SECTION J

ENVIRONMENTAL ASSESSMENT

Part 111 Hazardous Waste Management of the Michigan Natural Resources Environmental Protection Act, 1994 PA 451, as amended, Section 324.11118(3) and R 299.9504(1)(e), R 299.9504 (1)(b) of the Part 111 Act 451 Administrative Rules

ENVIRONMENTAL ASSESSMENT
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J-1 Description of Existing Environment

J-1a Physiography

J-1a(i) Topography

The EQD facility site occupies an area of approximately 15 acres and is located at 1923 Frederick Street in the City of Detroit, Wayne County Michigan. The location of the subject property is shown on **Sheet A-0** which is a portion of the Topographic Map proceeding Sheet A-0.

The site and the areas adjacent to it have a relatively flat surface topography, and there are no streams or lakes within one mile of the facility.

EQD is extensively developed and several buildings and other structures exist on the property. These buildings include: office buildings, The Main Treatment Building/Laboratory/Maintenance Shop, the Transfer/Storage Area, the Process Building, the North Drum Storage Building, the Guard Shack, the Waste Acceptance Building, the Chemical Fixation Building with associated storage silos, and the Lab Pack/HHW/Transfer and Processing Building. The remaining portion of the site is covered with asphalt/concrete pavement, gravel and/or grass. **Sheet A-1** (Surveyed Property Description) depicts the general layout of the property.

A review of the Federal Emergency Management Agency, National Flood Insurance Rate (FEMA-NFIR) , shows the Detroit River, located approximately 2.7 miles south of the site, as the nearest surface water body, and the closest potential flood risk in the surrounding area. Based on this mapping EQD lies within a Zone C area and is not considered subject to flooding.

J-1a(ii) Geology

Based on a review of **Figures J-1 and J-2** (the glacial surficial geology map and the glacial drift thickness map), and **Figures J-3 and J-4** (bedrock maps of Wayne County), the site sits on lacustrine clays near a small beach ridge and lies above two formations which form the bedrock surface, specifically the Dundee Limestone and the Traverse Group formations. Geologic bedrock maps indicate the bedrock surface boundary between these formations runs near the site.

Maps showing the thicknesses of the Dundee Limestone and the Traverse Group formations throughout the Lower Peninsula of Michigan are presented in **Figures J-5, J-6 and J-7**.

The Traverse Group formation is a 100 to 800 foot thick sequence of alternating shales, limestones and dolomites. The shales in this group are not considered water bearing aquifers, however the limestone units may supply large volumes of water locally. Shales in the Traverse Group serve as excellent confining layers having low effective porosity. The limestone units are relatively impermeable, but have local porous zones particularly near the surface of the formation.

The Dundee Limestone Formation is a fossiliferous limestone that is locally dolomitized. It ranges from about 50 to more than 350 feet in the eastern portion of Michigan’s Lower

Peninsula. Although the Dundee Limestone has a relatively low effective porosity, "selective" porous and permeable zones associated with fractures and bedding planes are considered water bearing aquifers. Because of the presence of these fractures, the Dundee Limestone is limited as a confining layer.

J-1a(iii) Soils and Hydrology

Based on the results of previous investigations, the subsurface conditions at the EQD site are characterized by near-surface sands, and fills occur as blanket materials under pavement and consist primarily of brown, loose to medium-dense, fine sands. These sands are limited in extent to the upper one to two feet below the pavement surfaces. Granular fill was also found in the eastern portion of the site. Miscellaneous cohesive fills are present throughout the site extending to a depth of about four to five feet below existing ground surface. Near-surface clays present below the fill materials, to depths up to 14 feet, are predominately highly desiccated, very stiff to hard, silty brown clays. Lenses of oxidation are found throughout this upper clay, forming both vertical and horizontal planes of separation. These planes are generally found to be discontinuous and limited in extent.

The glacial, lacustrine clays found below a depth of about 14 feet are medium to hard, silty to sandy, gray clays. Clayey sand and/or silty sand layers within this clay are of substantial thickness, on the order of about two to 15 feet, between the depths of 40 to 60 feet. Similar layers are also found at a depth of about 25 feet, but are limited to less than three feet in thickness. Hydrogeological reports from the surrounding area indicate that these clayey/silty sand layers are common to the area and appear to be generally continuous within individual site boundaries. However, because of their random nature, the layers are not considered to be continuous over substantially larger distances. Based on a review of the literature it is anticipated that these clayey soils continue to depths of about 150 feet below the ground surface.

Groundwater at EQD reportedly occurs in both the "upper" (less than 30 feet bgs) and "lower" (40 to 60 feet bgs) aquifers. Data from the previous investigations indicated generally very low to moderate groundwater yields to depths of approximately 100 feet below ground surface. Groundwater elevations at EQD generally decrease from southwest to northeast or east. For a more detailed description of the geology of the site, see **Section E**; Environmental Monitoring Systems.

J-1b Climate

The Great Lakes have a significant effect on the climate in the area by providing a source of moisture; by increasing cloudiness; by lowering temperatures in the summer; and moderating winter temperatures. Because the prevailing westerly winds coming off Lake Michigan pass over considerable expanses of land surface before reaching the eastern part of the state, the influence of the Great Lakes on this region's weather is somewhat modified. Whenever the winds are from the northeast, east, or southeast, however, the influence of the Great Lakes on the regions climate is much more pronounced due to the proximity of Lake Huron, Lake St. Clair and Lake Erie in these directions.

Wayne County falls within the Northern Temperate Climate Zone which is characterized by four seasons.

The average annual precipitation for the Wayne County area is 33 inches of rain and about 42 inches of snowfall. The mean temperature is about 22 °F during the winter and about 72° during the summer.

J-1c Terrestrial Systems

The site on which the EQD facility is located has been part of a developed urban area for at least 40 years. Land use north, south and west of the site is typically medium to heavy industrial. Land use to the east is generally residential and commercial. There are no rare and endangered plant species present at or near the site at this time. Vegetation at the site is limited to small, isolated areas of grass.

Animals which may inhabit the area include such urban dwellers as squirrels, opossum and raccoon. It is possible that other species of wildlife are present though probably in very small numbers. There are no endangered or threatened species of wildlife present in the vicinity.

J-1d Aquatic Systems

There are no surface water systems present in the vicinity of EQD. Surface water runoff in the area is directed into the urban stormwater/sanitary sewer system which has existed for a number of years.

J-1e Hydrology

J-1e(i) Groundwater Occurrence

The greatest density of community public water supplies, per county, is in southeast Michigan, including Oakland, Wayne, Monroe and Macomb Counties. The water supplies in this area are generally served by the Detroit Metropolitan Water System which obtains water from Lake Huron, Lake St. Clair, Lake Erie and the Detroit River. No records of wells exist for the area within a one-mile radius of EQD.

J-1e(ii) Surface Water Quality

Surface runoff from the site is generally collected through the City of Detroit combination storm/sanitary sewer system. In areas that are unpaved, surface water may infiltrate the ground in limited quantities.

The major bodies of water in the Detroit are include Lake St. Clair, the Detroit River and the Rouge River. EQD will not discharge any wastewater into any of these waters.

All treated wastewater discharges from EQD go to the Great Lakes Water Authority (GLWA) sewerage system in accordance with the policy guidelines established by the DWSD Industrial Waste Control Permit No. 923-91964-IU. The water collected in this sewerage system is treated by the Metro Detroit Treatment Plant.

Detroit River water quality is of special importance because it is a connecting waterway for the Great Lakes and the largest inflow into Lake Erie. For this reason, Lake St. Clair

and the Detroit River are both classified by the MDEQ for usage as public water supplies, for cold-water fish, and for total-body-contact recreation. The Rouge River is designated for use as an industrial and agricultural water supply, for partial-body-contact recreation, for warm-water fish, and for navigation. The Detroit River receives many industrial and tributary inputs as well as municipal wastewater treatment plant effluents. Improvements in water quality of the Detroit River have been demonstrated over the past 20 years, due largely to improvements in municipal wastewater treatment, as well as municipal treatment of certain industrial wastes before discharge.

J-1e(iii) Groundwater Quality

Data from previous hydrogeological investigations conducted in 1987 through 1995 indicate that existing groundwater underlying EQD is free of contaminants. A discussion of the hydrogeological investigation information is contained in **Section E.**

Because the majority of the EQD property is paved and/or covered by buildings or other structures, site recharge of groundwater is negligible. This inhibits the downward travel of contaminants toward the water table.

J-1e(iv) Site Drainage

Runoff from EQD enters the combined storm and sanitary sewer system and under normal operating conditions, goes to the City of Detroit GLWA wastewater treatment plant for processing prior to release to the Detroit River.

J-1f Air Quality

Based on the Detroit River-Western Lake Erie Basin Indicator Project Report "INDICATOR: Criteria Air Pollutants in Southeast Michigan" 1995 through 2005 data, the air quality in the vicinity of the EQ Detroit site appears to have attained the NAAQS primary and secondary standards for sulfur dioxide, ozone, carbon monoxide, nitrogen dioxide and lead. The Detroit area did not meet the NAAQS standard for $PM_{2.5}$ during 1995 through 2005.

All operations at EQD are controlled in such a way that there is an absence of dust, odors, and/or other inconveniences to local residents. All on site-traffic areas are paved in order to minimize dust. Processing and/or reactor tanks and storage silos are fitted with baghouse filters, to control emissions from these areas.

The active portions (tank valves, transfer lines, etc.) of the above-ground tank storage tank farms are fully enclosed to control air emissions. The container storage and the loading/unloading area are equipped with an equalization line for emissions control from tank trucks loading and unloading.

All truck traffic is strictly controlled such that only the entrance off of St. Aubin Street and the other major roadways in the area (Ferry Street, Russell Street, Farnsworth Street, Chene Street and I-75 and I-94) are authorized for use by trucks arriving at the EQD facility.

J-1g Aesthetics

The EQD site is located in a primarily industrial area with no special aesthetic value. Perhaps the most dominant feature of this area is the flatness of the terrain for several miles in any direction. Any panoramic views of this terrain are limited by the other dominant feature of the area. The diversity and intensity of the land-use activities. No unique natural or manmade features are present in the area and the site is typical of an industrial waste facility and offers little aesthetic quality from a visual sense.

J-1h Land Use

Detroit is highly urbanized and has a high density of population, housing and industry. According to 1984 estimates, 93.6 per cent of the City's 89,343 acres are classified as urban development. Approximately 40 percent of this developed land is for residential use, 3.9 per cent for commercial use, 7.1 per cent for industrial use and 7.5 per cent for institutional use. Traffic ways account for 25.4 per cent of the developed land in Detroit. The 6.4% of undeveloped land in the city is in the form of small vacant lots situated between residences.

Detroit can be divided into three concentric districts which correspond to the three major stages in the city's development. The first area, "Old City", lies with Grand Boulevard and was built prior to 1900. This area was build without adherence to a building code, zoning regulations or street plans and therefore is characterized by narrow lots, congested street patterns, and mixed commercial and industrial land used with residential areas.

The "Middle City" is located between Grand Boulevard and a circle of industry that follows the Detroit Terminal Rail Line. This area grew, along with the development of the automobile industry between 1900 and 1930. Most homes were built in accordance with existing building codes but without regard to zoning. Again, the area is characterized by mixed industrial, commercial and residential land uses and limited off-street parking.

The "New City" extends from "Middle City" to the outer city limits and is the most recent area to have undergone development. The area is less congested and is made up primarily of single family homes built on single lots. Construction was performed in accordance with building codes, zoning and subdivision controls. This area is adequately served by supermarkets, shopping centers, playgrounds and recreational areas.

J-1i Archeological and Historical Resources and Sites

Based on a review of published information, it is revealed that EQD is situated within approximately one mile radius of seven of Detroit's historic landmarks. These landmarks are identified and described in the following table.

Name	Date	Description
Charles Lang Freer House* (Merrill-Palmer Institute of Human Life)	1887	Shingle-style home of well known art collector Charles Lang Freer
Col. Frank J. Hecker House*	1888-91	Chateauesque-style mansion
David Whitney House*	1890-94	Chateauesque-style mansion of lumber baron David Whitney
Detroit Public Library	1921	Italian renaissance style; white marble exterior with mosaics and murals decorating interior
Sweetest Heart of Mary Roman Catholic Church	1892	Gothic revival design church
Packard Motor Co. No. 10 Building	1903-05	First reinforced concrete factory erected in Detroit
Ford Motor Company Piquette Plant	1904	First plant to manufacture model T

Recognized in National Register of Historic Places.

Source: Adapted from Giffels, Inc./Black and Veatch, 1977, pp 30-50.

However, due to the industrial nature of the area and due to solid waste collection truck traffic in the vicinity of the Detroit Renewable Power incinerator near EQD, the existence of EQD is not expected to affect the existing historic resources.

Contact with the State of Michigan's Archeologist's office revealed that no known archeological sites presently exist in the area.

J-1j Social Environment

The facility is located in the City of Detroit which has a population of approximately 650,000 people. There are an estimated 500 people living within one mile of the site. According to the 2010 U.S. Census Bureau, 26.7% of the residents of Detroit were under age 18, 11.5% were over the age of 65, and 7% were under the age of 5.

There are about 340,000 occupied housing units in Detroit with 49.4% of these units being owner occupied, single-family dwellings with the median value being $42,300. The median family income is $25,764 in 2015.

Detroit's economic base is largely comprised of retail establishments along with many industrial, manufacturing and service companies. The State-equalized value for EQD, including real and person property is $1,289,000.

Public utilities available in the City of Detroit include: electric (Detroit Edison), natural gas (Michigan Consolidated), telephone (Ameritech, AT&T, MCI, Sprint and many other local mobile phone providers) and multiple cable TV providers. Water supply and sewage disposal are provided by the City of Detroit. The storm and sanitary sewer system in the area surrounding EQD is a combined system. Residential solid waste collection is provided by the City of Detroit. Solid and other waste disposal for business and industry is provided by private haulers, as contracted by the business or industry.

The major transportation routes that service Detroit include six freeways (I-94, I-75, I-375, I-96, M-10, and M-8), numerous major thoroughfares (2- and 1-way), secondary thoroughfares (2-and 1-way) and several railroads. Truck traffic is excluded from traveling on residential side streets around EQD by posted signs. Trucks traveling to and from the facility are limited to travel on the major traffic routes to the entrance off of St. Aubin Street.

J-1k Floodplain Considerations

Based on the examination of the FEMA-NFIR Map for the City of Detroit, it is observed that the 100-year floodplain runs along the shore of the Detroit River, and is approximately 2.7 miles from EQD. The area immediately surrounding the facility, as well as most of the City of Detroit is located in Zone C, described as "areas of minimal flooding". This data indicates that the facility is not in a 100-year flood plain and should not be affected by a 100-year flood.

J-2 Alternatives Considered

The EQD Treatment facility has been specifically designed to safely process both hazardous and non-hazardous wastes. Alternative design features were reviewed, but the final selection of the design reflected several advantages, such as satisfying setback requirements, fire-protection needs and the use of structure already present, as well as providing optimum secondary containment structures and separate treatment processes for potentially incompatible wastes.

The processing of hazardous wastes at EQD complements the existing waste-management programs of the community, state and nation, by providing properly designed and operating treatment facilities. EQD also implements management procedures that reduce the disposal amounts and the potential for release of hazardous and/or non-hazardous wastes or waste constituents to the environment. EQD also encourages reuse/recycling of materials, and thus reduces the consumption of natural resources.

The no-action alternative was considered, but was not consistent with EQD's objectives of helping to meet the increasing demand for the safe management of a variety of wastes from large-quantity and small-quantity generators of hazardous wastes. The

wastes that are accepted for processing by EQD are primarily generated from the use of products that allows EQD to be very familiar with the waste's characteristics and the proper handling and processing of those wastes.

Wastes are stored temporarily on-site until a sufficient quantity has accumulated. By storing wastes on-site, EQD can control how the wastes are handled, to assure that the environment is protected and that their liability is also minimized. EQD can also take advantage of some cost savings by accumulating sufficient quantities of hazardous wastes to make collection, disposal or recycling of these wastes more practical for waste generators. Also, by minimizing the number of times that the wastes must be handled after they have been generated prior to the disposal, the possibility of releases from such handling can be reduced.

By not storing the hazardous wastes on-site at EQD, any potential adverse impacts from their storage would be eliminated locally, but these potentially adverse impacts would be transferred to another location.

J-3 Anticipated Environmental Impacts of the Proposed Action

J-3a Physiography

Existing operations/processes along with storage activities will not affect topography, drainage, streams, lakes, roads, bedrock or glacial features of the area. There may be some very minor impacts on soils on the site, as related to the present waste processing activities. These soils have already been greatly altered and are paved over or covered with gravel or buildings, so the impact will not be significant.

J-3b Climate

Operations/processes at EQD will not affect the climate in any way.

J-3c Terrestrial Systems

Operations at EQD will have no significant impact on terrestrial systems. The area has no value as a wildlife habitat.

J-3d Aquatic Systems

Operations/processes at EQD will have no impact on any aquatic system. The majority of waste management areas, including storage areas and loading areas, will be covered, so runoff cannot come in contact with wastes. Dikes prevent runoff from entering any areas where wastes may be present. All storage and management areas have secondary containment, so that any leaked or spilled wastes are confined in blind sumps for recovery and disposal, and cannot leave the site.

J-3e Aesthetics

Operations at EQD will not change the aesthetics of the area, and will not result in any negative impacts on the aesthetics of the neighborhood.

J-3f Air Quality

Operations at the facility will have no significant impact on air quality. EQD reports emissions from treatment processes on the site in accordance with MDEQ AQD Permit to Install No. 269-04G.

J-3g Hydrology and Hydrogeology

Processes and Operations as designed and routinely operated at EQD, are not anticipated to have adverse effects on hydrology or ground water quality. All process, storage and loading areas have curbing or secondary containment systems so that any accidental spills or releases are contained on-site for appropriate clean-up.

J-3h Land Use

Existing operations at EQD do not affect existing land use or the zoning of the site or nearby areas.

J-3i Archeological and Historic Resources

Existing operations at EQD are not anticipated to have any adverse impacts on the historic structures or the use of these known historic resources that may be located in the proximity of EQD.

J-3j Social Environment

The existing operations at EQD will not adversely effect fire or police protection or sewer services to the community or EQD.

Truck traffic to the facility may increase, but combined with current truck traffic from neighboring facilities in the area, the minimal potential increase in traffic-related noise is not expected to be a source of annoyance for nearby residents. The potential adverse impact will be effectively mitigated by routing truck traffic to and from the site through an established route along I-94, I-75, Farnsworth Street, Russell Street, Ferry Street, St. Aubin Street, and Chene Street that will impact the smallest number of residences possible.

The risk of a traffic accident is not anticipated to increase significantly, due to the presence of EQD, because the amount of waste transported to the facility is fixed by the permitted storage and treatment capacities. If a traffic accident does occur, the impact will be limited to the immediate area of the accident.

The primary impacts of a transportation accident will be the possible release of waste materials to the air and ground. If the accident results in the release of a hazardous waste to the environment, the waste transporter and the generator will be responsible for any clean-up activities. Detroit Police and Fire Departments will respond to any emergency, and are well trained and equipped to do so.

EQD recognizes its role and responsibility as the waste processing facility which would be receiving the waste material. EQD will use all information and resources available to aid designated response personnel in the containment and clean-up of any spill. EQD

will also be able to provide spill containment supplies that are located at the facility for use in spill control procedures.

J-3k Energy Demand and Non-Renewable Resources

Safe local handling of hazardous waste reduces use of fuels for transportation. Other non-renewable resources may be required for disposal (e.g. solidification additives, incineration), recycling, or recovery at the facilities that will receive wastes from the EQD facility. This demand for energy and non-renewable resources is an unavoidable impact of safe handling and disposal of hazardous wastes; however, recycling reduces the overall consumption of non-renewable resources.

J-3l Summary of Environmental Impacts

Table J-1 summarizes the environmental impacts. The facility has no significant impacts on physiography, climate, terrestrial systems, aquatic systems, hydrology, hydrogeology, aesthetics, land use and/or zoning.

Truck traffic is routed to avoid adverse impacts on residential areas. Management and handling of stored hazardous wastes at EQD does not require substantial amounts of non-renewable resources to be consumed.

Existing operations at EQD will have beneficial effects on the local economy and tax base and on the management of hazardous wastes. The facility provides a needed service to its many customers that generate hazardous and/or non-hazardous wastes.

J-4 Unavoidable Adverse Impacts

Unavoidable adverse impacts include:

- An increase in truck traffic near a residential area
- An increased use of some non-renewable resources, in order to properly process hazardous wastes.

The adverse impact from these items is considered minimal; the EQD facility will work to reduce any adverse impacts from the storage and processing of hazardous wastes.

J-5 Mitigating Measures

The impact of increased truck traffic near a residential area has been mitigated by routing the traffic through the major transportation networks surrounding the site (I-94, I-75, Farnsworth Street, Russell Street, Ferry Street, St. Aubin Street, and Chene Street) and by requiring trucks to turn off their motors when the semi-tractors are not in use.

Safe and effective management of hazardous wastes require the use of some energy and non-renewable resources. The use of these required resources are minimized by reducing the amounts of hazardous wastes generated, by recycling certain wastes, and by bulking some wastes. Reducing the amounts of wastes generated can only be done by generators of the wastes.

Any measures that would prevent negative impacts on the environment from the processing of hazardous wastes at EQD have been and will be implemented. These

measures include secondary dike containment systems, overfill protection alarms, spill-prevention structures and strategies and routine inspection procedures.

J-6 Failure Mode Assessment

J-6a Description of the System

The detailed physical description and operating processes of the facility are contained in **Section B** (Facility Site Description) and **Section D** (Plans and Specifications), respectively.

EQD operates a hazardous and non-hazardous waste treatment facility. The treatment facility processes hazardous and non-hazardous wastes which are regulated by the EPA and the MDEQ. A description of the facility operations and the facility preparedness is presented in the following **Subsections J-6a(i)** through **J-6a(v).**

The waste processing operations occur within primary structures. These structures are the Container Staging Area, the Container Storage Area, the Main Treatment Building, the Process Building, the Stabilization/Fixation Facility, and the Lab Pack/DePack Area.

J-6a(i) Main Treatment Building

The Main Treatment Building, maintenance area and laboratory services are located north of the general offices and are bordered by a continuous curbed concrete roadway. This building accepts and processes hazardous and non-hazardous wastewaters containing heavy metals, pressable sludge and oily wastes. The Main Treatment Building occupies the majority of a two-story concrete block building with concrete flooring. Entrance doors are located on all sides of the building. The treatment areas contains waste water treatment or reactor tanks, reagent tanks, control office, plate frame filter presses, sumps, pumps and piping, some of which is overhead. The treatment tanks are equipped with access covers, bottom drain lines and audible, visible high level alarms.

The Main Treatment Building, two associated unloading areas and storage area for storing plastic polymer drums containing maintenance and treatment chemicals, are curbed to facilitate secondary containment of spilled wastes. The entire processing area, unloading area, and storage area is secondarily contained by the building walls and continuous concrete curbing.

Containment areas drain to the northwest sump or to the spill containment structure, where any accumulated liquids are removed for chemical and physical treatment at EQD according to their characteristics.

The south and east sides of the building houses in-plant offices, maintenance shop and an analytical laboratory. The laboratory contains instrumentation designed to analyze and characterize small quantity representative samples of the materials being treated. The maintenance shop area is utilized for repair and servicing of on-site equipment. This area is physically separated from the treatment plant by concrete block walls with metal entrance doors.

J-3a(ii) Process Building

The Process Building is located to the north of the Main Treatment Building. This treatment building accepts non-hazardous oily wastewaters.

The Process Building operations are housed within a pre-engineered metal structure that is attached to the above-ground storage tank (AGST) farm. The active portions (tank valves, transfer lines etc.) of the AGST farm are fully enclosed to facilitate air emissions, and is separated from the treatment building by a pre-engineered metal wall and metal doors. The associated exterior unloading area is secondarily contained within the Process Building structure by associated curbing and/or drains to the spill containment structure. Accumulated liquids are removed for chemical and physical treatment at EQD according to their characteristics.

J-6a(iii) Chemical Fixation Building

The facility is located north of the Main Treatment Building. The facility operations are housed within a pre-engineered metal structure that is attached to treatment/storage tanks/vaults. The active portions (i.e. vaults, pugmill) are fully enclosed within the building.

EQD's Chemical Fixation Facility utilizes a waste treatment technique commonly referred to as pozzolanic stabilization. This technique relies on materials rich in stabilization and fixation agents to provide a solid stabilized mass when mixed with wastes. The most commonly utilized materials in EQD's process are soluble silicates, lime, Cement Kiln Dust (CKD), fly ash, and Portland Cement.

Table B-3 of the Facility Site Description presents the waste storage and process tanks/vaults descriptions and volumes associated with the Chemical Fixation Facility operations. **Section G** (Contingency Plan) provides an overview of the hazards associated with these wastes and materials/chemicals.

J-6a(iv) Container Staging Area

The Container Staging Area is located north of the Main Treatment Plant. This area is designed to hold 54,340 gallons of containerized waste.

Containerized waste streams arriving for process and destined for EQD will first arrive at the EQD Container Staging Area. Here, the drums will be off loaded and appropriate representative samples taken. Those drums which meet waste acceptance criteria will be stored in either the Container Staging area or taken directly to the Container Storage Building. Incompatible wastes are not stored in the Container Staging area.

Rejected containerized wastes not meeting waste acceptance standards will then be loaded back on transporter trucks.

Containers are stored in a manner that will contain potential leaks/spills within the Staging Area. The Container Staging Area is inspected once per day. Accumulated liquids collected in trench containment structure or trench is removed upon detection.

J-6a(v) Container Storage Building

The Container Storage Building is centrally located north of the Main Treatment Building and is completely enclosed. The Container Storage Area is designed to hold a maximum capacity of 100,430 gallons of containerized waste. The waste is stored in rows running east and west approximately 4 foot wide, separated by approximately 2 foot wide aisle. Incompatible wastes are separated in accordance with DOT and 40 CFR Appendix 5 segregations criteria. Incompatible wastes are separated by a dyke, berm wall or other devices as per 40 CFR 264.177 as shown on **Sheet R-4.**

Containers are placed into the storage area on pallets or directly onto the concrete slab using a fork-truck or other container/drum handling equipment.

The Container Storage Building is completely covered which prevents precipitation from entering. The storage is sloped to blind sumps which serve as a collection point for liquids in the event of spills or leaks in the storage area. Containers are stored in a manner that will contain potential leaks/spills within the curbed area.

The container storage area and blind sumps are inspected daily. Accumulated liquids collected in the blind sumps will be removed with a vacuum truck.

J-6a(vi) North Container Storage Pad

The North Container Storage Pad is located adjacent to and North of the Container Storage Building. The North Container Storage Pad has a maximum capacity of 80,800 gallons of containerized waste. This area is exterior to the Container Storage Building and is entirely enclosed by concrete curbing which serves as secondary containment to collect precipitation and in the event of a spill. The concrete pad is sloped to a blind sump which serves as a collection point for liquids. Containers are stored in a manner that will contain potential leaks/spills within the curbed area.

The container storage area and blind sumps are inspected daily. Accumulated liquids collected in the blind sumps will be removed with a vacuum truck.

J-6a(vii) Corrosive (Acid/Base) Treatment Area

The Corrosive Treatment Area lies directly northeast of the administrative building and is completely enclosed. The area is designed to hold a maximum of 6,600 gallons of containerized waste. The waste is stored in rows running east to west approximately 4 foot wide separated by 2 foot wide aisles. Drums are place in the area on pallets or directly onto the concrete slab using a fork-truck or other container/drum handling equipment. The area is completely covered which prevents precipitation from entering.

The storage area is sloped towards trenches which serve as a collection point for liquid in the event of spills or leaks in the storage area. Containers are stored in a manner that will contain potential leaks or spills within the curbed area.

J-6a(viii) Lab Pack/DePack Area

The Lab Pack/DePack Building is located at the Northeast corner of the facility. The Lab Pack/DePack Area has a maximum capacity of 8,800 gallons of containerized waste. The Lab Pack/DePack area is entirely enclosed within the building. Secondary

containment for this area is shown in **Sheet C-14**. Containers are stored in a manner that will contain potential leaks/spills within the secondary containment. The container storage area and blind sumps are inspected daily.

J-6a(ix) Other Structures

In addition to the wastes in tank trucks, EQD accepts wastes in rail tank cars. The tank cars are positioned northwest of the Main Treatment Building. The railroad car spur was designed and installed to provide secondary containment for possible leaks that may occur during the rail cars loading/unloading process. The soils directly under the rail tracks were excavated and the excavation is lined with a 80 mil polyvinyl chloride (PVC) liner, backfilled with stone ballast and a series of metal collections pans installed to capture any leakage. The collection pans are sloped to cross drains, which slope to a collection under-drain system which will drain into the lined spill containment structure.

In addition to the structures described above, the facility contains a number of waste and reagent unloading areas adjacent to the described structures. All unloading areas are located in the concrete roadway described, at locations not to restrict traffic flow patterns. The unloading areas are within the engineered spill containment and collection system.

J-6b Definition of Failure

While many precautions have been implemented within the existing systems to prevent the release of hazardous wastes into the environment, such as the design of processing and containment structures, as well as the training of employees in handling these wastes, the potential for system failure does exist as it does for any system. A failure in the existing system would be defined as a release of hazardous waste or hazardous waste constituents into the environment due to:

1. A leak or spill of hazardous waste during waste handling;
2. A leak or spill of hazardous waste during waste processing;
3. A leak or spill of hazardous waste during waste storage;
4. A leak or spill of hazardous waste during waste transportation;
5. A chemical reaction between a hazardous waste and an incompatible material;
6. Power outages, failure of electrical equipment or failure of mechanical equipment;
7. Inadequate storage space for wastes;
8. The inability to identify a facility to accept wastes for treatment/disposal;
9. The acceptance of restricted wastes; and
10. Fire, explosion, and extreme weather.

J-6c Possible Causes of Failure

The possible causes of system failure that could result in the release of hazardous waste or hazardous waste constituents into the environment of each of the failures defined above are summarized as follows:

1. Leakage or spillage of waste could be caused by:
    a. Leakage from tank trucks or drums during loading or unloading;
    b. Leakage from the secondary containment structures, transfer pipes, piping or valves;
    c. Leakage from waste storage tanks;
    d. Leakage from waste processing reactors;
    e. Leaks from drums in storage; and
    f. Overfilling of storage/processing tanks or drums.
2. Each of these failures could potentially cause contamination of soil or groundwater only if the secondary containment system also failed at the same time. Possible causes of failure of the secondary containment system are:
    a. Physical damage to the secondary containment structures;
    b. Contact of containment structure with wastes that affect the integrity of the structure;
    c. Inadequate capacity of the secondary containment to store the volume of wastes leaked or spilled; and
    d. A loss of containment volume due to the presence of water, wastes soil or other material in the containment area.

    A large spill or leak combined with a failure of secondary containment could result in wastes flowing from the site and into nearby storm sewers. This could contaminate the sewage and storm water. This combination of events is highly unlikely.
3. Incompatible chemical reactions between wastes or wastes and their containers could be caused by:
    a. The mixing of incompatible wastes in a tank or drum;
    b. The mixing of incompatible wastes that have leaked or spilled;
    c. The addition of waste to a container containing a residue of and incompatible waste; and
    d. The addition of a waste to a container that is incompatible with the waste.
4. Power outages, failure of electrical equipment, or failure of mechanical equipment could be caused by:
    a. Damage to the equipment;
    b. Inadequate maintenance;

c. A power failure outside of the facility;

d. Defective equipment supplied by the manufacturer; and

e. Improper use or installation of equipment.

5. Inadequate storage space for wastes could be caused by:

   a. The failure to locate and transfer wastes to treatment/disposal facilities on schedule; and

   b. The acceptance of wastes at the facility for which proper storage is not available.

6. Inability to identify a facility that will accept wastes to be transferred could be caused by:

   a. Acceptance of a waste before a facility that will accept it has been identified;

   b. Rendering a waste unacceptable through unintentional mixing as the result of improper containment, inadequate documentation, or inadequate testing; and

   c. Facility that formerly agreed to accept a waste subsequently refusing to do so.

7. Acceptance of restricted waste could be caused by:

   a. Inadequate waste evaluation;

   b. Inadequate screening and fingerprint analysis; and

   c. Incorrect identification of a waste by a generator.

8. Fire or explosion due to improper processing. The risk of fire or explosion due to the improper storage methods is virtually non-existent. There are very clearly defined proper storage procedures for the material and containers stored at the site. EQD is committed to complying with these requirements. Inspections are conducted daily to ensure proper storage procedures being adhered to. EQD is also required to follow these procedures as a requirement of their facility liability insurance.

J-6d Detection of Failure

Failure of waste storage containers or tanks, containment systems, pumping, piping and management systems will readily be detected by careful observations, regular and routine inspection and testing of equipment and waste handling procedures, communication with disposal facilities for wastes being transferred, and screening of shipments by plant personnel. Facility inspections include observation of waste storage container conditions, any structural deterioration, container spacing and labeling, waste quantities, equipment operation, containment system integrity and any potential problems that may lead to system failure. Plant personnel are also instructed to check for any leaks or spills of stored material and to immediately initiate appropriate response

procedures when such a release has been detected. All inspections are guided by an inspection schedule and are recorded on inspection logs (see **Section 0**).

J-6d(i) Leaks and Spills

This failure mode will be obvious if it occurs and will be immediately detected by facility personnel. Incoming tank trucks are unloaded by trained personnel and will be continuously observed by facility personnel.

Any leaks or spills from the tanker or hoses connected to receiving tanks will be immediately evident. Regularly conducted inspections will detect any leaks or spills.

Groundwater underneath the EQD site is free of contaminants. For a complete discussion of the current site groundwater monitoring status, refer to **Appendix E-3** (Hydrogeological Investigations Summary).

J-6d(ii) Incompatible Reactions

The possibility of mixing incompatible wastes is minimized by the use of procedures for identifying and accepting wastes. Incompatible reactions will be easily observed by trained facility personnel who will take prompt action in accordance with EQD's Prevention Plan (**Section F**) and Contingency Plan (**Section G**) of this Permit Application.

J-6d(iii) Power Outages and Equipment Failure

Power outages at the facility will be detected immediately since all equipment and lights operate on electricity. Any pumps in use would cease operating in the event of loss of power. In this way, the transfer, overfilling or releases of waste material will be stopped by loss of power. Failure of mechanical or electrical equipment will also be detected immediately if the equipment stops working completely, delivers reduced power or emits false signals (in the case of pump controls and meters) Regular inspection and testing of critical equipment will detect potential equipment failure.

J-6d(iv) Inadequate Storage

Inadequate storage at EQD will be detected by regular inspections and inventory of wastes.

J-6d(v) Inability to Transfer Wastes

Inability to transfer wastes to treatment/disposal facilities will be detected by refusal of facilities to accept wastes.

J-6d(vi) Potential Acceptance of Restricted Wastes

Acceptance of restricted wastes will be detected and prevented by proper waste evaluation and shipping screening as described in **Section C**, the Waste Analysis Plan.

J-6e Environmental Effects of Failure

The potential environmental effects of failure will be separated into those effects confined on-site and those effects that may have consequences off-site.

The potential environmental effects on-site at EQD as a result of a release of hazardous wastes or hazardous waste constituents will be the degradation of groundwater quality and the exposure of employees with the release either in the form of a surface leak or spill or a toxic gas emitted from the chemical reaction of incompatible materials.

The effects of a failure that would degrade air quality will be dependent upon the type of failure, the magnitude of the failure, and the type of material lost to the atmosphere from this failure. A failure mode for the container storage and/or processing areas that could affect air quality will be the corrosion of a container, a puncture to the container, a release of the container's contents, or improperly covering the container during storage. The container storage areas at EQD allow the natural movement of air so that concentrations of vapors do not build up.

The complete failure of the containers and the container storage and/or processing areas at EQD may result in localized but temporary degradation of air quality.

EQD accepts hazardous and non-hazardous wastes from various generators in liquid and solid forms.

Solids are directed to chemical fixation in the presence of lime and CKD at pH ranges that are well within the alkaline range (pH=9-12.4 su). The release of any toxic gases such as cyanides, sulfide and/or chlorine is not possible due to the stability of the above three liquids in an alkaline medium. Furthermore, the whole building is under negative pressure and vented with 180,000 CFM through the Chemical Fixation Building Air Pollution Control System (**Sheet M-25)**.

Liquid wastes are directed to the acid tanks, where acids are bulked for transshipment. The tanks are pumped through a scrubber system that neutralizes any acidic vapors that may be generated during the bulking operation. Should any release occur, then the exhaust fan will cause an at least 100 time dilution to lower the concentration in air to a level below the TLV values.

Potential off-site environmental effects from systems failure may be described as either localized, affecting nearby neighborhoods; or as more regional impacts where the effects span a larger distance beyond the EQD site. Potential localized environmental effects from system failure may include the contamination of exposed solids from the runoff of a spill or leak, the degradation of groundwater quality, damage to vegetation or wildlife, and exposure of nearby residents and industries to a toxic gas release. More distant environmental effects may be to surface waters where a spill or release enters the combination sanitary sewer/storm drain.

Many of these potential environmental effects presupposes a "worst case" scenario where the system experiences a complete failure and large quantities of hazardous wastes have been involved. Under the most probable failure situation, any potential environmental effects will be confined on-site, easily managed and result in minimal effects to the environment on-site, locally or regionally.

J-6f Possible Corrective Actions in the Event of Failure

If a failure of the system has occurred, the following summarized corrective actions would be undertaken as detailed in the Contingency Plan (**Section G**) that has been prepared by EQD. This plan describes the procedures that will be followed in the event of an emergency situation such as fire, explosion, tornados, severe weather, or any unplanned sudden or non-sudden release of hazardous materials to the air or surface water at the facility.

1. The discoverer of an emergency situation contacts the Emergency Coordinator. A determination is made whether the situation is an imminent or actual emergency. All facility personnel and appropriate Federal, State and local agencies will be notified.
2. The character, source, amount and extent of released material will be identified. Any potential hazard to human health or the environment associated with this release will be assessed. Evacuation will be initiated, if necessary. Any materials that may be reactive with the release will be removed from the area.
3. For a fire and/or explosion, efforts will be made to prevent the fire from spreading to nearby areas. Spills of flammable material will be contained through the use of chemical absorbents. Flushing the area with large quantities of water or applying foam to the spill will be performed, if indicated.
4. In the event of a leak or a spill, standing liquids will be transferred to a containment system or tank. If beyond in-house capabilities, a contractor will be called to remove standing liquids within the containment system and transport the spilled materials to an approved facility or transfer the material into another approved tank or container on-site. Small spills or leaks will be flushed to the sump, and a pump will be used to retrieve the diluted waste material. Absorbent material may also be used. Spills or leaks that are not contained will be isolated, appropriately recovered and disposed. Though the entire EQD storage areas are poured concrete flooring, if soils are involved, excavation of affected soils may be necessary.
5. If the spill or leak results in the formation and release of a toxic vapor cloud, and assessment will be made of what areas may be impacted and should be evacuated.
6. Actions will be undertaken to prevent the recurrence of fire, explosion or release, including shutting down processes and operations, the collection and containment of released material and the recovery or isolation of containers. Valves, pipes and other equipment will be monitored prior to start up for leaks, pressure build-up, gas generation or ruptures.
7. Arrangements will be made for the treatment, storage or disposal of recovered or contaminated materials. These materials will be properly stored at EQD until they can be properly removed.

All of these actions will be undertaken to correct any hazard that may result from the release of hazardous waste constituents.

J-6g Actions to Minimize the Possibility of Failure and Adverse Impacts of Failure

The following procedures, structures and equipment have been established to minimize the possibility of failure and any adverse impacts resulting from a failure of the system:

J-6g(i) Reaction of Incompatible Wastes

On of the reasons for establishing six separate hazardous waste storage and/or processing areas at EQD is to keep incompatible wastes separate from each other. The possibility of mixing incompatible wastes is minimized by the use of procedures for identifying and accepting wastes for processing. Employees are trained to prevent the mixing of incompatible wastes. In addition, any incompatible reactions will be observed by trained personnel who will take prompt action

J-6g(ii) Hazards During Unloading Operations

A trained employee familiar with waste loading and unloading operations will be available to observe and control waste loading and unloading activities. Every precaution will be taken to assure that these materials are handled properly.

Areas where hazardous wastes are loaded/unloaded have been designed and constructed to contain any spills/leaks and to prevent the release of any materials. Features include concrete curbs, imperviously coated container storage and tank storage surfaces, sloping floors to accommodate access by forklift trucks and to control the direction of flow, and plugged drains with blind trenches and sumps. Spill response materials are readily available to minimize any potentially adverse effects of a release during waste loading/unloading operations.

J-6g(III) Run-off From Waste Handling Areas to Other Areas

The runoff of accumulated water within the waste handling, processing and storage areas will be managed through facility design, such as the installation of impervious surfaces, sloping floors, secondary containment structures, blind trenches and sumps and a roof to prevent precipitation from accumulating in these areas. Regular inspections of these areas will identify where runoff may present a problem.

J-6g(iv) Contamination of Water Supplies

Because water for the City of Detroit is supplied by the Detroit River and there are no recorded potable water wells in use within a 1.5 mile radius of EQD, the probability of water supplies becoming contaminated from the failure of the system would be considered negligible. However, the actions that have been established to minimize the possibility of failure and other adverse impact, would also effectively prevent the contamination of any water supplies if they were present.

J-6g((v) Effects of Equipment Failure and Power Outages

In the event of equipment failure or power outage, the pumps will cease to be operated. The high level alarms on the tanks will not be operable, but since the pumps will not be able to load any material into the tanks, this will not present a problem. Equipment

failure or power outages will not result in the discharge of any hazardous waste material.

J-6g(vi) Exposure of Personnel to Hazardous Wastes

All employees that handle hazardous wastes have been trained in procedures that will minimize their potential exposure. The use of personal protective equipment is covered under training programs, as is the safe and proper handling, storage and processing of hazardous wastes. Employees are also instructed on the hazardous nature of these wastes and what procedures should be followed during an emergency. Both classroom and on-the-job instruction are included in the training program (see **Section H**: **Personnel Training**) which is reviewed and updated annually.

During an emergency, all personnel not essential to the response activities would be evacuated to prevent their exposure to any released hazardous wastes or hazardous waste constituents. Evacuation routes have been established. Personnel will be allowed to return to the area, once the area has been cleaned and it has been determined that it is safe to return the area to normal operations. For more detailed information see **Section G: Contingency Plan**.

The effects of any failure on employee health and on public health will depend on the type of material lost during failure, the concentration of the material, the exposure routes, and the duration of human contact. Employees at EQD are the most likely population that could be exposed to the wastes.

Losses of dilute acidic or alkaline solutions or more concentrated reagents could pose a threat to employee or public health upon direct contact. The leakage or spillage of corrosive materials, either acidic or alkaline, could cause acute symptoms ranging from tissue irritation to chemical burns on exposed skin or other tissue. Inhalation of acidic fumes or vapors could result in inflammation of the nose, throat or larynx.

A massive spill of any liquid material could produce a spray of material as the spilled material contacted a hard surface, such as the concrete containment structure. The spray would be of short duration, and its health effect would be dependent upon individuals present in the spray area, the type of material sprayed, and the barrier provided by clothing or personal protective equipment. Contact with sprays, which may be produced in the event of a massive spill, could cause those employees in the immediate vicinity of the spilled material to be exposed by both tissue contact and inhalation of small quantities of the material. There is no reason to believe that public health would be affected beyond the boundaries of this facility. Vapors released from a massive spill would be quickly diluted and dispersed in the atmosphere. Power outages or mechanical or equipment failure are not expected to cause adverse effects to employee or public health from the storage of containerized wastes.

J-6g(vii) Effects of Tornados or Other Severe Storms

Whenever weather conditions indicate the potential for severe weather, EQD personnel will inspect and secure the container storage areas to minimize the effect of heavy precipitation or heavy winds on these areas. The container storage areas have been designed and constructed to withstand most severe storms anticipated to be

encountered and to prevent the release of hazardous wastes during storm events. Employees will be evacuated from the facility or sheltered during a tornado warning to minimize any injuries from the storm. EQD has adopted procedures and provided structures as needed. The mitigation procedures for hazardous waste released during a catastrophic event, such as a direct hit by a tornado, have been installed by EQD in the best anticipated manner for an unpredictable and low probability situation.

J-6g(viii) Air Quality Impact

A preliminary screening analysis of the air quality impact of two, worst case, accidental releases was performed by Tetra Tech EM, Inc. using US EPA “T-Screen” Model. The results show that the predicted maximum air quality impact from these two release scenarios are well below a harmful level fro both H_2S and HCN. The results of these two scenarios are provided in **Appendix J-2**.

Figure J- 1: Glacial Surface Geology Map

Figure J- 2: Glacial Drift Thickness Map

Figure J- 3: Bedrock Formation Map

Figure J- 4: Bedrock Surface Map

Figure J- 5: Thickness Lithofacies Map of Dundee Formation

Figure J- 6: Thickness Lithofacies Map of Traverse Formation

Figure J- 7: Thickness % Shale Map of Traverse Group

Table J- 1: Summary of Anticipated Environmental Impact

Appendix J- 1: Evaluation of Releases