

The background of the slide is a photograph of a bright blue sky with wispy white clouds above a calm, deep blue body of water. The text is centered and rendered in white.

Energy-Water Nexus: Water and Wastewater View

Salt Lake City Department of
Public Utilities

Jeff Niermeyer, Director

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SLCDPU Operations

- Culinary water storage, treatment and distribution to more than 400,000 customers in Salt Lake City and Salt Lake County
- Sewer conveyance and treatment for Salt Lake City residents
- Stormwater conveyance in Salt Lake City

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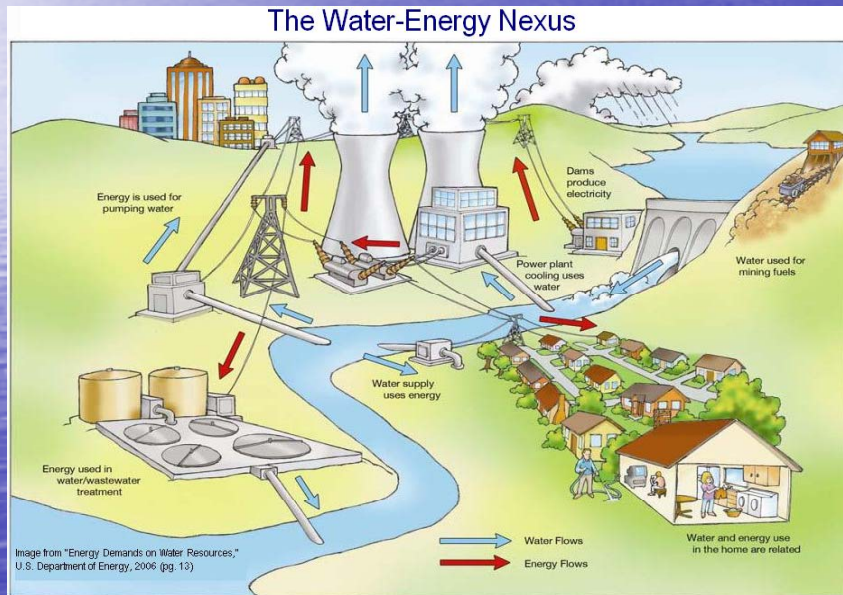
SLCDPU Operations (cont)

- Water resources include surface water from Wasatch Canyons and groundwater
- 121,568 acres of watershed area outside the City's municipal boundaries
- Three water treatment facilities, one sewer treatment facility
- 26 deep wells
- 1,373 miles of water pipe; 645 miles of sewer pipe; 465 miles of storm drain pipe
- 31 water pump stations; 35 sewer lift stations; 28 storm drain lift stations



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Interdependencies and Interrelationships



- The water and wastewater sector relies on the energy sector to physically move water around, treat water and wastewater, as well as to support these tasks administratively.
- The energy sector relies on the water sector to directly make energy through hydro-power, and significant quantities of water used in processing and cooling.

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Energy to Make Water

- It takes a lot of energy to process and convey water and wastewater
- In 2007, SLCDPU used 39,942,462 kilowatt hours of electricity, 26303.1 decatherms of natural gas, and 240,675 gallons fuel

Water to Make Energy

- In FY 2007, one oil refinery in Salt Lake City was the City's largest retail customer using 880,378 ccf, or 658,568,477 gallons of water from SLCDPU's system (2.5% of total water used that year).
- In FY 2007, one power company in Salt Lake City used 252,026 ccf, or 188,515,448 gallons of water (.71% of total water used that year).

Shared Pressures

- The energy and water sectors share the same pressures:
 - Regional and global demand increase due to population and development
 - Resource Competition
 - Emerging regulations (water quality, air quality, carbon emissions)
 - Environmental stewardship - climate change, water quality and aquatic habitat, etc...

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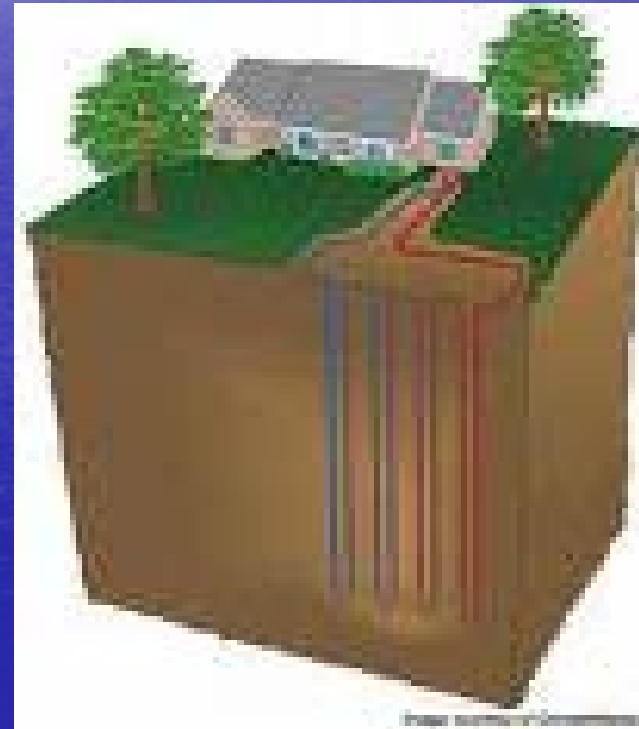
Local Energy/Water Resource Issue: Ground Source Heat Pumps

- Salt Lake City is encouraging production of renewable and low/no carbon energy sources
- Ground source heat pump systems could work for site-generated renewable energy with minimal carbon footprint
- Technology could negatively affect groundwater quality if not implemented carefully

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Ground Source Heat Pumps

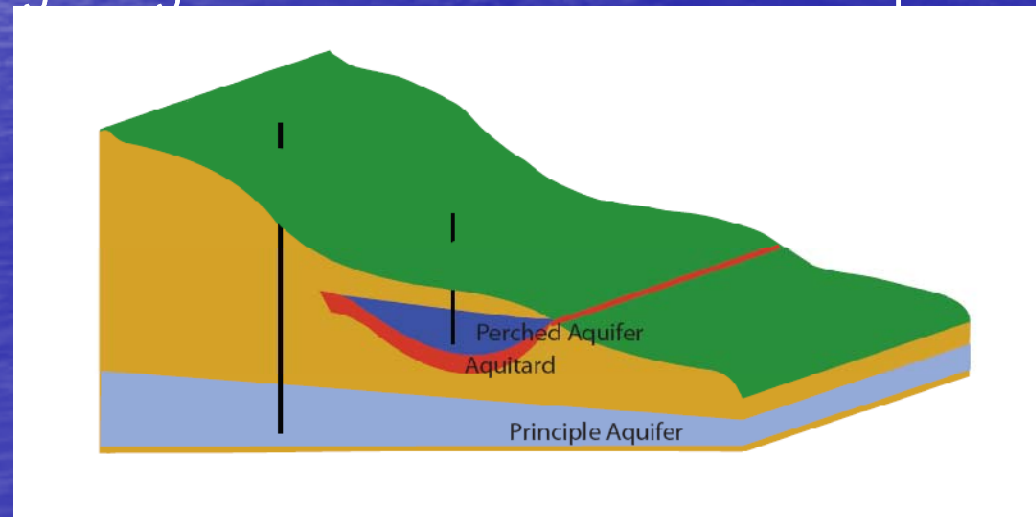
- Ground source heat pumps (GSHPs) are electrically powered systems that tap the stored energy of the greatest solar collector in existence: the earth. These systems use the earth's relatively constant temperature to provide heating, cooling, and hot water for homes and commercial buildings.



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Groundwater Source Protection Concerns with GSHP

- GSHP drilled into primary aquifer
- GSHP cross-connecting aquifers
- GSHP can introduce contaminants to groundwater (surface water, leaking, failure)
- Minimal short and long term oversight on GHSP drilling, monitoring
- Open loop systems extract groundwater resources
- Possible change in groundwater elevation and temperature



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Further Discussion Needed for GSHP Implementation

- Jurisdiction specific discussion of the delicate balance between trading energy savings and future water quality
- Determining roles of various regulatory authorities
- Create design criteria for designers
- Including environmental concerns in the site specific designs

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What Next for GSHP Implementation?

- Create regulatory standards for proper design
- Clearly establish where regulator authority lies for each component
- Create a monitoring program
- Create a data base of wells

QUESTIONS?



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