

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation

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February 06, 2026

Niagara Falls Bridge Commission
Robert Koert
5362 Military Rd.
Lewiston, NY 14092

Re: Site Management (SM) Periodic Review Report (PRR) Response Letter

Whirlpool Rapids Bridge, Site No.: V00655
Niagara Falls, Niagara County

Dear Robert Koert (as the Certifying Party):

The Department has reviewed your Periodic Review Report (PRR) and IC/EC Certification for following period: January 1, 2023 to January 1, 2026.

The Department hereby accepts the PRR and associated Certification. The frequency of Periodic Reviews for this site is 3 year(s), your next PRR is due on January 31, 2029. You will receive a reminder letter and updated certification form 75-days prior to the due date. Regardless of receipt or not, of the reminder notice, the next PRR including the signed certification form, is still due on the date specified above.

If you have any questions, or need additional forms, please contact me at 716-851-7258 or e-mail: matthew.king@dec.ny.gov.

Sincerely,



Matthew King
Project Manager

cc:

Matthew King, NYSDEC, Project Manager
Andrea Caprio, NYSDEC, RHWRE
Iyer Dharmarajan, Iyer Environmental Group PLLC

**SITE MANAGEMENT
PERIODIC REVIEW REPORT (PRR)
WHILPOOL BRIDGE SOILS REMEDIATION**

for

**NIAGARA FALLS BRIDGE COMMISSION
NIAGARA FALLS, NY**



Submitted to NYSDEC, Buffalo, NY

January 2026

by



Iyer Environmental Group, PLLC

Description of Institutional Controls

Parcel

Owner

Institutional Control

144.09-2-2.01

Niagara Falls Bridge Commission

O&M Plan
Ground Water Use Restriction
Land use Restriction

April 6, 2006 a DECLARATION OF COVENANTS AND RESTRICTIONS was filed with the Niagara County Clerk in Book 1380 of Deeds at Page 37. Covenant restricts site use to current passive recreational for the hiking trail area and restricted commercial for the remainder of the site. Requires the owner to maintain the remedy, including proper operation. Monitoring and maintenance of the remedy in accordance with the Long-Term Monitoring and Maintenance plan revised April 18, 2005.

Description of Engineering Controls

None Required

Not Applicable/No EC's

Periodic Review Report (PRR) Certification Statements

1. I certify by checking "YES" below that:

a) the Periodic Review report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

b) to the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and the information presented is accurate and complete.

YES NO

2. If this site has an IC/EC Plan (or equivalent as required in the Decision Document), for each Institutional or Engineering control listed in Boxes 3 and/or 4, I certify by checking "YES" below that all of the following statements are true:

(a) the Institutional Control and/or Engineering Control(s) employed at this site is unchanged since the date that the Control was put in-place, or was last approved by the Department;

(b) nothing has occurred that would impair the ability of such Control, to protect public health and the environment;

(c) access to the site will continue to be provided to the Department, to evaluate the remedy, including access to evaluate the continued maintenance of this Control;

(d) nothing has occurred that would constitute a violation or failure to comply with the Site Management Plan for this Control; and

(e) if a financial assurance mechanism is required by the oversight document for the site, the mechanism remains valid and sufficient for its intended purpose established in the document.

YES NO

IF THE ANSWER TO QUESTION 2 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.

A Corrective Measures Work Plan must be submitted along with this form to address these issues

NA

Signature of Owner, Remedial Party or Designated Representative

Date

**IC CERTIFICATIONS
SITE NO. V00655**

Box 6

SITE OWNER OR DESIGNATED REPRESENTATIVE SIGNATURE

I certify that all information and statements in Boxes 1,2, and 3 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I Robert Koert at 5365 Military Road, Lewiston, NY 14092,
print name print business address

am certifying as Niagara Falls Bridge Commission (Owner or Remedial Party)

for the Site named in the Site Details Section of this form.

Robert R Koert

Signature of Owner, Remedial Party, or Designated Representative
Rendering Certification

1/12/25

Date

WHIRLPOOL BRIDGE SOILS REMEDIATION PERIODIC REVIEW REPORT (PRR) Period from January 1, 2023 through January 1, 2026

I. EXECUTIVE SUMMARY

A. Site History

Bridge painting operations at the Whirlpool Rapids Bridge before 1990 involved uncontrolled blast cleaning using coal slag as an expendable abrasive. Heavy metals contamination from spent abrasives and paint waste were found on the slopes of Niagara Gorge below the Bridge. Lead concentrations in surficial soil were found to range from 16 to 11,640 mg/Kg across a 400-foot wide sampling area on either side of the Bridge, with heavy metals migrating through the bedrock aquifer (0.1 to 1.2 mg/L lead in groundwater) into Niagara River.

The selected remedy had two primary objectives: limit exposure to visitors and minimize contaminant loadings to the Niagara River. The remedy was implemented in 2004 with the removal of contaminated soils (1,037 tons) and rebuilding of the hiking trail under the bridge, while preserving the natural beauty of the area. As part of institutional control, the area has continued to remain only a tourist attraction, and side slopes are not accessible to visitors.

B. Effectiveness of Remedial Program

The objective of limiting exposure to visitors to Niagara Gorge was met immediately after implementation of the remedy - removal of contaminated soils on and around the trail, and the placement of large stone blocks along the trail to prevent visitors from accessing the side slopes. A drastic reduction in heavy metals was observed in the bedrock aquifer in the first monitoring event (May 2005), immediately following remedial action. Lead dropped two orders of magnitude, from a pre-remedy high of 1.2 mg/L (9/2003) to a post-remedy level of 0.04 mg/L (5/2005). Lead and four other heavy metals monitored routinely, continue to remain at trace to non-detect ever since.

C. Compliance

There are no non-compliance issues with monitoring or institutional controls. The NFBC has followed the long-term monitoring plan with routine sampling of groundwater and surface water, reducing the frequency over time, with NYSDEC approval, as monitoring data continued to demonstrate heavy metals remained at trace to non-detect levels: quarterly from 2005 through 2008, semi-annual from 2009 to 2012, annual sampling from 2013 to 2019, and once every two to three years from 2019 onwards.

There was one annual groundwater/surface water sampling event (September 2023) since the last PRR Report (January 2023) as per the revised monitoring frequency. The next monitoring event is tentatively scheduled for Spring/Summer 2026.

The trail leading to the Bridge is maintained by the NYS Office of Parks, Recreation and Historical Preservation (NYSOPRHP). The NFBC continuously monitored the area for signs of contamination during the last bridge painting project which was completed in 2010. There was no impact from this re-painting project based on groundwater and surface water monitoring results.

Side slope erosion from runoff during storm events had been significant in 2012 and 2013 in the area around MW-1/SW-2 (see 2017 PRR Report). In addition, a sink hole formed above the Lower Retaining Wall. These erosions resulted in elevated levels of lead and

other metals in surface and groundwater but still well below pre-remediation levels. The NYSDEC directed the NFBC to undertake erosion repair work and restore the trail.

Soil erosion repair work was undertaken by the NFBC as part of the Lower Retaining Wall Repair Project with Parsons Brinckerhoff as the consultant for the retaining wall, IEG as the subconsultant for the soil erosion, and BVR Construction Company, Inc. as the contractor for all work on this project. The work consisted of the removal of side slope landslide depositions and the enlargement of the erosion control wall in the vicinity of MW-1 and SW-2 just south of the Bridge footing (see photopages). The site work was performed from October 2014 to June 2015, and upon completion, IEG issued a letter report (December 2015) for the erosion repair work.

There has been no significant side slope erosion within the remediation zone since the repair of the last such event in June 2015. No landslide debris was observed in front of the Erosion Control Wall during this PRR reporting period, and the space (vertical and horizontal) remaining behind this Wall appeared to be adequate for potential erosions in the near future.

In July 2021, a severe rainstorm with close to 5 inches of rain created a major washout of a small section of the trail upriver from (and south of) the CN bridge. NYS Parks immediately closed the Gorge trail to the public and undertook repair work in 2022. The remediated, rebuilt trail section under the Whirlpool Bridge was not affected by this storm, and routine inspection by NYS Parks and NFBC showed it to be in good condition.

In Spring 2025, a visitor drove a Toyota Tacoma through a fence near the entrance to the upper trail, drove it down the Gorge trail and flipped over the side of the lower trail, south of the remediation zone (upstream of the CNN Bridge). The visitor got out unscathed, and NYS Parks had to extract the vehicle in pieces as it became embedded in the trees. There was no damage to the trail from this accident.

D. Recommendations

The site management program will continue to include periodic inspection and monitoring, and institutional controls limiting access to the side slopes and keeping the area as a tourist destination. NYS Parks routinely checks the trail including prior to the onset of winter season and in spring clears the trail of talus that breaks off from overhanging cliffs.

Based on the last few groundwater and surface water monitoring results, it is recommended that site monitoring continue at every three years (coinciding with PRR reporting frequency) unless a significant landslide occurs from a major storm event. Corrective action consisting of erosion repair and follow-up groundwater/surface water sampling will be implemented following a significant soil erosion event.

II. SITE OVERVIEW

A. Site Description

The Whirlpool Rapids Bridge (see location on Figure 1), constructed in 1897, is one of three bridges connecting the United States and Canada in the Niagara Falls area and operated by the Niagara Falls Bridge Commission (NFBC) since 1959. The lower deck is for automobile and pedestrian traffic, while the upper deck serves the railroad. Bridge painting operations before 1990 involved uncontrolled blast cleaning using coal slag as an expendable abrasive without containment of the spent abrasives and paint waste. The Bridge was abrasively blast cleaned and painted about five times (last time in 1986-87) in its 100+ years of existence which resulted in lead-paint contamination of the trail and side

slopes. The trail is owned by New York Power Authority (NYPA) and operated by New York State Office of Parks, Recreation and Historical Preservation (NYOPRHP) under a lease agreement.

Spent abrasives and finely divided paint waste were found (Environmental Impact Assessment, May 2003) along the trail and side slopes of the Bridge in discrete sections as well as mixed with soils. Lead concentrations ranged from 16 ppm to 11,640 ppm across the entire width of the 400-foot sampling area on either side of the Bridge. In comparison, the background soil samples ranged from 46 to 437 mg/Kg lead. Lead concentrations were higher (68 to 11,640 ppm) within the first 275 feet from the bridge and tapered off within the last 125 feet (16 to 2,220 ppm lead). The highest lead levels were found near the footings of both the Whirlpool Bridge and the adjacent Canadian National Bridge. Elevated polynuclear aromatic hydrocarbons (PAHs) were found in only one sample on the upper slope. The underlying bedrock aquifer feeding into the Niagara River had heavy metal contamination, with lead and zinc levels up to 1.2 mg/L.

The NFBC started the last bridge painting project in 2007 using state of the art techniques including a containment structure to capture, collect and dispose off-site spent abrasives and paint waste. The trail was visually inspected during the course of the painting project, and waste material was vacuumed periodically by the paint contractor. Finishing touches and removal of the containment structure were completed by the end of 2010.

B. Chronology of Site Remedy

An Environmental Impact Assessment was completed in May 2003, and included soil and groundwater sampling, VLF survey of the bedrock to locate monitoring wells, soil leachability testing, and an ecological evaluation. The remedial goals (see Remedial Action Work Plan, October 2003) for the site were as follows:

- Limit exposure to visitors to Niagara Gorge underneath the Bridge
- Minimize contaminant loadings to the Niagara River, a Class A Special water body
- Preserve the natural beauty of the area and do not alter side slope stability
- Limit dangerous construction operations on the slope

The remedial action, undertaken from September through December 2004 (see RA Construction Report, February 2005), included:

- Excavation and disposal of 1,037 tons of contaminated soils
- Reconstruction of 500 feet of trail
- Drainage pipes (200 feet total) and three sumps for surface water sampling
- Road boxes with bolted covers around two bedrock monitoring wells
- Placement of large blocks of stone along reconstructed trail to provide an additional level of visitor safety and to minimize visitor access to the side slopes
- Restoration of the upper trail
- Implementation of a long-term monitoring program for groundwater and surface water
- Institutional controls to maintain the area as a tourist attraction and limit visitor access to the side slopes

During the 2005 remediation project, the side slopes by the rebuilt trail on either side of the Whirlpool Bridge were stabilized by two to three layers of large stone blocks with sufficient empty space behind them to allow for accumulation of eroding soil. These were sufficient until 2012 when the area around SW-2 was severely impacted by large runoff and associated carryover of eroded soil and talus.

Major storms in 2012/2013 created landslides that impacted a 50' long section of the Improved Trail in the vicinity of MW-1 and SW-2. Around the same time a sink hole developed on the Rebuilt Trail in front of the upper retaining wall which opened up on the lower retaining wall.

The soil erosion repair work was initiated by the NFBC in October 2014 with the removal of eroded soil and repair of the lower retaining wall. The work was completed in June 2015 with the repair of the trail following removal of all construction equipment (see 2017 PRR Report and 2015 Erosion Repair Report).

In July 2021 (a month after the 2021 sampling event), Niagara Falls area experienced close to 5 inches of rain which created a major washout (mostly rock coming down) of a small section of the trail south (upriver) of the CN bridge. NYS Parks closed the Niagara Gorge trail to the public until it undertook repair work of the eroded trail section in 2022. The remediated, rebuilt trail section under the Whirlpool Bridge was not affected by this storm, and site inspection showed it to be in good condition all the way from the south entrance to the north end. See 2023 PRR Report and September 2023 LTM Report.

In Spring 2025, a visitor crashed a Toyota Tacoma through a fence near the entrance to the upper trail, drove down the into the Gorge and flipped over the side of the lower trail into the Gorge, south of the remediation zone (upstream of the CN Bridge). The visitor got out unscathed, and NYS Parks had to extract the vehicle in pieces as it became embedded in the trees. There was no damage to the trail from this accident.

The following steps and associated groundwater/surface water monitoring (before/after repair) that was undertaken as part of the 2014/2015 erosion repair work by the NFBC form the template for similar work in the future:

- Remove all contaminated soil eroded from the side slope on to the rebuilt trail and/or accumulated behind the stone wall, and disposed it as solid waste.
- Rebuild surface water sump(s) and associated drainpipe if necessary.
- Repair portions of the rebuilt trail damaged by the soil erosion, restoring the layers of geotextile membrane, crushed stone and bentonite.

Attached are photopages showing current (September 2023) rebuilt trail conditions compared to pre-remediation conditions (2014).

III. REMEDY PERFORMANCE, EFFECTIVENESS AND PROTECTIVENESS

The attached before/after photo pages and site drawing (Figure 1) show features of the implemented remedy. The objective of limiting exposure to visitors to the Niagara Gorge was met immediately after implementation of the 2005 remedy - removal of contaminated soils on and around the trail; rebuilding of the trail with geotextile membrane, crushed stone and bentonite; and the placement of large stone blocks along the trail to prevent visitors from accessing the side slopes. Signs posted along the trail also warn visitors to keep away from the side slopes. The rebuilt trail under the Bridge has remained in good condition over the years. Eroded slopes on each end of the Upper Retaining Wall are repaired by the NFBC and NYSOPRHP as they occur. The remedy thus continues to be protective of human health and the environment.

Table 1 lists heavy metals (As, Cd, Cr, Pb and Zn) concentrations in groundwater and surface water before and after remediation, while Figure 2 illustrates the trend in lead

concentrations over time. The results of the monitoring program demonstrate the effectiveness of the remedial action. The effectiveness of the remedy was evident from the results of groundwater/surface water monitoring events immediately after remedial action. Lead in particular dropped from a pre-remedy high of 1.2 mg/L (9/2003) in groundwater to a post-remedy level of 0.04 mg/L (5/2005). Lead continues to remain at trace levels (non-detect in the last monitoring event) in groundwater in the years following the Bridge painting project, and following the erosion repair work.

The Niagara Gorge Trailway is enhanced as a result of this project. Hazardous materials were removed, the visitor's trail surface reconstructed in the vicinity of the Whirlpool Bridge, and new native species of plants were introduced. Areas outside of the pathway were restored with the placement of large stone blocks (sandstones and limestone) and talus rock groundcover. As the NYSOPRHP continues trail improvements, the area beneath the Whirlpool Bridge crossing is open to even greater numbers of trail users. This project, with its clarified pathway and trail edge landscaping, subtly directs trail users along a quick, defined and limited route of passage under the bridge.

IV. IC/EC PLAN COMPLIANCE

A. IC/EC Requirements and Compliance

The site remains in compliance with the IC/EC requirements. A Declaration of Covenants and Restrictions was developed and filed with the Niagara County Clerk. It is as follows:

Maintain area as a tourist attraction: No residential, commercial or industrial use is contemplated for this area, and it will continue to remain a tourist attraction. Posted warning signs and security cameras keep visitors away from the side slopes, thereby preventing exposure to residual contamination there.

Limiting visitor access to side slopes: Site management has included routine inspection of the trail under the Bridge and vacuuming of any spent abrasives released during blasting and painting. The NFBC and NYSOPRHP have maintained the trail in good condition, repairing side slopes after soil erosion and rockslides. Continuing improvements to the Trailway will increase the number of visitors but their movement will be subtly restricted to the Trailway.

B. IC/EC Certification

The IC/EC certification by the NFBC and IEG is attached.

V. MONITORING PLAN COMPLIANCE

A. Components

Long-term monitoring includes the following elements:

- Routine (monthly during bridge painting) inspections of the site with checks on visitor access and potential signs of erosion along the side slopes.
- Removal of contaminated soils that may erode/slide off the side slopes during extreme weather conditions and pile up on to the visitors' path.
- Routine groundwater sampling at bedrock wells (MW-1 and MW-2) and surface water in the three collection sumps (quarterly for the first two years, semi-annually

through 2012, annually through 2019, and every two to three years thereafter) to monitor the effectiveness of the remedy.

The long-term groundwater and surface water monitoring was anticipated to be performed at least until just after completion of the Bridge painting project. It was, however, extended on a reduced frequency based on previous analytical data. The monitoring continued on an annual basis after significant soil erosion events in 2012 and 2013 from the side slopes around MW-1, and a reduced frequency subsequently based on groundwater data.

B. Summary of Monitoring Completed

Iyer Environmental Group PLLC (IEG) has been performing environmental monitoring at the site since the completion of remedial action. Groundwater and surface water samples were collected during monitoring events for heavy metals (As, Cd, Cr, Pb and Zn) analysis.

Monitoring completed to-date includes quarterly events from 2005 to 2008. In addition, the soil along the improved trail and the buffer zone was sampled in October 2006 after spent abrasives were found beneath the bridge. A round of soil sampling was done in April/May 2011 after completion of the bridge painting operation.

The long-term groundwater and surface water monitoring was anticipated to be performed at least until just after completion of the Bridge painting project. It was however extended on a reduced frequency based on previous analytical data. The monitoring continued after significant soil erosion events in 2012 and 2013 from the side slopes around MW-1. There were nine semi-annual events since 2007 (June 2008, November 2008, June 2009, November 2009, June 2010, May 2011, December 2011, June 2012 and December 2012), and seven annual events from 2013 to 2019 (August 2013, August 2014, October 2015, June 2016, July 2017, August 2018 and September 2019).

With the NYSDEC's approval, the sampling frequency was further reduced to one every two years (2021 and 2023) based on groundwater/surface water monitoring data for the prior three years and historical trends. There was one annual groundwater/surface water sampling event (September 2023) since the last PRR Report (January 2023) as per the revised monitoring frequency. Separate reports were submitted to the NYSDEC for each monitoring event. Field inspection reports and laboratory reports for monitoring event during this PRR reporting period (September 2023 LTM) are attached. The next monitoring event is tentatively scheduled for Spring/Summer 2026.

Heavy metals remain at trace levels in groundwater and surface water, which is at least two orders of magnitude below pre-remediation levels. Groundwater and surface water has been monitored annually since 2013. The spikes in metals concentrations (see Table 1 and Figure 2) are observed following major storm events and the resulting significant soil erosion from the side slopes, most notably the 2012/2013 storm events that created a landslide around MW-1/SW-2. The heavy metals continue to remain at non-detect to trace levels based on 2023 LTM), well below the spikes observed following the 2013 landslide.

C. Comparison with Remedial Objectives

The remedial objective is to limit contaminant loadings to the Niagara River, a Class A water body. This objective was met with the removal of over 1000 tons of contaminated soil from the trail beneath the Whirlpool Bridge, and easily accessible areas of the side slopes. The trend in heavy metals concentrations (see Figure 2 and Table 1) demonstrate that the remedy has been effective in significantly reducing heavy metals migration from the site.

The metals are now at trace levels, with lead at non-detect in the two bedrock wells (MW-1 and MW-2) and non-detect to 0.0212 mg/L in the three surface water sumps based on the last round (September 2023) of sampling.

Heavy metals continue to remain at non-detect to trace levels and well below pre-remediation concentrations in groundwater and surface water. Soil erosion from the side walls during heavy rainfall (2012/2013 being the most significant) tend to spike the levels until the erosion is repaired. The monitoring events following the erosion repair project confirm that removal of eroded soil and continued maintenance of the trail will be protective of groundwater and human health.

D. Monitoring Deficiencies

There are no monitoring deficiencies. All monitoring events have been performed in accordance with NYSDEC requirements and consistent with the long-term monitoring plan.

E. Conclusions and Recommendations for Changes

The remedy implemented in 2004 has been effective in meeting the remediation goals for the site. The blasting and paint work during the three years of 2007 to 2010 were performed by the NFBC's paint contractor with a state-of-the-art containment system that had little noticeable effect on the environment.

Soil erosion repair work was performed in 2014/2015 to address landslides created by major storms along a 50' long section of the Improved Trail in the vicinity of MW-1 and SW-2. The erosion repair included removal and offsite disposal of contaminated soil, increase in the height of the existing stone wall to accommodate future erosion, and rebuilding damaged sections of the trail. Subsequent monitoring has shown that removal of eroded soil and continued maintenance of the trail will be protective of groundwater and human health.

Long-term monitoring (six annual events) since the 2015 erosion repair has consistently shown non-detect to trace levels of heavy metals in surface and groundwater. Based on this IEG recommends the annual groundwater/surface water sampling events continue at once every three years with routine inspection. Corrective action consisting of erosion repair and follow-up groundwater/surface water sampling will be implemented following a significant soil erosion event.

VI. O&M PLAN COMPLIANCE

A. Compliance Monitoring

There is no specific O&M associated with the environmental remedy for this site. Trail repair work as needed due to erosion is being done by the NFBC and NYSOPRHP.

B. Compliance Remedy

During October 2014, the erosion repair work in the Remediation Zone was begun. Contaminated soil that had eroded from the side slope on to the Rebuilt Trail was excavated along with material from behind the existing stone block wall. This material was hauled to Modern Landfill. A collector pipe was installed behind the stone block wall and routed underneath the trail to the downslope side near where the existing SW-2 sump pipe discharges. The two sections of stone wall (north and south of SW-2) were bridged and then heightened by up to four layers of additional stones. Pilaster stones were added to

resist down slope pressure on the wall and thick pieces of rope were added in the grouted spaces to provide additional drainage.

During the work on the Erosion Wall and the Lower Retaining Wall Repair which occurred concurrently from October to December 2014, the Improved Trail received some damage from heavy equipment. During the spring of 2015 BVR Construction repaired the Improved Trail to original conditions using geotextile membrane, crushed stone and bentonite.

VII. OVERALL PRR CONCLUSIONS AND RECOMMENDATIONS

A. Compliance with SMP

Monitoring: All monitoring requirements have been met with quarterly (2005 – 2007), semi-annual (2008 – 2012), annual (2013 – 2019) and bi-annual (2021-2023) sampling of groundwater and surface water.

IC/EC: All IC/EC requirements are met through restricting visitors to the trail and away from the side slopes, and repair of side slopes affected by soil erosion or rockslides. A containment system and vacuuming of the trail during the last bridge painting project kept spent abrasives and paint from entering the Niagara River. Erosion repair work was completed to remove contaminated landslide soil and accommodate future erosion.

B. Performance and Effectiveness of Remedy

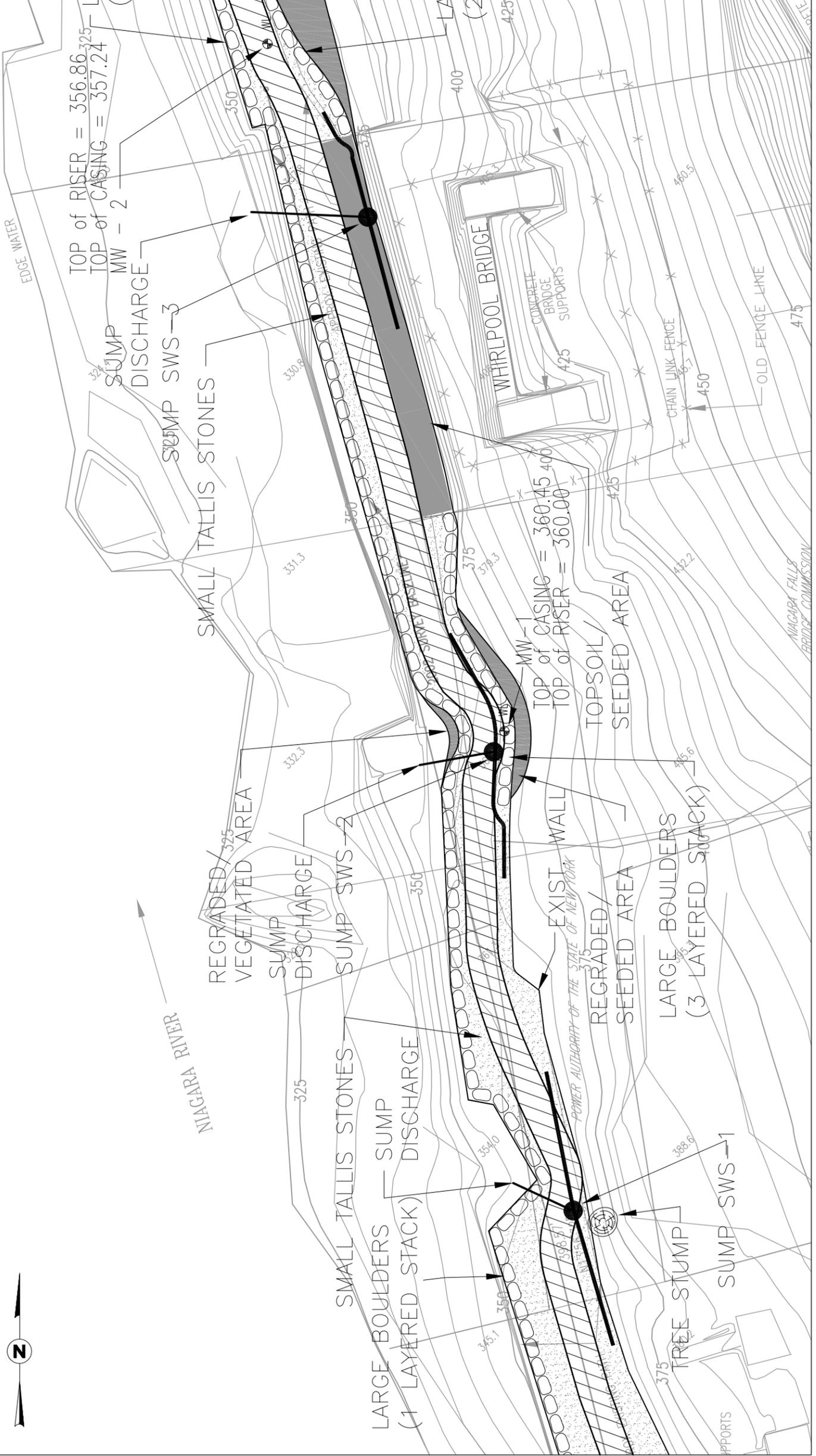
The remedy has been effective in meeting its objectives. Exposure to residual contamination is prevented by limiting visitors to the trail and away from the side slopes. Contaminant migration has been significantly reduced with the removal of a significant amount of the source of contamination, and maintenance of the trail and side slopes.

C. Future PRR Submittals

The next PRR, due in 2029, will document ongoing monitoring efforts and maintenance/repair work on the trail and side slopes. The scope of future site management will be evaluated as more monitoring data becomes available. Institutional controls will remain in place to limit visitor access to the side slopes.

DRAWING 1

WATER GAUGE
ELEVATION = 323.29'



WHIRLPOOL BRIDGE - SOIL REMEDIATION
PHOTOS – PRE-REMEDIATION (2004) AND AFTER (2023)



Before – North end of Trail in Excavation Zone



After – North section of Trail in Excavation Zone



Before – Looking North at Upper Retaining Wall



After – Looking South at Upper Retaining Wall



Before – South end of Excavation Zone near Old Bridge Supports



After – South end of Excavation Zone near Old Bridge Supports

WHIRLPOOL BRIDGE – POST-REMEDATION LTM/INSPECTION
REMEDATION ZONE PHOTOS – SEP 2023



Looking North on the Improved Trail at the gate near the south end



A wetter than normal summer has fostered rapid non-woody plant growth



The Erosion Control Wall is still in excellent condition



Landslide debris behind the Erosion Control Wall is about 2/3s of the total wall height



The Improved Trail remains in excellent condition. Vigorous plant growth is visible below the wall.



Most of the signs on the Upper Retaining Wall remain in good condition

WHIRLPOOL BRIDGE – POST-REMEDATION LTM/INSPECTION
UPPER TRAIL PHOTOS – SEP 2023



The Upper Staging Area remains dominated by non-woody plants



There are a few small ruts in the steep area under the rock cliff of the Upper Trail



Most of the Upper Trail remains in excellent condition



The washed-out area of the trail has been repaired with secured stone and a culvert



The Lower Staging Area. The removal of the Norway Maples resulted in aggressive plant growth.



Dead invasive Norway Maples and Ailanthus are still visible on the steep slopes since being girdled.



**WHIRLPOOL BRIDGE SOILS REMEDIATION
LOCATION MAP/AERIAL PHOTO**

FIGURE 1

IEG

FIGURE 2
WHIRLPOOL BRIDGE SOILS
LEAD IN GROUNDWATER AND SURFACE WATER

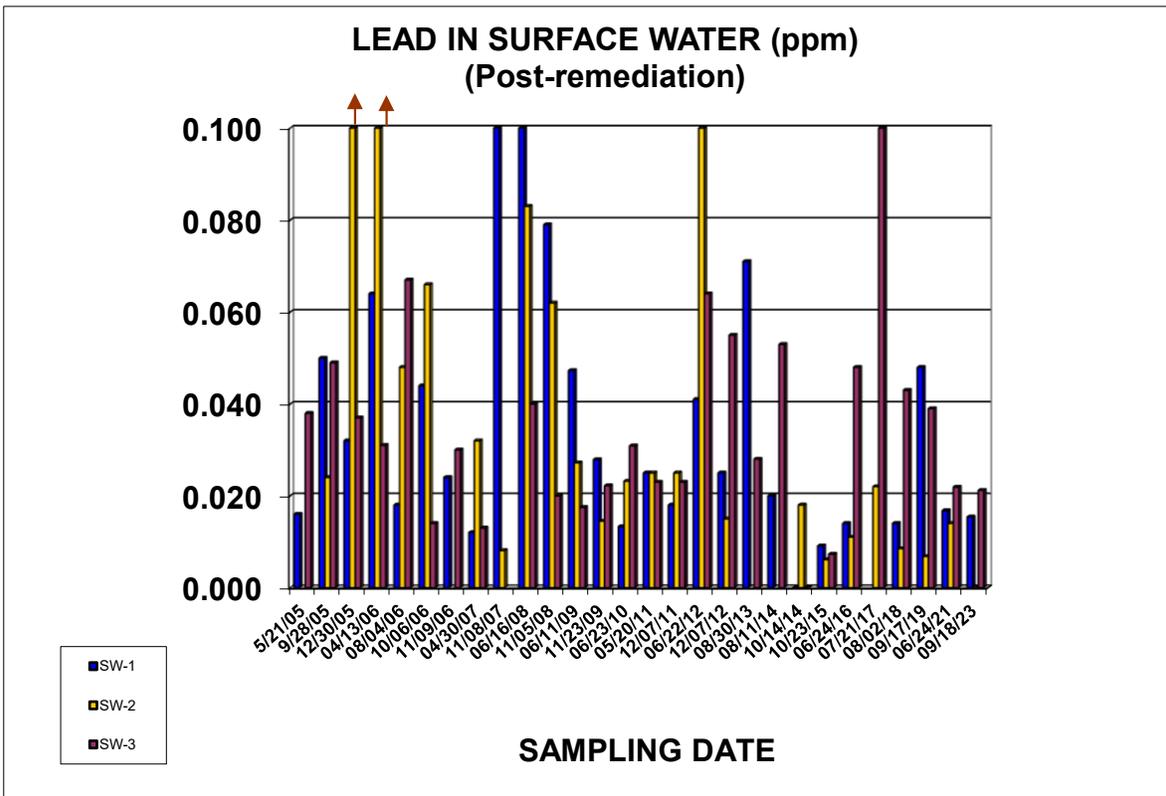
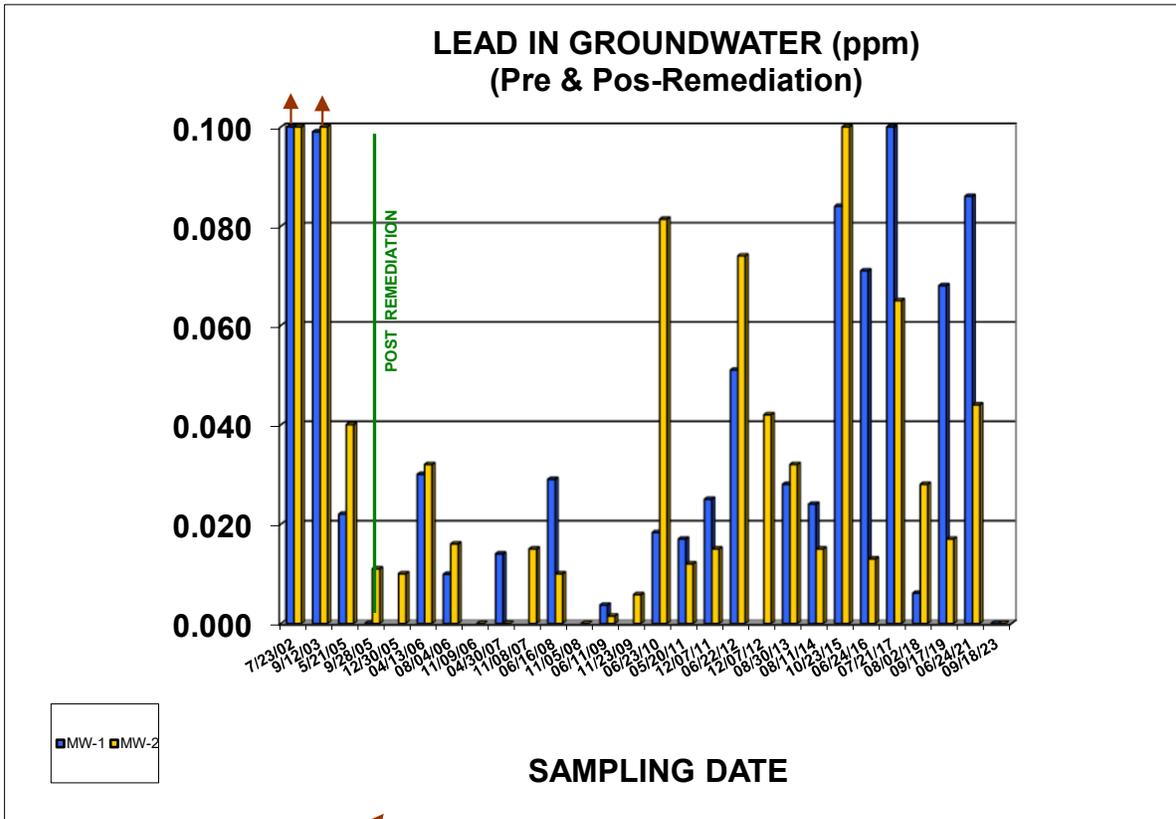
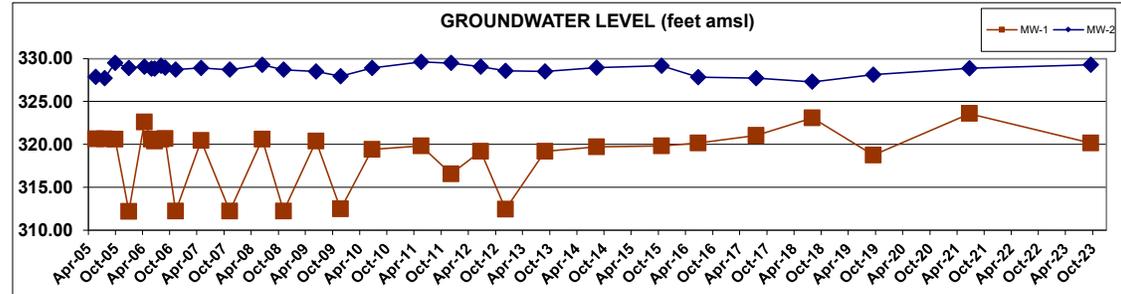


TABLE 1
WHIRLPOOL BRIDGE SOILS
POST-REMEDATION MONITORING
WATER LEVEL MEASUREMENTS - GW MONITORING WELLS

WELL ID		MW-1		MW-2		RIVER	
LOCATION		Located south of Bridge footing by the trail		Located north of bridge footing on the trail		Located on stone block across from MW-2	
SURVEY COORDs (ft)	LATITUDE	373313.04		373373.90		373223.27	
	LONGITUDE	1133329.90		1133152.90		1133325.62	
ELEVATIONS (ft)	TOP OF CASING	360.45		357.24		323.29 (Nail on stone)	
	TOP OF RISER	360.00		356.86			
	BOTTOM OF WELL	311.59		319.03			
	WELL DEPTH	48.41		37.83			
WATER LEVEL MEASUREMENTS (ft)		Depth	Elevation	Depth	Elevation	Depth	Elevation
PRE-REMEDATION	10-Jul-02	39.73	320.66	31.42	326.77	2.26	321.03
	15-Aug-02	39.55	320.84	30.25	327.94	2.95	320.34
	13-Sep-02	40.30	320.09	30.65	327.54	2.37	320.92
POST-REMEDATION	21-May-05	39.35	320.65	28.97	327.89	--	--
	20-Jul-05	39.37	320.63	29.13	327.73	2.89	320.40
	28-Sep-05	39.39	320.61	27.34	329.52	--	--
	30-Dec-05	47.82	312.18	27.94	328.92	--	--
	13-Apr-06	37.40	322.60	27.81	329.05	--	--
	30-May-06	39.42	320.58	28.03	328.83	--	--
	21-Jun-06	39.62	320.38	28.04	328.82	--	--
	4-Aug-06	39.40	320.60	27.68	329.18	--	--
	30-Aug-06	39.34	320.66	27.90	328.96	--	--
	9-Nov-06	47.81	312.19	28.12	328.74	--	--
	30-Apr-07	39.57	320.43	27.95	328.91	--	--
	8-Nov-07	47.80	312.20	28.15	328.71	--	--
	15-Jun-08	39.40	320.60	27.58	329.28	--	--
	5-Nov-08	47.80	312.20	28.15	328.71	--	--
	11-Jun-09	39.62	320.38	28.37	328.49	--	--
	23-Nov-09	47.55	312.45	28.91	327.95	--	--
	23-Jun-10	40.58	319.42	27.96	328.90	--	--
	20-May-11	40.18	319.82	27.23	329.63	--	--
	7-Dec-11	43.45	316.55	27.37	329.49	--	--
	22-Jun-12	40.82	319.18	27.80	329.06	--	--
	7-Dec-12	47.57	312.43	28.29	328.57	--	--
	30-Aug-13	40.81	319.19	28.37	328.49	--	--
	11-Aug-14	40.29	319.71	27.91	328.95	--	--
23-Oct-15	40.18	319.82	27.69	329.17	--	--	
24-Jun-16	39.86	320.14	29.01	327.85	--	--	
21-Jul-17	38.97	321.03	29.13	327.73	--	--	
2-Aug-18	36.90	323.10	29.55	327.31	--	--	
17-Sep-19	41.26	318.74	28.71	328.15	--	--	
24-Jun-21	36.41	323.59	28.00	328.86	--	--	
18-Sep-23	39.85	320.15	27.56	329.30	--	--	

NOTES:
1. All depths are measured from Top of Riser in each well
2. River level varies by about 3 feet between night and day due to diversion of flow at night to reservoir
River levels are measured during day time when the levels are at their highest.
3. The Top of Casing and Top of Riser in MW-1 and MW-2 were resurveyed in July '05 following remediation



**TABLE 2
WHIRLPOOL BRIDGE SOILS REMEDIATION
POST-REMEDIATION MONITORING
GROUNDWATER/SURFACE WATER ANALYSIS**

ID	DATE	Arsenic	Cadmium	Chromium	Lead	Zinc	PAHs	
MONITORING WELLS (in mg/L)								
MW-1	7/23/02	0.006	0.002	0.108	0.240	0.335	ND	
	9/12/03	0.046	ND	0.059	0.099	0.234	ND	
	5/21/05	ND	ND	0.010	0.022	0.076	--	
	9/28/05	ND	ND	ND	ND	0.036	--	
	12/30/05	NO SAMPLE; WELL DRY						
	04/13/06	0.011	ND	0.015	0.030	0.130	--	
	08/04/06	ND	ND	0.006	0.010	0.056	--	
	11/09/06	NO SAMPLE; WELL DRY						
	04/30/07	ND	0.001	0.006	0.014	0.094	--	
	11/08/07	NO SAMPLE; WELL DRY						
	06/16/08	ND	ND	0.009	0.029	0.070	--	
	11/05/08	NO SAMPLE; WELL DRY						
	06/11/09	ND	ND	0.001	0.004	0.041	--	
	11/23/09	NO SAMPLE; WELL DRY						
	06/23/10	ND	ND	0.003	0.018	0.037	--	
	05/20/11	ND	0.0004	0.006	0.017	0.040	--	
	12/07/11	ND	0.0005	0.006	0.025	0.140	--	
	06/22/12	0.015	ND	0.018	0.051	0.140	--	
	12/07/12	NO SAMPLE; WELL DRY						
	08/30/13	0.012	ND	0.012	0.028	0.110	--	
	08/11/14	ND	0.0028	0.008	0.024	0.550	--	
	10/23/15	0.022	0.00056	0.023	0.084	0.200	--	
	06/24/16	ND	ND	ND	0.071	0.024	--	
07/21/17	0.008	0.00077	0.010	0.170	0.080	--		
08/02/18	ND	ND	0.006	0.006	0.027	--		
09/17/19	ND	ND	0.013	0.068	0.079			
06/24/21	ND	ND	0.021	0.086	0.097	--		
09/18/23	ND	ND	0.012	ND	ND	--		
MW-2	7/23/02	0.670	0.009	0.340	1.110	1.460	ND	
	9/12/03	0.428	0.006	0.234	1.240	1.240	ND	
	5/21/05	0.014	ND	0.009	0.040	0.051	--	
	9/28/05	ND	ND	ND	0.011	ND	--	
	12/30/05	ND	ND	ND	0.010	ND	--	
	04/13/06	0.017	ND	0.013	0.032	0.057	--	
	08/04/06	ND	ND	0.008	0.016	0.064	--	
	11/09/06	ND	ND	ND	ND	0.043	--	
	04/30/07	ND	ND	ND	ND	0.026	--	
	11/08/07	ND	ND	0.009	0.015	0.050	--	
	06/16/08	ND	ND	ND	0.010	0.012	--	
	11/05/08	ND	ND	ND	ND	0.017	--	
	06/11/09	0.009	ND	ND	0.002	0.006	--	
	11/23/09	0.010	ND	ND	0.006	0.016	--	
	06/23/10	0.065	ND	0.044	0.081	0.029	--	
	05/20/11	ND	0.0005	0.003	0.012	0.015	--	
	12/07/11	ND	ND	0.001	0.015	0.027	--	
	06/22/12	0.054	0.0008	0.032	0.074	0.140	--	
	12/07/12	0.048	ND	0.035	0.042	0.140	--	
	08/30/13	0.010	ND	0.004	0.032	0.019	--	
	08/11/14	0.016	0.0057	0.027	0.015	0.620	--	
	10/23/15	0.084	0.00086	0.054	0.120	1.700	--	
	06/24/16	0.021	0.00061	0.009	0.013	0.081	--	
07/21/17	0.041	ND	0.023	0.065	0.290	--		
08/02/18	0.032	0.00050	0.038	0.028	0.098	--		
09/17/19	0.027	ND	0.017	0.017	0.081			
06/24/21	0.055	ND	0.030	0.044	0.128	--		
09/18/23	0.013	ND	ND	ND	ND	--		

**TABLE 2
WHIRLPOOL BRIDGE SOILS REMEDIATION
POST-REMEDIATION MONITORING
GROUNDWATER/SURFACE WATER ANALYSIS**

ID	DATE	Arsenic	Cadmium	Chromium	Lead	Zinc	PAHs	
SURFACE WATER SUMPS (in mg/L)								
SW-1	5/21/05	ND	ND	ND	0.016	ND	--	
	9/28/05	ND	ND	ND	0.050	0.055	--	
	12/30/05	ND	ND	ND	0.032	0.029	--	
	04/13/06	ND	ND	ND	0.064	0.034	--	
	08/04/06	ND	ND	ND	0.018	0.026	--	
	10/06/06	ND	ND	ND	0.044	--	--	
	11/09/06	ND	ND	ND	0.024	0.020	--	
	04/30/07	ND	ND	ND	0.012	0.025	--	
	11/08/07	ND	ND	ND	0.120	0.059	--	
	06/16/08	ND	ND	ND	0.120	0.075	--	
	11/05/08	ND	ND	ND	0.079	0.030	--	
	06/11/09	ND	ND	0.000	0.047	0.078	--	
	11/23/09	ND	ND	ND	0.028	0.039	--	
	06/23/10	ND	ND	ND	0.013	0.014	--	
	05/20/11	ND	ND	ND	0.025	0.040	--	
	12/07/11	ND	ND	ND	0.018	0.026	--	
	06/22/12	ND	ND	0.0015	0.041	0.065	--	
	12/07/12	ND	ND	ND	0.025	0.020	--	
	08/30/13	ND	ND	ND	0.071	0.035	--	
	08/11/14	ND	ND	ND	0.020	0.015	--	
	10/14/14	--	--	--	--	--	--	
	10/23/15	ND	ND	ND	0.0091	0.0086	--	
	06/24/16	ND	ND	ND	0.0140	0.0120	--	
07/21/17	<i>NO SAMPLE; SUMP DRY</i>							
08/02/18	ND	ND	0.0013	0.0140	0.0370	--		
09/17/19	ND	ND	ND	0.0480	0.0240	--		
06/24/21	ND	ND	ND	0.0168	ND	--		
09/18/23	ND	ND	ND	0.0154	ND	--		
SW-2	5/21/05	<i>NO SAMPLE; SUMP DRY</i>						
	9/28/05	ND	ND	ND	0.024	0.036	--	
	12/30/05	ND	ND	ND	0.290	0.180	--	
	04/13/06	ND	ND	ND	0.120	0.082	--	
	08/04/06	ND	ND	ND	0.048	0.045	--	
	10/06/06	ND	ND	ND	0.066	--	--	
	11/09/06	<i>NO SAMPLE; SUMP DRY</i>						
	04/30/07	ND	ND	ND	0.032	0.055	--	
	11/08/07	ND	ND	ND	0.008	0.032	--	
	06/16/08	ND	ND	0.006	0.083	0.120	--	
	11/05/08	ND	ND	ND	0.062	0.074	--	
	06/11/09	ND	ND	0.002	0.027	0.055	--	
	11/23/09	ND	ND	ND	0.015	0.041	--	
	06/23/10	ND	ND	0.001	0.023	0.055	--	
	05/20/11	ND	ND	0.004	0.025	0.041	--	
	12/07/11	ND	ND	0.016	0.025	0.038	--	
	06/22/12	0.0076	0.0007	0.0071	0.260	0.230	--	
	12/07/12	ND	ND	0.0056	0.015	0.030	--	
	08/30/13	<i>NO SAMPLE; BURIED BY LANDSLIDE</i>						
	08/11/14	<i>NO SAMPLE; SUMP BOX FILLED WITH SOIL</i>						
	10/14/14	ND	ND	ND	0.018	0.024	--	
	10/23/15	ND	ND	0.0026	0.0061	0.024	--	
	06/24/16	ND	ND	0.0048	0.0110	0.024	--	
07/21/17	ND	ND	0.0020	0.0220	0.037	--		
08/02/18	ND	ND	0.0038	0.0085	0.031	--		
09/17/19	ND	ND	0.0020	0.0068	0.022	--		
06/24/21	ND	ND	ND	0.0140	ND	--		
09/18/23	ND	ND	ND	ND	ND	--		
SW-3	5/21/05	ND	ND	ND	0.038	0.084	--	
	9/28/05	ND	ND	0.004	0.049	0.056	--	
	12/30/05	ND	ND	0.004	0.037	0.170	--	
	04/13/06	ND	ND	ND	0.031	0.110	--	
	08/04/06	ND	ND	ND	0.067	0.120	--	
	10/06/06	ND	ND	ND	0.014	--	--	
	11/09/06	ND	ND	ND	0.030	0.060	--	
	04/30/07	ND	ND	ND	0.013	0.390	--	
	11/08/07	<i>NO SAMPLE; COULD NOT LOCATE SUMP</i>						
	06/16/08	ND	ND	ND	0.040	0.110	--	
	11/05/08	ND	ND	ND	0.020	0.061	--	
	06/11/09	0.003	ND	0.001	0.018	0.125	--	
	11/23/09	ND	ND	0.001	0.022	0.384	--	
	06/23/10	ND	ND	0.002	0.031	0.285	--	
	05/20/11	ND	0.0004	0.003	0.023	0.160	--	
	12/07/11	ND	ND	ND	0.023	0.110	--	
	06/22/12	ND	ND	0.0012	0.064	0.110	--	
	12/07/12	ND	ND	0.0016	0.055	0.360	--	
	08/30/13	ND	ND	ND	0.028	0.100	--	
	08/11/14	ND	ND	ND	0.053	0.110	--	
	10/14/14	--	--	--	--	--	--	
	10/23/15	ND	ND	ND	0.0073	0.130	--	
	06/24/16	ND	ND	ND	0.0480	0.072	--	
07/21/17	ND	ND	0.0050	0.1400	0.150	--		
08/02/18	ND	ND	0.0016	0.0430	0.055	--		
09/17/19	ND	ND	0.0013	0.0390	0.059	--		
06/24/21	ND	ND	ND	0.0219	ND	--		
09/18/23	ND	ND	ND	0.0212	ND	--		



FIELD INSPECTION REPORT

TO: Brian Sadowski (NYSDEC) / Rob Koert (NFBC)
FROM: Dharma Iyer
DATE: September 30, 2023
RE: Whirlpool Bridge – Post-remediation Inspection/Monitoring

DATE ON SITE	September 18, 2023
ACTIVITIES	Inspection; Groundwater, surface water and analysis
FIELD MEASUREMENTS	Water levels and field parameters (pH, TDS, turbidity, ORP, temp.)
UPPER TRAIL & STAGING AREAS	<p>Observations:</p> <ul style="list-style-type: none">• Upper Staging Area – Vigorous non-woody plant colonization. Several small woody plants (locust trees) were observed.• Talus under the cliff has been cleared to the sides of the trail.• Upper Trail – Mostly in very good condition; Trail System information signs have been added. Yellow Pesticide Caution signs were placed at the edge of the trail near the north end.• The washed-out area has been repaired with secured stone and a culvert.• Lower Staging Area – A WARNING sign has been added to the metal railing.• Aggressive understory non-woody plant growth in the Lower Staging Area due to the removal of the Norway Maple overstory.• Invasive tree species (Ailanthus and Norway Maple) are girdled and cut down across the gorge.
REMEDIATION ZONE	<p>Observations:</p> <ul style="list-style-type: none">• Rebuilt trail generally in very good condition.• Non-woody and a smaller number of woody plants are growing on remediated slopes. Plant growth in some areas is negatively impacted by recurring landslides.• Erosion/washouts/landslide above MW-1 and SW-2 are being contained by the Erosion Control Wall. Debris has thus far accumulated up to 3' below the top of the wall.• Surface rust has formed on the Monitoring Wells.• Access to the Remediation Zone is restricted by a stone wall and fence on the north end. Near the south end there is a gate that is open.• The metal WARNING signs on the Upper Retaining Wall could benefit from cleaning.• The metal AREA UNDER SURVEILLANCE sign on the Upper Retaining Wall is peeling.• Some large stones have been pushed over the edge near the north end by vandals.• All the Sump Boxes are in good condition.
PLANNED ACTIVITIES	<ul style="list-style-type: none">• Routine inspection, and sampling once every two years• Post-erosion repair (if necessary following significant rain storm)



FORM 1

Site Name: WHIRLPOOL RAPIDS BRIDGE

Site Location: Niagara Falls, NY, Niagara County

GROUNDWATER AND SURFACE WATER SAMPLING LOG

Sampled by: R. Allen, D. Iyer			Date: 18-Sep-23		
Well Type: Flush mount with 1" riser			Weather: 63 F, mostly clear		
Measuring Point: Top of Riser			Purging Equipment: Bailer		
(in feet)	MW-1	MW-2	Sampling Equipment: Bailer		
Measuring Point Elev.	360.00	356.86	Decon. method: Distilled water		
Depth to Water:	39.85	27.56	Riser diameter: 1"		
Depth to Well Bottom:	47.5	38.15	(gallons)	MW-1	MW-2
Water Table Elevation:	320.15	329.3	One well volume	0.33	0.43
Length of Water Column:	8	10.59	Three well volumes	1.00	1.3
			Well volume = 0.041 x length of water column in ft		
Observations:	MW-1	MW-2	Surface waters		
Color	clear	turbid with black specs	clear		
Odors:	none	H2S odor	none		
PRECIPITATION	Week of 9/04/23: Total 0.85 inches		Range 0 to 0.62 inches		
	Week of 9/11/23: Total 0.21 inches		Range 0 to 0.19 inches		
VOLUME REMOVED (gal)	Turbidity (ntu)	TEMP. (°C)	SP. COND. (µmhos) / TDS (mg/L)	pH (s.u.)	ORP (mv)
MONITORING WELL MW-1					
0	22	15.6	799 / 398	7.0	-3.8
0.5	120	15.0	544 / 267	6.8	13
1	32	14.2	494 / 247	6.9	63
MONITORING WELL MW-2					
0	50	13.9	2940 / 1470	6.1	-318
0.5 gal	180	14.5	2803 / 1400	6.3	-322
1.0 gal	160	13.7	2860 / 1430	6.4	-333
SURFACE WATER SUMPS					
SW-1 (Depth 1 7/8 ")	5.0	17.5	418 / 209	6.8	233
SW-2 (Depth 1 7/8")	6.2	16.1	332 / 166	6.7	6.8
SW-3 (Depth 1 7/8 ")	8.5	16.6	1760 / 880	7.0	210
NOTES:	Trail System information signs have been added on the Upper Trail. Yellow Pesticide Caution signs have been placed at the edge of the Upper Trail near the Lower Staging Area.				
	The washed out area of the Upper Trail has been repaired with secured stone and a culvert.				



PARADIGM
ENVIRONMENTAL SERVICES, INC.

Analytical Report For
Iyer Environmental Group

For Lab Project ID

234318

Referencing

Whirlpool Bridge LTM

Prepared

Tuesday, September 26, 2023

Any noncompliant QC parameters or other notes impacting data interpretation are flagged or documented on the final report or are noted below.

Emily Farmer

Certifies that this report has been approved by the Technical Director or Designee

179 Lake Avenue • Rochester, NY 14608 • (585) 647-2530 • Fax (585) 647-3311 • ELAP ID# 10958

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.



Lab Project ID: 234318

Client: Iyer Environmental Group

Project Reference: Whirlpool Bridge LTM

Sample Identifier: MW-1

Lab Sample ID: 234318-01

Date Sampled: 9/18/2023 10:00

Matrix: Groundwater

Date Received 9/19/2023

Metals

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Arsenic	< 0.0100	mg/L		9/21/2023 10:50
Cadmium	< 0.00500	mg/L		9/21/2023 10:50
Chromium	0.0122	mg/L		9/21/2023 10:50
Lead	< 0.0100	mg/L		9/21/2023 10:50
Zinc	< 0.0600	mg/L		9/21/2023 10:50

Method Reference(s): EPA 6010C

EPA 3005A

Preparation Date: 9/20/2023

Data File: 230921A

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.



Lab Project ID: 234318

Client: Iyer Environmental Group

Project Reference: Whirlpool Bridge LTM

Sample Identifier: MW-2

Lab Sample ID: 234318-02

Date Sampled: 9/18/2023 10:30

Matrix: Groundwater

Date Received 9/19/2023

Metals

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Arsenic	0.0128	mg/L		9/21/2023 10:58
Cadmium	< 0.00500	mg/L		9/21/2023 10:58
Chromium	< 0.0100	mg/L		9/21/2023 10:58
Lead	< 0.0100	mg/L		9/21/2023 10:58
Zinc	< 0.0600	mg/L		9/21/2023 10:58

Method Reference(s): EPA 6010C

EPA 3005A

Preparation Date: 9/20/2023

Data File: 230921A

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.



Client: Iyer Environmental Group

Project Reference: Whirlpool Bridge LTM

Sample Identifier: SW-1

Lab Sample ID: 234318-03

Date Sampled: 9/18/2023 11:00

Matrix: Water

Date Received 9/19/2023

Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Arsenic	< 0.0100	mg/L		9/21/2023 11:10
Cadmium	< 0.00500	mg/L		9/21/2023 11:10
Copper	< 0.0200	mg/L		9/21/2023 11:10
Lead	0.0154	mg/L		9/21/2023 11:10
Zinc	< 0.0600	mg/L		9/21/2023 11:10

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 9/20/2023
Data File: 230921A



Client: Iyer Environmental Group

Project Reference: Whirlpool Bridge LTM

Sample Identifier: SW-2

Lab Sample ID: 234318-04

Date Sampled: 9/18/2023 11:30

Matrix: Water

Date Received 9/19/2023

Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Arsenic	< 0.0100	mg/L		9/21/2023 11:13
Cadmium	< 0.00500	mg/L		9/21/2023 11:13
Chromium	< 0.0100	mg/L		9/21/2023 11:13
Lead	< 0.0100	mg/L		9/21/2023 11:13
Zinc	< 0.0600	mg/L		9/21/2023 11:13

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 9/20/2023
Data File: 230921A



Lab Project ID: 234318

Client: Iyer Environmental Group

Project Reference: Whirlpool Bridge LTM

Sample Identifier: SW-3

Lab Sample ID: 234318-05

Date Sampled: 9/18/2023 12:00

Matrix: Water

Date Received 9/19/2023

Metals

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Arsenic	< 0.0100	mg/L		9/21/2023 11:16
Cadmium	< 0.00500	mg/L		9/21/2023 11:16
Chromium	< 0.0100	mg/L		9/21/2023 11:16
Lead	0.0212	mg/L		9/21/2023 11:16
Zinc	< 0.0600	mg/L		9/21/2023 11:16

Method Reference(s): EPA 6010C

EPA 3005A

Preparation Date: 9/20/2023

Data File: 230921A

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.



Method Blank Report

Client: Iyer Environmental Group
Project Reference: Whirlpool Bridge LTM
Lab Project ID: 234318
Matrix: Water

Metals

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Arsenic	<0.0100	mg/L		9/21/2023 10:24
Cadmium	<0.00500	mg/L		9/21/2023 10:24
Chromium	<0.0100	mg/L		9/21/2023 10:24
Lead	<0.0100	mg/L		9/21/2023 10:24
Zinc	<0.0600	mg/L		9/21/2023 10:24

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 9/20/2023
Data File: 230921A
QC Batch ID: QC230920water
QC Number: Blk 1



QC Report for Laboratory Control Sample and Control Sample Duplicate

Client: Iyer Environmental Group

Project Reference: Whirlpool Bridge LTM

Lab Project ID: 234318

Matrix: Water

Metals

Analyte	LCS	LCSD	Spike	Units	Result	LCSD	Recovery	LCSD	Recovery	%Rec	Limits	Outliers	Relative %	RPD	Outliers	Date
Arsenic	2.50	2.50	mg/L	2.37	2.40	94.8	96.1	80 - 120	1.42	20	9/21/2023					
Cadmium	1.00	1.00	mg/L	1.03	1.03	103	103	80 - 120	0.292	20	9/21/2023					
Chromium	2.50	2.50	mg/L	2.38	2.38	95.1	95.2	80 - 120	0.168	20	9/21/2023					
Lead	2.50	2.50	mg/L	2.46	2.47	98.5	98.7	80 - 120	0.162	20	9/21/2023					
Zinc	2.50	2.50	mg/L	2.52	2.51	101	101	80 - 120	0.278	20	9/21/2023					

Method Reference(s):

EPA 6010C
EPA 3005A

Preparation Date: 9/20/2023

Data File: 230921A

QC Number: 1

QC Batch ID: QC230920water

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.



Analytical Report Appendix

The reported results relate only to the samples as they have been received by the laboratory.

Each page of this document is part of a multipage report. This document may not be reproduced except in its entirety, without the prior consent of Paradigm Environmental Services, Inc.

All soil/sludge samples have been reported on a dry weight basis, unless qualified "reported as received". Other solids are reported as received.

Low level Volatiles blank reports for soil/solid matrix are based on a nominal 5 gram weight. Sample results and reporting limits are based on actual weight, which may be more or less than 5 grams.

The Chain of Custody provides additional information, including compliance with sample condition requirements upon receipt. Sample condition requirements are defined under the 2003 NELAC Standard, sections 5.5.8.3.1 and 5.5.8.3.2.

NYSDOH ELAP does not certify for all parameters. Paradigm Environmental Services or the indicated subcontracted laboratory does hold certification for all analytes where certification is offered by ELAP unless otherwise specified. Aliquots separated for certain tests, such as TCLP, are indicated on the Chain of Custody and final reports with an "A" suffix.

Data qualifiers are used, when necessary, to provide additional information about the data. This information may be communicated as a flag or as text at the bottom of the report. Please refer to the following list of analyte-specific, frequently used data flags and their meaning:

"<" = Analyzed for but not detected at or above the quantitation limit.

"E" = Result has been estimated, calibration limit exceeded.

"H" = Denotes a parameter analyzed outside of holding time.

"Z" = See case narrative.

"D" = Sample, Laboratory Control Sample, or Matrix Spike Duplicate results above Relative Percent Difference limit.

"M" = Matrix spike recoveries outside QC limits. Matrix bias indicated.

"B" = Method blank contained trace levels of analyte. Refer to included method blank report.

"J" = Result estimated between the quantitation limit and half the quantitation limit.

"L" = Laboratory Control Sample recovery outside accepted QC limits.

"P" = Concentration differs by more than 40% between the primary and secondary analytical columns.

"NC" = Not calculable. Applicable to RPD if sample or duplicate result is non-detect or estimated (see primary report for data flags). Applicable to MS if sample is greater or equal to ten times the spike added. Applicable to sample surrogates or MS if sample dilution is 10x or higher.

"" = Indicates any recoveries outside associated acceptance windows. Surrogate outliers in samples are presumed matrix effects. LCS demonstrates method compliance unless otherwise noted.*

"(1)" = Indicates data from primary column used for QC calculation.

"A" = denotes a parameter for which ELAP does not offer approval as part of their laboratory certification program.

"F" = denotes a parameter for which Paradigm does not carry certification, the results for which should therefore only be used where ELAP certification is not required, such as personal exposure assessment.

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GENERAL TERMS AND CONDITIONS

LABORATORY SERVICES

These Terms and Conditions embody the whole agreement of the parties in the absence of a signed and executed contract between the Laboratory (LAB) and Client. They shall supersede all previous communications, representations, or agreements, either verbal or written, between the parties. The LAB specifically rejects all additional, inconsistent, or conflicting terms, whether printed or otherwise set forth in any purchase order or other communication from the Client to the LAB. The invalidity or unenforceability in whole or in part of any provision, term or condition hereof shall not affect in any way the validity or enforceability of the remainder of the Terms and Conditions. No waiver by LAB of any provision, term, or condition hereof or of any breach by or obligation of the Client hereunder shall constitute a waiver of such provision, term, or condition on any other occasion or a waiver of any other breach by or obligation of the Client. This agreement shall be administered and interpreted under the laws of the state which services are procured.

Warranty.

Recognizing that the nature of many samples is unknown and that some may contain potentially hazardous components, LAB warrants only that it will perform testing services, obtain findings, and prepare reports in accordance with generally accepted analytical laboratory principles and practices at the time of performance of services. LAB makes no other warranty, express or implied.

Scope and Compensation.

LAB agrees to perform the services described in the chain of custody to which these terms and conditions are attached. Unless the parties agree in writing to the contrary, the duties of LAB shall not be construed to exceed the services specifically described. LAB will use LAB default method for all tests unless specified otherwise on the Work Order.

Payment terms are net 30 days from the date of invoice. All overdue payments are subject to an interest charge of one and one-half percent (1-1/2%) per month or a portion thereof. Client shall also be responsible for costs of collection, including payment of reasonable attorney fees if such expense is incurred. The prices, unless stated, do not include any sale, use or other taxes. Such taxes will be added to invoice prices when required.

Prices.

Compensation for services performed will be based on the current Lab Analytical Fee Schedule or on quotations agreed to in writing by the parties. Turnaround time based charges are determined from the time of resolution of all work order questions. Testimony, court appearances or data compilation for legal action will be charged separately. Evaluation and reporting of initial screening runs may incur additional fees.

Limitations of Liability.

In the event of any error, omission, or other professional negligence, the sole and exclusive responsibility of LAB shall be to re-perform the deficient work at its own expense and LAB shall have no other liability whatsoever. All claims shall be deemed waived unless made in writing and received by LAB within ninety (90) days following completion of services.

LAB shall have no liability, obligation, or responsibility of any kind for losses, costs, expenses, or other damages (including but not limited to any special, direct, incidental or consequential damages) with respect to LAB's services or results.

All results provided by LAB are strictly for the use of its clients and LAB is in no way responsible for the use of such results by clients or third parties. All reports should be considered in their entirety, and LAB is not responsible for the separation, detachment, or other use of any portion of these reports. Client may not assign the lab report without the written consent of the LAB.

Client covenants and agrees, at its/his/her sole expense, to indemnify, protect, defend, and save harmless the LAB from and against any and all damages, losses, liabilities, obligations, penalties, claims, litigation, demands, defenses, judgments, suits, actions, proceedings, costs, disbursements and/or expenses (including, without limitation attorneys' and experts' fees and disbursements) of any kind whatsoever which may at any time be imposed upon, incurred by or asserted or awarded against client relating to, resulting from or arising out of (a) the breach of this agreement by this client, (b) the negligence of the client in handling, delivering or disclosing any hazardous substance, (c) the violation of the Client of any applicable law, (d) non-compliance by the Client with any environmental permit or (e) a material misrepresentation in disclosing the materials to be tested.

Hazard Disclosure.

Client represents and warrants that any sample delivered to LAB will be preceded or accompanied by complete written disclosure of the presence of any hazardous substances known or suspected by Client. Client further warrants that any sample containing any hazardous substance that is to be delivered to LAB will be packaged, labeled, transported, and delivered properly and in accordance with applicable laws.

Sample Handling.

Prior to LAB's acceptance of any sample (or after any revocation of acceptance), the entire risk of loss or of damage to such sample remains with Client. Samples are accepted when receipt is acknowledged on chain of custody documentation. In no event will LAB have any responsibility for the action or inaction of any carrier shipping or delivering any sample to or from LAB premises.

Client authorizes LAB to proceed with the analysis of samples as received by the laboratory, recognizing that any samples not in compliance with all current DOH-ELAP-NELAP requirements for containers, preservation or holding time will be noted as such on the final report.

Disposal of hazardous waste samples is the responsibility of the Client. If the Client does not wish such samples returned, LAB may add storage and disposal fees to the final invoice. Maximum storage time for samples is 30 days after completion of analysis unless modified by applicable state or federal laws. Client will be required to give the LAB written instructions concerning disposal of these samples.

LAB reserves the absolute right, exercisable at any time, to refuse to receive delivery of, refuse to accept, or revoke acceptance of any sample, which, in the sole judgment of LAB (a) is of unsuitable volume, (b) may be or become unsuitable for or may pose a risk in handling, transport, or processing for any health, safety, environmental or other reason whether or not due to the presence in the sample of any hazardous substance, and whether or not such presence has been disclosed to LAB by Client or (c) if the condition or sample date make the sample unsuitable for analysis.

Legal Responsibility.

LAB is solely responsible for performance of this contract, and no affiliated company, director, officer, employee, or agent shall have any legal responsibility hereunder, whether in contract or tort including negligence.

Assignment.

LAB may assign its performance obligations under this contract to other parties, as it deems necessary. LAB shall disclose to Client any assignee (subcontractor) by ELAP ID # on the submitted final report.

Force Majeure.

LAB shall have no responsibility or liability to the Client for any failure or delay in performance by LAB, which results in whole or in part from any cause or circumstance beyond the reasonable control of LAB. Such causes and circumstances shall include, but not limited to, acts of God, acts or orders of any government authority, strikes or other labor disputes, natural disasters, accidents, wars, civil disturbances, difficulties or delays in transportation, mail or delivery services, inability to obtain sufficient services or supplies from LAB's usual suppliers, or any other cause beyond LAB's reasonable control.

Law.

This contract shall be continued under the laws of the State of New York without regard to its conflicts of laws provision.

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CHAIN OF CUSTODY

1.52



PARADIGM ENVIRONMENTAL SERVICES

REPORT TO:

INVOICE TO:

LAB PROJECT ID

234318

Quotation #:

Email:

iyerenve@gmail.com

CLIENT: Iyer Environmental Group
 ADDRESS: 105 Indian Trail
 CITY: Williamsville STATE: NY ZIP: 14220
 PHONE: (716) 445-9684

CLIENT: SAME
 ADDRESS:
 CITY: STATE: ZIP:
 PHONE:

PROJECT REFERENCE
 Whirlpool Bridge
 LTMper email
 9/18/23

ATTN: Dharmya Iyer
 Matrix Codes:
 AQ - Aqueous Liquid
 NA - Non-Aqueous Liquid

WA - Water
 WG - Groundwater

DW - Drinking Water
 WW - Wastewater

SO - Soil
 SL - Sludge

SD - Solid
 PT - Paint

WP - Wipe
 CK - Caulk

OL - Oil
 AR - Air

REQUESTED ANALYSIS

DATE COLLECTED	TIME COLLECTED	COMPOSITE	GRADES	SAMPLE IDENTIFIER	MC AOD RIS	NCUMTBAIORS	REQUESTED ANALYSIS	REMARKS	PARADIGM LAB SAMPLE NUMBER
9/18/23	10:00A	V		MW-1	WG	V	5 Metals (As, Cd, Cr Pb, Zn)		01
	10:30A	V		MW-2	WG	V			02
	11:00A	V		SW-1	WA	V			03
	11:30A	V		SW-2	WA	V			04
	12:00P	V		SW-3	WA	V			05

Turnaround Time	Report Supplements
Availability contingent upon lab approval; additional fees may apply.	
Standard 5 day <input checked="" type="checkbox"/>	None Required <input type="checkbox"/>
10 day <input type="checkbox"/>	Batch QC <input checked="" type="checkbox"/>
Rush 3 day <input type="checkbox"/>	Category A <input type="checkbox"/>
Rush 2 day <input type="checkbox"/>	Category B <input type="checkbox"/>
Rush 1 day <input type="checkbox"/>	Other <input type="checkbox"/>
Other <input type="checkbox"/>	Other EDD <input type="checkbox"/>

Received By: Rachel Chavis Date/Time: 9/18/23 2:30 PM

Relinquished By: Dharmya Iyer Date/Time: 9/18/23 2:30 PM

Received By: [Signature] Date/Time: 9/19/23 15:35

Received @ Lab By: [Signature] Date/Time: 9/19/23 15:32

Total Cost:

By signing this form, client agrees to Paradigm Terms and Conditions (reverse).

See additional page for sample conditions.



Chain of Custody Supplement

Client: Iyer Environmental Completed by: ZF
 Lab Project ID: 234318 Date: 9/17/23

Sample Condition Requirements
 Per NELAC/ELAP 210/241/242/243/244

Condition	NELAC compliance with the sample condition requirements upon receipt		
	Yes	No	N/A
Container Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	_____		
Transferred to method-compliant container	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Headspace (<1 mL)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Preservation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	_____		
Chlorine Absent (<0.10 ppm per test strip)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Holding Time	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	_____		
Temperature	<input checked="" type="checkbox"/> ^{ZF} _{9/19} ^{6°C}	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Compliant Sample Quantity/Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	_____		