

Region M Solid Waste Management District
Illegal Dump Survey



Prepared by



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REGION M SOLID WASTE MANAGEMENT DISTRICT ILLEGAL DUMP SURVEY

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Acknowledgements

The staff of Harry S Truman Coordinating Council wish to thank the elected officials and public employees in Vernon, Barton, Jasper, Newton and McDonald Counties. This survey would not have been possible without the local knowledge provided by various members and employees of county commissions, sheriffs departments, and road districts.

Assistance with GIS analysis and map production was provided by Janet Carroll, GISP, of Janet Carroll Consulting, Rolla Missouri.

Harry S Truman Coordinating Council staff performing the bulk of the work for this project was Joe Kelley, Planner, with assistance from Craig Jones, Assistant Director.

Project Description

Concern Associated with Illegal Dumping

Illegal Dumping may affect the health and safety of humans and wildlife. Items such as metal, old appliances, broken glass, and other objects may contribute to physical injuries if unexpected contact is made. Other problems may develop if harmful substances are dumped at the site, these substances may leach into the environment and contaminate the soil and groundwater. Air quality may be threatened if the illegal dumpsite is burned; many plastics and other waste products are known to be extremely toxic when burned.

The purpose of the illegal dump survey was to document illegal dumpsites within the Region M Solid Waste Management District. The district is comprised of the following 5 counties located in southwest corner of Missouri: Vernon County, Barton County, Jasper County, Newton County and McDonald County. Illegal dumping most often occurs in isolated places, areas with little population, and along roadways which are less traveled, as a result of these factors, very few people are aware of the problem with illegal dumping within the Region.

A first step in developing a plan of action against illegal dumping activities within the Region was to determine the extent of the problem. After the illegal dumpsites are located and data is collected this may be used to:

1. Demonstrate illegal dumping does exist within the Region
2. Help prioritize sites for cleanup and abatement
3. Document materials at dumpsite
4. Establish a benchmark for future cleanup activities

The completed survey can also be used as a tool for future planning purposes in the Region, compliment existing solid waste and recycling programs and an aid in the solicitation of funds to help cleanup documented dumpsites.

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Methods

Identifying an Illegal Dumpsite

The initial goal of the illegal dump survey was to document the problem of dumping trash illegally within the Region; as a result the following areas were considered an illegal dumpsite for the purpose of the study.

1. Areas with heavy concentrations of trash
2. Areas with large amounts of scattered trash, which are not considered roadside litter (bottles, fast food wrappers, beer cans, etc.)
3. Areas containing large piles of yard waste. These areas may become a catalyst for future dumping.
4. Areas containing isolated or solitary items (large appliances, tires, construction debris, etc.)

Site Assessment and Identification

Preliminary data collection was conducted by soliciting proposed site location from area representatives. These representatives were from a diversified background of county, city, civic and private organizations.

During the site identification process it was found that in order to effectively identify illegal dumpsites within the Region, it was necessary to physically travel along roadways, concentrating on high possibility areas for dump location such as pull-offs, roads that followed ridgelines, and locations where roadways cross waterways.

Once an illegal dumpsite was located, a brief description about the site was recorded, photographs were taken and a global positioning system (GPS) coordinate were established to demonstrate the site location in relationship to other geographical features.

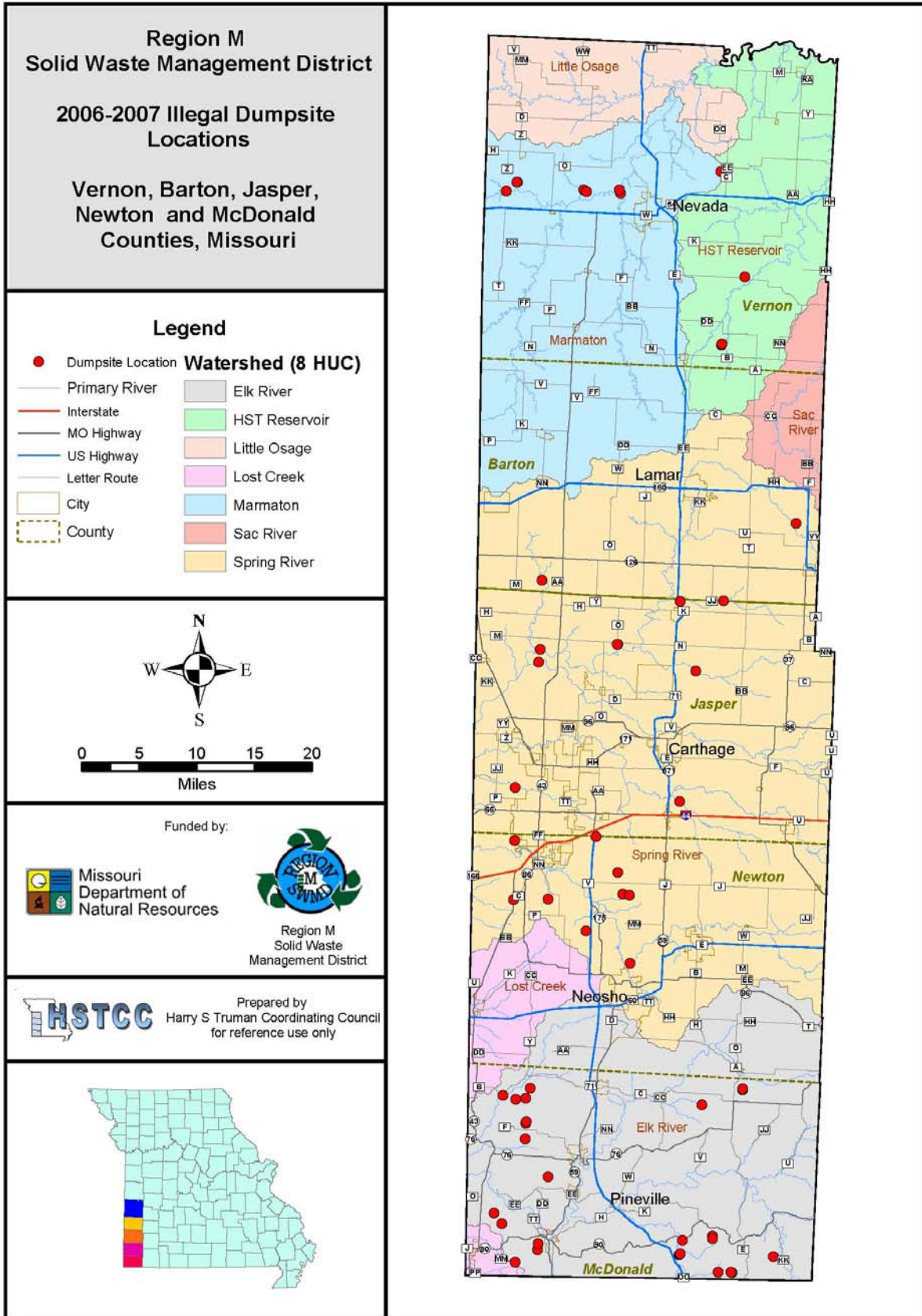
Limitations Associated with Road Survey

The primary limitation with using a road survey is the method only permits discovery of sites visible from the public right-of-way, therefore only sites located within the public right of way were assessed. Surveyors did not enter private property to assess dump sites; it can be assumed there may be significant numbers of legal and illegal dumpsites located on private property. The majority of the survey was conducted during the late fall and early spring when the area foliage was reduced and visibility improved.

Survey Area

Demographic data for the counties surveyed is described in detail within each county's individual section. This data is from US census and the Nation Association of Counties.

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Regional Findings

Site Characteristics

The completed survey resulted in the identification of sixty four (64) illegal dumpsites throughout the Region. The majority of the sites resemble what the surveyors describe as a “single truck load”. This “single truck load” represents the approximant amount of material a person can put into the cargo area of a common pickup truck. The majority of the sites were at least partially visible from the public right-of-way. See the Regional map on following page for site locations.

Waste characteristics

Area dumpsites contained a variety of wastes including common household wastes, household hazardous wastes, construction and demolition debris, scrap tires, and large appliances. Tires and Large appliances were the most frequently found items, perhaps due to their durability and perceived difficulty of disposal.

Water Resource Impacts and GIS analysis

A great majority of the sites documented in this report were located in close proximity to a local waterway. The impacts of illegal dumping along area waterways and in drainage courses may contribute to water resource contamination if not addressed. The District’s counties of Jasper Newton and McDonald contain geologic features known as Karst terrain, which was formed over thousands of years as water soluble minerals eroded from the bedrock. The result of this erosion is a landscape characterized by sinkholes, caves, and fissures. The porosity of Karst terrain provides very little filtration as surface waters are quickly transported to groundwater supplies. Groundwater in Karst terrain is as easily contaminated as surface waters, exposing springs, wells and aquifers to surface contaminants.

Table 1. Dumpsite Distribution by Watershed

Watershed Name	8 Digit Hydrologic Unit Code	Dumpsites Per Watershed	Watershed Acres in Region M	Percentage of Region M Area
Little Osage River	10290103	0	105462	5.1%
Marmaton River	10290104	9	342500	16.5%
Harry S Truman Reservoir	10290105	5	199777	9.6%
Sac River	10290106	0	49829	2.4%
Lost Creek	11070206	0	72030	3.5%
Spring River	11070207	21	879390	42.4%
Elk River	11070208	29	424236	20.5%
Totals		64	2,073,611	100%

Proximity to Streams

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Spatial analysis using GIS was conducted to evaluate stream exposure to illegal dumpsites. The analysis was conducted by calculating buffers around both dumpsites and streams in order to measure the number of dumpsites and the length of the stream within the buffer. A ¼ mile buffer was created along stream courses to count dumpsites. Dumpsite buffers of ¼ mile and ½ mile radii were used to calculate miles of stream within the dumpsite buffers. See table 2 below.

Table 2. Stream Exposure to Illegal Dumping Sites

Dumpsite Buffer Radius	Streams		Losing Streams	
	Site count	Exposure	Site count	Exposure
1/4 mile	33	13.4 stream miles	22	7.5 stream miles
1/2 mile	33	31.9 stream miles	22	26.4 stream miles

The analysis reveals that 55 of the 64 documented sites are within ¼ mile of a stream. 22 of the 55 sites are near losing streams. A losing stream is simply a surface stream that loses its surface flow as the water penetrates the porous Karst terrain. Losing streams provide a direct pathway for surface water contaminants to enter groundwater.

Proximity to Sinkholes, Springs, and Wells

Dumpsite buffers were also used to evaluate the numbers of Karst features and wells exposed to possible dumpsite contaminants.

Table 3. Other Feature Exposure to Illegal Dumping Sites

Dumpsite Buffer Radius	Sinkholes	Springs	Public Wells	Certified Wells
1/4 mile	0	3	0	23
1/2 mile	0	8	1	118

The available data indicate there are 135 sinkholes Region M. This is likely an incomplete data set, as subsidence in areas with karst topography is an ongoing phenomenon. Sinkholes are not always recognized as being sinkholes; the sunken areas can fill over time, appearing as a very shallow depression. No known sinkholes were found within the dumpsite buffers. It is likely, however, that there are unrecognized sinkholes near dumpsites and undocumented dumping sites on private property that are situated near or in sinkholes. These naturally occurring depressions in the landscape have commonly been used as farmstead and household dumps by landowners to *legally* dispose of their own solid wastes. Any undocumented dumping site on public land would of course be an illegal disposition of wastes, as would the dumping on private land of wastes not generated by the owner of the land.

Of the 233 identified springs in Region M, 3 were found to be within ¼ mile of an illegal dumping site. When the buffer was increased to a ½ mile radius, the number of potentially exposed springs increased to 8.

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Of the 79 public water supply wells in Region M, one was found to be within ½ mile of an illegal dumping site. There were none within ¼ mile.

Of the 11,371 certified wells in Region M, 23 were found to be within ¼ mile of an illegal dumping site. When the buffer was increased to a ½ mile radius, the number of potentially exposed wells increased to 118. The previous discussion of the sensitivity of groundwater resources in Karst areas is also salient here.

Recommendations

Possible causes and proposed solutions

Illegal dumping is not isolated; it is a problem in many areas of the country. There are many general reasons why illegal dumping occurs, below is a list of possible reasons and suggested solutions.

Possible causes

- Some communities do not require curbside trash collection.
- Unavailability of recycling programs
- Inconvenient location and operational hours of recycling centers
- High cost associated with the disposal of construction related materials
- Insufficient funding available for enforcement
- A general lack of education in regards to illegal dumping

Suggested solutions

- Increase community education activities
- Organize cleanup of illegal dumpsites
- Promote monitoring of sites after cleanup
- Conduct special waste collection events
- Close off certain areas with physical barriers, if feasible