

MEMORANDUM

September 8, 1992

TO: Don Hull
FROM: Ron Geitgey
SUBJECT: Lake Albert Soda Ash Project

COMMODITY - Soda ash, sodium carbonate.

U.S. PRODUCTION

Green River Basin, WY: underground and solution mining of bedded trona deposits (a hydrated sodium carbonate sodium bicarbonate mineral), six producers, about 10 million tpa.

Searles Lake, CA: saturated subsurface brines, about 600,000 tpa, recently announced planned expansion to 1.8 million tpa.

Rifle, CO: solution mining of nahcolite (sodium bicarbonate), just starting up a 125,000 tpa plant.

Owens Lake, CA: 600,000 tpa plant to be completed in 1993, cost of \$100 million.

DOMESTIC: EXPORT, 73%:27% (much of it through Portland)

USES - glass (flat, container, and fiber), 49%; chemicals, 23%; soaps and detergents, 12%; flue gas desulfurization, 3%; pulp and paper, 3%; water treatment, 2%; miscellaneous; 7%.

PRICES - \$100 to \$150 per ton, f.o.b. mine depending on product and shipping method.

MARKET TRENDS in soda ash consumption

glass - stable to declining due to recycling

chemicals - stable

soaps and detergents - increasing, production of many low phosphate cleaners requires more sodium carbonate.

flue gas desulfurization - may increase markedly after 1995 when stricter sulfur dioxide emission standards go into effect, new and growing technology to remove sulfur from stack gases of coal burning plants.

pulp and paper - potential rapid growth; both require caustic soda (sodium hydroxide) and bleaching reagents; current source is primarily from the electrolysis of salt (sodium chloride) producing both caustic soda and chlorine; use of chlorine is decreasing in part due to dioxin concerns; soda ash can be used both to produce caustic soda and as a bleaching agent.

LAKE ABERT

closed-basin lake about 40 miles north of Lakeview in Lake Co.

size in historic times has ranged from completely dry in 20's and 30's at about 4244 ft elev to high water level of 4260.5 ft in 1958 (about 41,000 acres)

pH around 10

total dissolved solids range from 20,000 to 90,000 ppm depending on lake level (volume) approx. 40% sodium, 30% carbonate/bicarbonate, 30% chloride

unusual in high carbonate/bicarbonate content and near absence of other cations and sulfate
possible sources of recoverable soda ash: lake water, lake bottom sediments, subsurface
brines, subsurface beds
total dissolved sodium content of lake water equivalent to about 10-12 million tons of soda
ash

OWNERSHIP - federal, state, private

EXPLORATION STATUS

Canadian Occidental has completed initial sampling and evaluation
will probably apply for federal leases in very near future

POSSIBLE PRODUCTION METHODS AND OTHER CONSIDERATIONS

carbonation: bubbling CO₂ through lake water or brine to precipitate soda ash, no water
loss, will require CO₂ supply

evaporation: ponds or thermal evaporators

bottom sediment dredging

product could be trucked to railhead at Lakeview or rail could be extended to Lake Abert

possible production of several hundred thousand tpa

minimum royalty of 5% of product value

POTENTIAL CONCERNS

state vs federal ownership of surface waters (and salts)

acreage limitations of federal sodium leases

pooling or unitization to exploit a fluid resource

brine shrimp collecting permit issued by State Marine Board

adjacent to Abert Rim WSA, recommended for Wilderness by BLM

state scenic corridor

snowy plovers nest at north end, soda ash production likely at south

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