



What's in YOUR Inlet?

MORENO VALLEY'S NO-HASSLE TLC STUDY USING GIS/GPS TECHNOLOGY

Phuong Hunter & Dale Mendenhall

Trash/Litter Characterization (TLC) studies are finding their way into Phase I National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permits. City and county maintenance and operations staff know that central business districts and transportation corridors are often major sources of trash, litter and other pollutants.

Unfortunately, just knowing where the problem areas are and



implementing best management practices (BMPs) to deal with the pollutants is not enough. Without proper documentation, data analysis and record keeping, local agencies find themselves searching for answers during permit compliance audits.

MORENO VALLEY

The city of Moreno Valley, Calif.'s, MS4 Permit, issued by the Regional Water Quality Control Board (RWQCB),

Region 8 (Santa Ana), requires the city to establish a system to record visual observation information regarding the materials collected from the MS4 (paper, plastic, wood, vegetative wastes, etc.), descriptions of its main sources (office, residential, commercial and industrial wastes) and the problem areas or locations.

"The regional board staff is very supportive of the city's environmental stewardship and efforts to use technology

(GIS/GPS) to track, monitor and characterize wastes going into their storm drain system," said Milasol Gaslan, chief, Inland Storm Water Section at the RWQCB—Santa Ana Region. "We believe that this approach will help the city focus other elements of their storm water program such as public outreach and inspection programs to maximize source control by identifying sources of these wastes. This also should help them find the problem areas in their conveyance



Moreno Valley maintenance crew members in the field.

system that might need more frequent cleaning to prevent or minimize impacts to receiving waters.”

The city of Moreno Valley is located approximately 66 miles east of Los Angeles. At over 50 sq miles with room to grow, it is the second-largest city (175,000 estimated population) in Riverside County and the sixth-fastest growing city in the U.S. Moreno Valley is one of 13 permittees named in the third round, Phase I NPDES MS4 Permit for the Santa Ana River Watershed Region.

IMPLEMENTING GIS/GPS

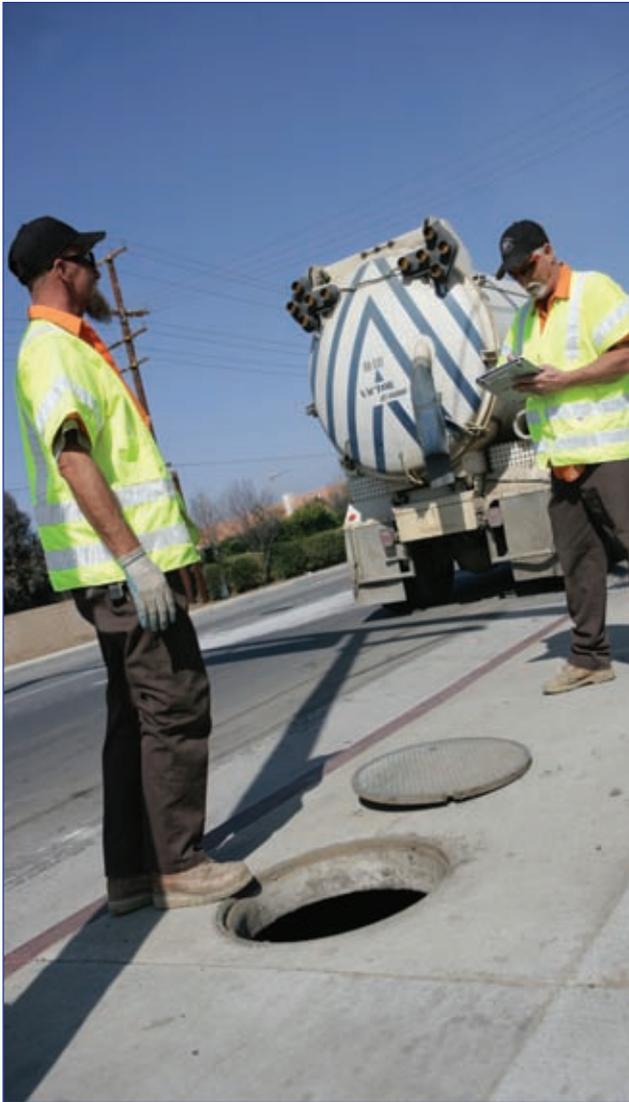
The city’s Storm Water Management Program (SWMP) staff, partnered with staff from the Technology Services Division, came up with an innovative and efficient way to conduct the study. They integrated geographic information system (GIS) and global positioning system (GPS) technologies to track, monitor and

record the types, sources and locations of wastes being discharged into its storm drain systems.

At the onset of implementing the study, SWMP staff were not surprised to find a simple but effective paper log being used by maintenance and operations (M&O) staff to document the catch basins/inlets that were inspected and cleaned. M&O staff also used outdated and inaccurate paper maps using dots to locate the inlets. This was problematic for the study as some location descriptions were vague and made it difficult for staff to determine the exact location of the catch basin or identify geographic and physical features on the map. Continuing to use these inspection forms for the study would have required organizing and shuffling through more than 1,700 records while trying to compare them with a dot map, making it virtually impossible for SWMP staff to

do any comprehensive analysis on the inspections.

It was evident that the current practice needed to change. The catch basins needed to be inventoried and assigned an identification number. SWMP staff quickly determined that the existing catch basin cleaning program should include additional field documentation by use of a new written inspection cleaning form and accurate location maps. The new form required information, such as date of inspection, estimated volume of wastes cleaned out of the catch basin (if any), type of litter removed (plastic, paper, wood, vegetative, metals, etc.), observed sources of litter (commercial, industrial, residential and office) and any other observation comments. Another field on this form was to accurately physically locate the catch basin. The city’s task was to move away from this type of inefficient record keeping and



Moreno Valley maintenance crew members record data.

move to a more accurate and effective method using a computer database system. The goal: Keep it simple so as not to overwhelm field staff responsible for this very important BMP.

Agreeing on an action plan, the first task was to inventory and capture catch basin/inlet data (ID number, location, street address, street intersection, physical properties, etc.) on all catch basins using GPS technology. Technology Services Division staff used a Trimble GeoXT GPS receiver with sub-meter accuracy and ESRI's ArcPad software to collect data and create the catch basin database. GPS data collected was entered into the city's GIS system and stored in a geo-database. It was important to develop this catch basin database so it could be shared across all departments for better planning, infrastructure management and use in existing and future SWMP applications.

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GIS Assistant Dale Mendenhall collects data near an inlet.



City of Moreno Management Analyst II Phuong Hunter manages the database.

Storing the catch basin data in the GIS gave the SWMP staff very accurate maps of catch basin location points. From their workstations, SWMP and M&O staff can view these location points with other GIS data (ortho-photography, elevation data, contours, land use maps, etc.), and evaluate and analyze current BMPs. Paper atlas maps with an ortho overlay were developed for M&O staff for use in the field showing the catch basin locations with identification numbers for placement on the appropriate line on the inspection forms.

Using the identification number on the inspection form gave the SWMP team the ability to pinpoint the exact location of the catch basin inspected and cleaned. To date, more than 1,700 catch basins (~100%) have been inventoried and globally positioned. As development projects continue to grow, so will the number of catch basins that will be constructed, marked with stainless steel curb markers that read, "No Dumping—Only Rain in the Drain," and globally positioned.

The next task was to enter the completed catch basin inspection/clean out records into a database. This was accomplished with a user-friendly custom data entry form. The data entry form was designed to look similar to the current paper inspection form for familiarity. Safeguards also were put in place to keep the data accurate. This database also was designed to use the GPS catch basin inventory database as a look-up table to minimize typing and eliminate errors. The form also had to be designed to enter data quickly since M&O staff in the very near future will be outfitted with a digital solution for field use. This will eliminate the paper forms and the duplicative effort by SWMP staff for entering the data into the database.

NO-HASSLE TOOL

Keeping inspection and maintenance records in a database has been advantageous to the SWMP. The information is easily accessible, and with custom reports and database queries, SWMP staff can now analyze the data in a variety of

ways. Additionally, integrating catch basin cleaning data with street sweeping data will assist in effectively managing these two BMPs.

Now the storm water managers can view all of the city's catch basins on a map and see which basins have been inspected and which have not, or view problem areas and see how many times they were inspected and the dates of those inspections in a matter of minutes. When database tables are linked in a GIS, the data can be geo-processed and the user can geographically analyze the data in ways that simply can not be done with tabular data. For example, a user can query the inspection database and it would show that four catch basins had an unusually high amount of paper litter; the same query in a GIS will return the same data and show that these four catch basins are located adjacent to schools; then a map can be printed and

"THE GIS HAS PROVEN TO BE A GREAT ASSET TO THE CITY, A REAL 'NO HASSLE' TOOL FOR THE STORM WATER MANAGEMENT TEAM."

forwarded to SWMP staff to determine what can be done to reduce the amount of trash going into these basins.

According to Moreno Valley employees, the GIS has proven to be a great asset to the city, a real "no-hassle" tool for the storm water management team. So ... what's in your inlet? **SWS**

Phuong Hunter is management analyst II and Dale Mendenhall is GIS assistant with the city of Moreno Valley. Hunter can be reached at 951/413-3470 or by e-mail at phuongh@moval.org. Mendenhall can be reached at 951/413-3425 or by e-mail at dalem@moval.org.

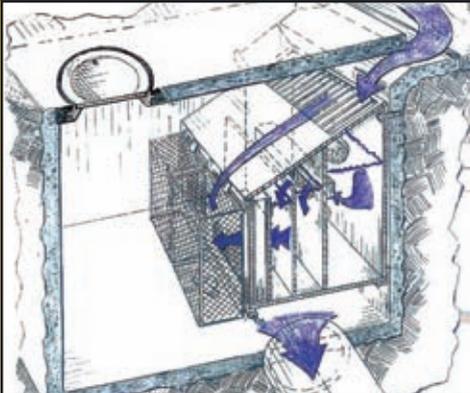
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