

FOR AGENCY USE ONLY

Latitude 47 08 01 . 11556 N "

Longitude 119 11 18 . 15378 W "

- ☒ GPS
- ☐ Topographic Map
- ☐ Survey
- ☐ Computer generated

- ☐ Digital Altimeter
- ☐ Topographic Map

☒ Other GPS

Elevation at land surface 401 feet feet meters (circle one)

Additional information, if available:

- ☐ Location marked on topographic map (please attach)
- ☐ Location marked on air photo (please attach)

FOR AGENCY USE ONLY

WELL CHARACTERISTICS

Physical Description of well (size of casing, type of well, housing, etc.)

Location of Well identification Tag:

on outlet pipe in well house

Was supplemental tag needed for ease of identifying well?

☐

Yes

☒

No

If yes, where was tag placed?

D	C	B	A
E	F	G	H
M	L	K	J
N	P	Q	R

Scale 1:24,000 (1"=2,000')

Indicate the location of the well within the Section by drawing a dot at that point.

SECTION

16

COMMENTS:

FOR ECOLOGY WATER RESOURCES PROGRAM ONLY

Water Right #

Date Issued

Circle One:

Application

Permit

Certificate

Claim

Exempt

50

9565-3

Water Right Permit No.

ECY 050, 20 (10 87) 1329.

File Original and First Copy with
Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No.

9565

Water Right Permit No.

51

1) OWNER: Name Union Carbide Address P.O. Box 1667 Moses Lake, Wa

(2) LOCATION OF WELL: County Grant Sec. 17 T. 19 R. 29 W. M

(2a) STREET ADDRESS OF WELL (or nearest address)

(3) PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal ☐
☐ Irrigation ☐ Test Well ☐ Other ☒
☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one)

Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 8" inches.
Drilled 41 feet. Depth of completed well 39 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 4"x6" Diam from +2 ft to -39 ft.
Welded ☒ 4" Diam from +2 ft to -39 ft.
Linear installed ☐
Threaded ☒ Diam. from ft to ft.

Perforations: Yes ☒ No ☐

Type of perforator used Torch

SIZE of perforations 1/8" in. by 3" in.
24 perforations from -20 ft to -39 ft.
perforations from ft to ft.
perforations from ft to ft.

Screens: Yes ☒ No ☐

Manufacturer's Name Aardvark

Type PVC Model No. 050

Diam 4" Slot size 10 from -19 ft to -39 ft.

Diam Slot size from ft to ft.

Gravel packed: Yes ☒ No ☐ Size of gravel 10-20 Sand

Gravel placed from ft to ft.

Surface seal: Yes ☒ No ☐ To what depth? 19 ft.

Material used in seal 3/8 pellets Bentonite

Did any strata contain unusable water? Yes ☐ No ☒

Type of water? Depth of strata

Method of sealing strata off

(7) PUMP: Manufacturer's Name

Type H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ft

Static level 30' ft below top of well Date 6-17-90

Artesian pressure lbs. per square inch Date

Artesian water is controlled by (Cap. valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☐ If yes, by whom?

Yield gal./min. with ft drawdown after hrs.

" " " " " " " "

" " " " " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time Water Level Time Water Level Time Water Level

" " " " " " " "

" " " " " " " "

Date of test

Railor test gal./min. with ft. drawdown after hrs.

Artest 3 gal./min. with stem seal at 41 ft. for 1/5 hrs.

Artesian flow g.p.m. Date

Temperature of water Was a chemical analysis made? Yes ☒ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information

	MATERIAL	FROM	TO
8"	Sand	0	14
	Caliche	14	27
	Gravel & Loose Sand	27	35
	Pattern Basalt	35	41

MONITORING WELL

JUN 25 1990

Work started 6-16 Completed 6-18 1990

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME H2O well Service Inc (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 582 W/ Haydon Ave. Haydon Id.

(Signed) John Wheeler License No. 1516 (WELL DRILLER)

Contractor's Registration No. H2O WES 1584B Date 6-19-90 1990

(USE ADDITIONAL SHEETS IF NECESSARY)

3

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File Original and First Copy with
Department of Ecology
Second Copy - Owner's Copy
Third Copy - Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 9565

Water Right Permit No. _____

(1) OWNER: Name Union Castille Address 1501 Box 1667 Marysville

(2) LOCATION OF WELL: County Grant Sec 17 T. 19 R. 29 WM

(2a) STREET ADDRESS OF WELL (or nearest address) _____

(3) PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal ☐
☐ Irrigation ☐ Test Well ☐ Other ☒
☐ DeWater ☐ Rotary ☐ Jetted

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well _____ inches.
Drilled _____ feet. Depth of completed well _____ ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6" Diam from +26' ft to -2' ft.
Welded ☒ 4" Diam from +2' ft to -50' ft.
Liner installed ☒
Threaded ☒ Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒

Type of perforator used _____

SIZE of perforations _____ in by _____ in.
perforations from _____ ft. to _____ ft.
perforations from _____ ft. to _____ ft.
perforations from _____ ft. to _____ ft.

Screens: Yes ☒ No ☐

Manufacturer's Name Cardwell
Type PVC Model No. _____
Diam 4" Slot size .010 from -30' ft to -50' ft.
Diam _____ Slot size _____ from _____ ft to _____ ft.

Gravel packed: Yes ☒ No ☐ Size of gravel 10-20 Sand
Gravel placed from -26' ft. to 50' ft.

Surface seal: Yes ☒ No ☐ To what depth? 26' ft.
Material used in seal 3/8" Bentonite pellets
Did any strata contain undesirable water? Yes ☐ No ☒
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation _____ ft.
above mean sea level
Static level -31' ft. below top of well Date 6-17-90
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap. valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield _____ gal./min with _____ ft drawdown after _____ hrs.
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)
Time Water Level Time Water Level Time Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Air test 2 gal./min with stem seal at 50' ft. for 1/3 hrs.
Artesian flow _____ g.p.m. Date 6-19-90
Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information

MATERIAL	FROM	TO
Sand	0	3
Caliche	3	6
Brown Sandy Clay	6	26
Reddish Clay & Gravel	26	50

MONITORING WELL

JUN 25 1990

Work started 6-16, 19. Completed 6-18, 1990

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief

NAME H2O Well Service Inc. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 582 W. Hayden Ave. Hayden Lake ID

(Signed) [Signature] License No 1516 (WELL DRILLER)

Contractor's Registration No H20 WES158KB Date 6-19-90 19

(USE ADDITIONAL SHEETS IF NECESSARY)

54

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
AND DEVELOPMENT

WELL LOG

No. **Appl. 4890**Date **12-18-58**, 19.....Record by **Well driller**Source **driller's record**

Location: State of WASHINGTON

County **Grant**

Area.....

Map.....

NW 1/4 sec. **17** T. **19** N., R. **29** E.

Diagram of Section

Drilling Co. **Frear Drilling Co.**Address **Moses Lake, Wash.**Method of Drilling..... Date **10-10**, 19**58**Owner **Anthony Mandery**Address **Seattle, Wash.**Land surface, datum **1218** ft. above
below

CORRE- LATION	MATERIAL	THICKNESS (feet)	DEPTH (feet)
------------------	----------	---------------------	-----------------

(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)

Dirt	2	2
Broken rock (water)	57	59
Hard grey basalt	107	166
Broken rock (water)	18	184
Reduced to 8' black basalt (water)	116	300
Black basalt & broken (water)	25	325
Black basalt & broken (water)	22	347
Hard black basalt (water)	11	358
Grey & hard basalt "	59	417
PUMP TEST:		
Dim. 12 to 184' x 417'		
SWL: 55 ft.		
DD: 98 ft.		
Yield: 1350 g.p.m.		
Water Temp. 58°		

Turn up

(over)

Sheet..... of..... sheets

No. _____/_____

B. F. No. 7440-12-34-SM. 40108.

19/29-17

54

RETURN TO:
DIVISION OF WATER RESOURCES
335 GENERAL ADMINISTRATION BLDG.
OLYMPIA, WASHINGTON

R. F. No. 7254-4-57-426, 68812

RECORD BY WELL DRILLER OR OTHER CONSTRUCTOR OF WORKS
FOR WITHDRAWAL OF GROUND WATER

RECEIVED
DIVISION OF WATER RESOURCES

DEC 1 1958

Under Permit No. G. W. 4890

(The well driller or other constructor of works for the withdrawal of public ground waters shall be obligated to furnish the permittee a certified record of the factual information necessary to show compliance with the provisions of this section." Sec. 8, Chap. 363, Laws of 1945.)

1. Anthony Mandley, 6551-50th Ave. Seattle 15
(Name and address of owner of well or other works for withdrawal of water)
2. Type; name or number of works where water is taken _____
(Well, tunnel or infiltration trench)
3. Date on which work on well or other structure was started July 15-1958
4. Date on which work was completed Oct 1 - 1958
5. If work on well or other structure was abandoned, give date _____
and reason for abandonment _____

6. DESCRIPTION OF WORKS:

(a) WELL: Depth 417 ft. Diameter 12 in. or ft. Dug or drilled Drilled
Flowing or pump well Pump Water Temp. 48

If PUMP WELL: Type and size of pump is 10" Bunker - (Bunker)

Type and size of motor or engine is 250 Hp. Continental. R. 311

Depth from ground surface to water level before pumping 55 feet

After continuous operation for 4 hours, the measured discharge of the pump is
1350 g.p.m., and the drawdown of water level is 98 feet
(At least four) (Pumping level above static water level)

Recovery data (taken after pump has been shut off) (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level
<u>4:00 PM.</u>	<u>153'</u>		
<u>4:03</u>	<u>98'</u>		
<u>4:07</u>	<u>55'</u>		

Date of test 10-10-58

If FLOWING WELL: Measured discharge _____ g.p.m. on _____ (Date)

Shut-in pressure at ground surface _____ lbs. per sq. in. on _____ (Date)

Water is controlled by _____ (Cap, valve, etc.)

CASING: (Give diameter, commercial specifications and depth below ground surface of each casing size.)

2 in. diameter _____ from 0 to 7 ft.
_____ in. diameter _____ from _____ to _____ ft.
_____ in. diameter _____ from _____ to _____ ft.
_____ in. diameter _____ from _____ to _____ ft.

Describe and show depth of shoe, plug, adapter, liner or other details:

OK
DM

54

Perforated casing or screens:

_____ from _____ to _____ ft.
 (Number per foot and size of perforations, or describe screen)
 _____ from _____ to _____ ft.
 _____ from _____ to _____ ft.
 _____ from _____ to _____ ft.
 _____ from _____ to _____ ft.

LOG OF WELL OR TUNNEL: (Describe each stratum or formation clearly, indicate if water bearing, and give thickness and depth as indicated.)

MATERIAL	Thickness (Feet)	Depth to bottom (Feet)
Gravel	2	2
Broken, Banks (water)	57	59
Hard Grey Basalt	107	166
Broken Rock (water)	118	184
Reduced to 8' Black Basalt (water)	116	300
Black Basalt & Broken (Water)	25	325
Black & Broken (Water)	22	347
Hard Black Basalt (Water)	11	358
Grey & Hard water	59	417

(b) INFILTRATION TRENCH OR TUNNEL: Type _____

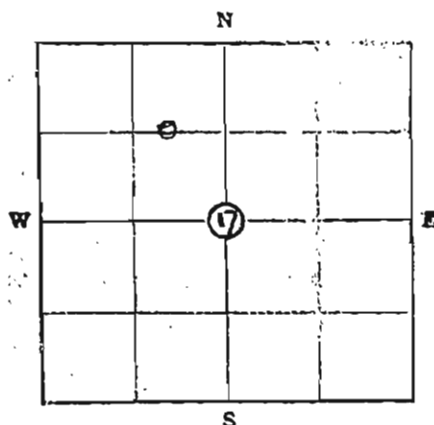
Dimensions:

(Tunnel—length, course, and cross-sectional size)

(Trench—entrance and maximum depth)

Bottom width _____ ft. Discharge _____ g.p.m. Date of test _____

Position of water bearing stratum with reference to portal of tunnel _____



Scale: 1" = 2000'

Sec. 17 Twp. 19 N Rge. 29 E

Show approximate location of well or other works with (X) on section plat at left.

Freed Drilling Co.
 Tukwila, WA

Signature of well driller or other constructor

7700 S. Lake Washington
 Address

55

File Original and First Copy with
Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. _____

Water Right Permit No. _____

(1) OWNER: Name Gary & Linda Kin Dopp Address 4308 10th Pl. MLK. Wa

(2) LOCATION OF WELL: County Grant NE 1/4 NE 1/4 Sec 17 T. 19 N. R. 29 W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) _____

(3) PROPOSED USE: ☒ Domestic ☐ Irrigation ☐ DeWater ☐ Industrial ☐ Test Well ☐ Municipal ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
Abandoned ☐ New well ☒ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Bored ☐ Cable ☐ Driven ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 170 feet. Depth of completed well 170 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 8 " Diam. from 41 ft. to 35 ft.
Welded ☒ Liner installed ☐ Threaded ☐ " Diam. from _____ ft. to _____ ft.
Perforations: Yes ☐ No ☒

Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 35 ft ft.
Material used in seal _____
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name Grundfos
Type Sub H.P. 3

(8) WATER LEVELS: Land-surface elevation 1075 ft.
Static level 8 ft. below top of well Date 8-20-92
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" 200 Gpm " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.

Artesian flow _____ g.p.m. Date _____

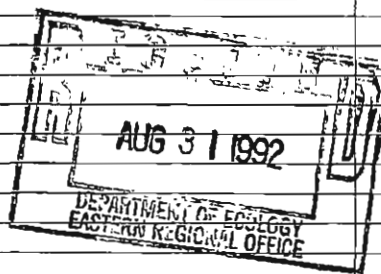
Temperature of water 60 Was a chemical analysis made? Yes ☐ No ☒

with Be.

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Dirt	0	10
caliche	10	16
Dirt & caliche	16	29
Basalt Black Brown	29	50
Basalt Red	50	62
Basalt Grey	62	130
Basalt Brown (H ₂ O)	130	165
Basalt Grey	165	170



Work started 8-19-92, 19. Completed 8-20-92, 19

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Joy Drilling Co (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address MOSES Lake WA.

(Signed) Jim Stivers License No. 469
(WELL DRILLER)

Contractor's Registration No. JOYDRRC 1370H Date 8-21, 1992

(USE ADDITIONAL SHEETS IF NECESSARY)

File Original and First Copy with
Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. _____

Water Right Permit No. _____

(1) OWNER: Name Megan Fielding Address 13952 Rd. 4 NE Moses Lake, WA

(2) LOCATION OF WELL: County Grant NE NE Sec 17 T 19 N, R 29 W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) _____

(3) PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐
☐ DeWater ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (If more than one) _____
Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6" inches.
Drilled 82 feet. Depth of completed well 82 feet.

(6) CONSTRUCTION DETAILS:

Casing installed: 6" Diam. from +2 1/2 ft. to 37 1/2 ft.
Welded ☒ 4" Diam. from 15 ft. to 82 ft.
Liner installed ☒
Threaded ☐ Diam. from _____ ft. to _____ ft.

Perforations: Yes ☒ No ☐
Type of perforator used Skill saw
SIZE of perforations 1/8 in. by 12" in.
80 perforations from 42 ft. to 82 ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 18' ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 16' ft. below top of well Date 2-14-92
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom? _____
Yield: 75+ gal./min. with _____ ft. drawdown after _____ hrs.
" Estimated air lift 75+ GPM "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Batter test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.

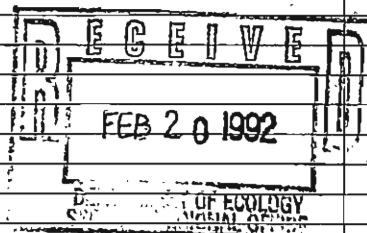
Artesian flow _____ g.p.m. Date _____

Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Top soil	0	3
Clay tan	3	18
Basalt gravel	18	37
Basalt gray	37	50
Basalt w/ caliche w/water 75 GPM	50	62
Basalt gray	62	82



6" Drive shoe utilized

Work started 2-13-92, 19. Completed 2-14, 1992

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Ponderosa Drilling & Development, Inc.
(PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address E. 6010 Broadway Spokane, WA 99212

(Signed) Alvin Carris License No. 1869
(WELL DRILLER) (Alvin Carris)

Contractor's Registration No. PO-ND-EI*248JE Date 2-17, 19 92

(USE ADDITIONAL SHEETS IF NECESSARY)

48237

ECY 050-1-20 (9/93) * * *

Permit No.

(1) OWNER: Name Union Carbide Address Moses Lake, Washington

LOCATION OF WELL: County _____ Grant _____ - _____ 1/4 Sec. 17 T. 19 N. R. 29 W.M.
Bearing and distance from section or subdivision corner _____ Monitoring well _____

(3) **PROPOSED USE:** Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☒

(4) TYPE OF WORK: Owner's number of well (if more than one)..... 1

New well <input type="checkbox"/>	Method: Dug <input type="checkbox"/>	Bored <input type="checkbox"/>
Deepened <input type="checkbox"/>	Cable <input checked="" type="checkbox"/>	Driven <input type="checkbox"/>
Reconditioned <input type="checkbox"/>	Rotary <input type="checkbox"/>	Jetted <input type="checkbox"/>

(5) **DIMENSIONS:** Diameter of well 12 inches.
 Drilled ft. Depth of completed well 40 ft.

(6) CONSTRUCTION DETAILS: 316 Stainless Steel

Casing installed: 4 " Diam. from +2 ft. to 20 ft.
 Threaded ☐ " Diam. from ft. to ft.
 Welded ☐ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☐

Type of perforator used.....

SIZE of perforations in. by in.

..... perforations from ft. to ft.

..... perforations from ft. to ft.

..... perforations from ft. to ft.

Screens: Yes ☒ No ☐

Manufacturer's Name Johnson 316

Type Stainless steel Model No. _____

Diam. 4" Slot size 0.025 from 20 ft. to 40 ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☒ No ☐ Size of gravel: _____
Gravel placed from 19 ft. to 40 ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal: cement
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? surface Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) **WATER LEVELS:** Land-surface elevation above mean sea level 1200 ft.
 Static level 18 ft. below top of well Date _____
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (Cap. valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☒ No ☐ If yes, by whom?

Yield: 25 gal./min. with 2 1/2 ft. drawdown after 2 hrs.

10	00	91	00
10	00	91	00

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
00:00	1.00	00:00	1.00	00:00	1.00
00:01	1.01	00:01	1.01	00:01	1.01
00:02	1.02	00:02	1.02	00:02	1.02
00:03	1.03	00:03	1.03	00:03	1.03
00:04	1.04	00:04	1.04	00:04	1.04
00:05	1.05	00:05	1.05	00:05	1.05
00:06	1.06	00:06	1.06	00:06	1.06
00:07	1.07	00:07	1.07	00:07	1.07
00:08	1.08	00:08	1.08	00:08	1.08
00:09	1.09	00:09	1.09	00:09	1.09
00:10	1.10	00:10	1.10	00:10	1.10
00:11	1.11	00:11	1.11	00:11	1.11
00:12	1.12	00:12	1.12	00:12	1.12
00:13	1.13	00:13	1.13	00:13	1.13
00:14	1.14	00:14	1.14	00:14	1.14
00:15	1.15	00:15	1.15	00:15	1.15
00:16	1.16	00:16	1.16	00:16	1.16
00:17	1.17	00:17	1.17	00:17	1.17
00:18	1.18	00:18	1.18	00:18	1.18
00:19	1.19	00:19	1.19	00:19	1.19
00:20	1.20	00:20	1.20	00:20	1.20
00:21	1.21	00:21	1.21	00:21	1.21
00:22	1.22	00:22	1.22	00:22	1.22
00:23	1.23	00:23	1.23	00:23	1.23
00:24	1.24	00:24	1.24	00:24	1.24
00:25	1.25	00:25	1.25	00:25	1.25
00:26	1.26	00:26	1.26	00:26	1.26
00:27	1.27	00:27	1.27	00:27	1.27
00:28	1.28	00:28	1.28	00:28	1.28
00:29	1.29	00:29	1.29	00:29	1.29
00:30	1.30	00:30	1.30	00:30	1.30
00:31	1.31	00:31	1.31	00:31	1.31
00:32	1.32	00:32	1.32	00:32	1.32
00:33	1.33	00:33	1.33	00:33	1.33
00:34	1.34	00:34	1.34	00:34	1.34
00:35	1.35	00:35	1.35	00:35	1.35
00:36	1.36	00:36	1.36	00:36	1.36
00:37	1.37	00:37	1.37	00:37	1.37
00:38	1.38	00:38	1.38	00:38	1.38
00:39	1.39	00:39	1.39	00:39	1.39
00:40	1.40	00:40	1.40	00:40	1.40
00:41	1.41	00:41	1.41	00:41	1.41
00:42	1.42	00:42	1.42	00:42	1.42
00:43	1.43	00:43	1.43	00:43	1.43
00:44	1.44	00:44	1.44	00:44	1.44
00:45	1.45	00:45	1.45	00:45	1.45
00:46	1.46	00:46	1.46	00:46	1.46
00:47	1.47	00:47	1.47	00:47	1.47
00:48	1.48	00:48	1.48	00:48	1.48
00:49	1.49	00:49	1.49	00:49	1.49
00:50	1.50	00:50	1.50	00:50	1.50
00:51	1.51	00:51	1.51	00:51	1.51
00:52	1.52	00:52	1.52	00:52	1.52
00:53	1.53	00:53	1.53	00:53	1.53
00:54	1.54	00:54	1.54	00:54	1.54
00:55	1.55	00:55	1.55	00:55	1.55
00:56	1.56	00:56	1.56	00:56	1.56
00:57	1.57	00:57	1		

Date of test 11/5/84
 Bailer test gal/min. with ft. drawdown after hrs.
 Artesian flow g.p.m. Date
 Temperature of water Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Over burden	0	2
Caliche	2	15
Red and Black Basalt with clay seams	15	31
water		
Grey Basalt	31	40

Installed		
-----------	--	--

20 ft. stainless X 4" steel John-	
son 316 well screen, slot size	
0.025 from 20 to 40 feet.	

22 ft. stainless steel casing 4" X	
22 ft. 2 ft. above grade.	

Screen gravel packed from 19 ft.		
to 40 ft. Pea gravel and F9		
filter sand.		

1 ft. of Bentonite pellets from		
18 to 19 ft.		

Cement seal from 1971-1972

4" stainless steel locking cap.

DEPARTMENT OF ECOLOGY
SPOKANE REGIONAL OFFICE

Work started 10/29 1984 Completed 11/5 1984

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME JOY DRILLING COMPANY, INC.
(Person, firm, or corporation) (Type or print)

Address P. O. Box 971, Moses Lake, Washington

[Signed] Ted Joy
Ted Joy (Well Driller)

License No. 0228 Date 11/8, 19 84

ECY DES-1-20

ADDITIONAL SHEETS
144466



WATER WELL REPORT

Original & 1st copy - Ecology, 2nd copy - owner, 3rd copy - driller

Construction/Decommission ("x" in circle)

☒ Construction☐ Decommission ORIGINAL INSTALLATION Notice of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal
☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned Method: ☐ Dug ☐ Bored ☐ Driven
☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 156 ft.
 Depth of completed well 156 ft.

CONSTRUCTION DETAILS

Casing ☒ Welded 6 " Diam. from 13 ft. to 55 ft.
 Installed: ☐ Liner installed " Diam. from " ft. to " ft.
☐ Threaded " Diam. from " ft. to " ft.

Perforations: ☐ Yes ☒ No

Type of perforator used _____

SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No ☐ Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 40 ft.Material used in seal GroutDid any strata contain unusable water? ☒ Yes ☐ NoType of water? Surface Depth of strata 40Method of sealing strata off Casing Grout

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 31 ft. below top of well Date 8-18-07

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____
(cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☐ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

CURRENT

Notice of Intent No. 4179306Unique Ecology Well ID Tag No. A17467

Water Right Permit No. _____

Property Owner Name Grant Co #5Well Street Address 3408 Rd N NECity MOSES LAKE County CANADLocation NE 1/4-1/4 SE 1/4 Sec 17 Twn 19 R29 WWM circle one

Lat/Long (s, t, r) Lat Deg _____ Lat Min/Sec _____

Still REQUIRED) Long Deg _____ Long Min/Sec _____

Tax Parcel No. 190462002

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Dirt	0	12
Caliche	12	13
Dirt	13	35
Dark Black	35	41
Basalt & black brown	41	50
Clay seams, covering	50	55
Basalt Black	50	57
Basalt Grey	57	81
Basalt soft black	81	83
Basalt Grey	83	135
Basalt brown	135	151
Basalt Grey	151	156

RECEIVED

SEP 19 2007

DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICEStart Date 8-17-07Completed Date 8-18-07

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Jim Stien SDriller/Engineer/Trainee Signature Jim Stien SDriller or trainee License No. 0469

If TRAINEE, Driller's Licensed No. _____

Driller's Signature _____

Drilling Company Joy Drilling CoAddress 5369 1st St NECity, State, Zip MOSES LAKE WA 98837

Contractor's

Registration No. Jay DRC137064 Date 8-18-07

Ecology is an Equal Opportunity Employer.

(22)

(6) LOCATION OF WELL By legal description:
County Grant Latitude _____ Longitude _____
Township 19N (N or S) Range 29E (E or W) Section 17
NE 1/4 of SE 1/4 of above section.
Street address of well location 3322 Road N NE
Moses Lake WA 98837
Tax lot number of well location 19-0463-000

(7) STATIC WATER LEVEL:
 _____ Ft. below land surface. Date _____
 Artesian Pressure _____ lb./sq. in. Date _____

(8) WATER BEARING ZONES

Depth at which water was first found _____

From	To	Est. Flow Rate	SWL

(9) WELL LOG:

Ground Elevation _____

Material	From	To	SW
Silt to caliche to Basalt	0	425	
RECEIVED			
SEP 19 2007			
DEPARTMENT OF ECOLOGY EASTERN REGIONAL OFFICE			

Date started 7/23/07 Completed 7/23/07

WELL CONSTRUCTION CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Type or Print Name: Jay Graham License No. 1621

Trainee Name Jerrad Thompson License No 2823T

Drilling Company Hobasene Drilling Inc

(Signed) De A. Schum License No. 11621

Address 3719 70th Ave E Bldg B Eire WA 9

Registration No. H01001044KH 0 Date Sept. 14 2014

(5) WELL TESTS:

☐ Pump ☐ Bailor ☐ Air ☐ Flowing Artesian

Permeability _____ Yield _____ GPM

Conductivity _____ PH _____

Temperature of water _____ OF/C Depth artesian flow found _____ ft

Was water analysis done? ☐ Yes ☐ No

By whom? _____

Depth of strata to be analyzed. From _____ ft to _____ ft

Remarks: _____

Name Of Supervising Geologist/Engineer H. H. C. J. J. J.

APF059

R108981e

WELL NO.

Zip 98851

☐ Abonnement☐ Other

Depth of Completed Wall 40 ft.

see 10/20

Tax lot number of well location 19-0462-000

Date _____

Depth at which water was first found

Ground Elevation

Date started 7/24/07 Completed 7/24/07

1/15/2020 11:15 AM

REMARKS:

Name Of Supervising Geologist/Engineer Paul Crossley

MONITORING WELL REPORT

307703

Well ID# BAT 5DL6
Start Card # R72306

64

(1) OWNER/PROJECT Name Moses Lake Silicon facility WELL NO. _____
Address 3322 Road N NE
City Moses Lake State WA Zip 98168

(6) LOCATION OF WELL By legal description:
County Grant Latitude _____ Longitude _____
Township 19N (N or S) Range 29E (E or W) Section 17
NE 1/4 of SE 1/4 of above section.
Street address of well location 3322 Road N NE
Moses Lake WA 98837
Tax lot number of well location 19-0462-000

(2) TYPE OF WORK

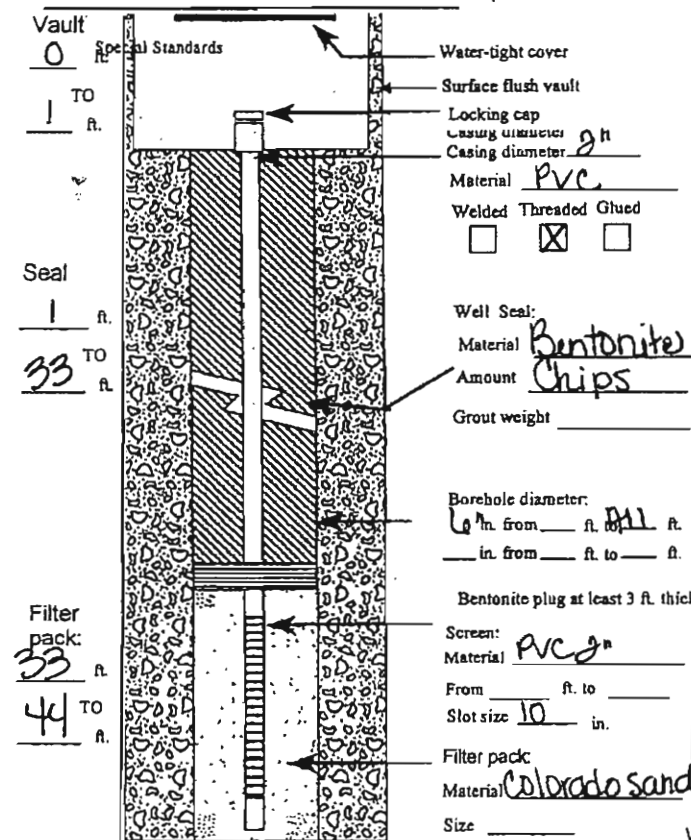
☒ New construction ☐ Alteration (Repair/Recondition)
☐ Conversion ☐ Deepening ☐ Abandonment

(3) DRILLING METHOD

☐ Rotary Air ☒ Rotary Mud ☐ Cable
☐ Hollow Stein Auger ☐ Other _____

(4) BORE HOLE CONSTRUCTION:

Special Standards ☐ Yes ☒ No Depth of Completed Well 44 ft.



(7) STATIC WATER LEVEL:

____ ft. below land surface. Date _____
Artesian Pressure _____ lb/sq. in. Date _____

(8) WATER BEARING ZONES:

From	To	Est. Flow Rate	SWL

(9) WELL LOG:

Material	From	To	SWL
Silt to caliche to Basalt	0	44	

RECEIVED

FEB 19 2008

DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

WELL CONSTRUCTION CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Type or Print Name Jay Graham License No. 1621
Trainee Name Tim Thompson License No. 2823T
Drilling Company Holocene Drilling Inc.
(Signed) J. Graham License No. 1621
Address 3719 70th Ave E Bldg B Fife WA 98424
Registration No. HOLC010412P Date 2/13/08

(5) WELL TESTS:

☐ Pump ☐ Bailor ☐ Air ☐ Flowing Artesian
Permeability _____ Yield _____ GPM
Conductivity _____ PH _____
Temperature of water _____ OF/C Depth artesian flow found _____ ft.
Was water analysis done? ☐ Yes ☒ No
By whom? _____
Depth of strata to be analyzed, From _____ ft. to _____ ft.
Remarks: _____
Name Of Supervising Geologist/Engineer Hartrowser

302702

Well ID# BAT505
Start Card # R72306

(65)

WELL NO

(6) LOCATION OF WELL By legal description:

County Grant Latitude _____ Longitude _____
Township 19N (N or S) Range 29E (E or W) Section 17
NE 1/4 of SE 1/4 of above section
Street address of well location 3322 Road N NE
Moses Lake WA 98837
Tax lot number of well location 19-0462-000

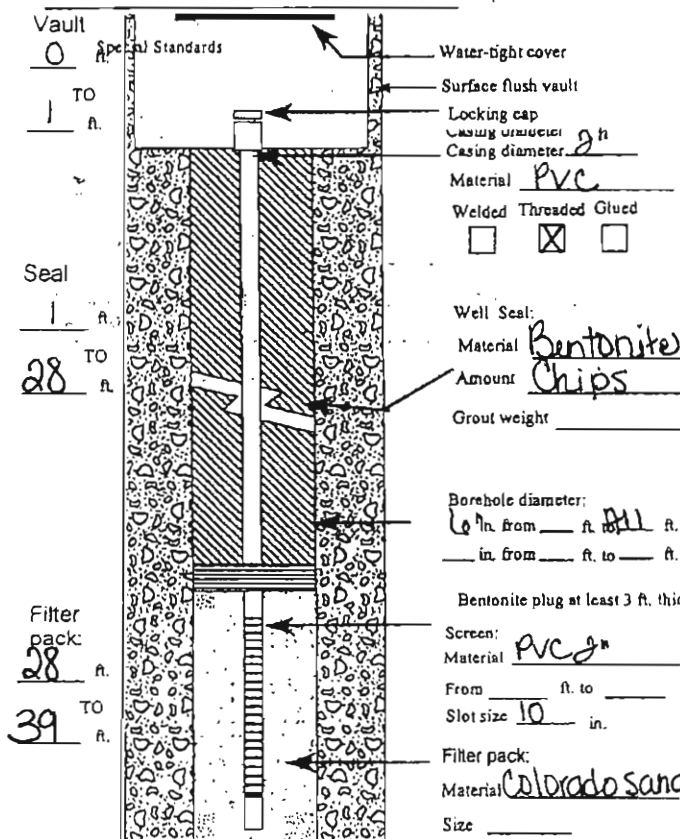
☒ New construction ☐ Alteration (Repair/Recondition)
☐ Conversion ☐ Deepening ☐ Abandonment

☐ Rotary Air ☒ Rotary Mud ☐ Cable
☐ Hollow Stein Auger ☐ Other

_____ Ft. below land surface Date _____

Artesian Pressure _____ lb/sq. in. Date _____

Special Standards ☐ Yes ☒ No Depth of Completed Well 39 ft.



Depth at which water was first found _____

From	To	Est. Flow Rate	SWL

Ground Elevation _____

Material	From	To	SW
Silt to caliche to Basalt	0	39	

RECEIVED

FEB 19 2008

DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Date started 10/1/07 Completed 10/1/07

☐ Pump! ☐ Bailer ☐ Air ☐ Flowing Artesian

Permeability: _____ Yield: _____ GPM

Conductivity _____ PH _____
 Temperature of water _____ OF/C Depth artesian flow found _____ ft.
 Was water analysis done? ☐ Yes ☒ No
 By whom? _____
 Depth of strata to be analyzed. From _____ ft. to _____ ft.

Remarks: _____

Name Of Supervising Geologist/Engineer Hartford

WELL CONSTRUCTION CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Type or Print Name Jay Graham License No 1621
Trainee Name Terrod Thompson License No 2823T
Drilling Company Holocene Drilling Inc
(Signed) [Signature] License No 1621
Address 3719 70th Ave E Bldg B Fife WA 98424
Registration No HOLOCOD044K7 Date 2/13/08

Permit No. _____

(1) OWNER: Name Spencer Jones Address 2123 1/2 153 Moses Lake, Wia
 (2) LOCATION OF WELL: County Sec attached N 1/2 N 1/2 Sec 18 T 19 N, R 29 W, M
 bearing and distance from section or subdivision corner FW, 66 Block 41

PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one).....

New well	<input checked="" type="checkbox"/>	Method: Dug	<input type="checkbox"/>	Bored	<input type="checkbox"/>
Deepened	<input type="checkbox"/>	Cable	<input type="checkbox"/>	Driven	<input type="checkbox"/>
Reconditioned	<input type="checkbox"/>	Rotary	<input checked="" type="checkbox"/>	Jetted	<input type="checkbox"/>

(5) DIMENSIONS: Diameter of well 6 inches.
 Drilled 65 ft. Depth of completed well 65 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6" Diam. from 0 ft. to 53 ft.
Threaded ☐ " Diam. from ... ft. to ... ft.
Welded ☒ " Diam. from ... ft. to ... ft.

Perforations: Yes ☐ No ☒

Type of perforator used.....

SIZE of perforations in. by in.

..... perforations from ft. to ft.

..... perforations from ft. to ft.

..... perforations from ft. to ft.

Screens: Yes ☐ No ☒

Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal: Bentonite
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name: _____
Type: _____ H.P. _____

(8) **WATER LEVELS:** Land-surface elevation above mean sea level 1500 ft.
 Static level 30 ft. below top of well Date 5/13/24
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

10	20	30	40
50	60	70	80

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)					
Time	Water Level	Time	Water Level	Time	Water Level

Date of test
 Test 60 gal/min. with P ft. drawdown after 1 1/2 hrs.
 Ar. 1 flow. g.p.m. Date
 Temperature of water. Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Top Soil	0	3
Soil + gravel	3	35
BROKEN BASALT REP	35	48
BROKEN BLACK BASALT	48	65

RECEIVED

JUN 2 1978

DEPARTMENT OF ECOLOGY
SPOKANE REGIONAL OFFICE

Work started 5/12 1978 Completed 5/13 1978

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME HANEY DRILLING CO.
(Person, firm, or corporation) (Type or print)

Address 140 E Maple Moses Lake WA

[Signed] Ronald C. Lang
(Well Driller)

License No. 0169 Date 5/15, 1929

File Original and First Copy with
Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

SC #6209

Application No.

Permit No.

(1) OWNER: Name Tren Jones Astro Enterprises. Address Route 2 Box 159A M.L. WA.

(2) LOCATION OF WELL: County Grant. — NE 1/4 NW 1/4 Sec. 18 T. 19 N. R. 29 W.M.

earing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one)
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 95 ft. Depth of completed well 95 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6" Diam. from 71 ft. to 64 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☐ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒

Type of perforator used.....

SIZE of perforations in. by in.

perforations from ft. to ft.

perforations from ft. to ft.

perforations from ft. to ft.

Screens: Yes ☐ No ☒

Manufacturer's Name.....

Type..... Model No.....

Diam. Slot size from ft. to ft.

Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:

Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.

Material used in seal benzoin + c.

Did any strata contain unusable water? Yes ☐ No ☒

Type of water?..... Depth of strata.....

Method of sealing strata off.....

(7) PUMP: Manufacturer's Name.....

Type:..... H.P.

(8) WATER LEVELS: Land-surface elevation 1060 ft.
above mean sea level

Static level 39 ft. below top of well Date 11-7-88

Artesian pressure lbs. per square inch Date.....

Artesian water is controlled by.....
(Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☐ If yes, by whom?.....

Yield: gal./min. with ft. drawdown after hrs.

" " " " " "

" " " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time Water Level Time Water Level Time Water Level

air lift 40 gpm.

Date of test

Baller test gal./min. with ft. drawdown after hrs.

Artesian flow g.p.m. Date.....

Temperature of water 54 Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Dirt & gravel mix.	0	22
Sand black.	28	44
Clay brown.	44	55
Basalt brown w/ clay seams.	55	59
Soap stone yellow.	59	61
Basalt brown & black.	61	79
Basalt black.	79	82
Basalt Red N ² O.	82	94
Basalt grey	94	95

NOV 14 1988

DEPARTMENT OF ECOLOGY
SPOKANE REGIONAL OFFICE

Work started 10-4-88 19..... Completed 10-7-88 19.....

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME JOY Drilling Co.
(Person, firm, or corporation) (Type or print)

Address MOSES lake wa.

[Signed] Tren Jones
(Well Driller)

License No. 0469 Date 11-8 88, 19.....

(USE ADDITIONAL SHEETS IF NECESSARY)

68

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
AND DEVELOPMENT

Well #1

WELL LOG

No. Appl. #2727

Date March 19, 1953

Permit #2570

Record by

Source well driller's record

Location: State of WASHINGTON

County Grant

Area

Map

W. 1/2 E. 1/2 sec 20 T. 19 N. R. 29 E. 20

Diagram of Section

Drilling Co.

Address

Method of Drilling drilled Date 3-16-3-19, 1953

Owner Utah-Idaho Sugar Co.

Address Salt Lake City, Utah

Land surface, datum 20 ft. above below

Sec 20
68-73

Core-Layer	MATERIAL	THICKNESS (feet)	DEPTH (feet)
------------	----------	------------------	--------------

(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)

See attached sheets Well No. 2			
Pump Test:			
Dim: 1030' x 24"x20"x16"			
SWL: 125' (3/16/53)			
Dd: 230'			
Casing: 28" OD Casing from 0-19.42'			
20" OD Casing from 0-79.33'			
20" Open rock hole from 79.33 to 820'			
16" Open rock hole from 820'-1080'			
Pump: 345' setting, 11 stage 12" bowl, Gear Head. Airline 365"			
Motor: dual gas engine drive			
Yield: 1416 (max. g.p.m.)			
Note: drawdown info. in folder			

Turn up

Sheet of sheets

No. _____ / _____ - _____

B. F. No. 78-12-54-SM, 4th DE.

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
AND DEVELOPMENT

WELL LOG

NoAppl1,....#2727
Permit #2570

Date.....April....., 1954

Record by.

Source well driller's record

Location: State of WASHINGTON

County.....Grant

Area.

Map.

W $\frac{1}{2}$ N $\frac{1}{2}$ E $\frac{1}{2}$ N $\frac{1}{2}$ sec 20...T.19..N., R..29....E

Diagram of Section

Drilling Co.

Address.

Method of Drilling...drilled..... Date...Apr. 12....., 1954

Owner.....Utah-Idaho Sugar Co.

Address Salt Lake City, Utah

Land surface, datum.....ft. above
below

CORRELATION	MATERIAL	THICKNESS (feet)	DEPTH (feet)
-------------	----------	---------------------	-----------------

(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)

[illegible]

Turn up

Sheet _____ of _____ sheets

70

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
AND DEVELOPMENT

WELL LOG

No. Appl. 2727
2573

Date Sept. 16, 1955

Record by Utah-Idaho Sugar Co.

Source Driller's Record

Location: State of WASHINGTON

County Grant

Area

Map

W. 1/2 E. 1/2 sec. 20 T. 19 N. R. 29 E.

Drilling Co. A.A. Durand

Address

Method of Drilling Drilled Date 9-14-1955

Owner Utah-Idaho Sugar Co.

Address Salt Lake City, Utah

Land surface, datum ft above below

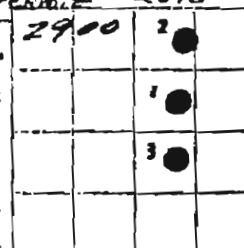


Diagram of Section

COM- LATION	MATERIAL	THICKNESS (feet)	DEPTH (feet)
----------------	----------	---------------------	-----------------

(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic columns, if feasible. Following log of materials, list all casings, perforations, screens, etc.)

See Attached Well No. 3			
Pump Test:			
Dia: 9 1/2" X 18" X 12" X 10"			
SWL: 107'			
DD: 228'			
Yield: 895 g.p.m.			
Casing:			
24" O.D. Well Casing from 0 to 6733'			
18" O.D. Well Casing from 0 to 9875'			
10" O.D. Well casing liner			
from 5 9 1/3" to 694'			
Perforations: None			

Turn up

Sheet 1 of 1 sheets

No. 1 / 1111-1111-1111-1111

E. F. No. 74-12-64-3M. 4th 08.

File Original and First Copy with
Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

35899

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. W041298

UNIQUE WELL I.D. # ABP 147

Water Right Permit No. _____

(1) OWNER: Name Pacific Address 18583 Wheeler Rd NE

(2) LOCATION OF WELL: County Grant NW 14 NE 1/4 Sec 20 T. 19 N. R. 29 W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) _____

(3) PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐
☐ Irrigation ☐ Test Well ☐ Other ☐
☐ DeWater ☐ Rotary ☒ Jetted ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 220 feet. Depth of completed well 220 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 Diam. from 4 ft. to 46 ft.
Welded ☒ Diam. from _____ ft. to _____ ft.
Liner installed ☐ Threaded ☐ Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 40 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation _____ ft.
Static level 48 ft. below top of well Date 11-18-94
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

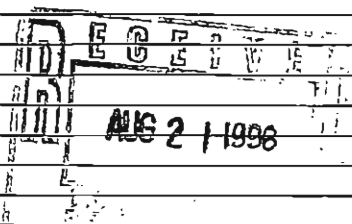
(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " " " "
" " " " " "
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)
Time Water Level Time Water Level Time Water Level

Date of test _____
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest 25 gal./min. with stem set at 200 ft. for 4 hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Top Soil	0	1
Culpechi	1	10
Brown Basalt	10	25
Black Basalt	25	120
Brown Basalt	120	122
Black Basalt	122	200
Brown Basalt	200	220



Work Started 11-17, 19. Completed 11-18, 1994

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME DLF Drilling (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address 205 Beal Moses Lake
(Signed) Cey (WELL DRILLER) License No. 0116

Contractor's Registration No. 0501189DL Date _____, 19____

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.



WATER WELL REPORT

Original & 1st copy Ecology 2nd copy owner 3rd copy driller

Construction/Decommission (x in circle)

126436

☐ Construction

☐ Decommission ORIGINAL CONSTRUCTION Notice of Intent Number

PROPOSED USE ☐ Domestic ☐ Industrial ☒ Municipal
☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other

TYPE OF WORK Owner's number of well (if more than one)
☒ New Well ☐ Reconditioned Method ☐ Dug ☐ Bored ☐ Driven
☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS Diameter of well 16 inches drilled 585 ft
 Depth of completed well 525 ft

CONSTRUCTION DETAILS
 Casing ☒ Welded 24 Diam from +1 ft to 44 ft
 Installed ☐ Liner installed 16 Diam from +1 ft to 280 ft
☐ Threaded Diam from ft to ft

Perforations ☐ Yes ☒ No
 Type of perforator used
 SIZE of perfs in by in and no of perfs from ft to ft

Screens ☐ Yes ☒ No ☐ K Pac Location
 Manufacturer's Name
 Type Model No
 Diam Slot Size FEB 6 2003 ft
 Diam Slot Size from ft to ft

Gravel/Filter packed ☐ Yes ☒ No
 Materials placed from ft to ft

Surface Seal ☒ Yes ☐ No To what depth? 280 ft
 Materials used in seal
 Did any strata contain unusable water? ☐ Yes ☒ No
 Type of water? Depth of strata
 Method of sealing strata off

PUMP Manufacturer's Name JAN 24 2003
 Type HP

WATER LEVELS Land and surface elevation above mean sea level ft
 Static level 51 ft below top of well Date
 Artesian pressure lbs per square inch Date
 Artesian water is controlled by (cap valve etc)

WELL TESTS Drawdown is amount water level is lowered below static level
 Was a pump test made? ☒ Yes ☐ No If yes by whom? Irrigators
 Yield 2200 gal/min with 150 ft drawdown after 8 hrs
 Yield gal/min with ft drawdown after hrs
 Yield gal/min with ft drawdown after hrs
 Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)
 Time Water Level Time Water Level Time Water Level
 Date of test
 Bailer test gal/min with ft drawdown after hrs
 Artesian 2500 gal/min with stem set at 525 ft for 2 hrs
 Artesian flow g p m Date
 Temperature of water Was a chemical analysis made? ☐ Yes ☐ No

CURRENT

Notice of Intent No W150719

Unique Ecology Well ID Tag No AAN 874

Water Right Permit No

Property Owner Name City of Moses Lake

Well Street Address P O Box 1579

City Moses Lake County GRANT

Location NW 1/4 1/4 NW 1/4 Sec 20 Twn 19N R 29 EWM circle or one

Lat/Long Lat Deg Lat Min/Sec

REQUIRED Long Deg Long Min/Sec

Tax Parcel No

CONSTRUCTION OR DECOMMISSION PROCEDURE
 Formation Describe by color character size of material and structure and the kind and nature of the material in each stratum penetrated with at least one entry for each change of information Indicate all water encountered (USE ADDITIONAL SHEETS IF NECESSARY)

MATERIAL	FROM	TO
Brown Silt	0	2
Black Sand & gravel	2	25
Broken Brown Basalt		
some Tan Clay Silt	25	34
Hard Gray Basalt	34	117
Med soft Brown & Black	117	128
Hard Dark gray	128	162
Soft Brown Visicular		
& Gray water	162	168
Hard gray basalt	168	196
Soft Dark gray	196	203
Hard light gray	203	221
Soft Broken gray & brown basalt some		
gray & brown clay	221	243
Med hard dark gray	243	270
Very hard gray basalt	270	305
Soft Brown Visicular		
Basalt, broken gray		
Brown silt water		
1000 GPM Approx	305	322
Hard gray basalt	322	375
Soft broken brown		
Basalt	375	379
Med hard dark gray		
Basalt 240psi 2Airpks	379	390
Hard dark gray Basalt	390	432

Start Date 11-01-02 Completed Date 12/23/03

WELL CONSTRUCTION CERTIFICATION I constructed and/or accept responsibility for construction of this well and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Larry McLanahan

Driller/Engineer/Trainee Signature

Driller or Trainee License No 0337

If trainee, licensed driller s
 Signature and License no

Drilling Company BJExploration Co Inc

Address 404 N Conway St

City State Zip Kennewick, WA 99336

Contractor s
 Registration No BJEXPCI1320K Date 12/23/03

Ecology is an Equal Opportunity Employer ECV 050 1 20 (Rev 4/01)



WATER WELL REPORT

Original & 1st copy - Ecology, 2nd copy - owner, 3rd copy - driller

Construction/Decommission ("x" in circle)

- ☐ Construction
☐ Decommission **ORIGINAL CONSTRUCTION Notice**
of Intent Number _____

PROPOSED USE: ☐ Domestic ☐ Industrial ☒ Municipal
☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____
☒ New Well ☐ Reconditioned Method: ☐ Dug ☐ Bored ☐ Driven
☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well _____ inches, drilled _____ ft
Depth of completed well _____ ft

CONSTRUCTION DETAILS
Casing ☒ Welded 24" Diam from +1 ft to 44 ft
Installed: ☐ Liner installed 16" Diam. from +1 ft to 280 ft
☐ Threaded _____" Diam from _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No
Type of perforator used _____
SIZE of perfs _____ in by _____ in and no of perfs _____ from _____ ft. to _____ ft

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____
Manufacturer's Name _____
Type _____ Model No _____
Diam _____ Slot Size _____ from _____ ft to _____ ft
Diam _____ Slot Size _____ from _____ ft to _____ ft

Gravel/Filter packed: ☐ Yes ☒ No ☐ Size of gravel/sand _____
Materials placed from _____ ft. to _____ ft

Surface Seal: ☒ Yes ☐ No To what depth? 280' ft
Materials used in seal _____
Did any strata contain unusable water? ☐ Yes ☐ No
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

PUMP: Manufacturer's Name _____
Type _____ HP _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 51' ft below top of well Date _____
Artesian pressure _____ lbs per square inch Date _____
Artesian water is controlled by _____ (cap, valve, etc)

WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☒ Yes ☐ No If yes, by whom? Irrigators
Yield 2200 gal/min with 150 ft drawdown after 8 hrs.
Yield _____ gal/min with _____ ft drawdown after _____ hrs
Yield _____ gal/min with _____ ft drawdown after _____ hrs
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)
Time Water Level Time Water Level Time Water Level

Date of test _____
Bailer test _____ gal/min with _____ ft drawdown after _____ hrs
Artest 2500 gal/min with stem set at 525 ft for 2 hrs
Artesian flow _____ gpm Date _____
Temperature of water _____ Was a chemical analysis made? ☐ Yes ☐ No

CURRENT

Notice of Intent No. W150719

Unique Ecology Well ID Tag No. AAN874

Water Right Permit No. _____

Property Owner Name City of Moses Lake

Well Street Address P.O. Box 1579

City Moses Lake County GRANT

Location NW 1/4 1/4 NW 1/4 Sec 20 Twn 19N R 29 EWM circle or one WWM

Lat/Long: Lat Deg _____ Lat Min/Sec _____
(s, l, r still REQUIRED) Long Deg _____ Long Min/Sec _____

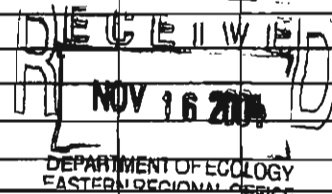
Tax Parcel No. _____

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. Indicate all water encountered (USE ADDITIONAL SHEETS IF NECESSARY)

MATERIAL	FROM	TO
Soft broken brown & Gray Basalt Trace of brown clay	432	435
Med. Hard Porus basalt	435	500
Broken gray basalt & Brown siltstone	500	518
Hard gray basalt	518	582
Fractured Basalt		
Loss Circulation	582	585
16" Casing to 280		
280-525 19" hole		
525-585 Hole full of caving material		

Placed 5/5gallon buckets of 1/2" Benonite pellets in hole.



Start Date 11-01-02 Completed Date 12/23/03

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Larry McLanahan

Driller/Engineer/Trainee Signature *Larry McLanahan*

Driller or Trainee License No. 0337

If trainee, licensed driller's
Signature and License no. _____

Drilling Company BJ Exploration Co., Inc.

Address 404 N. Conway Street

City, State, Zip Kennewick, WA 99336

Contractor's BJEXPCI1320K Date 12/23/03

Ecology is an Equal Opportunity Employer ECY 050-1-20 (Rev 4/01)

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Water Well Report

Original - Ecology, 1st copy - owner, 2nd copy - driller

Construction/Decommission

☐ Construction☐ Decommission *ORIGINAL INSTALLATION Notice of Intent Number*

PROPOSED USE: ☐ DeWater ☐ Domestic ☐ Industrial ☐ Municipal
☒ Irrigation ☐ Test Well ☐ Other

TYPE OF WORK: Owner's number of well (if more than one)

☒ New well ☐ Reconditioned ☐ Method: ☐ Dug ☐ Bored ☐ Driven
☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 16" inches, drilled 584 ft.
 Depth of completed well 584 ft.

CONSTRUCTION DETAILS

Casing ☒ Welded 20" Diam from +1 ft to 79' ft.
 Installed: ☐ Liner installed Diam from ft to ft.
☐ Threaded Diam from ft to ft.

Perforations: ☐ Yes ☒ No

Type of perforator used

SIZE of perforis in by in and no. of perforis from ft to ft

Screens: ☐ Yes ☒ No ☐ K-Pac Location

Manufacturer's Name

Type Model No.

Diam. Slot size from ft to ft

Diam. Slot size from ft to ft

Gravel/Filter packed: ☐ Yes ☒ No ☐ Size of gravel/sand

Materials placed from ft to ft

Surface Seal: ☒ Yes ☐ No To what depth? 79' ft.

Material used in seal CEMENT

Did any strata contain unusable water? ☐ Yes ☐ No

Type of water? Depth of strata

Method of sealing strata off

PUMP: Manufacturer's Name

Type H.P.

WATER LEVELS: Land-surface elevation above mean sea level ft.

Static level 40' ft. below top of well Date

Artesian pressure lbs. per square inch Date

Artesian water is controlled by (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☐ No If yes, by whom?

Yield: gal./min. with ft. drawdown after hrs

Yield: gal./min. with ft. drawdown after hrs

Yield: gal./min. with ft. drawdown after hrs

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time Water Level Time Water Level Time Water Level

Date of test

Bailer test gal./min. with ft. drawdown after hrs

Airtest 300 gal./min. with stem set at 570 ft. for hrs

Artesian flow g.p.m. Date

Temperature of water Was a chemical analysis made? ☐ Yes ☐ No

Current

Notice of Intent No. W150751

Unique Ecology Well ID Tag No. AHP781

Water Right Permit No.

Property Owner Name Central Leasing of Washington

Well Street Address P.O. Box 850

City Moses Lake

County GRANT

Location NW 1/4-1/4 SE 1/4 Sec 20 Twn 19N R 29

EWM or WWM ☒ circle one

Lat/Long (s, t, r) Lat Deg Lat Min/Sec

still REQUIRED) Long Deg Long Min/Sec

Tax Parcel No.

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information indicate all water encountered. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Caliche	0	9
Med. hard brown	9	33
Med soft brown & gray basalt	33	58
Hard gray basalt	58	60
Broken soft water	60	76
Hard gray basalt	76	84
Red brown black broken basalt water 190psi	84	89
Hard gray basalt	89	149
Brown & black basalt	149	153
Med gray basalt	153	162
Hard gray basalt	162	198
Brown black basalt clay seams	198	206
Hard gray basalt	206	236
Soft black basalt	236	245
Med black basalt	245	263
Hard gray	263	341
Red brown black broken Basalt Water 195psi	341	352
Med. basalt	352	371
Hard gray basalt	371	408
Void or crevis	416	419
Brown broken black basalt siltstone Water 200psi	408	429
Med. hard Basalt	429	440
Black red basalt clay seams	440	444
Med gray	444	463
Black brown siltstone	463	471
Med gray Basalt	471	482
Soft black brown basalt	482	485
Med hard basalt	485	509
Soft gray porous basalt H2O 210psi	509	518
Med. hard gray basalt	518	534
Hard gray basalt	534	542

Start Date 11-4-04

Completed Date 11-14-04

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Driller/Engineer/Trainee Name (Print) Larry McLanahan

Driller/Engineer/Trainee Signature *Larry McLanahan*

Driller or trainee License No. 0337

TRAINEE

Driller's License No.

Driller's Signature

Drilling Company BJ Exploration Co. Inc

Address 404 North Conway Street

City, State, Zip Kennewick, WA 99336

Contractor's

Registration No. BJEXPCT1320K

Ecology is an Equal Opportunity Employer.

DEC 13 2004

ECY 050-1-20 (Rev 2003)
 DEPARTMENT OF ECOLOGY
 EASTERN REGIONAL OFFICE

File Original and First Copy with
Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Sheet Card No. 74

Water Right Permit No. _____

(1) OWNER: Name Eka Nobel, Ron Stevenson Address 2701 Rd N, NE, Moses Lake, WA 98837

(2) LOCATION OF WELL: County Grant 1/4 NW 1/4 Sec 21 T. 19 N. R. 29E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) _____

(3) PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐
☐ Irrigation ☐ Test Well ☐ Other ☐
☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 43 feet. Depth of completed well 43 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 * Diam. from +1 ft. to 42 ft.
Welded ☒ * Diam. from _____ ft. to _____ ft.
Liner installed ☒ * Diam. from _____ ft. to _____ ft.
Threaded ☐ * Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒

Type of perforator used _____

SIZE of perforations _____ in. by _____ in.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____

Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.

Material used in seal Bentonite

Did any strata contain unusable water? Yes ☐ No ☐

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation _____ ft.

Static level 20 ft. below top of well Date _____

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☒ If yes, by whom? _____

Yield: 75 gal./min. with _____ ft. drawdown after _____ hrs.

" ESTIMATED AIRLIFT " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time Water Level Time Water Level Time Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.

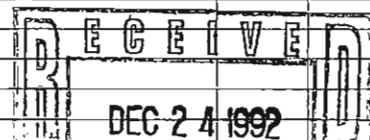
Artesian flow _____ g.p.m. Date _____

Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Caliche, Gravel, Black, Medium	0	3
Caliche, Sand, Gravel, Brown/Black, Medium	3	7
Caliche, Pink, White, Hard	7	12
Caliche, Redish Brown, Medium	12	14
Basalt, Brown/Black, Hard	14	26
Porous Basalt, Brown, Medium	26	43



DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Work started 12-11-92, 19. Completed 12-11-92, 19.

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Ponderosa Drilling & Development, Inc.

(PERSON, FIRM, OR CORPORATION)

(TYPE OR PRINT)

Address E. 6010 Broadway, Spokane, WA 99212

(Signed) Steve Mills License No. 1335

(WELL DRILLER)

(Steve Mills)

Contractor's

Registration

No. PO-ND-EI*248JE Date December 16, 19 92

(USE ADDITIONAL SHEETS IF NECESSARY)



File Original and First Copy with
Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. _____

Water Right Permit No. _____

(1) OWNER: Name Merle Hardy Address Rt. 2 280 R.D. NE. Wheeler

(2) LOCATION OF WELL: County GRANT NW 1/4 NW 1/4 Sec. 21 T. 19 N. R. 29E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) _____

(3) PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐
☐ Irrigation ☐ Test Well ☐ Other ☐
☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) _____

Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 100 feet. Depth of completed well 100 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from +1 ft. to 19 ft.
Welded ☐ " Diam. from _____ ft. to _____ ft.
Liner installed ☐ " Diam. from _____ ft. to _____ ft.
Threaded ☐ " Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒

Type of perforator used _____

SIZE of perforations _____ in. by _____ in.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____

Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 19 ft.

Material used in seal Benetonite

Did any strata contain unusable water? Yes ☒ No ☐

Type of water? Gas d Depth of strata 50-70 ft

Method of sealing strata off CASING

(7) PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation _____ ft.
above mean sea level

Static level 35 ft. below top of well Date 7/6/88

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

" " " " " "

" " " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time Water Level Time Water Level Time Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 40 gal./min. with stem set at 100 ft. for 1 hrs.

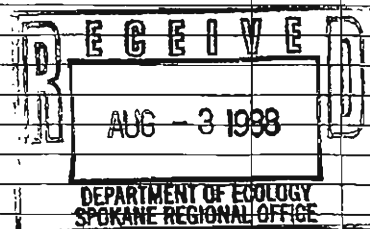
Artesian flow _____ g.p.m. Date _____

Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Top soil	0	1
Caliche	1	4
Fractured Brown Basalt	4	15
Hard Black Basalt	15	35
Broken Brown Basalt	35	40
Hard Black Basalt	40	50
Brown Porous & Broken Basalt	50	90
Hard Black Basalt	90	100



Work started 7/5, 19. Completed 7/5, 1988

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Evergreen Well Drilling
(PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address RF 2 Box 243 A Moses Lake

(Signed) E. J. Kelly License No. 591
(WELL DRILLER)

Contractor's
Registration 4747777 Date 7/7, 1988

(USE ADDITIONAL SHEETS IF NECESSARY)

Please print, sign and return to the Department of Ecology



Water Well Report

Original - Ecology, 1st copy - owner, 2nd copy - driller

Construction/Decommission

☒ Construction☐ Decommission ORIGINAL INSTALLATION Notice of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal
☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____
☐ New well ☐ Reconditioned ☐ Dug ☐ Bored ☐ Driven
☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 162 ft.
 Depth of completed well 162 ft.

CONSTRUCTION DETAILS
 Casing: ☒ Welded 6 " Diam. from 41 ft. to 34 ft.
 Installed: ☐ Liner installed " Diam. from " ft. to " ft.
☐ Threaded " Diam. from " ft. to " ft.

Perforations: ☐ Yes ☒ No
 Type of perforator used _____
 SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____
 Manufacturer's Name _____
 Type _____ Model No. _____
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No ☐ Size of gravel/sand _____
 Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 34 ft.
 Material used in seal Grout
 Did any strata contain unusable water? ☐ Yes ☐ No
 Type of water? _____ Depth of strata _____
 Method of sealing strata off _____

PUMP: Manufacturer's Name _____
 Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
 Static level 6 ft ft. below top of well Date _____
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____
 (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level
 Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____
 Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
 Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
 Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
 Airstest 20 gal./min. with stem set at 14 ft for 2 hrs
 Artesian flow _____ g.p.m. Date _____
 Temperature of water 58.8 Was a chemical analysis made? ☐ Yes ☒ No

Current

Notice of Intent No. W216356Unique Ecology Well ID Tag No. A11 402

Water Right Permit No. _____

Property Owner Name Glen & Janet McCloudWell Street Address 90 Hendricks Ln. 99344City Othello County FranklinLocation SW 1/4-1/4 NW 1/4 Sec 21 Twp 19 R 29 EWM or WWM ☒ circle one

Lat/Long (s, t, r) Lat Deg _____ Lat Min/Sec _____

still REQUIRED) Long Deg _____ Long Min/Sec _____

Tax Parcel No. 120-210-020

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information indicate all water encountered. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Dirt	0	16
Sandstone	16	24
Basalt w/ clay hum	24	34
Basalt block	34	37
Basalt Drum	37	49
Basalt Red	49	64
Basalt Grng.	64	99
Basalt Drum H ₂ O	99	130
Basalt Grng	130	147
Drum H ₂ O	147	160
Basalt Grng	160	162

RECEIVED

JAN - 3 2006

DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Start Date 11-16-05Completed Date 11-17-05

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Driller/Engineer/Trainee Name (Print) Jim StensDriller/Engineer/Trainee Signature Jim StensDriller or trainee License No. 0469

IF TRAINEE,

Driller's Licensed No. _____

Driller's Signature _____

Drilling Company Joy Drilling CoAddress 5369 Jewel St.City, State, Zip MOSES LAKE WA 98837

Contractor's _____

Registration No. Joy DRC1370H Date 11-18-05

Ecology is an Equal Opportunity Employer. ECY 050-1-20 (Rev 2/03)

File Original and First Copy with
Department of EcologySecond Copy—Owner's Copy
Third Copy—Driller's Copy**WATER WELL REPORT**

STATE OF WASHINGTON

Start Card No. 77

Water Right Permit No. _____

(1) OWNER: Name Sun Harvest INC Address 15250 N.E. 95th Redmond, Wa.(2) LOCATION OF WELL: County Grant SE 1/4 SE 1/4 Sec. 21 T. 19 N. R. 29 W.M.(2a) STREET ADDRESS OF WELL (or nearest address) 1420 Rd 2 NE Moses Lake, Wa. 98837(3) PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐
☐ Irrigation ☐ Test Well ☐ Other ☐
☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) _____

Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 177 feet. Depth of completed well 177 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from +1 ft. to 19 ft.
Welded ☐ " Diam. from _____ ft. to _____ ft.
Liner installed ☐ " Diam. from _____ ft. to _____ ft.
Threaded ☐ " Diam. from _____ ft. to _____ ft.Perforations: Yes ☐ No ☒Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.Screens: Yes ☐ No ☒Manufacturer's Name _____ Model No. _____
Type _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.Gravel packed: Yes ☐ No ☒ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.Surface seal: Yes ☒ No ☐ To what depth? 19 ft.Material used in seal Cement BentoniteDid any strata contain unusable water? Yes ☐ No ☒

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 17 ft. below top of well Date 6-12-90

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

" Air lift 70 GPM " " "

" " " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time Water Level Time Water Level Time Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.

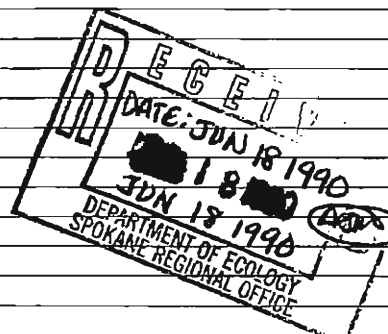
Artesian flow _____ g.p.m. Date _____

Temperature of water 59 Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Caliche	0	3
Dirt	3	6
Basalt brown	6	15
Basalt black	15	62
Basalt brown (water)	62	75
Basalt hard gray	75	157
Basalt brown (water)	157	174
Basalt black	174	177

Work started 6-11-90, 19. Completed 6-12-90, 19.

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Joy Drilling Co. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)Address Moses Lake, Wa.(Signed) Ted J. Shivers License No. 469 (WELL DRILLER)Contractor's Registration No. J0YDRC1370H Date 6-14-90, 19.

(USE ADDITIONAL SHEETS IF NECESSARY)

The Well Log Data and Image are 'As Is' with NO Warranty. Well Log ID: 107108 (page 1 of 1)

File Original and First Copy with
Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. **W27558**

OWNER: Name **George Pollak** Address **Rd 2 N.E. Moses Lake**

(2) LOCATION OF WELL: County **Grant** **SE 1/4 SE 1/4 Sec 21, T. 19N, R. 29W**

(2a) STREET ADDRESS OF WELL (or nearest address)

(3) PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐
☐ Irrigation ☐ Test Well ☐ Other ☐
☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one)
Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well **6"** inches.
Drilled **200** feet. Depth of completed well **200** ft.

(6) CONSTRUCTION DETAILS:

Casing installed: **6** Diam. from **+2** ft. to **38** ft.
Welded ☒ Diam. from _____ ft. to _____ ft.
Liner installed ☒ Diam. from _____ ft. to _____ ft.
Threaded ☐ Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒
Type of perforator used _____
Size of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? **38** ft.
Material used in seal **benoite & cement**
Did any strata contain unusable water? Yes ☒ No ☐
Type of water? **surface** Depth of strata **6'-30'**
Method of sealing strata off **casing & cement**

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level **surface** ft. below top of well Date **8-18-93**
Artesian pressure **10** lbs. per square inch Date **8-18-93**
Artesian water is controlled by **packer & liner valves** (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: **90** gal./min. with _____ ft. drawdown after _____ hrs.
" **90 gals. per minute** "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)
Time Water Level Time Water Level Time Water Level

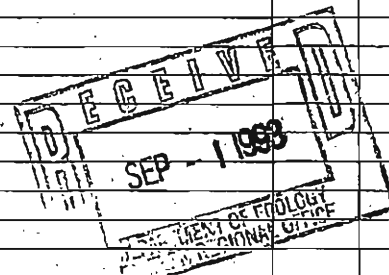
Date of test _____

Ball test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Air test _____ gal./min. with stem set at _____ ft. for _____ hrs.
Artesian flow **90** g.p.m. Date **8-18-93**
Temperature of water **60** Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
dirt	0	8
caliche	8	13
dirt	13	22
clay	22	29
basalt brown soft	29	36
basalt grey hard	36	145
basalt brown	145	152
basalt grey	152	192
basalt brown H2O	192	198
basalt black	198	202



Work started **8-16-93** Completed **8-18** 19 **93**

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME **Joy Drilling Co** (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address **913 Garden Moses Lake**

(Signed) **Jim Smith** License No. **0469** (WELL DRILLER)

Contractor's Registration No. **584 DEC 1370-H** Date **8-24** 19 **93**

(USE ADDITIONAL SHEETS IF NECESSARY)

61828

79

File Original and First Copy with
Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Water Right Permit No.

Start Card No.

UNIQUE WELL I.D. #

40094429

Acce. 268

OWNER: Name Larry CampbellAddress 4480 Rd N. NE Moses Lake wa.(2) LOCATION OF WELL: County Grant2W 1/4 SE 1/4 Sec 21 T. 19 N. R. 29 WM.

(2a) STREET ADDRESS OF WELL (or nearest address)

(3) PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐
☐ Irrigation ☐ Test Well ☐ Other ☐
☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one)

Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐
 Deepened ☐ Cable ☐ Driven ☐
 Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
 Drilled 300 feet. Depth of completed well 300 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 ft. Diam. from 41 ft. to 39 ft.
 Welded ☐ Diam. from _____ ft. to _____ ft.
 Liner installed ☐ Diam. from _____ ft. to _____ ft.
 Threaded ☐ Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒

Type of perforator used

SIZE of perforations _____ in. by _____ in.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒

Manufacturer's Name

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____

Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 30 ft. ft.Material used in seal PortlandDid any strata contain unusable water? Yes ☐ No ☒

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____ H.P. _____
 Type: _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
 Static level 239 ft. below top of well Date 6-27-98
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
 Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
 Yield: 40 gal./min. with 0.1-1.5 ft. drawdown after 2 hrs.

" " " "

" " " "

" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time ^a Water Level Time Water Level Time Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.

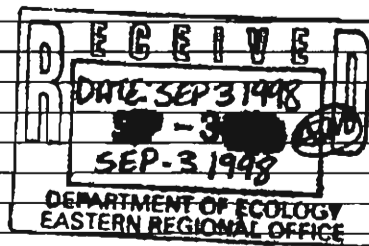
Artesian flow _____ g.p.m. Date _____

Temperature of water 61 Was a chemical analysis made? Yes ☒ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Dirt	0	12
Col. ch	12	18
Clay	18	28
Basalt soft brown	28	39
Basalt grey	39	162
Basalt brown	162	167
Basalt black	167	201
Basalt grey	201	239
Basalt black soft	239	246
Basalt hard black	246	259
Basalt soft black	259	265
Basalt grey	265	281
Basalt black brown red	281	294
Basalt grey	294	300

Work Started 6-26-98 19. Completed 6-27-98 19

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Joy Drilling Co (PERSON, FIRM OR CORPORATION) (TYPE OR PRINT)Address Moses Lake wa.(Signed) Tim Stien License No. 0469 (WELL DRILLER)

Contractor's
 Registration
 No. Joy PRC137064 Date 6-27 19 98

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

File Original and First Copy with
Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Water Right Permit No.

Start Card No. W-36455

UNIQUE WELL I.D. # 726

OWNER: Name Moses Lake

Address Moses Lake

(2) LOCATION OF WELL: County Grant

(2a) STREET ADDRESS OF WELL (or nearest address)

(3) PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal ☒ X
☐ Irrigation ☐ Test Well ☐ Other ☐
☐ DeWater

(4) TYPE OF WORK: Owner's number of well 17
(If more than one)

Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 18 1/2 - 12 1/4 inches.
Drilled _____ feet. Depth of completed well 1250 KB ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 16 ft. Diam. from 0 ft. to 686 ft.
Welded ☒ 20 ft. Diam. from 0 ft. to 44 ft.
Liner installed ☐ Threaded ☐

Perforations: Yes ☐ No ☒

Type of perforator used _____

SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒

Manufacturer's Name _____

Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 44 ft.

Material used in seal cement

Did any strata contain unusable water? Yes ☐ No ☒

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land surface elevation _____ ft.
Static level: 185 ft. below top of well Date _____
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom Golder/Lad
Yield: 3000 gal./min. with 120 ft. drawdown after 24 hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time Water Level Time Water Level Time Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.

Artesian flow _____ g.p.m. Date _____

Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Top Soil	10	20
Cemented Gravel	20	32
Basalt w/caliche - set 20"	32	54
Basalt - grey	54	65
Black basalt fractured	65	80
Red & brn basalt water	80	92
grey basalt med hard	92	125*
porous brown basalt	125	137
brn blk basalt	137	152
hard grey basalt	152	172
very hard grey basalt	172	194
soft blk basalt	194	210*
blk basalt w/grey clay	210	222
frac. blk basalt- (circ)	222	230
black med hard basalt	230	235
soft blk basalt	235	257
grey basalt hard	257	275
frac. grey hard basalt	275	313
black basalt med hard	313	323
soft blk basalt	323	336
water rock red & blk	336	342*
blk soft basalt	342	353
med hard black basalt	353	365
hard grey basalt	365	371
med blk basalt	371	389
hard grey basalt	389	395
med blk basalt	395	407
soft red blk brown basalt	407	414*
med to soft blk basalt	414	474
hard grey basalt	474	500
soft to med blk basalt	500	533
med grey blk basalt	533	612

* indicates water

Work Started 1-4-94 19. Completed 7-26 19 94

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Aqua Drilling & Engineering
(PERSON, FIRM, OR CORPORATION)
Address 120 Crestview Dr., Colville, WA

(Signed) David R. Huxley License No. 1532
(WELL DRILLER)

Contractor's
Registration
No. AQUADEC08503 Date 3/27 19 94

(USE ADDITIONAL SHEETS IF NECESSARY)

File Original and First Copy with
Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Water Right Permit No. _____

Start Card No. W-36455UNIQUE WELL I.D. # 726

(1) OWNER: Name Moses Lake Address Moses Lake
(2) LOCATION OF WELL: County Grant NW 1/4 SW 1/4 Sec 21 T 19 N. R. 29 W.M.

(2a) STREET ADDRESS OF WELL (or nearest address): _____

(3) PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal ☐
☐ Irrigation ☐ Test Well ☐ Other ☐
☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
Abandoned ☐ New well ☐ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well _____ inches.
Drilled _____ feet. Depth of completed well _____ ft.

(6) CONSTRUCTION DETAILS:

Casing installed: _____ Diam. from _____ ft. to _____ ft.
Welded ☐ _____ Diam. from _____ ft. to _____ ft.
Liner installed ☐ _____ Diam. from _____ ft. to _____ ft.
Threaded ☐ _____ Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☐
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☐
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☐ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☐ No ☐ To what depth? _____ ft.
Material used in seal _____
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level _____ ft. below top of well Date _____
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap. valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)
Time Water Level Time Water Level Time Water Level

Date of test _____

Boiler test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Artest _____ gal./min. with stem set at _____ ft. for _____ hrs.

Artesian flow _____ g.p.m. Date _____

Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information

MATERIAL	FROM	TO
Top of Vantage-clay & blk	612	625
blk basalt	625	666
red & tan basalt blk	666	699
hard grey basalt	699	703
blk w/red med hard	703	760
med blk basalt	760	802
soft med blk basalt	801	814
med grey basalt	814	835
hard grey basalt	835	924
soft porous b/basalt w/blueclay	924	925
soft b/basalt hard tan clay	925	945*
porous blk & brown basalt		
basalt med	945	970
hard grey basalt	970	980
grey basalt med	980	1054
blk basalt	1054	1144
blk brown water rock	1144	1207*
med grey basalt	1207	1250
		T.D.

** Note: All measurments above
are made from the drill rig
Kelly base which was ten feet
above the ground surface

Work Started _____ 19 _____ Completed _____ 19 _____

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME _____ (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address _____

(Signed) _____ License No. _____ (WELL DRILLER)

Contractor's Registration No. _____ Date _____ 19 _____

(USE ADDITIONAL SHEETS IF NECESSARY)



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Grant County, Washington**



June 5, 2014

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<http://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

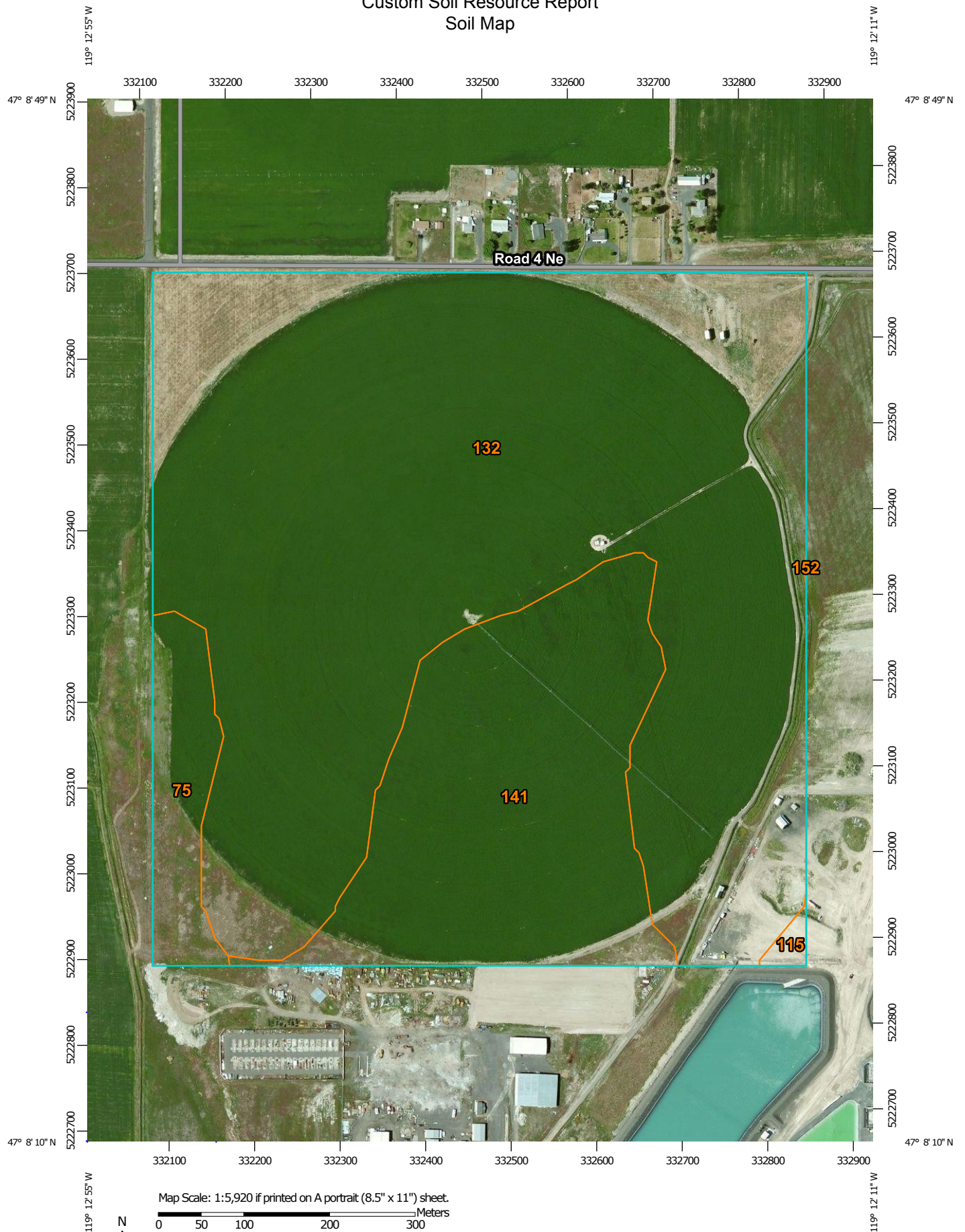
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Map Scale: 1:5,920 if printed on A portrait (8.5" x 11") sheet.

0 50 100 200 300 Meters


0 250 500 1000 1500 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge ticks: UTM Zone 11N WGS84

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MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)


Soils


 Soil Map Unit Polygons


 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit


 Clay Spot


 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water


 Perennial Water

 Rock Outcrop


 Saline Spot

 Sandy Spot

 Severely Eroded Spot


 Sinkhole


 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot


 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals


Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Grant County, Washington
Survey Area Data: Version 7, Dec 7, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Grant County, Washington (WA025)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
75	Malaga cobbly sandy loam, 0 to 15 percent slopes	6.8	4.4%
115	Royal very fine sandy loam, 0 to 2 percent slopes	0.5	0.4%
132	Scoon silt loam, 0 to 5 percent slopes	112.4	73.3%
141	Starbuck very fine sandy loam, 0 to 15 percent slopes	33.5	21.9%
152	Taunton fine sandy loam, 0 to 2 percent slopes	0.0	0.0%
Totals for Area of Interest		153.3	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Grant County, Washington

75—Malaga cobbly sandy loam, 0 to 15 percent slopes

Map Unit Setting

Elevation: 500 to 1,300 feet

Mean annual precipitation: 6 to 10 inches

Mean annual air temperature: 48 to 50 degrees F

Frost-free period: 180 to 195 days

Map Unit Composition

Malaga and similar soils: 100 percent

Description of Malaga

Setting

Landform: Escarpments, terraces

Parent material: Glacial outwash

Typical profile

H1 - 0 to 6 inches: neutral, cobbly sandy loam

H2 - 6 to 11 inches: neutral, gravelly sandy loam

H3 - 11 to 18 inches: neutral, very gravelly sandy loam

H4 - 18 to 60 inches: neutral, extremely gravelly coarse sand

Properties and qualities

Slope: 0 to 15 percent

Depth to restrictive feature: 15 to 28 inches to strongly contrasting textural stratification

Natural drainage class: Somewhat excessively drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Available water storage in profile: Very low (about 2.0 inches)

Interpretive groups

Farmland classification: Farmland of unique importance

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: B

Ecological site: LOAMY 6-10 PZ (R007XY102WA)

115—Royal very fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

Elevation: 400 to 1,000 feet

Mean annual precipitation: 6 to 9 inches

Mean annual air temperature: 48 to 54 degrees F

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Frost-free period: 150 to 210 days

Map Unit Composition

Royal and similar soils: 100 percent

Description of Royal

Setting

Landform: Terraces, hills

Landform position (two-dimensional): Footslope

Parent material: Sandy alluvium

Typical profile

H1 - 0 to 10 inches: neutral, very fine sandy loam

H2 - 10 to 16 inches: neutral, very fine sandy loam

H3 - 16 to 60 inches: strongly alkaline, stratified fine sand to very fine sandy loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 30 percent

Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Moderate (about 7.6 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated

Land capability classification (irrigated): 2e

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: A

Ecological site: SANDY 6-10 PZ (R007XY501WA)

132—Scoon silt loam, 0 to 5 percent slopes

Map Unit Setting

Elevation: 1,000 to 4,900 feet

Mean annual precipitation: 6 to 12 inches

Mean annual air temperature: 48 to 50 degrees F

Frost-free period: 100 to 210 days

Map Unit Composition

Scoon and similar soils: 100 percent

Description of Scoon

Setting

Landform: Terraces, alluvial fans

Parent material: Loess

Typical profile

H1 - 0 to 6 inches: moderately alkaline, silt loam
H2 - 6 to 16 inches: moderately alkaline, gravelly silt loam
H3 - 16 to 26 inches: , cemented material
H4 - 26 to 60 inches: , stratified indurated to extremely gravelly sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: 10 to 20 inches to duripan
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: Very low (about 2.5 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: STONY 6-10 PZ (R007XY202WA)

141—Starbuck very fine sandy loam, 0 to 15 percent slopes

Map Unit Setting

Elevation: 400 to 2,700 feet
Mean annual precipitation: 6 to 12 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 115 to 210 days

Map Unit Composition

Starbuck and similar soils: 100 percent

Description of Starbuck

Setting

Landform: Structural benches, hillslopes
Landform position (two-dimensional): Summit
Parent material: Loess and residuum weathered from basalt

Typical profile

H1 - 0 to 8 inches: neutral, very fine sandy loam
H2 - 8 to 15 inches: neutral, silt loam
H3 - 15 to 19 inches: , unweathered bedrock

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: 12 to 20 inches to lithic bedrock
Natural drainage class: Well drained

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Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Very low (about 2.6 inches)

Interpretive groups

Farmland classification: Not prime farmland

Land capability classification (irrigated): 6s

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D

Ecological site: STONY 6-10 PZ (R007XY202WA)

152—Taunton fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

Elevation: 200 to 2,200 feet

Mean annual precipitation: 6 to 12 inches

Mean annual air temperature: 48 to 54 degrees F

Frost-free period: 140 to 210 days

Map Unit Composition

Taunton and similar soils: 100 percent

Description of Taunton

Setting

Landform: Terraces

Parent material: Alluvium and loess

Typical profile

H1 - 0 to 8 inches: moderately alkaline, fine sandy loam

H2 - 8 to 19 inches: moderately alkaline, very fine sandy loam

H3 - 19 to 27 inches: moderately alkaline, gravelly fine sandy loam

H4 - 27 to 37 inches: , cemented material

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: 20 to 40 inches to duripan

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 30 percent

Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Farmland classification: Farmland of statewide importance

Land capability classification (irrigated): 4e

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Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: C

Ecological site: SANDY 6-10 PZ (R007XY501WA)

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