

ATTACHMENT 9

TANK SYSTEMS

GLOSSARY

Effective April 22, 2019, the Michigan Department of Environmental Quality (DEQ), Waste Management and Radiological Protection Division (WMRPD), became the Michigan Department of Environment, Great Lakes, and Energy (EGLE), Materials Management Division (MMD).

40 CFR	Title 40 of the Code of Federal Regulations
ABR	Adopted by reference
Act 207	Michigan Fire Protection Act, PA 207, as amended
Act 451	Natural Resources and Environmental Protection Act, 1994 PA 451, as amended
Dynecol	former name of facility, now known as US Ecology Detroit North, Inc US Ecology Michigan?
EPA	United States Environmental Protection Agency
HWSA	Hazardous and Solid Waste Amendments of 1984
Part 111	Part 111, Hazardous Waste Management, of Act 451
Part 111 Rules	Administrative rules promulgated pursuant to Part 111, Hazardous Waste Management, of Act 451
R	Rule (example: R 299.9504)

FORM EQP5111 ATTACHMENT TEMPLATE MODULE C2

FACILITY-SPECIFIC INFORMATION: TANK SYSTEMS

The Administrative Rules for Part 111, Hazardous Waste Management, of the Michigan Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451) Rule 299.9615 of Act 451; R 29.4101 to R 29.4505 pursuant to the provisions of the Michigan Fire Protection Act, PA 207, as amended (Act 207) ; and Title 40 of the Code of Federal Regulations (40 CFR) 270.14(d), 270.16, 270.24, 270.27, Part 264, Subpart J and 40 CFR Part 60, Appendix A, which are adopted by reference (ABR) in R 299.11003, establish requirements for tank systems.

This license application module addresses requirements for tank systems at the *Dynecol, Inc.* facility in Detroit, Michigan. This module includes assessments of new and existing tank systems; installation of new tank systems; secondary containment systems and release detection; variances for secondary containment; controls and practices to prevent spills and overfills; inspections; response to leaks or spills and disposition of leaking or unfit-for-use tank systems; closure and post-closure requirements; requirements for storing or treating ignitable, reactive, or incompatible wastes

This module is organized as follows:

(Check as appropriate)

- ☒ Existing Tank System
☐ New Tank System

This module is organized as follows:

C2.A Assessment of Existing Tank System

- C2.A(1) Design Standards
- C2.A(2) Dimensions and Capacity of Each Tank
- C2.A(3) Description of Feed Systems, Safety Cutoff, Bypass System, and Pressure Controls
- C2.A(4) Diagram of Piping, Instrumentation, and Process Flow
- C2.A(5) Characteristics of Waste
- C2.A(6) Existing Corrosion Protection Measures
- C2.A(7) Documented Age of Tank System

- C2.A(8) Leak Tests, Inspections, and Other Examinations
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- C2.B Assessment of New Tank System
- C2.C Installation of New Tank Systems
- C2.D Secondary Containment Systems and Release Detection
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 - C2.F(3) Freeboard Maintenance
- C2.G Inspections
 - C2.G(1) Schedule and Procedures for Overfill Control System Inspections
 - C2.G(2) Daily Inspections of Aboveground Portions of Tank Systems and

Monitoring and Leak Detection Data

- C2.G(3) Daily Inspection of Construction Materials, Local Areas, and Secondary Containment System for Erosion and Leakage
- C2.G(4) Inspection of Cathodic Protection Systems
- C2.G(5) Inspection Requirements before Full Secondary Containment is Provided
- C2.G(6) Reporting Requirements
- C2.H Response to Leaks or Spills and Disposition of Leaking or Unfit-for-use Tank Systems
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 - C2.J(3) Incompatible Wastes

C2.A ASSESSMENT OF EXISTING TANK SYSTEM

{R 299.9615 (1) and Title 40 of the Code of Federal Regulations (40 CFR) 264 Subpart J, which are ABR in R 299.11003}

C2.A(1) Design Standards

{R 299.9615 (1) and 40 CFR 264.191 (b)(1)}

All tanks on the Dynecol facility have secondary containment that meets the requirements of 40 CFR 264.193. See Appendices C2-1 and C2-4.

C2.A(1)(a) Description of regulated tanks

Tanks #1, #2, #3, and #4 are 20,000 gallon tanks measuring 12 feet high with a 12-foot diameter and are used for primary treatment of hazardous wastes

Tanks #7* and #10 are vertical FRP tanks with capacities of 10,000 and 12,000 gallons, respectively. Tank #7* measures seventeen feet high with a ten-foot diameter. Tank #10 measures 14 feet high with a 12-foot diameter. These tanks are used for used for storage of hazardous wastes.

*Tank Seven clean closed on 1/14/2020.

Tanks #18, #19, #20, and #21 are each 20,000-gallon tanks measuring 22 feet high with a 12-foot diameter and are used for secondary treatment of hazardous waste.

Tanks #30 and #31 are 15,000-gallon each steel tanks measuring 22 feet high and 10 feet in diameter. These tanks are used to store effluent from the treatment process before polishing.

Tanks #34 and #35 are each 30,000-gallon cone bottom FRP tanks measuring 35 feet high and 14 feet in diameter. These tanks are used to store effluent from the treatment process before polishing.

Tank #36 is a 1000-gallon dish top and bottom Fiberglass tank measuring 5 feet in diameter and approximately 7 feet high. This tank is used to store flocculated sludge from the effluent polishing system.

Tanks #37 and #38 are each 30,000-gallon cone bottom FRP tanks measuring 35 feet high and 14 feet in diameter. These tanks are used to store effluent after polishing.

Dynecol proposes to increase the hazardous waste storage capacity in the existing Treatment Facility. The proposed tanks include the following:

- Tank #11 - 20,000 gallons (currently out of service)
- Tank #27 - 20,000 gallons cone bottom tank made of reinforced fiberglass plastic (FRP) (converted to hazardous waste storage 7/24/2020)
- Tanks #32 & #33 - 5,500 gallons each
- Tanks #12, 13, 16 & 17 - 25,800 gallons each vertical FRP tanks measuring 35 feet high with an 11-foot diameter.

Dynecol also proposes to convert the existing non-hazardous treatment and storage building

(Building 4) for the treatment and storage of hazardous waste. The proposed hazardous waste storage and treatment will be conducted in an enclosed 20,250 square foot building within three in-ground concrete steel lined stabilization/processing pits totaling approximately 90,000 gallons. The process pits are constructed of 24-inch thick reinforced concrete with a $\frac{3}{4}$ -inch plate steel liner. Waste incompatible with the materials of construction of a process pit are not placed in process pits by Dynecol. Compatibility is determined as outlined in the WAP.

The process pits in Building 4 have secondary containment that meets the requirements of 40 CFR 264, Subpart J. Each of the process pits is adequately designed and has sufficient structural strength and compatibility with waste(s) to be stored or treated, to ensure that it will not collapse, rupture or fail. The process pits are constructed of 24-inch thick reinforced concrete with a $\frac{3}{4}$ -inch plate steel liner. The existing steel liner will be overlaid by another steel liner and will serve as secondary containment. The pits are designed to allow for monitoring in the void between the concrete and the plated vessel to detect any free liquids accumulating in the interstitial space and may be used to remove such liquid. Liquid collected in the secondary containment are properly managed in accordance with applicable regulations. If liquid materials are detected in the secondary containment, the accumulated liquid materials will be characterized based on materials present in the Subpart J mixing tank or the material itself. Liquid accumulated in the secondary containment structure is removed within 24 hours, or in as timely manner as is possible.

C2.A(1)(b) Description of other non-regulated tanks

Tanks #9 and #15 are each 27,600-gallon steel tanks and are typically used to store liquid sodium hydroxide or liquid potassium hydroxide or any other alkaline reagents prior to use in the waste treatment process. These tanks measure 24 feet high by 14 feet in diameter.

Tank #14 is a 14,000-gallon steel tank, typically used to store lime slurry prior to use in the waste treatment process. The tank measures 12 feet high by 14 feet in diameter.

Tank #22 is a 1,000-gallon vertical FRP tank measuring eleven feet, six inches high, with a four-foot diameter and possessing an overflow nozzle. This tank is located in the lower level of the filter press building and is typically used as a mild acid cleaning solution holding tank for the filter presses.

Tank #23 is a 6,000-gallon tank and is typically used to store lime slurry. It measures 16 feet high, with an 8-foot diameter.

Tank #24 is a 6,000-gallon carbon steel tank measuring 16 feet high with an 8-foot diameter. It is typically used as a holding tank for sodium hydroxide used in the scrubber.

Tanks #25 and #26 are each vertical 50,000-gallon carbon steel tanks measuring 60 feet high with a 12-foot diameter and a cone bottom. The tanks are used to store dry lime or other reagents.

Tank #28 is a 1,900-gallon stainless steel tank located in the CMF used to store non-hazardous wastes.

C2.A(1)(c) Hazardous Waste Treatment Operations

The waste treatment processes undertaken at Dynecol in the commercial waste water treatment plant include primary treatment, secondary treatment, solids de-watering, carbon adsorption, and effluent polishing. These treatment processes result in the detoxification of the water contained in the initial solutions, stabilization of toxic constituents, and the fixation of the constituents into a solid mass that is reduced in volume and is safer to handle and properly dispose of. The following discussion describes the handling procedures for hazardous wastes that are stored and processed in tanks at the Dynecol facility.

C2.A(1)(d) Delivery and Receipt of Materials

Hazardous wastes are delivered to the treatment and container storage areas in bulk trailers and containers. Vehicles arriving at the facility are unloaded only within designated areas in the plant which are provided with spill control structures and equipment to contain spills or leaks. Prior to unloading a shipment of hazardous waste, the accompanying manifest and land disposal restriction notification are inspected. A sample of the tankers' or containers' content is fingerprinted to verify that the waste received is the same as described on both the accompanying manifest and the waste characterization report on file at the facility, see Module A3. The contents of the tanker are either removed by pressurization of the tanker with air or by a pump system. Containers are unloaded with fork lifts and drum handlers.

C2.A(1)(e) Storage of Hazardous Wastes Prior to Treatment

Currently, in the commercial waste water treatment plant, two storage vessels, designed for hazardous wastes, may receive the incoming waste material. The storage vessels, identified as tanks #7(clean closed on 1/14/2020) and #10, can be used to store hazardous waste until a primary treatment vessel becomes available to process the waste. This occurs within less than 24-hours, normally. Additionally Dynecol proposes to increase hazardous waste storage capacity in the existing Treatment Facility by 154,200 gallons. These vertical FRP tanks have the following capacities:

- Tank #11 - 20,000 gallons (currently out of service)
- Tank #27 - 20,000 gallons(converted to hazardous waste storage 7/24/2020)
- Tanks #32 & #33 - 5,500 gallons each
- Tanks #12, 13, 16 & 17 - 25,800 gallons each

C2.A(1)(f) General Description of Treatment Methods

C2.A(1)(f)(i) Primary Treatment

Primary treatment processes are batch rather than continuous, and typically entail chemical oxidation, chemical reduction, adsorption, co-precipitation initiation, and neutralization. Chemical oxidation can be achieved either through air injection at a pressure point of 30 pounds per square inch (psi) or through the addition of chemical reagents and proper agitation with air sparger/mechanical mixer.

Chemical reduction is required whenever hexavalent chromium is present in a waste

stream. Wastes containing hexavalent chromium are first processed to chemically reduce the hexavalent state to a trivalent one. Hexavalent chromium, when placed in an aqueous solution containing excess acid and ferrous iron or sodium bisulfite, is reduced to the trivalent oxidation state. The trivalent chromium can then be readily precipitated in the secondary treatment process.

Organic adsorption can be performed through the addition of powdered activated carbon to the treatment vessel. Adsorption is a relatively rapid process when conducted under a strong mixing condition, i.e, air sparging or mechanical agitation.

Chemical co-precipitation of toxic metals during the secondary treatment process can be initiated, if necessary, during the primary treatment process by the addition of recycled/reused reagents such as ferrous sulfate, ferrous chloride, or ferric chloride to the waste stream being processed.

Oxidation/reduction/adsorption can then be followed by neutralization in the primary treatment process. Acidic solutions are treated with various alkaline solutions, such as sodium hydroxide solution or lime slurry, to a pH of about 5.

The primary treatment procedures are typically as follows:

- Pumping treatment reagents to a designated process vessel;
- Agitating the waste and reagent mixture using sparger/mechanical agitator which is provided for each vessel;
- Providing adequate retention time to allow the reaction mixture to equalize at pH of +/- 5.0.

C2.A(1)(f)(ii) Secondary Treatment

The secondary treatment processes are batch rather than continuous, and normally include neutralization, chemical precipitation, flocculation, detoxification, clarification, sedimentation, chemical fixation, and lime stabilization. Treatment reagents used in the secondary treatment step include lime slurry or other alkaline solutions. This process detoxifies the original solution by removing the toxic heavy metals from the liquid phase, and stabilizing them in a solid phase.

The secondary treatment process is carried out by the addition of lime slurry or other alkaline solutions, and by thoroughly agitating the waste and reagent mixture with mechanical mixers which are present on the vessel. The process is concluded when the appropriate pH is obtained to precipitate the inorganic constituent.

The lime or alkaline solutions that are added during the secondary treatment processes react with the heavy metals to form metal hydroxides, which are insoluble and will then precipitate from solution. Once precipitated, the heavy metals are no longer dissolved in the aqueous phase, and the liquid portion is detoxified. The precipitated heavy metal hydroxide are encapsulated and chemically fixed in a matrix of excess lime, iron hydroxide and other inert, non-hazardous solid materials. The excess lime, which will remain in the solid state through subsequent processing and disposal, will stabilize the resulting de-watered sludge.

Iron salts introduced, if necessary, during the primary treatment process in the form of either ferrous sulfate or ferrous/ferric chloride can facilitate co-precipitation of certain heavy metals during the secondary treatment process. These iron salts can also enhance the chemical fixation of the toxic metals and act as the primary flocculent for sludge conditioning/de-watering.

C2.A(1)(f)(iii) De-watering

In the final step of processing, treated wastes from the secondary treatment process are de-watered and fixed by pressure filtration. Pressure filtration compresses the material into a solid mass, which typically contains about 40-60% solids. In this final form, the toxic components which were present in the initial solutions are tightly bound in the solid mass. The stabilized, fixated, and de-watered solids resist leaching of toxic heavy metals and organics from the solid mass during acid extraction testing. Prior to disposal of the de-watered solids off-site, the solids are periodically sampled and tested for hazardous waste characteristics (see Modules A2 and A3)

There are two recessed chamber filter presses (A and B) on site for the de-watering of characteristic/listed wastes. Each filter press has a processing capacity of about 167 cubic feet of de-watered sludge per cycle. A third filter press (C) that has a processing capacity of 100 cu ft per cycle and is normally used to de-water the Other Listed Wastes can also be used to de-water listed-filter cake-generating characteristic wastes and the listed wastes (except K062). These presses are located on the second floor of a two-story building, with the first floor used to receive solid transport vehicles. A pre-coat system can be used for any of the filter presses by the injection of a solution of diatomaceous earth, activated carbon or other pre-coat material at the beginning of the de-watering operation.

The de-watering and filtration process is carried out in batches staggered among any of the filter presses. After the secondary treatment is complete, the treated waste is pumped into a filter press by means of air diaphragm pumps. The completion of the filtration cycle is indicated by the feed pump discharge whenever a pressure of about 90-psi is reached and no more liquid can be pumped. The filter press is then opened, and de-watered sludge is allowed to fall into the solid transport vehicle located directly below each filter. The de-watered sludge is recycled or shipped to an appropriate landfill for ultimate disposal in accordance with all provisions of 40 CFR 268.

The solid transport vehicle area below the filter presses is cleaned daily and additionally as necessary to prevent the track-out of sludges. Wash waters are collected in the sump and reprocessed through the treatment system.

C2.A(1)(f)(iv) Effluent Management

Treated effluent from the de-watering process is discharged to the Detroit wastewater treatment facility in accordance with discharge permit requirements. This effluent is exempt from hazardous waste regulations under the domestic sewage exclusion in 40 CFR 261.4.

Treated effluent from the filter press may be subjected to carbon adsorption. This can be performed by routing effluent from either tank #30 or #31 through a system composed of an in-line filter and two 1,000-pound carbon vessels in parallel.

Treated effluent from the filter press may be subjected to effluent polishing. This can be performed by routing effluent from either tanks #30 or #31 through a system composed of holding tanks, a dissolved air flotation device, and a sand filter. Tanks #34 and #35 are used to hold effluent during quality control testing. When testing is complete, the effluent is sent to a dissolved air flotation device where the effluent polishing process will be conducted in three stages. In the first stage, the pH of the wastewater is adjusted using aluminum sulfate that will be injected into the DAF unit with an automatic pH control system to a desired pH range. After the pH is adjusted polymers will be injected into a plug-flow-reactor type pipe flocculator. These chemicals remove soluble metals and cause the precipitated metals to agglomerate in a dense floc. Dissolved air is then injected at precise points to the system so that micro air bubbles force the flocculated material to the surface, where it is skimmed off and pumped into a collection tank (Tank #36). The sludge will be routed back to the filter presses for de-watering and ultimately disposed of in either a hazardous or a solid waste landfill, in compliance with the provisions defined in 40 CFR 268. Polished effluent is collected in two retention tanks (#'s 37 and 38) and for final quality control before being discharged to the City of Detroit Sanitary Sewer System in accordance with the requirements of Dynecol's Wastewater Discharge Permit.

The effluent polishing system is located in the area between the current Container Management Facility and the Maintenance Garage as seen on the site plan as shown on the site plan. (See Figure A1-4).

C2.A(1)(f)(v) Procedures for characteristic/listed wastes

The treatment procedures for characteristic wastes (corrosives, TCLP metals, TCLP organics, and listed wastes – see Table A2-1) are as follows:

- After fingerprint verification, the hazardous wastes are transferred into one of four 20,000-gallon primary treatment vessels. Air emissions from these tanks are vented through a control system.
- The wastes will then be typically subjected to primary treatment and secondary treatment processes, as described above.
- After secondary treatment, the treated waste is de-watered through one of the three filter presses, i.e, A through C, as appropriate under other permit conditions.
- In case of listed waste (see Table A2-1), proper decontamination of process tankage and equipment used in the treatment will be performed by running a non-listed or non-listed filter cake-generating waste through all tankage, piping, de-watering equipment (Press A or B), and effluent polishing equipment. De-watered solids from the decontamination processes are collected and handled in the same manner as the solids from the wastes that originated the decontamination requirement.

C2.A(1)(f)(vi) Air Emission Control Systems

Dynecol has installed and operates air control systems for all treatment and storage tanks in compliance with current Michigan Department of Environmental Quality – Air Quality Division permits.

The current processes permitted for the treatment of hazardous waste at Dynecol do not include any processed identified in 40 CFR 264.1030. Specifically, the air sparging of hazardous waste that occurs in the Primary treatment system is designed only to maintain a homogenous solution within the tank. All organic wastes are treated through chemical reactions or physical treatment as defined above.

C2.A(1)(f)(vii) Subpart J Regulated Waste Treatment Technologies

Building 4, the proposed hazardous waste storage and treatment will be conducted in an enclosed 20,250 square foot building within three in-ground concrete stabilization/processing pits totaling approximately 90,000 gallons. These process pits have secondary containment that meets the requirements of 40 CFR 264, Subpart J. The hazardous wastes received for treatment are characteristic wastes and listed hazardous wastes. These wastes are delivered to the Stabilization Facility in containers and bulk shipment. Other materials that are handled at this facility include non-hazardous industrial wastes and recycled materials which are used as effective substitutes for commercial chemical products.

Dynecol will utilize several different treatment technologies in order to meet the applicable land disposal restriction (LDR) or other standard as applicable. Dynecol utilizes the term “stabilization” throughout this document in a generic sense to mean the treatment of a waste material to make it physically and chemically stable. In this sense, it consists of those processes, which make the material pass applicable LDR standards or other applicable standard(s).

In this process, waste will be treated to meet land disposal restrictions (e.g., elimination of free liquids, chemical and/or physical stabilization to remove or immobilize hazardous constituents, etc) or to meet other appropriate requirements (e.g., permit or regulatory requirements). 40 CFR §268.42 provides specific definitions for several potentially distinct treatment technologies including Stabilization, Chemical Oxidation, Chemical Reduction, Deactivation, Neutralization, Adsorption, and Precipitation. Although the above treatment technologies may be considered distinct processes, the stabilization process is defined in the more generic sense due to the overlap of the associated treatment technologies and methods.

Pre-treatment analyses will consist of tests necessary to insure the wastes can be treated to meet the applicable treatment requirement. In-process analyses are generally not required.

Post-treatment analyses will be performed, as necessary, to ensure restricted wastes meet applicable treatment standards. Treatment will be performed to meet EPA LDR standards. Sampling, analysis verification of the treatment effectiveness and frequency of testing follows the guidelines presented in Module A3, Waste Analysis Plan.

The following technologies, defined as “stabilization” and associated documents will be

utilized by Dynecol:

Stabilization

Stabilization is defined as stabilization with the following reagents (or waste reagents) or combinations of reagents (1) Portland Cement; or (2) lime/pozzolans (e.g., fly ash and cement kiln dust) – this does not preclude the addition of reagents (e.g., iron salts, silicates, and clays) designed to enhance the set/cure time and/or compressive strength, or to overall reduce the leachability of the metal or organic. Stabilization is the treatment of appropriate waste streams by use of pozolonic materials or wastes with pozolonic properties to reduce the leachability of organic, inorganic or metals of concern. Appropriate use of this treatment technology is determined during the approval process.

Chemical Oxidation

Chemical oxidation is a treatment process targeted primarily at organic constituents, (e.g., toluene and benzene) but may be used for inorganic constituents as well (e.g., cyanides and heavy metals such as mercury). An organic or inorganic species is oxidized when its respective chemical oxidation number increases (i.e., loses electrons). The following oxidation reagents (or waste reagents) may be used in part or whole: (1) Hypochlorite (e.g. bleach); (2) chlorine; (3) chlorine dioxide; (4) ozone or UV (ultraviolet light) assisted ozone; (5) peroxides; (6) persulfates; (7) perchlorates; (8) permanganates; and/or (9) other oxidizing reagents of equivalent efficiency.

Chemical Reduction

Chemical reduction or redox occurs when the targeted component/constituent atoms change as a resultant transfer of electrons from one chemical species to another. The chemical oxidation number for the targeted components decrease (i.e., gains electrons) when the target constituents are reduced. Conversely, the reducing reagents used in this process lose electrons or become oxidized. The following reducing reagents (or waste reagents) may be used in whole or part: (1) Sulfur dioxide; (2) sodium, potassium, (salts), or other alkali salts or sulfites, bisulfites, metabisulfites and polyethylene glycols (e.g., NaPEG and KPEG); (3) sodium hydrosulfide; (4) ferrous salts; and/or (5) other reducing reagents of equivalent efficiency.

Deactivation

Deactivation is the treatment of those wastes that exhibit the characteristics of ignitability, corrosivity, and/or reactivity. Appropriate use of this treatment technology is determined during the pre-acceptance process.

Neutralization

Neutralization is a treatment process designed to render corrosive matrices non-corrosive. According to 40 CFR 268.42, the following reagents (or waste reagents) in part or whole may be used for neutralization: (1) Acids; (2) Bases; or (3) water (including wastewater's) resulting in a pH greater than 2 but less than 12.5 measured in the aqueous residuals.

Precipitation

Precipitation is the process by which regulated metals and/or inorganics are precipitated out as insoluble precipitates of oxides, hydroxides, carbonates, sulfates, chlorides, fluorides, or phosphates. This process entails adjusting the pH of the waste matrix between 9 and 11.

This pH range is ideal for hydroxide precipitation. An alternative to this common standard practice is sulfide precipitation. Sulfide precipitates are less soluble and non-amphoteric (less pH dependent than hydroxyl precipitates). However, caution must be employed to ensure hydrogen sulfide is not released at harmful levels by maintaining a pH greater than 8 throughout the treatment process. Based on 40 CFR 268.42, the following reagents (or waste reagents) are typically used alone or in combination: (1) Lime (i.e., containing oxides and/or hydroxides of calcium and/or magnesium); (2) caustic (i.e., sodium and/or potassium hydroxides); (3) soda ash (i.e., sodium carbonate); (4) sodium sulfide; (5) ferric sulfate or ferric chloride; (6) alum; or (7) sodium sulfate. Additional flocculating, coagulation or similar reagents/processes that pertain to precipitation are not precluded from use.

Adsorption

Adsorption is the use of an appropriate reagent (e.g. activated carbon or treated clay) to remove chemical components from aqueous or compressed gas waste streams. It is most commonly employed for the removal of organic compounds, although some inorganic constituents are effectively removed as well. This process is achieved through physical, chemical, and electrostatic interactions between the waste material and the adsorbent media. Pursuant with 40 CFR 268.42, Total Organic Carbon can be used as an indicator parameter for the adsorption of many organic constituents that cannot be directly analyzed in wastewater residues.

C2.A(2) Dimensions and Capacity of Each Tank

{R 299.9615 (1) and 40 CFR 270.16 (b) }

See Table C2-1.

Building 4 has three in-ground concrete steel lined stabilization/processing pits totaling approximately 90,000 gallons. The process pits are constructed of 24-inch thick reinforced concrete with a $\frac{3}{4}$ -inch plate steel liner. The process pits in Building 4 have secondary containment that meets the requirements of 40 CFR 264, Subpart J.

C2.A(3) Description of Feed Systems, Safety Cutoff, Bypass System, and Pressure Controls

{R 299.9615 (1) and 40 CFR 270.16 (c) }

C2.A(3)(a) Feed Systems

{R 299.9615 (1) and 40 CFR 270.16 (c) }

See Table C2-1, Appendix C2-5 and Appendix C2-6.

Loading and unloading operations of the process pits are constantly monitored by plant personnel to ensure against overfilling and the maintenance of adequate freeboard. Dynecol personnel will also maintain a written log of all materials received in each process pit. If the equipment personnel observe a condition which does not provide sufficient freeboard to allow proper treatment within the pits, the operator will cease mixing and remove material as necessary.

C2.A(3)(b) Safety Cutoff or Bypass Systems
{R 299.9615 (1) and 40 CFR 270.16 (c)}

See Table C2-1 and Appendix C2-5.

C2.A(3)(c) Pressure Controls
{R 299.9615 (1) and 40 CFR 270.16 (c)}

See Table C2-1.

C2.A(4) Diagram of Piping, Instrumentation, and Process Flow
{R 299.9615 (1) and 40 CFR 270.16 (c)}

See Appendix C2-5 (process flow diagrams).

C2.A(5) Characteristics of Waste
{R 299.9615 (1) and 40 CFR 264.191 (b)(2)}

See Module A2 (Chemical and Physical Analyses) and Module A3, Section 3.A(2).

C2.A(6) Existing Corrosion Protection Measures
{R 299.9615 (1) and 40 CFR 264.191 (b)(3)}

(Check as appropriate)

External corrosion protection required:

- ☐ External shell of metal tank will be in contact with soil or water.
- ☐ Any external metal components of the tank system will be in contact with soil or water.

The characteristics of tank construction and lining materials for all tanks are compatible with stored materials, treatment reagents, and hazardous wastes to reduce the effects of tank corrosion and erosion. The primary treatment tanks (#'s 1-4) are lined with either chlorobutyl or Hypalon rubber as a corrosion resistant barrier. The secondary treatment tanks (#'s 18-21) are constructed with fiberglass reinforced plastic (FRP) materials.

Building 4 has three in-ground concrete steel lined stabilization/processing pits totaling approximately 90,000 gallons. The process pits are constructed of 24-inch thick reinforced concrete with a 3/4-inch plate steel liner.

C2.A(7) Documented Age of Tank System
{R 299.9615 (1) and 40 CFR 264.191 (b)(4)}

The tanks at the facility have been installed from 1976 through 2005. See Table C2-1.

C2.A(8) Leak Tests, Inspections, and Other Examinations
{R 299.9615 (1) and 40 CFR 264.191 (b)(5)}

Leak tests are not performed. See Module A5 (Inspection Schedule) and Appendix A5-1 for inspection requirements.

C2.A(8)(a) Non-enterable Underground Tanks
{R 299.9615 (1) and 40 CFR 264.191 (b)(5)(i)}

There are no non-enterable underground tanks at the Dynecol facility.

C2.A(8)(b) Other than Non-enterable Underground Tanks and for Ancillary Equipment
{R 299.9615 (1) and 40 CFR 264.191 (b)(5)(ii)}

There are no underground tanks (non-enterable or otherwise) at the Dynecol facility.

C2.A(8)(c) Internal Inspections
{R 299.9615 (1) and 40 CFR 264.191 (b)(5)(ii)}

See Module A5 (Inspection Schedule) and Appendix A5-1.

C2.A(9) Ancillary Equipment Assessment
{R 299.9615 (1) and 40 CFR 264.191 (b)(5)(ii)}

Waste material is transferred from the primary treatment tank to a designated secondary treatment vessel. Each treatment tank has its own pipeline with fittings and valves properly labeled, and is provided with one or more of the following equipment and devices for monitoring and controlling safety cut-off during material flows: level switch, pneumatic activated valve with manual override and limit switches, manual valve, and solenoid valve. All treatment tanks are vented to an appropriate air control unit.

C2.A(10) Leaking or Unfit-for-Use Tank Systems
{R 299.9615 (1) and 40 CFR 264.191 (b)(5)(ii)}

During an inspection of the facility, if a tank holding hazardous waste is found to be in poor condition (such as apparent structural defects or evident corrosion and leakage), the hazardous waste will be transferred to another tank in good condition. If the inspection identifies an unsatisfactory condition, such as an actual release or the potential for release, remedial actions as specified in the Contingency Plan (Module A7) will be promptly implemented.

C2.A(11) Tank Labels
{R 299.9615 (5)}

The tank systems are labeled in accordance with the NFPA Standard No. 704.

C2.B ASSESSMENT OF NEW TANK SYSTEM
{R 299.9615 (1) and 40 CFR 264.192}

No new tanks have been installed at the facility since the last permit modification application was prepared and submitted.

C2.C INSTALLATION OF NEW TANK SYSTEMS
{R 299.9615 (1) and 40 CFR 264.192 (b) through (g)}

No new tanks have been installed at the facility since the last permit modification application was prepared and submitted. Dynecol proposes to increase hazardous waste storage capacity in the existing Treatment Facility by adding one new tank and converting few of the existing non-hazardous storage tanks into hazardous storage tanks.

C2.D SECONDARY CONTAINMENT SYSTEMS AND RELEASE DETECTION
{R 299.9615 (1) and 40 CFR 264.193 (a)}

C2.D(1) Secondary Containment Implementation Schedule
{R 299.9615 (1) and 40 CFR 264.193 (a)}

Secondary containment for existing tanks has been implemented in accordance with the schedule established in 40 CFR 264.193(a).

C2.D(2) Secondary Containment Type and Performance Criteria
{R 299.9615 (1) and 40 CFR 264.193 (b)}

- ☐ Liner external to the tank
- ☐ Vault
- ☐ Double-walled tank
- ☒ Device approved by the director

The following sections describe the information that is required for the designated secondary containment for the tank system:

C2.D(3) Design Parameters
{R 299.9615 (1) and 40 CFR 264.193 (c)}

Concrete dike walls completely surround the treatment and storage tanks, providing secondary containment capacity of 150% of the volume of the largest tank within the area. The three 20,000-gallon primary treatment vessels (#1, #2, #3, and #4) are located within a concrete diked structure that provides secondary containment for 100,159 gallons (five times the capacity of the largest tank). The four 20,000 gallon secondary treatment tanks

are located within a building with concrete secondary containment of 32,948 gallons, more than 150% of the volume of the largest tank. The hazardous waste storage tanks #7* and #10 and proposed additional storage tanks (#11, #12, #13, #16, #17, #27(*converted to hazardous waste storage 7/24/2020*), #32 and #33) are located in Building #2 which has concrete secondary containment capacity of 102,182 gallons, more than 150% of the capacity of the largest tank. The effluent storage tanks and the flocculant storage tanks, #34, #35, #36, #37, and #38 are located in the effluent processing area that has reinforced concrete secondary containment capacity of 33,000-gallons. These secondary containment systems are constructed of concrete and are free of cracks or gaps and sufficiently impervious and stable to contain any leaks or spills until the release is detected.

*Tank Seven clean closed on 1/14/2020.

All floor surfaces, including the secondary containment structures, are covered with a continuous chemical-resistant coating. The secondary containments are sloped to drain and remove liquids resulting from any leaks or spills. A blind sump is provided for each secondary containment structure in order to facilitate the removal of spilled or leaked material from the bay. A portable air diaphragm pump can be used, if necessary, to pump out materials in the sumps. Routine inspections of these sumps identify when a release has occurred and appropriate response procedures are then followed in removing this release from the secondary containment system.

Run-on is prevented from entering the facility by the roof and walls of the building and by the adjacent concrete areas that are sloped away from the building to direct drainage towards the site's storm sewers.

In the primary treatment tanks, a high-level sensor control activates/deactivates the solenoid control valve on the compressed air piping system. Since compressed air is typically used to off-load tanker to primary tanks, this control system will automatically prevent overfill of the primary tanks.

Secondary tanks are equipped with two high-level sensors. The first, set at about 8,250-gallon level, will automatically shut off the transfer pump from the primary tank system. A second high-level sensor will activate an audible alarm at the 17,600-gallon level. Additionally, common valves and pipes are designated so that material flows cannot cross over. An alarm will sound whenever a sequence of events is not followed during transfer.

The process pits in Building 4 have secondary containment that meets the requirements of 40 CFR 264, Subpart J. Each of the process pits is adequately designed and has sufficient structural strength and compatibility with waste(s) to be stored or treated, to ensure that it will not collapse, rupture or fail. The process pits are constructed of 24-inch thick reinforced concrete with a 3/4-inch plate steel liner. The existing steel liner will be overlaid by another steel liner and will serve as secondary containment. The pits are designed to allow for monitoring in the void between the concrete and the plated vessel to detect any free liquids accumulating in the interstitial space and may be used to remove such liquid. Liquid collected in the secondary containment are properly managed in accordance with applicable regulations. If liquid materials are detected in the secondary containment, the accumulated liquid materials will be characterized based on materials present in the Subpart J mixing tank or the material itself. Liquid accumulated in the secondary containment structure is removed within 24 hours, or in as timely manner as is possible.

C2.D(3)(a) Compatibility and Strength
{R 299.9615 (1) and 40 CFR 264.193 (c)(1)}

See Section C2.D(3), above.

C2.D(3)(b) Foundation Integrity
{R 299.9615 (1) and 40 CFR 264.193 (c)(2)}

See Section C2.D(3), above.

C2.D(3)(c) Leak Detection Capability
{R 299.9615 (1) and 40 CFR 264.193 (c)(3)}

See Section C2.D(3), above.

C2.D(3)(d) Adequate Drainage
{R 299.9615 (1) and 40 CFR 264.193 (c)(4)}

See Section C2.D(3), above.

C2.D(4) External Liner Requirements
{R 299.9615 (1) and 40 CFR 264.193 (e)(1)}

There are no external liners for the tanks at the facility.

C2.D(5) Vault systems Requirements
{R 299.9615 (1) and 40 CFR 264.193 (e)(2)}

Building 4 has three in-ground concrete steel lined stabilization/processing pits totaling approximately 90,000 gallons. The process pits are constructed of 24-inch thick reinforced concrete with a ¾-inch plate steel liner. The process pits have secondary containment that meets the requirements of 40 CFR 264, Subpart J (40 CFR 264.193).

C2.D(6) Double-walled Tank Requirements
{R 299.9615 (1) and 40 CFR 264.193 (e)(3)(i)}

There are no double-walled tanks at the facility.

C2.D(7) Ancillary Equipment with Secondary Containment
{R 299.9615 (1) and 40 CFR 264.193 (f)}

See Appendix C2-5 (Process flow diagrams).

C2.D(7)(a) Secondary Containment Type and Performance Criteria
{R 299.9615 (1) and 40 CFR 264.193 (f)}

Concrete dike walls completely surround the treatment and storage tanks, providing

secondary containment capacity of 150% of the volume of the largest tank within the area. All floor surfaces and secondary containment structures are covered with a continuous chemical-resistant coating.

The shell and lining (if relevant) of each tank are visually inspected weekly and monthly, respectively, for any signs of erosion, corrosion or leaks. The tank containment structures are also inspected daily for erosion, cracks, leaks and the pumps, piping, hoses, valves and fittings are also inspected for signs of corrosion, leaks, malfunctions or operator errors. The area immediately surrounding the tanks is inspected daily to detect signs of leakage.

Other equipment associated with the treatment and storage tanks at the facility that is routinely inspected includes electrical equipment (circuit breakers and control panels), material-handling equipment (mixers, air compressors, filter presses, silos, etc.), monitoring equipment (gauges), security equipment (fencing, gates and lighting) and safety and emergency equipment (eye washes, showers, water-supply valves, alarms, fire extinguishers, etc.). Refer to Appendix A5-2 for copy of an inspection report.

The process pits in Building 4 have secondary containment that meets the requirements of 40 CFR 264, Subpart J. Each of the process pits is adequately designed and has sufficient structural strength and compatibility with waste(s) to be stored or treated, to ensure that it will not collapse, rupture or fail. The process pits are constructed of 24-inch thick reinforced concrete with a 3/4-inch plate steel liner. The existing steel liner will be overlaid by another steel liner and will serve as secondary containment. The pits are designed to allow for monitoring in the void between the concrete and the plated vessel to detect any free liquids accumulating in the interstitial space and may be used to remove such liquid. Liquid collected in the secondary containment are properly managed in accordance with applicable regulations. If liquid materials are detected in the secondary containment, the accumulated liquid materials will be characterized based on materials present in the Subpart J mixing tank or the material itself. Liquid accumulated in the secondary containment structure is removed within 24 hours, or in as timely manner as is possible.

C2.D(7)(b) Design Parameters

{R 299.9615 (1) and 40 CFR 264.193 (f)}

See Appendices C2-1 and C2-2.

C2.D(7)(c) Exempted Ancillary Equipment and Inspections

{R 299.9615 (1) and 40 CFR 264.193 (f)}

There is no ancillary equipment at the facility that would be exempt from the secondary containment requirement and the required daily inspections.

C2.D(8) Requirements for Tank Systems that are not in Compliance with Secondary Containment

{R229.9615 (2)}

All tanks that are used for treatment and storage at the facility have secondary containment structures and are located within a building. All floor surfaces and secondary containment structures are covered with a continuous chemical-resistant coating. Concrete dike walls

completely surround the treatment and storage tanks, providing secondary containment capacity of 150% of the volume of the largest tank within the area. Therefore, requirements for secondary containment have been met and this section is not applicable.

C2.E VARIANCES FOR SECONDARY CONTAINMENT

{R 299.9615 (1) and 40 CFR 264.193 (g)}

There are no variances for secondary containment at the Dynecol facility.

C2.F CONTROLS AND PRACTICES TO PREVENT SPILLS AND OVERFILLS

{R 299.9615 (1) and 40 CFR 264.194 (b)}

C2.F(1) Spill Prevention Controls

{R 299.9615 (1) and 40 CFR 264.194 (b)}

C2.F(2) Overfill Prevention Controls

{R 299.9615 (1) and 40 CFR 264.194 (b)}

Various operating practices and controls are implemented by Dynecol to prevent overfilling. Waste material is transferred from the primary treatment tank to a designated secondary treatment vessel. Each treatment tank has its own pipeline with fittings and valves properly labeled, and is provided with one or more of the following equipment and devices for monitoring and controlling safety cut-off during material flows: level switch, pneumatic activated valve with manual override and limit switches, manual valve, and solenoid valve. All treatment tanks are vented to an appropriate air control unit.

In the primary treatment tanks, a high-level sensor control activates/deactivates the solenoid control valve on the compressed air piping system. Since compressed air is typically used to off-load tanker to primary tanks, this control system will automatically prevent overfill of the primary tanks.

Secondary tanks are equipped with two high-level sensors. The first, set at about 8,250-gallon level, will automatically shut off the transfer pump from the primary tank system. A second high-level sensor will activate an audible alarm at the 17,600-gallon level. Additionally, common valves and pipes are designated so that material flows cannot cross over. An alarm will sound whenever a sequence of events is not followed during transfer.

The procedure for off-loading wastes into the listed waste treatment system is the same as defined for off-loading wastes into the standard treatment system (Tanks #'s 1-4).

The hazardous waste storage tanks #7* and #10 and proposed additional storage tanks (#11, #12, #13, #16, #17, #27(converted to hazardous waste storage 7/24/2020), #32 and #33) are equipped with high-level sensors that will activate/deactivate a solenoid control valve on the compressed air piping system. Since pressurization by air of the tankers is typically used for off-loading, this device will automatically prevent overfill of the storage tanks.

The effluent storage tanks #34, #35, #37 and #38 and the flocculation collection tank #36 are equipped with high level shut-off sensors that will automatically shut off the transfer

pump.

Loading and unloading operations of the process pits are constantly monitored by plant personnel to ensure against overfilling and the maintenance of adequate freeboard. Dynecol personnel will also maintain a written log of all materials received in each process pit.

*Tank Seven clean closed on 1/14/2020.

C2.F(3) Freeboard Maintenance

{R 299.9615 (1) and 40 CFR 264.194 (b)}

High-level sensors are set at a volume to maintain freeboard.

C2.G INSPECTIONS

{R 299.9615 (1) and 40 CFR 264.195 (a)}

See Module A5 (Inspection Schedule) and Appendix A5-1.

C2.G(1) Schedule and Procedures for Overfill Control System Inspections

{R 299.9615 (1) and 40 CFR 264.195 (a)}

Overfill control system is included as an appurtenance system to tanks and is inspected with each tank.

C2.G(2) Daily Inspections of Aboveground Portions of Tank Systems and Monitoring and Leak Detection Data

{R 299.9615 (1) and 40 CFR 264.195 (b)}

Leak detection is included as an appurtenance system to tanks and is inspected with each tank.

C2.G(3) Daily Inspection of Construction Materials, Local Areas, and Secondary Containment System for Erosion and Leakage

{R 299.9615 (1) and 40 CFR 264.195 (b)(3)}

Erosion and Leakage are included as an appurtenance system to tanks and is inspected with each tank.

C2.G(4) Inspection of Cathodic Protection Systems

{R 299.9615 (1) and 40 CFR 264.195 (c)}

Cathodic protection system is included as an appurtenance system to tanks and is inspected with each tank.

C2.G(5) Inspection Requirements before Full Secondary Containment is Provided

{R 299.9615 (1) and 40 CFR 264.193 (i)}

See Module A5 (Inspection Schedule) and Appendix A5-1.

C2.G(5)(a) Non-enterable underground tanks
{R 299.9615 (1) and 40 CFR 264.193 (i)(1)}

There are no non-enterable underground storage tanks at the Dynecol facility; therefore this section is not applicable.

C2.G(5)(b) Other than non-enterable underground tanks
{R 299.9615 (1) and 40 CFR 264.193 (i)(2)}

There are no underground storage tanks (non-enterable or otherwise) at the Dynecol facility.

C2.G(5)(c) Ancillary equipment
{R 299.9615 (1) and 40 CFR 264.193 (i)(3)}

See Module A5 (Inspection Schedule) and Appendix A5-1.

C2.G(6) Reporting Requirements
{R 299.9615 (1) and 40 CFR 264.193 (i)(4)}

All inspections will be documented in the Operating Record maintained by the facility operations manager at the compliance room and are also backed up electronically (see Appendix A5-1 for documentation forms).

C2.H RESPONSE TO LEAKS OR SPILLS AND DISPOSITION OF LEAKING OR UNFIT-FOR-USE TANK SYSTEMS
{R 299.9615 (1) and 40 CFR 264.196}

See Module A7 (Contingency Plan).

C2.H(1) Response Actions for Leaks and Spills
{R 299.9615 (1) and 40 CFR 264.196 (a)}

See Module A7 (Contingency Plan).

C2.H(1)(a) Waste Flow Stoppage
{R 299.9615 (1) and 40 CFR 264.196 (a)}

See Module A7 (Contingency Plan).

C2.H(1)(b) Waste Removal
{R 299.9615 (1) and 40 CFR 264.196 (b)}

See Module A7 (Contingency Plan).

C2.H(1)(c) Visible Release Containment
{R 299.9615 (1) and 40 CFR 264.196 (c)}

See Module A7 (Contingency Plan).

C2.H(1)(d) Repair, Replacement, or Closure
{R 299.9615 (1) and 40 CFR 264.196 (e)}

See Module A7 (Contingency Plan).

C2.H(1)(e) Certification of Major Repairs
{R 299.9615 (1) and 40 CFR 264.196 (f)}

See Module A7 (Contingency Plan).

C2.H(2) Required Notifications and Reports
{R 299.9615 (1) and 40 CFR 264.194 (d)}

See Module A7 (Contingency Plan).

C2.I CLOSURE AND POST CLOSURE REQUIREMENTS
{R 299.9615 (1) and 40 CFR 270.14 (b)}

(Check as appropriate)

- ☒ Category A *(where decontamination is practical and secondary containment is provided)*
- ☐ Category B *(where decontamination or removal is not practical and where secondary containment is provided and tank system will be closed as a landfill)*
- ☐ Category C *(where decontamination is practical and where secondary containment is not provided)*
- ☐ Category D *(where decontamination or removal is not practical, and where secondary containment is not provided, and tank system will be closed as a landfill)*

See Module A11 (Closure/Post-Closure Plan) for a detailed description of closure activities.

C2.I(1) Category A
{R 299.9615 (1) and 40 CFR 264.197}

See Module A11 (Closure/Post-Closure Plan) for a detailed description of closure activities.

C2.I(1)(a) Closure Plan
{40 CFR 264.112, except 264.112(d)(1)}

See Module A11 (Closure/Post-Closure Plan) for a detailed description of closure activities.

C2.I(1)(b) Closure Activities
{40 CFR 264.111 through 114 and R 299.9613(3)}

See Module A11 (Closure/Post-Closure Plan) for a detailed description of closure activities.

C2.I(1)(c) Cost Estimate For Closure
{R 299.9702 and 40 CFR 264.142}

See Module A12.

C2.I(1)(d) Financial Assurance for Closure
{R 299.9703 and 40 CFR 264.143}

See Module A12.

C2.J SPECIAL REQUIREMENTS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTES
{R 299.9615 (1) and 40 CFR 270.16 (j)}

No extreme heat is generated during the processing of waste materials handled at this facility. Heat is generated in primary treatment due to neutralization reactions. In the typical extreme case, a waste containing 15% hydrochloric acid neutralized with a solution containing 50% sodium hydroxide would result in a temperature rise of 44 degrees F. A typical extreme situation in the neutralization of spent acids is the reaction of a 25,800-gallon batch of solution having a concentration of acid of 15% hydrochloric acid and using 50% sodium hydroxide solution as the treatment reagent. Temperature rise is determined, as shown below, for these concentrations of acid solutions:

Acid Type	H2SO4	HCl	HN03
Acid Concentration	15%	15%	15%
Total Volume of Acid solution (gal)	25,800	25,800	25,800
Weight of solution (10#/gal)	258,000 lbs	258,000 lbs	258,000 lbs
Weight 100% acid	38,700 lbs	38,700 lbs	38,700 lbs
Total weight of solution	331,200 lbs	331,200 lbs	331,200 lbs
Weight of 50% NaOH (12#/gal)	165,600 lbs	165,600 lbs	165,600 lbs
Weight of mixture	589,200 lbs	589,200 lbs	589,200 lbs

Heat of reaction (million BTU)	18.62	25.7	15.09
Change in temp* (Degree F)	37.5	43.6	25.6

*Temperature rise from ambient temperature

No extreme pressure is generated during the processing of waste materials handled at this facility. Neither the waste materials nor the treatment reagents react to form gases as products of the reaction. Temperature increases during reaction may produce some water vapor, but the boiling temperature of the waste materials is never approached. The tanks in which treatment takes place are always maintained at atmospheric pressure due to venting to an air control system.

There is no potential for the waste materials or treatment reagents to produce uncontrolled toxic dust at this facility. Dry lime is stored in silos and slurried with water within a silo building. The silo and handling building is provided with induced draft ventilation and dust is removed from air exhausted to the atmosphere by baghouse air filtration.

Mists containing hazardous waste fumes or gases could be generated during the transfer of raw waste materials from incoming tankers into primary treatment tanks and during aeration of the primary tanks. Any mists, fumes, or gases which may be generated at these particular times are vented into the caustic scrubber/condenser. The scrubber/condenser prevents any of these materials from being discharged to the atmosphere. Secondary processing and solids de-watering do not produce and mists, fumes, or gases.

In the very unlikely event of a massive spill of hazardous wastes, a spray may be generated for a brief period of time while the material is impacting the floor of the facility containment area or unloading pad or driveway. In a worst-case situation, a massive spill of hydrochloric acid at 104 degrees F and 15% concentration could emit HCl into the atmosphere at concentrations exceeding the ceiling limit exposure to HCl of 5.0 ppm. In response to a spill of this magnitude, the employees would implement the Contingency Plan as identified in Module A7.

Because the vapor pressures of both sulfuric and nitric acids are much less than the vapor pressure of HCl, massive spills of these materials would pose no air quality problems for employees or the general public.

The vapor pressure of hydrochloric acid at 40 degrees C and 15% concentration is 0.184 mmHg. The concentration of HCl in air immediately above and in equilibrium with this HCl solution is:

$$\begin{aligned} 0.184 \text{ mmHg}/760 \text{ mmHg} &= 2.4 \text{ E-4 mole HCl/Mole air} \\ &= 240 \text{ ppm of HCl} \end{aligned}$$

Note that the concentration of HCl would theoretically equal this value in a very thin layer of air above the solution. Dilution with air above this thin layer will result in HCl concentrations at breathing level, about five feet above the spill, to be much less than the theoretically calculated concentration.

C2.J(1) Ignitable or Reactive Wastes Precautions
{R 299.9615 (1) and 40 CFR 264.198}

There is no potential for the waste materials, treatment reagents, or products of any reactions to be flammable or explosive or produce violent chemical or physical reactions in the tanks.

C2.J(2) Distance Requirements for Ignitable or Reactive Wastes
{R 299.9615 (1) and 40 CFR 264.198 (a) and (b)}

All the tanks at the Dynecol facility were installed in accordance with the NFPA Standard No. 704.

C2.J(3) Incompatible Wastes
{R 299.9615 (1) and 40 CFR 264.199}

Occasionally, there are needs for blending different waste streams together in order to get the most efficient usage of treatment reagent(s) and/or a satisfactory filter cake consistency. Blending of wastes will be done in accordance with specific predetermined written treatability instructions. Additionally, to prevent incompatible wastes from coming in contact in the same tank with a heel of previously treated waste, the following procedure is used. The procedure affects only the primary treatment system tanks because a tank heel is not a factor for the secondary treatment tanks (#'s 18-21) since they are cone-bottomed and all discharges are via a bottom drain.

1. For strong acids and alkalis: If a strong acid ($\text{pH} < 2$) is to be unloaded into a primary treatment tank which was previously used to treat a strong alkali waste, the tank heel is evaluated to see if there will be any adverse reactions that result from the mixing of the wastes. If necessary, the heel will be treated by adding acid until a pH of less than 8.0 is achieved.
2. If a strong alkali waste ($\text{pH} > 12$) is to be unloaded into a primary tank which was previously used to treat a strong acidic waste, the heel will be evaluated to determine if there will be any adverse reactions resulting from the mixing of the wastes. If necessary, the pH of any remaining heel will be treated by adding lime slurry until a pH greater than 6.0 is achieved.
3. For ammonia containing wastes: Prior to unloading an ammonia containing waste, the tank heel is evaluated to determine whether there will be any adverse reactions resulting from the mixing of the wastes. If necessary, the pH of any remaining heel will be adjusted to a pH less than 7.0.
4. For chlorine containing wastes: Prior to unloading a chlorine containing waste, the tank heel is evaluated to determine if there will be any adverse reactions from the mixing of the wastes. If necessary, the pH of any remaining heel will be adjusted to a pH greater than 7.0.
5. For sulfide/sulfite containing wastes: Prior to unloading a sulfide/sulfite bearing waste, the tank heel is evaluated to determine if there will be any

adverse reactions from the mixing of the wastes. If necessary, the pH of any remaining heel will be adjusted to a pH of 7.0 or higher.

6. Specific treatment and unloading procedures are defined for each waste stream prior to acceptance for treatment at this facility. The waste approval record and treatment procedures are maintained on file for future reference by operating staff.

TABLE C2-1
Summary Description of Regulated Tanks

Tank Number	Location	(gallons unless otherwise noted)	Dimension	Construction Materials/Corrosion Protection	Usage	Date Installed	Feed System	Safety Cutoff	By-Pass	Shell Thickness	Pressure Control
Tanks 1, 2, 3, and 4	Primary Treatment Area	20,000	12'D x 24'L	Rubber lined steel	Primary Treatment	1976	Flex hose	High-level controls/Solenoid valves	Overflow to secondary containment	0.240 in	Vent to scrubber
7*	Chemical Storage Area (Building #2)	10,000	10'D x 17'H	FRP	Storage	1991	Flex hose	High-level alarm	Overflow to secondary containment	0.495 in	Vent to scrubber
10	Chemical Storage Area	12,000	12'D x 14'L	FRP	Storage	1997	Flex hose	High-level alarm	Overflow to secondary containment	0.255 in minimum	Vent to scrubber
Tanks 18, 19, 20 and 21	Secondary Treatment Area	20,000	12'D x 22'L	FRP	Secondary Treatment	1985	CPVC	High-level controls/Transfer pump	Overflow to secondary containment	0.495 in	Vent to scrubber
Tank 30 and 31	Effluent Room	15,000	10'D x 22'H	Steel	Effluent	1993	Steel	High-level alarm	Overflow to secondary containment	0.24 in	Vent to atmosphere
Tank CV1 and CV2	Filter Press Control Room	1,000 lbs carbon	6'D x 6.5'H	PVC lined Steel	Treatment	1990	CPVC	N/A	N/A	0.25 in	Relief Valve
Tanks 34 and 35	DAF Building	30,000	14'D x 35'H	FRP	Effluent	2003	PVC	High level shut-off/Control interlock to pump	Overflow to secondary containment	0.25 in min	Vent to atmosphere
Tank 36	DAF Building	1,000	5'D x 7'H	FRP	Storage from sludge from effluent polishing system	2003	PVC	High level shut-off/Control interlock to pump	Overflow to secondary containment	0.20 in min	Vent to atmosphere
Tanks 37 and 38	DAF Building	30,000	14'D x 35'H	FRP	Effluent	2003	PVC	High level shut-off/Control interlock to pump	Overflow to secondary containment	0.25 in min	Vent to atmosphere
Tanks 32 and 33	Chemical Storage Area (Building #2)	5,500	10'D x 10.5'H	FRP	Storage	1998	Flex hose	High level shut-off/Control interlock to pump	Overflow to secondary containment	0.25 in min	Vent to scrubber
Tanks 12, 13, 16 and 17	Chemical Storage Area (Building #2)	25,800	11'D x 35'H	FRP	Storage	1984	CPVC	High level shut-off/Control interlock to pump	Overflow to secondary containment	0.25 in min	Vent to scrubber
Tank 11	Chemical Storage Area (Building #2)	20,000	12.5'D x 35'H	FRP	Storage	2013	CPVC	High level shut-off/Control interlock to pump	Overflow to secondary containment	0.25 in min	Vent to scrubber
Tank 27	Chemical Storage Area (Building #2)	20,000	12.5'D x 35'H	FRP	Storage	1998	CPVC	High level shut-off/Control interlock to pump	Overflow to secondary containment	0.25 in min	Vent to scrubber

*Tank Seven was clean closed on 1/14/2020

Table C2-2
Summary of Non-regulated Tank Storage Information

Tank Number	Location	Chemical Stored	Tank Volume (gallons)
9	Chemical Storage Area (Building #2)	Alkaline reagent storage	27,600
14	Chemical Storage Area (Building #2)	Lime Slurry	14,000
15	Chemical Storage Area (Building #2)	Alkaline reagent storage	27,600
22	Filter Press Control Room	Mild acid cleaning solution	1,000
23	Chemical Storage Area (Building #2)	Lime slurry	6,000
24	Chemical Storage Area (Building #2)	Sodium hydroxide for scrubber	6,000
25	Lime Storage Area	Dry lime	50,000
26	Lime Storage Area	Dry lime	50,000
28	Container Management Facility Building	Non-haz waste	1,900

BASIS OF DESIGN AND DESIGN CAPACITY

BULK TREATMENT FACILITY

I. GENERAL

- A. Treatment of hazardous and non-hazardous wastes, sludges and other wastes generated off-site.
- B. Design capacity: 144,000 gallons per day in a 24-hour per day operation (average flow rate: 100 gpm)
- C. Primary treatment: Three (3) 20,000-gallon rubber-lined steel tanks
- D. Secondary treatment: Four (4) 20,000-gallon FRP tanks
- E. Sludge dewatering: Two (2) 167-cubic foot recessed chamber filter presses.
- F. Carbon filtration: Two (2) 1,000-pound carbon filters
- G. Listed Hazardous Waste treatment system: One (1) 20,000 gallon working capacity treatment vessel and One (1) 100 cubic foot recessed chamber filter press.

II. PRIMARY TREATMENT SYSTEM

A. General Equipment

- 1. Tanks: Three (3) 20,000-gallon rubber-lined steel tanks
- 2. Containment System: concrete with New Generation 100 coating by Spartan Chemicals (or equivalent).
- 3. Mixing: compressed air system and sparger.
- 4. pH Control System: Lakewood Model 820 (or equivalent).
- 5. Chemical Feed system: lime slurry feed system and/or caustic/caustic pot ash feed system.
- 6. High level alarm with overfill protection.
- 7. Vent: discharge to air emissions control scrubber.

B. Treatment Process: Oxidation, Reduction, Neutralization on batch basis.

- 1. Liquid transfer from bulk tanker to primary tanks via hose and piping system: Q= 200 GPM avg.

2. Control: manual with continuous supervision from control room.
3. Typical treatment volume: 12,000 gallons
4. Mixing: continuous via air sparger system
5. Chemical Addition:
 - . caustic/caustic pot ash/lime slurry solution via pump system with typical feeding rate of 120 GPM.
 - . sodium bisulfite solution via pump system with typical feed rate of 100 GPM.
 - . ferrous sulfate/chloride or ferric chloride solution via pump system with typical feed rate of 200 GPM.
 - . activated carbon powder via top opening of tank.
6. Neutralization: following oxidation/reduction process, and as follows:
 - . neutralization to a typical pH range of 5.0 to 6.0 (volume increase: generally about 30%).
 - . treatment time: variable, depending on initial pH and/or initial acid concentration (average: 2 hours).
 - . transfer to secondary treatment system via one of two transfer pumps (typical feed rate of 320 GPM) and CPVC (or equivalent) piping system.

III. SECONDARY TREATMENT SYSTEM

A. General Equipment

1. Tanks: Four (4) 20,000 gallon FRP tanks in vertical position with cone bottom.
2. Containment System: concrete with New Generation 100 chemical resistant coating (or equivalent).
3. Transfer Pumps: Two (2) centrifugal pumps rated at approximately 320 GPM.
4. Mixing: Two (2) mechanical mixers, 25 HP side-mount and 5 HP bottom mount agitators by Process Equipment Company (or equivalent).
5. pH Control System: Lakewood Model 520 probe and 900 Controller (or equivalent).
6. Chemical Feed System: lime slurry feed system.
7. Process Piping: CPVC (or equivalent).
8. Vent: discharge to air emissions control scrubber.

9. High-level alarm and overflow protection.

B. Treatment Process: Neutralization, chemical precipitation, flocculation, detoxification, clarification, sedimentation, chemical fixation, and lime stabilization on batch basis.

1. Liquid transfer from primary to secondary tank via process piping, valves and transfer pumps.
2. Valves: air actuated, spring to close remote operation from the main control panel.
3. Treatment Volume: 8,250 gallons.
4. Mixing: continuous via two mechanical mixers per tank.
5. Chemical addition: lime slurry transfer pump rated at approximately 300 GPM.
6. pH adjustment to typical range from 7.0 to 10.5 depending on the type of waste being treated.
7. Transfer to filtration process via two air diaphragm pumps rated at approximately 120 GPM each.
8. Average Flushing Time: 5 minutes.

IV. DEWATERING SYSTEM

A. General Equipment

1. Two (2) 167 cubic foot recessed chamber filter presses by Durco.
2. Operating Pressure Range: 90-100 psig.
3. Plate Material: polypropylene (or equivalent).
4. Cloth Material: Crossible polypropylene 89X (or equivalent).
5. Hydraulic Closing Mechanism: semi-automatic with maximum pressure of 3,600 psi.
6. Feed Pump: dual air operated diaphragm pumps with neoprene diaphragms (or equivalent).

B. Operating Discussion

1. Filtrate Volume: 8,500 gallons average.
2. Feed Rate: variable, average = 120 GPM.

3. Average Filtration Period: 75 minutes.
4. Average Cake Dumping Time: 45 minutes.
5. Average Clean-up Time: 2 Hours.
6. Average Cycle Time: 4 hours.
7. Typical Sludge Volume: 167 cubic feet per cycle and 195 cubic yards per day (average at 144,000 GPD treatment rate).

V. LISTED WASTES/OTHER LISTED WASTES TREATMENT SYSTEM

A. General Equipment

1. Tank: One (1) 20,000 FRP tank in vertical position with cone bottom.
2. Containment System: as defined for Tank Farm Building (#2).
3. Mixing: Two (2) mechanical mixers, 25 HP side mount and 5 HP bottom mount.
4. pH Control System: Lakewood Model 520 probe and 900 controller (or equivalent).
5. Chemical Feed Systems: Lime slurry feed system, and other treatment reagents feed systems.
6. Process Piping: CPVC (or equivalent).
7. Vent: Discharge to Air Emissions Control Scrubber.
8. High level alarm and overflow protection.
9. Valves: Air actuated, spring closed for remote operations from the main control panel.
10. Dewatering: One (1) 100 cubic foot recessed chamber filter press with typical specifications as follows:
 - . Operating Pressure Range: 90-100 psig.
 - . Plate Material: Polypropylene (or equivalent).
 - . Cloth Material: Crossible Polypropylene 89 X (or equivalent).
 - . Feed Pump: Dual air diaphragm pumps.
 - . Filtrate Volume: typically 5,000 gallons.
 - . Feed Rate: variable, average = 120 GPM.
 - . Average Filtration Period: 50 minutes.
 - . Average Cake Dumping Time: One hour.
 - . Average Clean-up Time: 1 Hour.
 - . Average Cycle Time: 2 Hours.

. Typical Sludge Volume: 100 cubic feet per cycle.

B. Treatment Process: Batch Basis. Typically includes primary and secondary processes (as described in parts II(B) and III(B)).

VI. LIME FEED SYSTEM

A. General Equipment

1. Storage Silos: two (2) 12-feet diameter by 60-feet high (5,000 cuft each).
2. Slurry System: 750 gallon tank with mixer, volumetric feeder, level control, etc.
3. Dust Filter: 180 sq. ft. Whirl-Air-Flow.

B. System Capacity

1. Typical Usage: peak 66,800 lbs/day of hydrated lime over 24 hours.
2. Slurry System: 20 % lime (maximum).
3. Typical Water Requirement: 22-60 GPM.
4. Typical Feed Rate: 300 GPM (Peak), 60 GPM (Average).

VII. AIR EMISSIONS CONTROL SYSTEM

A. General Equipment

1. Model 734-XL Heil Fume Alkaline Scrubber with a capacity of 5,000 CFM, 200 DEG F (maximum) at 4-inch water pressure.
2. Recirculation Pump: Vanton Model CG-PY 800, 3HP, 1750 RPM, rated at 75 GPM, 40-foot head (or equivalent).
3. pH System: Great Lakes Instrument, Model #A72-1-1-2-3, and probe # 6030PO (or equivalent).
4. Chemical Pump: Chem-Tech Model #2-120, PVC and Teflon fittings, rated for 0-120 GPD (or equivalent).
5. Centrifugal fan: HCL-20 Heil blower, 10 HP, 1800 RPM, 5000 CFM (or equivalent).

B. Design Capacity

1. Controls vapor and off gases from the three primary treatment tanks, the hazardous waste storage tank, the

four secondary treatment tanks, and certain storage tanks within the tank farm building.

2. Alkaline wet scrubber is capable of controlling nearly all vapors emitted from the treatment and storage processes.

C. Additional Control System for Certain TCLP Organics

Air emissions from the treatment of certain TC organics in treatment tank #3 will be directed through a caustic scrubber with a capacity of 500 CFM and then through the activated carbon adsorption system in the container management facility. The caustic scrubber will have the typical specifications as follows:

- . Met-Pro Duall Division Model FW-300 (or equivalent).
- . Capacity: 500 CFM
- . Temperatures: Exhaust = ambient
Scrubbing solution = ambient
- . Scrubbing Solution: Water and caustic
- . Scrubbing Solution Flow Rate: Approximately 5 GPM
- . Pressure Drop: Approximately 3 in WC
- . Height of Packing: Approximately 20 inches
- . Packing Description: Random-dumped, high efficiency polypropylene
- . Efficiency: > 80 % on acid gases

VIII. CARBON ADSORPTION SYSTEM

A. General Equipment

1. Filtration Unit: two 1,000-pound filter vessels.
2. Valving: full isolation and control valving.
3. Sampling Port: following each unit.
4. Feed Rate: Average = 50 GPM per carbon vessel.

B. Operating Discussion

1. Usage: 1,000 pounds of activated carbon. Adsorption capacity is dependent upon filtrate stream constituents.
2. Filtration System: primary (Filter presses) and secondary (in-line filter system).
3. Monitoring: periodic checks for applicable organics in effluent of the unit in use to determine possible breakthrough. At confirmation of breakthrough, the feed is rerouted through the second filter unit.

IX. CONTROL SYSTEM

A. General Equipment

1. Main control board and graphics panel
2. Pump and motor, start-stop control
3. Valve actuator controls
4. Level, pH indicators and recorders
5. Running and alarm lights

B. Operations

1. The control system is designed to provide full treatment system feedback and control from the control room.

X. OPERATION PROCEDURE SUMMARY

Treatment system control procedures are outlined below.

A. Typical Operations Sequence

The Batch Treatment Tables (Exhibits A, B, and C) provide a typical treatment sequence including start and stop times, volumes, etc. Tank numbers correspond with actual tank labels at Dynecol.

B. Instrument Calibration

Calibration of pH instruments and level transmitters is routinely performed by either trained maintenance personnel or outside contractor.

C. Console Operating Sequence

1. Turn Control Power Selector Switch on. The Power On light will come on. The audio alarm will usually sound because the batch treatment tanks are empty. The Low Alarm lights will be flashing. Press the Silence pushbutton. The audio alarm will silence and the flashing alarm lights will go to steady ON.
2. All valves should be closed and their associated selector switches on their auto position. The auto position allows valves and pumps to open and close on demand from the programmable controller computer.
3. Determine which primary tank has been treated and manually connect that tank via a hose to the desired transfer pump, i.e., P1/P2. Open the manual valve

associated with that primary tank.

4. Pick the secondary tank to be filled from that pump and turn the selector switch to the correct tank number.
EXAMPLE: If tank #4 was connected to transfer pump #1 and we wanted to use tank #18, we would turn the selector switch for pump #1 to the T18 position. This switch is located at the bottom corner of the selector switch deck.
5. Press the Start pushbutton for Pump #1; several functions will occur:
 - a. The step sequence lights for T18 will go from Off to the Filling step.
 - b. Only the appropriate valves will open. In this example, only V1 and V3 will open.
 - c. Pump P1 will start and transfer from T4 to T18. As the level in T18 rises, the Low Alarm light will go out. The level can be observed by the meter in the graphic display with T18.
 - d. As the level gets above the bottom mounted agitator, A18B will start.
 - e. When the level gets up to 45% full, the transfer pump P1 will stop and the inlet valves will close. The next step light treating will flash. This indicates that all conditions are ready to go to the treating step. The process will hold this way until the Start Treatment 18 pushbutton is pushed.
6. Press the Start treatment T18 pushbutton; several function will occur:
 - a. The filling step light will go out and the treating light will go on steady.
 - b. Valves 22 and 23 will open.
 - c. The side mounted agitator A18S will start.
 - d. P18, the recirculation pump, will start.
 - e. P18 will circulate liquid from T18 past the pH sensor and back to T18.
 - f. If the solution being pumped past the pH sensor gets below pH of 5, the pH Low Alarm will sound and the light will flash until the Silence pushbutton is pushed.
 - g. After a preset time of three minutes, the lime feed system will start adding lime to T18.
 - h. Valves V172, V173, and V10 will open and the lime feed pump will start and continue until the pH is at a preset level, for example 10.0.
 - i. After a preset time of ten minutes, the Instrument Flush step light will start flashing. This indicates that all conditions are ready to go to the Instrument Flush step.
7. Press the Start Instrument Flush T18 pushbutton. Two

flushes will occur as follows:

- a. Flushing of the pH control loop occurs.
 - 1) P18 stops and V23 closes.
 - 2) V24 water flush valve opens and flushes water into T18 for 90 seconds to clean that section of the piping.
 - 3) V24 closes, V23 opens, and P18 starts for another 90 seconds. The pump, pH sensor, and pipes are flushed.
 - b. Flushing of the Lime Feed System.
 - 1) P25 is already off and the valves are closed.
 - 2) Valve V14 water flush and V172 will open for 90 seconds, flushing the lime back into the day tank T14 or T23.
 - 3) V172 closes, V173 and V10 open, and P25 starts. The piping section between P25 and T18 will be flushed for 90 seconds.
 - c. After the flushing of all valves and pumps is done, the filtering step light will flash. This indicates that all conditions are ready to go to the filtering step.
 - d. The agitators continue to run to keep the solids from settling.
8. The operator must decide which filter press is clean and ready to accept sludge. The sludge feed pumps will not start without adequate hydraulic pressure on the press.
- a. Select the treatment tank to press by turning the selector switch for Press A to the T18 position.
 - b. Press the Start Feed to Press A pushbutton and V15 will open and AP3 and AP4 will start and fill Press A.
 - c. When the press is full, the High Inlet Pressure Alarm will sound and the light will flash until silenced. If the batch tank is not yet empty, do not push the Stop Feed to Press A pushbutton. To clean the press and continue filtering, the manual inlet valve to the press must be closed, the press emptied and the valve reopened, thus allowing more of the sludge from T18 to be filtered.
 - d. If the tank becomes empty before the press is full, press the Stop Feed to Press A pushbutton.
 - 1) AP3 and AP4 will stop.
 - 2) V15 will close.
 - 3) The OFF sequence light will come on.
9. Notes of Clarification
- a. Transfer Pump P1 can pump to T18, T19, T20, or T21. P2 can also pump to any of these tanks. However, due to the fact that they share some common valves and pipes, it is set up so that they cannot crossover.
EXAMPLE: If P1 is pumping to T20, we cannot allow P2 to pump to T19 or T18. Any time the pump to

treatment tank selectors get into a crossover not allowed position, the Sequence Not Allowed alarm will sound, and it cannot be silenced. Any pump that is running, when this alarm sounds, will stop and will have to be restarted.

- b. It is, however, permissible for both P1 and P2 to fill the same tank.
- c. The lime feed system is large enough for several tanks to be in the treatment step at the same time.
- d. Press A or B can receive sludge from T18, T19, T20, or T21. Due to the fact that they share some pipes and valves, it is set up so that they cannot crossover.

EXAMPLE: Tank T19 is being filtered through Press B. T20 or T21 cannot go to Press A. Any time the treatment tank selectors get put into a crossover not allowed position, the Sequence Not Allowed alarm will sound and it cannot be silenced. Any air pumps running, when this alarm happens, will stop and will have to be restarted.

- e. It is allowable, but not recommended, to let one press filter two tanks at the same time.

- 10. The filtrate from each press goes to either holding tank 30 or 31. The filtrate will be discharged to the City Sewer system via a centrifugal pump, after a check on the quality of the filtrate is performed.

EXHIBIT A

TANK 4

	BATCH #1		BATCH #5		BATCH #9	
Starting Volume	12,000		12,000		12,000	
Ending Volume	15,600		15,600		15,600	
Start Treatment	4 a.m.		8:05 a.m.		4:05 p.m.	
Stop Treatment	4:30 a.m.		8:35 a.m.		4:35p.m.	

TANK 18

	BATCH #1		BATCH #5		BATCH #9	
Starting Volume	8250	7350	8250	7350	8250	7350
Ending Volume	9900	8820	9900	8820	9900	8820
Start Filling	4:30 a.m.	6:35 a.m.	8:33 a.m.	2:35 p.m.	4:35 p.m.	12:40 a.m.
Stop Filling	5:00 a.m.	7:05 a.m.	9:05 a.m.	3:05 p.m.	5:05 p.m.	1:10 a.m.
Start Treatment	5:00 a.m.	7:05 a.m.	9:05 a.m.	3:05 p.m.	5:05 p.m.	1:10 a.m.
Stop Treatment	5:15 a.m.	7:20 a.m.	9:05 a.m.	3:20 p.m.	5:20 p.m.	1:25 a.m.

PRESS A

	BATCH #1		BATCH #5		BATCH #9	
Start Filtering	5:15 a.m.	7:20 a.m.	1:15 p.m.	3:20 p.m.	11:20 p.m.	1:25 a.m.
Stop Filtering	6:35 a.m.	8:30 a.m.	2:35 p.m.	4:30 p.m.	12:40 a.m.	2:35 a.m.
Net Volume	9900	8820	9900	8820	9900	8820
Start Dumping	6:35 a.m.	8:30 a.m.	2:35 p.m.	4:30 p.m.	12:40 a.m.	2:35 a.m.
Stop Dumping	7:15 a.m.	9:15 a.m.	3:20 p.m.	5:15 p.m.	1:25 a.m.	3:20 a.m.
Ready	7:15 a.m.	9:15 a.m.	3:20 p.m.	7:20 p.m.*	1:25 a.m.	3:20 a.m.

*Wash edge of filter trays (2 hours, 5:20 p.m. - 7:20 p.m.).

EXHIBIT B

TANK 2

	<u>BATCH #2</u>	<u>BATCH #6</u>	<u>BATCH #10</u>	<u>BATCH #12</u>
Starting Volume	12,000	12,000	12,000	12,000
Ending Volume	15,600	15,600	15,600	15,600
Start Treatment	4:30 a.m.	8:35 a.m.	12:40 p.m.	8:10 p.m.
Stop Treatment	5:00 a.m.	9:05 a.m.	1:10 p.m.	8:40 p.m.

TANK 19

Starting Volume	8250	7350	8250	7350	8250	7350	8250	7350
Ending Volume	9900	8820	9900	8820	9900	8820	9900	8820
Start Filling	5:00 a.m.	7:05 a.m.	9:05 a.m.	11:10 a.m.	1:10 p.m.	6:40 p.m.	8:45 p.m.	10:50 p.m.
Stop Filling	5:30 a.m.	7:35 a.m.	9:35 a.m.	11:40 a.m.	1:40 p.m.	7:10 p.m.	9:15 p.m.	11:20 p.m.
Start Treatment	5:30 a.m.	7:35 a.m.	9:35 a.m.	11:40 a.m.	1:40 p.m.	7:10 p.m.	9:15 p.m.	11:20 p.m.
Stop Treatment	5:45 a.m.	7:50 a.m.	9:50 a.m.	11:55 a.m.	1:55 p.m.	7:25 p.m.	9:30 p.m.	11:35 p.m.

PRESS B

Start Filtering	5:45 a.m.	7:50 a.m.	9:50 a.m.	11:55 a.m.	5:20 p.m.	7:25 p.m.	9:30 p.m.	11:35 p.m.
Stop Filtering	7:05 a.m.	9:00 a.m.	11:10 a.m.	1:05 p.m.	6:40 p.m.	8:45 p.m.	10:50 p.m.	12:45 a.m.
Net Volume	9900	8820	9900	8820	9900	8820	9900	8820
Start dumping	7:05 a.m.	9:00 a.m.	11:10 a.m.	1:05 p.m.	6:40 p.m.	8:45 p.m.	10:50 p.m.	12:45 a.m.
Stop dumping	7:50 a.m.	9:45 a.m.	11:55 a.m.	1:50 p.m.	7:25 p.m.	9:30 a.m.	11:35 p.m.	1:30 a.m.
Ready	7:50 a.m.	9:45 a.m.	11:55 a.m.	5:20 p.m.*	7:25 p.m.	9:30 p.m.	11:35 p.m.	1:30 a.m.

*2 hours for clearing edges of filter bags (3:20 p.m. - 5:20 p.m.).