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Water Supply Wells at Elwha, Olympic National Park

There are two NPS water-supply wells in the Elwha River Valley. There is a shallow well at the Elwha campground and a shallow well at the Elwha ranger station. A test hole was drilled at the Altaire campground, but it was dry.

The well at the Elwha campground was constructed in October 1974. It was drilled to 80 feet, but then backfilled to 22 feet; probably because the lower part of the borehole was drilled entirely in “gray silty clay” which would not be a good aquifer and might be a continuous source of fine-grained sediment to the well. The driller’s log for the Elwha campground well shows;

0-1½ feet	Brown sand silty soil
1½-5 feet	Rocks, boulders, silt, sand
5-14 feet	Brown rocks, silt, sand
14-16 feet	Gray clay, rocks
16-20 feet	Gray silty clay
20-80 feet	Gray silty clay

The well was completed with five feet of 0.050” slot Johnson well screen from 11-16 feet. Apparently the predominance of clay below 16 feet formed the base of a thin, near-surface aquifer. The well was test pumped at 20-25 gpm.

The well at the Elwha ranger station was constructed in October 1974. It was drilled to 136 feet, but then backfilled to 25 feet; probably because the lower part of the borehole was drilled entirely in “gray clay” which would not be a good aquifer and might be a continuous source of fine-grained sediment to the well. The driller’s log for the Elwha ranger station well shows;

0-7 feet	Brown loose rocks, gravel, soil, and sand
7-12 feet	Brown packed gravel, soil, and sand
12-17 feet	Brown cemented gravel, soil, and sand
17-18½ feet	Broken shale, gravel, and sand; water bearing
18½-20 feet	Shale particles, gravel, and gray clay
20-136 feet	Gray silty clay

The well was completed with five feet of 0.060” slot Johnson well screen from 16-21 feet. Apparently the predominance of clay below 20 feet formed the base of a thin, near-surface aquifer. The well was test pumped at 12 gpm.

The test hole at the Altaire campground was drilled in September 1981. It was drilled to 200 feet. Well casing was installed to 100 feet. The well completion report states that the well was dry.

There is no record of the disposition of the well. The driller's log for the Altaire campground well shows;

0-3 feet	Silt and brown clay
3-15 feet	Large rocks and hard pan
15-22 feet	Brown hard pan
22-26 feet	Red clay
26-31 feet	Red hard pan
31-89 feet	Blue clay
89-98 feet	Silt, water, and blue clay
98-200 feet	Blue clay

The entire well was drilled through clay and hard pan. Hard pan is a driller's term for dense, compacted clay.

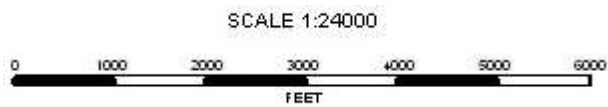
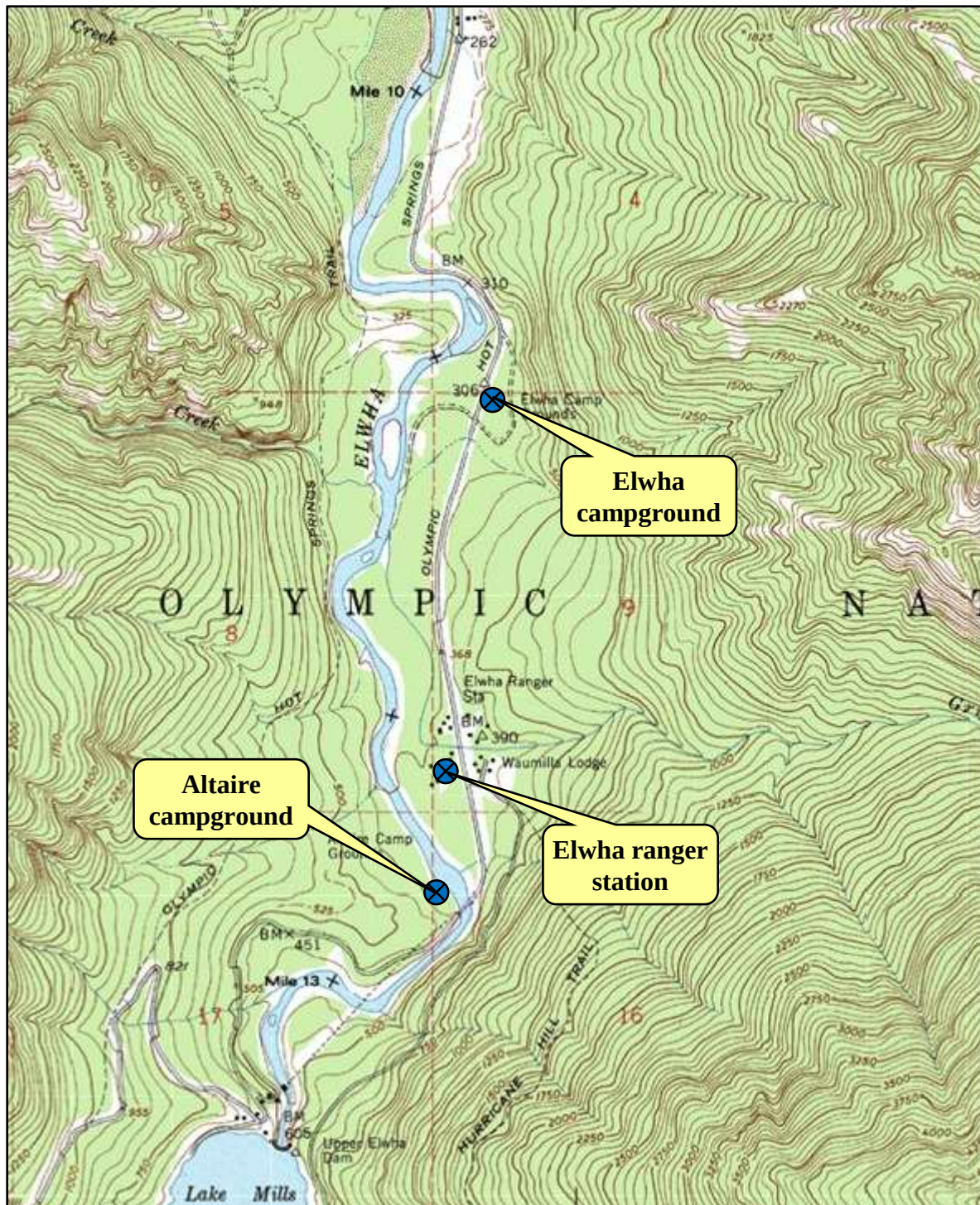
The hydrogeologic story of the Elwha River Valley seems to be that there is a thin (about 20 feet) layer of alluvium (sand and gravel) overlying glacial till (mostly clay). The underlying bedrock is basalt in the lower part of the valley, downstream from the ranger station. Upstream of the ranger station, the valley is underlain by marine sedimentary rocks; sandstone and siltstone. There are no records of wells drilled into these bedrock formations in this area, so the water-bearing potential is unknown. The basalt bedrock in the lower part of the valley is likely to yield some water, so a deeper well at the campground is a possibility. If it is found that the basalt bedrock will yield groundwater, then a deeper well for the ranger station could also be constructed, but it would need to be north of the ranger station to locate it in the basalt bedrock, rather than the marine sediments in the bedrock south of the ranger station.

Summary

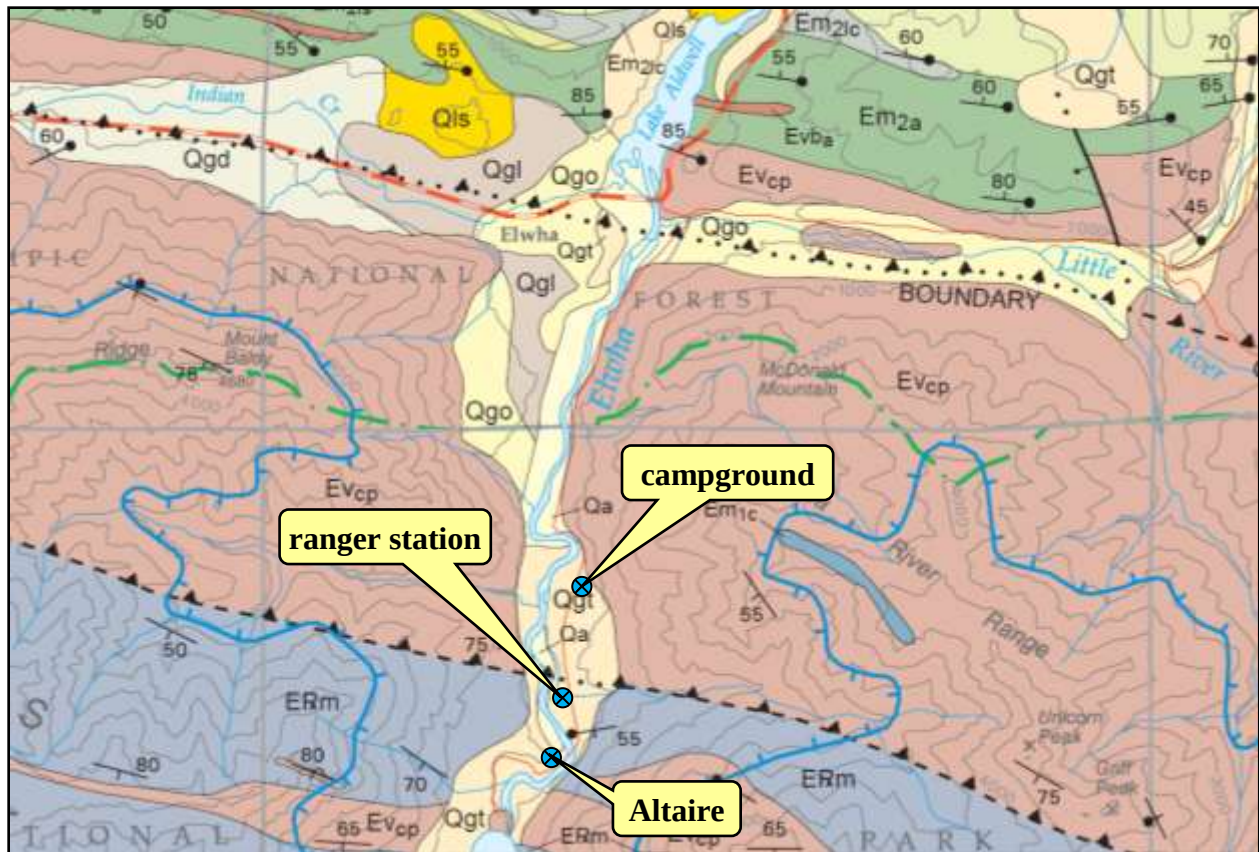
Existing wells in the Elwha River Valley obtain water from shallow (less than 20 feet deep) sand and gravel deposits which overly low-permeability glacial till deposits. These shallow wells are vulnerable to contamination from surface sources. Replacement wells would also be shallow, unless a decision was made to target the underlying basalt bedrock in the lower part of the valley. Upstream of the ranger station, the bedrock is marine sedimentary rock and likely to have poor water-bearing potential.

If groundwater from the existing, shallow wells meets drinking water standards and passes the GWI test, then we should continue using them, being careful to protect the area upstream and surrounding the well from contaminant sources.

If deeper wells are desired, they should target the basalt bedrock in the lower part of the valley, downstream of the ranger station.



**NPS well locations in
the Elwha River Valley**



A portion of the Port Angeles 1:100,000 geologic map by Henry Schasse (2003).

Description of geologic map units

- Qa – Alluvium: well-sorted gravel, sand, silt, and clay deposited by running water in and along streams.
- Qgt – Glacial till: unstratified, highly-compacted mixture of poorly sorted clay, silt, sand, gravel and boulders deposited directly by glacier.
- Qgo – Glacial outwash: stratified, poorly-to-moderately sorted outwash sand and gravel.
- Ev_{cp} – Marine basalt rocks: pillow basalts, basalt breccias, and volcaniclastic sandstone and sedimentary rocks.
- EP_{Am} – Marine sedimentary rocks: gray-to-black sandstone, siltstone, and argillite, commonly laminated and rhythmically bedded

WATER WELL REPORT
STATE OF WASHINGTON

Application No. _____
Permit No.

(1) OWNER: Name Olympic National Park Address 4th & Pike Bldg - Seattle, WA 98101

(2) LOCATION OF WELL: County CLALLAM NW 1/4 NW 1/4 Sec. 9 T. 29 N., R. 7W W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Elwha Camp Ground
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 20 ft. Depth of completed well 30 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 5" Diam. from 0 ft. to 13'6"
Threaded ☐ 5" Diam. from 18 ft. to 30 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 THOMSON
Type SLOT SCREEN Model No 16
Diam. 5" Slot size 50 from 18 ft. to 30 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 Portland Cement & Gravel
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 150' ABOVE
Static level 6 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? Well Driller

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
20 GPM " 2 1/2' " 7 "
25 GPM " 3 1/2' " 1 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>5:35</u>	<u>Stop Pump</u>				
<u>5:37</u>	<u>26' 1"</u>				
<u>5:40</u>	<u>6'</u>				

Date of test 10/31/74

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

Artesian flow _____ g.p.m. Date _____

Temperature of water 50 Was a chemical analysis made? Yes ☐ No ☒

USGS

(USE ADDITIONAL SHEETS IF NECESSARY)

(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 sand & silty soil	0	1 1/2'
Clay & boulders silty sand	1 1/2'	5'
Brown clay boulders silty sand	5'	14'
Gray clay rocks	14'	16'
Gray silty clay	16'	30'
"	30'	30'

Back Filled Hole to 22 ft

RECEIVED

NOV 23 1974

DEPARTMENT OF ECOLOGY
SOUTHWEST REGIONAL OFFICE

Work started 10/2 19 74 Completed 10/31 19 74

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 STOLCAN DRILLING CO. INC.
(Person, firm, or corporation) (Type or print)

Address P.O. Box 161 Sequim, WA 98282

[Signed] Valer Stucan
(Well Driller)

License No. 0473 Date 11/6 19 74

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Elwha Campground Well

