



CITY OF BATTLE CREEK
PERFORMANCE STANDARDS
FOR
GROUNDWATER PROTECTION
WITHIN THE WELLHEAD PROTECTION AREA

PREPARED BY:

THE CITY OF BATTLE CREEK

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1.0 INTRODUCTION

This document provides Performance Standards (Standards) for groundwater protection within the WHPA of the City of Battle Creek. The Standards are designed to be consistent with the overall objectives of the Wellhead Protection Program.

These Standards were developed primarily for use during site plan review and to supplement the City of Battle Creek's Wellhead Protection Ordinance ("Ordinance") Chapter 1041. The intent/purpose of the Ordinance is to safeguard the health, safety, and welfare of persons served by the City of Battle Creek Public Water Supply System by protecting the groundwater that serves as drinking water from activities that have been found, through research and experience, to have an increased risk of causing contamination of groundwater, thus providing a safe potable water supply now and for future generations.

For the purpose of these Standards regarding Wellhead Protection, the City of Battle Creek's WHPA (WHPA) has been divided into two groundwater contamination risk areas based on Time-of-Travel to a municipal well field:

- 1-Year Time-of-Travel = Area located within a 1-Year Time-of-Travel to a municipal well field; and
- 10-Year Time-of-Travel = Area located within a 10-Year, but outside of the 1-Year, Time-of-Travel to a municipal well field.

In certain cases, more stringent standards have been developed for sites located closer to the City of Battle Creek wellheads. Consequently, proposed development of sites within the 1-Year Time-of-Travel will be expected to implement greater controls than those within the 10-Year Time-of-Travel.

This document includes a variety of Best Management Practices (BMPs) related to groundwater and surface water protection. These BMPs were derived from multiple sources, some of which are provided in this document. The BMPs used in this document are considered commonly accepted practices associated with groundwater and/or surface water protection. Other commonly accepted BMPs are presented in the "BMP Guidebook for Michigan's Watersheds," Michigan Department of Environmental Quality (MDEQ), 1998.

Maps showing the WHPA and any Well Isolation Distance related to a WHPA are maintained by the City of Battle Creek Utilities Director and available from the City Clerk's Office and the Planning Department. Figure 1 "Wellhead Protection Zone Map" is the official map reference of the Ordinance and the WHPA and includes 1-Year and 10-Year Time-of-Travel.

The Standards are divided into seven sections, including Section 1.0 "Introduction".

Section 2.0 “Groundwater Contamination Risk Assessment” discusses groundwater risk categories (i.e., higher or lower risk) designated for various land uses. Supporting rationale for the designations is also provided.

Section 3.0 “General Site Plan Review Standards” details standard practices expected of any site within the WHPA, particularly those sites in possession of regulated substances (as defined in the Ordinance).

Section 4.0 “Land Use Specific Site Plan Review Standards” includes more specific standards for several particular higher-risk land uses that are referenced in Ordinance.

Section 5.0 “Storm Water Quality Management Criteria” establishes technical standards that apply inside the WHPA for storm water management. These standards are intended to address groundwater vulnerability and land use risks associated with storm water management in the WHPA. These standards are in addition to the storm water requirements set forth in the City of Battle Creek’s Storm Water Ordinance, Chapter 1048, and the accompanying Battle Creek Area Clean Water Partners’ Technical Reference Manual.

Section 6.0 “Treatment and Spill Containment” provides guidance regarding BMPs that can meet treatment requirements for storm water quality and provides required specifications, including spill containment cells and volumes, water quality swales, and proprietary systems.

Section 7.0 “Nonconforming Facilities and Activities” specifically addresses sites within the WHPA with existing nonconforming land uses pursuant to the Ordinance, including the requirement for the implementation of BMPs and/or Spill Contingency Plans (SCPs) at those sites.

2.0 GROUNDWATER CONTAMINATION RISK ASSESSMENT

Typical land use zoning districts were assessed and were designated as either higher-risk or lower-risk for potential groundwater contamination, as shown in Table 1. Higher-risk designations were assigned to zoning districts that pertain to the usage and/or storage of regulated substances.

**Table 1
Zoning Risk Designations**

<u>Higher-Risk Zoning Districts:</u> Commercial and Industrial
<u>Lower-Risk Zoning Districts:</u> Residential and Office

The land use activity designation as either higher-risk or lower-risk to groundwater resulted from the review of various documentation, such as the “Guidance for Applications for State Wellhead Protection Assistance Funds Under the Safe Drinking Water Act” by the U. S. Environmental Protection Agency (EPA) Office of Groundwater Protection published in June 1987 and the “Standard Industrial Classification” (SIC) code list (also published by the EPA). Other reviewed works included “Community Planning & Zoning for Groundwater Protection: A Guidebook for Local Officials” by Lillian Dean and Mark Wyckoff, 1991, and various ordinances and standards. Table 2 provides a list of high-risk land use activities that pose potential threats to groundwater.

**Table 2
High-Risk Land Use Activities that Pose Potential Threats to Groundwater**

Commercial
Analytical and clinical laboratories
Animal feedlots
Auto washes
Boat builders/refinishers
Car rental and service stations/automotive repair
Commercial establishments with fleets of trucks and cars
Concrete/asphalt/coal/tar companies
Drum recycling and cleaning
Dry cleaners and laundries
Equipment repair
Food processors/meat packers/slaughterhouses
Fuel oil distributors/stores
Furniture stripping or refinishing
Gas stations
Junk and salvage yards
Motor vehicle repair/service shops
Pesticide application services/pesticide stores/retailers
Petroleum bulk storage (wholesale)

Photographic development
Printing
Salvage yards/impoundment lots
Truck or rail tanker cleaning
Wood preserving and treatment
Manufacturing
Chemical, paint, and plastics manufacturing
Furniture manufacturing
Metal manufacturing (including metal plating)
Mining operations/injection wells
Other manufacturing (textiles, rubber, glass, etc.)
Pulp and paper industry
Transportation
Airport maintenance/fueling areas
Governmental agencies with fleets of trucks and cars
Salt piles/sand-salt piles
Trucking/bus terminals
Vehicle maintenance operations (transportation/trucking, contractors/construction, auto dealers)
Utilities
Aboveground oil pipelines
Electric power generation substations
Waste Disposal
Landfills/dumps/transfer stations

Other higher-risk land use activities are identified in the MDEQ document “Minimum Isolation Distances (from Contamination Sources and Buildings), Part 127, Act 368, P.A. 1978 and Act 399, P.A. 1976” (Attachment 1). This document specifies well isolation distances considered for the issuance of Type I well permits.

Generally, these groundwater risk designations were used to help determine what land use standards should be applied to protect groundwater

3.0 GENERAL SITE PLAN REVIEW STANDARDS

The site plan review standards detailed in this section apply to those facilities within the WHPA in the City of Battle Creek and they are in addition to other applicable City of Battle Creek site plan review standards. This section is divided into five subsections: Site Design and Development or Redevelopment, Process Activities, Regulated Substance Storage Units, Fueling Establishments, and Waste.

3.1 SITE DESIGN AND DEVELOPMENT OR REDEVELOPMENT

3.1.1 CONSTRUCTION ACTIVITIES

An appropriate material and equipment maintenance and storage area should be identified on the site plan. If construction equipment is to be temporarily stored in an open area:

- The storage site should not be located within the drip line of trees.
- The storage site should not be within 100 feet of a watercourse, wetland, or storm water sewer inlet(s), unless approved by the City of Battle Creek. Runoff should be diverted away from watercourses and wetlands.
- The construction site should be designed and operated to prevent excess solids from being discharged into wetlands and surface waters, whether directly or via a municipal storm water collection system.
- Secondary containment is required for regulated substances stored in containers larger than typical household quantities during site construction activities. These substances include, but are not limited to, fuels, oils, and lubricants. All regulated substances must be stored in a manner that diminishes the possibility of a release to soils and groundwater.

3.1.2 SOIL EROSION AND SEDIMENTATION CONTROL

Proper provision for water disposal and protection of soil surfaces is required during and after construction in order to promote the safety, public health, and general welfare of the City of Battle Creek, as well as to limit the exposed area of any disturbed land for the shortest possible period of time.

Soil erosion and sedimentation control is covered by the Calhoun County Road Commission under existing statutes and pursuant to Part 91, Soil Erosion and Sedimentation Control Act 451 of the Public Acts of 1994 as amended, being sections 324.9 101 to 324.9123 (a) of the Michigan Compiled Laws, and the Administrative Rules promulgated by the State of Michigan under the authority of Part 91. This statute provide standards to control, regulate, enforce, and maintain proper soil erosion and sedimentation control practices for administrative procedures and enforcement powers within the County of Calhoun.

3.1.3 DEWATERING

If dewatering (the temporary discharge of groundwater associated with a construction project requiring the need to maintain below grade excavation free from surface or subsurface infiltration of water) is necessary, a dewatering plan must be included with materials being submitted for Site Plan Review so that sanitary and storm sewer capacity and condition issues can be assessed. Conditional approval from the Utilities Director must be obtained prior to discharge. The plan will include items such as a map detailing pertinent dewatering activities; the proposed dewatering (pumping) rate; proposed period of dewatering activity; discharge entry point; discharge outfall location; dewatering contingency plan and emergency contact information; known historic parameters of concern (e.g., hydrocarbons, metals, volatile organic compounds, etc.); identification of known contaminated sites and any associated plumes within a radius of 1,000 feet of the dewatering points; and dewatering sampling plan (frequency of sampling, parameters to be analyzed, etc.). At a minimum, Total Suspended Solids will be required to be monitored and reported to the City of Battle Creek as an indicator of effective sediment control. Other requirements may be applicable, dependent upon site conditions and characteristics.

Sediment basins, filters, or other BMPs may be required to filter the dewatered water before it is discharged to surface water directly or via a storm water collection system. Dewatering must be performed so that the velocity of the discharged water does not cause scouring of the receiving area. If the receiving area is a structural BMP (i.e., basin or sump), the design of the BMP should be based on the anticipated flow from the dewatered area. Sediment-laden water from cofferdams, trenches, and other areas that need to be dewatered shall be pumped through a geotextile material before the water is discharged to a watercourse. If the dewatered water is discharged through a filter to a county drain, permission must be obtained from the drain commissioner.

The dewatering site should be inspected and its condition documented at least twice daily to ensure the pumping procedure is adequately controlling the excess water and that any filtering/sediment reducing BMP is functioning properly (e.g., not clogged). If the BMP is not functioning properly, appropriate maintenance procedures for the specific BMP(s) must be performed immediately and/or the BMPs replaced with the appropriate new one(s).

Dewatering activities may be subject to the State of Michigan laws regarding Large Quantity Withdrawals (LQW). As such, if a dewatering activity qualifies as a LQW, the State of Michigan Water Withdrawal Assessment Tool (<http://www.miwwat.org>) should be used to determine the type of withdrawal and whether the withdrawal would result in an Adverse Resource Impact (ARI).

3.1.4 FILL MATERIAL

Use of fill material containing regulated substances above any state and/or federal cleanup criteria for soils is prohibited in the 1-Year and the 10-Year Times-of-Travel. Throughout the WHPA where filling is required, efforts should be made to ensure the fill originates from a clean source (i.e., not contaminated with regulated substances). The fill source should be from a non-industrial area and not from sites of known or suspected contamination (i.e., MDEQ Part 201 facilities, Part 213 sites, or federal Resource Conservation and Recovery Act or Comprehensive Environmental Response, Compensation and Liability Act sites). If the source is from an agricultural area, care should be taken to ensure the fill does not include pesticides or former agricultural waste process byproducts, such as manure or decomposed organic material. Fill material should not be used from industrial and/or commercial sites where hazardous materials were used, handled, or stored, nor from unpaved parking areas where petroleum hydrocarbons could have been spilled or leaked into the soil. Alternatives to using fill from construction sites include the use of fill material obtained from a commercial supplier of fill material or from soil pits in rural or suburban areas. However, care should be taken to ensure that these materials are also uncontaminated.

3.1.5 CONTAMINATED SITES

Site plans must take into consideration the location and extent of any contaminated soils and/or groundwater on the site and the need to protect public health and the environment. A depiction of the location and extent of contamination shall be submitted on or with the site plan. See Section 9.0 for discussion regarding contaminated properties.

Any site used to temporarily store contaminated soils (such as during removal of an UST) must do so in a designated area indicated on the site plan. This area should be located indoors. Alternatively, the soils/material shall be containerized in Michigan Department of Transportation (MDOT)-approved drums or covered with tarp or plastic and placed on a paved/impermeable material contained by a curb, dike, or berm. The storage area must be designed to prevent or minimize storm water run-on to the area.

3.1.6 PARKING AREAS

Parking areas within the 1-Year Time-of-Travel that are designed to accommodate 20 or more vehicles or exceed 6,000 square feet shall be paved with concrete, asphalt, or an equivalent smooth, impervious surface and designed to prevent ponding of water. These areas should be served by an appropriate and approved storm water treatment system. Surface areas where regulated materials are to be stored, transferred, or have an otherwise potential use should be served with an approved treatment system. These parking areas shall be controlled so that all runoff is directed to the collection system, prohibiting the potential migration offsite or into groundwater. See Table 3 “Storm Water Discharge Summary” for other applicable Standards.

3.1.7 FLOOR DRAINS AND DRY WELLS

General purpose floor drains must be connected to a public sanitary sewer system or an onsite holding tank (not a septic system) in accordance with state, county, and municipal requirements, unless a groundwater discharge permit has been obtained from the MDEQ. General purpose floor drains that discharge to groundwater or a storm water collection system are not permitted. In addition, dry wells are prohibited within 200 feet of a Type I Public Water Supply well.

Dry wells are a type of drainage well used for the underground disposal of storm water runoff from paved areas, which include parking lots, streets, highways, residential subdivisions, building rooftops, agricultural areas, and industrial areas. Dry wells must be located only in areas that receive clean water discharges and are required to be managed in accordance with Section 5 “Storm Water Quality Management Criteria” (BMP, CDEP). Dry wells may also require a groundwater discharge permit from the MDEQ. The site plan must show the proposed location of any dry well(s).

3.1.8 WELLS

All currently functioning, proposed, and abandoned wells, including potable water wells and monitoring wells, should be indicated on the site plan.

The Ordinance prohibits within the WHPA:

- Installation of a private water well for the purpose of drinking water or irrigation if, in the determination of the City of Battle Creek’s Department of Public Works and/or the Calhoun County Health Department, water service is reasonably available.
- Use of a private well, if said well is likely to cause an adverse impact to the public water supply.

- Installation or use of a water well not installed for the purpose of drinking water or irrigation, unless it is determined by the Department of Public Works that the well owner (or representative) has scientifically demonstrated that the well will not cause an adverse impact to the public water supply.
- Drilling for natural gas or petroleum, whether for exploration, production, or otherwise.
- Presence of an abandoned well, which is defined as any well that has either been discontinued for more than one year, is in such disrepair that its continued use for obtaining groundwater is impractical, has been left uncompleted, is a threat to groundwater resources, or is a health or safety hazard. A well shall not be considered abandoned if it has been properly plugged pursuant to the Groundwater Quality Control Act, Part 127, 1978 PA 368. When a well is plugged, formal well abandonment logs must be completed and provided to the City of Battle Creek's Department of Public Works, except in cases where wells were abandoned in the past and no well abandonment logs are available.

3.1.9 WELL ISOLATION DISTANCE REQUIREMENTS

Within the isolation areas shown on the Wellhead Protection Zone Map, no person shall cause or allow uses or activities that would violate the terms and conditions set forth in the document "Minimum Well Isolation Distances (From Contamination Sources and Buildings)," Part 127, Act 368, P.A. 1978 and Act 399, P.A.1976 as prepared by the MDEQ, Water Division, as it may be amended. This document is presented as Attachment 1. These land-use restrictions directly relate to the City of Battle Creek's ability to replace or add new wells to its Public Water Supply System, since they are part of the permit criteria used by the MDEQ.

3.1.10 SEPTIC SYSTEMS

For sites where the municipal sanitary sewer is not available, all septic systems must comply with Calhoun County sewage disposal system requirements, including the acquisition of necessary permits. Flow restrictors and low-flow faucets for sinks and spray nozzles should be installed to minimize hydraulic loading to subsurface disposal systems. Floor drains may not be connected to septic systems. The locations of existing and proposed septic tanks and drain fields should be indicated on the site plan.

3.2 PROCESS ACTIVITIES

3.2.1 REGULATED SUBSTANCE USE AREAS

The possession of regulated substances, including fuel in quantities that exceed 55 gallons aggregate for liquid materials or 440 pounds aggregate for dry weights, unless prepackaged and intended for retail sale or for commercial or household use (such as salt used in water softeners, fertilizers, pesticides, herbicides) is prohibited in the 1-Year Time-of-Travel. Possession of such regulated substances is only allowed in the 10-Year Time-of-Travel portion of the WHPA if engineering controls are designed and implemented consistent with the BMPs contained herein, the City of Battle Creek's Fire Codes, and applicable State of Michigan laws and regulations. Where otherwise permitted, sites where regulated substances are stored, used, or generated shall be designed to prevent spills and discharges of such materials to the environment. The storage or presence of a regulated substance in a manner in which the substance could reasonably enter the soils or groundwater is prohibited.

Floor surfaces in work areas should be impervious to the types of materials that may be used or generated at the facility and, if necessary, should be sealed with an impermeable material. The work area floor should be pitched to an appropriate floor drain or collection area (e.g., holding tank). Alternatively, if floor drains are not used, or if they are located close to entranceways, then entrances should be designed to prevent storm water runoff from entering the building and prevent spills from leaving the building. Curbing and internal floor berms should be used to isolate floor drains from spill-prone areas, where necessary.

Whenever possible, manufacturing and processing activities involving the possession or control of regulated substances should be conducted indoors. If indoor manufacturing/processing is not feasible, the potentially pollutant-generating activities should be segregated from nonpolluting activities and conducted on an impervious surface. The area should be covered, if possible and as appropriate. The surface should be graded to minimize run-on of storm water and runoff of spills. The area must be adequately designed to prevent spilled regulated materials from escaping the area. Drains in these areas can be connected to the sanitary sewer, with approval and appropriate pretreatment, or to a holding tank meeting the specifications of this Standard. If potentially polluting activities cannot be covered, discharge of low-volume, high-frequency storms to the sanitary sewer should be considered.

3.2.2 LOADING/UNLOADING AREAS

Loading/unloading areas used to transfer regulated substances should be indicated on the site plan. The areas should be paved with concrete or another material sufficiently impervious to the materials loaded and unloaded in that area. Loading/unloading docks must be isolated from storm drains and dry wells to prevent potential spills from contaminating storm water or discharging to the ground (California [CA] BMP Handbook, 2003). If storm water runoff is a concern in the loading/unloading dock, and the site is located within the 1-Year Time-of-Travel, the area should be covered or enclosed and should be designed to reduce storm water run-off. If the loading/unloading dock is uncovered, grading and/or berms should direct drainage to a dead-end sump or another appropriate collection device. A positive control valve should be installed on the drain. Alternatively, at the discretion of the Site Plan Review committee, a precipitation valve may be installed in the curb, which may be left open to drain precipitation except during loading/unloading. If tanker trucks are used to load/unload aboveground storage tanks (ASTs) or USTs containing regulated substances, full containment of the loading/unloading area should be considered and may be required.

The storage of spill response equipment should be indicated on the site plan. Storage should be in an area accessible to loading/unloading areas where regulated substances are transferred.

3.2.3 SPILL RESPONSE EQUIPMENT

Sites intending to use, store, or generate regulated substances in quantities meeting or exceeding 55 gallons for liquids or 440 pounds for solids are required to have emergency spill response equipment and must indicate on the site plan the locations for it and other similar equipment. Spill response equipment should be located throughout the site so that spills may be contained in storage areas, loading/unloading areas, dispensing areas, and work areas, as appropriate. The specific types of spill response equipment to be stored shall reflect the types of chemicals and petroleum products stored onsite, other engineering controls present, the potential threat to site soils/groundwater, and the location of the site within the WHPA.

3.2.4 AGRICULTURAL USES

Only the application of agricultural chemicals, fertilizers, mineral acids, organic sulfur compounds, etc., as used in routine agricultural operations and applied under the "Generally Accepted Agricultural Management Practices" (GAAMPs) and consistent with label directions approved by the USEPA or the Michigan Department of Agriculture are allowed.

3.2.5 VEHICLE WASHING

Commercial vehicle washing must be conducted on a wash pad. Wash areas must be paved with an impervious surface and bermed or curbed to prevent storm water run-on and wash water runoff. The wash area should be sloped for wash water collection, which may be discharged to a wash water recycling system, to the sanitary sewer directly (with approval and appropriate pretreatment), or to a dead-end sump (from which the material may be pumped to the sanitary sewer or to an offsite treatment facility). Because wastewaters from vehicle washing represent significant flows that can hydraulically overload an oil/grit separator, any such treatment device must be sufficiently sized to accept these volumes. The wash pad areas should be covered, if possible.

The cleaning of semi-trailer and tanker truck interiors may be approved in the WHPA, if the following standards are met (CA BMP Handbook, 2003):

- The interior of the semi-trailer should be swept, and all debris should be collected and properly disposed.
- Dry cleaning methods should be used whenever possible. If rinsing the inside of the trailer is necessary, cleaning shall be conducted over an impervious surface. Wash water must not be discharged to the storm sewer or the ground. With approval and appropriate pretreatment, rinse water may be disposed to the sanitary sewer.
- Wash water from the interior of tanker trucks or rail tankers shall be pumped directly into containers for appropriate offsite disposal or, with approval and appropriate pretreatment, must be pumped directly to a sanitary sewer drain. Rail tankers may not be cleaned in the 1-Year Time-of-Travel, unless the wash water can be completely contained and appropriately disposed.

3.2.6 PRESSURE WASHING/STEAM CLEANING

Pressure washing and steam cleaning activities may be permitted within covered, completely contained areas, particularly where these methods replace cleaning/degreasing operations that would otherwise use solvents. However, due to the possibility of generating runoff with high concentrations of pollutants, exterior pressure washing or steam cleaning of parts, vehicles, and other materials is not permitted in the 1-Year Time-of-Travel. Pressure washing and steam cleaning may be conducted in the 10-Year Time-of-Travel, if either is conducted on a sealed impervious surface that is completely contained and graded toward a drain that discharges either to the sanitary sewer (with approval and appropriate pretreatment) or a holding tank (not into the storm sewer or directly to site soils or groundwater). Alternatively, steam

cleaning or pressure washing facilities may have zero-discharge recycling systems equipped with oil/water separators or other treatment devices.

The MDEQ has prepared a Guidance Document on Mobile Power Washing. This document contains further details regarding BMPs for these systems. The guidance document can be obtained at: <http://www.deq.state.mi.us/documents/deq-ead-tas-powrwash.pdf>.

3.2.7 COOLING WATER/GEOTHERMAL

State of Michigan guidance should be consulted for geothermal systems in City of Battle Creek WHPA (http://www.michigan.gov/documents/deq/deq-wd-gws-wcu-ghpsguidance_195216_7.pdf).

3.2.8 ROAD SALT STORAGE

All salt and associated sand mix piles must be stored on an impermeable surface and covered with a waterproof material (Source Protection). Inside the 1-Year Time-of-Travel, salt should be stored in indoor sheds surrounded by impervious paving. Stockpiles should not be located near surface waters, in flood plains, or areas with steep slopes, and should be designed to prevent surface water runoff. Snow containing road salt should not be brought to sites inside the 1-Year Time-of-Travel for disposal. Environmentally-friendly snow and ice removal products and procedures are encouraged.

3.2.9 MATERIAL SUBSTITUTION/POLLUTION PREVENTION

Whenever possible, sites should select non-hazardous or less-hazardous chemicals for processes such as degreasing, cleaning, and plating that have historically used toxic materials. In addition, when possible, materials such as oils should be standardized throughout a site to reduce the quantity of leftover material and mixed waste. Practices that minimize waste generation, such as countercurrent solvent cleaning, are encouraged.

3.3 REGULATED SUBSTANCE STORAGE UNITS

A regulated substance storage unit is considered to be any UST, AST, drum, carboy, or other container used for the storage of one or more regulated substance(s) including silo, bag, tank wagon, box, glass, cylinder, total bin, truck body, rail car, tanker, or tool crib when used for permanent or temporary storage of regulated substances (Butler Co., 1999). The following standards apply to specific types of regulated substance storage units.

3.3.1 GENERAL PROVISIONS

Regulated substance storage units containing greater than 55 gallons for liquids or 440 pounds for solids are prohibited within the 1-Year Time-of-Travel.

Within the 10-Year Time-of-Travel, regulated substance storage units containing greater than 55 gallons for liquids or 440 pounds for solids shall be indicated on the site plan and are allowed if the following standards are applied:

- Unless other sufficient measures have been implemented at the site, these regulated substance storage units shall be completely contained, isolated from floor and storm drains, have sealed surfaces, comply with fire safety regulations, and should not be accessible to unauthorized personnel. Whenever possible, regulated substance storage units should be consolidated into one location for better control of material and waste inventory. All storage units shall be properly labeled as to contents and periodically inspected for evidence of leaks, improper storage, or potential hazards that may result in a release of regulated substances being stored in or transferred into or out of the storage unit. All doors, valves, or other openings through which a release could occur must be locked or otherwise secured when not in use.
- Regulated substances should be stored inside, whenever feasible. If it is not feasible, it is required that outside storage areas be covered, preferably with a roof. A curb or berm may be required along the perimeter of outdoor storage areas to prevent the run-on of uncontaminated storm water from adjacent areas, as well as runoff of storm water from the storage area. The area inside the curb should slope to a drain, then to a holding tank or sanitary sewer (if approved) with a positive control such as a lock, valve, or plug.
- Regulated substances stored outdoors must be in product-tight containers that are protected from weather, leakage, accidental damage, and vandalism. Sites storing regulated substances outdoors must implement security measures that are appropriate for the material stored and the nature of the site. Measures to be implemented, as appropriate, include:
 - Fencing the regulated substance storage unit or the entire site and locking or guarding entrance gates when the storage unit/facility is not in production or is unattended.
 - Ensuring that valves permitting direct outward flow of a container's contents have adequate security measures so they remain in the closed position when in non-operating or standby status.

- Preventing unauthorized access to starter controls of pumps.
- Providing facility lighting that will assist in the discovery of releases during hours of darkness and prevention of discharges occurring through acts of vandalism.

3.3.2 SECONDARY CONTAINMENT (FOR REGULATED SUBSTANCES OTHER THAN FUEL)

Secondary containment must be provided for regulated substance storage units. Secondary-containment facilities shall be designed and constructed so that potential polluting material cannot escape from the unit by gravity through sewers, drains, or other means directly or indirectly into a sewer or storm water collection system or to the waters of the state, including groundwater. Secondary containment shall include protective measures, such as double walls, dikes, vaults, or impervious liners (both natural and synthetic).

Exterior secondary containment provided by dikes shall be constructed of poured concrete or a pre-manufactured containment tub. Concrete-block containment is prohibited in outdoor areas because it can easily crack and does not weather well. Exterior secondary-containment areas should be capable of containing 100% of the largest vessel or 10% of the total volume of tanks in containment (whichever is larger) plus freeboard to contain precipitation from a 25-Year, 24-hour storm. Alternatively, the vessel may be an Underwriters Laboratories, Inc.-approved, double-walled tank. If containment is provided by a dike, the containment must be higher than the 100-year flood level. When possible and as appropriate, exterior storage of regulated substances and their containment structures should be covered to protect the containers from exposure to precipitation. If this is not possible, the base of the dike should be sloped to a collection point or sump to allow for controlled removal of accumulated storm water or spilled regulated substances. If the dike is penetrated by a drainage or conveyance pipe, the opening must be sealed on both sides to ensure a liquid-tight penetration. Drainage pipes must have a lockable valve. This valve must be kept closed and locked under normal conditions, until a determination is made by a trained individual that the discharge of the storm water is acceptable (this may require a Storm Water Permit with Required Monitoring; see Section 8.3.5). Discharge of accumulated storm water from a secondary containment structure containing petroleum products shall be pre-treated as necessary to meet all applicable water quality standards prior to discharge to soils, surface water, or a storm water collection system.

Secondary containment for indoor ASTs may be provided by the building, as long as discharge from the AST cannot escape the building via floor drains, entrances, or any other means, and no specific containment is required by other regulations. Although not permitted for outdoor containment structures, concrete-block containment may be used indoors with the City of Battle Creek's approval.

3.3.3 ABOVEGROUND STORAGE TANKS (ASTs)

ASTs shall be certified, installed, operated, maintained, closed, or removed in accordance with MDEQ regulations and the local fire code (see Section 8.0). All ASTs must be indicated on the site plan. A copy of any required local or state AST registration document should be provided to the City of Battle Creek's Department of Public Works.

All ASTs containing flammable or combustible materials must meet the requirements of the MDEQ Proposed Rules for the Storage of Flammable and Combustible Materials (<http://www.deq.state.mi.us/documents/deq-std-rules-fl-cl.pdf>).

No ASTs should be located in direct contact with site soils. The tank should have sufficient ground clearance for visual inspection of the bottom of the AST for deterioration, unless the size of the AST prevents raising the tank (as required) or if the AST is a concrete-vaulted tank.

Any AST that is open to vehicle damage must be protected against impact with physical barriers. Any impervious dike utilized as secondary containment must meet the requirements for a physical barrier. Objects used as physical barriers should be included in the site plan.

For ASTs not subject to the MDEQ Rules for the Storage of Flammable and Combustible Materials, the following conditions apply:

- Regulated substances must have secondary containment meeting the standards of Section 3.3.
- Tank piping should be located within secondary containment whenever possible and must be located below the product level.
- Piping must be designed so that liquid will not continue to flow by gravity or siphoning from the storage tank if the piping or fittings break.
- Tanks should be equipped with a shut-off valve, preferably an automatic shear valve, with the shut-off located inside the tank.
- For flood control, all exterior ASTs should have a monitoring system and secondary standpipe above the 100-year flood-control level for monitoring and recovery.

- Fill-pipe inlets should be above the elevation of the top of the storage tank.
- ASTs must have overflow protection, such as a visual liquid-level-indicator gauge or alarms.

3.3.4 UNDERGROUND STORAGE TANKS (USTs)

USTs are prohibited within the 1-Year Time-of-Travel, if 55 gallons aggregate for liquid material or 440 pounds aggregate for dry weights are exceeded and shall not be used in the 10-Year Time-of-Travel unless the use of ASTs is impractical or unsafe. The USTs must conform to EPA, MDEQ, and local fire code requirements. The minimum requirements are outlined in the Proposed Rules for the Storage and Handling of Flammable and Combustible Liquids and Michigan Underground Storage Tank Rules. Requirements include such protective measures as secondary containment within WHPAs.

If new tanks are to be installed, a copy of all registration documents should be provided to the City of Battle Creek's Department of Public Works. If existing USTs are to be closed, all MDEQ closure procedures must be followed, and a copy of the closure documents should be submitted to the City of Battle Creek's Department of Public Works. All current and proposed USTs must be indicated on the site plan.

3.4 FUELING ESTABLISHMENTS

Fueling establishments where storage, handling, or use of fuels exceed 55 gallons aggregate including, but not limited to, gasoline, diesel, kerosene, and jet fuel are prohibited in the 1-Year Time-of-Travel. ASTs and USTs are prohibited in the 10-Year Time-of-Travel, unless such tanks meet the minimum requirements outlined in the Proposed Rules for the Storage and Handling of Flammable and Combustible Liquids and Michigan Underground Storage Tank Rules. These rules require the use of secondary containment for storage tank systems within wellhead protection areas.

The fuel dispensing area must be paved with concrete or an equivalent smooth impervious surface (not asphalt) with slope to prevent ponding of storm water. The fuel dispensing area must be covered at least as far as the length that the hose and nozzle assembly may be operated, plus one foot. The cover must not drain onto the fuel dispensing area. The covered fuel dispensing area must be separated from the rest of the site by a grade break that prevents run-on of storm water to the maximum extent practicable. Drains at the site should be labeled to indicate whether they flow directly to the sanitary sewer or storm sewer or if they flow through an oil/water separator. All storm water shall be managed in accordance with Section 5.0.

All fuel dispensing nozzles should have automatic shut-off mechanisms to help prevent overfilling. Spill response equipment should be stored in the fuel dispensing area. The proposed location of this equipment should be indicated on the site plan.

ASTs and USTs at fueling areas must be in compliance with local, state, and federal regulations and comply with the Standards detailed in other portions of this document. In addition, when fueling is not the primary land use, fueling should be conducted, whenever possible, at an offsite location better equipped to handle fuel and spills properly. If equipment/vehicle fueling is conducted onsite, fueling should be conducted in properly designed, designated areas, as indicated on the site plan.

3.4.1 HOLDING TANKS

Floor drains should discharge to holding tanks, if they are located where municipal sanitary sewers are not available, subsurface disposal systems are failing, or they are higher-risk facilities located in WHPA (BMP, CDEP). Holding tanks should adhere to the Standards listed for ASTs and USTs, including secondary containment, unless otherwise approved by the City of Battle Creek.

3.4.2 TRUCKS, TRAILERS, TANKERS, RAIL CARS, AND TOOL CRIBS

The possession of regulated substances in trucks, trailers, tanker trucks, rail cars, tool cribs, or similar vehicles is prohibited in the 1-Year Time-of-Travel where possession or control of a regulated substance exceeds 55 gallons aggregate for liquid materials or 440 pounds aggregate for dry weights, unless allowed pursuant to the Ordinance.

In the 10-Year Time-of-Travel, the possession of a regulated substance stored in trucks, trailers, tanker trucks, rail cars, tool cribs, or similar vehicles is prohibited, unless secondary containment is provided that is sufficient to contain the entire contents of the largest distinct compartment of the container. Sites must also implement appropriate security measures, such as those detailed in Section 3.3.1.

3.5 WASTE

3.5.1 SOLID WASTE

Solid-waste dumpsters must have lids and be stored on a paved surface, unless otherwise approved by the City of Battle Creek. All dumpsters must be indicated on the site plan (BMP, CDEP). Refer to the Codes of the City of Battle Creek for other specific requirements.

3.5.2 SCRAP METAL

Dumpsters and drums containing scrap metal that may contain residual chemicals or oils shall be stored on an impervious surface in an enclosed area or covered with an impervious liner to prevent accumulation of storm water, whenever possible. Where storm water may otherwise accumulate in the scrap metal collection units, drain plugs should be left in place to prevent discharge onto the ground. If necessary, such collection units should be located on an impervious surface with a separate collection catch basin containing an oil/grit separator that discharges to the municipal sanitary sewer (with prior approval and pretreatment) or a holding tank.

3.5.3 HAZARDOUS WASTES

If the site will generate, transport, recycle, or treat hazardous waste, the applicant shall indicate in the Environmental Protection Questionnaire the site's expected waste management status (e.g., small-quantity generator). Proposed hazardous waste accumulation areas should be indicated on the site plan. Hazardous waste management techniques must comply with all applicable federal, state, and local requirements.

When possible, hazardous-waste-generating operations at the site should be physically segregated from other operations. Work areas and all storage areas containing hazardous waste should be located within a containment area with appropriately sealed floors and no direct access outside the facility.

Refer to the City of Battle Creek Codes of Ordinances for other specific requirements.

3.5.4 LIQUID WASTE PONDS

Open liquid-waste ponds are not permitted in WHPA without City of Battle Creek approval. Any such ponds must be engineered to be protective of the site environment, particularly site groundwater, and comply with all applicable state and federal rules and regulations.

3.6 REFERENCES

Best Management Practices for the Protection of Ground Water: A Local Official's Guide to Managing Class V UIC Wells by Connecticut Department of Environmental Protection (Not viewable online).

Butler County Zoning Resolution No. 99-3-371 – WHPA. 1999. The Groundwater Consortium.

California Storm Water Best Management Practice Handbook. 2003 California Storm Water Quality Association. www.cabmphandbooks.com.

Michigan Department of Environmental Quality. 1992. "Equipment Maintenance and Storage Areas." Web site.

Source Protection: A National Guidance Manual for Surface Water Supplies. Road Salt Storage Facilities.

Warren County Ohio Building and Zoning Department. Frequently updated. "Aquifer Protection and Wellhead Protection Overlay Areas" Warren Co. Rural Zoning Code "A" – Chapter 5.50.

4.0 LAND USE SPECIFIC SITE PLAN REVIEW STANDARDS

This section highlights specific standards for certain land use activities that use or store regulated substances in the WHPA, which require site-specific review. All land use activities should incorporate the general standards detailed in Section 3.0. Other use-specific standards not contained herein may be required and subsequently adopted, if determined to be a generally accepted industry standard.

4.1 BULK MIXING OF FERTILIZERS AND PESTICIDES

The following standards apply to all facilities conducting bulk mixing of fertilizers, pesticides, and related materials within the WHPA, including existing nonconforming sites in the 1-Year Time-of-Travel:

- Storage areas must be designed to protect these chemicals from possible theft, unauthorized use by untrained personnel, and temperature extremes. Outdoor storage areas shall be located within a permanently fenced area and should have a permanent roof to prevent precipitation and sunlight from entering the storage area. All storage areas shall have an impervious surface and secondary containment. Floor drains shall not be located in storage areas without City of Battle Creek approval (BMP, CDEP).
- Pesticides, fertilizers, and similar chemicals should be stored separately to minimize the possibility of cross-contamination in case of fire or other disaster. Smaller facilities may choose to construct a containment area with multiple storage compartments for pesticides and fertilizers (BMP, CDEP).
- Mixing areas for pesticides should be located indoors or mixing should be done at the application site. Onsite mixing and loading areas shall have a spill-containment surface. For liquids, this surface shall be curbed, bermed, or sloped to contain spillage and drain into an impermeable liquid tight containment structure. For non-liquid materials, this surface should be constructed to prevent water from flowing into the containment system (BMP, CDEP).
- Facility piping from bulk storage tanks shall be installed aboveground to facilitate inspection for leaks (BMP, CDEP).
- Truck rinse/cleaning areas shall be conducted within a containment area. The floor must be sealed with a suitable impermeable material. Washing areas shall drain into a watertight containment structure (BMP, CDEP).

The application of agricultural chemicals, fertilizers, mineral acids, organic sulfur compounds, etc., as used in routine agricultural operations are not allowed unless consistent with existing GAAMPs (Michigan Department of Agriculture, 2001 to 2006), and consistent with label directions approved by the USEPA or Michigan Department of Agriculture.

4.2 DRY CLEANING FACILITIES

The following standards apply to all dry-cleaning facilities within the WHPA storing or using Regulated Substances, including existing nonconforming sites in the 1-Year Time-of-Travel:

- Documentation of compliance with MDEQ dry-cleaning regulations must be provided to the City of Battle Creek upon request (BMP, CDEP).
- The dry-cleaning area should be isolated from other site operations (BMP, CDEP).
- Dry cleaners must provide secondary containment for machines containing solvents. The containment area should be impermeable and capable of holding 110% of the largest possible spill and should prevent the spill from reaching the sanitary sewer, storm drains, or soil (BMP, CDEP).

The following BMPs should be considered and implemented whenever possible:

- Traditional dry-cleaning solvents may be replaced by petroleum solvents with a flash point greater than 140 degrees and with a specific gravity less than 1.0. These solvents present a lower fire hazard and are less mobile if released to the environment (BMP, CDEP).
- Dry-to-dry machines are preferred to transfer machines because of the elimination of the need to transfer solvent-laden garments from a washer unit to a dryer unit, which reduces solvent vapor loss (BMP, CDEP).
- A hamper enclosure or a room enclosure of impermeable construction may be installed to reduce solvent release during transfer (BMP, CDEP).
- Distillation equipment designed to allow still bottoms to be removed without opening the still is preferred (BMP, CDEP).

4.3 FUELING ESTABLISHMENTS

Fueling establishments where storage, handling, or use of fuels exceed 55 gallons aggregate including, but not limited to, gasoline, diesel, kerosene, and jet fuel are prohibited in the 1-Year Time-of-Travel. ASTs and USTs are prohibited in the 10-Year Time-of-Travel unless such tanks meet the minimum requirements outlined in the Proposed Rules for the Storage and Handling of Flammable and Combustible Liquids and Michigan Underground Storage Tank Rules. These rules require the use of secondary containment for storage tank systems within wellhead protection areas. Required standards include, but may not be limited to, the following:

- The fuel dispensing area must be paved with concrete or an equivalent smooth impervious surface (not asphalt) with a suggested 2 to 4% slope to prevent ponding of storm water (CA BMP Handbook, 2003). The fuel dispensing area must be covered at least as far as the length that the hose and nozzle assembly may be operated, plus one foot. The cover must not drain onto the fuel dispensing area. The covered fuel dispensing area must be separated from the rest of the site by a grade break that prevents run-on of storm water to the maximum extent practicable. Drains at the site should be labeled to indicate whether they flow directly to the sanitary sewer or storm sewer, or if they flow through an oil/water separator. All storm water shall be managed in accordance with Section 5.0.
- All fuel dispensing nozzles shall have automatic shut-off mechanisms to help prevent overfilling (CA BMP Handbook, 2003). Spill response equipment should be stored in the fuel dispensing area. The proposed location of this equipment shall be indicated on the site plan.
- ASTs and USTs at fueling areas must be in compliance with local, state, and federal regulations and comply with the Standards detailed in other portions of this document. In addition, when fueling is not the primary land use, fueling should be conducted, whenever possible, at an offsite location better equipped to handle fuel and spills properly. If equipment/vehicle fueling is conducted onsite, fueling should be conducted in properly designed, designated areas, as indicated on the site plan.

The Standards detailed in this section also apply to existing, nonconforming fueling establishments in the WHPA.

4.4 FURNITURE STRIPPING OR REFINISHING

The following Standards apply to all furniture stripping or refinishing operations located within the WHPA storing or using Regulated Substances, including existing nonconforming sites in the 1- and 10-Year Times-of-Travel:

The use of a site for furniture stripping or refinishing is prohibited in a 1-Year Time-of-Travel, if the site possesses a regulated substance exceeding 55 gallons aggregate for liquids and 440 pounds aggregate for solids. If the use is allowed as consistent with the Ordinance, it is allowed within the 10-Year Time-of-Travel, if it meets all applicable standards contained in this document. In addition, the following minimum standards should be attained to gain this approval:

- Chlorinated hydrocarbons, such as methylene chloride and tetrachloroethylene (which have a specific gravity greater than 1.0) should be avoided whenever possible. Replacements can include solutions containing either dimethylformamide and xylene, or dimethyl adipate, dimethyl glutarate, and hydrated aluminum silicate. Other stripping agents are available that use a methylene chloride/phenol solution diluted with water, which reduces the quantity of methylene chloride used (BMP, CDEP).

4.5 SCRAP AND RECYCLING OPERATIONS

The following Standards apply to all scrap and recycling operations located within the WHPA storing or using Regulated Substances, including existing nonconforming sites in the 1- and 10-Year Times-of-Travel:

- The site plan shall be designed to consolidate, contain, and collect differing sources of hazardous substances into manageable point sources. For efficiency, and to prevent contamination of areas not specifically designed for certain activities, the site should be segregated into specific areas especially equipped for receiving, holding, dismantling, cleaning, inventory flow, parts storage, core storage, fuel storage, special waste storage, crushing, sales, shipping, receiving, and the office (as applicable to the proposed use). There should be a logical relationship between these areas so that salvaged materials flow smoothly from area to area and eventually offsite.
- The receiving area shall be designed for temporary storage prior to any dismantling or transfer to a longer-term storage area. This area shall have an impervious surface and be able to sufficiently contain damaged, leaking items. Fluid-containing items, including vehicles, should be inspected for leaks or unwanted contents at the time of receiving.
- Any fluid removal from salvaged items shall be conducted as soon as possible after receiving the item, in an area equipped to drain fluids into appropriate collection containers.
- Any dismantling of fluid-containing items shall be conducted in an area equipped to drain fluids into appropriate collection vessels. The area must be able to contain spills from these vessels and from the work area (ARA, website).

- Steam cleaning of parts shall be conducted only when absolutely necessary and only in an area capable of fully containing associated wastewater for appropriate disposal.
- The site must have an established secure area to store certain components of vehicles and other materials that pose special hazards, such as mercury switches, air-bags containing sodium azide propellants, lead-acid batteries, tires, and oily rags. The site must also be able to accommodate storage of various fluids, which, depending on items received and processed, could include gasoline, diesel fuel, motor oil, transmission oil, power steering fluid, brake fluid, hydraulic fluid, differential fluid, antifreeze, windshield washer fluid, refrigerants, battery acid, cleaning solvents, and contaminated water. Waste fluid storage areas must conform to the Standards established in earlier portions of this document.
- Once all fluids have been drained and there is no more possibility of regulated substances reaching the ground, salvaged items may be stored in a long-term storage area until the item is sold or otherwise disposed.
- Scrap vehicles or other units brought into a commercial junk yard located within the WPHA must have all fluids removed in accordance with current federal, state, and local regulations before onsite crushing. However, the crushing area must be adequately contained to capture any residual fluids (Butler Co., 1999).
- Certain parts that can be remanufactured or rebuilt have intrinsic value, unless seriously damaged. These parts are removed and stored prior to being sold and will usually contain fluids and lubricants. Such parts should be stored on an impervious, contained surface.
- Concrete or asphalt surfaces at junk and salvage yards must be properly designed to minimize cracking as they age. These surfaces are required to be sealed with epoxy or another chemical resistant material, as necessary.

4.6 MOTOR VEHICLE REPAIR/SERVICE SHOPS AND/OR BODY REPAIR

The following Standards apply to all motor vehicle repair/service shops and/or body repair shops operating within the WPHA storing or using Regulated Substances, and existing nonconforming sites in the 1-Year Time-of-Travel:

- Floor drains in service bays and vehicle washing areas must either be connected to a holding tank with a gravity discharge pipe, to a sump that pumps to a holding tank, or to an appropriately designed oil/grit separator that discharges to a municipal sanitary sewer (BMP, CDEP). Also see Section 3.1.6.
- Vehicle washing is encouraged to be conducted at a commercial car wash, especially when cars only need to be washed occasionally. If vehicle washing is conducted regularly, it should be done either in a wash bay or on a wash pad, in accordance with the Standards detailed in Section 3.2.5.
- Service bay floors and service pits must be constructed of concrete and sealed with an impervious material to facilitate clean-up without using solvents (BMP, CDEP). Also see Section 3.2 and 3.3 for other relevant standards.
- Areas where vehicles are stored or repaired must have provisions for containment of vehicle leaks and shall be paved with an impervious material, particularly in the 1-Year Time-of-Travel (BMP, CDEP). Also see Sections 3.2 and 3.3 for other relevant standards.
- Parts cleaning and degreasing should be isolated from other operations, preferably located within a containment area with no direct access outside the facility, and the floor must be sealed with a suitable impermeable material (BMP, CDEP). Also see Sections 3.2 and 3.3 for other relevant standards.
- Auto body painting shall be done in a separate, secure area with no floor drains (BMP, CDEP). Also see Sections 3.2 and 3.3.

4.7 PLATING AND ANODIZING

The following Standards apply to all plating, polishing, etching, engraving, anodizing, and similar facilities within the WHPA and the existing nonconforming sites in the 1-Year Time-of-Travel. Also see Sections 3.2 and 3.3 for other relevant standards.

Facilities shall minimize or eliminate the use of particularly hazardous plating chemicals in accordance with prevailing industry BMPs. For example, the following chemical replacements should be implemented whenever possible:

- Replace hexavalent chromium solutions with trivalent chromium solutions (UME, website).
- Replace cadmium plating with zinc-nickel plating (UME, website).

- Substitute persulfate with sulfuric peroxide for copper etching where technically feasible (UME, website).
- Eliminate terpene usage by implementing a "no-clean" technology and glycol ethers usage by implementing a water-based process.
- Substitute cyanide plating solutions with alkaline zinc, acid zinc, acid sulfate copper, pyrophosphate copper, alkaline copper, copper fluoborate, electroless nickel, ammonium silver, halide silver, methanesulfonate-potassium iodide silver, amino or thio complex silver, no free cyanide silver, cadmium chloride, cadmium sulfate, cadmium fluoborate, cadmium perchlorate, gold sulfite, and cobalt-hardened gold (UME, website).
- Ion vapor deposition of aluminum may be used for corrosion protection in place of cadmium plating.
- Replace vapor degreasers, typically using trichloroethylene or 1,1,1-trichloroethane, with aqueous or semi-aqueous based cleaning systems.

The following process-related practices should be considered for implementation:

- Use deionized water in place of tap water to facilitate recycling and to minimize the generation of sludges.
- Reduce drag-out by one or more of the following methods: use wetting agents to decrease surface tension in the tank; lower the concentration of plating bath to the minimum possible; reduce the plating bath viscosity with higher bath temperature; proper rack and barrel design; use drip bars; increase drain time over the process tanks; decrease withdrawal rate of parts from the plating bath; shake, vibrate, or pass the parts through an air knife; angle drain boards between tanks; and/or install drainage boards between tanks (UME, website).
- Install overflow systems on process baths for make-up water and flow restrictors on rinse tanks to control the flow rate of water.
- Reduce the frequency of bath dump by using filtration to remove suspended solids.
- Recover metals from solution using an electrowinning process.
- Regenerate the plating bath by activated carbon filtration to remove built-up organic contaminants.

- Conserve water by methods such as: using countercurrent or cascade rinse tank arrangements, installing a closed-loop system for rinse water, using spray rinsing, or rinse water agitation.

4.8 TRUCKING AND BUS TERMINALS

The following standards apply to all trucking and bus terminals within the WHPA that are storing or using Regulated Substances, including existing nonconforming sites in the 1-Year Time-of-Travel of the WHPA:

- All truck and bus parking at terminals must take place on an impermeable surface, except where otherwise approved by the City of Battle Creek. In particularly high-risk areas, grading to a containment area (holding tank, curbing, etc.) may be required to reduce impact of potential leaks or spills in the area.
- If fueling takes place at the terminal, all requirements in Section 3.2 must be followed, in addition to those Standards described for ASTs and USTs in Sections 3.3 and 3.4.
- Vehicle maintenance must be conducted indoors in a contained area or offsite (EPA, website). Also see Sections 3.2 and 3.3.
- If onsite cleaning of trucks or buses is proposed to be conducted, full containment of wash water is required. Also see Sections 3.2 and 3.3.
- Onsite painting of trucks/buses is not permitted without City of Battle Creek approval. Also see Sections 3.2 and 3.3.
- If regulated substances will be loaded on/off trucks or other vehicles, it is required that this activity be conducted on an impervious surface. Spill response equipment must be readily accessible to the loading/unloading area. Also see Sections 3.2 and 3.3.

4.9 REFERENCES

Automotive Recyclers Association: Storm Water Legislation/Regulation.

Best Management Practices for the Protection of Ground Water: A Local Official's Guide to Managing Class V UIC Wells by Connecticut Department of Environmental Protection (not viewable online).

Butler County Zoning Resolution No. 99-3-371 – WHPA. 1999. The Groundwater Consortium.

California Storm Water Best Management Practice Handbook. 2003 California Storm Water Quality Association. www.cabmphandbooks.com.

Environmental Protection Agency document: Sample Storm Water Pollution Prevention Plan.

Michigan Department of Agriculture. "Generally Accepted Agricultural Management Practices." 2001-2006.

University of Missouri Extension: Pollution Solutions: Waste Reduction Assistance for Business.

5.0 STORM WATER QUALITY MANAGEMENT WITHIN THE WELLHEAD PROTECTION AREA

The general objective of storm water management in the City of Battle Creek is to protect the quality and quantity of storm water runoff into area waters, including groundwater. The City of Battle Creek has regulations for post-development storm water discharges. This document specifies how storm water will be managed in the WHPA in addition to the requirements set forth in the City's Storm Water Ordinance, Chapter 1048, and the accompanying *Battle Creek Area Clean Water Partners Technical Reference Manual (TRM)*.

KEY DEFINITIONS

Vegetated Buffer Strip: A defined zone of selected plantings along a surface water feature capable of filtering storm water.

Pretreatment: The additional measures taken to protect groundwater and/or surface water quality by removing pollutants from collected storm water beyond those required to adequately collect and remove storm water. Typically, pretreatment is accomplished by a BMP designed to provide controlled removal of oils and grease, coarse to fine sediments, and may provide for a containment area in the case of an accidental spill or other release.

Proprietary Treatment System: An engineered structure used to separate sediments, trash, and oils from storm water runoff using enhanced gravitational separation through rotational hydraulic flow and/or filter media, and that provides an impermeable chamber for the collection of pollutants.

Sediment Basin: A man-made depression in the ground surface where runoff is collected and stored to allow suspended solids to settle out. Sediment basins may be wet or dry.

Sediment Forebay: A small, separate storage area located upstream to the inlet to a storm water facility used to trap and settle incoming sediments.

Sediment Sump: A constructed sump or surface depression used to trap and settle incoming sediments. Generally smaller than a sediment basin or forebay.

Spill Containment Cell: A BMP designed to provide controlled removal of oils and grease, coarse to fine sediments, and other subject pollutants to protect groundwater and surface water resources, and to provide for a containment area in the case of a spill or other pollutant release.

Spill Containment Volume: The volume of storm water required to protect groundwater and surface water from a release of regulated substances.

5.1 STORM WATER DISCHARGE STANDARDS

The following additional requirements address storm water discharge strategies as related to the proposed land use and associated groundwater contamination risk assessment, the site's location in regard to the WHPA, the zoning district (as defined in the City of Battle Creek Code of Ordinances), potential to impact surface water features, and physical characteristics of the site. Storm Water discharge strategies have been incorporated into the following City of Battle Creek-adopted storm water discharge Standards that must be met at development and re-development sites that require site plan review. The Standards apply to the areas as described below.

Standard A: Within the 1-Year Time-of-Travel, sites with higher-risk land uses (Tables 1 and 2) and/or those exceeding 55 gallons aggregate for liquids and 440 pounds aggregate for dry weights, must discharge to surface water with pretreatment and a spill containment volume. This can be accomplished by solid-wall pipes that discharge to a defined storm water collection system, surface water feature, or detention area.

Standard B: Within the 1-Year Time-of-Travel associated with lower-risk land uses, surface water discharge with pretreatment is preferred, but groundwater infiltration is allowed, if pretreatment is provided. Certain larger parking areas (see below) and regulated substance areas are required to have pretreatment with a spill containment volume.

Standard C: Within the 10-Year Time-of-Travel associated with higher-risk land uses (Tables 1 and 2), and/or those exceeding the 55-gallon/440-pound aggregate thresholds for regulated substances, storm water infiltration is allowed only with pretreatment and a spill containment volume. Certain larger parking areas and regulated substance areas require pretreatment and a spill containment volume, regardless of discharge strategy.

Standard D: In lower-risk land use areas within the 10-Year Time-of-Travel to the WHPA, infiltration is allowed, but may require pretreatment depending upon site-specific analysis regarding items such as larger parking areas (discussed below) and regulated substance areas.

Standard E: Parking areas shall be controlled so that all runoff is directed to the collection system with pretreatment, thus minimizing the potential of flows with pollutants to migrate offsite or into groundwater.

Standard F: Within the 10-Year Time-of-Travel portion of the WHPA, storm water infiltration is preferred with lower-risk land uses, but larger parking areas and regulated substance storage areas on larger sites may require pretreatment. In the higher-risk land use areas, infiltration may be allowed, depending upon site-specific analysis. However, pretreatment and spill containment volume are required for larger parking areas and if land uses exceed the 55-gallon/440-pound aggregate thresholds for regulated substances.

Table 3 summarizes the discharge strategy in different land use risk types.

**Table 3
Storm Water Discharge Summary**

WHP Area	Applicable Standards	Higher-Risk Land Use¹ and/or Above Quantity Thresholds¹	Lower-Risk Land Use
1-Year	A, B, E	<ul style="list-style-type: none"> No storm water infiltration. Pretreatment with spill containment volume³ is required. 	<ul style="list-style-type: none"> Pretreatment is required for storm water infiltration. Certain parking areas² and regulated substance areas require pretreatment with spill containment volume³.
10-Year	C, D, E, F	<ul style="list-style-type: none"> Pretreatment may be required for storm water infiltration, pending site-specific evaluation. Storm Water infiltration allowed pending site-specific evaluation. Certain parking areas² and regulated substance areas require pretreatment with spill containment volume³. 	<ul style="list-style-type: none"> Storm Water infiltration preferred. Certain parking areas² and regulated substance areas for large sites⁴ require pretreatment.

¹ See Tables 1 and 2 for Higher-Risk Land Use designations.
Regulated Substance Thresholds: 55 gallons aggregate for liquids and 440 pounds aggregate for dry weights.

² 20 or more parking spaces or >6,000-square-foot paved area.

³ See Section 6 for requirements.

⁴ For the purposes of Sections 5 and 6: a site < ½ acre (21,780 square feet) is considered a “small site” and one ≥ ½ acre is a “large or larger site.”

6.0 TREATMENT AND SPILL CONTAINMENT

The following table provides guidance on the types of BMPs that can meet treatment requirements for storm water quality.

**Table 4
Storm Water Treatment Strategy**

BMP	Surface Water Quality Volume	Pretreatment	Spill Containment Volume
Sediment Sump		X	
Sediment Basin		X	
Sediment Forebay		X	
Vegetated Buffer Strip		X	
Proprietary Treatment System		X	X
Water Quality Swale	X		X [a specialized filter]
Spill-Containment Cell	X		X [a specialized pond]

* bioretention/rain garden, infiltration trench, infiltration/retention basin

Pretreatment

Pretreatment helps to protect groundwater from the accumulated impacts of pollutants in storm water runoff when infiltration BMPs are used to meet the water quality volume requirements.

A spill containment volume may be required as an additional component of pretreatment for both surface and groundwater discharges for certain higher risk land uses and within the WHPA as specified below.

Spill Containment Volume

Spill Containment Volume is required to protect groundwater from pollutant spills in: all of the 1-Year Time-of-Travel Higher-Risk Land Use and/or for sites above regulated substance thresholds; certain 1-Year Time-of-Travel Lower-Risk Land Use areas; and 10-Year Times-of-Travel with Higher-Risk Land Use, and/or for sites above regulated substance thresholds. In higher-risk land use areas, spill containment may also be required regardless of proximity to the WHPA, if it is deemed appropriate to safeguard environmentally sensitive areas.

The Spill Containment Volume is equivalent to 30% of 0.5 inch of runoff per impervious acre (30% of 1,815 cubic feet). The volume is given by the following equation:

$$\begin{aligned}
 V &= \text{Spill Containment Volume} \\
 &= 30\% \text{ of } 1,815 \text{ cubic feet per impervious acre} \\
 &= 30\% \text{ of } 13,577 \text{ gallons per impervious acre} \\
 &= 4,073 \text{ gallons per impervious acre}
 \end{aligned}$$

A minimum spill containment volume of 400 gallons shall be provided. The minimum volume is allowable only on small sites where proprietary treatment systems are used.

In general, measures meeting Spill Containment standards must have an impermeable barrier between the treated material and the groundwater; have provisions for the capture of oil, grease, and sediments; and meet the volume requirements. Spill containment may be provided by one of the following BMPs:

- Spill-containment cell
- Water quality swale
- Proprietary storm water treatment system

These measures are described in the following sections.

6.1 SPILL-CONTAINMENT CELL

A spill-containment cell may be used to trap and localize incoming sediments and to capture slug pollutant loads from accidental spills of regulated substances (spill containment volume). A spill-containment cell, which is depicted in Figure 3, must have the following characteristics:

General Specifications

- The spill-containment cell shall be a wet basin with an impermeable bottom and sides to the design high-water level.
- The minimum surface area shall be 25% of the required volume.
- The length-to-width ratio shall be a minimum of 3:1 and a maximum of 4:1 to allow for adequate hydraulic length, yet minimize scour velocities.
- The minimum hydraulic length shall be equal to the length specified in the length-to-width ratio.
- The minimum diameter of the transfer pipe, between the spill containment cell and the infiltration basin, shall be 12 inches.
- The overflow structure from the spill containment cell shall be sized for the peak inflow from a 10-year rainfall event.

- The top-of-berm elevation between the spill-containment cell and the basin shall be a minimum of one foot below the outer berm elevation.
- The spill-containment cell shall have a minimum one-foot-deep sump below the inlet pipe for sediment accumulation.
- The outlet structure from the spill-containment cell shall be designed to draw water from the central portion of the water column within the cell, to trap floatables, and to contain sediments. The crown of the inlet end of the transfer structure pipe shall be located vertically, a minimum of 1 foot below the normal water level and a minimum of 1.5 feet from the bottom of the spill-containment cell. Minimum depth of the permanent pool is 2.5 feet.

Material Specifications

- The spill-containment cell shall be lined with impermeable materials extending up to the design high-water elevation. A minimum 18-inch-thick clay layer or an impermeable liner protected with a minimum 12 inches of soil cover are acceptable alternatives.
- Maximum allowable permeability shall be 1×10^{-7} centimeter per second (cm/sec), as determined by the geotechnical consultant for clay placement or manufacturer's certificate for liner products.
- A 40-millimeter polyvinyl chloride liner is an acceptable impermeable material.
- Maintenance responsibility shall be vested with the owner or authorized operator.

6.2 WATER QUALITY SWALES

Water quality swales may be used for spill containment on smaller sites of less than 1/2 acre, or larger sites where space is limited and/or a permanent pool of water is not desirable. Figure 4 depicts a dimensioned water quality swale. The water quality swale shall be sized to contain the spill-containment volume without release. Following is a summary of required characteristics of a water quality swale:

Pretreatment Criteria

- A minimum 25-foot vegetated buffer is required between directly contributing impervious surfaces and the water quality swale.

Controls

- Inlet pipes shall not be fully submerged at normal pool elevations.
- All inlet pipes must enter this swale for pretreatment.
- A manhole or catch basin shall be required immediately downstream of the water quality swale.
- The swale and outlet shall be sized to pass the 10-year design flood.
- A 4-inch perforated-pipe underdrain shall be placed along the center length of the swale and bedded in coarse aggregate.
- Upland construction areas shall be completely stabilized prior to final swale construction. The detention basin may be constructed first as a temporary erosion control measure during construction.
- Inlets and outlets require energy dissipation and transition from outlet to open channel.
- Inlets shall have a riprap apron to dissipate the velocity of incoming storm water runoff. The following minimum square yards of riprap shall be provided based on pipe diameter.

<u>Pipe Diameter (inches)</u>	<u>Riprap (square yards)</u>
12 to 18	4
21 to 36	12
42 to 60	24

Geometry

- The swale shall have a minimum bottom width of two feet.
- Side slopes shall be 3:1 (horizontal:vertical) or flatter.

- The sand filter shall be placed to a depth of 24 inches below the swale invert.
- The sand filter media shall meet at least MDOT Class II requirements for granular materials.
- Six inches of coarse aggregate shall be placed below the sand filter.
- The filter fabric shall be a nonwoven geotextile with a minimum weight of 3.5 ounces per square yard, a minimum coefficient of permeability of 0.02 cm/sec, and apparent opening size ranging between 70 and 120 U.S. standard sieve size.
- The coarse aggregate shall be washed, rounded-stone aggregate, 1.5 to 3 inches in diameter, or other City of Battle Creek-approved aggregate with void ratio adjusted accordingly (i.e., MDOT 6A, $V_v = 0.33$).
- The bottom and sides of the swale shall be lined with an impermeable liner.

Public Safety

- The swale shall be designed for a maximum depth of 2 feet of water.
- If the water quality swale receives runoff from a higher-risk land use or zoning district (as indicated in Section 2.1 Groundwater Contamination Risk Assessment), the owner/operator shall indicate in the site's SCP actions to be taken to contain the spill prior to leaving the downstream manhole/catch basin.

Maintenance

Maintenance shall be vested with the responsible party through a maintenance agreement as included in the TRM. In addition to the required elements of the maintenance agreement, the maintenance plan shall include the following components:

- Sediment shall be removed when it reaches a depth equal to 50% of the water-quality depth. A visual inspection shall be conducted at least once per year.
- The sand filter shall be replaced, if the swale fails to infiltrate.

- If a pollutant spill occurs, permeable soil shall be removed and disposed in accordance with applicable regulations. Clean permeable fill shall replace it.
- Eroded and barren areas shall be re-vegetated as soon as possible. Trash and debris shall be removed on a regular schedule. Outlets and underdrain outlets shall be inspected annually.

6.3 PROPRIETARY STORM WATER TREATMENT SYSTEMS

General information regarding storm water treatment systems are contained within the Site Plan Review Application packet, including examples of “vertical flow” (e.g., catch basin inserts) and “horizontal flow” (swirl concentrator) systems, general maintenance overview, Storm Water Treatment Unit Inspection Report, and limited vendor contact information for storm water treatment products and treatment unit cleaning/vacuuming.

Catch Basin/Inlet Inserts

Only small sites are allowed to use catch basin/inlet inserts that provide treatment through vertical (gravity-based) flow only. These systems require a suitable treatment media (filter) for the subject pollutants at the site. Typically, these systems are used on small higher-risk sites (e.g., gasoline stations or larger parking lots) where the larger hydrodynamic separators are not practical. Detailed hydraulic calculations shall be provided to demonstrate that the system will treat the first flush and have the capacity to allow flows from the 10-year storm to pass without causing surface ponding.

Hydrodynamic Separators

Many proprietary storm water systems may not achieve full spill containment volumes as a stand-alone practice. Proprietary storm water treatment systems can be used alone or in combination with other BMPs to meet the treatment criteria. Septic tanks and other proprietary systems that do not prevent re-suspension of solids or oils are not allowed. Acceptable proprietary storm water treatment systems must have the following characteristics:

Controls

- The bypass overflow shall be designed to convey, at a minimum, the 10-year storm. The outlet from the device shall not be submerged under normal conditions.

Geometry

- The geometry of the proprietary storm water treatment system shall promote the trapping of sediments and capture slug pollutant loads from accidental spills of regulated substances.
- The portion of the device used for spill containment shall be a wet basin with waterproof bottom and sides to the design volume elevation.
- The overflow control for the proprietary storm water treatment system shall be sized to pass the 10-year rainfall event without releasing trapped sediments and captured pollutants.
- The proprietary storm water treatment system shall be designed to prevent surcharging in pipes upstream from the system.

Public Safety

- Proprietary storm water treatment systems may be reviewed by the City of Battle Creek for public safety.

Maintenance

Maintenance shall be vested with the responsible party through a maintenance agreement as included in the TRM. In addition to the required elements of the maintenance agreement, the maintenance plan shall include the following components:

- The device shall be inspected quarterly for sediment buildup and spill accumulations.
- Semi-annual cleaning shall be conducted by an approved vacuum truck service or in accordance with manufacturer's recommendations.
- Documentation of actions taken after spill events into the device shall be submitted to the Department.

7.0 NONCONFORMING FACILITIES AND ACTIVITIES

A nonconforming facility and/or activity is defined as any existing facility and/or activity that, as of the effective date of the Ordinance, contains an amount of regulated substances in excess of those amounts established by Ordinance or provides improper storage and/or containment of said regulated substances within a designated WHPA.

7.1 CONFORMANCE WITH STANDARDS

Existing nonconforming facilities and/or activities will be allowed within the WHPA only if in accordance with the City of Battle Creek Code of Ordinances.

In addition, nonconforming facilities and/or activities pursuant to the Ordinance must meet the requirements of the Standards established in this document within three years from the adoption date of the Ordinance.

7.2 SPILL CONTINGENCY PLAN (SPC)

Nonconforming facilities and/or activities that are allowed within the 10-Year Time-of-Travel that have in possession regulated substances in quantities exceeding 55 gallons aggregate for liquids and 440 pounds aggregate for solids are required to conform to the specific land use standards within this document within three years of the adoption of the Ordinance.

A SCP may be required by the City if the proposed facilities and/or activities poses a direct or potential significant adverse impact to a surface water feature, such as a river, stream, pond, lake, or wetland. An example template of a SCP is provided in Attachment 2. Any existing SCPs for the site may be submitted to the Department for review and approval to meet these requirements, as discussed in Section 7.2.5.

7.2.1 REGULATED SUBSTANCE INVENTORY

It is recommended that a business keep an inventory that identifies all regulated substances stored at the site in containers exceeding either 10 pounds for liquids or 100 pounds for solids. For each regulated substance, the inventory should identify the type of storage container, storage location(s), and typical and maximum storage quantities in each storage location. The site should maintain a file of current Material Safety Data Sheets (MSDS) that includes the hazardous components and percentage by weight of each regulated substance on the inventory. This MSDS file should be readily accessible in the event of an

emergency. Section 3.0 of the SCP template (Attachment 2) provides an example table that can be used for a Regulated Substance Inventory.

7.2.2 RELEASE POTENTIAL ANALYSIS

The site should develop a written analysis of the potential for a release of each regulated substance stored at the site. This analysis should consider the potential for release during transfer of the regulated substance to and from the storage area, during storage of the regulated substance, and during use of the regulated substance. In addition, the site should evaluate the likely size of a release for each scenario, as well as the likely destination of the release (e.g., to a floor drain, sump, storm drain, etc.). The information may be compiled in table form for ease of data compilation and use. An example table is found in Section 4.0 of the SPC (Attachment 2).

7.2.3 RELEASE PREVENTION MEASURES

Considering each potential release identified as part of Section 7.2, the site should identify in writing release prevention measures that will minimize the likelihood and/or reduce the impact of such a release at the site. These measures could include work practices, housekeeping practices, inspection practices, and/or structural controls (e.g., secondary containment). These prevention measures may be included in the example table found in Section 4.0 of the SCP (Attachment 2).

7.2.4 RELEASE RESPONSE PROCEDURES

The SCP should identify procedures to be followed in the event of a release of a regulated substance. Written procedures should be established both for minor releases – which pose no danger to health or the environment and can be handled by trained employees in the immediate vicinity of the release – and for significant releases that have one or more of the following characteristics:

- The spill cannot be contained safely by site personnel.
- Sufficient resources are not available at the site to contain the spill.
- The spilled material has entered the site's drain system (sanitary or storm) and cannot be contained.
- The spilled material has entered site soils or a vegetated area.

In addition, the SCP should include the following:

- Identification of responsibilities of various site personnel in the event of an emergency.
- Internal site emergency notification procedures (chain-of-command reporting).
- Emergency contact information, including, at a minimum:
 - Key site personnel/emergency coordinators.
 - At least one 24-hour emergency contact.
 - Local emergency response agencies (e.g., police department, fire department, ambulance).
 - Local, state, and federal environmental agencies.
 - At least one spill response contractor able to respond to the site in the event of a significant spill.
- An inventory of onsite spill response equipment.

The SCP should also address methods to determine proper disposal of waste generated by a release of regulated substances. Section 5.0 of the template SCP (Attachment 2) provides an example format to document release response procedures.

7.2.5 USE OF OTHER EMERGENCY RESPONSE PLANS

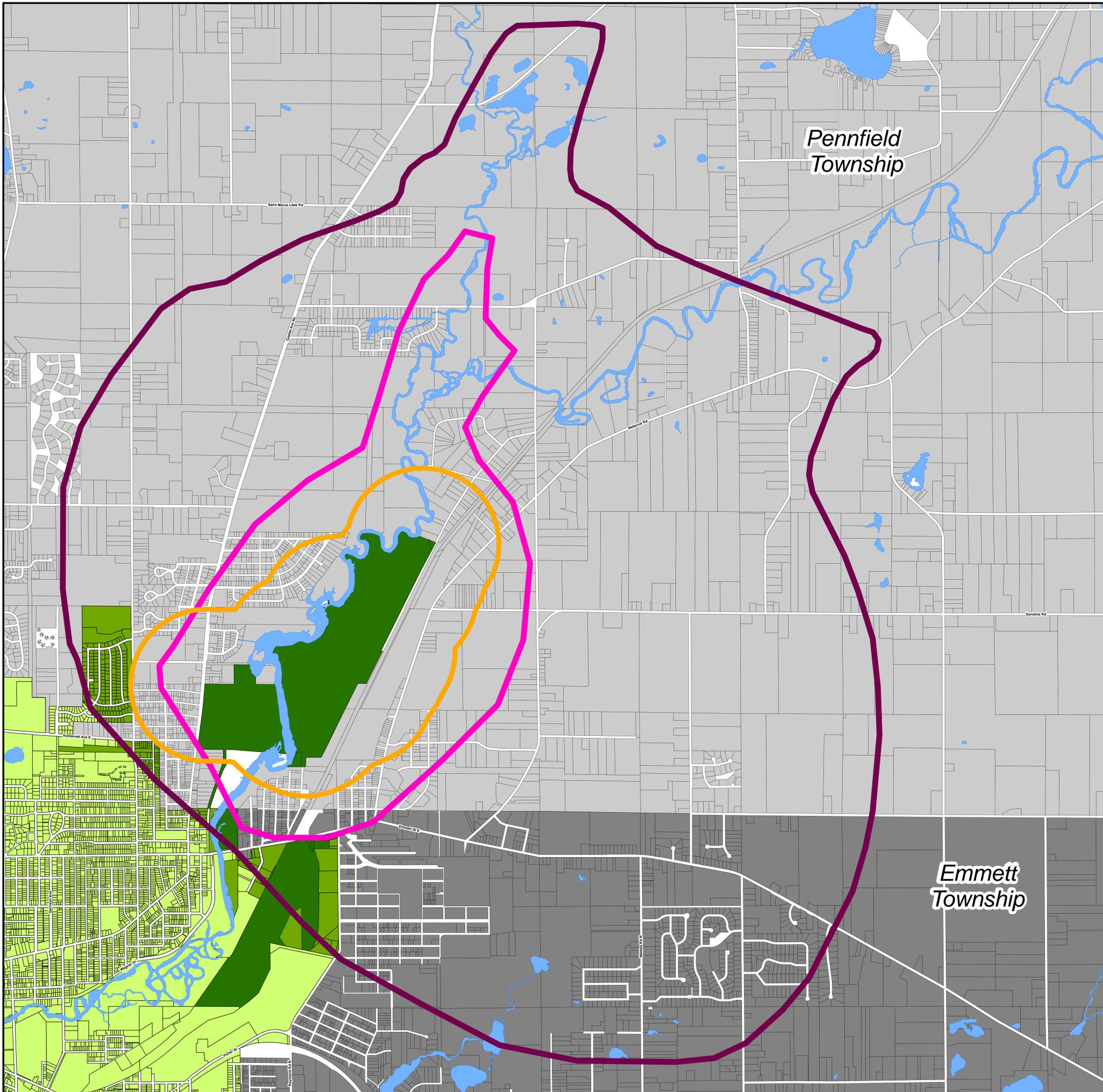
Many sites using or storing regulated substances are required under state or federal environmental laws to develop a written spill response plan, such as a Pollution Incident Prevention Plan (PIPP) or a Spill Prevention Control and Countermeasure (SPCC) Plan. Sites may also be required to prepare a Hazardous Waste Contingency Plan or Storm Water Pollution Prevention Plan (SWP3). Provided that all of the elements described above are included in one or more existing emergency response plans, the site may substitute the existing plan(s) for the SCP. If the existing plan(s) addresses part, but not all, of the requirements detailed in Sections 7.1 to 7.2.4, the site may prepare an addendum to the existing plan(s) so that all requirements are met.

FIGURE 1

Wellhead Protection Zone Map

Wellhead Protection Zone Map

City of Battle Creek



Legend

- Surface Water
- Water Wells
 - 2,000 ft Well Buffer
- Wellhead Protection Areas
 - Verona WHPA: 10 years
 - Verona WHPA: 1 year
- Township Parcels
 - Pennfield Township Parcels
 - Emmett Township Parcels
- City of Battle Creek Parcels
 - Parcels partially or completely within the 1 year WHPA
 - Parcels partially or completely within the 10 year WHPA
 - Parcels completely outside of the WHPA



Prepared by:

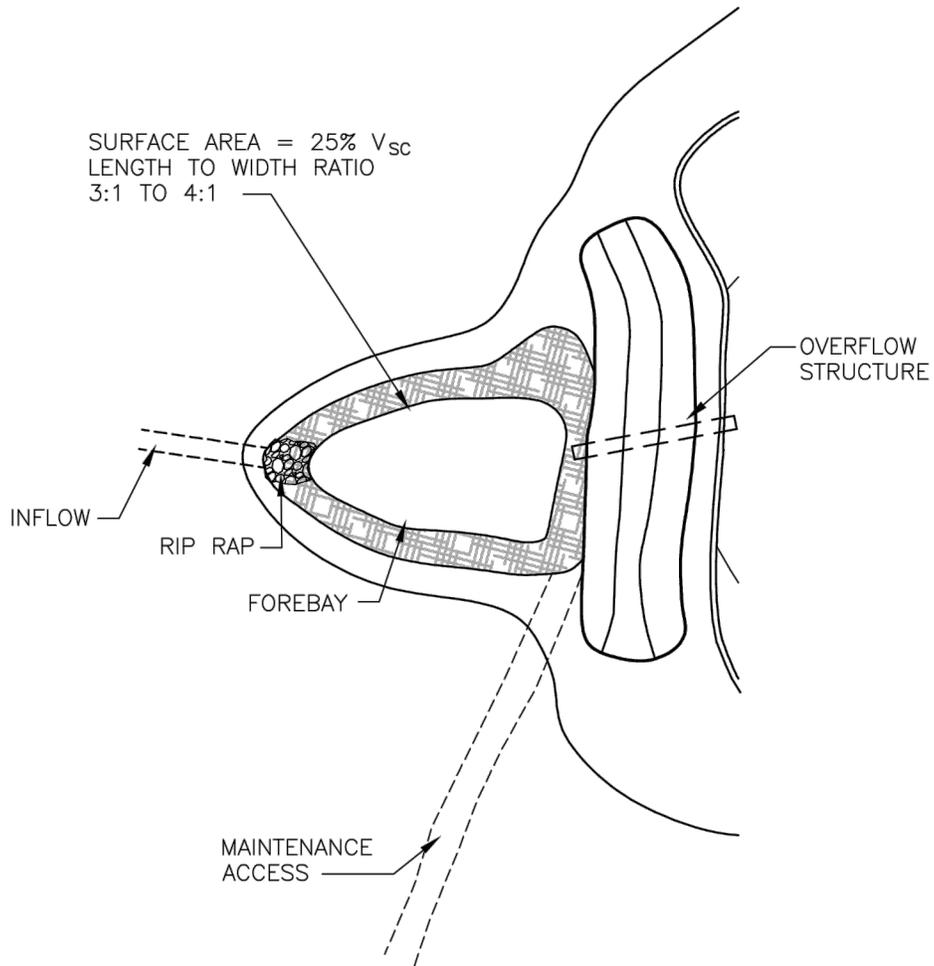
The City of Battle Creek
Department of Public Works
150 South Kendall Street
Battle Creek, MI 49017
Phone (269) 966-3343
Fax (269) 966-3482



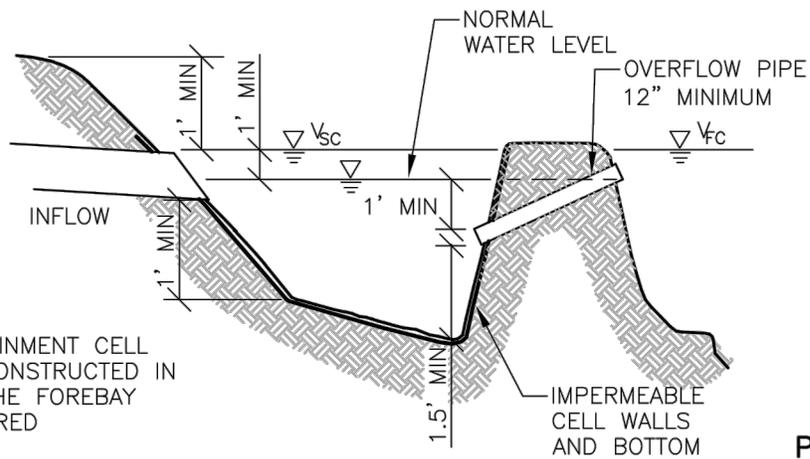
Every reasonable effort has been made to assure the accuracy of this map and associated data. The City of Battle Creek (hereinafter "City") makes no warranty, representation, or guarantee as to the content, sequence, accuracy, timeliness, or completeness of any data herein. The user of this map should not rely on the data provided herein for any reason. The City explicitly disclaims any representations and warranties, including, without limitation, the implied warranties of merchantability and fitness for a particular purpose. The City shall assume no liability for any decision made or actions taken or not taken by the user of the map in reliance upon any information or data furnished hereunder. To be sure of the accuracy, please check with City staff for updated information.

Figure 2
Spill-Containment Cell

SPILL CONTAINMENT CELL



PLAN VIEW

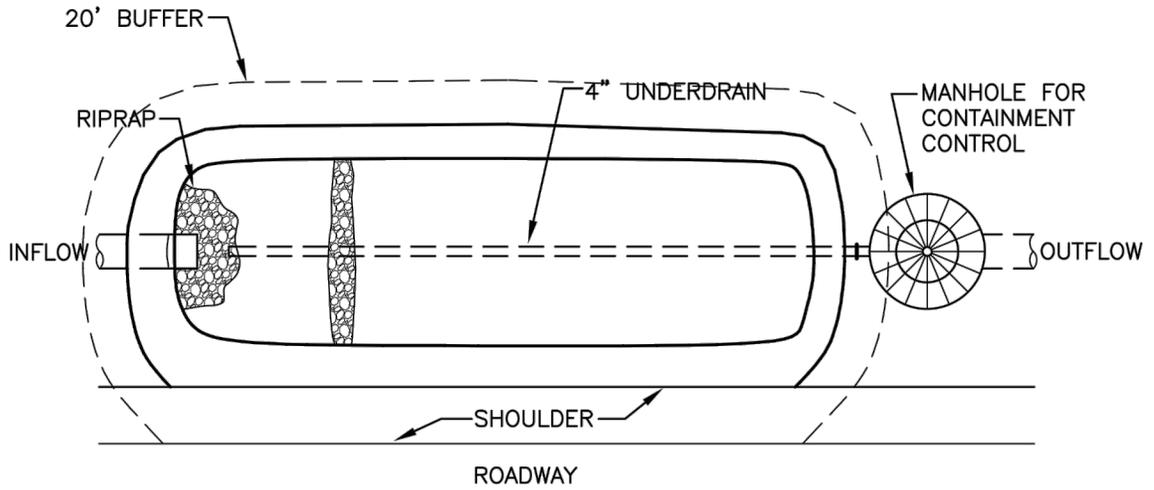


NOTE:
SPILL CONTAINMENT CELL
SHALL BE CONSTRUCTED IN
PLACE OF THE FOREBAY
WERE REQUIRED

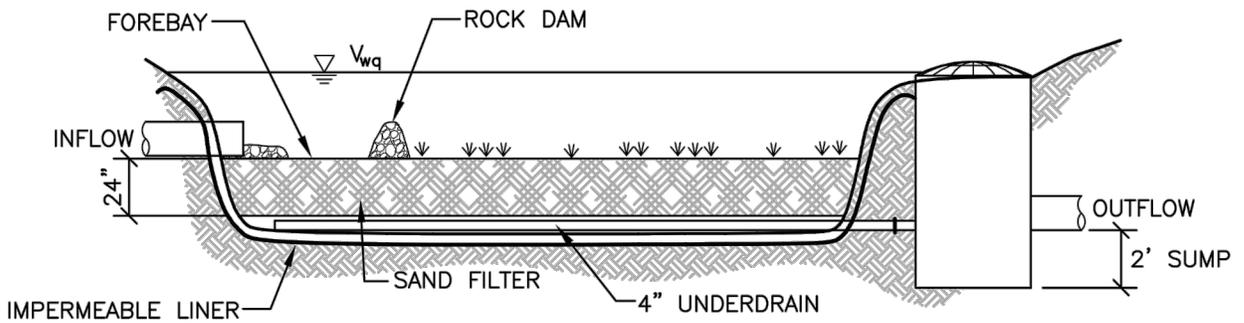
PROFILE

Figure 3
Water Quality Swale

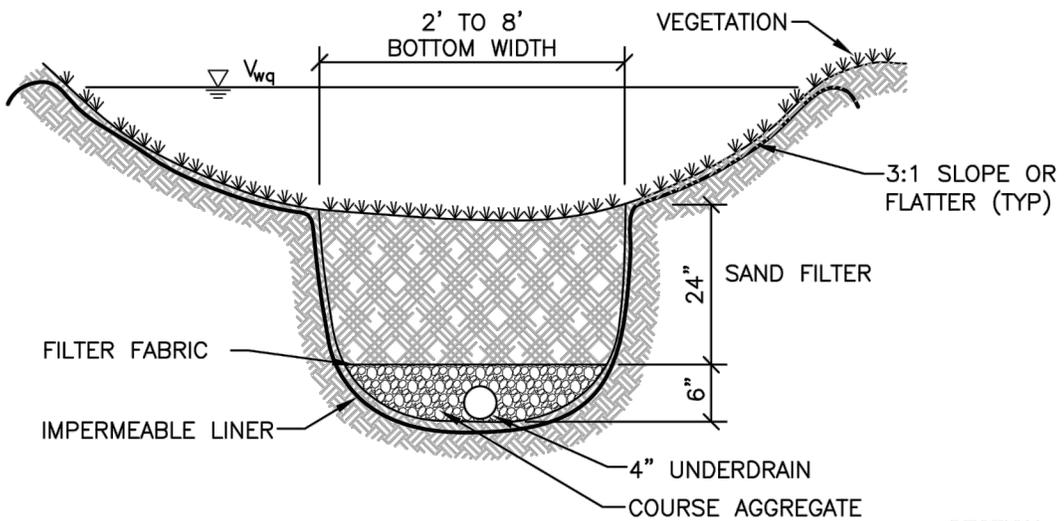
WATER QUALITY SWALE



PLAN VIEW



PROFILE



SECTION

ATTACHMENT 1

Well Isolation Distances

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER DIVISION
GROUNDWATER SECTION – WELL CONSTRUCTION UNIT**

**MINIMUM WELL ISOLATION DISTANCES
(From Contamination Sources and Buildings)
Part 127, Act 368, P.A. 1978 And Act 399, P.A. 1976**

The following lists sources of contamination and the well isolation distances required from those sources by state codes. The Michigan Department of Environmental Quality and local health departments have authority to issue deviations from these minimum isolation distances on a case by case basis. Criteria for issuance of deviations are set forth in R 325.1613 of the Rules for Part 127, and R 325.10809 of the Rules for Act 399.

* = For the isolation distances marked with a single asterisk, the isolation distance is for a source of contamination which is not specifically listed in the rules. However, the source of contamination is interpreted as belonging in a general contamination source group (example - a sewage holding tank is the same as a septic tank) which is listed in the rules, and therefore, the isolation distance listed in this document is required.

** = For the isolation distances marked with a double asterisk, the isolation distance is from a source of contamination which is not specifically named in the rules. However, the Michigan Department of Environmental Quality has established a recommended isolation distance based on the contaminant involved, the risk to public health, and other factors. Under the general authority of a health officer's responsibility to protect the public health, health officers may modify this recommended isolation distance, either increasing or decreasing it, on a case by case basis.

CONTAMINATION SOURCE	REQUIRED MINIMUM ISOLATION DISTANCE (FEET)		
	Part 127, Act 368 PA 1978	Act 399, PA 1976	
		IIb and III	I and IIa
Agricultural chemical/ fertilizer storage or preparation area	150	800	2000
Animal/poultry yard	50	75	200
Brine wells/injection wells	**150	**800	**2,000
Building or projection thereof	3	3	3
Cemetery/graves	**50	*75	*200
Cesspool	50	75	200
Chemical Storage	150	800	2,000
Contaminant plumes, known (Act 307, LUST sites, etc.)	**150	**800	**2,000
Drainfield	50	75	200
Drywell	50	75	200
Footing Drains	10	10	10
Fuel/chemical storage tanks – Underground or abovegrade and associated piping			
depot/tank farm	300	800	2,000
1,100 gal. or larger, without secondary containment	300	800	2,000
1,100 gal. or larger with secondary containment	50	800	2,000
less than 1,100 gal. that store motor or heating fuel for noncommercial purpose or consumptive use on premises where fuel is stored	50	800	2,000
less than 1,100 gal. that store motor fuel for commercial purpose	*50	800	2,000
located in a basement, regardless of size	*50	800	2,000
Grease trap	50	*75	*200
Kennels	50	*75	*200
Landfill or dump sites (Active or Inactive)	800	800	2,000

Liquid Petroleum (LP) Tanks (See comments on last page)			
Liquid waste draining into the soil	50	*75	200
Metering station for pipelines	*300	*300	*300
Municipal wastewater effluent or sludge disposal area (land surface application or subsurface injection)	300	800	2,000
Oil or gas well	300	300	300
Other wastewater handling or disposal unit	50	*75	*200
Petroleum product processing or bulk storage	300	800	2,000
Pipelines gas, oil, etc.	*300	*300	*300
natural gas (See comments on last page)			
Privy/Outhouse	50	75	200
Seepage pit	50	75	200
Septic tank	50	75	200
Septage waste (land application area)	800	800	2,000
Sewage holding tank	50	*75	*200
Sewage lagoon serving a single family dwelling	50	75	200
Sewage lagoon effluent – land application area	50	800	2,000
Sewage or liquid waste draining into soil	50	*75	*200
Sewage pump chamber, transfer station, or lift station	50	75	200
Sewers			
Buried gravity sewer (sanitary or storm) - Service weight or heavier ductile-iron or cast iron, or schedule 40 PVC, all with watertight joints	10	75	200
Buried pressure sewer (sanitary or storm) Watertight joints (pressure tested after installation to 100 psi), equivalent to Schedule 40 or SDR 21, and meets or exceeds ASTM Specifications D1785-91 or D2241-89	10 (by written deviation only)	75	200
Buried gravity or pressure sewer (sanitary or storm), constructed of materials not meeting the specifications listed in the two categories above, or the materials are unknown	50	75	200
Sump pit			
Receiving other than household waste (footing drain, roof drain, etc.)	10	10	10
Receiving household waste (laundry, softener backwash, sink waste, etc.)	50	75	200
Surface water (lake, river, stream, pond, ditch, etc.)	10	75	200
Unfilled space below ground surface (except an approved basement, basement offset, or crawl space beneath single family dwelling)	10	10	10

Comments: Natural gas and liquid petroleum (LP) are not considered sources of ground water contamination because of the volatile gas nature of the fuels. If leaks occur, the gases escape into the atmosphere. Leaked gases do not migrate downward into the soil. Wells should be sufficiently isolated from natural gas lines or LP tanks to minimize the potential for damage to the lines or tanks during well construction or repair, trenching of water lines, etc., and to allow accessibility to the well.

ATTACHMENT 2

Spill Contingency Plan Template

SPILL CONTINGENCY PLAN

SITE NAME:

SITE ADDRESS:

1.0 INTRODUCTION

The purpose of the Plan is to establish procedures to be implemented in the event of a release of Regulated Substances, as well as describe measures implemented to reduce the likelihood of such a release. For the purposes of this document, Regulated Substances are defined in the City of Battle Creek Code of Ordinances (Chapter 1041 – Wellhead Protection).

Regulated Substances within such areas have an elevated risk of compromising area drinking water. Therefore, the primary goal of this plan is to protect drinking water supplies located in the vicinity of this facility.

2.0 FACILITY INFORMATION

This facility is described as follows:

Facility Name:	
Street Address:	
Mailing Address:	
Facility Telephone Number:	
Facility Operator Name:	
Facility Operator Telephone Number:	
24-Hour Emergency Contact Person:	
24-Hour Emergency Telephone Number:	
Description of Facility Operations:	
SCP Preparer Name:	
SCP Preparer Title:	
SCP Preparer Affiliation:	
Original Date of SCP Preparation:	

4.0 RELEASE POTENTIAL AND PREVENTION ANALYSIS

For each Regulated Substance contained in the inventory in Section 3.0, the Facility must document in the following table the potential causes of releases (spills, leaks, etc.) to the indoor or outdoor portions of the facility, both from storage areas and use areas. The Facility must also document measures initiated to help prevent a release of Regulated Substances (e.g., inspections, work practices, good housekeeping and training), contain a release (e.g., secondary containment or diversions from the outside environment) or minimize the environmental impact of a release. If different types of Regulated Substances have virtually identical storage, use, potential for release, potential destination of release and prevention measures, those substances may be listed together in the table.

Regulated Substance(s)	Storage/Use Area	Potential Types/Causes of Release in Area(s)	Potential Destination of Release (check all that apply)	Release Prevention or Minimization Measures
	Storage Areas:		<input type="checkbox"/> Storm Sewer Drain <input type="checkbox"/> Soil <input type="checkbox"/> Dry Well/Catch Basin <input type="checkbox"/> Sump <input type="checkbox"/> Surface Water <input type="checkbox"/> Other: <input type="checkbox"/> Floor Drain	
	Use Areas:		<input type="checkbox"/> Storm Sewer Drain <input type="checkbox"/> Soil <input type="checkbox"/> Dry Well/Catch Basin <input type="checkbox"/> Sump <input type="checkbox"/> Surface Water <input type="checkbox"/> Other: <input type="checkbox"/> Floor Drain	
	Storage Areas:		<input type="checkbox"/> Storm Sewer Drain <input type="checkbox"/> Soil <input type="checkbox"/> Dry Well/Catch Basin <input type="checkbox"/> Sump <input type="checkbox"/> Surface Water <input type="checkbox"/> Other: <input type="checkbox"/> Floor Drain	
	Use Areas:		<input type="checkbox"/> Storm Sewer Drain <input type="checkbox"/> Soil <input type="checkbox"/> Dry Well/Catch Basin <input type="checkbox"/> Sump <input type="checkbox"/> Surface Water <input type="checkbox"/> Other: <input type="checkbox"/> Floor Drain	
	Storage Areas:		<input type="checkbox"/> Storm Sewer Drain <input type="checkbox"/> Soil <input type="checkbox"/> Dry Well/Catch Basin <input type="checkbox"/> Sump <input type="checkbox"/> Surface Water <input type="checkbox"/> Other: <input type="checkbox"/> Floor Drain	
	Use Areas:		<input type="checkbox"/> Storm Sewer Drain <input type="checkbox"/> Soil <input type="checkbox"/> Dry Well/Catch Basin <input type="checkbox"/> Sump <input type="checkbox"/> Surface Water <input type="checkbox"/> Other: <input type="checkbox"/> Floor Drain	

Regulated Substance(s)	Storage/Use Area	Potential Types/Causes of Release in Area(s)	Potential Destination of Release (check all that apply)	Release Prevention or Minimization Measures
	Storage Areas:		<input type="checkbox"/> Storm Sewer Drain <input type="checkbox"/> Soil <input type="checkbox"/> Dry Well/Catch Basin <input type="checkbox"/> Sump <input type="checkbox"/> Surface Water <input type="checkbox"/> Other: <input type="checkbox"/> Floor Drain	
	Use Areas:		<input type="checkbox"/> Storm Sewer Drain <input type="checkbox"/> Soil <input type="checkbox"/> Dry Well/Catch Basin <input type="checkbox"/> Sump <input type="checkbox"/> Surface Water <input type="checkbox"/> Other: <input type="checkbox"/> Floor Drain	
	Storage Areas:		<input type="checkbox"/> Storm Sewer Drain <input type="checkbox"/> Soil <input type="checkbox"/> Dry Well/Catch Basin <input type="checkbox"/> Sump <input type="checkbox"/> Surface Water <input type="checkbox"/> Other: <input type="checkbox"/> Floor Drain	
	Use Areas:		<input type="checkbox"/> Storm Sewer Drain <input type="checkbox"/> Soil <input type="checkbox"/> Dry Well/Catch Basin <input type="checkbox"/> Sump <input type="checkbox"/> Surface Water <input type="checkbox"/> Other: <input type="checkbox"/> Floor Drain	
	Storage Areas:		<input type="checkbox"/> Storm Sewer Drain <input type="checkbox"/> Soil <input type="checkbox"/> Dry Well/Catch Basin <input type="checkbox"/> Sump <input type="checkbox"/> Surface Water <input type="checkbox"/> Other: <input type="checkbox"/> Floor Drain	
	Use Areas:		<input type="checkbox"/> Storm Sewer Drain <input type="checkbox"/> Soil <input type="checkbox"/> Dry Well/Catch Basin <input type="checkbox"/> Sump <input type="checkbox"/> Surface Water <input type="checkbox"/> Other: <input type="checkbox"/> Floor Drain	
	Storage Areas:		<input type="checkbox"/> Storm Sewer Drain <input type="checkbox"/> Soil <input type="checkbox"/> Dry Well/Catch Basin <input type="checkbox"/> Sump <input type="checkbox"/> Surface Water <input type="checkbox"/> Other: <input type="checkbox"/> Floor Drain	
	Use Areas:		<input type="checkbox"/> Storm Sewer Drain <input type="checkbox"/> Soil <input type="checkbox"/> Dry Well/Catch Basin <input type="checkbox"/> Sump <input type="checkbox"/> Surface Water <input type="checkbox"/> Other: <input type="checkbox"/> Floor Drain	

Regulated Substance(s)	Storage/Use Area	Potential Types/Causes of Release in Area(s)	Potential Destination of Release (check all that apply)	Release Prevention or Minimization Measures
	Storage Areas:		<input type="checkbox"/> Storm Sewer Drain <input type="checkbox"/> Soil <input type="checkbox"/> Dry Well/Catch Basin <input type="checkbox"/> Sump <input type="checkbox"/> Surface Water <input type="checkbox"/> Other: <input type="checkbox"/> Floor Drain	
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	Storage Areas:		<input type="checkbox"/> Storm Sewer Drain <input type="checkbox"/> Soil <input type="checkbox"/> Dry Well/Catch Basin <input type="checkbox"/> Sump <input type="checkbox"/> Surface Water <input type="checkbox"/> Other: <input type="checkbox"/> Floor Drain	
	Use Areas:		<input type="checkbox"/> Storm Sewer Drain <input type="checkbox"/> Soil <input type="checkbox"/> Dry Well/Catch Basin <input type="checkbox"/> Sump <input type="checkbox"/> Surface Water <input type="checkbox"/> Other: <input type="checkbox"/> Floor Drain	
	Storage Areas:		<input type="checkbox"/> Storm Sewer Drain <input type="checkbox"/> Soil <input type="checkbox"/> Dry Well/Catch Basin <input type="checkbox"/> Sump <input type="checkbox"/> Surface Water <input type="checkbox"/> Other: <input type="checkbox"/> Floor Drain	
	Use Areas:		<input type="checkbox"/> Storm Sewer Drain <input type="checkbox"/> Soil <input type="checkbox"/> Dry Well/Catch Basin <input type="checkbox"/> Sump <input type="checkbox"/> Surface Water <input type="checkbox"/> Other: <input type="checkbox"/> Floor Drain	
	Storage Areas:		<input type="checkbox"/> Storm Sewer Drain <input type="checkbox"/> Soil <input type="checkbox"/> Dry Well/Catch Basin <input type="checkbox"/> Sump <input type="checkbox"/> Surface Water <input type="checkbox"/> Other: <input type="checkbox"/> Floor Drain	
	Use Areas:		<input type="checkbox"/> Storm Sewer Drain <input type="checkbox"/> Soil <input type="checkbox"/> Dry Well/Catch Basin <input type="checkbox"/> Sump <input type="checkbox"/> Surface Water <input type="checkbox"/> Other: <input type="checkbox"/> Floor Drain	

5.0 RELEASE RESPONSE PROCEDURES

The Facility must identify procedures to be followed in the event of release of a Regulated Substance. These procedures must take into account both minor releases, which pose no danger to health or the environment and can be handled by trained employees in the immediate vicinity of the release, and for significant releases that have one or more of the following characteristics:

- The spill cannot be contained safely by site personnel.
- Sufficient resources are not available at the site to contain the spill.
- The spilled material has entered the site drain system (sanitary or storm) and cannot be contained.
- The spilled material has entered site soils or a vegetated area.

INTERNAL EMERGENCY CONTACTS		
Primary Emergency Contact:	Phone Number:	Responsibilities:
Secondary Emergency Contact:	Phone Number:	Responsibilities:
24-Hour Emergency Contact:	Phone Number:	Responsibilities:
<i>Other Onsite Personnel Contacted</i>		
Name:	Phone Number:	Responsibilities:
EXTERNAL EMERGENCY CONTACTS		
Police Department:	Phone Number:	
Fire Department:	Phone Number:	
Hospital:	Phone Number:	
Ambulance Service:	Phone Number:	
City of Battle Creek Public Utilities Department		
City of Battle Creek Wastewater Treatment Plant		
MDEQ Kalamazoo District Office	269-567-3500	
MDEQ 24-Hour Pollution Emergency Alert System	800-292-4706 (for MDEQ-reportable spills)	
National Response Center	800-424-8802 (for EPA-reportable spills)	
Spill Response Contractor:	Phone Number:	

7.0 EMPLOYEE TRAINING

The facility must train all employees who handle Regulated Substances or work in the vicinity of Regulated Substance storage or use areas. Thus, the following groups of employees and/or individuals will be trained on the release procedures outlined in the previous section. This training will take place within one month of the completion of this SCP and then annually. In addition, all new hires requiring training will receive the training within one month of hire. A training log is available as Appendix A.

8.0 SCP UPDATES

The SCP must be updated every two years or when any of the following occur:

- There is a change in ownership at the facility.
- The use, storage or types of Regulated Substances at the facility change.
- Changes, structural or otherwise, are made at the facility that will affect the anticipated flow direction or final destination of any release from a Regulated Substance storage or use area (e.g., regarding the property, paving, building additions, additional structural controls).

An SCP Update Log is provided as Appendix B.

9.0 SCP AVAILABILITY

The SCP is stored onsite in the following locations:

