

**Operation and Maintenance Program
For Pollution Prevention/Good Housekeeping in
Municipal Operations**



Greene County, Missouri

Municipal Separate Storm Sewer System (MS4)

Permit # MO-R040014



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PURPOSE STATEMENT

This operation and maintenance plan provides guidance on the prevention of stormwater pollution during routine functions of the Greene County Highway Department. This plan provides a written explanation of Greene County's compliance with the requirements found in Missouri State Storm Water Regulations found in 10 CSR 20-6.200 and Section 4.2.6 of the Municipal Separate Storm Sewer System (MS4) permit number MO-R040014 issued to Greene County by the Missouri Department of Natural Resources (MDNR).

Fleet Maintenance



POLLUTANT CONCERN

Vehicle maintenance activities can result in a variety of possible stormwater pollutants. Motor oil, transmission oil, brake fluid, engine coolant, and multiple other fluids must be appropriately stored, used, and disposed of to prevent water pollution. These fluids can be directly toxic to plants and animals that are exposed, they carry other toxic materials such as metals, and they can pose a risk to human health.

OPERATIONS SUMMARY

The Greene County Highway Department is responsible for the maintenance and repair of 390 Greene County vehicles ranging from light vehicles to tracked excavators. Vehicle maintenance and repair is performed indoors in a 20 bay facility. The bays are large enough to accommodate even the largest pieces of equipment owned by Greene County, allowing all vehicle maintenance work to be done indoors protected from exposure to rainfall.

MATERIALS STORAGE

All bulk storage containers for petroleum products and chemicals used for vehicle maintenance are stored inside the service bays or in the parts warehouse. All oil and other fluids used in vehicle maintenance are stored inside (see the SPCC plan for the Clifton facility for specific details on storage location, quantities, and secondary containment for petroleum products).

WASTE GENERATION, STORAGE AND DISPOSAL

All used oil and other petroleum products are drained from vehicles into drip pans that funnel the oil into steel roller containers built specifically for the purpose of collecting used oil. Once full, the inflow valve is closed and a hose from the container drum is connected to a 1,000 gallon double walled steel tank on the west side of the North Shop. The drum can then be pressurized with compressed air to pump the used oil into the 1,000 gallon used oil holding tank. The heavy equipment bay in the North Shop is equipped with a steel oil sump which is directly plumbed into the 1,000 gallon steel holding tank. An air actuated pump on the used oil tank pumps the oil directly from the heavy equipment bay to the used oil tank. The sump in the heavy equipment bay does not have a floor drain and can be emptied only via pumping. Used oil from the 1,000 gallon holding tank is collected by Heritage-Crystal Clean for recycling, usually once per month. Heritage-Crystal Clean is called when the holding tank reached 1/2-3/4 full (500-750 gallons). Three viscosity weights of new oil are kept on hand and each is contained in a separate 125 gallon or 250 gallon steel roller drum. Smaller, commercially available size plastic jugs of various miscellaneous oil are stored in the parts warehouse between the vehicle service bays and the heavy equipment bay. A 250 gallon steel drum of hydraulic oil is located in the heavy equipment bay in

the North Shop. Details on petroleum product storage, secondary containment, and spill response can be found in the SPCC plan

Vehicle parts are cleaned with 106 or 142 mineral spirits solvents from Heritage-Crystal Clean. Parts are cleaned in a sink mounted on top of the 55 gallon steel drum which contains the solvent. An electric pump recirculates solvent from the drum onto the sink and the sink drains into the drum. This closed, self-contained system ensured no spillage of solvent liquid. Used solvent is collected by Heritage Crystal Clean on an as needed basis for recycling.

Spill kits are distributed throughout the vehicle maintenance facility. Each spill kit contains a roll of Pig Mat™ for use on oil drips and small spills. A minimum of four oil absorbent booms 6-8 feet long are also included in each spill kit for immediate containment of larger spills. Once the initial spill has been contained by the booms, the appropriate amount of absorbent can be obtained from the warehouse that adjoins each shop. When a New Pig™ mat is used the absorbed oil is wrung into an appropriate oil pan for transfer to the 1,000 gallon storage tank. The New Pig™ mat is either re-used or placed in the trash for transfer to the landfill.

Waste	Storage Location	Disposal Method	Disposal Frequency
Used Motor Oil, Hydraulic Fluid, and Transmission Fluid	1,000 gallon above ground tank	Collection by vendor for recycling	Before tank reaches 75% capacity
Used Oil Filters	Leak-proof bin after draining for 24 hours	Collection by vendor for recycling	As needed
Used Engine Coolant	2 -55 gallon drums in the South Shop	Recovery by vendor for recycling	As needed
Worn Brake Pads/Shoes	Warehouse	Recycled with metal	As needed
Used Lead-Acid Batteries	Designated bench in the South Shop	Collected by the manufacturer	As needed
Tires	Tire Shop	Collected by vendor	As needed
Scrap Metal		Recycled	As needed
Parts Cleaning Solvent	55 gallon recirculating drum	Recovery by waste vendor	As needed
Refrigerant	30 lb. cylinders in warehouse	Recovered for recycling	Recycled on-site

Contact information for the oil recovery and solvent vendor:

Heritage Crystal Clean
 1135 N. Fr 123 #A
 Springfield, MO 65802
 417-865-4811
www.crystal-clean.com

POLLUTION PREVENTION PROCEDURES

- Use non-hazardous, environmentally safe products when possible. Avoid the use of chlorinated solvents
- All material and waste containers must be properly labeled for content identification
- Keep safety data sheets (SDS) on site for information on safety, handling, and reportable spill quantities for all materials on hand
- Store all supply materials and waste containers indoors to prevent contact with rainfall
- Ensure that waste oil, antifreeze, filters, and other waste are collected in designated labeled containers and recycled to the maximum extent practical
- Maintain a record of all waste pick-ups by the collection contractor
- Always use drip pans under vehicles when making or breaking fluid system connections
- Drain used oil filters for at least 24 hours with a hole punched in the filter dome or anti-back drain valve. Crush and collect filters for recycling
- Keep batteries and other fluids in secondary containment whenever possible
- Have spill kits available near battery and oil storage areas
- Keep neutralizer and absorbent by both new and used batteries
- Clean up any spills immediately using dry methods (absorbents).
- Keep the floor and working areas clean

De-Icing Operations



POLLUTANT CONCERN

Salt, in the form of sodium chloride (NaCl) is widely used on roadways to lower the freezing point of water to melt ice. This provides a safer driving surface for motorists when ice and snow would otherwise cover roads. When salt is washed off the roadway it can have detrimental environmental impacts. Elevated sodium chloride levels in soils inhibits water absorption and nutrient uptake in plants. Sodium and chloride in waterways can be directly toxic to aquatic life such as fish and aquatic insects. For these reasons Greene County will follow these steps to limit the amount of salt entering waterways to the maximum extent practicable.

OPERATIONS SUMMARY

The Greene County Highway Department spreads approximately 2,800 tons of salt on county roads through the course of a typical winter. The salt storage barn at the Greene County facility on N. Clifton provides covered storage for 1,300-1,400 tons of salt. Salt is loaded into spreader trucks with a front end loader. Salt that is spilled during loading is scooped back into the barn by the loader. Any salt that cannot be collected with the heavy equipment is swept back into the barn with a push broom. Between snow storms, all trucks with salt spreading equipment are stored in covered vehicle sheds. In the spring all salt spreading equipment is washed first at the large equipment wash located on the south end of the facility. All wash water goes through a grit separator, allowing the solid materials to settle out before the water enters the City of Springfield sanitary sewer system. All equipment is then washed with soap in the covered vehicle wash bay. All wash water from this facility likewise passes through a grit separator prior to discharge to the City of Springfield sanitary sewer system. The vehicles are then washed with a rust inhibitor in the vehicle wash bay. After washing in the spring, all salt spreading equipment is stored in covered vehicle sheds for the duration of inactivity during warm weather. In October all salt equipment is loaded onto the trucks and tested for mechanical functionality as part of a fall readiness drill. Any equipment that fails to function properly is either replaced or repaired prior to cold weather. Salt is also stored at the joint City/County facility located on Kaufmann Road. Trucks are not loaded for immediate spreading directly from the stockpile at this location due to accounting difficulties. All salt is dispensed to the spreader trucks from the N. Clifton facility. When this barn gets low salt is trucked in all at once from the Kaufmann Rd. facility to N. Clifton.

POLLUTION PREVENTION PROCEDURES

- Salt stockpiles must be stored indoors at all times
- Any salt spilled during loading activities must be immediately swept back into the salt barn
- Minimize the amount of salt used without compromising public safety
- Stop salt feed on trucks at stop signs/lights if the truck is equipped to do so

- All salt hoppers and spreaders are to be checked annually for mechanical functionality to prevent over-application of salt
- Each spring when the threat of snow has passed, all salt equipment is to be thoroughly washed
 - Wash equipment initially in the heavy equipment wash area
 - Following the initial wash with soap wash
 - Follow the soap wash with rust inhibitor
- Store all salt spreading equipment in covered equipment sheds

Waste Management



POLLUTANT CONCERN

Contaminants from solid and liquid wastes can runoff or leach into the ground when exposed to rain or otherwise improperly disposed of. The possible pollutants contained in the wide variety of waste collected and/or generated by the Highway Department can negatively impact waterways.

OPERATIONS SUMMARY

The Greene County Highway Department collects trash along the county rights of way both in response to citizen complaints and when a Highway Department crew sees some that needs to be collected. Trash collected directly by the Highway Department is stored at the N. Clifton facility until there's a quantity sufficient to take to the landfill. Most trash is collected by inmates of the Greene County Jail on a supervised work release program. Inmates gather the trash and place it in bags that are left on the roadside. The bags are then collected by the Highway Department and taken to the Springfield sanitary landfill. During a given year these efforts result in about 90 tons of trash removed from the county right of way.

POLLUTION PREVENTION PROCEDURES

- Properly store waste materials as far away from storm inlets and drainage ways as is practical
- Store solid wastes in appropriate containers (dumpsters) when feasible
- Do not dispose of hazardous or unknown materials in the landfill
- Containers of unknown liquids could potentially be hazardous; store such containers in a covered area protected from rainfall, have the material tested by a qualified contractor, and dispose of the material promptly according to contractor's recommendations
- Recycle materials when possible, appropriate, and feasible
- Keep the facility clean by promptly picking up any trash that can be blown around on a windy day
- Never clean/wash paint or concrete into the street or near a gutter or stormwater inlet

Street Sweeping

POLLUTANT CONCERN



The particulate matter that accumulates on roadway surfaces can contain a variety of pollutants such as trash, bacteria, pesticides, nutrients, metals, hydrocarbons (from vehicle leaks), and sediment. These pollutants come from a variety of sources such as vehicle emissions and wear and tear, atmospheric deposition, road surface deterioration, littering, etc. Regularly cleaning the streets with street sweepers plays an important role in keeping these pollutants from washing into the storm system during rainfall events.

OPERATIONS SUMMARY

The Greene County Highway Department operates two street sweeping trucks on a daily basis. The trucks sweep all streets within the urban services area. This includes most neighborhood streets and some county roads within the urban services area. Sweeper trucks do not sweep farm roads in the rural areas. One truck is assigned to the eastern portion of the urban services area and another to the west. Campbell Ave is the dividing line between these two areas of responsibility. Each truck completes a circuit of all streets within its assigned area approximately every 4-6 weeks before starting anew. The truck assigned to the east side of the county returns to the N. Clifton facility when it reaches capacity. It has the capability of raising the storage unit hydraulically to dump it into a dump truck. This is repeated several times a day and at the end of each day the dump truck containing the sweepings takes them to the sanitary landfill. The west side truck cannot raise its load high enough to empty into a dump truck so it must take the sweepings directly to the landfill several times a day. Loads tend to increase in the summer time when lawn clippings get into the street and are taken up by the sweepers. Sweeper trucks remove approximately 75 tons of trash and sediment from county roads each year.

POLLUTION PREVENTION PROCEDURES

- Properly maintain and operate the sweepers in accordance with the manufacturer's
- Take sweepings to the landfill the day they are collected or make sure swept material is stored in a covered area

Vehicle Washing

POLLUTANT CONCERN

When a vehicle is washed it is not just sediment that is washed away. A variety of pollutants that accumulate on roadways such as salt, metals, hydrocarbons (oil products), and pesticides can all attached to the dirt on the vehicle too. Even the soap itself if too highly concentrated can cause water quality problems. For this reason all wash water must be captured and treated before it enters a water way.



OPERATIONS SUMMARY

The vehicle wash bay at the Clifton facility is utilized by county vehicles from the Highway Department, County Sheriff, and vehicles assigned to the Juvenile, Assessor, and Resource Management offices. Vehicles are washed on an as-needed basis. All waste water from the vehicle washing bay passes through a sediment trap prior to flowing into the City of Springfield sanitary sewer system. The sediment trap is cleaned out on an as needed basis several times per year. Cleaning procedures require the removal of the lid and removal of the accumulated material with a backhoe and workers with shovels or with a vacuum truck depending on how solidly packed the material is. All removed material is hauled to the City of Springfield sanitary landfill. The wash bay is covered to prevent stormwater from entering the sanitary sewer system. All soap and rinse aids are stored in a separate room of the wash bay building protected from rain.

POLLUTION PREVENTION PROCEDURES

- Monitor grit separator on a routine basis
- Remove accumulated sediment and trash from the sediment trap quarterly, or as needed
- Keep soap, rinse aids, and other wash chemicals stored inside, protected from rainfall

Vehicle Fueling



POLLUTANT CONCERN

When petroleum products get into waterways it can affect human health as well as animals and plants. Petroleum products including oil, gasoline, and diesel fuel contain compounds that are toxic to aquatic life and harmful to humans. Petroleum products contain carcinogenic (cancer causing) compounds such as benzene. Even a very small amount of oil is sufficient to pollute a large quantity of water. One gallon of oil/fuel can pollute one million gallons of water.

OPERATIONS SUMMARY

The Greene County Highway Department's N. Clifton facility has four underground storage tanks (UST's) for fuel storage. Two interconnected 20,000 gallon tanks store diesel fuel and two interconnected tanks totaling 26,000 gallons store unleaded gasoline. All county owned vehicles refuel at the N. Clifton facility. The USTs are filled frequently to make sure they do not drop below 75% capacity as part of the Emergency Operations Center Contingency Plan for Greene County ensuring that police and first responders will have access to fuel in an emergency. The fuel island is equipped with an emergency shut off valve in case of a spill or damage to the pumps. These tanks are regulated under 40 CFR Part 268. The transfer of fuel both from the tanker to the tanks and from the tanks to vehicles is regulated under Spill Prevention Containment and Countermeasures (SPCC) regulations found in 40 CFR Part 112. For more specific information on the underground storage tanks see the SPCC plan for the Clifton Facility.

POLLUTION PREVENTION PROCEDURES

- Have a properly supplied spill kit at the fueling station
- Monitor tank filling operations for overfills and spills
- Stay with the vehicle during fueling and monitor to avoid overflows and leaks
- Do not top off vehicle fuel tanks
- Regularly inspect fuel dispensing equipment for leaks and mechanical failures
- Perform regular maintenance on the fuel dispensing equipment to ensure proper operation of emergency shut off devices on pumps
- Clean up all spills immediately using dry methods (absorbent material)

Herbicide Storage and Use



POLLUTION CONCERN

The Greene County Highway Department uses several different herbicides for control of vegetation within the right-of-way to maintain lines of sight and improve safety and appearance. Some of these chemicals can be acutely toxic to aquatic animals, including fish, if the herbicide is applied directly to a water body or to road ditches that can convey the chemical to a water body. All herbicides are toxic to plants, including aquatic plants. If the product enters waterways in sufficient concentrations the resulting loss of vegetation can reduce oxygen levels in the water and cause fish kills.

OPERATIONS SUMMARY

Herbicides used include Element 3A, 2-4D, and Gly-4 (glyphosate) for weed control along Greene County right of way. Element 3A is applied primarily via drip emitters on the ends of the blades on mowing rigs to control woody plants and broadleaf weeds. The sign maintenance crews also uses 2-4D and glyphosate (Gly-4) to control weeds and vegetation around road signs where mowers cannot reach. Approximately 150 gallons of herbicide is used on right of way in a given year in the treatment of 120 lane miles of roadway. Herbicides are mixed in the Bridge Maintenance Building. A spill absorption kit is present in the bridge maintenance building to clean up any herbicide that accidentally spills during mixing operations. See Safety Data Sheets in the Appendix.

MATERIALS STORAGE

All herbicide containers are stored in a locked, fire-proof steel container in the bridge maintenance building. Herbicide is stored in manufacturer's 2.5 gallon containers with 50 gallons being the maximum quantity on hand at any given time.

WASTE GENERATION AND DISPOSAL

Any spills that occur during product mixing are cleaned up immediately with absorbent material. Absorbent material is disposed of in accordance with the manufacturer's label. At the end of each day all herbicide tanks and drip lines used for applying Element 3A are flushed and the rinse water is captured in the herbicide containers and then re-used the following day. At the end of the mowing season all equipment is rinsed back into the herbicide containers and stored for use the following year. This results in no runoff of the product and no need to dispose of excess product. When containers are empty they are disposed of in the manner specified on the product label. Containers are triple rinsed into the mixing tank; containers are punctured to prevent re-use and then disposed of at the sanitary landfill.

POLLUTION PREVENTION PROCEDURES

- Follow all instructions on product labels and SDS (Safety Data Sheets) for storage, mixing, application, and disposal
- Follow all safety precautions on the product label and use appropriate personal protective equipment (PPE)
- Have a spill kit immediately accessible during mixing procedures
- Do not spray herbicides when rain is likely
- Do not spray herbicides over water or in roadside ditches where flowing water is present
- When cleaning application equipment do not pour wash water on the ground, capture the rinse water in herbicide containers for reuse when possible
- Make sure equipment is in good working condition and calibrated to spray herbicide at the correct application rate
- Store pesticides in the original containers and handle carefully to avoid spills

Pavement Striping and Marking



POLLUTANT CONCERN

The water-based striping paint used by the Greene County Highway Department is much less toxic than the solvent based alternative products on the market. However, the paint still contains chemicals such as methyl alcohol, propylene glycol, and butoxyethanol. These substances are toxic to humans and aquatic life and it is important to take steps to ensure that the liquid product does not end up in waterways.

OPERATIONS SUMMARY

The Greene County Highway Department uses water-based EP301Y3 MO Waterborne Paint Traffic paint used (yellow and white). Paint is stored in 250 gallon plastic cubical totes protected by metal cages. Spraying and striping occurs only in good weather without the chance of rain to ensure dry pavement necessary for good bonding with paint. This has an additional benefit of virtually eliminating the risk of wet paint being washed off by stormwater runoff. Paint is transferred from the storage totes to the spray truck via a hose and pump that transfers the paint directly into the spray tanks which greatly reduces the risk of spilled material.

MATERIALS STORAGE

Paint is ordered from Ennis Flint on an as-needed basis with 12 white totes and 6 yellow totes kept on hand during the summer peak application period. During summer the totes are stored outside due to lack of storage space adequate for 18 totes inside the shop bays. Two totes of each color are kept on hand throughout the winter. During the winter, totes are stored inside with the application equipment to protect it from the weather.

WASTE GENERATION AND DISPOSAL

During the summer season the striping crew will typically use 450 gallons of paint per day, or 6-7 totes of paint per four-day work week. Empty paint totes are collected by the manufacturer for recycling, re-use, or disposal. Following each day of spraying the spray nozzles are flushed with water at the Highway Department facility on N. Clifton. Nozzle flushing is done at the heavy equipment bay on the south side of the facility where discharge water is directed into the Springfield sanitary sewer. The safety data sheets (see appendix) for this product does not list any hazardous materials or give any specific guidance that would preclude rinsing residue down the sanitary sewer. Any excess paint left in the spray truck tanks at the end of the day is likewise flushed into the sanitary sewer system.

POLLUTION PREVENTION PROCEDURES

- Use only water based paints or thermoplastics rather than solvent based paints
- Apply road paint only during dry weather with no chance of rain the forecast
- Follow manufacturers recommendations and all state and federal guidelines on material handling
- Flush spray nozzles into the sanitary sewer system and not on the ground
- Keep spill cleanup material on hand at storage locations and on dispensing equipment

Road Maintenance



POLLUTANT CONCERN

Repair and maintenance activities performed on Greene County roads includes excavation, patching, grinding, resurfacing, sealing etc. These activities can generate a variety of pollutants including nutrients, sediment, trash, and hydrocarbons (benzene, toluene, ethylbenzene, and xylene). Excavation can generate sediment and the emulsions used on road resurfacing and patching can run off into ditch lines along the road. If not properly managed, these can all negatively impact waterways and human health.

OPERATIONS SUMMARY

The road network in Greene County consists of approximately 1,250 miles of roadway that must be maintained by the Greene County Highway Department. Maintenance activities consist primarily of repaving with cold mix asphalt. Cold mix is manufactured on site and on demand by Highway Department crews at the County-owned pug mill located at the Conco Quarries site near Willard. The pug mill used to generate cold mix asphalt is typically used during the warm months of May through September. Oil for the cold mix is not stored on site. For any batch that is to be mixed the Highways Department calls a day beforehand to Coastal Energy and Oil to arrange to have a tanker truck on site for mixing. The tanker truck is hooked directly to the mill via a hose and the oil is pumped into the mix. A conveyor transfers the mixed asphalt directly to waiting trucks for immediate transport to the construction site. MSHA (Mining Safety and Health Administration) rules are strictly observed and care is taken to ensure no oil is spilled on the ground. The small amount of oil that does drip is absorbed by the gravel on site. The gravel is then scooped up and placed in the hopper to be mixed in with the asphalt. New, clean gravel is then placed. The cold mix is typically used for resurfacing and edging of the pavement to prevent tire drop offs. The Highway Department averages 15 miles of road edging per year and used 1,400 tons of mix per mile. Cold mix is not stockpiled. Only the amount needed is produced.

POLLUTION PREVENTION PROCEDURES

- Non-emergency maintenance activities likely to generate pollutants that can be carried in stormwater runoff will be scheduled during times of dry weather if possible
- Recycle used asphalt and utilize used asphalt whenever possible
- For asphalt overlays, ensure stormwater drainage capacity of curbs and inlets is maintained by milling the existing asphalt at the curb or by using thin bonded overlay
- Minimize soil disturbance
- Implement erosion and sediment control BMPs for all projects that disturb soil, regardless of size
- Prevent paving materials from entering the storm drain system and road ditches

- Mix only the amount of cold-mix needed for each individual project to avoid the need for materials storage
- Do not apply cold mix asphalt if rain is in the forecast for the next 48 hours

References

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