Using Remote Tools to Improve Utility Pollution Prevention Programs

Emily Jones, Madison Metropolitan Sewerage District
Madison Metro Sewerage District

- Regional separate sanitary sewer serving 26 communities
- Roughly 380,000 people served
- Avg. flow ~ 42 MGD
Pollutants of Concern

- Mercury
- Salt
- Phosphorus
- Pharmaceuticals
- "Flushables," FOG

Opportunities for Pollution Prevention

Regulated – MMSD has permit limit
Comparing approaches to reduce pollution

**Plant upgrades**
- More expensive
- Can increase energy use
- More certainty in process

**Pollution prevention**
- Less expensive
- Can avoid need for increased energy use
- Less certainty in process
District pollution prevention activities

- Policy Change
- Training
- Incentives
- New Technology
- Outreach and education
- Source Identification

Pollution prevention
Traditional methods

- Data collection has relied on paper (e.g., certification forms; surveys)
- Outreach & training have taken place in person
- Can be time-consuming and limited in scope
Remote approaches to pollution prevention

- Tools in ArcGIS suite
  - Survey123
  - Dashboards
  - Storymaps
- Online/asynchronous training modules
Using Survey123 for data collection

- Application within ESRI ArcGIS suite
- Customizable
- Creates data set that facilitates analysis

2) Use of amalgam and best management practices for collection

Select all answers that apply to your clinic.

- This clinic places new amalgam fillings
- This clinic removes amalgam fillings
- This clinic extracts teeth that contain amalgam fillings
- This clinic does not place or remove amalgam fillings, except for in infrequent, unplanned situations.

On average, about how many amalgam fillings are removed per week in your clinic?

- Fewer than one removal per week
- 1 to 5 removals per week
Example: dental certification

- MadMSD requires annual certification report from clinics to verify amalgam being managed properly
- Historically included in-person inspections
Traditional certification: mailed paper forms

[Image of a document with a form for Madison Metropolitan Sewerage District, titled "2019 Dental Clinic Amalgam Management Annual Certification."]
Challenges of certification program

- Time-consuming – significant admin time sending, collecting, reviewing, filing paper certifications
- Difficult to observe trends across time in spreadsheet-based data organization
- Consumed resources in use of paper; fuel for travel to inspect clinics
Shift to online reporting, inspections

- Originated in recent years to streamline process; reduce use of paper and fuel
- Online format went from optional to required in 2020
Collects photos to verify maintenance

Are you able to see the contents of the amalgam separator? (That is, is the collection canister clear?)

- Yes
- No

Separator picture
To get the best image, turn off the vacuum pump to let the separator contents settle, and shine a light through the collection canister. The level of the contents and the canister fill line should be clearly visible in the photo.

exampleseparator.jpg 40.5KB

Madison Metropolitan Sewerage District
6) Follow-up actions

The actions below are based on your responses to questions in this report. If actions appear here, you will need to complete those actions promptly to be in full compliance with MMSD amalgam requirements. After you complete these actions, contact Emily Jones at MMSD to verify completion of these actions.

- Extracted teeth that contain amalgam should be disposed of as amalgam waste in the amalgam collection container. They should not be placed in the biohazard bag or regular trash. If you send amalgam-containing teeth home with patients, make sure to educate them about proper mercury disposal.

- Change the line cleaner used in vacuum lines to a type with a pH between 6 and 8. Line cleaners with a pH out of this range can make your separator less effective at capturing mercury.
Submitted reports appear in Survey123

<table>
<thead>
<tr>
<th>Email address for clinic</th>
<th>Clinic phone</th>
<th>Year clinic founded</th>
<th>Select all answers that apply to your clinic.</th>
<th>On average, about how many amalgam fillings are placed per week in your clinic?</th>
<th>On average, about how many amalgam fillings are removed per week in your clinic?</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="mailto:jan@mmsdtestclinic.com">jan@mmsdtestclinic.com</a></td>
<td>6082221201</td>
<td>1,976</td>
<td>places, removes, extracts</td>
<td>1 to 5 placements per week</td>
<td>6 to 10 removals per week</td>
</tr>
</tbody>
</table>

Demographic information:

**Instructions for completing this report**

In the official form, in this field you will be asked to enter your clinic's PIN that was provided to you by MMSD. This PIN will pull information we have on file for your clinic into the report, and verify that the report is being collected for the right clinic. To complete a test version of this form, enter D1610.

D1610

1) Clinic Information

- Clinic name
  - MMSD Test
Dashboards also help with data analysis.

<table>
<thead>
<tr>
<th>Metric</th>
<th>Percentage</th>
<th>Last Updated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent dispose of capsules as amalgam waste</td>
<td>100%</td>
<td>a few seconds ago</td>
</tr>
<tr>
<td>Percent using chairside traps</td>
<td>93%</td>
<td>a few seconds ago</td>
</tr>
<tr>
<td>Disposing of amalgam waste</td>
<td>91%</td>
<td>a few seconds ago</td>
</tr>
<tr>
<td>Percent disposing of chairside traps properly</td>
<td>78%</td>
<td>a few seconds ago</td>
</tr>
<tr>
<td>Percent that have collection container</td>
<td>90%</td>
<td>a few seconds ago</td>
</tr>
<tr>
<td>Compliant with bleach BMP</td>
<td>86%</td>
<td>a few seconds ago</td>
</tr>
<tr>
<td>Percent stocking a variety of capsule sizes</td>
<td>63%</td>
<td>a few seconds ago</td>
</tr>
<tr>
<td>Percent using a neutral line cleaner</td>
<td>71%</td>
<td>a few seconds ago</td>
</tr>
</tbody>
</table>

**Reports completed out of total**: 100 out of 116

**Number of placements per week**:
- Null: 3
- More than 10 placements per week: 83
- 1 to 5 placements per week: 17
- Fewer than one placement per week: 20
- 6 to 10 placements per week: 7

**Clinics with 100% compliance**:
- 48%
- No 5%

**Has amalgam collection container**:
- Yes 90%
- No 3%

**Collection container**
- Yes 90%
- No 10%

**Uses precapsulated alloys**
- Yes 90%
- No 10%
Survey123 also used for chloride reduction

- Most chloride to MMSD is from water softeners
- MMSD study: optimizing or replacing water softeners can reduce salt by about 25-50%
- Survey123 designed to help accomplish softener improvements
Form captures data; guides providers

- Softener service providers trained on softener efficiency and use of Survey123 app

- Providers use form during service calls under Salt Savers pilot program to document softener evaluations and optimizations
Recommendations for optimized settings built into survey form to appear based on entered data
**Salt Savers Pilot Program Tracking**

**McFarland Salt Savers Program**

<table>
<thead>
<tr>
<th>Date</th>
<th>Service Type</th>
<th>Address</th>
<th>Previously Evaluated?</th>
<th>Clunker?</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/29/2021</td>
<td>Installation of new unit replacing an identified unit</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>01/25/2021</td>
<td>Installation of new unit replacing an identified unit</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>01/23/2021</td>
<td>Installation of new unit replacing an identified unit</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>01/12/2021</td>
<td>Installation of new unit replacing an identified unit</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>01/07/2021</td>
<td>Installation of new unit replacing an identified unit</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Optimization at**

- Review Status: Complete; paid
- Service Type: Optimization
- Customer’s utility account number: [Details]
- Provider: [Details]
- Company: [Details]
- Date: 11/6/2020

Madison Metropolitan Sewerage District
Pandemic spurred creation of virtual tour

Virtual Tour of Nine Springs Wastewater Treatment Plant

Headworks

The first stop for incoming wastewater, called influent, is the Headworks building. An average of 42 million gallons of influent reach the plant each day, plus truckloads of hauled waste called septage. In this building, the water flows through screens to remove trash, such as wipes, rags, and...
Remote trainings offered; recorded

Amalgam separator inspection – clear

1) Turn off vacuum pump to let contents settle

2) Turn off or dim the lights in the room.

3) Shine a flashlight through the lower canister to verify contents are below fill line.

4) Shine a light through the upper chamber to make sure solids haven’t backed up.
Amalgam Management

Training Resources for Clinic Staff

The District has developed resources to help dental clinic staff learn about amalgam management requirements and practices to minimize pollution. The presentations linked below are intended for dental clinic staff who are involved in handling and disposing of amalgam waste, and can be an introduction for staff new to amalgam management or a refresher for staff experienced in working with amalgam. Click the links to view the videos on YouTube.

1. Mercury, Amalgam, and Wastewater (7:07) -- Background on mercury pollution and why the District regulates amalgam waste.

2. Amalgam Requirements for Dental Clinics (23:24) -- Overview of local and federal amalgam management requirements and descriptions of each required best management practice.

3. Reporting Requirements, Tools, and Other Resources (11:00) -- Summary of EPA and MMSD amalgam reporting requirements, an overview of the MMSD annual certification, and other recommended pollution prevention practices for dental clinics.

In addition to these informational modules, you can also view a recorded demonstration of accessing and completing the online certification form or review instructions for accessing and navigating through the form.
Takeaways

• Remote data collection tools allow for:
  • More efficient reporting
  • Instant data review/analysis
  • Dynamic forms with real-time feedback; decision support
  • Visual confirmation without in-person inspection

• Helps reach a wider audience

• Remote resources can be shared among utilities