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INTER-OFFICE MEMORANDUM

SUBJECT: A geochemical appraisal of the Bully Creek, Vale, North Vale, Beulah, and Animas geothermal prospects

DATE April 29, 1977

TO: R. A. Barker, W. M. Dolan, H. J. Olson

FROM: Frank Dellechaie

The following table is a comparison of the EPG geothermal prospects. The 1 to 10 rating in the last row is based predominately on hydrogeochemical studies and biased with my understanding of the geology.

Frank Dellechaie

Frank Dellechaie

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	BULLY CREEK	VALE	NORTH VALE	BEULAH	ANIMAS
Thermal manifestations	6 hot springs 4 warm springs	4 hot springs	1 tepid mineral spring	2 hot springs	Four 20-30m superheated wells, 1 hot well
Surface temperature range	96°C (Boiling) to 25°C	91°C to 44°C	26°C	72°C to 70°C	102-65°C
Recent spring deposits	Major quantity Hard white silica	Tan calcite	none	Moderate quantity Hard white silica	none
Thermal water type	Sodium bicarbonate	Sodium chloride	Sodium chloride	Sodium sulfate	Sodium sulfate
Water was in last equilibrium with -	Silica and igneous minerals	Carbonates and metamorphic minerals	metamorphic minerals	Amorphous silica, chalcedony, metamorphic minerals	Carbonates and igneous minerals
Probability of $CaCO_3$ scaling	Low	Very high	Data does not lend information	Low	Low to moderate
Subsurface temperature Credibility	SiO_2 177 Alkali 183 good good	SiO_2 148 Alkali 153 good good	SiO_2 85 Alkali 79 good good	SiO_2 178 Alkali 135 poor good	SiO_2 159 Alkali 165 good good
Probability of cold water dilution of thermal waters	Very low	Very low	Low	Low - moderate	very low
Potential reservoir configuration	A wide fault zone trending NW of Jorden Hot Spring	Fault intersection Lytle Blvd. and Malheur River faults	?	?	Fault intersection sec. 7
Areas youngest rocks	7.5 my Rhyolite 1.8 km from hot springs Youngest Rhyolite in eastern Oregon	Pliocene Chalk Butte sediments	Tertiary basalt and andesite	Pliocene rhyolites	Middle-late Tertiary rhyolite
Rating based on geochemistry and geochronology, 1 to 10. Roosevelt area, Utah would equal 10.	7	3	2	3	5