Mining and Water in Wisconsin:
Water Use for Non-Metallic Mining

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October 7th, 2014
SME Wisconsin Annual Conference
Eau Claire, WI
In 2013, total withdrawals exceeded 2.12 trillion gallons of water from over 14,000 wells, ponds, streams, rivers and lakes.

- This is roughly equal to 3 times the water in Lake Winnebago.
- Enough water to cover the surface of Wisconsin in about 2” of water.

Total 2013 withdrawals were down 6% from 2012.

Non-metallic mining ranked 8th in total withdrawals with 15 bGal or .71% of the total withdrawal.
Surface Water Use in Wisconsin: 2013 Withdrawals

2013 Surface water withdrawals totaled 1.87 trillion gallons from 682 active sources. Total volume was down 5% from 2012.

Non-metallic Mining Ranked 5th with 12 bGal or .7% of the total surface water withdrawal. Non-metallic mining surface water withdrawals increased 25% from 2012 due mostly to increased dewatering.

Decreases were seen in Cranberry Production (-19%), Municipal Public Supply (-17%) and Power Generation (-3%)
Surface Water Use in Wisconsin: 2013 Withdrawals
Groundwater Use in Wisconsin: 2013 Withdrawals

250 billion groundwater gallons from 10,901 active sources in 2013. Total volume was down 14% from 2012.

- Agricultural Irrigation decreased 25% but still remained the top user of groundwater.
- Mining ranked 10th with 2.6 billion gallons of groundwater withdrawn or 1% of the Wisconsin’s groundwater withdrawal.
- Could cover the land area of Wisconsin with ¼ inch of water.
- Enough water to fill Lambeau Field over 500 times.
Groundwater Use in Wisconsin:
2013 Withdrawals
## Non-Metallic Mining Withdrawals:
### Site Locations and Counts

<table>
<thead>
<tr>
<th>Active Sources</th>
<th>Quarry Dewatering</th>
<th>Non-Metallic Mining Processing</th>
<th>Industrial Sand Mining</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>85</td>
<td>137</td>
<td>26</td>
</tr>
<tr>
<td>2012</td>
<td>82</td>
<td>160</td>
<td>27</td>
</tr>
<tr>
<td>2013</td>
<td>105</td>
<td>143</td>
<td>32</td>
</tr>
</tbody>
</table>

The map shows the distribution of active sites across Wisconsin, categorized by water withdrawal volumes and types of mining activities.
Water Use Reporting Program: Required Registration

One or more wells or surface water pumps capable of withdrawing at 70 gpm.
  • Annual report
  • $125 fee

Multiple wells or surface water sources that are cumulatively capable of withdrawing at 70 gpm.
  • Annual report

Temporary sources or temporary sites should be registered, but
  • Annual report only if needed
  • In rare case a fee could be needed
Dewatering

• For mining activities below the water table.

• Most have discharge permits.

• Water table varies by years, so do withdrawals.
Water Use Reporting Program: Water Usages for Non-Metallic Mining

Material wash and processing

- Used to wash sand, aggregate or rock.
- Most is drained back to settling ponds and reused.
- Dust Suppression
- Wash water might be exclusively groundwater, exclusively storm water or a combination of both.
Industrial sand wash and processing

• Used to slurry sand for easier movement.

• Sand is frequently quarried and crushed at mining site and trucked to a process center.

• Used to wash sand, aggregate or rock.
  • Much is drained back to settling ponds and reused.
  • However, sand facilities lose water to evaporation during drying.
  • Drying operations may run year long.

• Dust Suppression
### Non-Metallic Mining Withdrawals: Total Withdrawal Volume

<table>
<thead>
<tr>
<th>Billion Gallons/yr</th>
<th>Quarry Dewatering</th>
<th>Non-Metallic Mining Processing</th>
<th>Industrial Sand Mining</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>9.24</td>
<td>4.49</td>
<td>1.47</td>
</tr>
<tr>
<td>2012</td>
<td>6.57</td>
<td>3.84</td>
<td>1.10</td>
</tr>
<tr>
<td>2013</td>
<td>10.02</td>
<td>3.01</td>
<td>1.99</td>
</tr>
</tbody>
</table>
Non-Metallic Mining Withdrawals:
Average Withdrawal Volume

<table>
<thead>
<tr>
<th>Million Gallons/yr</th>
<th>Quarry Dewatering</th>
<th>Non-Metallic Mining Processing</th>
<th>Industrial Sand Mining</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>108.73</td>
<td>33.04</td>
<td>56.72</td>
</tr>
<tr>
<td>2012</td>
<td>80.13</td>
<td>23.98</td>
<td>40.91</td>
</tr>
<tr>
<td>2013</td>
<td>95.43</td>
<td>21.05</td>
<td>62.19</td>
</tr>
</tbody>
</table>

2013 Average Irrigation Withdrawal: 29.7
2013 Average Municipal Withdrawal: 112.0
Defined by several very large withdrawers at and several very withdrawal locations.

- Ten companies withdrew 75% of the water withdrawn by non-metallic mining operations.

- Ten facilities withdrew nearly half of the water withdrawn by non-metallic mining operations.
Non-Metallic Mining Withdrawals: Water Conservation and Efficiency

Water Conservation and Efficiency, that we mandate or encourage. Many are probably doing these already:

- **Tier 1 - General water use permit**
  - Water Use Audit
  - Leak Detection and Repair
  - Worker Training
  - Source Measurement

- **Tier 2 – Individual water use permit**
  - Water loss detection
  - Water reuse

**Water Conservation and Dewatering**
- Not the best fit, but... withdrawals and pumping costs can be reduced:
  - Dewater the minimal amount
  - Reuse as much as possible
Non-metallic mining is an important component of Wisconsin's industrial and transportation sector that relies on withdrawing and using water for multiple purposes.

97% of required reports were received from non-metallic operators.

Registration, conservation and reporting presents several challenges for non-metallic mining operations.
For additional questions or copies of this presentation, please contact:

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