



Mineral Extraction Industry

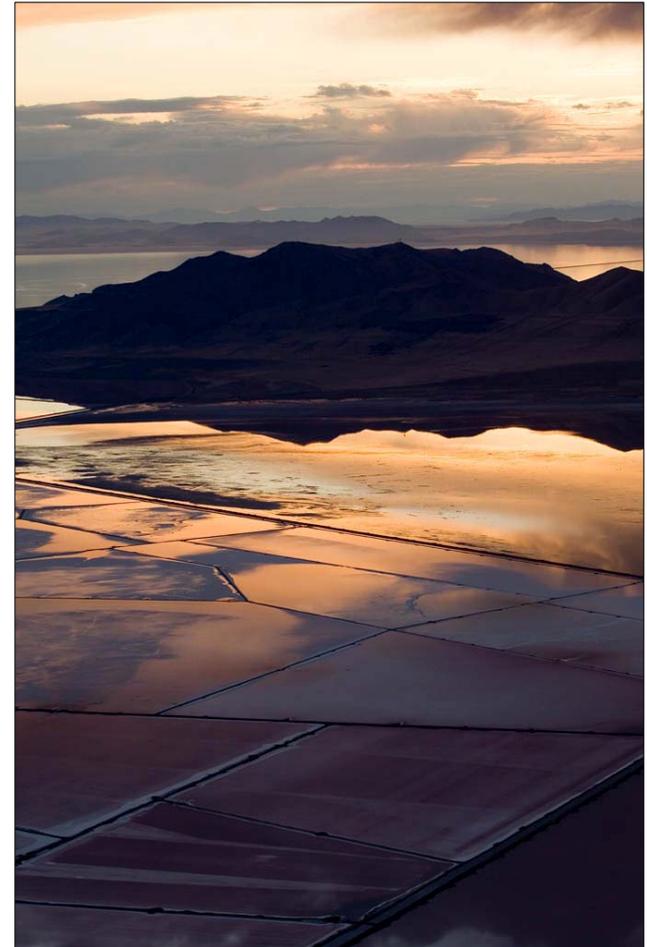
**Great Salt Lake Advisory
Council Presentation
August 26, 2010**



**Great Salt Lake
Minerals Corporation**
A Compass Minerals Company

Today's Agenda

- ▶ Mineral extraction industry on the lake
- ▶ Who is GSL, what do we do?
- ▶ GSL expansion plans
- ▶ Q & A



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Mineral Extraction on the Great Salt Lake



History of Minerals on the Lake

- ▶ 1850: First salt plant opens near Antelope Island.
- ▶ 1880s: Inland Salt Company consolidates small salt companies on south shore.
- ▶ 1918–1922: Morton starts potash operations, then buys Inland Salt.
- ▶ 1950s: Three other salt companies open.
- ▶ 1960s: Great Salt Lake Minerals begins potash operations.



Mineral Extraction Overview

- ▶ Great Salt Lake is one of the largest industrial solar energy sites in the world.
- ▶ Solar energy evaporates water to crystallize raw materials for production of salt, potassium sulfate fertilizer, magnesium chloride, magnesium metal, chlorine, calcium chloride and iron chloride.
- ▶ Plants refine products to a marketable quality, products are shipped by rail and truck, package and bulk.
- ▶ Major economic benefits for the State.



Mineral Extraction Permits and Approvals

- ▶ Water rights to pump from the lake – DNR, Division of Water Rights.
- ▶ Mineral lease or easement – DNR, Division of Forestry, Fire and State Lands.
- ▶ Mining plan – DNR, Division of Oil, Gas and Mining.
- ▶ Air operating permits for dryers and stationary engines – Dept. of Environmental Quality.
- ▶ Water discharge and storm water runoff permits – Dept. of Environmental Quality.
- ▶ Discharge permits for dikes, canals or pump stations– US Army Corps of Engineers.



Pressures Affecting Mineral Extraction

- ▶ The lake's water level changes every year:
 - Low years require intake pump and canal modifications to feed solar ponds.
 - High years can damage dikes and reduce mineral concentration, affecting production.
 - Wet years or late storms reduce net evaporation and thus production.
- ▶ Uncertain impacts of changing standards.
- ▶ Uncertainty over climate change initiatives.



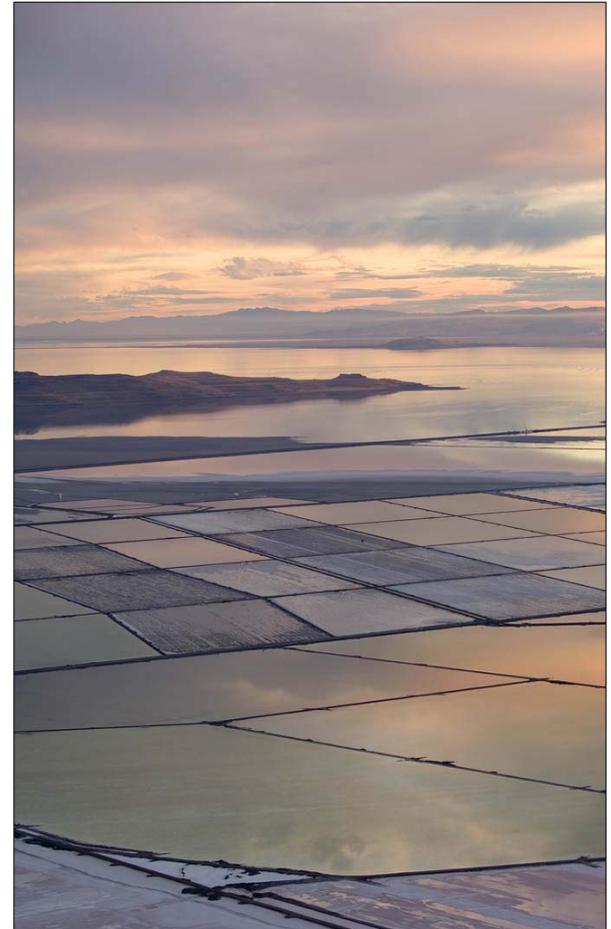
Blueprint for Effective Lake Management

- ▶ A plan that balances the needs of wildlife, recreation and the economy.
- ▶ Consistent and coordinated management from multiple State agencies.
- ▶ Coordination by State and Federal agencies.
- ▶ Fact-based decision-making.
- ▶ A central library of data and reports about the lake.
- ▶ Sufficient resources so agencies regulating the lake can make timely decisions.



About Great Salt Lake Minerals

- ▶ Operating on the lake for 40 years.
- ▶ About 350 employees and 80 contractors.
- ▶ \$65 million per year to the Northern Utah economy in payroll, taxes, royalties, and contracts with local vendors.
- ▶ Bird habitats thrive adjacent to GSL's ponds.



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Green Business, Green Products

- ▶ Evaporation ponds use clean solar energy.
- ▶ Bio–diesel blend for vehicles.
- ▶ On–site cogeneration plant for power.
- ▶ No hazardous chemicals, no toxic waste.
- ▶ What we make:
 - Organic–approved SOP fertilizer, our most valuable product.
 - Salt for animal feed, de–icing for winter road safety, and water softening.
 - Magnesium chloride for summer dust prevention and winter de–icing.

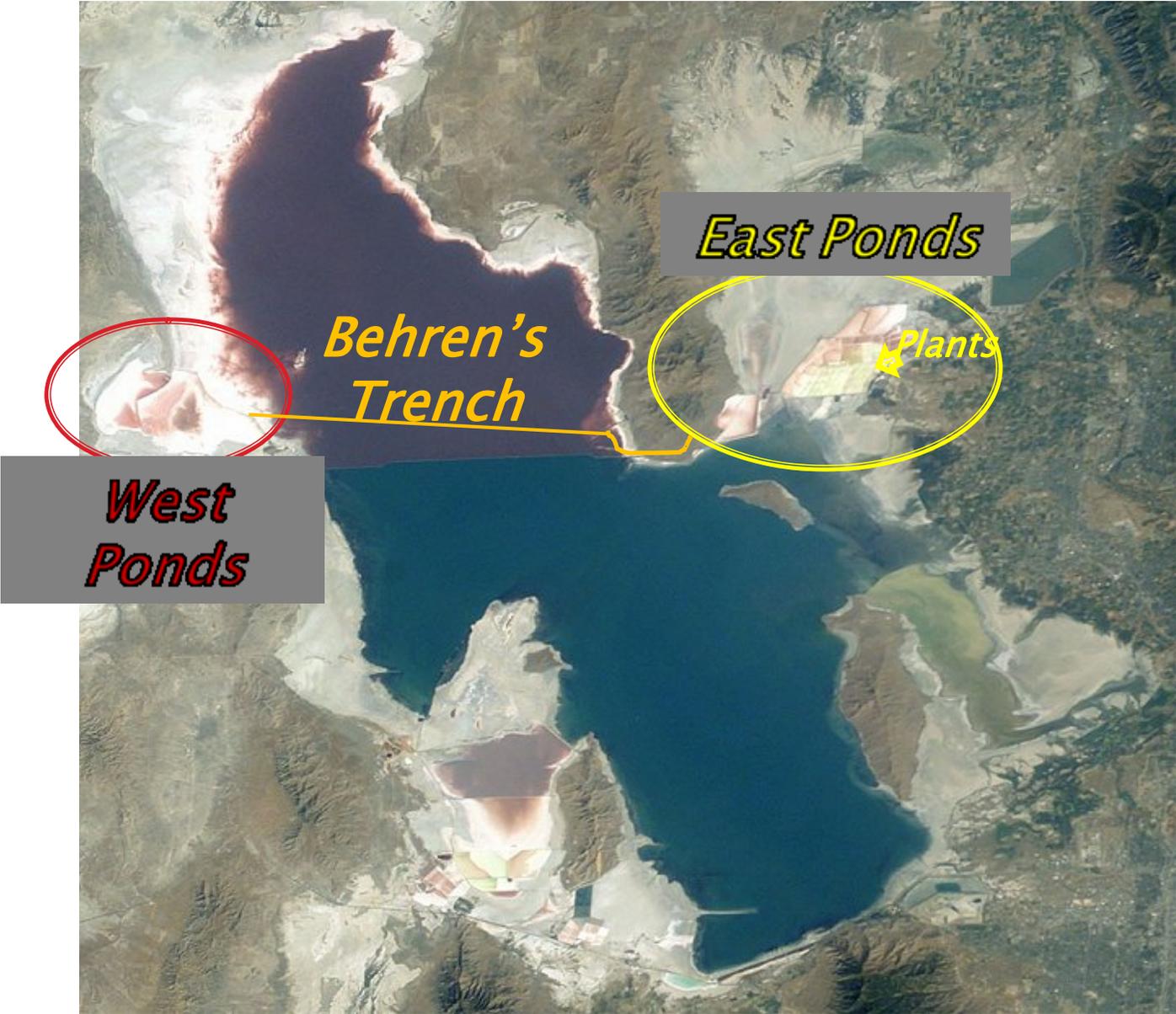


Our SOP Fertilizer is Special

- ▶ GSL is the only American supplier of sulfate of potash fertilizer (SOP).
- ▶ Our SOP is all-natural, organic-approved, and has virtually no chloride which can damage some crops' roots.
- ▶ That's why it is essential for growers of chloride-sensitive vegetables, fruits, nuts and other crops.
- ▶ Without chlorides to flush from the soil, farmers applying SOP use much less water.



GSL Operations – Overview



GSL Operations – West Side

- ▶ High-salinity brine of the lake's northwest arm evaporates for one year in large solar ponds.
- ▶ At 1.4% K concentration, the brine flows along GSL's unique underwater trench to east side via gravity -- 21 miles in 7 days.
- ▶ Brine then is pumped around Promontory Point to east ponds for two more years of solar evaporation.



GSL Operations – East Side

- ▶ Brine evaporates for two years, advancing through smaller ponds as mineral concentrations increase.
- ▶ First salt, then potassium minerals naturally crystallize on pond floors, leaving a final brine high in magnesium chloride.
- ▶ The minerals are gathered from the ponds, then processed naturally via heating, cooling and filtering.



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The Need for More Nutrients

- ▶ U.S. population projection = 438 million in 2050.
source: US Census Bureau

- ▶ Worldwide population projection = 9.2 billion in 2050.

- ▶ Worldwide food demand projection = 70% increase by 2050.

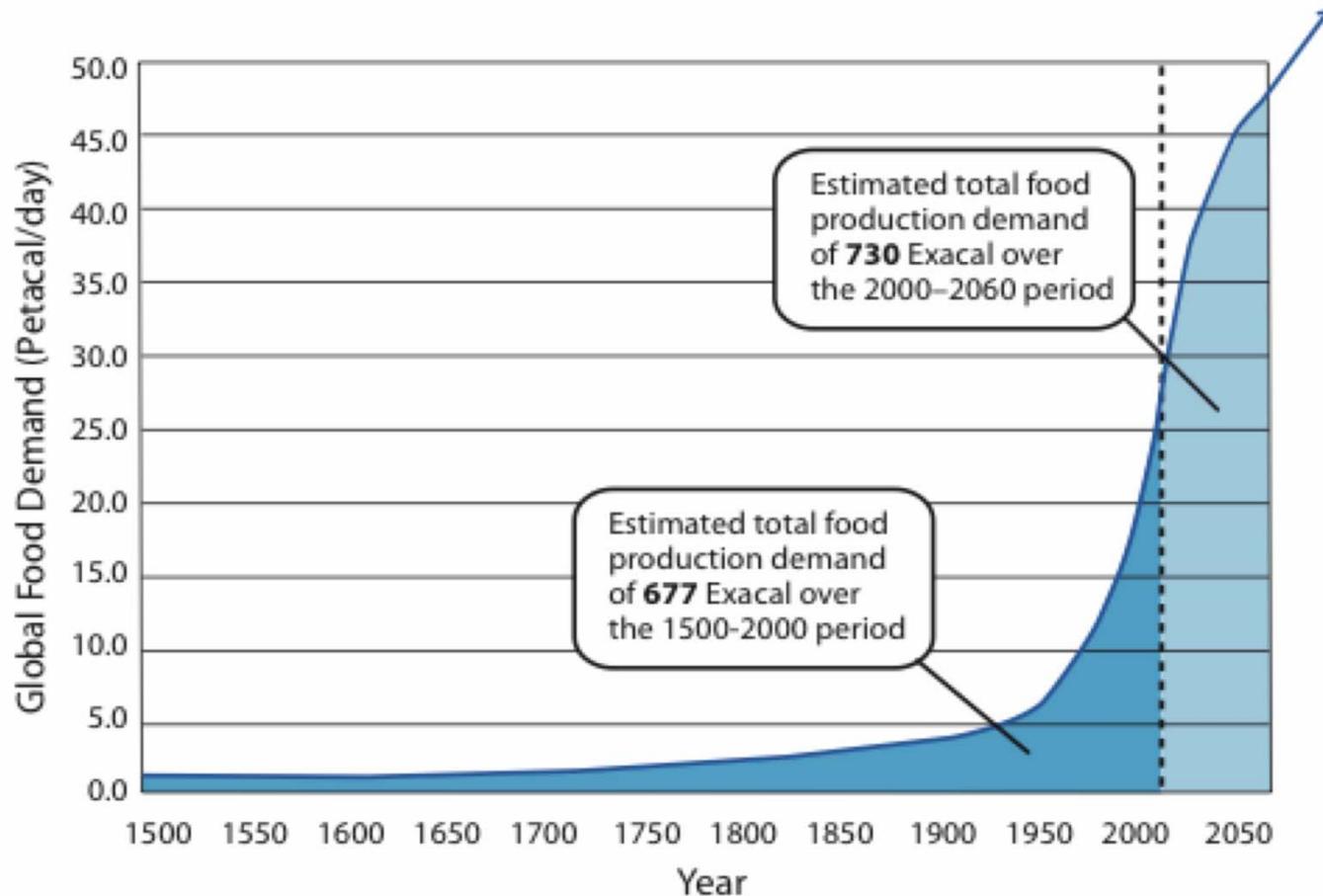
source: UN Food Agricultural Organization

Thus GSL's projection of continued 2–3% annual growth for SOP demand over the next decades is extremely conservative.



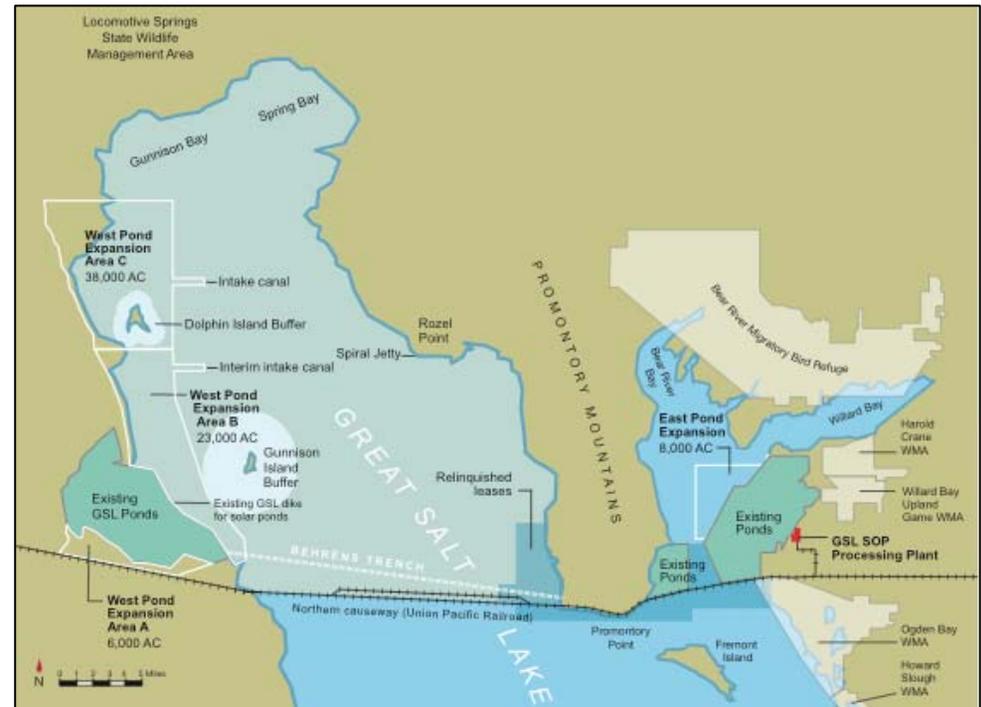
Rising Demand for Healthy Food

Source: Professor Julian Cribb, *"The Coming Famine"*



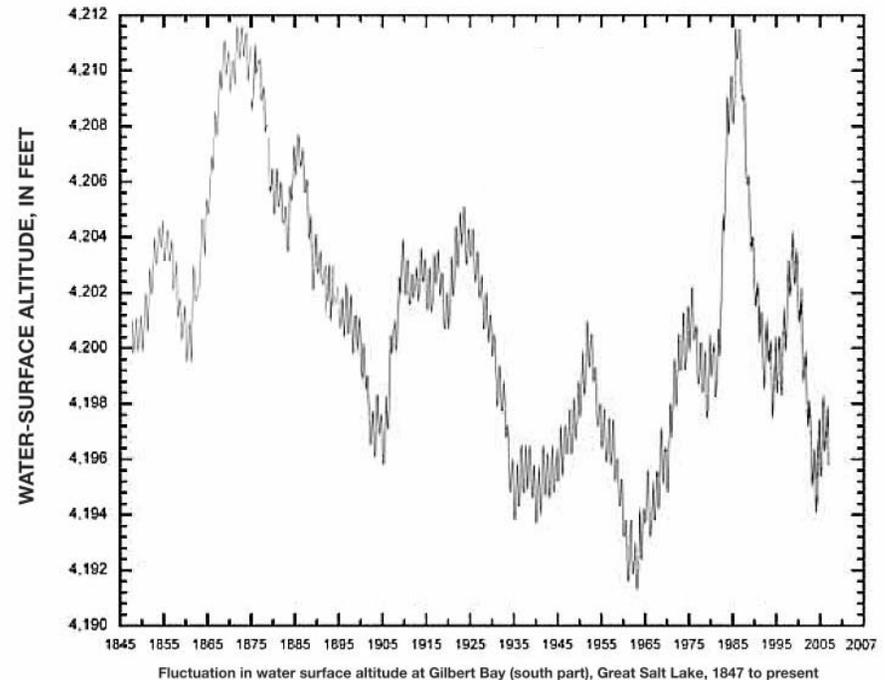
Details of GSL's Expansion Plan

- ▶ \$40 million investment to increase efficiency.
- ▶ 23,000 acres on west shore leased in 2008.
- ▶ Lease exchange in 2009 -- 38,000 acres in remote northwest areas received, 30,000 acres near Promontory Point relinquished.
- ▶ New permit application filed in May 2009.



The Water Level Issue

- ▶ Lake levels fluctuate each year -- historic average is a surface elevation of 4200'.
- ▶ Lake level is the same today as in 1967 before GSL built its first pond.
- ▶ Effect of GSL's proposal is still being modeled.
- ▶ Real impacts: weather, urban development and upstream interception of rivers that feed the lake.



Utah's Needs and the Lake's Future

- ▶ A vibrant lake ecology.
- ▶ A balance of wildlife, recreation and industry.
- ▶ Jobs that help raise families, educate children and pay for retirement.
- ▶ Taxes and royalties to build State facilities and fund lake improvements.
- ▶ Products to support the world's future food needs.



Questions & Answers



For more information: www.gslfuture.com



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