

# **Road Salt Storage in Ohio**

## **Recommendations for Protecting Water Resources**

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**Franklin County Soil & Water  
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# This talk will cover ...

- \* What's the problem?
- \* How does Ohio regulate this problem?
- \* What guidance is Ohio providing for this problem?

# The good, bad and ugly of salt

- \* THE GOOD: Its TASTE! (Who wants to eat a baked potato without salt?!)



- \* Also, our bodies require some sodium for electrolyte balance.

# The good, bad and ugly of salt

- THE BAD:
- Chloride has unpleasant taste; secondary MCL is 250 mg/L
- Chloride corrodes metal
- Sodium raises blood pressure in susceptible individuals



- U.S. EPA recommended level of sodium in drinking water for people on a low salt diet is 20 mg/L

# The good, bad and ugly of salt

## \* THE UGLY:



USA TODAY

News » Nation

## Salt piles pollute drinking water in Ohio towns

Posted 12/12/2010 4:52 PM ET

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COLUMBUS, Ohio (AP) — Piles of road salt used to melt ice on streets and sidewalks are polluting the drinking water in several Ohio communities, environmental regulators said.

The state Environmental Protection Agency found that rainwater runoff from salt piles has been tainting several public and private wells in Ohio, The Columbus Dispatch reported.

The drinking water in the western Ohio village of Camden was so salty that the residents abandoned its wells.

The village, located in Preble County, started pumping water from a temporary well last month after two salt piles at a nearby business had fouled three wells. The EPA has ordered Camden to get its water from the Southwest Regional Water District.

Camden officials did not return calls for comment, but Preble County health commissioner Melissa Williams talked about the effects of the stockpiled salt.

"After you get to a certain level, you can certainly tell there is a change in the taste," Williams told The Dispatch. "It will corrode your plumbing fixtures, also."

There are no legal limits on how much salt can be in drinking water aside from a federal guideline meant to safeguard taste. There aren't rules to govern how road salt is stored, either.

"The (Ohio EPA) director has broad authority to protect health and welfare," said Mike Baker, the agency's drinking-water and groundwater chief. "If you can't drink the water due to taste, it's a real concern."

State environmental officials also are looking into water pollution problems caused by salt piles near Springfield, Athens, Chardon and Vandalia, The Dispatch reported.

A spokesman for industry-supported Salt Institute in Alexandria, Va., said regional piles are used to eliminate supply shortages during snowy winters.

"That way, there wouldn't be a panic to buy the stuff and no one is gouging you," said the spokesman, Morton Sabin.

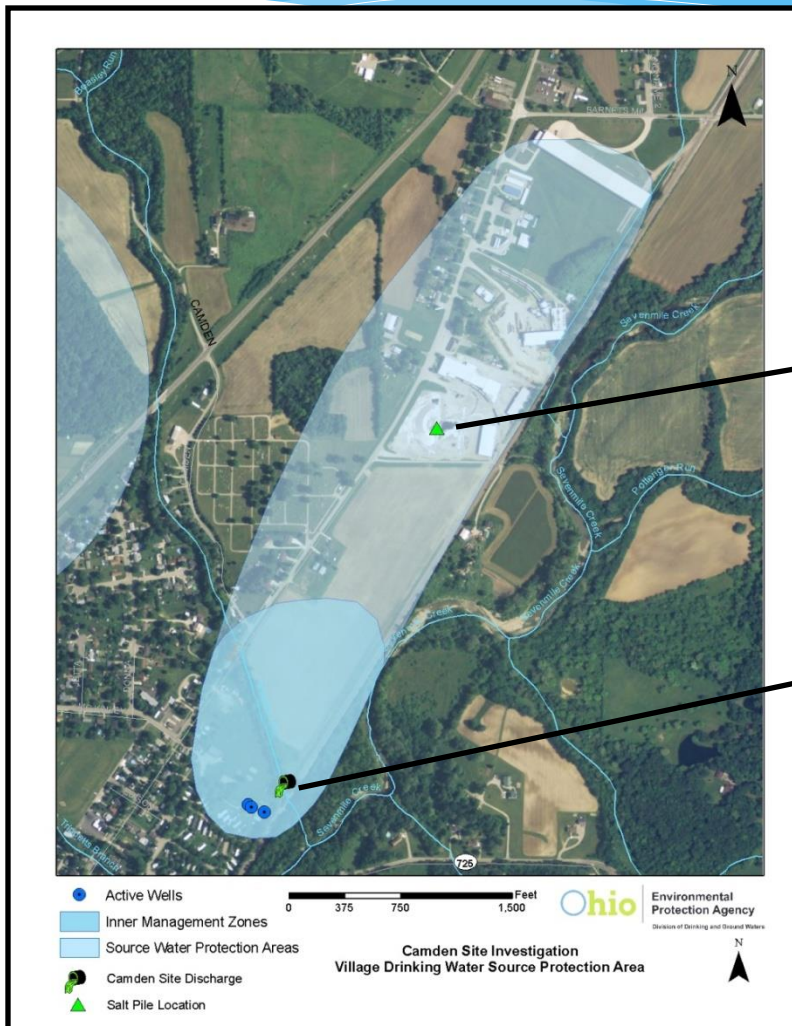
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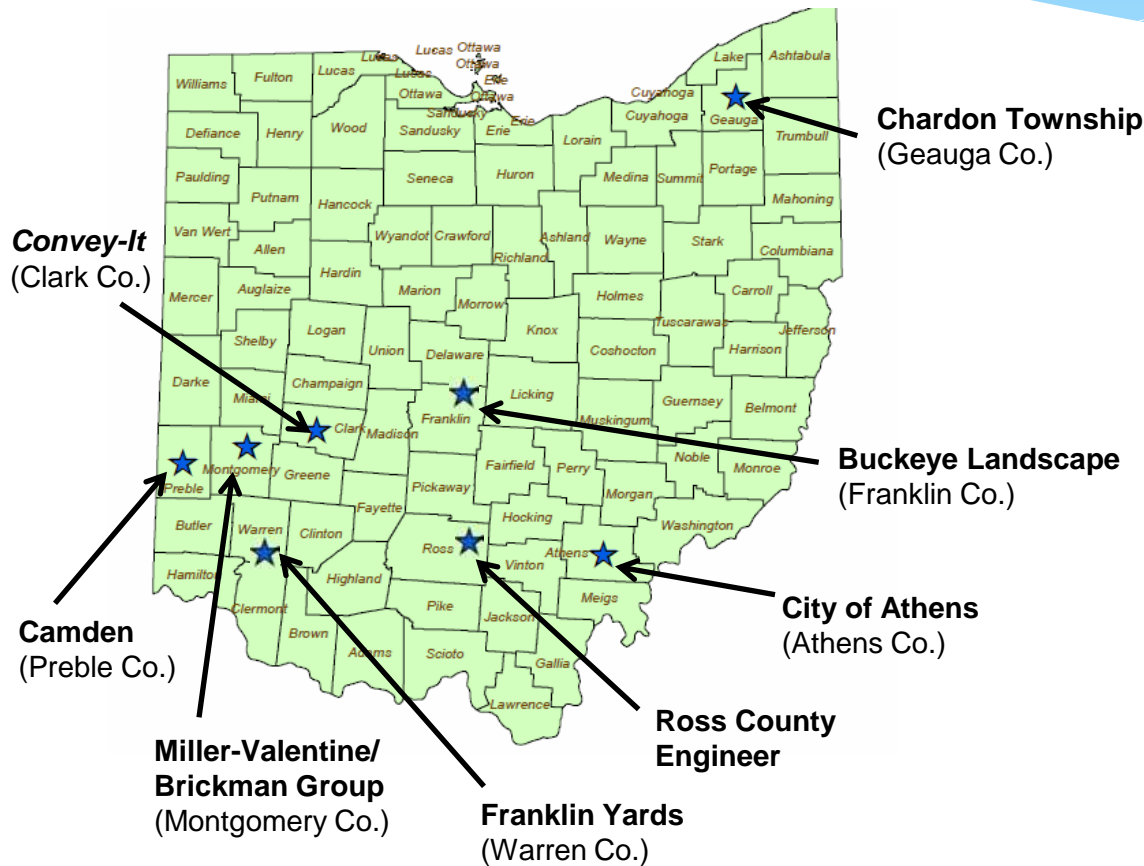
# The poster child: Camden, Ohio



Location of Salt Storage

Location of wells

# Sites with ground water and drinking water impacted by salt, 2009-2011



**Wellfield Lost – Camden**

Chardon Township  
(Geauga Co.)

**Public Wells Contaminated**

Athens, Ross Co. Engineer

**Contamination In SWAP Area**

Buckeye Landscape

**Contamination Outside**

**SWAP Area –**

Convey It, Franklin Yards

**Private Wells Contaminated**

Miller Valentine,  
Chardon Twp.,  
Buckeye Landscape

# In Summary:

—Millions of pounds of salt are used in Ohio every winter. Environmental damage is generally minimized because salt is widely dispersed when spread and is diluted by melting ice and snow. **Brine runoff from a salt pile, however, is not diluted, and can have salt concentrations up to 10 times that of sea water.** Brine entering fresh water streams or lakes can harm fish and other aquatic life. Brine-contaminated ground water may be even more problematic, as treatment to remove dissolved salt is extremely expensive. **Impacted aquifers may not be able to supply drinking water for decades.**

*“Improper stockpiling of salt is responsible for as much as 80% of environmental problems associated with salt use.”—Salt Institute (2007)*

# What authority does Ohio have to regulate salt storage?

The brine that is created when rainfall or melted snow runs off of a salt pile is considered by Ohio and other states to be contaminated storm water that is subject to storm water permitting requirements.

**Municipal Separate Storm Sewer System Permit (MS4):**  
For salt piles in designated urban areas, best management practices can be required, but there are no specific siting or design criteria.

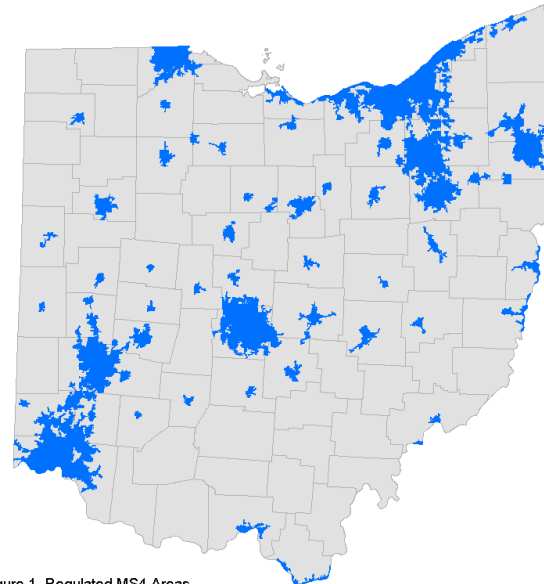


Figure 1. Regulated MS4 Areas

# What authority does Ohio have to regulate salt storage?

**Industrial Multi-Sector General Storm Water Permit:** For salt stored at an industrial site, this would require that salt be properly covered/enclosed.

# What authority does Ohio have to regulate salt storage?

**Discretionary Authority:** A National Pollutant Discharge Elimination System (NPDES) permit can be required for any salt storage site--regardless of location or type of site--*if a storm water program is aware of pollution.*

For a new site, a permit-to-install (PTI) can be required to ensure adequate protection of water quality resources.

# What authority does Ohio have to regulate salt storage?

## **Characterization and Abatement of Unpermitted Discharges:**

In Ohio, **Ohio Revised Code 6111** prohibits unauthorized discharge of pollutants to waters of the state, including runoff from salt storage, and grants the Director of Ohio EPA authority to require abatement/characterization.

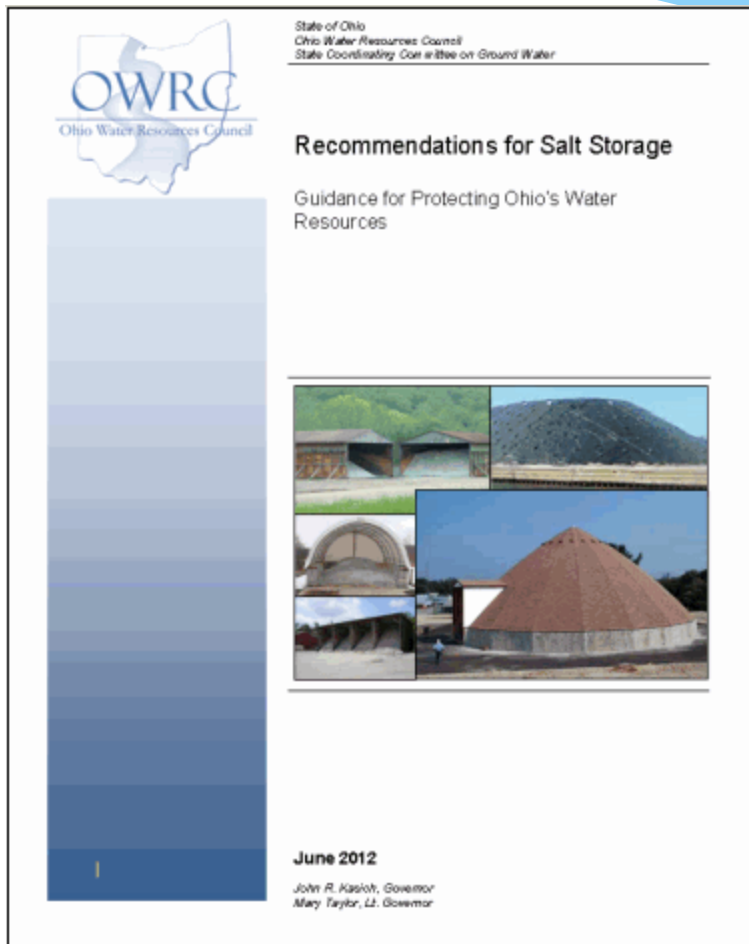
# Summary - Existing Facilities

- DSW can require an NPDES permit or BMPs to ensure protection of water resources.
- DSW can address water quality impacts caused by poor management practices by working with the operator to correct any problems. If necessary, DSW can take enforcement action.

# Summary - New Facilities

- Ohio EPA-DSW can require a permit-to-install (PTI) to ensure protection of water resources. (Starting in 2013, Ohio EPA will require a PTI for new outdoor piles, regardless of size, that are in place for more than seven days.)
- NPDES permit and/or BMPs may also be required.

# Ohio Guidance for Salt Storage Facilities



Commissioned by Ohio Water Resources Council in 2012, and developed by a workgroup that included:

Ohio EPA  
County Health Departments  
Ohio Department of Health  
Planning Agencies  
Ohio Department of Natural Resources  
Salt Institute  
Ohio Department of Transportation  
Cargill  
County Engineers

# Four categories of salt piles:

- Indoor storage / indoor operations – “All Indoor”
- Indoor storage / outdoor operations – “Partially Indoor”
- Outdoor piles, small (<3,000 tons) – “Small Outdoor”
- Outdoor piles, large (>3,000 tons)– “Large Outdoor”

# Guidance – All Indoor

- Low threat
- Everything is covered, minimizing contact with precipitation
  - Ideal storage facility will have:
    - Ability to fully enclose (requires ventilation and light)
    - Poured concrete walls
    - Room for equipment to load and unload
    - Impervious pad
    - Curbs along parking area/drive
- Ohio contamination cases: none



# All Indoor - Siting Guidance

	Indoor storage and operations	Storage indoors, but operations outdoors	Storage outdoors – small piles	Storage outdoors – large piles
Avoid 100-year floodplain	X	X	X	X
Maintain 300-foot setback from surface water	X	X	X	X
Maintain 300-foot setback from drinking, irrigation, and industrial wells; also dry wells	X	X	X	X
Maintain 100-foot setback from conveyances such as storm drains and roadside ditches	X	X	X	X
Avoid inner management zones		X	X	X
Avoid entire source water protection areas			X	X
Avoid areas that are hydrogeologically sensitive				X

# Partially Indoor - Operational

- Minimize spillage
- Clean up spills immediately
- Place delivered salt in structure ASAP
- Place leftover salt into storage
- Mix during dry weather and place immediately into storage
- Cover temporary pile with a waterproof tarp
- Sweep the pad after mixing



# Partially Indoor - Siting

	Indoor storage and operations	Storage indoors, but operations outdoors	Storage outdoors - small piles	Storage outdoors - large piles
Avoid 100-year floodplain	X	X	X	X
Maintain 300-foot setback from surface water	X	X	X	X
Maintain 300-foot setback from drinking, irrigation, and industrial wells; also dry wells	X	X	X	X
Maintain 100-foot setback from conveyances such as storm drains and roadside ditches	X	X	X	X
Avoid inner management zones		X	X	X
Avoid entire source water protection areas			X	X
Avoid areas that are hydrogeologically sensitive				X

# What is an “inner management zone”?

This refers to a zone within a “source water protection area” for a public water system.

All public water systems in Ohio have a source water protection area. (Private wells do not)

The ‘inner management zone’ is shown in darker blue at left, closer to the wells.

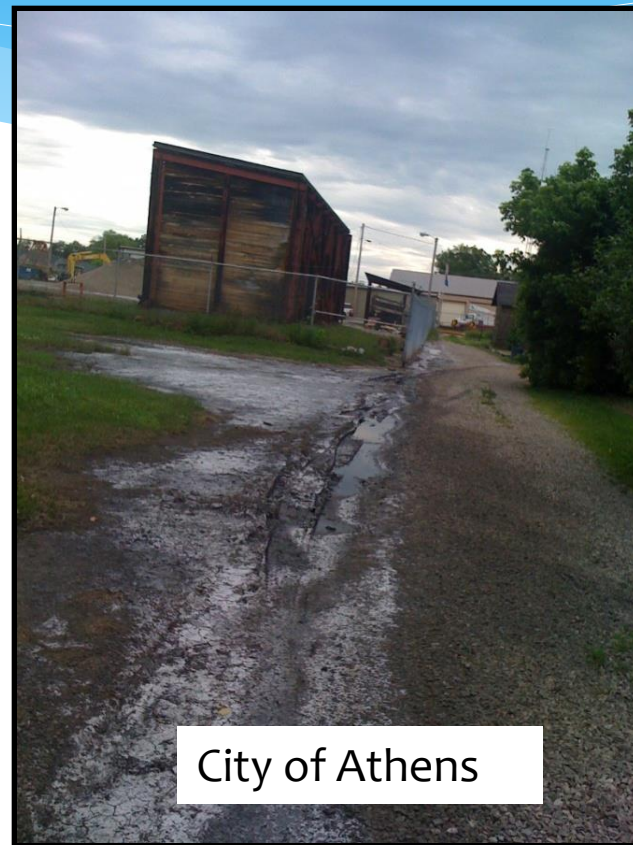
County maps of source water protection areas are available electronically at Ohio EPA’s website:  
<http://epa.ohio.gov/ddagw/swap.aspx>



# Partially Indoor– Ohio Problem Sites



Chardon Township



City of Athens

# Small Outdoor - Operational

- Cover storage pile with a tarp
- Clean up spills and return salt to storage area, or cover operations area with a tarp
- Storm water control could also be important



# Small Outdoor - Siting

	Indoor storage and operations	Storage indoors, but operations outdoors	Storage outdoors – small piles	Storage outdoors – large piles
Avoid 100-year floodplain	X	X	X	X
Maintain 300-foot setback from surface water	X	X	X	X
Maintain 300-foot setback from drinking, irrigation, and industrial wells; also dry wells	X	X	X	X
Maintain 100-foot setback from conveyances such as storm drains and roadside ditches	X	X	X	X
Avoid inner management zones		X	X	X
Avoid entire source water protection areas			X	X
Avoid areas that are hydrogeologically sensitive				X

# Small Outside– Ohio Problem Sites



Franklin County



Ross County

# Large Outdoor Piles

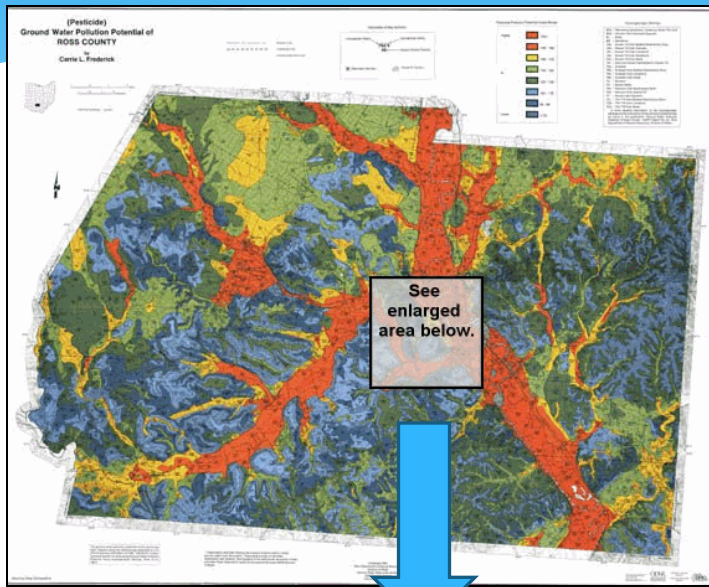
- Greatest threat due to a very large amount of salt stored and handled
- >3,000 tons
- Difficult to cover
- Tendency to locate in sensitive hydrogeologic settings



# Large Outdoor - Siting

	Indoor storage and operations	Storage indoors, but operations outdoors	Storage outdoors – small piles	Storage outdoors – large piles
Avoid 100-year floodplain	X	X	X	X
Maintain 300-foot setback from surface water	X	X	X	X
Maintain 300-foot setback from drinking, irrigation, and industrial wells; also dry wells	X	X	X	X
Maintain 100-foot setback from conveyances such as storm drains and roadside ditches	X	X	X	X
Avoid inner management zones		X	X	X
Avoid entire source water protection areas			X	X
Avoid areas that are hydrogeologically sensitive				X

# What are “hydrogeologically sensitive” areas?



The Ohio Department of Natural Resources publishes county maps (also available electronically) showing which areas of each county are more sensitive to pollution –i.e., the yellow and orange colored areas.

A few counties do not have these maps, but they all have ground water resources maps, which are similar. Anyone preparing to site a large salt storage facility should contact Ohio EPA for assistance (see contact information at the end of this presentation)

# Large Outside– Ohio Problem Sites



Clark County – Convey-It  
--Estimated 50,000 tons  
--Usually left uncovered  
--Asphalt pad, but  
originally no runoff control



Village of Camden – Preble County  
--2 piles estimated at 40,000 tons  
each  
--Usually left uncovered  
--Partially on pad  
--No runoff control

# Guidance – Large Outdoor

- Pad: Impervious  
Capable of supporting equipment  
Asphalt or air-entrained concrete  
Slope away
- Cover: well-secured, durable and waterproof tarp
- Mixing: on pad, with sweeping and return of salt to storage
- Storm Water Control: Ohio EPA will require a PTI for piles in place >7 days

# Guidance – Large Outdoor

- Working end should be downwind
- Durable, waterproof tarp should be weighted down at perimeter and on pile
- Pile should be covered in stages as salt is added or removed
- Time that salt is not covered should be minimized
- Ground water monitoring is recommended

# Summary

Ohio EPA-DSW regulates salt storage to some degree through:

- MS4 permits in designated urban areas
- Industrial General Storm Water Permit
- PTIs for new salt piles
- Requiring remediation at facilities that are causing water quality impacts

# Summary

## (continued)

- Ohio EPA will require a PTI for new outdoor piles (large *and* small) that are in place for more than seven days.
- Any new storage facility should be sited away from water wells, surface water, floodplains, and any feature that could be a conduit for contamination migration. Additional recommendations are provided for three types of facilities:
  - Indoor storage with outdoor operations
  - Small outdoor piles
  - Large outdoor piles (>3,000 tons)

# Draft OWRC Siting Guidance

	Indoor storage and operations	Storage indoors, but operations outdoors	Storage outdoors – small piles	Storage outdoors – large piles
Avoid 100-year floodplain	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Maintain 300-foot setback from surface water	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Maintain 300-foot setback from drinking, irrigation, and industrial wells; also dry wells	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Maintain 100-foot setback from conveyances such as storm drains and roadside ditches	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Avoid inner management zones		<b>X</b>	<b>X</b>	<b>X</b>
Avoid entire source water protection areas			<b>X</b>	<b>X</b>
Avoid areas that are hydrogeologically sensitive				<b>X</b>

# Summary

## (continued)

- Relocation of existing facilities is encouraged if the siting recommendations are not met. If relocation is not practical, owners/operators should at least be aware of proximity to floodplains, water bodies, wells and ditches, source water protection areas, and hydrogeologically sensitive areas.
- Salt should be stored, mixed, and loaded on an appropriately designed, impervious pad.

# Summary

(continued)

- Storage of salt in a structure with a roof and walls is highly preferred. If that is not feasible, the salt should be covered with a durable and waterproof tarp.
- While it may be difficult to maintain daily cover for an extremely large outdoor pile, every effort should be made to minimize the time that it is uncovered.
- When salt is handled outdoors, care should be taken to minimize spillage. Any salt that is spilled should be collected and returned to storage as soon as possible.

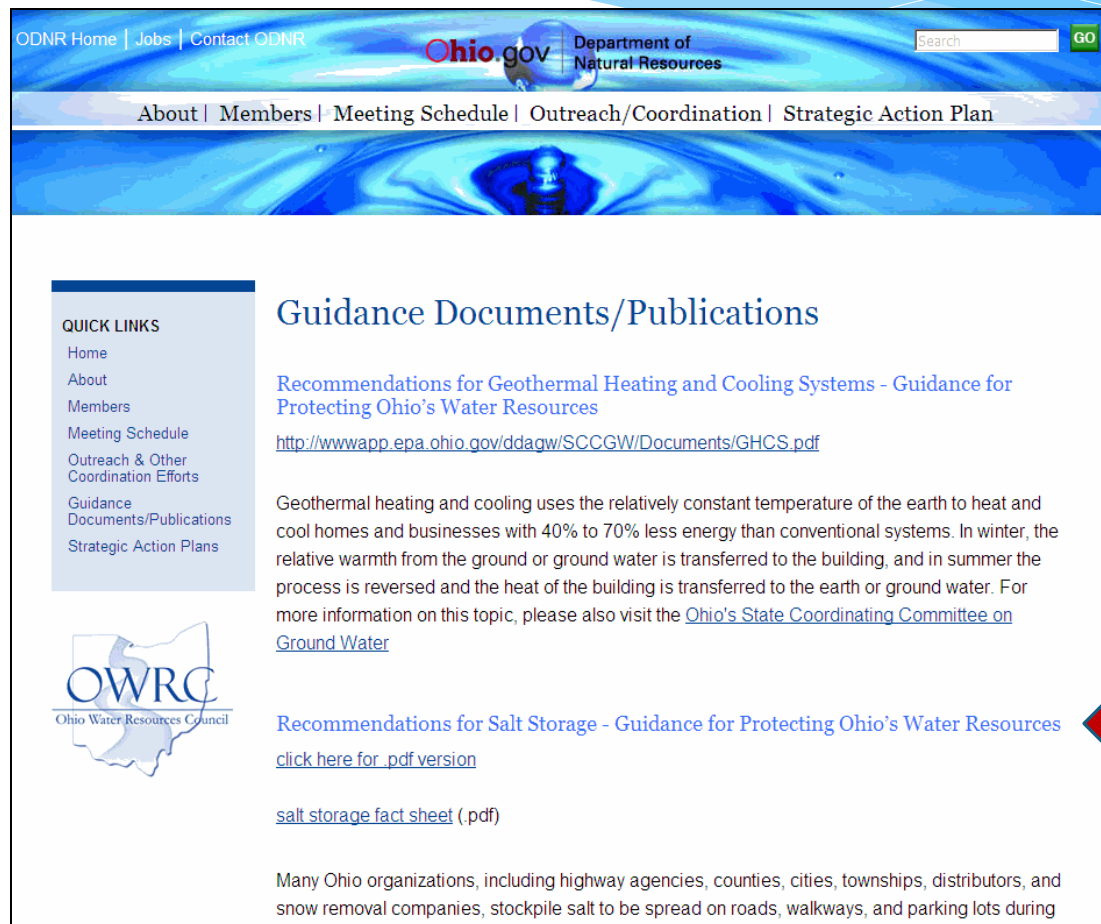
# Summary

(continued)

- Storage facilities should be maintained to ensure physical integrity consistent with the original design criteria.
- Proper storage and operating procedures can minimize the need for storm water control; however, if there is salt-contaminated runoff, control and collection are necessary to prevent contamination of water resources.

# For more information ...

- The Guidance is available on the Ohio Water Resources Council's website at <http://www.ohiodnr.com/tabid/23948/Default.aspx>



The screenshot shows the Ohio Department of Natural Resources website. The header includes navigation links for "ODNR Home", "Jobs", and "Contact ODNR", along with the "Ohio.gov" logo and "Department of Natural Resources". A search bar with a "GO" button is also present. Below the header is a navigation menu with links for "About", "Members", "Meeting Schedule", "Outreach/Coordination", and "Strategic Action Plan". The main content area features a "QUICK LINKS" sidebar with options like "Home", "About", "Members", "Meeting Schedule", "Outreach & Other Coordination Efforts", "Guidance Documents/Publications", and "Strategic Action Plans". The main heading is "Guidance Documents/Publications". Two documents are listed: "Recommendations for Geothermal Heating and Cooling Systems - Guidance for Protecting Ohio's Water Resources" with a link to a PDF, and "Recommendations for Salt Storage - Guidance for Protecting Ohio's Water Resources" with a link to a PDF version. A red arrow points to the second document link. The OWRC logo is visible in the bottom left corner.

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## Guidance Documents/Publications

**QUICK LINKS**

- Home
- About
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- Strategic Action Plans

**Recommendations for Geothermal Heating and Cooling Systems - Guidance for Protecting Ohio's Water Resources**

<http://wwwapp.epa.ohio.gov/ddagw/SCCGW/Documents/GHCS.pdf>


Geothermal heating and cooling uses the relatively constant temperature of the earth to heat and cool homes and businesses with 40% to 70% less energy than conventional systems. In winter, the relative warmth from the ground or ground water is transferred to the building, and in summer the process is reversed and the heat of the building is transferred to the earth or ground water. For more information on this topic, please also visit the [Ohio's State Coordinating Committee on Ground Water](#)

**Recommendations for Salt Storage - Guidance for Protecting Ohio's Water Resources**

[click here for .pdf version](#)

[salt storage fact sheet \(.pdf\)](#)

Many Ohio organizations, including highway agencies, counties, cities, townships, distributors, and snow removal companies, stockpile salt to be spread on roads, walkways, and parking lots during



# Questions / Comments

For more information:

Jeff Patzke, Manager, Ohio EPA – 614-644-2752  
[jeff.patzke@epa.ohio.gov](mailto:jeff.patzke@epa.ohio.gov)

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