Fac Pond 5 Response Action Plan

NOTE: The following Fac Pond 5 Response Action Plan is to be added to Appendix D-2.

RESPONSE ACTION PLAN

Facultative Pond 5

Model City Treatment, Storage, and Disposal Facility

Model City, Niagara County, New York

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1.0 INTRODUCTION

1.1 General

CWM Chemical Services, LLC (CWM) owns and operates the Model City Treatment Storage, and Disposal (TSD) Facility (Model City Facility or "Site"), in Niagara County, New York. The Model City Facility is regulated at the federal level under the Resource Conservation and Recovery Act (RCRA) and the Toxic Substances Control Act. Since the United States Environmental Protection Agency (USEPA) has delegated the implementation of the RCRA regulations in New York to the New York State Department of Environmental Conservation (NYSDEC), the Model City Facility operates under an NYSDEC-issued Permit pursuant to Title 6 of the New York Codes, Rules, and Regulations (6 NYCRR) Part 373. The general site layout, shown on Permit Drawing No. 2 of the permit drawing set, comprises waste receiving areas, storage and mixing tanks, chemical treatment facilities, biological treatment impoundments, and secure landfills. Current operations include treatment, recovery, stabilization, disposal, and transfer of hazardous and industrial non-hazardous waste.

As part of the revised permit application for Residuals Management Unit 2 (RMU-2) Facultative (Fac) Pond 5 will be added. New Fac Pond 5 will be a double-composite-lined surface impoundment for the storage of treated wastewater from CWM's Aqueous Wastewater Treatment System (AWTS).

As required by 6 NYCRR Part 373-2.11(k), a Response Action Plan (RAP) must be approved for surface impoundments prior to receipt of any treated wastewater and this requirement applies to Fac Pond 5. The RAP is a site-specific plan that the owner develops to address leakage through the primary liner and into the leak detection system (LDS) to minimize the potential migration of treated wastewater out of the Fac ponds. This RAP, which is part of CWM's overall leachate management program, describes the criteria used to establish key inflow rates to the LDS that require the implementation of certain response actions as described herein. Fac Pond 5 consists of an open-air facultative pond with primary and secondary liner systems. The layout of Fac Pond 5 is shown on Fac Pond Permit Drawing No. 3.

This RAP addresses the potential sources of inflows to the LDS in Fac Pond 5 and discusses the development of site-specific performance characteristics for the pond. It should be noted that liquids encountered in the LDS of the facultative ponds are not necessarily derived from the treated wastewater. Depending on the rate, responses to inflows of liquids into the LDS of the Fac ponds include no action, modifying operating procedures, and, where appropriate, notifying the USEPA and the NYSDEC. The various response actions are described in Section 4.

1.2 Action Leakage Rate and Response Rate

In accordance with 6 NYCRR Parts 373-2.11(j) and (k), this RAP presents the Action Leakage Rate (ALR), which is the primary trigger to implement a response action, for the Fac ponds. The ALR is based on the maximum flow rate that the LDS can remove without the fluid head on the secondary liner exceeding 1 foot. Consistent with the Residuals Management Unit 1 (RMU-1) RAP, and the RMU-2 RAP, this RAP also presents a secondary trigger level known as the Response Rate (RR). The RR is based on the anticipated maximum inflow to the LDS that could be expected under normal operating conditions. The RR could be used in identifying potential problems with the primary liner by alerting CWM personnel to unanticipated inflows to the LDS. The trigger levels are presented both as "unit-specific" and "pond-specific." The term "unit-specific" relates to a unit area (e.g., 1 acre), whereas "pond-specific" is a function of each Fac pond area. Unit-specific rates are presented in terms of gallons per acre per day [gpad]; pond-specific rates are presented in terms of gallons per day (gpd). The development of the ALR and RR values is discussed in greater detail in Sections 2 and 3, respectively.

1.3 RMU-2 Overview

The Site has been a hazardous waste TSD facility since 1972. RMU-2 encompasses approximately 43.5 acres (as measured to the outside toe of the perimeter mechanically stabilized earth wall). Fac Pond 5 are constructed above the existing ground surface and are surrounded by containment berms. Fac Pond 5 is approximately 4.7 acres, as measured planimetrically along the centerline of the top of slope for the side slope liner system.

1.3.1 Facultative Pond Liner System Description

The Fac Pond 5, which ispart of RMU-2 development, has been designed to meet or exceed the requirements for hazardous waste landfills as specified in 6 NYCRR Part 373-2.11. As shown on Fac Pond Permit Drawing No. 4, the facultative pond liner system consists of the following components (in descending order):

- Primary Liner System
  - 1 foot of ballast layer stone on the pond floors;
  - A layer of nonwoven geotextile on the pond floors;
  - A 30-mil ethylene interpolymer alloy (EIA) geomembrane on the pond floors and side slopes; and,
  - A layer of geosynthetic clay liner (GCL) on the pond floors and side slopes.
- Leak Detection System (LDS)
  - A layer of geocomposite on the pond floors and side slopes;
  - A layer of non-woven cushion geotextile heat bonded to the geocomposite on either side of the sump and riser trench; and,
  - A select fill sump with an 18-inch diameter perforated collection pipe and an 18-inch diameter solid riser pipe.
- Secondary Liner System
  - A 30-mil EIA geomembrane on the pond floor and side slopes; and
  - 3 feet of compacted glacial till or other suitable clay soil having a maximum hydraulic conductivity of 1×10^{-7} cm/s on the pond floor and side slopes.

On the perimeter side slopes, the 1 foot of ballast stone has been omitted and replaced with weight tubes to provide ballast against uplift forces on the geomembranes. In addition, vent pockets will be installed in the primary and secondary liners at the edge of the anchor trench. These vent pockets will allow any gas below the liners to escape without allowing liquid within the LDS to pass through the liner system.

1.3.2 Liquid Collection and Removal from the Leak Detection System

The LDS is designed and managed to control and remove liquids in a manner consistent with the requirements of 6 NYCRR Part 373-2.11(b)(3)(ii) and (iii). A sumps located at the low point of the Fac pond collect liquids that enter the LDS. Liquids that collect in the LDS are removed by pumping through the 18-inch diameter high density polyethylene (HDPE) side slope riser pipes. Liquids are removed from the LDS at regular intervals with dedicated automatic pumps to provide effective leachate management and to minimize the hydrostatic head on the secondary liner. The performance of the LDS of the Fac pond will be monitored based on regular documentation of the liquid volume encountered in and removed from the LDS.

1.3.3 Geologic and Hydrogeologic Setting

Numerous past investigations have been conducted throughout the Model City Facility. Geologic and hydrogeologic investigations for the entire Model City Facility have been performed and were submitted to the NYSDEC and the USEPA in March 1985 (*Hydrogeologic Characterization*, Golder Associates, Inc. [Golder], March 1985). Two updates to the 1985 hydrogeologic report were prepared and submitted in 1988 (*Hydrogeologic Characterization Update*, Golder, February 1988) and in 1993 (*Hydrogeologic Characterization Update*, Golder, June 1993). These studies detail the physiography, drainage, regional geology, site stratigraphy, hydrogeology and site hydrologic parameters. In terms of hydrogeology, these studies focused on defining the uppermost aquifer underlying the Model City Facility, groundwater flow direction and rates. A supplemental geologic investigation within the footprint of RMU-2 was also performed and presented in a letter report entitled *Geotechnical Investigation for Proposed Residuals Management Unit Number 2 Western Expansion Area* (Golder, December 2002). In general, the 2002 geotechnical investigation confirmed the geologic findings presented in the 1985, 1988 and 1993 site-wide investigations. Additional hydrogeologic investigations were performed by Golder in 2004 and again in 2009 to obtain geological and subsurface site stratigraphy data specific to the proposed RMU-2 location. The 2009 investigation was summarized in a report entitled *Landfill Footprint Analytical Data Study and Western Boundary Relocation Investigation, Residuals Management Unit Number 2* (Golder, August 2009). Additionally, groundwater elevation measurements were performed in 2008 in the area of the proposed RMU-2. Copies of the 2002 and 2009 Golder reports are presented in Appendices A-2 and A-4, respectively, of the *RMU-2 Engineering Report* (ARCADIS, April 2003, revised August 2009 and February 2013).

The Site is situated on the Ontario Plain that is an area of low topographic relief between the Niagara Escarpment and Lake Ontario. The upper portion of the stratigraphy at the Model City Facility generally includes low-permeability silt and clay tills over Glaciolacustrine Clay, underlain by a Glaciolacustrine Silt/Sand unit. Beneath these units is a lodgment of till (Basal Red Till) above shale bedrock. Over the northwestern portion of the Model City Facility, the Glaciolacustrine Clay is separated into an upper and lower member by a silt till (Middle Silt Till). Because of variations in topography, the thickness of the prevailing materials and the subbase depth of the cells, RMU-2 penetrates either one or both of the Upper Tills and the Glaciolacustrine Clay units.

In general, a varying thickness of in-situ glacial till will be left in place above the in-situ Glaciolacustrine Clay formation to withstand hydrostatic pressures and provide a suitable surface for construction equipment. The thickness of glacial till varies because of the irregularity of the surface of the Glaciolacustrine Clay. However, in particular areas, the entire in-situ glacial till may be removed in order to accommodate excavation grades in certain sump elevations. Natural surface elevations in the vicinity of RMU-2 are approximately 320 feet above mean sea level.

The typical hydraulic conductivity values of the geologic formations indicate that the Glaciolacustrine Silt/Sand stratum is the most permeable geologic unit and forms the uppermost aquifer underlying the Model City Facility. The Silt Till, Clay Till and Glaciolacustrine Clay above this aquifer are very low-permeability materials and restrict aquifer recharge from infiltration. The Basal Red Till and bedrock beneath the aquifer are also low-permeability units, although the shallow, weathered bedrock is more permeable than the deeper bedrock.

Water-level data collected on May 15, 2001 and in October 2004 from wells screened in the Glaciolacustrine Silt/Sand unit appear to represent the period of greatest piezometric heads for the confined aquifer since regular recording of Site-wide groundwater elevation data began in the early 1980s. Of these two monitoring events, the May 2001 levels were found to be more critical (i.e., higher) and, thus, governed the establishment of design elevations for the RMU-2 cells. Additional groundwater elevation data from "Figure 4 – Upper Tills Unit Potentiometric Surface Contours October 2011" prepared by Golder was also used to estimate the inflow rate of groundwater through the Fac pond secondary liner (see Section 3).

2.0 ACTION LEAKAGE RATE

2.1 General

The purpose of this section is to quantify the ALR for the Fac pond. The NYSDEC defines the ALR as the maximum design flow rate that the LDS can remove without the fluid head on the bottom liner exceeding 1 foot. As such, the ALR is dependent on the hydraulic capacities of the various components of the LDS. The ALR for the Fac ponds is established by evaluating each component of the LDS to determine the limiting component (i.e., the component having the least hydraulic capacity that would cause the fluid head on the bottom liner to exceed 1 foot). A factor of safety is typically applied to the hydraulic capacity of the limiting component to arrive at the actual ALR. The individual flow rate components that are used to determine the ALR are discussed in the following section. The ALR calculation is presented in Appendix A and summarized in Section 2.3.

2.2 ALR Flow Rate Components

The following hydraulic capacities for the various LDS components are calculated to determine the ALR for each pond:

- Flow rate through the geocomposite that drains directly to the LDS sump;
- Flow rate through the drainage stone surrounding the perforated section of the 18-inch diameter side slope riser pipe within the LDS sump; and,
- Flow rate through the perforations in the horizontal portion of the 18-inch diameter side slope riser pipe.

The analysis of each of these components is discussed in greater detail below.

2.2.1 Flow Rate through the Geocomposite Draining Directly into the LDS Sump

The LDS of each Fac pond includes a geocomposite that covers the side slopes and floor and discharges into the sump. The capacity of the geocomposite is designed to exceed the contributing maximum flow rate into the geocomposite, with a minimum transmissivity of 3×10^{-4} meters squared per second (m^2/s). The maximum flow rate conveyed into the sump via this mechanism is estimated by multiplying the flow per unit width through the geocomposite by the perimeter of the LDS sump.

2.2.2 Flow Rate through the Drainage Stone Surrounding the Perforated Section of the Side Slope Riser Pipe within the LDS Sump

Liquids that drain into the LDS sump from the surrounding geocomposite must permeate through the stone surrounding the perforated section of the side slope riser pipe and pass through the perforations. The maximum flow rate through the drainage stone is computed using Darcy's law and a flow net for the drainage stone surrounding the perforated portion of the side slope riser pipe.

2.2.3 Flow Rate through the Perforations in the Horizontal Portion of the Side Slope Riser Pipe

Liquids that flow through the drainage stone surrounding the perforated portion of the side slope riser pipe must ultimately pass through the perforations themselves. The flow rate through the perforations is determined from calculations presented in Appendix A, which are based on the orifice equation and the effective head on each perforation in the side slope riser pipe.

2.3 ALR Values

For the Fac pond, the limiting flow rate is determined to be the flow rate through the geocomposite that drains directly into the sump (discussed in Section 2.2.1). Because this flow rate is dependent on the slope of the pond floor, the ALRs are pond-specific (i.e., the ALR per unit area differs from one pond to the next). The calculation for the Fac Pond 5 ALR is summarized in Table 1. As discussed above, the ALR is calculated by multiplying the limiting flow rate by a factor of safety. To maintain consistency with the RMU-1 and RMU-2 RAPs and USEPA recommendations, a factor of safety of two is applied to the calculated ALR.

Table 1: Calculated ALR Values

Fac Pond	Pond-Specific ALR [gpd]	Pond Area[1] [acres]	Unit-Specific ALR [gpad]
5	7,982	4.7	1,698

Notes:
1. Pond area is the planimetric area as measured along the centerline of the top of slope for the side slope liner system.

The unit-specific ALR of 1,698 gpad is used to calculate the Pond-Specific ALR for Fac Pond 5. This unit-specific ALR value is multiplied by the pond area to calculate a pond-specific ALR, as summarized in the following table.

Table 2: Final ALR Values

Fac Pond	Unit-Specific ALR[1] [gpad]	Pond Area[2] [acres]	Pond-Specific ALR [gpd]
5	1,698	4.7	7,982

Notes:
1. Unit-specific ALR is based on the minimum calculated value from Table 1.
2. Pond area is the planimetric area as measured along the centerline of the top of slope for the side slope liner system.

3.0 RESPONSE RATE

3.1 General

The purpose of this section is to quantify the RR Fac Pond 5. As described earlier in this RAP, the RR is the anticipated maximum inflow to the LDS that could be expected under normal operating conditions. An RR value is calculated to represent the Fac pond at their maximum design capacity. The Fac pond RR value is discussed below in Section 3.2. The RR calculation is presented in Appendix B and summarized in Section 3.3.

3.2 Facultative Pond RR

The maximum design capacity RR has been established to account for the increased flow rates experienced in the LDS when the liquid level in the Fac ponds is at the maximum design level. The higher flow rates are primarily attributable to increased flows in the LDS due to leakage and permeation through the primary and secondary liner systems into the LDS.

In order to calculate the Fac pond RRs, it is necessary to identify potential inflow sources to the LDS and estimate the peak anticipated inflow to the LDS from each source. The following potential inflow sources to the LDS are considered in the estimation of the Fac pond RR:

- Leakage and permeation of liquids through the primary liner system due to hydrostatic head on the primary liner;
- Leakage and permeation of groundwater through the secondary liner system; and
- Leakage and permeation of consolidation water from the compacted clay layer in the secondary liner system.

Construction liquids (i.e., liquids that have entered the pond during the LDS construction period) are not considered in the Fac pond RR because these liquids will have been collected by the LDS during the initial stages of pond operation. Furthermore, because the liner system of the RMU-2 Fac ponds utilizes a GCL in the composite primary liner system, the Fac pond RR calculation does not consider the generation of liquids from the consolidation of a primary clay layer. The potential inflow sources to the LDS are discussed in greater detail below and in Appendix B.

3.2.1 Inflow through the Primary Liner System

Leakage and permeation through the primary liner system is considered one of the three main long-term sources for liquids entering the LDS. Higher heads on the primary liner will cause a corresponding increase in flow to the LDS due to leakage and permeation through the primary geomembrane and GCL. The computation of leakage and permeation rates through the primary liner system is discussed separately in the following sections.

3.2.1.1 Leakage through the Primary Liner System

Good construction practices and thorough construction quality control/quality assurance procedures can be employed in the installation of pond liners to minimize or eliminate defects in the geomembrane that typically occur during the course of installation. Defects in the form of pinholes are also known to occur during the manufacturing process. The frequency and size of these installation and manufacturing defects are estimated from the *Hydrologic Evaluation of Landfill Performance (HELP) Model User's Guide for Version 3* (USEPA, September 1994).

Leakage through defects in the primary liner geomembrane will occur whenever a hydrostatic head exists on the primary liner geomembrane and is a function of the frequency of defects, their size, head on the geomembrane and the hydraulic conductivity of the material beneath the geomembrane (i.e., the GCL). For the purposes of determining the RR, the leakage rate is estimated assuming the maximum operational level on the primary liner geomembrane. Using equations from the *HELP Model Engineering Documentation for Version 3* (USEPA, September 1994), leakage rate through the assumed geomembrane defects isestimated to be approximately 712.4 gpd for Fac Pond 5. The calculations for the leakage rate through the primary liner system is presented in Appendix B and summarized in Table 1 of Appendix B.

3.2.1.2 Permeation of Liquids through the Primary Liner System

Permeation of liquids through the primary liner system will occur whenever a hydrostatic head exists on the primary geomembrane. The permeation rate estimate assumes the pond is filled to its maximum operational level of 26 feet. In order for liquids to permeate completely through the primary liner and into the LDS, they must pass through a geomembrane layer and a GCL. The presence of both these low-permeability layers is accounted for in the permeation rate estimate by combining their individual thicknesses and using an effective hydraulic conductivity, as recommended in the *HELP Model Engineering Documentation for Version 3* (USEPA, September 1994). The resulting permeation rate through the primary liner system is estimated to be approximately 879.3 gpd for Fac Pond 5. The calculations for the permeation rates through the primary liner system are presented in Appendix B and summarized in Table 2 of Appendix B.

3.2.2 Groundwater Inflow through Secondary Liner System

In general, the elevations of the components in the secondary liner system (geomembrane and compacted clay layer) on the pond floors are below the historical high piezometric head in the confined aquifer (i.e., those recorded in October 2011). The historical high groundwater elevation beneath Fac Pond 5 is 308 feet. Using the Fac Pond elevations provided on Permit Drawing No. 3 and the liner system details on Permit Drawing No. 4, the low point of the compacted clay layer of the secondary liner system is at elevation 301 feet for Fac Pond 5. The resulting hydrostatic head exerted on the compacted clay layer and geomembrane in the secondary liner system of 7 ft. will cause groundwater to enter the LDS by permeation and leakage through the geomembrane, similar to the mechanisms discussed in Section 3.2.1. Although the rate of groundwater inflow to the LDS is expected to fluctuate due to seasonal variations in groundwater elevations, the presence of this external hydrostatic head is expected continuously throughout the life of the Fac pond. The computation of leakage and permeation rate of groundwater through the secondary liner is discussed separately in the following sections.

3.2.2.1 Leakage of Groundwater through the Secondary Liner System

Leakage of groundwater into the LDS through assumed defects in the secondary liner geomembrane will occur whenever the confined aquifer piezometric head beneath a given pond exceeds the lowest LDS elevation. For the purposes of determining the RR, the leakage rate of groundwater through the secondary liner is estimated using the bottom of the liner system design grade (i.e., subgrade) depicted on Fac Pond Permit Drawings 3 and 4 prepared by Arcadis of New York, Inc. as well as the groundwater elevation contours on Figure 4 – Upper Tills Unit Potentiometric Surface Contours October 2011 prepared by Golder Associates Inc. Using equations from the *HELP Model Engineering Documentation for Version 3* (USEPA, September 1994), leakage of groundwater though the assumed defects in the secondary liner geomembrane is estimated at 22.7 gpd for Fac Pond 5. The calculations for the leakage of groundwater through the secondary liner system are presented in Appendix B and summarized in Table 3 of Appendix B.

3.2.2.2 Permeation of Groundwater through the Secondary Liner System

Permeation of groundwater into the LDS through the secondary liner will occur whenever the confined aquifer piezometric head beneath a given pond exceeds the lowest LDS elevation. As with the leakage rate calculation in the preceding section, the permeation rate estimate is based on the design grades for the bottom of the compacted clay layer in the secondary liner and the average piezometric heads from the

October 2011 monitoring event. In order for groundwater to permeate completely through the secondary liner and into the LDS, it must pass through the compacted clay layer and the geomembrane. As for the composite primary liner system discussed in Section 3.2.1.1, the presence of both of these low-permeability layers in the secondary liner system is accounted for in the permeation rate estimate by combining their individual thicknesses and using an average effective hydraulic conductivity. The flow rate of groundwater into the LDS through the secondary liner system due to permeation is estimated at 195.9 gpd for Fac Pond 5. The calculations for the permeation of groundwater through the secondary liner system are presented in Appendix B and summarized in Table 3 of Appendix 2.

3.2.3 Consolidation Water Inflow from the Secondary Liner Compacted Clay Layer

Construction of the pond system and subsequent filling activities result in applied stresses to the compacted clay layer in the secondary liner system. The applied stress will vary as the liquid level in the pond varies under operational conditions.

The resulting consolidation of the compacted clay layer produces excess pore pressures within the clay, which drive water from the clay layer. The resulting flow rate depends on, and is expected to temporarily lag slightly behind, the filling rate. The inflow of consolidation water to the LDS is expected to continue for some period after the pond is initially filled and gradually diminish over time. As with the other potential inflow sources discussed thus far, this consolidation water will enter the LDS via leakage and permeation through the secondary liner system. The computation of leakage and permeation rates of consolidation water through the secondary liner system is discussed separately in the following sections.

3.2.3.1 Leakage of Consolidation Water through the Secondary Liner Geomembrane

The leakage rate of consolidation water through assumed defects in the secondary liner geomembrane is calculated using equations from the *HELP Model Engineering Documentation for Version 3* (USEPA, September 1994), as discussed in previous sections. The hydrostatic head used to calculate leakage is equal to the excess pore pressure produced within the compacted clay layer during consolidation divided by the unit weight of water. The resulting leakage rate through geomembrane defects is estimated at 54.1 gpd for Fac Pond 5. The calculations for the leakage of consolidation water through the secondary liner system are presented in Appendix B and summarized in Table 3 of Appendix B.

3.2.3.2 Permeation of Consolidation Water through the Secondary Liner System

The permeation rate of consolidation water through the secondary liner geomembrane is estimated using Darcy's law. The flow rate of consolidation water through the pond floors is estimated at 727.4 gpd for Fac Pond 5. The calculations for the permeation of consolidation water through the secondary liner system are presented in Appendix B and summarized in Table 2 of Appendix B.

3.3 RR Values

Unit-specific RR values were calculated based on the conditions in the Fac pond. For the Fac pond RR, the individual flow rates into the LDS from the sources described in Section 3.2 are combined to generate a single unit-specific RR for the pond. The following table summarizes the estimated flow rates into the LDS from each potential inflow source for the pond.

Table 3: Calculated Fac Pond Unit-Specific RR Inflow Components (From Appendix B)

Fac Pond	Leachate Inflow through Primary Liner System		Groundwater Inflow through Secondary Liner System		Consolidation Water Inflow through Secondary Liner System		Combined [gpad]
	Leakage Rate [gpad]	Permeation Rate [gpad]	Leakage Rate [gpad]	Permeation Rate [gpad]	Leakage Rate [gpad]	Permeation Rate [gpad]	
5	151.6	187.1	4.8	41.7	11.5	154.8	551.5

Pond-specific RR values have been calculated using the unit-specific RR values summarized in Table 3. The unit-specific RR value was multiplied by the pond area to calculate the Fac pond RR that is pond-specific, and is summarized in Table 4.

Table 4: Final Fac Pond RR Values

Fac Pond	Unit-Specific RR[1] [gpad]	Pond Area[2] [acres]	Pond-Specific RR [gpd]
5	552	4.7	2,595

Notes:
1. Unit-specific RR values have been rounded up for conservatism.
2. Pond area is the planimetric area as measured along the centerline of the top of slope for the side slope liner system.

4.0 RESPONSE ACTIONS

4.1 General

The purpose of this section is to outline the required response actions corresponding to various flow rates in the LDS sumps of the Fac pond, including the ALR and RR calculated in Sections 2 and 3, respectively. For all flow rates, the following procedure is required for monitoring of the LDS:

- The LDS sump will be monitored at least once every seven (7) days for the presence of liquids. Pumpable amounts of liquids contained in the sump will be removed automatically or manually, and the liquid quantity will be measured and recorded. The inflow value will be determined by taking the liquid volumes removed each week divided by seven (7) days to establish an average daily inflow for the week.

4.2 Flow Rate at or Below the RR

Routine monitoring should continue. No action is required.

4.3 Flow Rate Between the RR and the ALR

1. If the average daily flow rate is between the RR and ALR, verbally notify the NYSDEC within three (3) working days of an apparent exceedance of the RR. Complete one or more of the following activities to determine whether the apparent exceedance is actually due to an electronic or mechanical equipment malfunction:

   a. Evaluate the LDS volume data transferred from Fac pond sump to the storage tank by checking recent level trends and alarm summary logs.

   b. Verify proper operation of the LDS pump via computer control and by manually switching it on and off.

   c. Inspect the LDS flow meter and verify its proper operation using timed pumping and comparing the estimated volume with the meter flow readings.

   d. Remove the LDS pump and level probe and inspect for any obvious defects. Verify proper operation of level probe by either electrical simulation or by manually placing the probe in water.

2. If the average daily flow to the LDS sump for a week exceeds the RR and is not conclusively determined within two (2) weeks of an apparent RR exceedance to be clearly attributable to an operational failure (e.g., equipment or power failures based on the investigation specified in Item 1 above), the following will be performed:

   a. Conduct a review of the most recent LDS analytical data available from the sampling programs required by the site permit.

   b. Immediately perform the following tests and observations on samples of the LDS liquids:

      1) color;

      2) turbidity;

      3) specific-conductance; and

      4) pH.

   c. Make a preliminary comparison of these values with the previous results and record the information.

d. Perform, within one (1) week after verifying that the RR exceedance is not attributed to operational failure, the sampling and analysis of the LDS liquid that would normally occur on a yearly basis (chloride and sulfate). Test results are to be available within 45 days of the exceedance. Results will be reviewed with the NYSDEC to determine what, if any, additional response actions are necessary based on the results. This sampling will satisfy the next yearly sampling requirements for that sump and pond.

e. Increase monitoring and calculation of the flow rate from the LDS sump of the pond involved, if pumpable quantities are present, to every day until flow decreases below the RR. Also, verify that the automatic removal of liquid from the LDS sumps is occurring as designed. If the automatic pumping of the LDS is unable to maintain a level of 12 inches or less in the LDS, evaluate whether it is necessary to increase the pumping rate.

f. Review all analytical data and if liquid characteristics do not match the pond contents investigate alternative sources of liquid.

3. If the flow is between the RR and the ALR for seven (7) consecutive additional days, provide written notification to the NYSDEC within 14 days from the date of determination and implement the following steps:

   a. Determine the need to temporarily stop placing treated wastewater into the affected pond during the pond's normal operation.

   b. Assess the potential cause or causes of the RR exceedance. In the affected pond, examine any exposed portions of the pond liner.

   c. Repair any observed damage.

   d. If no obvious defects are detected, propose mitigative actions to return the leakage rate to below the RR. Upon approval, sequentially inspect side slope liner and likely locations of base liner, if necessary, removing water and ballast stone as needed. Repair any observed damage.

   e. Document location, type and extent of liner damage, if any.

4. If the liquid in the LDS appears to be stormwater, investigate possible pathways and repair, as necessary. After all necessary mitigative measures have been taken, the pond may be returned to service upon authorization by the NYSDEC.

5. Return to routine monitoring as indicated in Section 4.1

4.4 Flow Rates Greater than the ALR

1. Notify, in writing, the USEPA and NYSDEC within seven (7) working days from the date of determination if the average daily flow from the LDS sump exceeds the ALR, if this is not clearly attributable to an operational disturbance. Determine the need to temporarily stop placing treated wastewater into the affected pond during the pond's normal operation. Prepare a written preliminary assessment report describing the amount of liquids; likely source of liquids; possible location, size and cause of any leaks and short-term actions taken and planned. Submit this report to the USEPA and NYSDEC within 14 days from the date of determination of exceedance. Use of the pond may not resume until written notification is given by the NYSDEC.

2. Increase monitoring and calculation of the flow rate from the LDS sump of the pond involved, if pumpable quantities are present, to every day until flow decreases below the ALR. Also, verify that the automatic removal of liquid from the LDS sumps is occurring as designed.

3. Immediately perform the following tests and observations on samples of the LDS liquids:

   1) color;

2) turbidity;

3) specific-conductance; and

4) pH.

Make a preliminary comparison of these values with the previous results and record the information.

4. Determine, to the extent practicable, the location, size and cause of any leak.
5. Determine other short-term and longer-term actions necessary to mitigate or stop any leaks.
6. Within 30 days after the notification that the ALR has been exceeded, submit to the USEPA and the NYSDEC the results of the analyses from Responses 1 through 5 above, as well as the results of actions taken and actions planned.
7. If the average daily flow exceeds the ALR for two weeks, implement the following steps:
   a. Test a sample of the liquid obtained from the LDS for chloride and sulfate and compare to pond contents;
   b. If the liquid characteristics match the pond contents, stop placing treated wastewater into the affected pond during the pond's normal operation;
   c. Assess the seriousness of the leak and the potential for release to the environment;
   d. Examine any exposed portion of the pond liner;
   e. Determine if material should be removed from the pond for repair or control; and
   f. Repair any observed damage. If damage cannot be repaired, determine whether the pond should be closed.
8. If the liquid in the LDS appears to be stormwater or groundwater, investigate possible pathways and repair as necessary. Provide third-party inspection by a registered professional engineer who will investigate alternative sources of liquid, review available analytical and pumping event data for the pond to identify any trends and prepare a written report to the USEPA and the NYSDEC on the findings and recommended actions to protect human health and the environment.
9. As long as the flow rate in the LDS exceeds the ALR, submit monthly reports to the USEPA and the NYSDEC summarizing actions taken and planned.
10. If the ALR value continues to be exceeded after taking all reasonable corrective measures, implement the following steps:
    a. Remove all standing water inside the Fac pond;
    b. Sequentially inspect side slope liner and likely locations of base liner, if necessary, removing ballast stone as needed;
    c. Repair any observed damage;
11. Prepare third-party certification that observed damage has been repaired and return the pond to service upon NYSDEC approval; and
12. Return to routine monitoring as indicated in Section 4.1.