

## **Appendix D**

### **Pollution Prevention/Good Housekeeping**

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## Appendix D.1 Salt and Sand Usage

### MDOT Salt and Sand Usage

**Winter 2007-2008**

**Municipal Salt**      Oct 2007-April 2008

Region	LANE MILES	TONS/DATE	TONS/LANE MILE
Superior	211.4	5192.2	24.6
North	143.4	7169.2	50.0
Grand	102.2	2476.7	24.2
Bay	291.6	4985.6	17.1
Southwest	283.8	4509.7	15.9
University	390.0	9269.5	23.8
Metro	268.9	8267.3	30.7
<b>TOTAL</b>	<b>1,691.37</b>	<b>41,870.09</b>	<b>26.61</b>

**County and Direct Forces Salt & Sand**

Oct 2007-April 2008

Region	LANE MILES	SALT/TONS	TONS/LANE MILE	SAND/TONS	TONS/LANE MILE
Superior	4183.1	106716.1	25.5	40596.0	9.7
North	4826.5	110401	22.9	27991.1	5.8
Grand	3387.1	91577.5	27.0	35825.5	10.6
Bay	4634.2	81962.9	17.7	2174.8	0.5
Southwest	3746.3	82162.1	21.9	6246.0	1.7
University	4379.0	106815.8	24.4	17852.8	4.1
Metro	5546.8	179612.1	32.4	0.0	0.0
<b>TOTAL</b>	<b>30,703.0</b>	<b>759,247.5</b>	<b>24.5</b>	<b>130,686.2</b>	<b>4.6</b>

**Combined Total (municipal, county, direct)**

Oct 2007-April 2008

Region	LANE MILES	SALT/TONS	TONS/LANE MILE	SAND/TONS	TONS/LANE MILE
Superior	4394.5	111908.3	25.5	39871.4	9.1
North	4969.9	117570.2	23.7	35953.5	7.2
Grand	3489.3	94054.2	27.0	14288.8	4.1
Bay	4925.8	86948.5	17.7	58.0	0.0
Southwest	4030.1	86671.8	21.5	67.9	0.0

## Appendix D.1 Salt and Sand Usage

<b>University</b>	4769.0	116085.3	24.3	10980.1	2.3
<b>Metro</b>	5815.7	187879.4	32.3	0.0	0.0
<b>TOTAL</b>	<b>32,394.4</b>	<b>801,117.6</b>	<b>24.6</b>	<b>101,219.7</b>	<b>3.2</b>

### Comparison of 2006-2007 and 2007-2008

Region	2006-2007			2007-2008			Change in Tonnage per Lane Mile, %
	Lane Miles	Salt Tonnage	Salt Tonnage per Lane Mile	Lane Miles	Salt Tonnage	Salt Tonnage per Lane Mile	
<b>Superior</b>	4202	89831	21.4	4394.5	111908.3	25.5	19
<b>North</b>	4942	110632	22.4	4969.9	117570.2	23.7	6
<b>Grand Bay</b>	3489	82124	23.5	3489.3	94054.2	27.0	15
<b>Southwest</b>	4682	68472	14.6	4925.8	86948.5	17.7	21
<b>University</b>	4025	80645	20.0	4030.1	86671.8	21.5	7
<b>University</b>	4739	72698	15.3	4769.0	116085.3	24.3	59
<b>Metro</b>	4990	104575	21.0	5815.7	187879.4	32.3	54
<b>Total</b>	<b>31,069</b>	<b>608,979</b>	<b>19.8</b>	<b>32,394</b>	<b>801,118</b>	<b>24.6</b>	

Region	2006-2007			2007-2008			Change in Tonnage per Lane Mile, %
	Lane Miles	Sand Tonnage	Sand Tonnage per Lane Mile	Lane Miles	Sand Tonnage	Sand Tonnage per Lane Mile	
<b>Superior</b>	4202	39871.4	9.5	4394.5	39871.4	9.1	-4
<b>North</b>	4942	35953.5	7.3	4969.9	35953.5	7.2	-1
<b>Grand Bay</b>	3489	14288.8	4.1	3489.3	14288.8	4.1	0
<b>Southwest</b>	4682	58.0	0.0	4925.8	58.0	0.0	-5
<b>University</b>	4025	67.9	0.0	4030.1	67.9	0.0	0
<b>University</b>	4739	10980.1	2.3	4769.0	10980.1	2.3	-1
<b>Metro</b>	4990	0.0	0.0	5815.7	0.0	0.0	-
<b>Total</b>	<b>31,069</b>	<b>122,778</b>	<b>3.3</b>	<b>32,394</b>	<b>101,219.7</b>	<b>3.2</b>	

Lane mile totals per region are within 10% from year to year.

## Appendix D.2 Maintenance Activity Costs for MDOT Direct Forces

### MDOT PCA Costs and Details FY 2008

Region	Activity		# Hours	Cost	# Units	Cost/unit
<b>Superior</b>	Roadside Maintenance	Catch Basin Cleanout	1,727	\$100,518	1,121	\$90
	General Maintenance	Approach Sweeping	0	\$0	0	-
		Curb Sweeping	76	\$2,485	3	\$828
		Total	1,803	\$103,003	0	\$0
<b>North</b>	Roadside Maintenance	Catch Basin Cleanout	1,095	\$94,723	2,011	\$47
	General Maintenance	Approach Sweeping	423	\$18,306	1,071	\$17
		Curb Sweeping	27	\$8,718	6	\$1,557
		Total	1,803	\$103,686	-	-
<b>Grand</b>	This region does not have any direct forces garages. Maintenance is done by local agencies.					
<b>Bay</b>	Roadside Maintenance	Catch Basin Cleanout	43	\$246,610	0	-
	General Maintenance	Approach Sweeping	503	\$20,787	504	\$41
		Curb Sweeping	977	\$329,065	165	\$1,994
		Total	1,523	\$596,462	0	\$0
<b>Southwest</b>	Roadside Maintenance	Catch Basin Cleanout	254	\$133,693	596	\$224
	General Maintenance	Approach Sweeping	848	\$39,522	2,360	\$17
		Curb Sweeping	78	\$172,742	0	\$0
		Total	1,180	\$345,957	0	\$0
<b>University</b>	Roadside Maintenance	Catch Basin Cleanout	229	\$128,457	194	\$662
	General Maintenance	Approach Sweeping	985	\$42,227	3,618	\$12
		Curb Sweeping	24	\$147,343	7	\$21,049
		Total	1,238	\$318,027	0	\$0
<b>Metro**</b>	Roadside Maintenance	Catch Basin Cleanout	28	\$100,563	0	\$0
	General Maintenance	Approach Sweeping	0	\$2	0	\$0
		Curb Sweeping		\$45,409	0	\$0
		Total	28	\$145,974	0	\$0
<b>Total*</b>	Roadside Maintenance	Catch Basin Cleanout	4,398	\$704,001	3,922	\$180
	General Maintenance	Approach Sweeping	2,759	\$120,842	6,710	\$18
		Curb Sweeping	1,208	\$660,379	0	\$0
		Total	<b>8,365</b>	<b>\$1,485,222</b>	0	\$0

\* Hourly and unit totals for Catch Basin Cleanout and Approach and Curb Sweeping do not include complete data from the regions. Cost information is assumed to be correct.\*\*Reported data incomplete



## Appendix D.3 Maintenance Activity Costs for Contracted Agencies

### Local Agency Payment System (LAPS) Report Summary for Maintenance Activities

Region	Activity	Cost	Lane Miles	Cost per Lane Mile	Average Cost per Hour	<i>Approximate Total Hours<sup>1</sup></i>
<b>Superior</b>	Street Sweeping and Flushing	\$21,139	3,397	\$6.22	\$102	207
	Culvert/Underdrain Maintenance	\$104,457	3,397	\$30.75	\$89	1,174
	Cleaning Drainage Structures	\$210,423	3,397	\$61.94	\$78	2,698
	Ditch Clean-out	\$27,206	3,397	\$8.01	\$70	389
	<b>Total</b>	<b>\$363,225</b>	<b>13,588</b>	<b>\$106.92</b>	<b>\$339</b>	<b>4,467</b>
<b>North</b>	Street Sweeping and Flushing	\$69,602	4,069	\$17.11	\$102	682
	Culvert/Underdrain Maintenance	\$90,154	4,069	\$22.16	\$73	1,235
	Cleaning Drainage Structures	\$209,288	4,069	\$51.44	\$62	3,376
	Ditch Clean-out	\$37,860	4,069	\$9.30	\$99	382
	<b>Total</b>	<b>\$406,904</b>	<b>16,276</b>	<b>\$100.01</b>	<b>\$336</b>	<b>5,675</b>
<b>Grand</b>	Street Sweeping and Flushing	\$229,794	3,387	\$67.85	\$302	761
	Culvert/Underdrain Maintenance	\$33,974	3,387	\$10.02	\$83	409
	Cleaning Drainage Structures	\$463,976	3,387	\$136.99	\$98	4,734
	Ditch Clean-out	\$39,322	3,387	\$11.61	\$83	474
	<b>Total</b>	<b>\$767,066</b>	<b>13,548</b>	<b>\$226.47</b>	<b>\$566</b>	<b>6,378</b>
<b>Bay</b>	Street Sweeping and Flushing	\$159,807	3,649	\$43.79	\$151	1,355
	Culvert/Underdrain Maintenance	\$150,976	3,649	\$41.37	\$89	1,696
	Cleaning Drainage Structures	\$571,103	3,649	\$156.51	\$108	5,288
	Ditch Clean-out	\$17,137	3,649	\$4.70	\$76	225
	<b>Total</b>	<b>\$899,023</b>	<b>14,596</b>	<b>\$246.37</b>	<b>\$424</b>	<b>8,565</b>
<b>Southwest</b>	Street Sweeping and Flushing	\$42,646	2,530	\$57.11	\$666	64
	Culvert/Underdrain Maintenance	\$89,617	746	\$120.01	\$91	985
	Cleaning Drainage Structures	\$59,918	746	\$80.24	\$76	788
	Ditch Clean-out	-	-	-	-	0
	<b>Total</b>	<b>\$192,181</b>	<b>4,022</b>	<b>\$257.36</b>	<b>\$833</b>	<b>1,837</b>
<b>University</b>	Street Sweeping and Flushing	\$196,729	2,530	\$77.75	\$455	432
	Culvert/Underdrain Maintenance	\$83,026	2,530	\$32.81	\$69	1,203
	Cleaning Drainage Structures	\$247,541	2,530	\$97.83	\$84	2,947
	Ditch Clean-out	\$55,899	2,530	\$22.09	\$78	717
	<b>Total</b>	<b>\$583,195</b>	<b>10,120</b>	<b>\$230.48</b>	<b>\$686</b>	<b>5,299</b>
<b>Metro</b>	Street Sweeping and Flushing	\$1,991,121	5,153	\$386.39	\$77	25,859
	Culvert/Underdrain Maintenance	-	0	-	-	0
	Cleaning Drainage Structures	\$1,184,814	5,153	\$229.92	\$99	11,968
	Ditch Clean-out	-	0	-	-	0
	<b>Total</b>	<b>\$3,175,935</b>	<b>10,306</b>	<b>\$308.16</b>	<b>\$176</b>	<b>37,827</b>
<b>Total</b>	Street Sweeping and Flushing	\$2,710,838	24,715	\$599.11	\$265	29,361
	Culvert/Underdrain Maintenance	\$552,204	17,778	\$257.12	\$82	6,702
	Cleaning Drainage Structures	\$2,947,063	22,931	\$814.87	\$86	31,799
	Ditch Clean-out	\$177,424	17,032	\$55.71	\$81	2,187
	<b>Total</b>	<b>\$6,387,529</b>	<b>82,456</b>	<b>\$1,726.81</b>	<b>\$3,184</b>	<b>70,049</b>

<sup>1</sup>Wayne County and many cities do not report labor hours in LAPS. The number of hours listed in italics is based the average "cost per hour" obtained from local agencies which had reported the number of their hours spent on the activity.



# Maintenance Advisory

From Jon W. Reincke, Engineer of Maintenance

## Catch Basin Cleaning

### MDOT

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The Michigan Department of Environmental Quality (MDEQ) has issued a new Guidance Document pertaining to Catch Basin Cleaning Activities. This guidance has generated changes to the following Maintenance Performance Guides:

- Activity 12200, Catch Basin Clean-Out
- Activity 13600, Curb Sweeping
- Activity 15300, Pump Station Maintenance

The *Catch Basin Cleaning Activities Guidance Document* no longer allows liquids removed from the catch basins to enter a tank and then be discharged back into the storm water system. Any water removed from a catch basin that enters a holding tank is considered liquid industrial waste. Historically, all the water and solids were collected by use of a vacuum truck, the solids were allowed to settle and the water was then discharged back into the storm water system (catch basin).

Now, all standing water in the catch basin must be removed with a pump not connected to the vacuum truck prior to removal of the solids. The other options of disposing the liquids by sanitary system or as liquid industrial waste remain unaffected. The solids may then be removed and disposed of properly.

Street sweepings are also required to follow the proper solid waste disposal requirements. If water is used during sweeping for dust control, any excess liquid portion must be separated properly (see Activity 13600) before disposal.

These changes are reflected in the above Maintenance Performance Guides.



# Maintenance Advisory

December 9, 2008

From Jon W. Reincke, Engineer of Operations

## Rest Area Lift Stations

MDOT

Division of Operations

Maintenance

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Lansing, MI 48917

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Many of our rest areas incorporate a sewage lift station as part of the wastewater treatment process. A lift station is used in low-lying areas where a gravity fed system is not sufficient. A series of pumps transports the sanitary wastewater to a treatment facility, lagoon, drain field, forced main, another gravity system, etc. A pump failure may result in a sewage overflow and the potential for environmental contamination and public endangerment. A few simple steps can be taken to ensure these important waste removal systems function properly.

- Frequent inspections of the lift stations and backup alarms are vital. These inspections should be conducted at least once a month by a Rest Area Coordinator and daily by Rest Area Attendants. A quick inspection is a simple way to ensure our alarms and pumps will function properly. An inspection checklist will be provided at all rest areas to guide coordinators and attendants in such inspections.
- A lift station allows for solids to settle to the bottom of the tank while the liquid portion is pumped out. As a result the solids may accumulate to the point where the pump and/or alarm are not functioning properly. If solids are found covering pipes, wiring and pump hardware, a tank cleaning contract is recommended.
- In the event of a power failure at the rest area, the backup alarm may malfunction. Often, those rest areas that incorporate a lift station also rely on well water for the water supply. A power failure in this instance may also result in a loss of water pressure reducing the chance of an overflow. However, it is still recommended that any rest area subject to a power failure be closed until power is fully restored and the pumps and alarms have been inspected.
- Any discharge must be reported to the DEQ. Contact the Rest Area Coordinator or region resource staff to ensure this reporting requirement is met. This individual will also provide advice on immediate response actions that should be taken to minimize health and environmental impacts.

Through proper maintenance and timely inspections, we can ensure our waste removal systems are working properly. With little effort, we can provide a clean, sanitary rest area for the public and protect our natural resources by eliminating the potential for sewage overflows.

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# Maintenance Advisory

December 9, 2008

From Jon W. Reincke, Engineer of Operations

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## Guidance for Storage of Empty Drums

In the past, there have been issues with the storing of empty drums for use in maintenance activities. These issues include:

- Storing large numbers of so-called empty drums in a random fashion.
- Storing drums on the bare ground in a back area of the facility yard.
- Storing drums in a way that precipitation can get into the drums, potentially overflowing onto the ground or in a way that allows paint chips, emulsion, fuel oil, or other materials to spill onto the ground.
- Storing drums in wet areas where they are constantly exposed to moisture, allowing materials to leach into the water and potentially into the soil.

Recommendations for good storage are:

1. Only keep as many drums as needed for the immediate future (within the next year). Long-term outdoor storage of drums eventually leads to rusty drums which will have limited usefulness. Minimize the number. Properly dispose of excess drums.
2. If possible, keep drums stored neatly under cover and on a hard surface rather than on bare soil. Be sure that the drums are stored in such a way that they do not present a fire hazard, are not in the way, and do not give off excessive vapors where workers might be exposed.
3. If drums must be stored outside, be sure they are tightly closed (with lids or bungs in place) or otherwise stored to keep out precipitation, and to avoid losing any material (paint chips, etc.) to the ground surface.
4. Empty drums and containers should not be left open and exposed to rainfall. Should rainfall accumulate in an empty container, the liquids must be properly characterized and disposed of according to applicable regulations.
5. Be sure that the drums are obviously empty to someone such as a regulatory person who may be inspecting the facility. If it isn't obvious that all the drums are empty, a regulatory person may assume they contain hazardous materials or hazardous wastes which have specific requirements for handling.
6. Be sure to remove any old labels, and label the drums as empty.
7. Properly dispose of rusty, banged up drums.
8. Drums containing resin or residue that cannot be removed must be disposed of in a similar manner to the original material contained in the drum.

# Maintenance Advisory

From Jon W. Reincke, Engineer of Operations

## Disposal of Used Motor Oil

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Used motor oil is regulated as a liquid industrial waste and needs to be disposed of properly. Proper handling of any used oil includes:

1. Make sure the used oil is being properly stored and labeled. Most garages have above ground tanks which are preferred.
2. Though not required, some means of secondary containment is recommended when storing used oil. (Refer to MDOT Safety Administration website Environmental Topic on [Secondary Containment](#).)
3. Do not mix other wastes with used oil. Do not dump any solvents or cleaning materials in the used oil storage tank. Keep all different types of waste separated.
4. When using drums, make sure the containers are closed when not adding used oils to prevent contamination.
5. Monitor your storage tank's level and contact the proper disposal agency to dispose of the used oil. Make sure that the transporter hauls it to an appropriate treatment, storage, and disposal (recycling) facility.
6. Any waste oil shipped must be manifested and copies of the manifest need to be filed and retained for at least 3 years. MDOT can be held liable for damages if the used oil is disposed of improperly.

If you have any questions, please contact MDOT Safety Administration, or Division of Operations - Maintenance or your Region Resource Specialist.

For additional information refer to the MDOT Safety Administration website Environmental Topics on [Used Oil](#), [Used Oil Filters](#) or use the link to the [Michigan Manufacturers' Guide to Environmental, Health, and Safety Regulations](#) and review the information in Chapter 2 Waste Management.