



Umitilla G.

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ENGINEERS AND PLANNERS

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S-4952.2

4 December 1968

Oregon State Board of Health
State Office Building
1400 S. W. Fifth Avenue
Portland, Oregon 97201

Well No. 1 - City of Irrigon, Oregon

Gentlemen:

The above well was drilled to a depth of 317 feet, and artesian flow of about 15 gallons per minute (gpm) with a shut-in pressure of 5 pounds per square inch was obtained on 16 October 1968. This water was allowed to flow freely to waste for about three weeks and did not appear to diminish in quantity or improve in quality which was unsatisfactory due to a high hydrogen sulphide content.

A pumping test on 13 November 1968 produced about 150 gallons per minute for four hours with pumping level of 210 feet, and 100 gpm for the next twelve hours from about 135 feet. A strong odor of H₂S persisted and a field test kit indicated a concentration of 1.0 part per million (ppm). Temperature was 64° F. At this time the well was continuously cased 6-inch diameter from the surface to 199 feet depth with concrete seal outside the casing at that depth. There was open 6-inch rock hole to 317 feet and 12-inch casing through alluvium from surface to 85 feet depth with cement grout seal water-tested at that depth.

It was decided to seal out the poor quality water by placing a cement grout plug from 282 feet to 270 feet in the open 6-inch hole on sand and gravel backfill from the bottom of the hole at 317 feet. This plug was checked out after three days by bailing down without recovery of the artesian pressure. As an added precaution, the hole was backfilled with sand and gravel from 270 feet to 255 feet and a second grout plug placed from 255 feet to 245 feet.

The 6-inch casing was perforated with a Mills knife from 185 feet up to 125 feet with six holes around per foot, and the static water level of 38 feet originally experienced in the basalt returned. The water level in the top alluvial material had been 38 feet which was cased out with the 12-inch casing and became 36 feet when drilling in the basalt.



A second pump test was conducted on 20 November 1968 which produced 140 gallons per minute from a depth of 153 feet after twenty-eight hours of pumping. This water was of better quality and field tested at 0.1 ppm H₂S or less with some slight odor and no taste. Temperature was 62° F. It is intended to use this as the source of water for the City of Irrigon, possibly with simple aeration.

We enclose a copy of a chemical analysis of a sample of the water tested less than 24 hours after collection. It appears similar to other water obtained from the basalt in the area and acceptable for municipal supply. We are presently proceeding with final design of the supply facilities which will be submitted for your review and approval on completion, but would appreciate your assurance that the chemical characteristics of the water are acceptable.

Very truly yours,

CORNELL, HOWLAND, HAYES & MERRYFIELD

Antony B. Barnes

ABB/dc

Enclosure: Chemical Analysis

cc: Mr. Chester A. Wilson, Mayor, Irrigon
Mr. James R. Sheetz, District Sanitary Engineer, Pendleton
Morrow County Health Officer, Boardman
✓ State Engineer's Office, Salem

NORTHWEST LABORATORIES

APPLIED INDUSTRIAL RESEARCH

STAFF AFFILIATIONS: A.S.T.M.-A.C.S.-A.I.Ch.E.-A.C.I.-A.S.M.-A.O.C.S.-A.M.E.-N.S.P.E.-A.C.I.L.

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Report to: **Cornell, Howland, Hayes & Marryfield**

Date: **November 26, 1968**

Report on: **Water Sample**

Lab. No. **C 6628**

IDENTIFICATION: City of Irrigon, Oregon. Water from about 150 depth in partly decomposed basalt for analysis for domestic supply Sample taken 11-21-68 at 5:00 p.m.

PHYSICAL CHARACTERISTICS:

Color (Cobalt-Platinum Scale)	1
Turbidity	2
Dissolved Solids	298.0

See letter - Umatilla Co.

** Will plug at 200 ft. H₂S below 200 to 317*

CHEMICAL CHARACTERISTICS:

pH 8.0

Ionic:

	<u>PPM*</u>	<u>PPM**</u>
Silica, SiO ₂	65.5	2.1812
Iron, Fe	0.10	---
Calcium, Ca	7.3	0.364
Magnesium, Mg,	2.9	0.239
Potassium + Sodium as Na	109.8	4.774
Manganese, Mn	Less Than 0.01	---

Hydroxyl, OH	None	---
Carbonate, CO ₃	10.9	0.363
Bicarbonate, HCO ₃	252.1	4.134
Sulphate, SO ₄	8.4	0.175
Chloride, Cl	25.0	0.705
Nitrate Nitrogen as NO ₃	0.04	---
Phosphate, PO ₄	Less Than 0.01	---
Fluoride, F	1.6	---
Free CO ₂	4.1	---

Normal Carbonate Alkalinity as CaCO ₃	18.2
Bicarbonate Alkalinity as CaCO ₃	206.6
Total Hardness as CaCO ₃	30.2
Non Carbonate Hardness as CaCO ₃	None
Hardness Classification	Soft Water (Range: 15-50 PPM)

* Parts Per Million

**Equivalent Parts Per Million

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