ENVIRONMENTAL MONITORING REPORT

BOBBY MORRIS PLAYFIELD RENOVATION PILOT PROGRAM

Prepared for
Seattle Parks and Recreation

Prepared by
Herrera Environmental Consultants, Inc.

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Prepared for
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INTRODUCTION

The Seattle Department of Parks and Recreation (Seattle Parks and Recreation) contracted with Herrera Environmental Consultants (Herrera) to monitor environmental conditions at two synthetic turf fields located on Capitol Hill in Seattle, Washington (Figure 1). One synthetic turf field, Bobby Morris Playfield, is located within Cal Anderson Park and contains an environmentally-friendly infill material composed of cork and sand. The other synthetic field, Miller Playfield, is located nearby next to the Miller Community Center and contains the traditional infill material composed of crumb rubber, which is made from recycled tires.

This monitoring project is part of the Bobby Morris Playfield Renovation Project developed to evaluate potential benefits and adverse impacts of using cork infill as an alternative to crumb rubber infill. The program includes testing the cork infill for durability, safety, playability, maintainability, and environmental health. If cork infill proves to be a better alternative, Seattle Parks and Recreation would replace crumb rubber infill with cork infill when synthetic playfield resurfacing is needed, which occurs approximately every 8 to 10 years.

The monitoring project objectives are to compare the following environmental conditions at the two playfields:

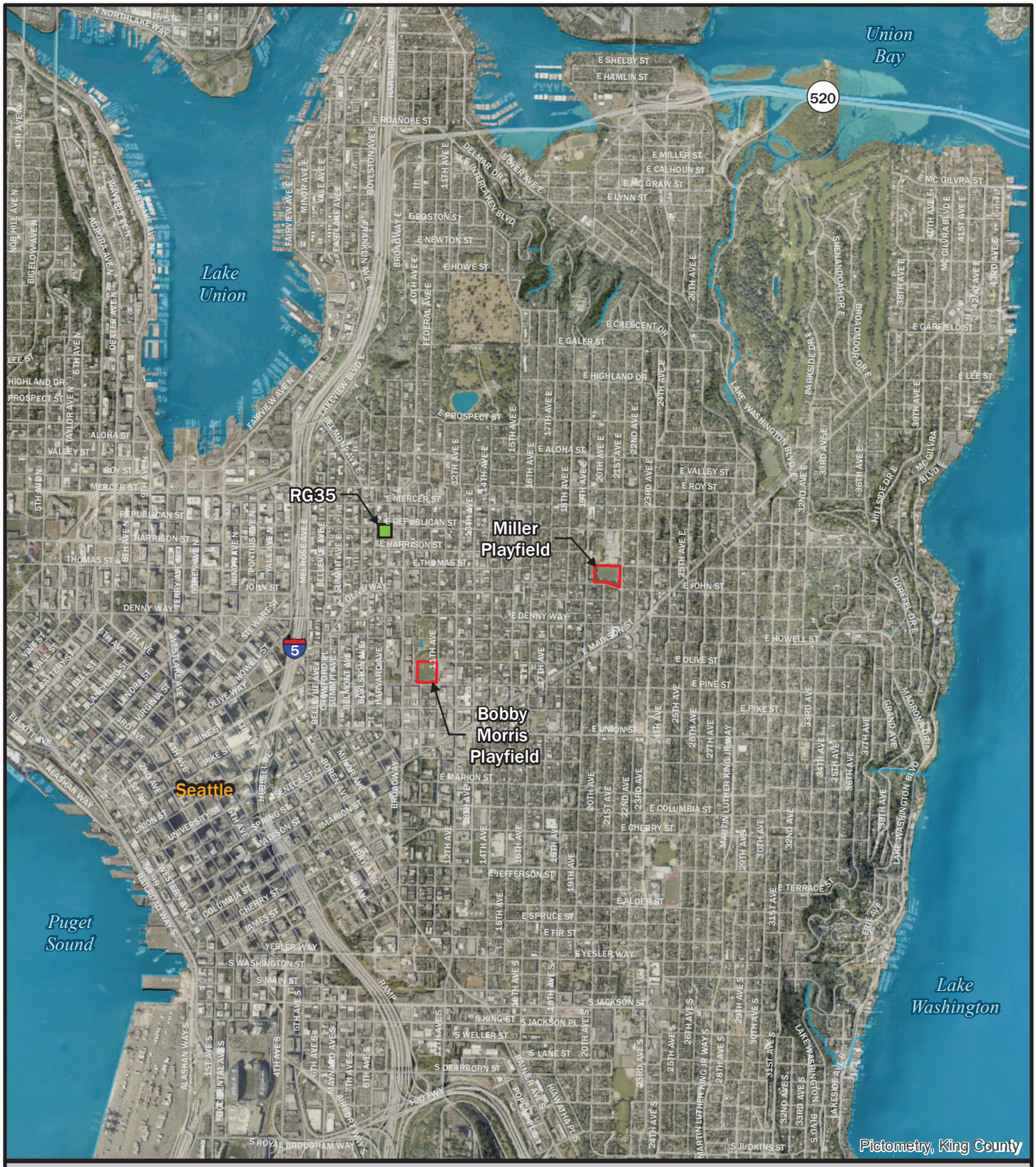
- Stormwater drainage monitoring at one downstream location at each playfield during three to five storm events to determine the quality of drainage from direct precipitation onto and through the playfield materials. Monitoring included collection of two grab samples at each location during each event for analysis of pollutants of concern according to methods previously used for stormwater monitoring in 2009–2010 of a new crumb rubber playfield constructed at Woodland Park.

- Lead wipe testing of painted lines at three locations on each field on one occasion to determine if lead is present on the paint surfaces.

- Mold testing of infill materials at two or three locations on each field on two occasions to determine if mold is present in the infill materials.

- Air temperature monitoring at two locations on each field at varied distances from the infill materials to determine if air temperatures differ between the fields.

Background information is provided followed by methods and results for each monitoring component, and the study conclusions.



Legend

- Project site
- Rain gauge
- Street
- Stream
- Waterbody

Figure 1
Vicinity Map.

N

0 1,250 2,500 5,000 Feet

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King County, Aerial (2017)

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BACKGROUND INFORMATION

Background information is provided below about the project and other synthetic turf studies evaluating the water quality of stormwater drainage and other relevant environmental variables at synthetic turf fields.

PROJECT BACKGROUND

Seattle Parks and Recreation has installed synthetic turf fields due in part to the several advantages that synthetic fields offer over traditional playfield surfaces (i.e., natural grass, sand, etc.). Currently, 30 of more than 200 athletic fields are synthetic surfaced. The advantages in using synthetic turf fields include:

- Lower maintenance costs (TRC 2008)
- Reduced need for fuel-powered equipment (TRC 2008)
- No use of chemical pesticides, herbicides, or fertilizers, providing some water quality benefits (Joyce 1998).
- Sustaining repeated heavy use during a variety of climatic conditions (unlike traditional grass fields) that can be used year-round in most weather (ASBA 2008).
- No need to be closed for protection or maintenance of grass (ASBA 2008; TRC 2008), which can extend for long periods of time during wet winter conditions in Seattle.
- Greater physical safety to athletes when compared to traditional natural grass fields (SDPR 2009).

Seattle Public Utilities (SPU) recently revised its stormwater code and manual that specifically define all sports fields (natural and artificial turf) as a pollution-generating pervious surface (Seattle 2017). This definition requires treatment of stormwater drainage from new or renovated fields draining to surface waters, regardless of the type of playing surface. Stormwater treatment is not required for new or renovated fields draining to sanitary wastewater systems, which includes Bobby Morris and Miller playfields. The addition of a stormwater treatment facility to new or renovated fields adds a considerable expense.

Seattle Parks and Recreation discussed with Seattle Public Utilities (SPU, the City Department administering the Municipal Stormwater Permit) the possibility for waiving stormwater treatment if natural cork or rubber materials were used as the synthetic turf infill. To meet stormwater permit and code requirements, Seattle Parks and Recreation would need to

scientifically establish that cork or other natural infills are not pollution generating (Sherell Ehlers, personal communication, March 21, 2018). Stormwater drainage monitoring would need to be conducted in accordance with the Phase I Municipal Stormwater Permit (Appendix 9 in Ecology 2016) as follows:

- A Quality Assurance Project Plan (QAPP) would need to be developed and approved by SPU.
- Flow monitoring and sampling with automatic samplers would be required for a minimum of 11 qualifying storm events per year to calculate wet and dry season pollutant loads.
- Sampling would likely be required at more than one field to account for different infill material types and ages, with an estimated cost of approximately $300,000 for three fields based on estimates of $20,000 for the QAPP, $60,000 for equipment, $20,000 for equipment installation, $100,000 for sampling and analysis, $30,000 for data management and validation, $50,000 for reporting, and $20, 000 for project management (D. Ahearn, Herrera, personal communication).

The determination of pollutant generating surface would be based on comparisons of the monitoring results to Washington State water quality criteria, but it is not clear which criteria (e.g., acute/chronic/human health criteria in marine/fresh/ground water) and which statistics (e.g., median, maximum, 95 percent confidence level) would be compared. It is likely that the human health criterion for at least one chemical would be exceeded in at least one sample, and that one or more field types would be deemed pollutant generating upon completion of an expensive monitoring program. At this time, Seattle Parks and Recreation is not planning to collect the data required to eliminate stormwater treatment requirements for new or renovated fields.

The Bobby Morris Playfield Renovation Pilot Program was developed to evaluate potential benefits and adverse impacts of using cork infill as an alternative to crumb rubber infill. The program includes testing the cork infill for durability, safety, playability, maintainability, and environmental health. If cork infill proves to be a better alternative, Seattle Parks and Recreation would replace crumb rubber infill with cork infill when synthetic playfield resurfacing is needed, which occurs approximately every 8 to 10 years.

Cork infill was used because of public health concerns about crumb rubber. Public health concerns about crumb rubber were recently raised in Seattle by the associate head soccer coach of the University of Washington women's soccer team, who expressed concern about cancer among 53 goalkeepers and other soccer players in Washington State. To address those concerns, the Washington State Department of Health and the University of Washington School of Public Health investigated the incident rate of cancer among soccer players on the coach's list (WDOH 2017). This investigation found less cancer among the soccer players on the coach's list than expected based on rates of cancer among Washington residents of the same ages. They concluded that the currently available research on the health effects of artificial turf does not

suggest that artificial turf presents a significant public health risk, and they recommended that soccer players should continue to play on playfields irrespective of the type of field surface. Assurances of the safety of artificial turf, however, were limited by lack of adequate information on potential toxicity and exposure because the investigation was not designed to determine if soccer players in general were at increased risk of cancer due to exposures from crumb rubber in artificial turf.

Cork is a sustainable natural material imported from southern Europe or northern Africa. Cork trees remain alive and continue to produce after the cork is harvested. Cork is durable, resists fungal growth, requires no supplemental irrigation (to remain stable during dry/warm periods), is playable, and has the same maintenance requirements as other turf infill systems. Cork has been used in Europe for several years and is being used in California and Southwest playfields. Cork's lighter color makes it more reflective than darker infills, thereby lessening field heat. Cork infill is mixed with sand and is 35 to 45 percent more expensive than crumb rubber. Crumb rubber is a sustainable material made from recycled tires, which are made from natural and synthetic rubber, with the addition of various chemicals and metal/textile reinforcements.

Environmental monitoring was included as part of the Bobby Morris Playfield Renovation Pilot Program to help with the overall evaluation and planning of other playfield renovation projects. Monitoring conducted for this project is not intended to provide detailed scientific evidence for changing stormwater treatment requirements or evaluating public health concerns of alternative infill materials.

In 2019, Seattle Parks and Recreation began renovating Brighton Playfield located in Hillman City, just north of Columbia City in the Rainier Valley. Brighton Playfield originally consisted of natural turf (grass/dirt) playfields that drain to Lake Washington. The renovation includes construction of 200,000 square feet of synthetic turf that is planned to include cork/sand infill. All stormwater drainage from the renovated playfield will be treated by biofiltration to meet stormwater treatment requirements because the field drains to Lake Washington and will include a pond to meet stormwater flow control requirements due to downstream conveyance capacity limitations. The renovated park is expected to open in March 2020. Seattle Parks and Recreation is planning to next renovate Soundview Park, which is a grass/dirt field located in Crown Hill.

SYNTHETIC TURF DRAINAGE STUDIES

A brief review of available scientific and grey literature was conducted on the water quality of drainage from synthetic turf fields containing crumb rubber infill. Drainage data were not found for synthetic turf fields containing other types of infill. This review was based on a literature search recently conducted by Ecology (Gary Meyers, personal communication, May 8, 2018). Data for five of the studies were previously compiled for the Woodland Park Synthetic Turf Field Stormwater Drainage Study (Herrera 2010a). Two additional studies with drainage data were identified.

In general, most of the scientific studies testing synthetic turf fields showed little to no risk to stormwater and the environment. A literature review conducted by Johns and Goodlin (2008) concluded that most chemicals leached out of synthetic turf fields were at such low levels that they were of little environmental relevance. They also found that zinc had the highest mobility compared to all other inorganic and organic chemicals studied.

The Connecticut Department of Environmental Protection concluded that aquatic toxicity from zinc is the only potential risk to aquatic organisms in surface waters receiving drainage from synthetic turf fields containing crumb rubber (CDEP 2010). Three of eight drainage samples were acutely toxic to aquatic invertebrates and fish, and those same three samples had the highest zinc concentrations. They suggested that stormwater treatment measures may reduce the zinc concentrations in drainage from synthetic turf fields containing crumb rubber to levels below the acute aquatic toxicity criterion.

Data reported by six water quality studies of synthetic turf field drainage are summarized in Table 1. These results are compared to acute and chronic criteria for freshwater aquatic life, and to human health criteria for consumption of fish and other aquatic organisms from the Washington State Surface Water Quality Standards (Ecology 2017; WAC 173-201A). These results are also compared to stormwater pollutant concentrations reported for western Washington NPDES Phase 1 stormwater permits (Ecology 2015).

Test results for the six studies are summarized separately below. Results of the Woodland Park Synthetic Turf Field Stormwater Drainage Study (Herrera 2010a) are presented with the current study results for comparison (see section Stormwater Monitoring Results).

Redmond Synthetic Turf Drainage Study

Talasaea Consultants (2003) conducted limited stormwater sampling for King County at two synthetic turf fields located in Redmond, Washington (Talasaea 2003). One grab sample was collected at Grass Lawn Park and two grab samples were collected at Field #3 at the Microsoft Campus. The samples were analyzed for copper, zinc, and the Microtox toxicity test using the marine bacterium *Vibrio fisheri*. Zinc was detected in two of the samples at low concentrations (9 and 19 µg/L) and copper was not detected in any of the samples at a detection limit of 6 µg/L (see Table 1). Microtox tests showed no effect on test organisms for any of the samples (Talasaea 2003).

Magnuson Park Synthetic Turf Drainage Study

Seattle Parks and Recreation recently initiated a long-term study of constructed wetlands in Warren G. Magnuson Park located on Sand Point Way Northeast in northeast Seattle. Monthly grab sampling of drainage water at wetland and upgradient stations began in November 2009 (A. Sheffer, personal communication, April 2010). Laboratory reports were compiled for four samples collected from one station (station 4b) that includes drainage only from one synthetic turf field (Field #7) constructed in 2008. The samples were analyzed for select conventional parameters, metals, and PAHs (see Table 1).

Table 1. Comparison of Synthetic Turf Field Drainage Data to Water Quality Criteria and Typical Stormwater Runoff.

Parameter	Freshwater Aquatic Life Criteria[a]		Freshwater Human Health Criteria[b]	Typical Stormwater Runoff[c]		Synthetic Turf Field Drainage Samples															
						Seattle (Woodland Park)		Seattle (Magnuson Park)		Redmond, WA		New York[d]		Conneticut 2008		Conneticut 2009		Ravensdale, WA		Redmond Ridge, W	
	Acute	Chronic		Median	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Pre-treat	Post-treat	Pre-treat	Post-treat
Reference	Ecology 2017		Ecology 2017	---	---	Herrera 2010		Sheffer 2010		Talasaea 2003		NYSDEC 2010		lilone/MacBroom 200		CDEP 2010		Sizemore 2017		Sizemore 2017	
Number of Locations	---	---	---	---	---	1		1		3		1		3		3		2		2	
Number of Samples	---	---	---	---	---	8		4		3		10		8		8		2		2	
Sample Period	---	---	---	---	---	11/2009 - 1/2010		12/2009 - 3/2010		12/2002 - 2/2003		4/2009		10/2007 - 7/2008		11/2009 - 12/3/20		2/27/2015		2/27/2015	
Conventional Parameters																					
Total suspended solids (mg/L)	---	---	---	31	1 - 4,700	7.4	2.2 - 15	9.2	2 - 46	---	---	---	---	---	---	---	---	---	---	---	---
pH	---	6.5 - 8.5	---	7.0	5.6 - 8.3	6.94	6.65 - 7.35	---	---	6.55	6.37 - 7.29	---	---	7.48	7.30 - 7.85	7.46	6.6 - 8.0	---	---	---	---
Total hardness (mg/L as $CaCO_3$)	---	---	---	25	2 - 1x10^6	150	93 - 211	---	---	85.7	66 - 112	346	---	---	---	43	8 - 59	---	---	---	---
Total phosphorus (µg/L)	---	---	---	110	8 - 4,600	35	27 - 47	62	54 - 82	---	---	---	---	---	---	---	---	---	---	---	---
Soluble reactive phosphorus (µg/L)	---	---	---	22	4 - 270	16	9 - 26	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Total Kjeldahl nitrogen (µg/L)	---	---	---	863	100 - 25,000	---	---														
Nitrate+nitrite nitrogen (µg/L)	---	---	---	245	12 - 58,000	---	---														
Biochemical oxygen demand (mg/L)	---	---	---	3.9	1.1 - 68	---	---														
Fecal coliform bacteria (CFU/100 mL)	100[e]	50[e]	---	264[e]	1 - 1x10^6	11	<2 - 44	3[e]	< 1 - 11	---	---	---	---	---	---	---	---	---	---	---	---
Metals (ug/L)																					
Arsenic, total	360 (d)	190 (d)	0.018	(0.25)	(0.17 - 1.04)	---	---	< 50	< 50	---	---	14.8	SE= ±1.7	---	---	ND	ND	0.77	0.79	2.46	2.42
Cadmium, total	1.75 (d)	0.62 (d)	---	0.11 (0.04)	0.01 - 10.1	---	---	---	---	---	---	< 5	< 5	< 1	< 1	ND	ND	< 0.025	< 0.025	< 0.025	< 0.025
Chromium, total	311	101	---	---	---	---	---	---	---	---	---	< 10	< 10	---	---	ND	ND	0.24	0.24	0.31	0.30
Copper, total	8.9 (d)	6.3 (d)	1,300	10.4 (3.9)	0.4 - 218	3.5	2 - 5.8	9.8	5 - 14	< 6	< 6	< 20	< 20	---	---	3.2	1.5 - 5	2.36	1.98	1.98	2.20
Lead, total	30.1 (d)	1.2 (d)	---	6.1 (0.2)	0.1 - 294	<1	<1	< 20	< 20	---	---	12.9	SE= ±2.7	< 1	< 1	ND	ND	0.06	0.09	0.07	0.21
Mercury, total	2.1 (d)	0.012	0.14	0.01	0.002 - 0.4	---	---	---	---	---	---	< 0.2	< 0.2	---	---	ND	ND	---	---	---	---
Nickel, total	787 (d)	87.5 (d)	80	---	---	---	---	---	---	---	---	< 40	< 40	---	---	ND	ND	0.38	0.41	0.86	1.07
Selenium, total	20	5.0	60	---	---	---	---	---	---	---	---	< 10	< 10	< 3	< 2 - < 10	ND	ND	< 0.25	< 0.25	2.39	2.24
Silver, total	1.05 (d)	---	---	---	---	---	---	---	---	---	---	< 10	< 10	---	---	---	---	< 0.05	< 0.05	< 0.05	< 0.05
Zinc, total	63.6 (d)	58.1 (d)	1,000	70.6 (26.9)	1.4 - 1,290	<5	<5 - 6	< 10	< 10	11.3	< 6 - 19	25.1	SE= ±2.7	18.4	< 2 - 36	84	10 - 260	2.4	2.4	1.3	2.3
Aromatic Hydrocarbons (ug/L)	---	---	0.000016 - 100	< 0.1	0.003 - 33	---	---	< 1	< 1	---	---	ND[f]	---	---	---	ND	ND	---	---	---	---
Phthalates (ug/L)	---	---	0.013 - 700	< 1	0.02 - 41	---	---	---	---	---	---	ND[f]	---	---	---	ND	ND	---	---	---	---
Misc. Semivolatile Organics (ug/L)	---[g]	---[g]	0.000005 - 700	---	---	<0.1	<0.09 - 1.1	---	---	---	---	ND[f]	---	---	---	ND	ND	---	---	---	---
Volatile Organic Compounds (ug/L)	---	---	---	---	---	---	---	---	---	---	---	ND[f]	---	---	---	ND	ND	---	---	---	---

--- = Not analyzed or applicable

ND = Not detected but detection limit not reported.

[a] Metals criteria noted by (d) are for dissolved metals at a hardness of 50 mg/L as $CaCO_3$, based on a 1-hour average concentration for acute criteria and a 4-day average concentration for chronic criteria. Criteria availble only for pentachlorophenol (WAC 173-201A)

[b] Lower of Ecology and EPA promulgated criteria for consumption of water and organisms (WAC 173-201A).

[c] Western Washington NPDES Phase I Stormwater Permit Data Characterization (Ecology 2015). Values in parentheses are for dissolved metals.

[d] Mean of detected values only and standard error (SE) of detected values is reported rather than a range for detected parameters.

[e] Geometric mean for fecal coliform bacteria

[f] Not deteted in one sample collected from same location in 2009.

[g] Criteria only available for pentachlorphenol at 9.0 and 5.7 ug/L for acute and chronic, respectively, at pH of 7.0.

Low concentrations were observed for total suspended solids (2 to 46 mg/L), total phosphorus (54 to 82 µg/L), and fecal coliform bacteria (<1 to 11 colony forming units per 100 milliliters [CFU/100 ml]). Total copper concentrations ranged from 5 to 14 µg/L and other metals were not detected in the samples (i.e., arsenic <50 µg/L, lead <20 µg/L, and zinc <10 µg/L). PAHs were not detected in any of the samples at a detection limit of 1 µg/L (A. Sheffer, personal communication, April 2010) (see Table 1).

New York Synthetic Turf Study

The New York State Department of Environmental Conservation (NYSDEC) performed a study of synthetic turf fields in 2008 that included testing of infill leachate, shallow groundwater, and stormwater drainage samples (NYSDEC 2009). A total of 31 crumb rubber samples were collected from four crumb rubber processing facilities in New York State and leachate samples were tested using the synthetic precipitation leaching procedure ([SPLP] EPA SW-846 Method 1312) where the crumb rubber was mixed with water at pH 4.2 to simulate acid rain conditions. Several metals and organic compounds were detected in all samples, with concentrations of zinc (mean of 1,947 µg/L) and two semivolatile organic compounds (means of 103 µg/L for aniline and 12.8 µg/L for phenol) that typically exceeded groundwater standards for New York State. The majority of other semivolatile organic compounds (SVOCs) were below the laboratory detection limit (NYSDEC 2009).

The NYSDEC also conducted leaching tests of two types of crumb rubber using a laboratory column procedure designed to more closely mimic ambient conditions at synthetic turf fields. As expected, results of the 24 column tests showed much lower contaminant concentrations than the SPLP test results (e.g., mean concentrations of 292 µg/L for zinc 38 µg/L for aniline and 0.7 µg/L for phenol) (NYSDEC 2009).

A total of 32 groundwater samples were collected from two or three wells installed immediately downgradient of four synthetic turf fields where sandy soil was predominant and the ground water table ranged from 8 to 70 feet below the surface. The samples were tested for SVOCs and none of the test results exceeded detection limits, which were typically less than 1 µg/L (NYSDEC 2009).

One stormwater sample was collected in 2008 from a synthetic turf field in New York State where low concentrations of some metals were detected (e.g., 60 µg/L for zinc), and concentrations all volatile organic compounds (VOCs) and SVOCs were below laboratory detection limits (NYSDEC 2009). The NYSDEC collected 10 additional stormwater drainage samples at the same synthetic turf field during two storm events in April 2009 (NYSDEC 2010). All results for the organic compounds analyzed were below laboratory detection limits (see Table 1). Total arsenic, lead, and zinc were detected at low concentrations (i.e., mean concentration of 15 µg/L for arsenic, 13 µg/L for lead, and 25 µg/L for zinc) that did not exceed surface water standards. The NYSDEC terminated the stormwater sampling program because of the low concentrations observed (L. Lim, personal communication, March 18, 2010).

Connecticut 2008 Synthetic Turf Study

A study of synthetic turf fields in Connecticut State included testing of both infill leachate and stormwater drainage samples (Milone and MacBroom 2008). A total of six infill samples consisting of crumb rubber and silica sand were collected from three synthetic turf fields, and the samples were extracted using SPLP to evaluate metals concentrations in the leachate. The study found high concentrations of dissolved zinc (910 to 4,700 µg/L), while all other metals were below detection limits in the leachate samples.

A total of eight stormwater drainage samples were collected from the three synthetic turf fields and analyzed for select dissolved metals. Only dissolved zinc was detected in the drainage samples where concentrations ranged up to a maximum of 36 µg/L(see Table 1); this value is two orders of magnitude less than the maximum concentration (4,700 µg/L) observed in the leachate samples.

Connecticut 2009 Synthetic Turf Study

The Connecticut Department of Environmental Protection collected a total of eight grab samples of stormwater drainage from three synthetic turf fields constructed with crumb rubber 2 years previously (CDEP 2010). No standard volatile or semivolatile organic compounds were detected in any sample using US Environmental Protection Agency (US EPA)-approved methods, while nine non-standard tentatively identified compounds were detected in some samples. The samples were also tested for conventional parameters, metals, and acute toxicity to *Daphnia pulex* (water flea 48-hour LC50) and *Pimephales promelas* (fathead minnow 48- and 96-hour LC50) using US EPA-approved methods. Zinc was the only metal exceeding the state acute toxicity criterion (65 µg/L), ranging from 130 to 260 µg/L in three samples. Those same three samples were the only samples found to be acutely toxic (less than 90 percent survival at 48 hours).

The study concluded that aquatic toxicity from zinc is the only potential risk to aquatic organisms in surface waters receiving drainage from synthetic turf fields containing crumb rubber (CDEP 2010). They suggested that stormwater treatment measures may reduce the zinc concentrations in drainage from synthetic turf fields containing crumb rubber to levels below the acute aquatic toxicity criterion.

King County Synthetic Turf Drainage Sampling

King County collected two grab samples of stormwater drainage from each of two synthetic turf fields (Ravensdale and Redmond Ridge) on one occasion in February 2015 (Sizemore, personal communication, December 7, 2017). The samples were collected upstream and downstream (pre-treat and post-treat) of a stormwater treatment device (StormFilter®) to evaluate treatment effectiveness for metals and petroleum hydrocarbons. Results for both fields showed very low concentrations of metals in drainage from the fields and no apparent effects of the treatment devices (see Table 1).

OTHER SYNTHETIC TURF ENVIRONMENTAL STUDIES

CalRecycle 2009 Study

Outdoor athletic fields made of the new generation of artificial turf containing crumb rubber from recycled tires were analyzed for bacteria by a contractor for California Department of Resources Recycling and Recovery (CalRecycle 2010). Five artificial turf fields located at high schools, colleges, and universities in the San Francisco Bay Area were measured. Two natural turf fields were analyzed for comparison. Samples of crumb rubber infill from artificial turf or soil from natural turf were collected, along with blades of artificial or natural grass. Samples were cultured in the laboratory for bacterial identification and quantification according to the three most prominent species assay, along with quantification of methicillin-resistant Staphylococcus aureus (MRSA).

Artificial turf yielded from 4 to 10 different species of bacteria per field, compared to 11 to 14 species per natural turf field. Artificial turf also yielded fewer bacterial colony forming units (according to the three most prominent species analysis) per gram of material than natural turf, ranging from 0 to 53,000 colony forming units per gram (CFU/g) of crumb rubber infill or artificial blades compared to 637,000 to 305,000,000 CFU/g of soil or natural blades from natural turf. Two of thirty samples (7 percent) from artificial turf were positive for a species of Staphylococci compared to 6 of 12 samples (50 percent) from natural turf ($p = 0.004$ by Fisher's Exact Test). No MRSA was detected on artificial turf, while a single sample of blades from natural turf was positive for MRSA ($p = 0.3$). These data indicate that the new generation of artificial turf containing crumb rubber infill harbors fewer bacteria than natural turf, including Staphylococci and MRSA. Environmental factors contributing to this difference may be the low moisture content and high temperature of artificial turf relative to natural turf.

Centers for Disease Control and Prevention 2008 Study

In June 2008, the Centers for Disease Control and Prevention issued a low-level public health advisory, due to extensive publicity surrounding synthetic turf. The Consumer Product Safety Commission (CPSC 2008) investigated reports of lead contamination from synthetic turf and conducted an assessment that concluded:

- Total acid-extractable lead concentrations in 19 turf blade samples ranged from undetectable to 0.96 percent (9,600 parts per million [ppm]).
- Total acid-extractable lead content in 20 turf wipe samples ranged from 0.4 to 98.7 micrograms using a sampling procedure that consisted of wiping a 400 square centimeter (0.43 square feet) turf area 20 times (10 back and forth strokes) with a pre-moistened Ghost Wipe™.

- The daily ingestion of lead by children using the synthetic fields was estimated to range from 0.04 to 9.9 micrograms/day, which was calculated by dividing the wipe sample content by 5 to account for differences in lead residue removal efficiency of the wipe and bare skin, and by 2 to account for the amount of lead residue transferred from hand to mouth.

- Young children are not at risk from exposure to lead in synthetic turf because lead consumption would not exceed 15 micrograms/day and the resulting blood lead concentration would not exceed the 10 micrograms/deciliter level of concern with respect to lead poisoning.

The CPSC (2008) noted that their assessment was subject to the following limitations:

- The representativeness of the wipe sampling method and locations for estimating exposure to lead-containing residue from touching or other contact with the synthetic turf surface

- The accuracy of assumptions about the capacity of bare skin to collect surface residues during a typical play event at a field

- The accuracy of assumptions related to hand-to-mouth transfer of lead-containing residues

- Accuracy of the assumption that bioavailability of lead would be the same for ingestion of lead from synthetic turf sources and ingestion of lead from food and drink sources

US EPA 2009 and Current Studies

The US Environmental Protection Agency (US EPA 2009) recently conducted a study of potential human health effects of synthetic turf fields. Air, surface wipe, crumb rubber infill, and turf blade samples were collected from six synthetic turf fields located in three geographic locations of the United States during the summer and autumn of 2008. Concentrations of volatile organic compounds (VOCs) in the air samples were extremely low and typical of ambient air concentrations.

Average concentrations of metals in the various materials tested were below levels of concern (US EPA 2009). For example, total extractable lead concentrations ranged from 11 to 61 mg/kg in the crumb rubber samples and from 2.4 to 700 mg/kg in the turf blade samples. Only one turf blade sample exceeded the US EPA standard for lead in soil (400 mg/kg). Total extractable lead concentrations in the surface wipe samples were less than 2 µg/ft^2, well below the US EPA standard for lead in residential floor dust (40 µg/ft^2). The study did not include analysis of leachate or stormwater samples.

The US EPA recently concluded that although studies have not shown an elevated health risk from playing on fields with crumb rubber, the existing studies do not comprehensively evaluate the concerns about health risks from exposure to crumb rubber (US EPA 2018). In February 2016, the US EPA, Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry (ATSDR), and the CPSC launched a multi-agency *Federal Research Action Plan on Recycled Tire Crumb Used on Playing Fields and Playgrounds* to study key environmental and human health questions. The study includes literature review/gap analysis, crumb rubber characterization, exposure characterization, and a playground study, but did not include water quality analysis of field drainage. Sample collection and analysis are complete, and the draft report has undergone peer review. The final report was released in the July 2019 (US EPA 2019) and concluded:

> *"As expected, a range of chemicals was found in the recycled tire crumb rubber, including metals and organic chemicals. Where comparative data are available concentrations of most metal and organic chemicals found in tire crumb rubber were found to be similar when comparing this study to previous studies. Further, the emissions of many organic chemicals into air were typically found to be below detection limits or test chamber background, and releases of metals into simulated biological fluids were very low (mean bioaccessibility values averaged about 3% in gastric fluid and less than 1% in saliva and sweat plus sebum). Together, these findings support the premise that while many chemicals are present in the recycled tire crumb rubber, exposure may be limited based on what is released into air or biological fluids."*

STORMWATER MONITORING

METHODS

Seattle Parks and Recreation initiated this water quality study of the two synthetic turf fields to compare pollutant concentrations in drainage from a new cork infill field at Bobby Morris Playfield to a traditional crumb rubber infill field at Miller Playfield. Stormwater monitoring results will be used to help with the overall evaluation and planning of other playfield renovation projects. Monitoring conducted for this project is not intended to provide detailed scientific evidence for changing stormwater treatment requirements or evaluating public health concerns of alternative infill materials.

Monitoring methods generally followed those specified in the QAPP for the previous synthetic turf field drainage assessment at Woodland Park (Herrera 2009). This section summarizes the sampling design, locations, and procedures, and the data quality objectives and procedures. Deviations from those methods specified in the QAPP are also described.

Site Description

Bobby Morris Playfield is located within Cal Anderson Park located on Capitol Hill at 1635 11th Avenue in Seattle, Washington (see Figure 1). The synthetic turf surface was replaced in July 2016 with new polyethylene fiber and cork/sand infill over a rubber pad. This is the first field constructed in Seattle with cork infill and a rubber pad. Existing base materials were regraded but not replaced. Permeable aggregate was installed as the base materials over 20 years ago when an experimental field surface was constructed of both polyethylene fiber and natural grass materials. This combination surface was replaced with standard polyethylene fiber and crumb rubber infill in 2005.

New drainage lines were installed at Bobby Morris Playfield in the existing permeable aggregate as shown on the drainage plan presented in Appendix A. Stormwater drainage is collected in drainage lines consisting of 6-inch high density polyethylene (HDPE) slotted pipes that slope east into one pipe that drains south into an existing manhole located at the southeast corner of the field. Field drainage into the manhole combines with other drainage and outflows to the combined sanitary/stormwater sewer system. Field drainage only occurs during periods of rainfall and does not appear to include inflow from offsite groundwater. Additional reconnaissance of the field conducted upon completion of sampling identified a small (1,000 square feet) area comprised of dirt that drained to a new catch basin located at the northwest corner of the field and is connected to the field drainage system (see drainage plan in Appendix A). However, the small dirt area comprised only 1 percent of the total field drainage area (approximately 105,000 square feet).

Miller Playfield is located adjacent to the Miller Community Center located on Capitol Hill at 330 19th Avenue E in Seattle, Washington. Miller Playfield is located approximately 0.65 miles northeast of Bobby Morris Playfield (see Figure 1). The former sand surface was replaced with new synthetic turf and crumb rubber infill in September 2009. New drainage lines were installed in new permeable aggregate as shown in the drainage plan presented in Appendix A. Stormwater drainage is collected in drainage lines consisting of 4-inch HDPE slotted pipes that slope east or west into one central solid pipe that drains south into a new catch basin located at the southern edge of the field. Field drainage does not continue south from this catch basin as shown in the drainage plan (see Appendix A). Rather, drainage from this catch basin drains west for 55 feet to another new catch basin, which drains southwest to an existing manhole where it combines with other drainage and outflows to the combined sanitary/stormwater sewer system. Field drainage only occurs during periods of rainfall and does not include inflow from offsite groundwater.

Sampling Design

Drainage systems at both playfields were inspected during dry weather on February 28, 2018, to verify access to sampling stations with sampling equipment. No flow was present at either sampling station selected to represent drainage from each entire playfield.

Stormwater samples were collected from one station each at Bobby Morris and Miller playfields during five storm events on the following dates:

- Event 1 on March 8, 2018 (Bobby Morris Playfield only)
- Event 2 on March 23, 2018
- Event 3 on April 7, 2018
- Event 4 on April 14, 2018
- Event 5 on February 1, 2019 (Bobby Morris Playfield only)

Generally, two grab samples were collected from each station during each storm event with two exceptions. One exception is that for Event 1 no drainage was present at Miller Playfield during either site visit, and samples could not be collected. The other exception occurred during Event 5 when two grab samples were collected only at Bobby Morris Playfield to verify the elevated fecal coliform bacteria and nutrient concentrations previously observed in drainage from the playfield. Thus, a total of 10 stormwater samples were collected from Bobby Morris Playfield, and six stormwater samples were collected from Miller Playfield. In addition, one field filter blank was collected during Event 1 for dissolved metals analysis only.

The stormwater samples were analyzed the following parameters of interest identified for the Woodland Park study (Herrera 2009; approved analytical methods are also listed):

- Total hardness (SM 2340 C)
- Total suspended solids (EPA 160.2)
- Total phosphorus (SM 4500-P F)
- Fecal coliform bacteria (SM 9222 D)
- Total copper, lead, and zinc (EPA 200.8)
- Dissolved copper, lead, and zinc (EPA 200.8)
- Semivolatile organic compounds including polycyclic aromatic hydrocarbons, phthalates, phenols, chlorinated hydrocarbons, and miscellaneous organic compounds (EPA 8270).

Additional parameters of interest were added to this list for Events 3 and 4 because of the high total phosphorus concentrations observed in samples from Bobby Morris Playfield during the first two events. The additional parameters of interest include:

- Soluble reactive (orthophosphate) phosphorus (SM 4500-P F)
- Total Kjeldahl nitrogen (SM 4500-Norg B)
- Nitrate+nitrite nitrogen (SM 4500-NO3- E)
- Biochemical oxygen demand, 5-day (SM5210 B)

A shortened list of parameters was analyzed for Event 5 at Bobby Morris Playfield to verify previous event results for all parameters except soluble reactive phosphorus, dissolved metals, and semivolatile organic compounds. In addition, one drainage sample was analyzed using microbial source tracking (MST) by digital quantitative polymerase chain reaction (dPCR) of one dog and one human biomarker to identify the likely source of fecal bacteria.

One composite infill sample was collected from each playfield during Event 5 for analysis of fecal coliform bacteria and the synthetic precipitation leaching procedure, which included leachate analysis of total phosphorus, soluble reactive phosphorus, total and dissolved copper, and total and dissolved zinc.

Monitoring Locations

One stormwater monitoring station was established at each playfield. The monitoring station location and drainage system are shown in Figure 2 for Bobby Morris Playfield and in Figure 3 for Miller Playfield. Both monitoring stations were located in catch basins at the terminus of a series of slotted drainage pipes located beneath each playfield. Drainage plans for the two synthetic turf fields are presented in Appendix A. Example photographs of the stormwater monitoring stations are shown in Figure 4.

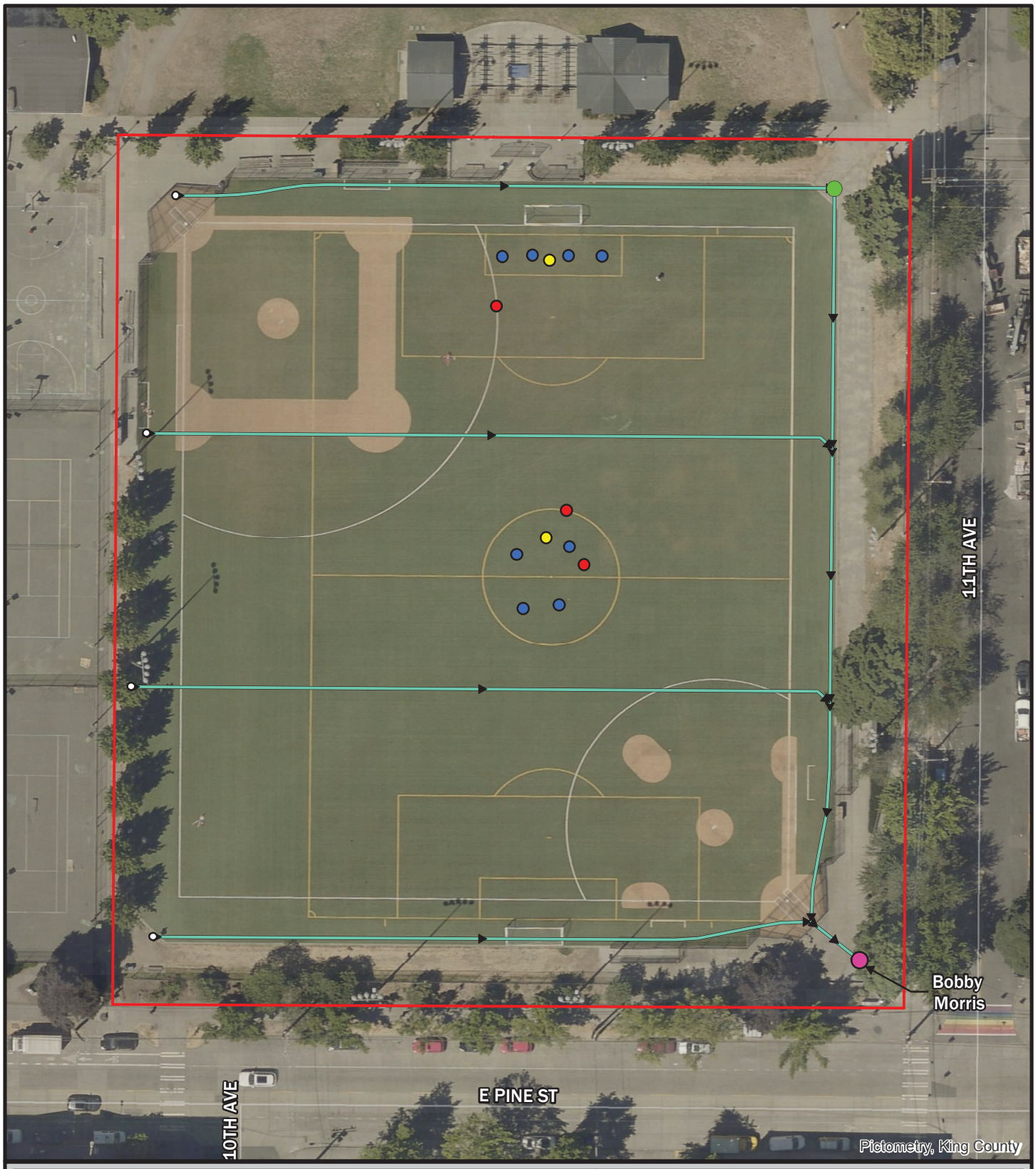
Station Bobby Morris was established at a manhole located at the southeast corner of Bobby Morris Playfield (see Figure 2). The catch basin is located at the terminus (outfall) of the 8-inch-diameter HDPE drainage pipe that collects drainage from a network of 6-inch slotted pipes (underdrains) located under the field. Grab samples were collected from the pipe outfall located 8 feet below the manhole rim.

Station Miller was established at a catch basin located on the south edge of the playfield near the center of the field (see Figure 3). The catch basin is located at the terminus (outfall) of a 6-inch-diameter drainage pipe that collects drainage from a network of 4-inch slotted pipes (underdrains) located under Miller Playfield. Grab samples were collected from the pipe outfall located approximately 3 feet below the catch basin rim.

Sampling Procedures

Water sampling consisted of two rounds of grab samples during five storm events. The targeted storm event size was a minimum of 0.20 inches of precipitation in a 24-hour period. Real-time Doppler radar images and precipitation gauges showing the distribution of rainfall in the watershed and the surrounding region were tracked via the internet prior to storm sampling. To document actual precipitation amounts for the sampled storm events, precipitation data were obtained from Seattle Public Utilities for rain gauge #35 located nearby both playfields in Seattle, Washington (Kara Peck, personal communication, July 17, 2018, and April 18, 2019) (see Figure 1). Flow rates were calculated for each sample collection from estimates of water depth and velocity in the drainpipes, based on an 8-inch-diameter pipe at the Bobby Morris station and a 6-inch-diameter pipe at the Miller station.

Prior to sample collection, the field technician donned two new sets of disposable gloves (i.e., new, non-talc nitrile gloves) for each sequence of clean or dirty hands operations that is required for proper implementation of the clean technique protocol established by Method 1669 Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels (US EPA 1996).



Legend

- Project site
- Stormwater sampling station
- Catch basin
- Cleanout
- Stormwater drainage pipe
- Infill material composite sample station
- Lead wipe sample station
- Temperature monitoring station

Figure 2.
Bobby Morris Playfield Stormwater Drainage Features and Sampling Locations.

N

0 30 60 120 Feet

HERRERA

King County, Aerial (2017)

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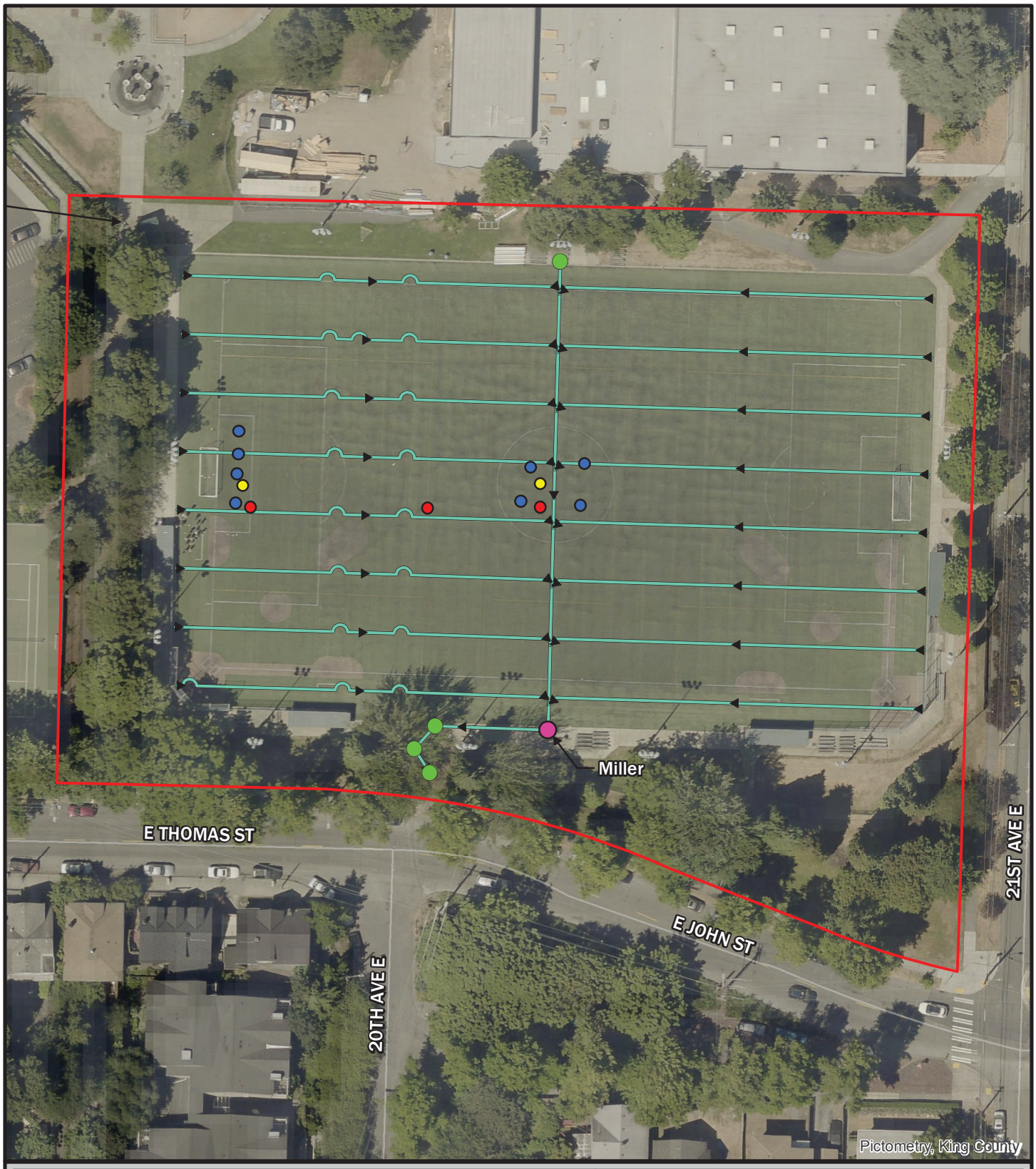

Legend

- Project site
- Stormwater sampling station
- Catch basin
- Stormwater drainage pipe
- Infill material composite sample station
- Lead wipe sample station
- Temperature monitoring station

Figure 3.
Miller Playfield Stormwater Drainage Features and Sampling Locations.

N

0 30 60 120 Feet

HERRERA

King County, Aerial (2017)

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Figure 4. Stormwater Monitoring Station Photographs for Bobby Morris Playfield (above) and Miller Playfield (below) in Seattle, Washington.

A sample extension device was used to directly fill sample bottles at both stations. All dissolved metals and soluble reactive phosphorus samples were field filtered by the field technician using a new 0.45-micron disposable nylon filter. A hand vacuum pump was used to filter sample water through the filtration device, and the filtered water was poured into sample bottles.

One composite infill sample was collected from each playfield during Event 5 using a decontaminated stainless-steel spoon and bowl. The sampling equipment was decontaminated by scrubbing with phosphate-free detergent (Liquinox®), rinsing with hot tap water and then deionized water, and covering with new aluminum foil. The spoon was used to collect a small amount of infill from at least 20 random locations within the center circle and a goal box for each playfield. Each composite sample was thoroughly mixed in the bowl prior to placement in a new 8-ounce sample jar. All sample containers were properly labeled prior to the sampling event in accordance with QAPP procedures. All sample containers were immediately stored in a cooler with ice to maintain the temperature between 2°C and 6°C. Sample containers and preservation techniques followed guidelines by US EPA (2007).

Measurement Procedures

Analytical methods and reporting limits for all target analytes are shown in Table 2. The samples were analyzed using US EPA-approved methods by Analytical Resources, Inc., which is certified by the Washington State Department of Ecology (Ecology) for each analytical method. Sampling observations, sample collection procedures, flow measurement data, and weather conditions at the time of sampling were recorded in a field notebook.

Data Quality Control Objectives and Procedures

The overall data quality control objective is to ensure that data of known and acceptable quality are obtained. Data quality control objectives and procedures specified in the QAPP are summarized in the Data Quality Assurance Report (Appendix B). Limits for quality control sample analyses are summarized in Table 2. All field and laboratory data were reviewed in accordance with the QAPP (Herrera 2009), and results of the data quality review are presented in the Quality Assurance Report (Appendix B).

QAPP Deviations

Major deviations from the QAPP methods include:

- Base flow samples were not collected at either playfield because base flow was not present at either playfield on two site visits during dry weather (February 23 and 28, 2018).
- Grab samples were collected only from Bobby Morris Playfield during the first storm event (March 8, 2018) because no stormwater drainage was present at Miller Playfield during the storm event.
- Biological oxygen demand, total Kjeldahl nitrogen, nitrate+nitrite, and orthophosphate were added to the parameter list after the first two events because of the high total phosphorus concentrations observed in the Bobby Morris drainage samples.

RESULTS

The data quality review results are presented in Appendix B. Laboratory data reports are presented in Appendix C. Monitoring results were entered into a database that is presented in Appendix D. Data quality review results are summarized below followed by results for precipitation, conventionals, metals, semivolatile organic compounds, and infill analyses.

Table 2. Analytical Methods, Reporting Limits, and Quality Control Limits.

Parameter	Analytical Method	Method Number[a]	Preservative	Maximum Holding Time	Target Reporting Limit (RL)	Matrix Spike Recovery (percent)	Blanks	Control Sample Recovery (percent)	Duplicate Precision (RPD)[b]
Total suspended solids	Gravimetric, 103°C	EPA 160.2	Cool to 4°C	7 days	1.0 mg/L	NA	≤2 x RL	90–110	≤20
Total hardness	ICP calculation	EPA 200.7	Cool to 4°C	6 months	0.5 mg/L	75–125	≤2 x RL	80–120	≤20
Total phosphorus	Automated ascorbic acid	SM 4500-P F	H_2SO_4 to pH<2, cool to 4°C	28 days	8 µg/L	75–125	≤2 x RL	90–110	≤20
Orthophosphorus	Automated ascorbic acid	SM 4500-P E	Field filter, cool to 4°C	18 hours filter, 48 hours analysis	4 µg/L	75–125	≤2 x RL	90–110	≤20
Total Kjeldahl nitrogen	Kjeldahl	SM 4500-Norg D-97	H_2SO_4 to pH<2, cool to 4°C	28 days	0.5 mg/L	75–125	≤2 x RL	90–110	≤20
Nitrate+nitrite nitrogen	Cadmium reduction	SM 4500-NO_3- I	H_2SO_4 to pH<2, cool to 4°C	28 days	0.010 mg/L	75–125	≤2 x RL	90–110	≤20
Biological oxygen demand (BOD)	5-day	SM 5210 B	Cool to 4°C	48 hours	1.0 mg/L	NA	≤2 x RL	80–120	≤20
Fecal coliform bacteria	Membrane filter	SM 9222 D	Cool to 4°C	18 hours	25 CFU/100 mL	NA	≤2 x RL	NA	≤30
Total copper, lead, and zinc	ICP/MS	EPA 200.8	HNO_3 to pH<2, cool to 4°C	6 months	0.5, 0.1, and 4 µg/L	75–125	≤2 x RL	80–120	≤20
Dissolved copper, lead, and zinc	ICP/MS	EPA 200.8	Field filter, HNO_3 to pH<2, cool to 4°C	18 hours filter, 6 months analysis	0.5, 0.1, and 4 µg/L	75–125	≤2 x RL	80–120	≤20
Semivolatile organic compounds	GC/MS	EPA 8270D	Cool to 4°C	7 days extraction, 40 days analysis	1–20 µg/L	~50–150	≤2 x RL	~50–150	≤30

RPD = Relative Percent Difference

NA = Not applicable or not available

[a] All methods are approved by US EPA. EPA methods are specified by US EPA (1983, 1986, 1994, 2007), and SM methods are specified by APHA et al (1995).

[b] The relative percent difference (RPD) of laboratory duplicates will be less than or equal to the percentage shown for values that are greater than 5 times the reporting limit, and ±2 times the reporting limit for values that are less than or equal to 5 times the reporting limit.

Site drainage at Bobby Morris Playfield was inspected on February 1, 2019, during Event 5 to identify possible sources other than turf field drainage for the elevated fecal coliform bacteria and nutrient concentrations previously observed in stormwater samples collected from Bobby Morris Playfield. A small (approximately 1,000 square feet) dirt and gravel-covered area located adjacent to the northeastern portion of the synthetic turf playfield was observed draining to a catch basin that is connected to the playfield drainage system (see Figure 2 and adjacent photograph). This off-turf drainage was not noticed during previous sampling events, and it could not be sampled or prevented from entering the catch basin during Event 5 with the available equipment. Although it is not known exactly how much this off-turf drainage contributed to the sampled field drainage, it is likely that it did contribute to the elevated levels of total suspended solids, phosphorus, fecal coliform bacteria, and metals observed in the drainage from the playfield. However, the off-turf drainage area represents only 1 percent of the total field drainage area (approximately 105,000 square feet). Therefore, all stormwater samples collected from Bobby Morris playfield were likely contaminated to a small degree by this off-turf drainage, and the water quality results for cork field drainage are likely to be slightly biased high.

Data Quality Review Results

A data quality assurance review was conducted for each set of samples submitted to the laboratory for analysis. Detailed results of the data quality review are presented in Appendix B. Data quality issues were identified for some quality control elements that resulted in qualification of data as estimated values (flagged J). No data were rejected, and all qualified data were used in the data analysis. The following sample data were qualified as estimates (flagged J) for the reasons noted:

- The maximum sample holding time for fecal coliform bacteria (18 hours) was exceeded for the two samples collected during Storm Event 1 (March 8, 2018) and analyzed approximately 24 hours after sample collection.
- The initial calibration verification (ICV) percent recovery (%R) for 2.4-dinitirophenol exceeded the lower control limit for samples collected during Storm Event 1 (March 8, 2018) and the ICV %R for 4-chloroaniline exceeded the lower control limit for samples collected during Storm Event 3 (April 7, 2018).
- The control limit for duplicate precision, based on relative percent difference (RPD), was not met for one analysis of total phosphorus (23 percent RPD versus a 20 percent limit for sample Bobby Morris A collected on April 14, 2018).
- The control limit for matrix spike recovery was not met for one analysis of TKN (60 percent versus a 75 to 125 percent limit for sample Bobbly Morris A collected April 14, 2018).

- The plate counts for fecal coliform bacteria were less than 20 colonies for the analysis of three samples: Miller A and B collected on April 7, 2018, and Miller B collected on April 14, 2018.

- Total and dissolved zinc were detected below the laboratory reporting limit in leachate from the cork infill sample Bobby Infill.

Hydrology

Precipitation data are presented for each monitoring event in Table 3. Precipitation data were obtained from Seattle Public Utilities for rain gauge #35 (Kara Peck, personal communication, July 17, 2018, and April 18, 2019) located near both playfields in Seattle, Washington (see Figure 1). Total rainfall amounts ranged from 0.37 to 2.25 inches for the five storm events, and stormwater samples were collected during varied portions of the hydrograph. The average rainfall intensity during the sampled storm events ranged from 0.02 to 0.06 inches/hour.

Flow rates estimated during sampling are also shown in Table 3. Flow rates ranged from 3 to 70 gallons per minute (gpm) at Bobby Morris Playfield, and from 0 to 100 gpm at Miller Playfield. The lowest flow rates were observed during Events 1 and 5, and the highest flow rates were observed during Event 3.

Table 3. Hydrologic Data for Sampled Storm Events.

	Event 1	Event 2	Event 3	Event 4	Event 5
Sample Date	3/8/18	3/23/18	4/7/18	4/14/18	2/1/19
Storm Event Duration (hours)	11	3.5	32	43	14
Antecedent Dry Period (hours)[a]	8.6	12	33	10	213
Total Rainfall Amount (inches)	0.50	0.37	0.97	2.25	0.48
Average Rainfall Intensity (inches/hour)	0.05	0.02	0.05	0.06	0.03
Maximum Rainfall Intensity (inches/hour)	0.12	0.24	0.60	0.72	0.12
Bobby Morris Flow Rate Round 1/2 (gpm)	3/23	20/33	40/70	40/40	0.5/3
Miller Flow Rate Round 1/2 (gpm)	0/0	80/80	100/80	40/35	---
Hydrograph Portion Samples	middle	end	middle	beginning	middle

Precipitation data source: Seattle Public Utilities rain gauge #35 (Kara Peck, personal communication, July 17, 2018, and April 18, 2019)

[a] Period before each storm event in which <0.04 inches of rain fell in less than 6 hours.

--- = Not analyzed or applicable

Conventional Parameters

Summary statistics for conventional parameters are compared to those for Woodland Park Playfield in Table 4 and summarized separately below.

Table 4. Summary Statistics of Stormwater Quality at Bobby Morris, Miller, and Woodland Park Playfields.														
		FW Acute	**Bobby Morris Playfield**				**Miller Playfield**				**Woodland Park Playfield[b]**			
Parameter		**Criterion[a]**	Median	Mean[c]	Min.	Max.	Median	Mean[c]	Min.	Max.	Median	Mean[c]	Min.	Max.
Conventionals														
	Hardness (mg $CaCO_3$/L)	---	61	59	42	76	90	87	74	98	142	150	93	211
	Total Suspended Solids (mg/L)	---	30	38	6.0	100	1.0	1.3	1.0	2.0	6.0	7.4	2.2	15
	Biochemical Oxygen Demand (mg/L)	---	2.3	4.7	1.4	16	1.2	1.5	1.2	2.4	---	---	---	---
	Total Phosphorus (µg/L)	---	162	190	72	340	14	15	10	22	34	35	27	47
	Soluble reactive phosphorus (µg/L)	---	40	40	37	42	10	9	7	10	14	16	9	26
	Total Kjeldahl Nitrogen (mg/L)	---	0.8	0.9	<0.5	1.5	<0.5	<0.5	<0.5	<0.5	---	---	---	---
	Nitrate+Nitrite (mg/L)	---	0.56	0.63	0.24	1.20	0.20	0.21	0.14	0.29	---	---	---	---
	Fecal Coliform Bacteria (CFU/100 mL)	100/200	813	**609**	145	**3300**	14	10	<1	63	15	11	<2	44
Metals (µg/L)														
	Copper, Total	---	8.9	8.6	4.9	11.7	5.7	5.2	3.6	6.2	2.9	3.5	2.0	5.8
	Copper, Dissolved	8.9	3.6	4.2	2.6	6.4	4.8	4.5	2.9	5.6	2.4	2.3	1.4	2.7
	Lead, Total	---	2.2	2.3	0.6	4.7	0.1	0.1	0.1	0.3	<1	<1	<1	<1
	Lead, Dissolved	30.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	<1	<1
	Zinc, Total	---	35	36	24	51	2.4	2.1	1.2	2.7	<5	<5	<5	6
	Zinc, Dissolved	63.6	23	22	15	30	2.3	2.1	1.2	2.6	<5	<5	<5	<5
Semivolatile Organic Compounds (µg/L)[d]														
	Aniline	---	---	---	---	---	---	---	---	---	<0.10	0.31	<0.09	1.10
	Bis(2-ethylhexyl) phthalate	---	<0.5	0.51	<0.5	0.6 J	<0.5	0.62	<0.5	1.2 J	<0.10	<0.10	<0.09	<0.10
	Di-n-butyl phthalate	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.10	<0.10	<0.09	0.12
	Pentachlorophenol	5.7	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6	<0.10	0.11	<0.09	0.16

Bold values exceed surface water quality standard for freshwaters (FW) (WAC 173-201A).

[a] Fecal coliform criteria are based on the geometric mean/single sample maximum for primary contact recreation. Acute aquatic life criteria for dissolved metals are based on a 1-hour average concentration at a hardness of 50 mg/L as $CaCO_3$. Acute aquatic life criterion for pentachlorophenol is based on a pH of 7.00 (WAC 173-201A).

[b] Data for 8 storm event samples from a new crumb rubber field (Herrera 2010).

[c] Geometric mean for fecal coliform bacteria, arithmetic mean for other parameters.

[d] Results only for compounds detected in one or more samples.

--- = Not analyzed or applicable

Hardness

Hardness is a measure of the calcium and magnesium content of water and is primarily used to evaluate the freshwater aquatic toxicity of heavy metals, where toxicity decreases with increased hardness.

Hardness concentrations were higher at Woodland Park Playfield (93 to 211 mg/L as $CaCO_3$) and Miller Playfield (74 to 98 mg/L as $CaCO_3$) than Bobby Morris Playfield (42 to 76 mg/L as $CaCO_3$). The primary source of hardness at all fields is the leaching of calcium and magnesium from the base materials underlying the synthetic turf. The higher hardness concentrations observed at Woodland Park than Miller may be due to differences in field age and a higher leaching rate for the new base materials at Woodland Park. The low hardness concentrations at the new Bobby Morris Playfield may be due to differences in base material characteristics and a lower leaching rate for the old base materials used at Bobby Morris, and was unlikely to be substantially affected by drainage from the small off-turf area.

Total Suspended Solids

High concentrations of total suspended solids (TSS) impair water quality and can impact aquatic biota, but there are no surface water quality standards for TSS in Washington State.

TSS concentrations were much higher in drainage from Bobby Morris Playfield (6 to 100 mg/L) than Miller Playfield (1 to 2 mg/L) and Woodland Park Playfield (2 to 15 mg/L). The elevated TSS concentrations observed at Bobby Morris Playfield may be due to degradation and drainage of the cork infill material. In contrast, the crumb rubber used at Miller and Woodland Park playfields is highly inert (chemically and biologically inactive) and does not break down (degrade or decompose) like organic materials such as cork. The samples from Bobby Morris exhibited a milky white color while samples from the crumb rubber fields were clear. The high nutrient and biochemical oxygen demand concentrations in drainage from Bobby Morris Playfield suggest that the TSS is primarily organic and not caused by leaching of inorganic base materials composed of rock.

The median TSS concentration of 30 mg/L observed at Bobby Morris Playfield is similar to the median TSS concentration of 31 mg/L typically observed in stormwater (see Table 1), while much lower median TSS concentrations of 1.0 and 6.0 mg/L were observed at Miller and Woodland Park playfields, respectively.

Assuming TSS originated from base materials and not infill and the old base materials at both Bobby Morris and Miller playfields were leaching equivalent amounts of TSS at 1 mg/L, the TSS concentration would be 290 mg/L for the off-turf area contributing 1 percent of the drainage flow rate. TSS concentrations are typically much lower at 31 mg/L in stormwater runoff, but have been observed to range up to 4,700 mg/L (Ecology 2015; see Table 1). The relatively high TSS concentration of 240 mg/L estimated for off-turf area combined with visual observations of only moderate turbidity in the off-turf area drainage (see photograph below), suggests that much of

TSS observed at Bobby Morris may have originated from the base materials in addition to the off-turf area.

Biochemical Oxygen Demand

Biochemical oxygen demand (BOD) is the amount of dissolved oxygen needed (i.e., demanded) by aerobic biological organisms to break down organic material present in a water sample at a certain temperature (25°C) over a specific time period (5 days). Thus, BOD is a measure of biodegradable organic matter that can impact aquatic organisms by lowering dissolved oxygen concentrations in receiving waters.

BOD concentrations were higher at Bobby Morris Playfield (1.4 to 16 mg/L) than Miller Playfield (1.2 to 2.4 mg/L). Median BOD concentrations observed at both fields (2.3 mg/L at Bobby Morris and 1.2 mg/L at Miller) were much less than typical stormwater runoff (3.9 mg/L; see Table 1). BOD was not measured in drainage samples from Woodland Park Playfield.

Off-turf drainage observed at Bobby Morris Playfield on 2/1/2019

Assuming BOD in field drainage from Bobby Morris was equivalent to the median concentration of 1.2 mg/L observed at Miller, the BOD concentration would have been 11 mg/L for the off-turf area contributing 1 percent of the drainage flow rate. BOD concentrations are typically only 4 mg/L in stormwater runoff, but have been observed to range up to 68 mg/L (Ecology 2015; see Table 1). The relatively high BOD concentration of 11 mg/L estimated for off-turf area, combined with visual observations of relatively low turbidity in the off-turf area drainage and the low total phosphorus concentration in cork infill leachate (see Infill Analysis section below), suggests that much of BOD observed at Bobby Morris may have been from old base materials in addition to the off-turf area.

Total Phosphorus

Phosphorus is an essential plant nutrient that can impair receiving waters by increasing algae growth and decreasing dissolved oxygen concentrations. Washington State surface water quality standards include a total phosphorus action level of 20 µg/L for lakes in the Puget Sound Lowlands (WAC 173-201A).

Total phosphorus concentrations for each of the three playfields are compared using a box and whisker plot in Figure 5. Total phosphorus concentrations were much higher at Bobby Morris Playfield (72 to 340 µg/L) than Miller Playfield (10 to 22 µg/L) and Woodland Park Playfield (27 to 47 µg/L). The median phosphorus concentration at Bobby Morris Playfield (162 µg/L) exceeds that for typical stormwater runoff (110 µg/L; see Table 1).

Assuming total phosphorus in field drainage from Bobby Morris was equivalent to the median concentration of 14 µg/L observed at Miller, the total phosphorus concentration would have been 1,500 µg/L for the off-turf area contributing 1 percent of the drainage flow rate. Total phosphorus concentrations are typically 110 µg/L in stormwater runoff, but have been observed to range up to 4,600 µg/L (Ecology 2015; see Table 1). The unusually high total phosphorus concentration of 1,500 µg/L estimated for the off-turf area combined with visual observations of relatively low turbidity in the off-turf area drainage, suggests that much of total phosphorus observed at Bobby Morris may have been from old base materials in addition to the off-turf area.

It is not likely that the cork infill contributed to the high total phosphorus concentrations observed at Bobby Morris Playfield based on the low phosphorus concentration (less than 8 µg/L) identified in cork infill leachate (see Infill Analysis section below). The high amount of phosphorus observed in Bobby Morris drainage could impair receiving waters by nutrient enrichment if the drainage is not treated with phosphorus removal media. Standard bioretention media typically does not remove phosphorus and has been shown to actually increase total phosphorus concentrations from inflow to outflow due to the compost component.

Soluble Reactive Phosphorus

Soluble reactive (orthophosphate) phosphorus concentrations were also much higher in drainage from Bobby Morris Playfield (40 µg/L median) compared to the crumb rubber playfields at Miller (10 µg/L median) and Woodland Park (14 µg/L median). Soluble reactive phosphorus is immediately available for algae uptake and the high concentrations in drainage from the cork infill would likely stimulate algae growth in a freshwater stream or lake if not properly treated for removal of dissolved phosphorus.

Assuming soluble reactive phosphorus in field drainage from Bobby Morris was equivalent to the median concentration of 10 µg/L observed at Miller, the soluble reactive phosphorus concentration would have been 300 µg/L for the off-turf area contributing 1 percent of the drainage flow rate. Soluble reactive phosphorus concentrations are typically 22 µg/L in stormwater runoff, but have been observed to range up to 270 µg/L (Ecology 2015; see Table 1). The unusually high soluble reactive phosphorus concentration of 300 µg/L estimated for the off-turf area, combined with visual observations of relatively low turbidity in the off-turf area drainage and the low soluble phosphorus concentration (less than 4 µg/L) in cork infill leachate (see Infill Analysis section below), suggests that much of soluble reactive phosphorus observed at Bobby Morris may have been from old base materials in addition to the off-turf area.

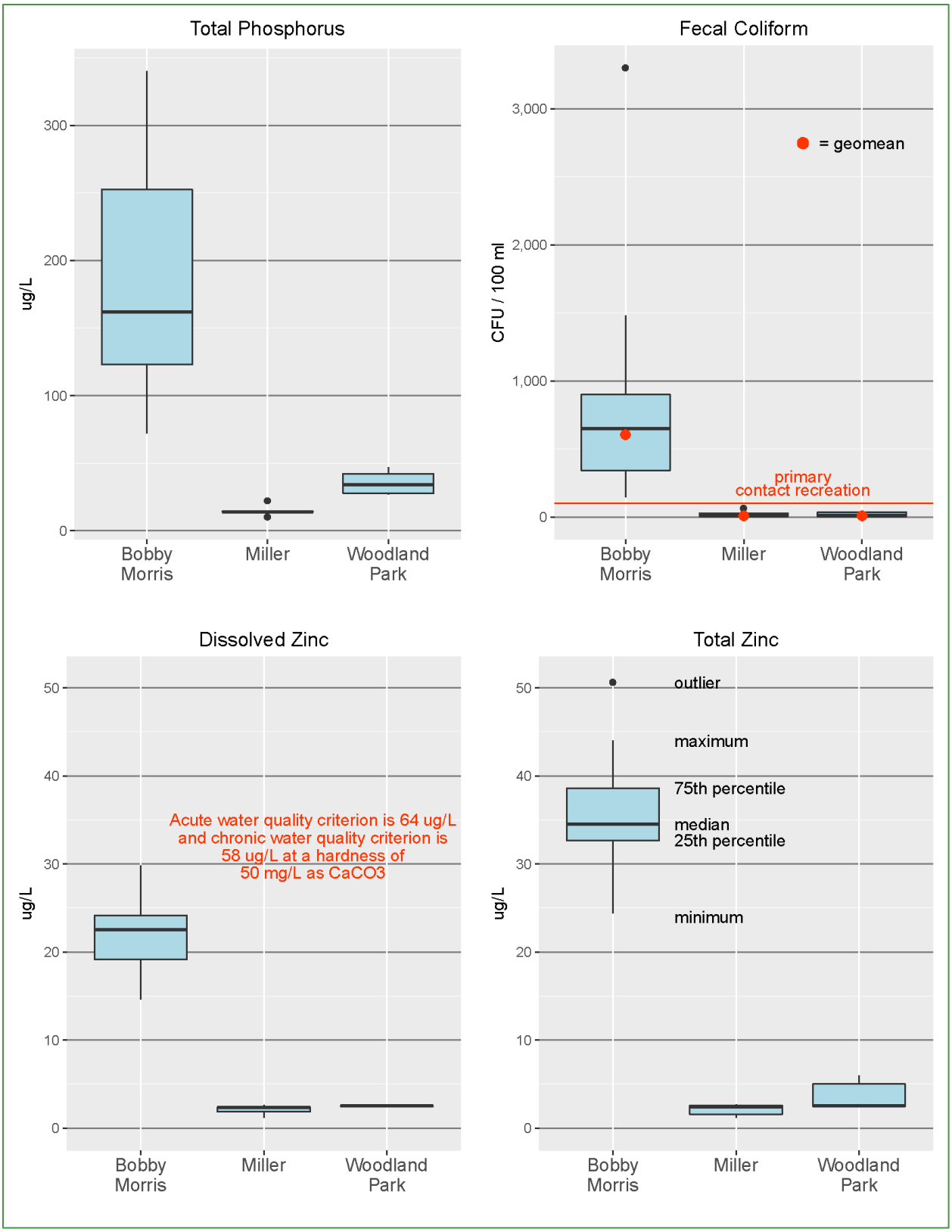

Figure 5. Total Phosphorus, Fecal Coliform Bacteria, and Zinc Concentrations in Drainage from Synthetic Turf Playfields in Seattle.

Total Kjeldahl Nitrogen

Total Kjeldahl nitrogen (TKN) is a measure of total organic nitrogen including ammonia nitrogen. The sum of TKN and nitrate+nitrite nitrogen approximates total nitrogen. Nitrogen is an essential plant nutrient that can impair receiving waters by increasing algae growth and decreasing dissolved oxygen concentrations, but nitrogen action levels have not been established by the Washington State surface water quality standards (WAC 173-201A).

Total Kjeldahl nitrogen concentrations were relatively low in drainage from both playfields with a median concentration of 0.8 mg/L median for Bobby Morris Playfield and not detected at less than 0.5 mg/L in any of the samples from Miller Playfield. TKN was not measured in drainage samples from Woodland Park Playfield.

Nitrate+Nitrite Nitrogen

Nitrate+nitrite nitrogen is a measure of dissolved inorganic nitrogen that is immediately available for algae uptake. Nitrate+nitrite nitrogen concentrations were higher in drainage from Bobby Morris Playfield (0.40 mg/L median) than Miller Playfield (0.20 mg/L median), possibly due to the off-turf drainage or leaching of cork infill and or new base materials. Nitrate+nitrite nitrogen was not measured in drainage samples from Woodland Park Playfield

Fecal Coliform Bacteria

Fecal coliform bacteria originate from human and animal waste and are used to protect human health from recreational use of receiving waters. Fecal coliform bacteria primarily include E. coli bacteria but can also include some Klebsiella bacteria, which grow on organic matter and do not originate from fecal waste. Washington State surface water quality standards (WAC 173-201A) include fecal coliform bacteria criteria for primary contact recreation in all freshwaters that are based on the geometric mean not to exceed than 100 CFU/100 mL, and the single sample (for less than 10 samples) or 90th percentile not to exceed 200 CFU/100 mL.

Fecal coliform bacteria concentrations for each of the three playfields are compared using a box and whisker plot in Figure 5. Fecal coliform bacteria concentrations were much higher in drainage from Bobby Morris Playfield (geometric mean of 609 CFU/100 mL) than Miller Playfield (geometric mean of 10 CFU/100 mL) and Woodland Park Playfield (geometric mean of 11 CFU/100 mL). Most samples collected from Bobby Morris Playfield exceeded the single sample criterion of 100 CFU/100 mL, while none of the samples collected at Miller and Woodland Park playfields exceeded the single sample criterion.

Assuming fecal coliform bacteria in field drainage from Bobby Morris was equivalent to the geometric mean concentration of 10 CFU/100 mL observed at Miller, the fecal coliform bacteria concentration would have been 6,000 CFU/100 mL for the off-turf area contributing 1 percent of the drainage flow rate. Fecal coliform bacteria are typically 264 CFU/100 mL as a geometric mean in stormwater runoff, but have been observed to range up to 1 million CFU/100 mL

(Ecology 2015; see Table 1). The fecal coliform bacteria concentration of 6,000 CFU/100 mL estimated for off-turf area is not exceptionally high considering elevated bacteria concentrations are often observed drainage from disturbed soils with relatively low turbidity.

Fecal coliform bacteria were not detected in the one composite sample of cork infill collected from Bobby Morris Playfield (see Infill Analysis section below). This result suggests that the cork infill was not the primary source of fecal coliform bacteria observed in drainage from Bobby Morris Playfield. Although fecal coliform bacteria have been shown to survive and grow in nutrient-rich organic media, it seems unlikely that most of the fecal coliform bacteria observed in drainage originated from the old inorganic (crushed rock) base materials at Bobby Morris Playfield.

Dogs were frequently observed at Bobby Morris Playfield and rarely observed at Miller Playfield. Based on these observations and additional monitoring results described below, the primary source of fecal coliform bacteria at Bobby Morris Playfield is likely dog waste in drainage from the small off-turf area.

Microbial source tracking (MST) was performed by Source Molecular (Miami, Florida) on the first fecal coliform sample collected for Event 5 on February 1, 2019 (Bobby Morris A), and the laboratory report is presented in Appendix C. A digital quantitative polymerase chain reaction (dPCR) analysis of deoxyribonucleic acid (DNA) sequences of the Bacteroidetes group of anaerobic gut bacteria was performed for a host-specific marker of human and dog. A moderately high concentration of a dog marker (16,700 copies per 100 milliliters) was measured in the sample, while the human marker was not detected (less than 35 copies per 100 milliliters). The MST results indicate that the fecal bacteria observed in drainage from Bobby Morris Playfield likely originated from dog feces and not an unknown sewer cross-connection.

Metals

Summary statistics for total and dissolved copper, lead, and zinc are presented in Table 4. Surface water quality standards for Washington State (WAC 173-201A) include acute (1-hour average) and chronic (4-day average) freshwater aquatic life criteria for dissolved copper, lead, and zinc that are based on hardness. Acute criteria are applied to stormwater drainage due to the limited period of storm flow.

Copper

Total copper concentrations were slightly higher in drainage from Bobby Morris Playfield (8.9 µg/L median) than Miller Playfield (5.7 µg/L median) and Woodland Park Playfield (2.9 µg/L median). Dissolved copper concentrations, however, exhibited a different pattern with slightly higher concentrations observed in drainage from Miller Playfield (4.8 µg/L median) than Bobby Morris Playfield (3.6 µg/L median) and Woodland Park Playfield (2.4 µg/L median). No dissolved copper concentrations exceeded the acute criterion of 8.9 µg/L at a conservatively low hardness value of 50 mg/L as $CaCO_3$. However, dissolved copper concentrations less than the chronic

criterion of 6.3 µg/L have been shown to have negative behavioral effects on some species of salmon.

Lead

Lead concentrations were low in drainage from both playfields, with higher total lead concentrations observed at Bobby Morris Playfield (0.6 to 4.7 µg/L) than Miller Playfield (0.1 to 0.3 µg/L median) and Woodland Park Playfield (all less than 1 µg/L). Dissolved lead concentrations were less than 0.1 µg/L in all samples collected in drainage from Bobby Morris and Miller playfields, and the acute criterion of 30.1 µg/L was not exceeded in any of the samples.

Zinc

Total and dissolved zinc concentrations for each of the three playfields are compared using a box and whisker plot in Figure 5. Total zinc concentrations were much higher in drainage collected from Bobby Morris Playfield (24 to 51 µg/L) than the crumb rubber fields at Miller Playfield (1.2 to 2.7 µg/L) and Woodland Park Playfield (less than 5 to 6 µg/L). Dissolved zinc concentrations were also much higher in drainage collected from Bobby Morris Playfield (15 to 30 µg/L) than the crumb rubber fields at Miller Playfield (1.2 to 2.6 µg/L) and Woodland Park Playfield (less than 5 µg/L). No total or dissolved zinc concentrations exceeded the acute criterion of 8.9 µg/L for dissolved zinc at a conservatively low hardness value of 50 mg/L as $CaCO_3$.

Assuming total zinc in field drainage from Bobby Morris was equivalent to the median concentration of 2.4 µg/L observed at Miller, the total zinc concentration would have been 330 µg/L for the off-turf area contributing 1 percent of the drainage flow rate. Total zinc concentrations are typically 70 µg/L in stormwater runoff, but have been observed to range up to 1,300 µg/L (Ecology 2015; see Table 1). The relatively high total zinc concentration of 330 µg/L estimated for off-turf area combined with visual observations of relatively low turbidity in the off-turf area drainage, suggests that some of total zinc observed at Bobby Morris may have been from old base materials in addition to the off-turf area.

It is not likely that the cork infill contributed to the high total zinc concentrations observed at Bobby Morris Playfield based on the low zinc concentration (2 µg/L) estimated for cork infill leachate (see Infill Analysis section below). Regardless of the source, the acute criterion of 63.6 µg/L for dissolved zinc was not exceeded in any of the collected drainage samples, suggesting that drainage from either cork or crumb rubber fields would not impact aquatic organisms in receiving waters.

Semivolatile Organic Compounds (SVOCs)

Results for detected semivolatile organic compounds (SVOCs) are summarized in Table 4. All SVOC results (including non-detected compounds) are presented in the database in Appendix D.

Bis(2-ethylhexyl) phthalate is the only SVOC that was detected in drainage from Bobby Morris Playfield (less than 0.5 µg/L to 0.6 µg/L) and Miller Playfield (less than 0.5 µg/L to 1.2 µg/L). However, both of these maximum values were flagged as an estimated because they were observed between the method detection and reporting limit (practical quantitation limit). All other SVOCs were not detected below the reporting limit.

Bis(2-ethylhexyl) phthalate was not detected at a reporting limit of 0.1 µg/L at Woodland Park Playfield. Two other SVOCs were occasionally detected in stormwater drainage at Woodland Park Playfield that included low levels of di-n-butyl phthalate (less than 0.1 µg/L to 0.12 µg/L) and pentachlorophenol (less than 0.1 µg/L to 0.16 µg/L). Phthalates are plasticizers and the low phthalate concentration observed may have originated from the synthetic turf. The low level of pentachlorophenol observed at Woodland Park Playfield was determined to have leached from treated wood light poles based on a high concentration of pentachlorophenol (18,000 mg/kg dry weight) observed in a composite wood pole sample and the close proximity of wood light poles to the sampled drainage system (Herrera 2010a).

Infill Analyses

The synthetic precipitation leaching procedure (SPLP) simulates the natural leaching process that occurs in the ground following a precipitation event to evaluate the mobility of inorganic and organic analytes. Results from the SPLP performed on composite infill samples from Bobby Morris and Miller playfields are presented in Table 5. SPLP analysis performed on cork infill collected from Bobby Morris Playfield showed very low mobility of the analyzed conventional and metal parameters. Total and soluble reactive phosphorus concentrations were not detected, and total and dissolved copper and zinc were detected at very low concentrations in the cork infill leachate. In addition, fecal coliform bacteria were not detected in the bulk cork sample. These results indicate that the cork infill used for the Bobby Morris Playfield likely was not the source of the elevated phosphorus, metals, and fecal coliform bacteria observed in the playfield stormwater samples, and that the off-turf drainage and possibly the old base materials were the primary sources of these contaminants.

Fecal coliform bacteria were also not detected in the bulk crumb rubber sample collected from Miller Playfield. Concentrations of total phosphorus (16 µg/L) and soluble reactive phosphorus (6.0 µg/L) were low in the crumb rubber leachate and comparable to the stormwater results (see Tables 4 and 5). Total zinc (148 µg/L) and dissolved zinc (34.8 µg/L) concentrations were high in crumb rubber leachate compared to the stormwater results for Miller Playfield (maximum concentrations less than 3 µg/L). These results clearly indicate that the SPLP method overestimates the mobility of zinc in crumb rubber, which has been observed in other synthetic turf drainage studies (see *Background Information*). However, the acute criterion for dissolved zinc (63.6 µg/L) was not exceeded in the crumb rubber leachate sample despite this overestimated mobility.

Table 5. Infill Sample Analysis Results for Bobby Morris and Miller Playfields.			
Parameter	**FW Acute Criterion[a]**	**Bobby Morris Playfield Cork Infill**	**Miller Playfield Crumb Rubber Infill**
Bulk Infill Analysis			
Total Solids (percent)	---	26.4	86.4
Fecal Coliform Bacteria (CFU/gram)	---	<8	<2
Synthetic Precipitation Leaching Procedure			
Total Phosphorus (µg/L)	---	<8	16
Soluble Reactive Phosphorus (µg/L)	---	<4	6
Copper, Total (µg/L)	---	0.7	2
Copper, Dissolved (µg/L)	8.9	0.57	1.3
Zinc, Total (µg/L)	---	2 J	148
Zinc, Dissolved (µg/L)	63.6	1.0 J	34.8

[a] Acute aquatic life criteria for dissolved metals are based on a 1-hour average concentration at a hardness of 50 mg/L as $CaCO_3$.

< = Analyte not detected above the laboratory reporting limit

--- = Not analyzed or applicable

J = estimated value

HUMAN HEALTH PARAMETER TESTING

Additional environmental monitoring was conducted at Bobby Morris Playfield and Miller Playfield to address human health concerns associated with the presence of lead on the turf surface and mold in the infill materials. Air temperatures were also monitored at both fields to evaluate potential effects of the different infill materials on player comfort during hot days. Table 6 presents a summary of samples and monitoring completed for the study.

These elements were not previously monitored at Woodland Park Playfield. However, lead wipe testing was previously conducted for Seattle Parks and Recreation at the Genesee Park Upper Playfield, which was an old crumb rubber field that had been constructed 8 years prior to sampling (Herrera 2010b). Samples collected for lead wipe testing and infill mold testing were submitted to NVL Laboratories in Seattle, Washington for analysis. Laboratory data reports are presented in Appendix C. Monitoring methods and results are presented separately below.

Table 6. Summary of Human Health Parameter Testing for the Bobby Morris Playfield Environmental Monitoring Study.

Sampling Event	Parameter		
	Lead Wipe Testing	Infill Mold Testing	Air Temperature Testing
Event 1 – May 7, 2018			
Bobby Morris Playfield	X	X	
Miller Playfield	X	X	
Event 2 – June 20, 2018			
Bobby Morris Playfield		X	X
Miller Playfield		X	X
Event 3 – July 16, 2018			
Bobby Morris Playfield			X
Miller Playfield			X

X = samples or measurements collected

LEAD WIPE TESTING

Methods

Herrera collected three lead wipe samples from the field surface at Bobby Morris Playfield and at Miller Playfield on May 7, 2018. The samples were collected from three areas in each field representing: 1) green turf within the center circle, 2) yellow line on the center circle (Bobby Morris) or near the center circle (Miller), and 3) white line on baseball infield boundary (Bobby

Morris) or goal box (Miller) (see Figures 2 and 3). Example photographs of lead wipe samples and locations are shown in Figure 6.

Each sample was collected from a 15- by 15-, or a 10- by 22.5-centimeter area using a Ghost Wipe cloth attached to an 8-centimeter disk. The disk was pushed with pressure by hand back and forth over the 225 cm^2 area. This method was used by the US Environmental Protection Agency (US EPA 2009) with the exception that a larger sampling area of 929 cm^2 (1 square foot) was sampled by US EPA (2009). This method varied from that used at Genesee Park in 2009 by Herrera (2010b) and by the US Consumer Product Safety Commission (CPSC 2008) where a weighted disk was pushed back and forth 10 times over a 400 cm^2 area.

The wipes meet ASTM Method E1792-96E specifications for sampling materials for lead in surface dust. Each wipe was gently shaken to remove all infill and large debris (but not all turf fibers) adhered to the wipe surface, placed in a sample jar, and submitted to NVL Laboratory for analysis of total lead by EPA Method 200.8 using inductively coupled plasma-mass spectrometry. In addition, one new wipe was placed in a container for field blank analysis.

Results

The wipe analysis results were reported in µg/wipe (Table 7). The laboratory data reports containing sample and quality control data is provided in Appendix C.

The wipe samples and wipe field blank did not contain lead above the reporting limit of 5 µg/wipe.

Table 7 compares results from this wipe study to results from the Genesee Park Upper Playfield (Herrera 2010b), CPSC (2008), and US EPA (2009) studies. The total lead per wipe results for all studies were normalized to micrograms per 400 square centimeters (µg/400 cm^2) to provide comparison across all studies. This area represents the total area wiped for the Genesee (Herrera 2010b) and CPSC (2008) studies. The total area wiped for this study was 225 cm^2 and the total area wiped for the US EPA (2009) study was 929 cm^2 (1 square foot).

The estimated daily lead ingestion amount was calculated from the laboratory results according to the following procedure established by CPSC (2008): divide the wipe sample content by a factor of 5 to account for differences in lead residue removal efficiency of the wipe and bare skin, and by a factor of 2 to account for lead residue transferred from hand to mouth. CPSC (2008) recommended a daily lead ingestion limit of 15 micrograms per day (µg/day) to not exceed the 10 micrograms per deciliter (µg/dL) blood level of concern for children.

The estimated daily lead ingestion amount in the Bobby Morris and Miller playfields was not detected at a reporting limits of 0.9 µg/day, which is well below the recommended limit of 15 µg/day. Higher daily lead ingestion amounts were observed at Genesee Park Upper Playfield and by CPSC (2008) (see Table 7), which may have been due in part by differences in wiping methods where those studies wiped an area with 10 back and forth strokes, versus one back and forth stroke for this study and by US EPA (2009).

Lead Wipe Sampling

Mold Sampling

Temperature Monitoring

Figure 6. Environmental Monitoring Photographs at Bobby Morris Playfield (left) and Miller Playfield (right).

Table 7. Lead Wipe Testing Results for the Bobby Morris Playfield Environmental Monitoring Study with Comparison to Other Studies.				
Sample ID	**Sample Description**	**Total Lead (µg/wipe)**	**Total Lead (µg/400 cm^2)[a]**	**Estimated Daily Lead Ingestion (micrograms/day)[b]**
Bobby Morris/Miller Playfields				
BM-W-1	Bobby Morris yellow center circle line	<5.0	<8.9	<0.89
BM-W-2	Bobby Morris green turf in center circle	<5.0	<8.9	<0.89
BM-W-3	Bobby Morris white outfield line	<5.0	<8.9	<0.89
M-W-1	Miller white goal box line	<5.0	<8.9	<0.89
M-W-2	Miller yellow field line	<5.0	<8.9	<0.89
M-W-3	Miller green turf in center circle	<5.0	<8.9	<0.89
FB-1	Field blank	<5.0	<8.9	<0.89
Genesee Park (Herrera 2010b)				
CW	White centerline	156	156	**15.6**
SW	White sideline	79	79	7.9
CG	Green turf center	165	165	**16.5**
SG	Green turf side	103	103	10.3
WB	Field blank	<1.0	<1.0	<0.10
CPSC 2008				
Field 1	Green turf installed 1999, 3 sample mean	68	68	6.8
Field 2	Green indoor turf installed 2000, 1 sample	14	14	1.4
Field 3	New green turf installed 2008, 3 sample mean	1.1	1.1	0.11
Field 4	New green turf installed 2008, 3 sample mean	0.7	0.7	0.07
Field 5	Yellow line installed 2005, 3 sample mean	1.3	1.3	0.13
Field 6	Yellow line installed 2005, 3 sample mean	1.0	1.0	0.10
US EPA 2009				
F1D1	Green turf at Field 1, Day 1	0.3 to 1.9	0.1 to 0.82	0.01 to 0.082
F1D2	Green turf at Field 1, Day 1	0.4 to 1.4	0.2 to 0.60	0.02 to 0.060
F2, F3	Green turf at Fields 2 and 3	0.3 to 0.5	0.1 to 0.2	0.01 to 0.02
F4, F5, F6	Green turf at Fields 4, 5, and 6	0.1 to 0.2	0.04 to 0.09	0.004 to 0.009

[a] All samples were normalized to a surface area of 400 square centimeters (cm^2), as used for the Genesee Park (Herrera 2010b) and CPSC (2008) studies.

[b] Ingestion limit is calculated by dividing the wipe sample content by a factor of 5 to account for differences in lead residue removal efficiency of the wipe and bare skin, and a factor of 2 to account for the amount of lead residue transferred from hand to mouth (CPSC 2008).

Bold values exceeded the 15 micrograms/day ingestion limit recommended by CPSC (2008) staff to not exceed the 10 micrograms/deciliter blood lead level of concern for children.

µg/day = microgram per day

µg/wipe = micrograms per wipe

µg/400 cm^2 = micrograms per 400 square centimeters

< = Lead not detected above the associated numerical laboratory reporting limit.

Infill Mold Testing

Methods

Herrera collected three samples of infill materials each at Bobby Morris Playfield and at Miller Playfield. Two samples were collected from each field during on May 7, 2018, following wipe sampling. One additional infill material sample was collected from each field on June 20, 2018. Each sample was collected as a composite sample from multiple locations in each field (e.g., center circle and each goal box; see Figures 2 and 3) using a stainless-steel spoon and bowl. The sampling equipment was decontaminated by scrubbing with phosphate-free detergent (Liquinox®), rinsing with hot tap water and then deionized water, and covering with new aluminum foil. Each of the six composite samples was thoroughly mixed, placed in one sample container, and submitted to the NVL Labs for analysis of mold spores and fungal fragments (living and dead).

The mold/fungal analysis was performed using light microscopy at 400 times magnification. The laboratory separated each sample into discrete layers, and a sample from each layer was mounted onto a slide in a clear liquid medium.

Results

No fungal growth was detected in any of the infill material samples.

Air Temperature Testing

Methods

Herrera monitored air temperatures at Bobby Morris Playfield and at Miller Playfield on 2 hot days in the summer of 2018 (June 20 and July 17, 2018). Air temperatures were measured on one occasion in the afternoon of each test day when ambient air temperatures exceeded 80 degrees Fahrenheit (°F). Air temperatures were measured at two locations per field (e.g., in the center circle and goal box; see Figures 2 and 3) and at the following four heights per location:

- Five millimeters (mm) below the surface of the infill
- One mm above the surface of the infill
- Ten mm above the surface of the infill
- Five feet (1,524 mm) above the surface of the infill.

Air temperatures were measured using a calibrated Cooper Atkins (model TM99A) thermistor temperature instrument that was shaded to prevent interference by direct sunlight.

Results

Air temperature results are presented below in Table 8. Ambient air temperature at 5 feet (1,524 mm) above the field surface ranged from 83.1°F to 84.4°F on June 20, 2018, and ranged from 91.3°F to 94.5ºF on July 16, 2018. Ambient air temperatures were similar above the cork infill at Bobby Morris Playfield and above the crumb rubber infill at Miller Playfield.

At all locations, air temperatures were highest at the surface or just below the surface of the infill and decreased with height above the infill surface. Air temperatures were higher within the infill than at the surface of the infill on all occasions except for lower temperatures within the infill at Bobby Morris on June 20, 2018. The highest recorded temperatures were measured within the crumb rubber at Miller Playfield on July 16, 2018, when they ranged from 120°F to 128°F.

Table 8. Air Temperature Testing Results for the Bobby Morris Playfield Environmental Monitoring Study.

Height (mm)	6/20/2018				7/16/2018			
	Bobby Morris		Miller		Bobby Morris		Miller	
	Center	Goal	Center	Goal	Center	Goal	Center	Goal
1524	83.1	84.4	83.4	84.3	91.3	92.8	95.4	94.3
10	89.1	94.3	87.8	92.9	108.8	104.4	98.8	105.3
1	101	99.7	91.7	106.7	112.7	117.3	113.1	119.6
-5	94.2	93.8	102.4	108.8	114.3	119.9	128.5	120.1

All temperature results in degrees Fahrenheit.

mm = millimeters

CONCLUSIONS

Herrera conducted environmental monitoring as planned for the Bobby Morris Playfield Renovation Pilot Program. Environmental monitoring consisted of stormwater monitoring, lead wipe testing, mold testing, and temperature monitoring. The four planned stormwater monitoring events conducted in 2018 were supplemented with an additional event in February 2019 to verify the elevated nutrient and fecal coliform bacteria concentrations previously observed in drainage from Bobby Morris Playfield, and to test leachate from infill samples of cork and crumb rubber for selected parameters of concern.

During the supplemental event, drainage from a small dirt and gravel area located northeast of the turf area was observed flowing into a catch basin connected to the Bobby Morris Playfield drainage system. Therefore, all stormwater samples collected from Bobby Morris Playfield were likely contaminated by this off-turf drainage to some unknown degree, and the water quality results are considered to not be representative of cork field drainage. Because the off-turf drainage area represented only 1 percent of the total field drainage area, the proportional drainage areas were combined with results of Miller Playfield drainage samples to estimate contaminant concentrations in the off-turf area drainage for comparison to typical concentrations in stormwater runoff and assessment of turf field versus off-turf sources of the contamination observed in Bobby Morris drainage samples.

STORMWATER QUALITY

Stormwater monitoring was conducted by collecting two grab samples during each of four storm events in March and April 2018 at Bobby Morris Playfield containing new cork infill and at Miller Playfield containing old crumb rubber infill. One exception is that stormwater samples were not collected at Miller Playfield during the first storm event due to a lack of flow. Two additional stormwater samples were collected from Bobby Morris Playfield during a supplemental storm event in February 2019 that also included collection of one infill sample from both fields for leachate analysis of selected parameters. Samples were collected and analyzed according to procedures specified in the Quality Assurance Project Plan prepared for previous sampling at Woodland Park Playfield by Herrera for Seattle Parks and Recreation. A data quality assurance review was conducted for each set of samples submitted to the laboratory for analysis. Data quality issues were identified for some quality control elements that resulted in qualification of some data as estimated values (flagged J). No data were rejected, and all qualified data were used in the data analysis.

Stormwater monitoring results were compared to those reported for Woodland Park Playfield containing new crumb rubber infill and to Washington State Surface Water Quality Standards. Cork infill drainage from Bobby Morris Playfield contained much higher pollutant concentrations

than crumb rubber infill drainage from Miller and Woodland Park playfields for the following monitoring parameters:

- Total suspended solids
- Biochemical oxygen demand
- Total and dissolved phosphorus
- Total and dissolved zinc.
- Fecal coliform bacteria.

Surface water quality standards were exceeded for fecal coliform bacteria but not dissolved zinc at Bobby Morris Playfield. No semivolatile organic compounds were detected in any of the samples collected from either Bobby Morris or Miller playfields.

Supplemental testing of fecal coliform bacteria and other analytes in February 2019 resulted in the following conclusions:

- No fecal coliform bacteria were detected in either the cork or crumb rubber infill sample, suggesting that the high fecal coliform bacteria in drainage from Bobby Morris Playfield was due to drainage from the small dirt area outside the turf area. Microbial source tracking analysis of fecal bacteria in one drainage sample from Bobby Morris Playfield identified moderately high concentrations of dog fecal DNA markers and no human fecal DNA markers, suggesting that dog waste in the off-turf area and not a potential sewer cross-connection was the primary source of the observed fecal coliform bacteria.
- No soluble or total phosphorus were detected in the cork infill leachate sample and low phosphorus concentrations were detected in the crumb rubber leachate sample. These results suggest that drainage from the small dirt area outside the turf area was likely the primary source of phosphorus observed in drainage from Bobby Morris Playfield, and this off-turf area also may have been the primary source of suspended solids and biochemical oxygen demand, which are commonly associated with high phosphorus.
- Estimated contaminant concentrations for the off-turf area were very high compared to typical concentrations observed in stormwater runoff samples collected elsewhere in the region. These comparisons suggest that the old base materials constructed over 20 years ago at Bobby Morris Playfield may have contributed to the elevated contaminant concentrations observed in drainage samples from this cork infill playfield.
- Total and dissolved zinc concentrations were very low in the cork infill leachate sample, suggesting that that the high zinc concentrations in drainage from Bobby Morris Playfield were likely due to drainage from the small dirt area outside the turf area. Total and dissolved zinc concentrations were elevated in the crumb rubber infill leachate sample, but the dissolved zinc concentrations did not exceed the acute criterion. The low

concentrations of dissolved zinc observed in drainage samples from crumb rubber fields indicates that the zinc present in crumb rubber is not significantly contaminating drainage from crumb rubber fields.

The study results clearly show that drainage from crumb rubber infill playfields yield high water quality that does not need treatment prior to discharging into a surface water body, regardless of whether it is a new crumb rubber field (Woodland Park Playfield) or an old crumb rubber field (Miller Playfield). The poor water quality of drainage from the tested cork infill playfield was likely due to contamination from the small dirt and gravel-covered area located northeast of the playfield and possibly due to contaminants still present in the old base materials placed over 20 years ago. Additional testing of drainage exclusively from a cork playfield with new base materials would be needed to accurately characterize pollutant concentrations and determine treatment requirements.

Lead

Lead wipe samples were collected on one occasion from unpainted green, painted yellow, and painted white surfaces at Bobby Morris and Miller playfields. No lead was detected in any of the wipe samples collected from either playfield. Extrapolation of the detection limits show that potential lead ingestion rates would be well below the limit recommended for children.

Mold

Five infill samples each were collected from Bobby Morris and Miller playfields to test for the presence of mold spores or fungal fragments (live of dead). No mold spores or fungal fragments were detected in any of the infill samples collected from Bobby Morris and Miller playfields.

Temperature

Air temperatures were measured on 2 hot days at two locations each at Bobby Morris and Miller playfields for evaluating temperatures within the infill and at three distances (1, 10, and 1,524 mm) above the infill surface. Ambient air temperatures at 5 feet (1,524 mm) above the field surface were similar above the cork infill at Bobby Morris Playfield and above the crumb rubber infill at Miller Playfield. The highest recorded temperatures were measured within the crumb rubber at Miller Playfield on July 16, 2018, when they ranged from 120°F to 128°F compared to 95°F at 5 feet above the surface.

RECOMMENDATIONS

Herrera recommends additional monitoring of playfield drainage to confirm results of the Woodland Park and Bobby Morris playfield studies and to address unresolved issues regarding contaminant sources, effectiveness of water quality treatment, and water quality impacts of future playfield renovations. Seattle Parks and Recreation has nearly completed renovation of Brighton Playfield in Hillman City and is planning next to renovate Soundview Playfield in Crown Hill.

Water quality monitoring of drainage from the renovated Brighton Playfield is recommended to evaluate the need and effectiveness of the constructed stormwater treatment facilities. Water samples should be collected during storm events from locations upstream and downstream of the treatment facilities. Samples should also be collected in drainage from only the synthetic turf field if off-turf areas also drain to the treatment system. At a minimum, one water sample should be collected from each location during each of five storm events and analyzed for the following parameters: total suspended solids, total phosphorus, nitrate+nitrite nitrogen, fecal coliform and E. coli bacteria, and dissolved and total copper and zinc.

Water quality monitoring of drainage from the existing Soundview Playfield is recommended to characterize water quality in drainage from a natural grass/dirt playfield for comparison to drainage from synthetic turf fields. Water samples should be collected during storm events from one or two locations representing drainage from only the existing field surfaces. At a minimum, one water sample should be collected from each location during each of five storm events and analyzed for the following parameters: total suspended solids, total phosphorus, nitrate+nitrite nitrogen, fecal coliform and E. coli bacteria, and dissolved and total copper and zinc.

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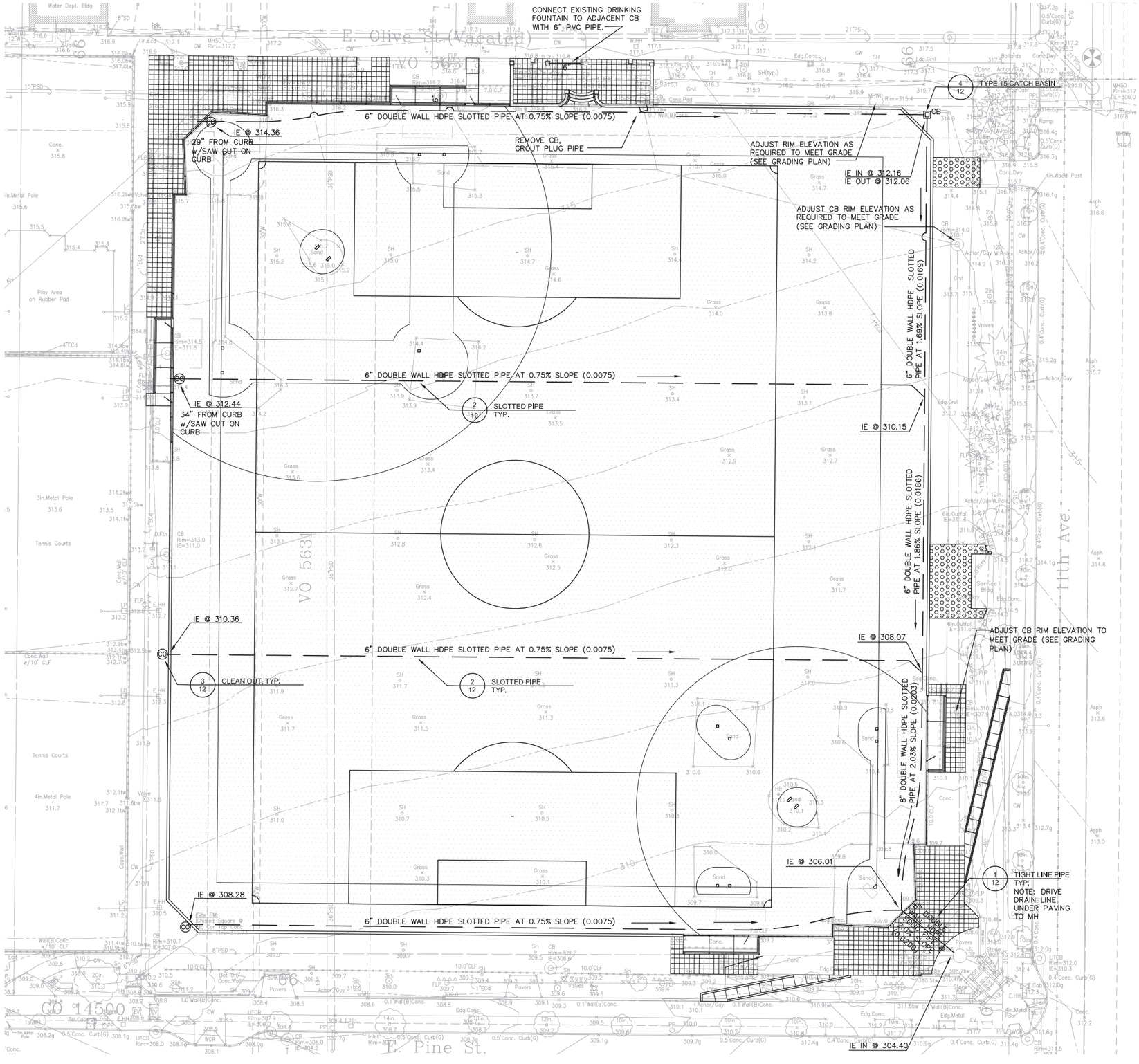
APPENDIX A

Field Drainage Plans

DRAINAGE SYMBOL LEGEND

SYMBOL	DESCRIPTION
———	SOLID TIGHTLINE COLLECTOR PIPE SIZE AND SLOPE AS NOTED
— — —	SLOTTED DRAIN PIPE SIZE AND SLOPE AS NOTED
▣ CB	CATCH BASIN
(CO)	CLEANOUT
RIM 100.0'	STRUCTURE RIM ELEV.
LF	LINEAL FEET
⌐	CAP ON PIPE
– – – – – –	SLEEVE



0 10 20 30 40 50

>>>>CAUTION<<<<

CALL BEFORE YOU DIG!

NOT LESS THAN TWO OR MORE THAN TEN BUSINESS DAYS PRIOR TO COMMENCING EXCAVATION OR DEMOLITION, SECURE THE SERVICES OF A COMMERCIAL UNDERGROUND UTILITIES LOCATOR SERVICE TO IDENTIFY BELOW-GROUND IMPROVEMENTS THAT MAY NOT BE INDICATED ON THE DRAWINGS. FOR IRRIGATION SYSTEMS, CALL SEATTLE PARKS PLUMBING SHOP (206 684 7070)

>>800 424 5555<<

DRAINAGE NOTES:

1. TEES ON NEW PIPE LESS THAN 24" DIAMETER SHALL BE PREFABRICATED. EXISTING PIPE WITHOUT PREFABRICATED TEES SHALL BE CONNECTED BY CORE DRILLING AND FLEXIBLE CONNECTION.

2. TEES, CATCH BASIN CONNECTIONS, SIDE SEWERS, AND SERVICE DRAINS SHALL BE PLACED AT A MINIMUM SLOPE OF 2% AND A MAXIMUM SLOPE OF 50%. INLET CONNECTIONS SHALL BE PLACED AT A MINIMUM SLOPE OF 5% AND A MAXIMUM SLOPE OF 50%.

3. SERVICE DRAINS AND SIDE SEWERS SHALL BE CONNECTED OR RECONNECTED AS APPROVED BY THE INSPECTOR.

4. RELAY EXISTING SERVICE DRAINS AND SIDE SEWERS TO CLEAR OVER OR UNDER THE NEW UTILITY AS APPROVED BY THE INSPECTOR.

5. WHERE A NEW PIPE CLEARS AN EXISTING OR NEW UTILITY BY 6" OR LESS, POLYETHYLENE PLASTIC FOAM SHALL BE PLACED AS A CUSHION BETWEEN THE UTILITIES.

6. SERVICE DRAINS AND SIDE SEWERS SHALL NOT BE BACKFILLED UNTIL THE PIPE HAS BEEN INSPECTED AND APPROVED AND THE LOCATION AND DEPTH IS RECORDED BY THE INSPECTOR.

7. EXCESS MATERIALS SHALL BE REMOVED FROM SITE. SUBGRADE SHALL BE COMPACTED AS REQUIRED.

8. ALL LAWN AND PLANTED AREAS REQUIRE FULL RESTORATION TO EQUAL CONDITIONS BEFORE CONSTRUCTION.

9. EXISTING DRAIN LINES TO REMAIN AND BE PROTECTED AND KEPT OPERATIONAL UNLESS OTHERWISE STATED.

NO.	REVISION – AS BUILT	DATE
3		
2		
1	AS–BUILT	4/4/06

REVIEWED: _____ PARK ENGINEER _____ DATE

All work done in accordance with the City of Seattle Standard Plans and Specifications in effect on the date shown above, and supplemented by Special Provisions.

STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT
KIM L. BALDWIN CERTIFICATE NO.849

STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT
TED HOLDEN CERTIFICATE NO.429

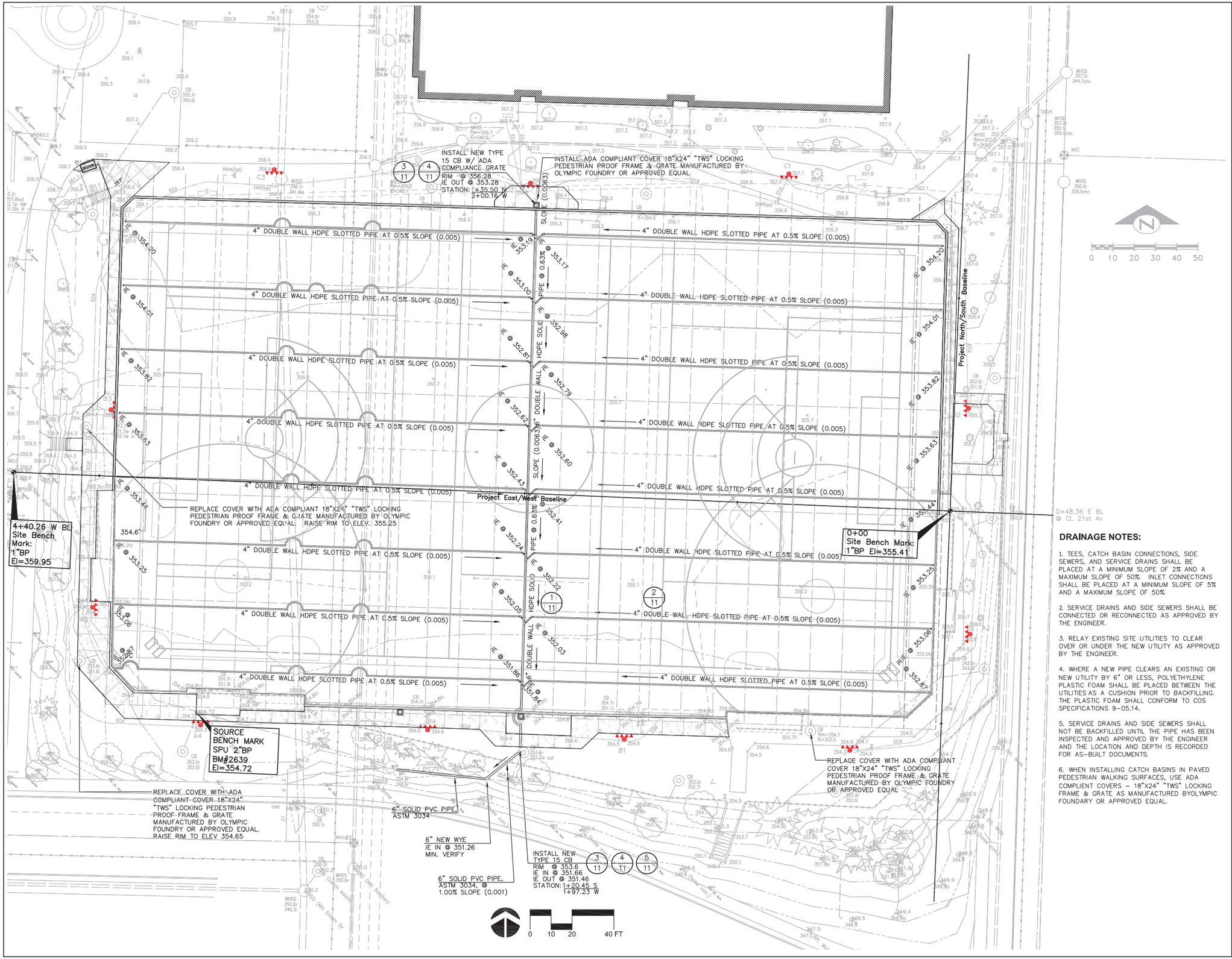
SEATTLE PARKS AND RECREATION

Cal Anderson Park

Bobby Morris Playfield - Ballfield Renovation

DRAINAGE PLAN

DESIGNED	TH	DATE	FEBRUARY 2005
DRAWN	KB, TH	SHEET	08 OF 18
CHECKED	JN		
ORDINANCE NO.	120333		
CONTRACT NO.	1675		
SCALE	1"=20'–0"		



>>>>CAUTION<<<<
CALL BEFORE YOU DIG!

NOT LESS THAN TWO OR MORE THAN TEN BUSINESS DAYS PRIOR TO COMMENCING EXCAVATION OR DEMOLITION, SECURE THE SERVICES OF A COMMERCIAL UNDERGROUND UTILITIES LOCATOR SERVICE TO IDENTIFY BELOW-GROUND IMPROVEMENTS THAT MAY NOT BE INDICATED ON THE DRAWINGS. FOR IRRIGATION SYSTEMS, CALL SEATTLE PARKS PLUMBING SHOP (206 684 7070)

>>800 424 5555<<

DRAINAGE LEGEND

═══	SOLID COLLECTOR PIPE SIZE AND SLOPE AS NOTED
═══	SLOTTED DRAIN PIPE SIZE AND SLOPE AS NOTED
CB	CATCH BASIN
CO	CLEANOUT
RIM 100.0'	STRUCTURE RIM ELEVEVATION
LF	LINEAL FEET
⌐	CAP ON PIPE
- - - - -	SLEEVE

DRAINAGE NOTES:

1. TEES, CATCH BASIN CONNECTIONS, SIDE SEWERS, AND SERVICE DRAINS SHALL BE PLACED AT A MINIMUM SLOPE OF 2% AND A MAXIMUM SLOPE OF 50%. INLET CONNECTIONS SHALL BE PLACED AT A MINIMUM SLOPE OF 5% AND A MAXIMUM SLOPE OF 50%.

2. SERVICE DRAINS AND SIDE SEWERS SHALL BE CONNECTED OR RECONNECTED AS APPROVED BY THE ENGINEER.

3. RELAY EXISTING SITE UTILITIES TO CLEAR OVER OR UNDER THE NEW UTILITY AS APPROVED BY THE ENGINEER.

4. WHERE A NEW PIPE CLEARS AN EXISTING OR NEW UTILITY BY 6" OR LESS, POLYETHYLENE PLASTIC FOAM SHALL BE PLACED BETWEEN THE UTILITIES AS A CUSHION PRIOR TO BACKFILLING. THE PLASTIC FOAM SHALL CONFORM TO COS SPECIFICATIONS 9-05.14.

5. SERVICE DRAINS AND SIDE SEWERS SHALL NOT BE BACKFILLED UNTIL THE PIPE HAS BEEN INSPECTED AND APPROVED BY THE ENGINEER AND THE LOCATION AND DEPTH IS RECORDED FOR AS-BUILT DOCUMENTS.

6. WHEN INSTALLING CATCH BASINS IN PAVED PEDESTRIAN WALKING SURFACES, USE ADA COMPLIENT COVERS - 18"X24" "TWS" LOCKING FRAME & GRATE AS MANUFACTURED BYOLYMPIC FOUNDARY OR APPROVED EQUAL.

NO.	REVISION - AS BUILT	DATE
3		
2		
1		

REVIEWED: _____ PARK ENGINEER _____ DATE

All work done in accordance with the City of Seattle Standard Plans and Specifications in effect on the date shown above, and supplemented by Special Provisions.

STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT
TED HOLDEN
CERTIFICATE NO.429

STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT
SHWU-JEN HWANG
CERTIFICATE NO.747

SEATTLE PARKS AND RECREATION

MILLER PLAYFIELD

MILLER PLAYFIELD RENOVATION

DRAINAGE PLAN

DESIGNED	TH, SH	DATE	FEB., 2009
DRAWN	TH, SH	SHEET	07 OF 16
CHECKED	TH, JN		
ORDINANCE NO.	122560		L7
CONTRACT NO.	1788		
SCALE	1"=20'-0"		

APPENDIX B

Data Quality Assurance Report

QUALITY ASSURANCE REPORT

This quality assurance report has been prepared for inclusion with the Bobby Morris Playfield Renovation Pilot Program Environmental Monitoring Report prepared by Herrera Environmental Consultants (Herrera). Quality assurance procedures generally followed those specified in the Quality Assurance Project Plan (QAPP) for the previous synthetic turf field drainage assessment at Woodland Park (Herrera 2009).

Quality assurance procedures are identified in the following sections describing field sampling methods, analytical testing procedures, data quality objectives and assessment procedures, and data management protocols. Data validation results are then presented for data collected during the stormwater monitoring period (March and April 2018). Monitoring consisted of stormwater sampling from one station each at Bobby Morris and Miller playfields during four storm events, and laboratory analysis of the collected stormwater samples. Additional environmental monitoring was conducted at Bobby Morris Playfield and Miller Playfield to address human health concerns associated with the presence of lead on the turf surface and mold in the infill materials. Data Quality Assurance Worksheets for the surface water sample analyses is included as Attachment 1.

Sampling Procedures

Stormwater sample collection consisted of two rounds of grab samples during each of three storm events. Sampling occurred at one station each at Bobby Morris and Miller playfields. One exception is that no samples were collected from Miller playfield during Event 1 because no drainage was present during either of the two site visits. Stormwater samples were collected from one station each at Bobby Morris and Miller playfields during four storm events on the following dates:

- Event 1 on March 8, 2018
- Event 2 on March 23, 2018
- Event 3 on April 7, 2018
- Event 4 on April 14, 2018
- Event 5 on February 5, 2019

Exceptions include that samples were not collected at Miller playfield during Event 1 due to a lack of flow observed at the sampling location or during Event 5 because only Bobby Morris playfield was sampled for that event.

Lead wipe samples were collected from the painted lines and green turf at Bobby Morris and Miller Playfields during one event on May 7, 2018. Two bulk composite mold samples were collected from the center circle and goal box at each field on May 7, 2018. One additional sample was collected from each field on June 20, 2018.

Collection of Stormwater Samples

A sample extension device was used to directly fill sample at both stations. All dissolved metals and dissolved phosphorus samples were field filtered by the field technician using a new 0.45-micron disposable nylon filter. A hand vacuum pump was used to filter sample water through the filtration device, and the filtered water was poured into the sample bottles.

The field technician used clean technique to ensure samples are not biased by contamination during the collection process, as described in the QAPP (Herrera 2009). Sample labeling conventions and sample container descriptions are also presented in subsequent subsections. All sample bottles were immediately stored with sufficient ice in a cooler to maintain the temperature between 2°C and 6°C.

Collection of Surface Wipe and Bulk Infill Samples

The wipe samples were collected in accordance with ASTM Method E1792-96E specifications for sampling materials for lead in surface dust. For this project, a Ghost Wipe™ cloth was placed on a disk having a diameter of 8 centimeters (cm). The Ghost Wipe™ is a sturdy wiping material that comes in an individually sealed packet and meets the ASTM Method E1792-96E specifications for sampling materials for lead in surface dust. Each wipe is 15 cm by 15 cm in size and is pre-moistened with deionized water. At the lab, the wipe readily and completely dissolves during the digestion process, providing more complete dispersion of analytes and more uniform recoveries than cloth wipes.

The wipe sample collection procedure was as follows:

1. A 15- by 15-, or a 10- by 22.5-centimeter area was outlined on the turf surface using rulers placed next to the desired sampling location.

2. A new pair of powder-free nitrile gloves were put on and used for all handling of the wipes

3. A Ghost Wipe™ was removed from its packet and attached to a the disk by wrapping the edge of the wipe around the lid, providing a clean disk liner to prevent contamination of the sample wipe by the disk.

4. Another Ghost Wipe™ was removed from its packet and placed on the disk liner to serve as the sample wipe.

5. The disk was dragged along the specified length of turf two times with even pressure while the sample wipe was held in place by hand.

6. The wipe was removed from the disk and gently shaken to remove all infill material or large debris adhered to the wipe surface. Synthetic turf fibers adhering to the wipe were not removed.

7. The wipe was placed into a clean, 4-ounce sample jar and labeled with the sample location, date, and time.

8. The sample jar was placed in a cooler with ice.

For the wipe blank, a new Ghost Wipe™ cloth was placed onto the lined disk, removed, and placed in a clean 4-ounce sample jar.

For bulk infield mold testing, each sample was collected as a composite sample from multiple locations in each field (e.g., center circle and each goal box) using a decontaminated stainless steel spoon and bowl. Each of the six composite samples was thoroughly mixed, placed in one sample container, and submitted to the NVL Labs for analysis of mold spores and fungal fragments (living and dead).

Clean Technique

Water sample collection required the proper implementation of the clean technique protocol as described in detail in the QAPP (Herrera 2009). This protocol involved the field technician, prior to sample collection, donning two new sets of disposable gloves (i.e., new, non-talc nitrile gloves) for each sequence of clean or dirty hands operations that is required for proper implementation of the clean technique protocol established by Method 1669 Sampling Ambient Water for Trace Metals at US Environmental Protection Agency Water Quality Criteria Levels (USEPA 1996).

Sample Labeling Conventions

All sample containers were labeled prior to the sampling event with the following information using indelible ink and labeling tape:

- Sample identification (monitoring station [Bobby Morris or Miller] followed by sampling round (A or B)

- Date of sample collection (day/month/year: dd/mm/yy)

- Time of sample collection (international format [24 hour])

- Project name (Bobby Morris) and name of Company (Herrera)

The date and time of sample collection and the initials of the primary field technician were added to the container label upon termination of the sampling event. The QC sample (filter blank) collected during Event 1 was identified as monitoring station QA for delivery to the laboratory.

Sample Containers, Preservation, and Holding Times

Sample containers, preservation techniques, and holding times followed guidelines by the US EPA. During the first two water quality sample collection rounds, seven sample bottles were filled at each monitoring station (exception noted below); during the third and fourth sample collection rounds, nine sample bottles were filled at each monitoring station because additional parameters were analyzed. Each bottle was filled leaving a small headspace to allow for preservation and mixing prior to analysis at the laboratory.

During the second round of sampling, only one of two sample bottles were filled for semivolatile organic compounds analysis for the second grab sample collected at Miller playfield. However, the laboratory was able to successfully analyze all parameters and no data were qualified.

Field Logbooks and Data Forms

Herrera documented all field observations on all-weather field notebooks. Documentation was sufficient to enable participants to accurately and objectively reconstruct events that occurred during the project at a later time. Entries were made in waterproof ink, dated, and signed.

Analytical Procedures

The stormwater samples were analyzed the following parameters (and approved methods) of interest identified for the Woodland Park study (Herrera 2009):

- Total hardness (SM 2340 C)
- Total suspended solids (EPA 160.2)
- Total phosphorus (SM 4500-P F)
- Fecal coliform bacteria (SM 9222 D)
- Total copper, lead, and zinc (EPA 200.8)
- Dissolved copper, lead, and zinc (EPA 200.8)
- Semivolatile organic compounds including polycyclic aromatic hydrocarbons, phthalates, phenols, chlorinated hydrocarbons, and miscellaneous organic compounds (EPA 8270).

Additional parameters of interest were added to this list for Events 3 and 4 because of the high total phosphorus concentrations observed in samples from Bobby Morris playfield during the first two events. The four samples collected from each playfield for these two events were also analyzed for:

- Soluble reactive phosphorus (SM 4500-P F)
- Total Kjeldahl nitrogen (SM 4500-Norg B)
- Nitrate+nitrite nitrogen (SM 4500-NO3- E)
- Biochemical oxygen demand, 5-day (SM5210 B)

Human health parameters analyzed for the Bobby Morris playfield study included:

- Lead by wipe sampling
- Bulk mold
- Air temperature (field parameter only)

A shortened list of parameters was analyzed for Event 5 at Bobby Morris playfield to verify previous event results for all parameters except soluble reactive phosphorus, dissolved metals, and semivolatile organic compounds. In addition, one drainage sample was analyzed using microbial source tracking (MST) by digital quantitative polymerase chain reaction (dPCR) of one dog and one human biomarker to identify the likely source of fecal bacteria.

One composite infill sample was collected from each playfield during Event 5 for analysis of fecal coliform bacteria and the synthetic precipitation leaching procedure, which included leachate analysis of total phosphorus, soluble reactive phosphorus, total and dissolved copper, and total and dissolved zinc.

Analytical methods, detection limits, units of measurement, and maximum sample holding times are presented in Table B-1.

Table B-1. Analytical Methods, Detection Limit, and Sample Holding Times.				
Parameter	**Analytical Method Number**	**Preservative**	**Maximum Holding Time**	**Target Reporting Limit**
Water Quality Parameters				
Total suspended solids	EPA 160.2	Cool to 4°C	7 days	1.0 mg/L
Total hardness	EPA 200.7	Cool to 4°C	6 months	0.5 mg/L
Total phosphorus	SM 4500-P F	H_2SO_4 to pH<2, cool to 4°C	28 days	8 µg/L
Soluble reactive phosphorus	SM 4500-P E	Field filter, cool to 4°C	18 hours filter, 48 hours analysis	4 µg/L
Total Kjeldahl nitrogen	SM 4500-Norg D-97	H_2SO_4 to pH<2, cool to 4°C	28 days	0.5 mg/L
Nitrate +nitrite nitrogen	SM 4500-NO_3- I	H_2SO_4 to pH<2, cool to 4°C	28 days	0.010 mg/L
Biological oxygen demand (BOD)	SM 5210 B	Cool to 4°C	48 hours	1.0 mg/L
Fecal coliform bacteria	SM 9222 D	Cool to 4°C	18 hours	25 CFU/100 mL
Total copper, lead, and zinc	EPA 200.8	HNO_3 to pH<2, cool to 4°C	6 months	0.5, 0.1, and 4 µg/L
Dissolved copper, lead, and zinc	EPA 200.8	Field filter, HNO_3 to pH<2, cool to 4°C	18 hours filter, 6 months analysis	0.5, 0.1, and 4 µg/L
Semivolatile organic compounds	EPA 8270D	Cool to 4°C	7 days extraction, 40 days analysis	1-20 µg /L
Human Health Parameters				
Mold	Bulk Direct Exam	NA	NA	1 spore or fungal fragment
Lead Wipe	EPA 200.8	NA	6 months	5 µg/wipe
Air Temperature (field measurement)	NA	NA	NA	0.1°F

NA = Not applicable

°C = Degrees Celsius

°F = Degrees Fahrenheit

µg/L = Micrograms per liter

µg/wipe = Micrograms per wipe

mg/L = Milligrams per liter

DATA QUALITY OBJECTIVES AND ASSESSMENT PROCEDURES

The goal of the QAPP is to ensure that data collected during this study are scientifically and legally defensible. To meet this goal, data were evaluated using the following data quality indicators:

- **Precision**
  A measure of the variability in the results of replicate measurements due to random error. Precision were assessed based on the analyses of laboratory and field duplicates, and matrix spike duplicates (MSD). Precision in these samples were evaluated based on their relative percent difference (RPD). The RPD of laboratory and field duplicates shall be less than or equal to 20 percent (30 percent for fecal coliform) for values that are greater than 5 times the reporting limit, and the difference between duplicates shall be within +/- 2 times the detection limit for values less than 5 times the reporting limit.

- **Bias**
  The constant or systematic distortion of a measurement process, different from random error, which manifests itself as a persistent positive or negative deviation from the known or true value. This can result from improper data collection, poorly calibrated analytical or sampling equipment, or limitations or errors in analytical methods and techniques. Bias was assessed based on analyses of method blanks, field blanks, matrix spikes (MS), and laboratory control samples (LCS). Bias in MS and LCS will be quantified based on percent recovery or the average (arithmetic mean) of the percent recovery.

- **Representativeness**
  The degree to which the data accurately describe the condition being evaluated, based on the selected sampling locations, sampling frequency and duration, and sampling methods. This project assessed a range of water quality conditions during winter storm flow conditions. Sample representativeness was also ensured by employing consistent and standard sampling procedures.

- **Completeness**
  The amount of valid data obtained from the measurement system. Completeness will be assessed based on the percentage of specified samples (listed in this QAPP) collected. The completeness goal shall be 90 percent. Completeness for acceptable data is defined as the percentage of acceptable data out of the total amount of data generated. Acceptable data is either data that passes all QC criteria, or data that may not pass all QC criteria but has appropriate corrective actions taken.

- **Comparability**
  A qualitative term that expresses the measure of confidence that one data set can be compared to another and can be combined for the decision(s) to be made. Data are comparable if sample collection techniques, measurement procedures, analytical methods, and reporting are equivalent for samples within a sample set. Standard

sampling procedures, analytical methods, units of measurement, and reporting limits will be applied in this study to meet the goal of data comparability. The results were tabulated in standard spreadsheets to facilitate comparison with other study results and water quality threshold limits (e.g., WAC 173-201A).

Data Validation Results

Quality control problems and correctives actions were summarized in quality assurance worksheets (Attachment 1). Values associated with minor quality control problems shall be considered estimates and assigned as J qualifiers. Values associated with major quality control problems shall be considered rejected and assigned as R qualifiers. Estimates values may be used for evaluation purposes, while rejected values shall not be used. Quality control data summaries submitted by the laboratories were reviewed; raw data were not submitted by the laboratories. Data quality assurance worksheets summarizing the quality assurance and quality control (QA/QC) review were completed for each sampling event and are included with the data. Data qualifiers (flags) were added to the sample results in the laboratory reports. Data validation results are summarized below followed by definitions of data qualifiers.

Completeness

Completeness for acceptable data is defined as the percentage of acceptable data out of the total amount of data generated. Acceptable data is either data that passes all QC criteria, or data that may not pass all QC criteria but has appropriate corrective actions taken. All data are acceptable and 100 percent complete.

Methodology

Methodology is assessed by examining and reviewing the field notebook and laboratory reports for deviation from the sampling and analysis plan. Unacceptable deviations will result in rejected values R, and will be corrected for any future analyses.

All laboratory reporting limits met the QAPP specified reporting limits for analyses, with the exception of total and dissolved zinc (see Table B-1). The QAPP reporting limit for zinc was identified as 1 µg/L while the laboratory reporting limit was 4 µg/L. This may impact data usability; however, no data were qualified based on laboratory reporting limits.

Holding Times

All samples were analyzed within the required holding times (Table B-1), with the exceptions below for fecal coliform (Table B-2).

Table B-2. Samples Qualified Due to Holding Time Exceedances.

Sample ID	Sample Date	Parameter	Reason for Qualification	Qualifier
Bobby Morris A	3/8/18	Fecal coliform	Maximum holding time exceeded	J
Bobby Morris B	3/8/18	Fecal coliform	Maximum holding time exceeded	J

Method Blanks

Method blanks were analyzed at the required frequency. No analytes were detected in the method blanks above the reporting limit for any parameters, with the exception noted below.

Total phosphorus was detected above the laboratory reporting limit in the method blank analyzed with the samples collected during Event 4. No samples were qualified because samples with total phosphorus results less than 10 times the method blank value were re-prepped and reanalyzed with an acceptable method blank.

Filter and Field Blanks

A filter blank was collected and analyzed for dissolved metals during the first stormwater sampling event on March 8, 2018. No target metals were detected in the filter blank above laboratory reporting limits.

A field blank was collected and analyzed with the lead wipe samples. Lead was not detected in the field blank above the laboratory reporting limit.

Laboratory Duplicates

Laboratory duplicate samples were analyzed at the required frequency. The relative percent difference for all sampling events met the QAPP criteria (less than 20 percent for all parameters except fecal coliform at less than 30 percent), with the exception noted below.

The percent relative difference (RPD) value for total phosphorus (23 percent) for the duplicate analyzed on sample Bobby Morris A collected on April 14, 2018, exceeded the less than 20 percent criterion. The total phosphorus result for sample Bobby Morris A collected on April 14, 2018, was qualified as estimated (J) as shown in Table B-3.

Table B-3. Samples Qualified Due to Laboratory Duplicate RPD Exceedances.

Sample ID	Sample Date	Parameter	Reason for Qualification	Qualifier
Bobby Morris A	4/14/18	Total phosphorus	Laboratory duplicate RPD exceedance	J

Laboratory Control Sample Analysis

Laboratory control samples (LCS) were analyzed at the required frequency. The percent recovery values for all sampling events met the method of laboratory established criteria (ranging from 23 to 183 percent for SVOCs, 80 to 120 percent for metals, and 90 to 110 percent for all other analyses), with the exceptions noted below.

For Event 3, the LCS percent recovery was low for 4-chloroanilineone. As the bias was low and 4-chloroaniline was not detected above the reporting limit for any associated samples, data for this compound was qualified as "UJ". A summary of the qualified results due to low LCS recoveries can be found in Table B-4.

Table B-4. Samples Qualified Due to Laboratory Control Sample Recovery Exceedances.

Sample ID	Sample Date	Parameter	Reason for Qualification	Qualifier
Bobby Morris A	4/7/18	4-Chloroaniline	LCS percent recovery outside control limits	UJ
Bobby Morris B	4/7/18	4-Chloroaniline	LCS percent recovery outside control limits	UJ
Miller A	4/7/18	4-Chloroaniline	LCS percent recovery outside control limits	UJ
Miller B	4/7/18	4-Chloroaniline	LCS percent recovery outside control limits	UJ

Surrogate Spike Analysis

Surrogates were added to all samples and associated quality control samples for SVOC analysis, as required by the method. The percent recovery for one surrogate in the analysis of the method blank associated with sampling Event 2 exceeded the laboratory established control limits. No data were qualified because surrogate recovery values met the criteria for all associated samples and all other QC criteria were met.

Matrix Spike

Matrix spike (MS) samples were analyzed at the required frequency. The percent recovery values for the MS analyses met the control limits (75 to 125 percent) established by the QAPP, with the exception noted below.

The matrix spike recovery was low (60 percent) for TKN for the matrix spike of sample Bobby Morris A collected on April 14, 2018. The undetected TKN result for sample Bobby Morris A was qualified as estimated non-detected (UJ) due to the matrix spike failure, as shown below in Table B-5.

Table B-5. Samples Qualified Due to Matrix Spike Recovery Exceedances.

Sample ID	Sample Date	Parameter	Reason for Qualification	Qualifier
Bobby Morris A	4/14/18	TKN	Matrix spike percent recovery outside control limits	UJ

Calibration Verification

The initial calibration verification (ICV) analyzed for semivolatile organic compounds (SVOCs) with the samples collected during Event 1 resulted in percent difference (%D) values for 1-chloropropane (biased high) and 2,4-dinitrophenol (biased low), and with the samples collected during Event 3 resulted in a %D value for butylbenzylphthalate (biased high) that exceeded the laboratory established control limits. Because the %D values were biased high for 1-chloropropane and butylbenzyl phthalate, and all associated samples did not have reportable results for these compounds above the laboratory reporting limit, no data were qualified.

Because the ICV failure was biased low for 2,4-dinitrophenol, and this compound was not detected above the laboratory reporting limit, the associated samples were qualified as estimated non-detected (UJ), as shown in Table B-6.

Table B-6. Samples Qualified Due to Initial Calibration Verification Exceedances.

Sample ID	Sample Date	Parameter	Reason for Qualification	Qualifier
Bobby Morris A	3/8/18	2,4-Dinitrophenol	ICV %R failure low and samples not detected	UJ
Bobby Morris B	3/8/18	2,4-Ditrophenol	ICV %R failure low and samples not detected	UJ

Raw Data Review of Fecal Coliform Data

Accuracy of the fecal coliform bacteria results were assessed during data quality review by requesting raw data from the laboratory to evaluate results obtained for each sample filtration volume. The membrane filtration method used to measure bacteria concentrations recommends that between 20 and 60 colonies are present on each culture plate to achieve the most accurate count (APHA et al. 1995). In accordance with this recommendation, results based on plate counts of less than 20 colonies or greater than 60 colonies were qualified as estimates and flagged with a "J" in the database. This data flagging procedure is not required by the analytical method and was not specified in the QAPP (Herrera 2009) but was conducted to account for the lower accuracy of results obtained from cultures having counts outside the recommended range.

Raw data was reviewed for all sample batches. As shown in Table B-7, a total of three of the 14 bacteria results were qualified as estimates and flagged with a J because they were based on counts less than 20 per culture plate. All estimated values were used for data analysis.

Table B-7. Samples Qualified Due to Holding Time Exceedances.

Sample ID	Sample Date	Parameter	Reason for Qualification	Qualifier
Miller A	4/7/18	Fecal coliform	Plate count less than 20	J
Miller B	4/7/18	Fecal coliform	Plate count less than 20	J
Miller B	4/14/18	Fecal coliform	Plate count less than 20	J

Definition of Data Qualifiers

Data flags were entered in separate columns adjacent to each data column using the following coding system taken from USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (USEPA 2002):

U — The material was analyzed for but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

J — The associated value is an estimated quantity.

UJ — The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

R — The data are unusable. (Note: analyte may or may not be present.)

REFERENCES

APHA, AWWA, and WEF. 1995. Standard Methods for the Examination of Water and Wastewater. 18th edition. Edited by A.E. Greenburg, American Public Health Association; L.S. Clesceri, Water Environment Federation, and A.D. Eaton, American Water Works Association.

Herrera. 2009. Woodland Park Synthetic Turf Field Stormwater Drainage Study Quality Assurance Project Plan, Prepared for City of Seattle, Department of Department of Parks and Recreation by Herrera Environmental Consultants, Inc., Seattle, Washington. November.

USEPA. 2002. Contract laboratory program national functional guidelines for inorganic data review. EPA-540/R-01/008. US Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, DC.

ATTACHMENT 1

Data Quality Assurance Worksheets

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Bobby Morris Playfield /18-06769-000/ Seattle Parks and Recreation | Date 9/19/18 | Page 1 of 1

Laboratory/Parameters: Analytical Resources, Inc. / TSS, TP, hardness, dissolved & total Pb, Cu, & Zn, fecal coliform, SVOCs | Checked: initials RZ

Sample Date/Sample ID: 3/8/18 / Bobby Morris (2 samples), QA(filter blank) | date 10/4/18

Parameter	Completeness/ Methodology	Preparation Holding Times (days)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / EPA 160.2	NA	NA	4	≤ 7	≤1.0 1.0	NA	NA	98	±10	NA	≤ 20	NS	≤ 20	OK	NONE
Total Phosphorus	OK / SM 4500P-F	NA	NA	6	≤ 7	≤0.0080 0.0080	NA	±25	104-105	±10	NA	≤ 20	NS	≤ 20	OK	NONE
Hardness	OK / SM 2340B	NA	NA	5	≤ 180	≤0.0500 0.0500	NA	±25	97-100	±20	NA	≤ 20	NS	≤ 20	OK	MB – MG >MDL BUT < RL, NO FLAGS
Total metals	OK / EPA 200.8	NA	NA	5	≤ 180	≤0.1–4 0.1-4.0	NA	±25	109-117	±20	NA	≤ 20	NS	≤ 20	OK	NONE
Dissolved metals	OK / EPA 200.8	OK	≤ 15 min	12	≤ 180	≤0.1–4 0.1-4.0	NA	±25	100-115	±20	NA	≤ 20	NS	≤ 20	OK	FB OK NONE
SVOCs	OK / EPA 8270	6	≤ 7	2	≤ 40	≤1–20 1-20	SURR 62-100	20-120	59-103	23-183	NA	≤ 30	NS	≤ 30	ICV - CHLOROPROPANE	ICV-. ALL ND, FLAG 2,4-DINITROPHENOL UJ SAMPLES – LOW FAILURE.
Fecal coliform	OK / SM 9222D	NA	NA	22-23	18 Hours	≤1 1	NA	NA	NA	NA	NA	≤ 30	NS	≤ 30	OK	J SAMPLES DUE TO HT

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

Rinsate blank – goal is ≤2X RL. If not met, associated blank concentration is defined as new reporting limit, and project samples within 5x this RL are flagged with a *J*.

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Bobby Morris Playfield /18-06769-000/ Seattle Parks and Recreation | Date 9/19/18 | Page 1 of 1

Laboratory/Parameters: Analytical Resources, Inc. / TSS, TP, hardness, dissolved & total Pb, Cu, & Zn, fecal coliform, SVOCs | Checked: initials RZ

Sample Date/Sample ID: 3/23/18 / Bobby Morris A, Bobby Morris B, Miller A, Miller B | date 10/4/18

Parameter	Completeness/ Methodology	Preparation Holding Times (days)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / EPA 160.2	NA	NA	3	≤ 7	≤1.0 1.0	NA	NA	99	±10	7.2	≤ 20	NS	≤ 20	OK	NONE
Total Phosphorus	OK / SM 4500P-F	NA	NA	3	≤ 7	≤0.0080 0.0080	94	±25	101-103	±10	1.7	≤ 20	NS	≤ 20	OK	NONE
Hardness	OK / SM 2340B	NA	NA	5	≤ 180	≤0.0500 0.0500	NA	±25	10-106	±20	NA	≤ 20	NS	≤ 20	OK	MB – CA >MDL BUT < RL, NO FLAGS
Total metals	OK / EPA 200.8	NA	NA	5	≤ 180	≤0.1–4 0.1-4.0	NA	±25	92-108	±20	NA	≤ 20	NS	≤ 20	OK	NONE
Dissolved metals	OK / EPA 200.8	OK	≤ 15 min	4	≤ 180	≤0.1–4 0.1-4.0	NA	±25	94-106	±20	NA	≤ 20	NS	≤ 20	OK	MB – ZN >MDL BUT < RL, NO FLAGS
SVOCs	OK / EPA 8270	5	≤ 7	2	≤ 40	≤1–20 1-20	SURR 54-105	20-120	42-100	23-183	NA	≤ 30	NS	≤ 30	OK	1 SURR HIGH REC IN MB, ALL SAMPLES OK, NO FLAGS..
Fecal coliform	OK / SM 9222D	NA	NA	<8	18 Hours	≤1 1	NA	NA	NA	NA	NA	≤ 30	NS	≤ 30	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

Rinsate blank – goal is ≤2X RL. If not met, associated blank concentration is defined as new reporting limit, and project samples within 5x this RL are flagged with a *J*.

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Bobby Morris Playfield /18-06769-000/ Seattle Parks and Recreation | Date 9/19/18 | Page 1 of 2

Laboratory/Parameters: Analytical Resources, Inc. / TSS, TP, hardness, dissolved & total Pb, Cu, & Zn, fecal coliform, SVOCs – Added: OP, TKN,N+N nitrogen, BOD (5-day) | Checked: initials RZ

Sample Date/Sample ID: 4/7/18 / Bobby Morris A, Bobby Morris B, Miller A, Miller B | date 10/4/18

Parameter	Completeness/ Methodology	Preparation Holding Times (days)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / EPA 160.2	NA	NA	2	≤ 7	≤1.0 1.0	NA	NA	97	±10	NA	≤ 20	NS	≤ 20	OK	NONE
Total Phosphorus	OK / SM 4500P-F	NA	NA	3	≤ 7	≤0.0080 0.0080	NA	±25	101-108	±10	NA	≤ 20	NS	≤ 20	OK	NONE
Hardness	OK / SM 2340B	NA	NA	9	≤ 180	≤0.0500 0.0500	NA	±25	99-102	±20	NA	≤ 20	NS	≤ 20	OK	NONE
OP	OK / SM 4500-P E	<18	≤ 18 hrs	<24	≤ 2	≤0.004 0.004	97	±25	99	±10	5.3	≤ 20	NS	≤ 20	OK	NONE
TKN	OK / SM 4500-N B	NA	NA	10	≤ 28	≤0.5 0.5	NA	±25	100-103	±10	NA	≤ 20	NS	≤ 20	OK	NONE
Nitrate-Nitrite Nitrogen	OK / SM 4500-NO3 E	NA	NA	11	≤ 28	≤0.010 0.010	NA	±25	97	±10	NA	≤ 20	NS	≤ 20	OK	NONE
BOD_5	OK / SM 5210 B	<1	≤ 2	5	≤ 7	≤1.2 1.2	NA	NA	91	±20	NA	≤ 20	NS	≤ 20	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

Rinsate blank – goal is ≤2X RL. If not met, associated blank concentration is defined as new reporting limit, and project samples within 5x this RL are flagged with a *J*.

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Bobby Morris Playfield /18-06769-000/ Seattle Parks and Recreation | Date 9/19/18 | Page 2 of 2

Laboratory/Parameters: Analytical Resources, Inc. / TSS, TP, hardness, dissolved & total Pb, Cu, & Zn, fecal coliform, SVOCs – Added: OP, TKN,N+N nitrogen, BOD (5-day) | Checked: initials RZ

Sample Date/Sample ID: 4/7/18 / Bobby Morris A, Bobby Morris B, Miller A, Miller B | date 10/4/18

Parameter	Completeness/ Methodology	Preparation Holding Times (days)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total metals	OK / EPA 200.8	NA	NA	3	≤ 180	≤0.1–4 0.1-4.0	NA	±25	96-104	±20	NA	≤ 20	NS	≤ 20	OK	NONE
Dissolved metals	OK / EPA 200.8	OK	≤ 15 min	10	≤ 180	≤0.1–4 0.1-4.0	NA	±25	98-113	±20	NA	≤ 20	NS	≤ 20	OK	MB – ZN >MDL BUT < RL, NO FLAGS
SVOCs	OK / EPA 8270	2	≤ 7	5	≤ 40	≤1–20 1-20	SURR 52-87	20-120	34-110	23-183	NA	≤ 30	NS	≤ 30	ICV -BBP %R HIGH	NO FLAG FOR ICV FAILURE – ALL SAMPLES ND LCS %R LOW FOR 4-CHLOROANILINE, SAMPLES ND, FLAG UJ.
Fecal coliform	OK / SM 9222D	NA	NA	<8	18 Hours	≤1 1	NA	NA	NA	NA	NA	≤ 30	NS	≤ 30	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.
NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.
Rinsate blank – goal is ≤2X RL. If not met, associated blank concentration is defined as new reporting limit, and project samples within 5x this RL are flagged with a *J*.

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Bobby Morris Playfield /18-06769-000/ Seattle Parks and Recreation | Date 9/19/18 | Page 1 of 2

Laboratory/Parameters: Analytical Resources, Inc. / TSS, TP, hardness, dissolved & total Pb, Cu, & Zn, fecal coliform, SVOCs – Added: OP, TKN,N+N nitrogen, BOD (5-day) | Checked: initials RZ

Sample Date/Sample ID: 4/14/18 / Bobby Morris A, Bobby Morris B, Miller A, Miller B | date 10/4/18

Parameter	Completeness/ Methodology	Preparation Holding Times (days)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / EPA 160.2	NA	NA	3	≤ 7	≤1.0 1.0	NA	NA	99	±10	NA	≤ 20	NS	≤ 20	OK	NONE
Total Phosphorus	OK / SM 4500P-F	NA	NA	13	≤ 28	0.0180, ND 0.0080	96	±25	97-105	±10	23	≤ 20	NS	≤ 20	OK	MB >RL, SAMPLES <10X MB REPREPPED AND ANALYZED NO FLAGS FLAG MORRIS A J DUP
Hardness	OK / SM 2340B	NA	NA	4	≤ 180	≤0.0500 0.0500	NA	±25	94-99	±20	NA	≤ 20	NS	≤ 20	OK	MB – CA >MDL BUT < RL, NO FLAGS
OP	OK / SM 4500-P E	<8	≤ 18 hrs	<1	≤ 2	≤0.004 0.004	97	±25	102	±10	2.5	≤ 20	NS	≤ 20	OK	NONE
TKN	OK / SM 4500-N B	NA	NA	12	≤ 28	≤0.5 0.5	60	±25	102-103	±10	NC	≤ 20	NS	≤ 20	OK	FLAG MORRIS A "J" DUE TO MS %R
N+N nitrogen	OK / SM 4500-NO3 F	NA	NA	4	≤ 28	≤0.010 0.010	NA	±25	97	±10	NA	≤ 20	NS	≤ 20	OK	NONE
BOD_5	OK / SM 5210 B	<1	≤ 2	5	≤ 7	≤1.2 1.2	NA	NA	86	±20	NA	≤ 20	NS	≤ 20	OK	NONE

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Bobby Morris Playfield /18-06769-000/ Seattle Parks and Recreation | Date 9/19/18 | Page 2 of 2

Laboratory/Parameters: Analytical Resources, Inc. / TSS, TP, hardness, dissolved & total Pb, Cu, & Zn, fecal coliform, SVOCs – Added: OP, TKN,N+N nitrogen, BOD (5-day) | Checked: initials RZ

Sample Date/Sample ID: 4/14/18 / Bobby Morris A, Bobby Morris B, Miller A, Miller B | date 10/4/18

Parameter	Completeness/ Methodology	Preparation Holding Times (days)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total metals	OK / EPA 200.8	NA	NA	2	≤ 180	≤0.1–4 0.1-4.0	NA	±25	104-116	±20	NA	≤ 20	NS	≤ 20	OK	NONE
Dissolved metals	OK / EPA 200.8	OK	≤ 15 min	4	≤ 180	≤0.1–4 0.1-4.0	97-104	±25	100-110	±20	1.7-3.6	≤ 20	NS	≤ 20	OK	MB – ZN >MDL BUT < RL, NO FLAGS
SVOCs	OK / EPA 8270	5	≤ 7	1	≤ 40	≤1–20 1-20	SURR 51-94	20-120	44-104	23-183	NA	≤ 30	NS	≤ 30	ICV -BBP %R HIGH	NO FLAG FOR ICV FAILURE – ALL SAMPLES ND
Fecal coliform	OK / SM 9222D	NA	NA	<8	18 Hours	≤1 1	NA	NA	NA	NA	NA	≤ 30	NS	≤ 30	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.
NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.
Rinsate blank – goal is ≤2X RL. If not met, associated blank concentration is defined as new reporting limit, and project samples within 5x this RL are flagged with a *J*.

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Bobby Morris Playfield /18-06769-000/ Seattle Parks and Recreation | Date 4/18/19 | Page 1 of 2

Laboratory/Parameters: Analytical Resources / TSS, TP, hardness, TKN, N+N, total Pb/Cu, fecal coliform, BOD (5-day); infill samples – SPLP (TP, SRP, total/dissolved Zn/Cu), fecal coliform | Checked: initials RZ

Sample Date/Sample ID: 2/1/19 / Bobby Morris A, Bobby Morris B, Bobby Infill, Miller Infill | date 4/22/19

Parameter	Completeness/ Methodology	Preparation Holding Times (days)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
TSS	OK / EPA 160.2	NA	NA	4	≤ 7	≤1.0 1.0	NA	NA	95	±10	11	≤ 20	NS	≤ 20	OK	NONE
Total Phosphorus	OK / SM 4500P-F	NA	NA	14	≤ 28	≤0.016 0.0080	95, 91	±25	99-101	±10	6.3, NC	≤ 20	NS	≤ 20	OK	NONE
Hardness	OK / SM 2340B	NA	NA	14	≤ 180	≤0.0500 0.0500	NA	±25	97,101	±20	NA	≤ 20	NS	≤ 20	OK	NONE
OP	OK / SM 4500-P E	14 days	≤ 18 hrs	1	≤ 2	≤0.004 0.004	97	±25	103	±10	NC	≤ 20	NS	≤ 20	OK	NONE, ANALYZED ONLY IN SPLP ON SAME DAY EXTRACTED
TKN	OK / SM 4500-N B	NA	NA	11-18	≤ 28	≤0.5 0.5	106	±25	93-98	±10	8.8	≤ 20	NS	≤ 20	OK	NONE
N+N nitrogen	OK / SM 4500-NO3 F	NA	NA	12	≤ 28	≤0.020 0.020	NA	±25	94	±10	NA	≤ 20	NS	≤ 20	OK	NONE
BOD_5	OK / SM 5210 B	<1	≤ 2	5	≤ 7	≤1.2 1.2	NA	NA	109	±20	NA	≤ 20	NS	≤ 20	OK	NONE

Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Bobby Morris Playfield /18-06769-000/ Seattle Parks and Recreation

Date 4/18/19 Page 2 of 2

Laboratory/Parameters: Analytical Resources / TSS, TP, hardness, TKN, N+N, total Pb/Cu, fecal coliform, BOD (5-day); infill samples – SPLP (TP, SRP, total/dissolved Zn/Cu), fecal coliform

Checked: initials RZ

Sample Date/Sample ID: 2/1/19 / Bobby Morris A, Bobby Morris B, Bobby Infill, Miller Infill

date 4/22/19

Parameter	Completeness/ Methodology	Preparation Holding Times (days)		Total Holding Times (days)		Method Blanks Reporting Limit	Matrix Spikes/ Surrogate Recovery (%)		Lab Control Samples Recovery (%)		Lab Duplicates RPD (%)		Field Duplicates RPD (%)		Instrument Calibration/ Performance	ACTION
		Reported	Goal	Reported	Goal		Reported	Goal	Reported	Goal	Reported	Goal[1]	Reported	Goal[1]		
Total metals	OK / EPA 200.8	NA	NA	11-20	≤ 180	≤0.1–0.5 0.1-4.0	98-113	±25	94-108	±20	D=0.0002 NC	≤ 20	NS	≤ 20	OK	NONE
Dissolved metals	OK / EPA 200.8	NA	≤ 15 min	17	≤ 180	≤0.5–4 0.1-4.0	98,79	±25	80-105	±20	17,3.2	≤ 20	NS	≤ 20	OK	NONE
Fecal coliform	OK / SM 9222D	NA	NA	<18	18 Hours	≤1 1	NA	NA	NA	NA	NA	≤ 30	NS	≤ 30	OK	NONE

[1] If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

Rinsate blank – goal is ≤2X RL. If not met, associated blank concentration is defined as new reporting limit, and project samples within 5x this RL are flagged with a *J*.

APPENDIX C

Laboratory Data Reports

Analytical Resources, Incorporated
Analytical Chemists and Consultants

23 March 2018

Rob Zisette
Herrera Environmental Consultants
2200 6th Avenue, Suite 1100
Seattle, WA 98121

RE: Bobby Moris Playfield

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
18C0175	N/A

Amanda Volgardsen

Digitally signed by Amanda Volgardsen
DN: c=US, st=Washington, l=Tukwila, o=Analytical Resources, Inc., ou=Project Manager, cn=Amanda Volgardsen, email=amanda.volgardsen@arilabs.com
Date: 2018.03.23 12:11:20 -07'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in it entirety.

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006

PJLA Testing
Accreditation # 66169

18C0175

HERRERA
2200 Sixth Avenue | Suite 1100
Seattle, Washington | 98121
p 206 441 9080 | f 206 441 9108

Chain of Custody Record

Project Name:	Project Number:	Client:
Bobby Morris Playfield Monitoring	18-06769-000	Herrera Environmental

Report To:	Page:
Rob Zisette	1/1

Sampled By:	Delivery Method:
Alex Svendsen	IN COOLER W/ICE

Laboratory:	Requested Completion Date:	Total No. of Containers:
Analytical Resources Inc.		15

Analyses Requested

Lab Use:						Total Suspended Solids- EPA 160.2	Total Hardness as CaCO3-SM 2340B	Total phosphorus - SM 4500P-F	Lead, dissolved - EPA 200.8	Lead, total - EPA 200.8	Copper, dissolved - EPA 200.8	Copper, total - EPA 200.8	Zinc, dissolved - EPA 200.8	Zinc, total - EPA 200.8	Fecal coliform bacteria – SM 9222D	SVOCs, EPA 8270	
Sample ID	Date	Time	Sample Type (see codes)	Preservative? (Y/N)	Matrix (see codes)												
Bobby Morris	3/8/18	1340	G	Y/N	SW	X	X	X	X	X	X	X	X	X	X	X	
Bobby Morris	3/8/18	1445	G	Y/N	SW	X	X	X	X	X	X	X	X	X	X	X	
~~Miller~~			~~G~~	~~N~~	~~SW~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	AS
~~Miller~~			~~G~~	~~N~~	~~SW~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	AS
QA	3/8/18	1500	G	N	W				X		X		X				

Comments/Special Instructions:

Relinquished by (Name/CO)	Signature	Date/Time		Received By (Name/CO)	Signature	Date/Time
Alex Svendsen/HRC		3/9/18 1200		Stephanie Fiori ARI	Stephanie Fiori	3/9/18 1200
Relinquished by (Name/CO)	Signature	Date/Time		Received By (Name/CO)	Signature	Date/Time

Sample Type: G=Grab C=Composite

Matrix Codes: A=Air GW=Groundwater SE=Sediment SO=Soil SW=Surface Water W=Water (blanks) M=Material O=Other (specify)

Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Bobby Morris	18C0175-01	Water	08-Mar-2018 13:40	09-Mar-2018 12:00
Bobby Morris	18C0175-02	Water	08-Mar-2018 13:40	09-Mar-2018 12:00
Bobby Morris	18C0175-03	Water	08-Mar-2018 14:45	09-Mar-2018 12:00
Bobby Morris	18C0175-04	Water	08-Mar-2018 14:45	09-Mar-2018 12:00
QA	18C0175-05	Water	08-Mar-2018 15:00	09-Mar-2018 12:00

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Case Narrative

Sample receipt

Samples as listed on the preceding page were received March 9, 2018 under ARI work order 18C0175. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Semivolatiles - EPA Method SW8270D

The samples were extracted and analyzed within the recommended holding times.

Initial calibrations were within method requirements.

The initial calibration verification (ICV) is outside of control limits high for 2,2'-oxybis(1-Chloropropane), and low for 2,4-Dinitrophenol. Associated detected results and QC have been flagged with "Q" qualifiers. No further corrective action was taken.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank was clean at the reporting limits.

The LCS percent recoveries were within control limits.

Total and Dissolved Metals - EPA Method 200.8

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

Total Hardness - EPA Method 200.7

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank has Magnesium detected below the reporting limit, but above the method detection limit. The Magnesium has been flagged with a "J" qualifier on the method blank. No further corrective action was taken.

The LCS percent recoveries were within control limits.

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Wet Chemistry (TSS, T-Phos, Fecal Coliform)

The Fecal Coliform samples were received outside of the 8 hour recommended holding time, and have been flagged with "H" qualifiers.

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

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WORK ORDER

18C0175

Client: Herrera Environmental Consultants	**Project Manager: Amanda Volgardsen**
Project: Bobby Moris Playfield	**Project Number: 18-06769-000**

Analysis groups included in this work order

Hardness, Calculated (200.7)

Met 200.7 - Mg Met 200.7 - Ca

Preservation Confirmation

Container ID	Container Type	pH
18C0175-01 A	Large OJ, 1000 mL	
18C0175-01 B	Small OJ, 500 mL, 9N H2SO4	≤2 pass
18C0175-01 C	HDPE NM, 500 mL, 1:1 HNO3	≤2 pass
18C0175-01 D	Corning Plastic, 125 mL, Na2S2O3	
18C0175-01 E	Glass NM, Amber, 500 mL	
18C0175-01 F	Glass NM, Amber, 500 mL	
18C0175-02 A	HDPE NM, 500 mL, 1:1 HNO3	≤2 pass
18C0175-03 A	Large OJ, 1000 mL	
18C0175-03 B	Small OJ, 500 mL, 9N H2SO4	≤2 pass
18C0175-03 C	HDPE NM, 500 mL, 1:1 HNO3	≤2 pass
18C0175-03 D	Corning Plastic, 125 mL, Na2S2O3	
18C0175-03 E	Glass NM, Amber, 500 mL	
18C0175-03 F	Glass NM, Amber, 500 mL	
18C0175-04 A	HDPE NM, 500 mL, 1:1 HNO3	≤2 pass
18C0175-05 A	HDPE NM, 500 mL, 1:1 HNO3	≤2 pass

SEF — Preservation Confirmed By

3/9/18 — Date

Reviewed By Date

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Herrera

Project Name: Bobby Morris Playfield

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 18C0175

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	NO
Were custody papers included with the cooler?	YES	NO
Were custody papers properly filled out (ink, signed, etc.)	YES	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 3.8

Time: 1200

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: D00256105

Cooler Accepted by: SEF Date: 3/9/18 Time: 1200

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used? … Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: NONE			
Was sufficient ice used (if appropriate)?	NA	YES	NO
Were all bottles sealed in individual plastic bags?		YES	NO
Did all bottles arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		YES	NO
Did the number of containers listed on COC match with the number of containers received?		YES	NO
Did all bottle labels and tags agree with custody papers?		YES	NO
Were all bottles used correct for the requested analyses?		YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	NA	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO
Date VOC Trip Blank was made at ARI	NA		

Was Sample Split by ARI : NA YES Date/Time: _____ Equipment: _____ Split by: _____

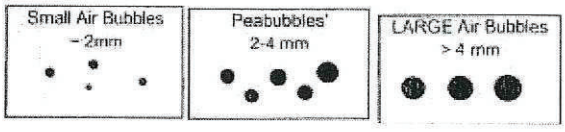
Samples Logged by: SEF Date: 3/9/18 Time: 1231

** ***Notify Project Manager of discrepancies or concerns*** ** SEF

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:



Small → "sm" (< 2 mm)
Peabubbles → "pb" (2 to < 4 mm)
Large → "lg" (4 to < 6 mm)
Headspace → "hs" (> 6 mm)

Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Bobby Morris

18C0175-01 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 03/08/2018 13:40

Instrument: NT12 — Analyzed: 16-Mar-2018 15:02

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGC0206 — Sample Size: 500 mL
Prepared: 14-Mar-2018 — Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	0.2	1.0	ND	ug/L	U
bis(2-chloroethyl) ether	111-44-4	1	0.4	1.0	ND	ug/L	U
2-Chlorophenol	95-57-8	1	0.4	1.0	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.3	1.0	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.3	1.0	ND	ug/L	U
Benzyl Alcohol	100-51-6	1	1.0	2.0	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.3	1.0	ND	ug/L	U
2-Methylphenol	95-48-7	1	0.3	1.0	ND	ug/L	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	0.5	1.0	ND	ug/L	U
4-Methylphenol	106-44-5	1	0.4	2.0	ND	ug/L	U
N-Nitroso-di-n-Propylamine	621-64-7	1	0.2	1.0	ND	ug/L	U
Hexachloroethane	67-72-1	1	0.3	2.0	ND	ug/L	U
Nitrobenzene	98-95-3	1	0.4	1.0	ND	ug/L	U
Isophorone	78-59-1	1	0.5	1.0	ND	ug/L	U
2-Nitrophenol	88-75-5	1	0.5	3.0	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	1.0	3.0	ND	ug/L	U
Bis(2-Chloroethoxy)methane	111-91-1	1	0.6	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	3.4	20.0	ND	ug/L	U
2,4-Dichlorophenol	120-83-2	1	1.9	3.0	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.3	1.0	ND	ug/L	U
Naphthalene	91-20-3	1	0.2	1.0	ND	ug/L	U
4-Chloroaniline	106-47-8	1	1.9	5.0	ND	ug/L	U
Hexachlorobutadiene	87-68-3	1	0.1	3.0	ND	ug/L	U
4-Chloro-3-Methylphenol	59-50-7	1	2.0	3.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	0.2	1.0	ND	ug/L	U
Hexachlorocyclopentadiene	77-47-4	1	2.5	5.0	ND	ug/L	U
2,4,6-Trichlorophenol	88-06-2	1	1.9	3.0	ND	ug/L	U
2,4,5-Trichlorophenol	95-95-4	1	1.8	5.0	ND	ug/L	U
2-Chloronaphthalene	91-58-7	1	0.5	1.0	ND	ug/L	U
2-Nitroaniline	88-74-4	1	2.0	3.0	ND	ug/L	U
Dimethylphthalate	131-11-3	1	0.4	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.3	1.0	ND	ug/L	U
2,6-Dinitrotoluene	606-20-2	1	2.1	3.0	ND	ug/L	U
3-Nitroaniline	99-09-2	1	2.2	3.0	ND	ug/L	U
Acenaphthene	83-32-9	1	0.3	1.0	ND	ug/L	U
2,4-Dinitrophenol	51-28-5	1	4.9	20.0	ND	ug/L	U

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Bobby Morris

18C0175-01 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 03/08/2018 13:40

Instrument: NT12 — Analyzed: 16-Mar-2018 15:02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dibenzofuran	132-64-9	1	0.3	1.0	ND	ug/L	U
4-Nitrophenol	100-02-7	1	1.0	10.0	ND	ug/L	U
2,4-Dinitrotoluene	121-14-2	1	2.0	3.0	ND	ug/L	U
Fluorene	86-73-7	1	0.3	1.0	ND	ug/L	U
Diethyl phthalate	84-66-2	1	0.4	1.0	ND	ug/L	U
4-Chlorophenylphenyl ether	7005-72-3	1	0.4	1.0	ND	ug/L	U
4-Nitroaniline	100-01-6	1	1.9	3.0	ND	ug/L	U
4,6-Dinitro-2-methylphenol	534-52-1	1	5.0	10.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.4	1.0	ND	ug/L	U
4-Bromophenyl phenyl ether	101-55-3	1	0.3	1.0	ND	ug/L	U
Hexachlorobenzene	118-74-1	1	0.4	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	2.6	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	0.2	1.0	ND	ug/L	U
Anthracene	120-12-7	1	0.4	1.0	ND	ug/L	U
Carbazole	86-74-8	1	0.6	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.5	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	0.4	1.0	ND	ug/L	U
Pyrene	129-00-0	1	0.3	1.0	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.4	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.4	1.0	ND	ug/L	U
3,3'-Dichlorobenzidine	91-94-1	1	1.6	5.0	ND	ug/L	U
Chrysene	218-01-9	1	0.4	1.0	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.5	3.0	ND	ug/L	U
Di-n-Octylphthalate	117-84-0	1	0.4	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.5	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.4	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.4	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.5	1.0	ND	ug/L	U
Benzofluoranthenes, Total		1	0.8	2.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.3	1.0	ND	ug/L	U
Surrogate: 2-Fluorophenol				*33-120 %*	*76.0*	*%*	
Surrogate: Phenol-d5				*38-120 %*	*62.2*	*%*	
Surrogate: 2-Chlorophenol-d4				*41-120 %*	*80.3*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*20-120 %*	*71.2*	*%*	
Surrogate: Nitrobenzene-d5				*27-120 %*	*90.3*	*%*	
Surrogate: 2-Fluorobiphenyl				*33-120 %*	*79.5*	*%*	
Surrogate: 2,4,6-Tribromophenol				*52-120 %*	*84.7*	*%*	
Surrogate: p-Terphenyl-d14				*28-120 %*	*85.5*	*%*	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Bobby Morris

18C0175-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.7 — Sampled: 03/08/2018 13:40

Instrument: ICP2 — Analyzed: 13-Mar-2018 17:00

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGC0294 — Sample Size: 25 mL
Prepared: 12-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0051	0.0500	**16.8**	mg/L	
Magnesium	7439-95-4	1	0.0160	0.0500	**4.73**	mg/L	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Bobby Morris

18C0175-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 — Sampled: 03/08/2018 13:40

Instrument: ICPMS2 — Analyzed: 13-Mar-2018 18:32

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0293 — Sample Size: 25 mL
Prepared: 12-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead	7439-92-1	5	0.340	0.500	**2.89**	ug/L	D

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Bobby Morris

18C0175-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 03/08/2018 13:40

Instrument: ICPMS2 — Analyzed: 13-Mar-2018 18:32

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0293 — Sample Size: 25 mL
Prepared: 12-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper	7440-50-8	5	1.70	2.50	**7.89**	ug/L	D
Zinc	7440-66-6	5	4.10	20.0	**50.6**	ug/L	D

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Bobby Morris

18C0175-01 (Water)

Wet Chemistry

Method: EPA 160.2 — Sampled: 03/08/2018 13:40

Instrument: BAL2 — Analyzed: 12-Mar-2018 09:42

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0297 — Sample Size: 460 mL
Prepared: 12-Mar-2018 — Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	2	2	**30**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Bobby Morris

18C0175-01 (Water)

Wet Chemistry

Method: SM 4500-P E-99 — Sampled: 03/08/2018 13:40

Instrument: UV1800-2 — Analyzed: 14-Mar-2018 14:03

Sample Preparation: Preparation Method: SM 4500-P B-5 Persulfate
Preparation Batch: BGC0363 — Sample Size: 25 mL
Prepared: 13-Mar-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Phosphorus	7723-14-0	1	0.0080	0.0080	**0.206**	mg-P/L	

Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Bobby Morris

18C0175-01 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 03/08/2018 13:40

Instrument: [CALC] — Analyzed: 13-Mar-2018 17:00

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 12-Mar-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1	0.331	**61.4**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Bobby Morris

18C0175-01 (Water)

Microbiology

Method: SM 9222D — Sampled: 03/08/2018 13:40

Instrument: N/A — Analyzed: 10-Mar-2018 15:20

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0274 — Sample Size: 4 mL
Prepared: 09-Mar-2018 — Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Fecal Coliforms		1		25	**600**	CFU/100 ml	H

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Bobby Morris

18C0175-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 03/08/2018 13:40

Instrument: ICPMS2 — Analyzed: 20-Mar-2018 19:34

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0526 — Sample Size: 25 mL
Prepared: 20-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	**0.0710**	ug/L	J

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Bobby Morris

18C0175-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 03/08/2018 13:40

Instrument: ICPMS2 — Analyzed: 21-Mar-2018 20:18

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0526 — Sample Size: 25 mL
Prepared: 20-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.340	0.500	**2.98**	ug/L	
Zinc, Dissolved	7440-66-6	1	0.820	4.00	**20.1**	ug/L	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Bobby Morris

18C0175-03 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 03/08/2018 14:45

Instrument: NT12 — Analyzed: 16-Mar-2018 15:36

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGC0206 — Sample Size: 500 mL
Prepared: 14-Mar-2018 — Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	0.2	1.0	ND	ug/L	U
bis(2-chloroethyl) ether	111-44-4	1	0.4	1.0	ND	ug/L	U
2-Chlorophenol	95-57-8	1	0.4	1.0	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.3	1.0	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.3	1.0	ND	ug/L	U
Benzyl Alcohol	100-51-6	1	1.0	2.0	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.3	1.0	ND	ug/L	U
2-Methylphenol	95-48-7	1	0.3	1.0	ND	ug/L	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	0.5	1.0	ND	ug/L	U
4-Methylphenol	106-44-5	1	0.4	2.0	ND	ug/L	U
N-Nitroso-di-n-Propylamine	621-64-7	1	0.2	1.0	ND	ug/L	U
Hexachloroethane	67-72-1	1	0.3	2.0	ND	ug/L	U
Nitrobenzene	98-95-3	1	0.4	1.0	ND	ug/L	U
Isophorone	78-59-1	1	0.5	1.0	ND	ug/L	U
2-Nitrophenol	88-75-5	1	0.5	3.0	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	1.0	3.0	ND	ug/L	U
Bis(2-Chloroethoxy)methane	111-91-1	1	0.6	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	3.4	20.0	ND	ug/L	U
2,4-Dichlorophenol	120-83-2	1	1.9	3.0	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.3	1.0	ND	ug/L	U
Naphthalene	91-20-3	1	0.2	1.0	ND	ug/L	U
4-Chloroaniline	106-47-8	1	1.9	5.0	ND	ug/L	U
Hexachlorobutadiene	87-68-3	1	0.1	3.0	ND	ug/L	U
4-Chloro-3-Methylphenol	59-50-7	1	2.0	3.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	0.2	1.0	ND	ug/L	U
Hexachlorocyclopentadiene	77-47-4	1	2.5	5.0	ND	ug/L	U
2,4,6-Trichlorophenol	88-06-2	1	1.9	3.0	ND	ug/L	U
2,4,5-Trichlorophenol	95-95-4	1	1.8	5.0	ND	ug/L	U
2-Chloronaphthalene	91-58-7	1	0.5	1.0	ND	ug/L	U
2-Nitroaniline	88-74-4	1	2.0	3.0	ND	ug/L	U
Dimethylphthalate	131-11-3	1	0.4	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.3	1.0	ND	ug/L	U
2,6-Dinitrotoluene	606-20-2	1	2.1	3.0	ND	ug/L	U
3-Nitroaniline	99-09-2	1	2.2	3.0	ND	ug/L	U
Acenaphthene	83-32-9	1	0.3	1.0	ND	ug/L	U
2,4-Dinitrophenol	51-28-5	1	4.9	20.0	ND	ug/L	U

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Bobby Morris

18C0175-03 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 03/08/2018 14:45

Instrument: NT12 — Analyzed: 16-Mar-2018 15:36

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dibenzofuran	132-64-9	1	0.3	1.0	ND	ug/L	U
4-Nitrophenol	100-02-7	1	1.0	10.0	ND	ug/L	U
2,4-Dinitrotoluene	121-14-2	1	2.0	3.0	ND	ug/L	U
Fluorene	86-73-7	1	0.3	1.0	ND	ug/L	U
Diethyl phthalate	84-66-2	1	0.4	1.0	ND	ug/L	U
4-Chlorophenylphenyl ether	7005-72-3	1	0.4	1.0	ND	ug/L	U
4-Nitroaniline	100-01-6	1	1.9	3.0	ND	ug/L	U
4,6-Dinitro-2-methylphenol	534-52-1	1	5.0	10.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.4	1.0	ND	ug/L	U
4-Bromophenyl phenyl ether	101-55-3	1	0.3	1.0	ND	ug/L	U
Hexachlorobenzene	118-74-1	1	0.4	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	2.6	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	0.2	1.0	ND	ug/L	U
Anthracene	120-12-7	1	0.4	1.0	ND	ug/L	U
Carbazole	86-74-8	1	0.6	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.5	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	0.4	1.0	ND	ug/L	U
Pyrene	129-00-0	1	0.3	1.0	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.4	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.4	1.0	ND	ug/L	U
3,3'-Dichlorobenzidine	91-94-1	1	1.6	5.0	ND	ug/L	U
Chrysene	218-01-9	1	0.4	1.0	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.5	3.0	ND	ug/L	U
Di-n-Octylphthalate	117-84-0	1	0.4	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.5	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.4	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.4	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.5	1.0	ND	ug/L	U
Benzofluoranthenes, Total		1	0.8	2.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.3	1.0	ND	ug/L	U
Surrogate: 2-Fluorophenol				*33-120 %*	*83.0*	*%*	
Surrogate: Phenol-d5				*38-120 %*	*91.5*	*%*	
Surrogate: 2-Chlorophenol-d4				*41-120 %*	*86.9*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*20-120 %*	*80.1*	*%*	
Surrogate: Nitrobenzene-d5				*27-120 %*	*97.5*	*%*	
Surrogate: 2-Fluorobiphenyl				*33-120 %*	*85.6*	*%*	
Surrogate: 2,4,6-Tribromophenol				*52-120 %*	*89.3*	*%*	
Surrogate: p-Terphenyl-d14				*28-120 %*	*94.0*	*%*	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Bobby Morris

18C0175-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.7 — Sampled: 03/08/2018 14:45

Instrument: ICP2 — Analyzed: 13-Mar-2018 17:04

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGC0294 — Sample Size: 25 mL
Prepared: 12-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0051	0.0500	**17.4**	mg/L	
Magnesium	7439-95-4	1	0.0160	0.0500	**4.97**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Bobby Morris

18C0175-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 — Sampled: 03/08/2018 14:45

Instrument: ICPMS2 — Analyzed: 13-Mar-2018 17:27

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0293 — Sample Size: 25 mL
Prepared: 12-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead	7439-92-1	1	0.0680	0.100	**1.75**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Bobby Morris

18C0175-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 03/08/2018 14:45

Instrument: ICPMS2 — Analyzed: 13-Mar-2018 17:27

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0293 — Sample Size: 25 mL
Prepared: 12-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper	7440-50-8	1	0.340	0.500	**5.00**	ug/L	
Zinc	7440-66-6	1	0.820	4.00	**32.0**	ug/L	

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Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Bobby Morris

18C0175-03 (Water)

Wet Chemistry

Method: EPA 160.2 — Sampled: 03/08/2018 14:45

Instrument: BAL2 — Analyzed: 12-Mar-2018 09:42

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0297 — Sample Size: 540 mL
Prepared: 12-Mar-2018 — Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	2	2	**29**	mg/L	

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Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Bobby Morris

18C0175-03 (Water)

Wet Chemistry

Method: SM 4500-P E-99 — Sampled: 03/08/2018 14:45

Instrument: UV1800-2 — Analyzed: 14-Mar-2018 14:03

Sample Preparation: Preparation Method: SM 4500-P B-5 Persulfate
Preparation Batch: BGC0363 — Sample Size: 25 mL
Prepared: 13-Mar-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Phosphorus	7723-14-0	1	0.0080	0.0080	**0.132**	mg-P/L	

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Bobby Morris

18C0175-03 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 03/08/2018 14:45

Instrument: [CALC] — Analyzed: 13-Mar-2018 17:04

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 12-Mar-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1	0.331	**63.8**	mg/L	

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Bobby Morris

18C0175-03 (Water)

Microbiology

Method: SM 9222D — Sampled: 03/08/2018 14:45

Instrument: N/A — Analyzed: 10-Mar-2018 15:20

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0274 — Sample Size: 20 mL
Prepared: 09-Mar-2018 — Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Fecal Coliforms		1		5	**205**	CFU/100 ml	H

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Bobby Morris

18C0175-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 03/08/2018 14:45

Instrument: ICPMS2 — Analyzed: 20-Mar-2018 20:36

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0526 — Sample Size: 25 mL
Prepared: 20-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Bobby Morris

18C0175-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 03/08/2018 14:45

Instrument: ICPMS2 — Analyzed: 21-Mar-2018 20:23

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0526 — Sample Size: 25 mL
Prepared: 20-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.340	0.500	**2.82**	ug/L	
Zinc, Dissolved	7440-66-6	1	0.820	4.00	**21.8**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

QA

18C0175-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 03/08/2018 15:00

Instrument: ICPMS2 — Analyzed: 20-Mar-2018 20:41

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0526 — Sample Size: 25 mL
Prepared: 20-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

QA

18C0175-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 03/08/2018 15:00

Instrument: ICPMS2 — Analyzed: 21-Mar-2018 20:28

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0526 — Sample Size: 25 mL
Prepared: 20-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.340	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	0.820	4.00	ND	ug/L	U

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Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Semivolatile Organic Compounds - Quality Control

Batch BGC0206 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0206-BLK1)				Prepared: 14-Mar-2018 Analyzed: 16-Mar-2018 13:21							
Phenol	ND	0.2	1.0	ug/L							U
bis(2-chloroethyl) ether	ND	0.4	1.0	ug/L							U
2-Chlorophenol	ND	0.4	1.0	ug/L							U
1,3-Dichlorobenzene	ND	0.3	1.0	ug/L							U
1,4-Dichlorobenzene	ND	0.3	1.0	ug/L							U
Benzyl Alcohol	ND	1.0	2.0	ug/L							U
1,2-Dichlorobenzene	ND	0.3	1.0	ug/L							U
2-Methylphenol	ND	0.3	1.0	ug/L							U
2,2'-Oxybis(1-chloropropane)	ND	0.5	1.0	ug/L							U
4-Methylphenol	ND	0.4	2.0	ug/L							U
N-Nitroso-di-n-Propylamine	ND	0.2	1.0	ug/L							U
Hexachloroethane	ND	0.3	2.0	ug/L							U
Nitrobenzene	ND	0.4	1.0	ug/L							U
Isophorone	ND	0.5	1.0	ug/L							U
2-Nitrophenol	ND	0.5	3.0	ug/L							U
2,4-Dimethylphenol	ND	1.0	3.0	ug/L							U
Bis(2-Chloroethoxy)methane	ND	0.6	1.0	ug/L							U
Benzoic acid	ND	3.4	20.0	ug/L							U
2,4-Dichlorophenol	ND	1.9	3.0	ug/L							U
1,2,4-Trichlorobenzene	ND	0.3	1.0	ug/L							U
Naphthalene	ND	0.2	1.0	ug/L							U
4-Chloroaniline	ND	1.9	5.0	ug/L							U
Hexachlorobutadiene	ND	0.1	3.0	ug/L							U
4-Chloro-3-Methylphenol	ND	2.0	3.0	ug/L							U
2-Methylnaphthalene	ND	0.2	1.0	ug/L							U
Hexachlorocyclopentadiene	ND	2.5	5.0	ug/L							U
2,4,6-Trichlorophenol	ND	1.9	3.0	ug/L							U
2,4,5-Trichlorophenol	ND	1.8	5.0	ug/L							U
2-Chloronaphthalene	ND	0.5	1.0	ug/L							U
2-Nitroaniline	ND	2.0	3.0	ug/L							U
Dimethylphthalate	ND	0.4	1.0	ug/L							U
Acenaphthylene	ND	0.3	1.0	ug/L							U
2,6-Dinitrotoluene	ND	2.1	3.0	ug/L							U
3-Nitroaniline	ND	2.2	3.0	ug/L							U
Acenaphthene	ND	0.3	1.0	ug/L							U

Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Semivolatile Organic Compounds - Quality Control

Batch BGC0206 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0206-BLK1)				Prepared: 14-Mar-2018 Analyzed: 16-Mar-2018 13:21							
2,4-Dinitrophenol	ND	4.9	20.0	ug/L							U
Dibenzofuran	ND	0.3	1.0	ug/L							U
4-Nitrophenol	ND	1.0	10.0	ug/L							U
2,4-Dinitrotoluene	ND	2.0	3.0	ug/L							U
Fluorene	ND	0.3	1.0	ug/L							U
Diethyl phthalate	ND	0.4	1.0	ug/L							U
4-Chlorophenylphenyl ether	ND	0.4	1.0	ug/L							U
4-Nitroaniline	ND	1.9	3.0	ug/L							U
4,6-Dinitro-2-methylphenol	ND	5.0	10.0	ug/L							U
N-Nitrosodiphenylamine	ND	0.4	1.0	ug/L							U
4-Bromophenyl phenyl ether	ND	0.3	1.0	ug/L							U
Hexachlorobenzene	ND	0.4	1.0	ug/L							U
Pentachlorophenol	ND	2.6	10.0	ug/L							U
Phenanthrene	ND	0.2	1.0	ug/L							U
Anthracene	ND	0.4	1.0	ug/L							U
Carbazole	ND	0.6	1.0	ug/L							U
Di-n-Butylphthalate	ND	0.5	1.0	ug/L							U
Fluoranthene	ND	0.4	1.0	ug/L							U
Pyrene	ND	0.3	1.0	ug/L							U
Butylbenzylphthalate	ND	0.4	1.0	ug/L							U
Benzo(a)anthracene	ND	0.4	1.0	ug/L							U
3,3'-Dichlorobenzidine	ND	1.6	5.0	ug/L							U
Chrysene	ND	0.4	1.0	ug/L							U
bis(2-Ethylhexyl)phthalate	ND	0.5	3.0	ug/L							U
Di-n-Octylphthalate	ND	0.4	1.0	ug/L							U
Benzo(a)pyrene	ND	0.5	1.0	ug/L							U
Indeno(1,2,3-cd)pyrene	ND	0.4	1.0	ug/L							U
Dibenzo(a,h)anthracene	ND	0.4	1.0	ug/L							U
Benzo(g,h,i)perylene	ND	0.5	1.0	ug/L							U
Benzofluoranthenes, Total	ND	0.8	2.0	ug/L							U
1-Methylnaphthalene	ND	0.3	1.0	ug/L							U
Surrogate: 2-Fluorophenol	34.5			ug/L	*37.5*		*92.1*	*33-120*			
Surrogate: Phenol-d5	37.9			ug/L	*37.5*		*101*	*38-120*			
Surrogate: 2-Chlorophenol-d4	36.2			ug/L	*37.5*		*96.5*	*41-120*			
Surrogate: 1,2-Dichlorobenzene-d4	22.0			ug/L	*25.0*		*87.8*	*20-120*			

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Semivolatile Organic Compounds - Quality Control

Batch BGC0206 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0206-BLK1)				Prepared: 14-Mar-2018 Analyzed: 16-Mar-2018 13:21							
Surrogate: Nitrobenzene-d5	27.4			ug/L	*25.0*		*110*	*27-120*			
Surrogate: 2-Fluorobiphenyl	23.7			ug/L	*25.0*		*94.7*	*33-120*			
Surrogate: 2,4,6-Tribromophenol	35.6			ug/L	*37.5*		*95.0*	*52-120*			
Surrogate: p-Terphenyl-d14	28.2			ug/L	*25.0*		*113*	*28-120*			
LCS (BGC0206-BS1)				Prepared: 14-Mar-2018 Analyzed: 16-Mar-2018 13:54							
Phenol	16.4	0.2	1.0	ug/L	25.0		65.6	35-120			
bis(2-chloroethyl) ether	21.8	0.4	1.0	ug/L	25.0		87.2	46.5-120			
2-Chlorophenol	18.0	0.4	1.0	ug/L	25.0		72.2	48-120			
1,3-Dichlorobenzene	17.5	0.3	1.0	ug/L	25.0		70.1	34.2-120			
1,4-Dichlorobenzene	17.9	0.3	1.0	ug/L	25.0		71.6	36-120			
Benzyl Alcohol	20.8	1.0	2.0	ug/L	25.0		83.4	27.4-120			
1,2-Dichlorobenzene	18.0	0.3	1.0	ug/L	25.0		72.1	38.4-120			
2-Methylphenol	18.9	0.3	1.0	ug/L	25.0		75.7	47.8-120			
2,2'-Oxybis(1-chloropropane)	23.9	0.5	1.0	ug/L	25.0		95.7	40.4-120			Q
4-Methylphenol	20.1	0.4	2.0	ug/L	25.0		80.4	52.3-120			
N-Nitroso-di-n-Propylamine	23.4	0.2	1.0	ug/L	25.0		93.7	51.4-120			
Hexachloroethane	17.9	0.3	2.0	ug/L	25.0		71.8	29.5-120			
Nitrobenzene	21.6	0.4	1.0	ug/L	25.0		86.5	51.5-120			
Isophorone	25.6	0.5	1.0	ug/L	25.0		103	62.3-128			
2-Nitrophenol	19.7	0.5	3.0	ug/L	25.0		78.8	58.6-124			
2,4-Dimethylphenol	49.6	1.0	3.0	ug/L	75.0		66.1	38.5-120			
Bis(2-Chloroethoxy)methane	22.6	0.6	1.0	ug/L	25.0		90.5	52.9-120			
Benzoic acid	117	3.4	20.0	ug/L	138		84.8	38.2-120			
2,4-Dichlorophenol	56.8	1.9	3.0	ug/L	75.0		75.8	43.6-120			
1,2,4-Trichlorobenzene	17.8	0.3	1.0	ug/L	25.0		71.2	38.6-120			
Naphthalene	19.2	0.2	1.0	ug/L	25.0		76.9	40.5-120			
4-Chloroaniline	44.2	1.9	5.0	ug/L	75.0		58.9	42.7-120			
Hexachlorobutadiene	16.9	0.1	3.0	ug/L	25.0		67.7	32.3-120			
4-Chloro-3-Methylphenol	62.9	2.0	3.0	ug/L	75.0		83.9	51.9-120			
2-Methylnaphthalene	18.6	0.2	1.0	ug/L	25.0		74.4	47.3-120			
Hexachlorocyclopentadiene	68.7	2.5	5.0	ug/L	75.0		91.5	23.3-120			
2,4,6-Trichlorophenol	55.9	1.9	3.0	ug/L	75.0		74.5	47-120			
2,4,5-Trichlorophenol	57.1	1.8	5.0	ug/L	75.0		76.1	48.4-120			
2-Chloronaphthalene	19.7	0.5	1.0	ug/L	25.0		78.6	47.7-123			

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Semivolatile Organic Compounds - Quality Control

Batch BGC0206 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BGC0206-BS1)					Prepared: 14-Mar-2018 Analyzed: 16-Mar-2018 13:54						
2-Nitroaniline	72.2	2.0	3.0	ug/L	75.0		96.3	56.8-120			
Dimethylphthalate	21.8	0.4	1.0	ug/L	25.0		87.2	65.2-125			
Acenaphthylene	19.9	0.3	1.0	ug/L	25.0		79.7	44.1-120			
2,6-Dinitrotoluene	70.7	2.1	3.0	ug/L	75.0		94.3	69.3-140			
3-Nitroaniline	65.0	2.2	3.0	ug/L	75.0		86.7	60.9-120			
Acenaphthene	20.9	0.3	1.0	ug/L	25.0		83.6	50.4-120			
2,4-Dinitrophenol	94.9	4.9	20.0	ug/L	138		69.0	33.7-183			Q
Dibenzofuran	19.1	0.3	1.0	ug/L	25.0		76.5	49.9-120			
4-Nitrophenol	60.9	1.0	10.0	ug/L	75.0		81.1	50.2-136			
2,4-Dinitrotoluene	69.0	2.0	3.0	ug/L	75.0		92.0	66.8-132			
Fluorene	20.2	0.3	1.0	ug/L	25.0		81.0	57.8-120			
Diethyl phthalate	22.1	0.4	1.0	ug/L	25.0		88.4	68.1-120			
4-Chlorophenylphenyl ether	20.2	0.4	1.0	ug/L	25.0		80.8	59.1-127			
4-Nitroaniline	63.6	1.9	3.0	ug/L	75.0		84.8	56-122			
4,6-Dinitro-2-methylphenol	119	5.0	10.0	ug/L	138		86.8	37.9-162			
N-Nitrosodiphenylamine	20.6	0.4	1.0	ug/L	25.0		82.6	59.6-120			
4-Bromophenyl phenyl ether	21.7	0.3	1.0	ug/L	25.0		86.9	59.6-120			
Hexachlorobenzene	20.0	0.4	1.0	ug/L	25.0		80.0	53.7-120			
Pentachlorophenol	55.5	2.6	10.0	ug/L	75.0		74.0	40.3-128			
Phenanthrene	20.8	0.2	1.0	ug/L	25.0		83.0	58.8-120			
Anthracene	19.6	0.4	1.0	ug/L	25.0		78.4	60.5-120			
Carbazole	18.3	0.6	1.0	ug/L	25.0		73.3	59.7-120			
Di-n-Butylphthalate	22.9	0.5	1.0	ug/L	25.0		91.5	71-120			
Fluoranthene	20.4	0.4	1.0	ug/L	25.0		81.4	66.7-120			
Pyrene	22.2	0.3	1.0	ug/L	25.0		88.6	62.7-127			
Butylbenzylphthalate	24.0	0.4	1.0	ug/L	25.0		95.9	67.4-128			
Benzo(a)anthracene	21.0	0.4	1.0	ug/L	25.0		83.9	58.3-128			
3,3'-Dichlorobenzidine	56.8	1.6	5.0	ug/L	75.0		75.8	34.1-120			
Chrysene	21.3	0.4	1.0	ug/L	25.0		85.2	58.9-120			
bis(2-Ethylhexyl)phthalate	22.4	0.5	3.0	ug/L	25.0		89.7	68.3-123			
Di-n-Octylphthalate	20.5	0.4	1.0	ug/L	25.0		81.8	61.5-120			
Benzo(a)pyrene	22.2	0.5	1.0	ug/L	25.0		88.7	70.6-120			
Indeno(1,2,3-cd)pyrene	17.4	0.4	1.0	ug/L	25.0		69.5	46.5-120			
Dibenzo(a,h)anthracene	17.1	0.4	1.0	ug/L	25.0		68.5	49.6-120			
Benzo(g,h,i)perylene	15.9	0.5	1.0	ug/L	25.0		63.5	37-120			

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Semivolatile Organic Compounds - Quality Control

Batch BGC0206 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BGC0206-BS1)	Prepared: 14-Mar-2018 Analyzed: 16-Mar-2018 13:54										
Benzofluoranthenes, Total	42.7	0.8	2.0	ug/L	50.0		85.4	66.5-120			
1-Methylnaphthalene	20.8	0.3	1.0	ug/L	25.0		83.1	46.9-120			
Surrogate: 2-Fluorophenol	31.3			ug/L	*37.5*		*83.5*	*33-120*			
Surrogate: Phenol-d5	34.3			ug/L	*37.5*		*91.5*	*38-120*			
Surrogate: 2-Chlorophenol-d4	33.3			ug/L	*37.5*		*88.8*	*41-120*			
Surrogate: 1,2-Dichlorobenzene-d4	20.7			ug/L	*25.0*		*82.6*	*20-120*			
Surrogate: Nitrobenzene-d5	25.0			ug/L	*25.0*		*99.9*	*27-120*			
Surrogate: 2-Fluorobiphenyl	21.9			ug/L	*25.0*		*87.5*	*33-120*			
Surrogate: 2,4,6-Tribromophenol	36.2			ug/L	*37.5*		*96.4*	*52-120*			
Surrogate: p-Terphenyl-d14	23.7			ug/L	*25.0*		*94.7*	*28-120*			

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Metals and Metallic Compounds - Quality Control

Batch BGC0293 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0293-BLK1)					Prepared: 12-Mar-2018 Analyzed: 12-Mar-2018 13:43							
Lead	208	ND	0.0680	0.100	ug/L							U
Copper	63	ND	0.340	0.500	ug/L							U
Copper	65	ND	0.350	0.500	ug/L							U
Zinc	66	ND	0.820	4.00	ug/L							U
Zinc	67	ND	0.940	4.00	ug/L							U
LCS (BGC0293-BS1)					Prepared: 12-Mar-2018 Analyzed: 12-Mar-2018 14:25							
Lead	208	28.5	0.0680	0.100	ug/L	25.0		114	80-120			
Copper	63	29.2	0.340	0.500	ug/L	25.0		117	80-120			
Copper	65	28.5	0.350	0.500	ug/L	25.0		114	80-120			
Zinc	66	88.1	0.820	4.00	ug/L	80.0		110	80-120			
Zinc	67	86.9	0.940	4.00	ug/L	80.0		109	80-120			

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Metals and Metallic Compounds - Quality Control

Batch BGC0294 - TWC EPA 3010A

Instrument: ICP2 Analyst: CC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0294-BLK1)				Prepared: 12-Mar-2018 Analyzed: 13-Mar-2018 17:25							
Calcium	ND	0.0051	0.0500	mg/L							U
Magnesium	0.0217	0.0160	0.0500	mg/L							J
LCS (BGC0294-BS1)				Prepared: 12-Mar-2018 Analyzed: 13-Mar-2018 17:43							
Calcium	9.70	0.0051	0.0500	mg/L	10.0		97.0	80-120			
Magnesium	10.0	0.0160	0.0500	mg/L	10.0		100	80-120			

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGC0526 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: CC

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0526-BLK1)					Prepared: 20-Mar-2018 Analyzed: 20-Mar-2018 18:47							
Lead, Dissolved	208	ND	0.0680	0.100	ug/L							U
Blank (BGC0526-BLK2)					Prepared: 20-Mar-2018 Analyzed: 21-Mar-2018 22:22							
Copper, Dissolved	63	ND	0.340	0.500	ug/L							U
Copper, Dissolved	65	ND	0.350	0.500	ug/L							U
Zinc, Dissolved	66	ND	0.820	4.00	ug/L							U
Zinc, Dissolved	67	ND	0.940	4.00	ug/L							U
LCS (BGC0526-BS1)					Prepared: 20-Mar-2018 Analyzed: 20-Mar-2018 19:08							
Lead, Dissolved	208	28.7	0.0680	0.100	ug/L	25.0		115	80-120			
LCS (BGC0526-BS2)					Prepared: 20-Mar-2018 Analyzed: 21-Mar-2018 22:44							
Copper, Dissolved	63	26.9	0.340	0.500	ug/L	25.0		108	80-120			
Copper, Dissolved	65	26.8	0.350	0.500	ug/L	25.0		107	80-120			
Zinc, Dissolved	66	84.8	0.820	4.00	ug/L	80.0		106	80-120			
Zinc, Dissolved	67	80.0	0.940	4.00	ug/L	80.0		100	80-120			

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Wet Chemistry - Quality Control

Batch BGC0297 - No Prep Wet Chem

Instrument: BAL2 Analyst: KLE

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0297-BLK1)				Prepared: 12-Mar-2018 Analyzed: 12-Mar-2018 09:42							
Suspended Solids	ND	1	1	mg/L							U
LCS (BGC0297-BS1)				Prepared: 12-Mar-2018 Analyzed: 12-Mar-2018 09:42							
Suspended Solids	49	1	1	mg/L	50.00		98.2	90-110			

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Wet Chemistry - Quality Control

Batch BGC0363 - SM 4500-P B-5 Persulfate

Instrument: UV1800-2 Analyst: KK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0363-BLK1)				Prepared: 13-Mar-2018 Analyzed: 14-Mar-2018 14:00							
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
Blank (BGC0363-BLK2)				Prepared: 13-Mar-2018 Analyzed: 14-Mar-2018 14:04							
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
LCS (BGC0363-BS1)				Prepared: 13-Mar-2018 Analyzed: 14-Mar-2018 14:00							
Total Phosphorus	0.312	0.0080	0.0080	mg-P/L	0.300		104	90-110			
LCS (BGC0363-BS2)				Prepared: 13-Mar-2018 Analyzed: 14-Mar-2018 14:04							
Total Phosphorus	0.316	0.0080	0.0080	mg-P/L	0.300		105	90-110			

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Microbiology - Quality Control

Batch BGC0274 - No Prep Wet Chem

Instrument: N/A

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0274-BLK1)				Prepared: 09-Mar-2018 Analyzed: 10-Mar-2018 15:20							
Fecal Coliforms	ND		1	CFU/100 ml							U

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Certified Analyses included in this Report

Analyte	Certifications
EPA 200.7 in Water	
Calcium	WADOE,NELAP,DoD-ELAP,WA-DW
Magnesium	WADOE,NELAP,DoD-ELAP,WA-DW
EPA 200.8 in Water	
Lead-208	NELAP,WADOE,WA-DW,DoD-ELAP
Lead-208	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 200.8 UCT-KED in Water	
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 8270D in Water	
Phenol	CALAP,WADOE,DoD-ELAP,NELAP
bis(2-chloroethyl) ether	CALAP,WADOE,DoD-ELAP,NELAP
2-Chlorophenol	CALAP,WADOE,DoD-ELAP,NELAP
1,3-Dichlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP
1,4-Dichlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP
Benzyl Alcohol	CALAP,WADOE,DoD-ELAP,NELAP
1,2-Dichlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP
2-Methylphenol	CALAP,WADOE,DoD-ELAP,NELAP
4-Methylphenol	CALAP,WADOE,DoD-ELAP,NELAP
N-Nitroso-di-n-Propylamine	CALAP,WADOE,DoD-ELAP,NELAP
Hexachloroethane	CALAP,WADOE,DoD-ELAP,NELAP
Nitrobenzene	CALAP,WADOE,DoD-ELAP,NELAP
Isophorone	CALAP,WADOE,DoD-ELAP,NELAP
2-Nitrophenol	CALAP,WADOE,DoD-ELAP,NELAP
2,4-Dimethylphenol	CALAP,WADOE,DoD-ELAP,NELAP
Bis(2-Chloroethoxy)methane	CALAP,WADOE,DoD-ELAP,NELAP
Benzoic acid	CALAP,WADOE,DoD-ELAP,NELAP
2,4-Dichlorophenol	CALAP,WADOE,DoD-ELAP,NELAP
1,2,4-Trichlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Naphthalene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
4-Chloroaniline	CALAP,WADOE,DoD-ELAP,NELAP
Hexachlorobutadiene	CALAP,WADOE,DoD-ELAP,NELAP
4-Chloro-3-Methylphenol	CALAP,WADOE,DoD-ELAP,NELAP
2-Methylnaphthalene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Hexachlorocyclopentadiene	CALAP,WADOE,DoD-ELAP,NELAP
2,4,6-Trichlorophenol	CALAP,WADOE,DoD-ELAP,NELAP
2,4,5-Trichlorophenol	CALAP,WADOE,DoD-ELAP,NELAP
2-Chloronaphthalene	CALAP,WADOE,DoD-ELAP,NELAP
2-Nitroaniline	CALAP,WADOE,DoD-ELAP,NELAP
Dimethylphthalate	CALAP,WADOE,DoD-ELAP,NELAP
Acenaphthylene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
2,6-Dinitrotoluene	CALAP,WADOE,DoD-ELAP,NELAP
3-Nitroaniline	CALAP,WADOE,DoD-ELAP,NELAP
Acenaphthene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
2,4-Dinitrophenol	CALAP,WADOE,DoD-ELAP,NELAP
Dibenzofuran	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
4-Nitrophenol	CALAP,WADOE,DoD-ELAP,NELAP
2,4-Dinitrotoluene	CALAP,WADOE,DoD-ELAP,NELAP
Fluorene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Diethyl phthalate	CALAP,WADOE,DoD-ELAP,NELAP
4-Chlorophenylphenyl ether	CALAP,WADOE,DoD-ELAP,NELAP
4-Nitroaniline	CALAP,WADOE,DoD-ELAP,NELAP
4,6-Dinitro-2-methylphenol	CALAP,WADOE,DoD-ELAP,NELAP
4-Bromophenyl phenyl ether	CALAP,WADOE,DoD-ELAP,NELAP
Hexachlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP
Pentachlorophenol	CALAP,WADOE,DoD-ELAP,NELAP
Phenanthrene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Anthracene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Carbazole	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Di-n-Butylphthalate	CALAP,WADOE,DoD-ELAP,NELAP
Fluoranthene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Pyrene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Butylbenzylphthalate	CALAP,WADOE,DoD-ELAP,NELAP
Benzo(a)anthracene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Chrysene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
bis(2-Ethylhexyl)phthalate	CALAP,WADOE,DoD-ELAP,NELAP
Di-n-Octylphthalate	CALAP,WADOE,DoD-ELAP,NELAP
Benzo(b)fluoranthene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Benzo(k)fluoranthene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Benzo(a)pyrene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Indeno(1,2,3-cd)pyrene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Dibenzo(a,h)anthracene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Benzo(g,h,i)perylene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Benzofluoranthenes, Total	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
1-Methylnaphthalene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
N-Nitrosodimethylamine	CALAP,WADOE,DoD-ELAP,NELAP
Aniline	CALAP,WADOE,DoD-ELAP,NELAP
Benzidine	CALAP,WADOE,DoD-ELAP,NELAP
Retene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Perylene	CALAP,WADOE,ADEC
Pyridine	CALAP,WADOE,DoD-ELAP,NELAP
N-Nitrosomethylethylamine	CALAP
2,6-Dichlorophenol	CALAP,WADOE
alpha-Terpineol	CALAP,WADOE,DoD-ELAP,NELAP
1,4-Dioxane	CALAP,WADOE,DoD-ELAP,NELAP
2,3,4,6-Tetrachlorophenol	CALAP,WADOE,DoD-ELAP
Triphenyl Phosphate	CALAP,WADOE,DoD-ELAP,NELAP
Butyl Diphenyl Phosphate	CALAP,WADOE,DoD-ELAP,NELAP
Dibutyl Phenyl Phosphate	CALAP,WADOE,DoD-ELAP,NELAP
Tributyl Phosphate	CALAP,WADOE,DoD-ELAP,NELAP
Butylated Hydroxytoluene	CALAP,WADOE,DoD-ELAP,NELAP
Azobenzene (1,2-DP-Hydrazine)	CALAP,WADOE,DoD-ELAP,NELAP
Tetrachloroguaiacol	CALAP,WADOE,DoD-ELAP
3,4,5-Trichloroguaiacol	CALAP,WADOE,DoD-ELAP
3,4,6-Trichloroguaiacol	CALAP,WADOE,DoD-ELAP
4,5,6-Trichloroguaiacol	CALAP,WADOE,DoD-ELAP
Guaiacol	CALAP,WADOE,DoD-ELAP
1,2,4,5-Tetrachlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP
SM 4500-P E-99 in Water	
Total Phosphorus	WADOE,NELAP
SM 9222D in Water	
Fecal Coliforms	WADOE

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	05/11/2018
CALAP	California Department of Public Health CAELAP	2748	06/30/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	23-Mar-2018 12:08

Notes and Definitions

U	This analyte is not detected above the applicable reporting or detection limit.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
J	Estimated concentration value detected below the reporting limit.
H	Hold time violation - Hold time was exceeded.
D	The reported value is from a dilution
*	Flagged value is not within established control limits.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

09 April 2018

Rob Zisette
Herrera Environmental Consultants
2200 6th Avenue, Suite 1100
Seattle, WA 98121

RE: Bobby Moris Playfield

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
18C0394	N/A

Amanda Volgardsen

Digitally signed by Amanda Volgardsen
DN: c=US, st=Washington, l=Tukwila, o=Analytical Resources, Inc., ou=Project Manager, cn=Amanda Volgardsen, email=amanda.volgardsen@arilabs.com
Date: 2018.04.09 14:37:04 -07'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

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ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006

PJLA Testing
Accreditation # 66169

18C0394

HERRERA
2200 Sixth Avenue | Suite 1100
Seattle, Washington | 98121
p 206 441 9080 | f 206 441 9108

Chain of Custody Record

Project Name:	Project Number:	Client:
Bobby Morris Playfield Monitoring	18-06769-000	Herrera Environmental
Report To: Rob Zisette		Page: 1/1
Sampled By: Alex Svendsen		Delivery Method: In cooler w/ ice
Laboratory: Analytical Resources Inc.	Requested Completion Date:	Total No. of Containers: 27

Sample ID	Date	Time	Sample Type (see codes)	Preservative? (Y/N)	Matrix (see codes)	Total Suspended Solids- EPA 160.2	Total Hardness as CaCO3-SM 2340B	Total phosphorus - SM 4500P-F	Lead, dissolved - EPA 200.8	Lead, total - EPA 200.8	Copper, dissolved - EPA 200.8	Copper, total - EPA 200.8	Zinc, dissolved - EPA 200.8	Zinc, total - EPA 200.8	Fecal coliform bacteria – SM 9222D	SVOCs, EPA 8270	
Bobby Morris A	3/23/18	1040	G	N	SW	X	X	X	X	X	X	X	X	X	X	X	
Bobby Morris B	3/23/18	1150	G	N	SW	X	X	X	X	X	X	X	X	X	X	X	
Miller A	3/23/18	1115	G	N	SW	X	X	X	X	X	X	X	X	X	X	X	
Miller B	3/23/18	1225	G	N	SW	X	X	X	X	X	X	X	X	X	X	X	

Comments/Special Instructions:

Relinquished by (Name/CO)	Signature	Date/Time		Received By (Name/CO)	Signature	Date/Time
Alex Svendsen/HEC		3/23/18 1520			ARI Brandon Fisk	3/23/18 1520
Relinquished by (Name/CO)	Signature	Date/Time		Received By (Name/CO)	Signature	Date/Time

Sample Type: G=Grab C=Composite

Matrix Codes: A=Air GW=Groundwater SE=Sediment SO=Soil SW=Surface Water W=Water (blanks) M=Material O=Other (specify)

Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Bobby Morris A	18C0394-01	Water	23-Mar-2018 10:40	23-Mar-2018 15:20
Bobby Morris B	18C0394-02	Water	23-Mar-2018 11:50	23-Mar-2018 15:20
Miller A	18C0394-03	Water	23-Mar-2018 11:15	23-Mar-2018 15:20
Miller B	18C0394-04	Water	23-Mar-2018 12:25	23-Mar-2018 15:20
Bobby Morris A	18C0394-05	Water	23-Mar-2018 10:40	23-Mar-2018 15:20
Bobby Morris B	18C0394-06	Water	23-Mar-2018 11:50	23-Mar-2018 15:20
Miller A	18C0394-07	Water	23-Mar-2018 11:15	23-Mar-2018 15:20
Miller B	18C0394-08	Water	23-Mar-2018 12:25	23-Mar-2018 15:20

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Case Narrative

Sample receipt

Samples as listed on the preceding page were received March 23, 2018 under ARI work order 18C0394. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Semivolatiles - EPA Method SW8270D

The samples were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank has high percent recovery for the surrogate p-Terphenyl-d14. The samples have this surrogate within control limits. Likely a high bias. The method blank was clean at the reporting limit for all other compounds. No corrective action was taken.

The LCS percent recoveries were within control limits.

Total and Dissolved Metals - EPA Method 200.8

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The dissolved method blank BGD0037 has Zinc detected below the reporting limit, but above the method detection limit. The Zinc has been flagged with a "J" qualifier on the method blank. The method blanks were clean at the reporting limits for all other metals. No further corrective action was taken.

The LCS percent recoveries were within control limits.

Total Hardness - EPA Method 200.7

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank has Calcium detected below the reporting limit, but above the method detection limit. The Calcium has been flagged with a "J" qualifier on the method blank. No further corrective action was taken.

The LCS percent recoveries were within control limits.

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Wet Chemistry (T-Phos, TSS, Fecal Coliform)

The samples were prepared and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

A T-Phos matrix spike and duplicate were prepared in conjunction with sample Bobby Morris B. The matrix spike percent recovery and duplicate RPD were within QC limits.

A TSS duplicate was prepared in conjunction with sample Bobby Morris A. The duplicate RPD was within QC limits.

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Herrera

Project Name: Bobby Morris Playfield

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 18C0394

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	NO
Were custody papers included with the cooler?	YES	NO
Were custody papers properly filled out (ink, signed, etc.)	YES	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 3.6

Time: 1520

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 17002565

Cooler Accepted by: BF Date: 3/23/18 Time: 1520

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used? … Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other:			
Was sufficient ice used (if appropriate)?	NA	YES	NO
Were all bottles sealed in individual plastic bags?		YES	NO
Did all bottles arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		YES	NO
Did the number of containers listed on COC match with the number of containers received?		YES	NO
Did all bottle labels and tags agree with custody papers?		YES	NO
Were all bottles used correct for the requested analyses?		YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)…	NA	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO
Date VOC Trip Blank was made at ARI	NA		

Was Sample Split by ARI : NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: SEF Date: 3/23/18 Time: 1527

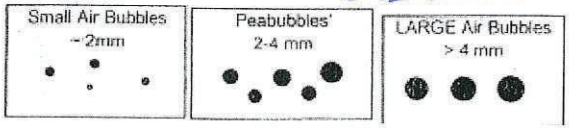
*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

Only one 8VOC bottle for Miller B

By: SEF Date: 3/23/18



Small → "sm" (< 2 mm)
Peabubbles → "pb" (2 to < 4 mm)
Large → "lg" (4 to < 6 mm)
Headspace → "hs" (> 6 mm)

WORK ORDER

18C0394

Client: Herrera Environmental Consultants	**Project Manager:** Amanda Volgardsen
Project: Bobby Moris Playfield	**Project Number:** Bobby Moris Playfield

Preservation Confirmation

Container ID	Container Type	pH
18C0394-01 A	Large OJ, 1000 mL	
18C0394-01 B	Small OJ, 500 mL, 9N H2SO4	SEF ~~<2 pass~~ >2 fail
18C0394-01 C	HDPE NM, 500 mL, 1:1 HNO3	<2 pass
18C0394-01 D	Corning Plastic, 125 mL, Na2S2O3	
18C0394-01 E	Glass NM, Amber, 500 mL	
18C0394-01 F	Glass NM, Amber, 500 mL	
18C0394-02 A	Large OJ, 1000 mL	
18C0394-02 B	Small OJ, 500 mL, 9N H2SO4	<2 pass
18C0394-02 C	HDPE NM, 500 mL, 1:1 HNO3	<2 pass
18C0394-02 D	Corning Plastic, 125 mL, Na2S2O3	
18C0394-02 E	Glass NM, Amber, 500 mL	
18C0394-02 F	Glass NM, Amber, 500 mL	
18C0394-03 A	Large OJ, 1000 mL	
18C0394-03 B	Small OJ, 500 mL, 9N H2SO4	<2 pass
18C0394-03 C	HDPE NM, 500 mL, 1:1 HNO3	<2 pass
18C0394-03 D	Corning Plastic, 125 mL, Na2S2O3	
18C0394-03 E	Glass NM, Amber, 500 mL	
18C0394-03 F	Glass NM, Amber, 500 mL	
18C0394-04 A	Large OJ, 1000 mL	
18C0394-04 B	Small OJ, 500 mL, 9N H2SO4	<2 pass
18C0394-04 C	HDPE NM, 500 mL, 1:1 HNO3	<2 pass
18C0394-04 D	Corning Plastic, 125 mL, Na2S2O3	
18C0394-04 E	Glass NM, Amber, 500 mL	
18C0394-05 A	HDPE NM, 500 mL, 1:1 HNO3	<2 pass
18C0394-06 A	HDPE NM, 500 mL, 1:1 HNO3	<2 pass
18C0394-07 A	HDPE NM, 500 mL, 1:1 HNO3	<2 pass
18C0394-08 A	HDPE NM, 500 mL, 1:1 HNO3	<2 pass

SEF
Preservation Confirmed By

3/23/18
Date

Reviewed By

Date

Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris A

18C0394-01 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 03/23/2018 10:40

Instrument: NT12 — Analyzed: 30-Mar-2018 18:01

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGC0751 — Sample Size: 500 mL
Prepared: 28-Mar-2018 — Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	0.2	1.0	ND	ug/L	U
bis(2-chloroethyl) ether	111-44-4	1	0.4	1.0	ND	ug/L	U
2-Chlorophenol	95-57-8	1	0.4	1.0	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.3	1.0	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.3	1.0	ND	ug/L	U
Benzyl Alcohol	100-51-6	1	1.0	2.0	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.3	1.0	ND	ug/L	U
2-Methylphenol	95-48-7	1	0.3	1.0	ND	ug/L	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	0.5	1.0	ND	ug/L	U
4-Methylphenol	106-44-5	1	0.4	2.0	ND	ug/L	U
N-Nitroso-di-n-Propylamine	621-64-7	1	0.2	1.0	ND	ug/L	U
Hexachloroethane	67-72-1	1	0.3	2.0	ND	ug/L	U
Nitrobenzene	98-95-3	1	0.4	1.0	ND	ug/L	U
Isophorone	78-59-1	1	0.5	1.0	ND	ug/L	U
2-Nitrophenol	88-75-5	1	0.5	3.0	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	1.0	3.0	ND	ug/L	U
Bis(2-Chloroethoxy)methane	111-91-1	1	0.6	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	3.4	20.0	ND	ug/L	U
2,4-Dichlorophenol	120-83-2	1	1.9	3.0	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.3	1.0	ND	ug/L	U
Naphthalene	91-20-3	1	0.2	1.0	ND	ug/L	U
4-Chloroaniline	106-47-8	1	1.9	5.0	ND	ug/L	U
Hexachlorobutadiene	87-68-3	1	0.1	3.0	ND	ug/L	U
4-Chloro-3-Methylphenol	59-50-7	1	2.0	3.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	0.2	1.0	ND	ug/L	U
Hexachlorocyclopentadiene	77-47-4	1	2.5	5.0	ND	ug/L	U
2,4,6-Trichlorophenol	88-06-2	1	1.9	3.0	ND	ug/L	U
2,4,5-Trichlorophenol	95-95-4	1	1.8	5.0	ND	ug/L	U
2-Chloronaphthalene	91-58-7	1	0.5	1.0	ND	ug/L	U
2-Nitroaniline	88-74-4	1	2.0	3.0	ND	ug/L	U
Dimethylphthalate	131-11-3	1	0.4	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.3	1.0	ND	ug/L	U
2,6-Dinitrotoluene	606-20-2	1	2.1	3.0	ND	ug/L	U
3-Nitroaniline	99-09-2	1	2.2	3.0	ND	ug/L	U
Acenaphthene	83-32-9	1	0.3	1.0	ND	ug/L	U
2,4-Dinitrophenol	51-28-5	1	4.9	20.0	ND	ug/L	U

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris A

18C0394-01 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 03/23/2018 10:40

Instrument: NT12 — Analyzed: 30-Mar-2018 18:01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dibenzofuran	132-64-9	1	0.3	1.0	ND	ug/L	U
4-Nitrophenol	100-02-7	1	1.0	10.0	ND	ug/L	U
2,4-Dinitrotoluene	121-14-2	1	2.0	3.0	ND	ug/L	U
Fluorene	86-73-7	1	0.3	1.0	ND	ug/L	U
Diethyl phthalate	84-66-2	1	0.4	1.0	ND	ug/L	U
4-Chlorophenylphenyl ether	7005-72-3	1	0.4	1.0	ND	ug/L	U
4-Nitroaniline	100-01-6	1	1.9	3.0	ND	ug/L	U
4,6-Dinitro-2-methylphenol	534-52-1	1	5.0	10.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.4	1.0	ND	ug/L	U
4-Bromophenyl phenyl ether	101-55-3	1	0.3	1.0	ND	ug/L	U
Hexachlorobenzene	118-74-1	1	0.4	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	2.6	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	0.2	1.0	ND	ug/L	U
Anthracene	120-12-7	1	0.4	1.0	ND	ug/L	U
Carbazole	86-74-8	1	0.6	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.5	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	0.4	1.0	ND	ug/L	U
Pyrene	129-00-0	1	0.3	1.0	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.4	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.4	1.0	ND	ug/L	U
3,3'-Dichlorobenzidine	91-94-1	1	1.6	5.0	ND	ug/L	U
Chrysene	218-01-9	1	0.4	1.0	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.5	3.0	ND	ug/L	U
Di-n-Octylphthalate	117-84-0	1	0.4	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.5	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.4	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.4	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.5	1.0	ND	ug/L	U
Benzofluoranthenes, Total		1	0.8	2.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.3	1.0	ND	ug/L	U
Surrogate: 2-Fluorophenol				*33-120 %*	*57.7*	*%*	
Surrogate: Phenol-d5				*38-120 %*	*62.1*	*%*	
Surrogate: 2-Chlorophenol-d4				*41-120 %*	*60.9*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*20-120 %*	*53.9*	*%*	
Surrogate: Nitrobenzene-d5				*27-120 %*	*66.7*	*%*	
Surrogate: 2-Fluorobiphenyl				*33-120 %*	*58.2*	*%*	
Surrogate: 2,4,6-Tribromophenol				*52-120 %*	*62.9*	*%*	
Surrogate: p-Terphenyl-d14				*28-120 %*	*80.4*	*%*	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris A

18C0394-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.7 — Sampled: 03/23/2018 10:40

Instrument: ICP2 — Analyzed: 28-Mar-2018 12:31

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGC0670 — Sample Size: 25 mL
Prepared: 26-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0051	0.0500	**11.3**	mg/L	
Magnesium	7439-95-4	1	0.0160	0.0500	**3.23**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris A

18C0394-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 — Sampled: 03/23/2018 10:40

Instrument: ICPMS1 — Analyzed: 27-Mar-2018 22:29

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0666 — Sample Size: 25 mL
Prepared: 26-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead	7439-92-1	1	0.0680	0.100	**3.38**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris A

18C0394-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 03/23/2018 10:40

Instrument: ICPMS1 — Analyzed: 27-Mar-2018 22:29

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0666 — Sample Size: 25 mL
Prepared: 26-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper	7440-50-8	1	0.340	0.500	**10.3**	ug/L	
Zinc	7440-66-6	1	0.820	4.00	**44.0**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris A

18C0394-01 (Water)

Wet Chemistry

Method: EPA 160.2 — Sampled: 03/23/2018 10:40

Instrument: BAL2 — Analyzed: 26-Mar-2018 09:06

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0671 — Sample Size: 200 mL
Prepared: 26-Mar-2018 — Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	5	5	**100**	mg/L	

Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris A

18C0394-01 (Water)

Wet Chemistry

Method: SM 4500-P E-99 — Sampled: 03/23/2018 10:40

Instrument: UV1800-1 — Analyzed: 26-Mar-2018 17:55

Sample Preparation: Preparation Method: SM 4500-P B-4 Strong Acid
Preparation Batch: BGC0663 — Sample Size: 25 mL
Prepared: 24-Mar-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Phosphorus	7723-14-0	1	0.0080	0.0080	**0.340**	mg-P/L	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris A

18C0394-01 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 03/23/2018 10:40

Instrument: [CALC] — Analyzed: 28-Mar-2018 12:31

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 26-Mar-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1	0.331	**41.6**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris A

18C0394-01 (Water)

Microbiology

Method: SM 9222D — Sampled: 03/23/2018 10:40

Instrument: N/A — Analyzed: 24-Mar-2018 16:35

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0651 — Sample Size: 4 mL
Prepared: 23-Mar-2018 — Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Fecal Coliforms		1		25	**825**	CFU/100 ml	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris B

18C0394-02 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 03/23/2018 11:50

Instrument: NT12 — Analyzed: 30-Mar-2018 18:35

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGC0751 — Sample Size: 500 mL
Prepared: 28-Mar-2018 — Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	0.2	1.0	ND	ug/L	U
bis(2-chloroethyl) ether	111-44-4	1	0.4	1.0	ND	ug/L	U
2-Chlorophenol	95-57-8	1	0.4	1.0	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.3	1.0	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.3	1.0	ND	ug/L	U
Benzyl Alcohol	100-51-6	1	1.0	2.0	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.3	1.0	ND	ug/L	U
2-Methylphenol	95-48-7	1	0.3	1.0	ND	ug/L	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	0.5	1.0	ND	ug/L	U
4-Methylphenol	106-44-5	1	0.4	2.0	ND	ug/L	U
N-Nitroso-di-n-Propylamine	621-64-7	1	0.2	1.0	ND	ug/L	U
Hexachloroethane	67-72-1	1	0.3	2.0	ND	ug/L	U
Nitrobenzene	98-95-3	1	0.4	1.0	ND	ug/L	U
Isophorone	78-59-1	1	0.5	1.0	ND	ug/L	U
2-Nitrophenol	88-75-5	1	0.5	3.0	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	1.0	3.0	ND	ug/L	U
Bis(2-Chloroethoxy)methane	111-91-1	1	0.6	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	3.4	20.0	ND	ug/L	U
2,4-Dichlorophenol	120-83-2	1	1.9	3.0	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.3	1.0	ND	ug/L	U
Naphthalene	91-20-3	1	0.2	1.0	ND	ug/L	U
4-Chloroaniline	106-47-8	1	1.9	5.0	ND	ug/L	U
Hexachlorobutadiene	87-68-3	1	0.1	3.0	ND	ug/L	U
4-Chloro-3-Methylphenol	59-50-7	1	2.0	3.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	0.2	1.0	ND	ug/L	U
Hexachlorocyclopentadiene	77-47-4	1	2.5	5.0	ND	ug/L	U
2,4,6-Trichlorophenol	88-06-2	1	1.9	3.0	ND	ug/L	U
2,4,5-Trichlorophenol	95-95-4	1	1.8	5.0	ND	ug/L	U
2-Chloronaphthalene	91-58-7	1	0.5	1.0	ND	ug/L	U
2-Nitroaniline	88-74-4	1	2.0	3.0	ND	ug/L	U
Dimethylphthalate	131-11-3	1	0.4	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.3	1.0	ND	ug/L	U
2,6-Dinitrotoluene	606-20-2	1	2.1	3.0	ND	ug/L	U
3-Nitroaniline	99-09-2	1	2.2	3.0	ND	ug/L	U
Acenaphthene	83-32-9	1	0.3	1.0	ND	ug/L	U
2,4-Dinitrophenol	51-28-5	1	4.9	20.0	ND	ug/L	U

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris B

18C0394-02 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 03/23/2018 11:50

Instrument: NT12 — Analyzed: 30-Mar-2018 18:35

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dibenzofuran	132-64-9	1	0.3	1.0	ND	ug/L	U
4-Nitrophenol	100-02-7	1	1.0	10.0	ND	ug/L	U
2,4-Dinitrotoluene	121-14-2	1	2.0	3.0	ND	ug/L	U
Fluorene	86-73-7	1	0.3	1.0	ND	ug/L	U
Diethyl phthalate	84-66-2	1	0.4	1.0	ND	ug/L	U
4-Chlorophenylphenyl ether	7005-72-3	1	0.4	1.0	ND	ug/L	U
4-Nitroaniline	100-01-6	1	1.9	3.0	ND	ug/L	U
4,6-Dinitro-2-methylphenol	534-52-1	1	5.0	10.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.4	1.0	ND	ug/L	U
4-Bromophenyl phenyl ether	101-55-3	1	0.3	1.0	ND	ug/L	U
Hexachlorobenzene	118-74-1	1	0.4	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	2.6	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	0.2	1.0	ND	ug/L	U
Anthracene	120-12-7	1	0.4	1.0	ND	ug/L	U
Carbazole	86-74-8	1	0.6	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.5	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	0.4	1.0	ND	ug/L	U
Pyrene	129-00-0	1	0.3	1.0	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.4	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.4	1.0	ND	ug/L	U
3,3'-Dichlorobenzidine	91-94-1	1	1.6	5.0	ND	ug/L	U
Chrysene	218-01-9	1	0.4	1.0	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.5	3.0	ND	ug/L	U
Di-n-Octylphthalate	117-84-0	1	0.4	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.5	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.4	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.4	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.5	1.0	ND	ug/L	U
Benzofluoranthenes, Total		1	0.8	2.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.3	1.0	ND	ug/L	U
Surrogate: 2-Fluorophenol				*33-120 %*	*69.3*	*%*	
Surrogate: Phenol-d5				*38-120 %*	*75.8*	*%*	
Surrogate: 2-Chlorophenol-d4				*41-120 %*	*72.8*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*20-120 %*	*63.5*	*%*	
Surrogate: Nitrobenzene-d5				*27-120 %*	*80.3*	*%*	
Surrogate: 2-Fluorobiphenyl				*33-120 %*	*68.1*	*%*	
Surrogate: 2,4,6-Tribromophenol				*52-120 %*	*73.8*	*%*	
Surrogate: p-Terphenyl-d14				*28-120 %*	*77.7*	*%*	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris B

18C0394-02 (Water)

Metals and Metallic Compounds

Method: EPA 200.7 — Sampled: 03/23/2018 11:50

Instrument: ICP2 — Analyzed: 27-Mar-2018 16:47

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGC0670 — Sample Size: 25 mL
Prepared: 26-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0051	0.0500	**12.8**	mg/L	
Magnesium	7439-95-4	1	0.0160	0.0500	**3.78**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris B

18C0394-02 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 — Sampled: 03/23/2018 11:50

Instrument: ICPMS1 — Analyzed: 27-Mar-2018 22:33

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0666 — Sample Size: 25 mL
Prepared: 26-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead	7439-92-1	1	0.0680	0.100	**0.940**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris B

18C0394-02 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 03/23/2018 11:50

Instrument: ICPMS1 — Analyzed: 27-Mar-2018 22:33

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0666 — Sample Size: 25 mL
Prepared: 26-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper	7440-50-8	1	0.340	0.500	**11.7**	ug/L	
Zinc	7440-66-6	1	0.820	4.00	**36.1**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris B

18C0394-02 (Water)

Wet Chemistry

Method: EPA 160.2 — Sampled: 03/23/2018 11:50

Instrument: BAL2 — Analyzed: 26-Mar-2018 09:06

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0671 — Sample Size: 850 mL
Prepared: 26-Mar-2018 — Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	**20**	mg/L	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris B

18C0394-02 (Water)

Wet Chemistry

Method: SM 4500-P E-99 — Sampled: 03/23/2018 11:50

Instrument: UV1800-1 — Analyzed: 26-Mar-2018 16:35

Sample Preparation: Preparation Method: SM 4500-P B-5 Persulfate
Preparation Batch: BGC0661 — Sample Size: 25 mL
Prepared: 24-Mar-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Phosphorus	7723-14-0	1	0.0080	0.0080	**0.120**	mg-P/L	

Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris B

18C0394-02 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 03/23/2018 11:50

Instrument: [CALC] — Analyzed: 27-Mar-2018 16:47

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 26-Mar-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1	0.331	**47.6**	mg/L	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris B

18C0394-02 (Water)

Microbiology

Method: SM 9222D — Sampled: 03/23/2018 11:50

Instrument: N/A — Analyzed: 24-Mar-2018 16:35

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0651 — Sample Size: 20 mL
Prepared: 23-Mar-2018 — Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Fecal Coliforms		1		5	**145**	CFU/100 ml	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Miller A

18C0394-03 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 03/23/2018 11:15

Instrument: NT12 — Analyzed: 30-Mar-2018 19:08

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGC0751 — Sample Size: 500 mL
Prepared: 28-Mar-2018 — Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	0.2	1.0	ND	ug/L	U
bis(2-chloroethyl) ether	111-44-4	1	0.4	1.0	ND	ug/L	U
2-Chlorophenol	95-57-8	1	0.4	1.0	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.3	1.0	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.3	1.0	ND	ug/L	U
Benzyl Alcohol	100-51-6	1	1.0	2.0	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.3	1.0	ND	ug/L	U
2-Methylphenol	95-48-7	1	0.3	1.0	ND	ug/L	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	0.5	1.0	ND	ug/L	U
4-Methylphenol	106-44-5	1	0.4	2.0	ND	ug/L	U
N-Nitroso-di-n-Propylamine	621-64-7	1	0.2	1.0	ND	ug/L	U
Hexachloroethane	67-72-1	1	0.3	2.0	ND	ug/L	U
Nitrobenzene	98-95-3	1	0.4	1.0	ND	ug/L	U
Isophorone	78-59-1	1	0.5	1.0	ND	ug/L	U
2-Nitrophenol	88-75-5	1	0.5	3.0	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	1.0	3.0	ND	ug/L	U
Bis(2-Chloroethoxy)methane	111-91-1	1	0.6	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	3.4	20.0	ND	ug/L	U
2,4-Dichlorophenol	120-83-2	1	1.9	3.0	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.3	1.0	ND	ug/L	U
Naphthalene	91-20-3	1	0.2	1.0	ND	ug/L	U
4-Chloroaniline	106-47-8	1	1.9	5.0	ND	ug/L	U
Hexachlorobutadiene	87-68-3	1	0.1	3.0	ND	ug/L	U
4-Chloro-3-Methylphenol	59-50-7	1	2.0	3.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	0.2	1.0	ND	ug/L	U
Hexachlorocyclopentadiene	77-47-4	1	2.5	5.0	ND	ug/L	U
2,4,6-Trichlorophenol	88-06-2	1	1.9	3.0	ND	ug/L	U
2,4,5-Trichlorophenol	95-95-4	1	1.8	5.0	ND	ug/L	U
2-Chloronaphthalene	91-58-7	1	0.5	1.0	ND	ug/L	U
2-Nitroaniline	88-74-4	1	2.0	3.0	ND	ug/L	U
Dimethylphthalate	131-11-3	1	0.4	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.3	1.0	ND	ug/L	U
2,6-Dinitrotoluene	606-20-2	1	2.1	3.0	ND	ug/L	U
3-Nitroaniline	99-09-2	1	2.2	3.0	ND	ug/L	U
Acenaphthene	83-32-9	1	0.3	1.0	ND	ug/L	U
2,4-Dinitrophenol	51-28-5	1	4.9	20.0	ND	ug/L	U

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Miller A

18C0394-03 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 03/23/2018 11:15

Instrument: NT12 — Analyzed: 30-Mar-2018 19:08

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dibenzofuran	132-64-9	1	0.3	1.0	ND	ug/L	U
4-Nitrophenol	100-02-7	1	1.0	10.0	ND	ug/L	U
2,4-Dinitrotoluene	121-14-2	1	2.0	3.0	ND	ug/L	U
Fluorene	86-73-7	1	0.3	1.0	ND	ug/L	U
Diethyl phthalate	84-66-2	1	0.4	1.0	ND	ug/L	U
4-Chlorophenylphenyl ether	7005-72-3	1	0.4	1.0	ND	ug/L	U
4-Nitroaniline	100-01-6	1	1.9	3.0	ND	ug/L	U
4,6-Dinitro-2-methylphenol	534-52-1	1	5.0	10.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.4	1.0	ND	ug/L	U
4-Bromophenyl phenyl ether	101-55-3	1	0.3	1.0	ND	ug/L	U
Hexachlorobenzene	118-74-1	1	0.4	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	2.6	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	0.2	1.0	ND	ug/L	U
Anthracene	120-12-7	1	0.4	1.0	ND	ug/L	U
Carbazole	86-74-8	1	0.6	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.5	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	0.4	1.0	ND	ug/L	U
Pyrene	129-00-0	1	0.3	1.0	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.4	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.4	1.0	ND	ug/L	U
3,3'-Dichlorobenzidine	91-94-1	1	1.6	5.0	ND	ug/L	U
Chrysene	218-01-9	1	0.4	1.0	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.5	3.0	**1.2**	ug/L	
Di-n-Octylphthalate	117-84-0	1	0.4	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.5	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.4	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.4	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.5	1.0	ND	ug/L	U
Benzofluoranthenes, Total		1	0.8	2.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.3	1.0	ND	ug/L	U
Surrogate: 2-Fluorophenol				*33-120 %*	*68.6*	*%*	
Surrogate: Phenol-d5				*38-120 %*	*75.2*	*%*	
Surrogate: 2-Chlorophenol-d4				*41-120 %*	*72.8*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*20-120 %*	*61.8*	*%*	
Surrogate: Nitrobenzene-d5				*27-120 %*	*81.7*	*%*	
Surrogate: 2-Fluorobiphenyl				*33-120 %*	*67.8*	*%*	
Surrogate: 2,4,6-Tribromophenol				*52-120 %*	*77.6*	*%*	
Surrogate: p-Terphenyl-d14				*28-120 %*	*105*	*%*	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Miller A

18C0394-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.7 — Sampled: 03/23/2018 11:15

Instrument: ICP2 — Analyzed: 27-Mar-2018 16:51

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGC0670 — Sample Size: 25 mL
Prepared: 26-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0051	0.0500	**34.6**	mg/L	
Magnesium	7439-95-4	1	0.0160	0.0500	**1.22**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Miller A

18C0394-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 — Sampled: 03/23/2018 11:15

Instrument: ICPMS1 — Analyzed: 27-Mar-2018 22:37

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0666 — Sample Size: 25 mL
Prepared: 26-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead	7439-92-1	1	0.0680	0.100	**0.126**	ug/L	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Miller A

18C0394-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 03/23/2018 11:15

Instrument: ICPMS1 — Analyzed: 27-Mar-2018 22:37

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0666 — Sample Size: 25 mL
Prepared: 26-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper	7440-50-8	1	0.340	0.500	**6.00**	ug/L	
Zinc	7440-66-6	1	0.820	4.00	**2.64**	ug/L	J

Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Miller A

18C0394-03 (Water)

Wet Chemistry

Method: EPA 160.2 — Sampled: 03/23/2018 11:15

Instrument: BAL2 — Analyzed: 26-Mar-2018 09:06

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0671 — Sample Size: 890 mL
Prepared: 26-Mar-2018 — Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	**2**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Miller A

18C0394-03 (Water)

Wet Chemistry

Method: SM 4500-P E-99 — Sampled: 03/23/2018 11:15

Instrument: UV1800-1 — Analyzed: 26-Mar-2018 16:37

Sample Preparation: Preparation Method: SM 4500-P B-5 Persulfate
Preparation Batch: BGC0661 — Sample Size: 25 mL
Prepared: 24-Mar-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Phosphorus	7723-14-0	1	0.0080	0.0080	**0.0140**	mg-P/L	

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Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Miller A

18C0394-03 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 03/23/2018 11:15

Instrument: [CALC] — Analyzed: 27-Mar-2018 16:51

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 26-Mar-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1	0.331	**91.4**	mg/L	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Miller A

18C0394-03 (Water)

Microbiology

Method: SM 9222D — Sampled: 03/23/2018 11:15

Instrument: N/A — Analyzed: 24-Mar-2018 16:35

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0651 — Sample Size: 75 mL
Prepared: 23-Mar-2018 — Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Fecal Coliforms		1		1	**32**	CFU/100 ml	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Miller B

18C0394-04 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 03/23/2018 12:25

Instrument: NT12 — Analyzed: 30-Mar-2018 19:42

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGC0751 — Sample Size: 500 mL
Prepared: 28-Mar-2018 — Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	0.2	1.0	ND	ug/L	U
bis(2-chloroethyl) ether	111-44-4	1	0.4	1.0	ND	ug/L	U
2-Chlorophenol	95-57-8	1	0.4	1.0	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.3	1.0	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.3	1.0	ND	ug/L	U
Benzyl Alcohol	100-51-6	1	1.0	2.0	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.3	1.0	ND	ug/L	U
2-Methylphenol	95-48-7	1	0.3	1.0	ND	ug/L	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	0.5	1.0	ND	ug/L	U
4-Methylphenol	106-44-5	1	0.4	2.0	ND	ug/L	U
N-Nitroso-di-n-Propylamine	621-64-7	1	0.2	1.0	ND	ug/L	U
Hexachloroethane	67-72-1	1	0.3	2.0	ND	ug/L	U
Nitrobenzene	98-95-3	1	0.4	1.0	ND	ug/L	U
Isophorone	78-59-1	1	0.5	1.0	ND	ug/L	U
2-Nitrophenol	88-75-5	1	0.5	3.0	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	1.0	3.0	ND	ug/L	U
Bis(2-Chloroethoxy)methane	111-91-1	1	0.6	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	3.4	20.0	ND	ug/L	U
2,4-Dichlorophenol	120-83-2	1	1.9	3.0	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.3	1.0	ND	ug/L	U
Naphthalene	91-20-3	1	0.2	1.0	ND	ug/L	U
4-Chloroaniline	106-47-8	1	1.9	5.0	ND	ug/L	U
Hexachlorobutadiene	87-68-3	1	0.1	3.0	ND	ug/L	U
4-Chloro-3-Methylphenol	59-50-7	1	2.0	3.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	0.2	1.0	ND	ug/L	U
Hexachlorocyclopentadiene	77-47-4	1	2.5	5.0	ND	ug/L	U
2,4,6-Trichlorophenol	88-06-2	1	1.9	3.0	ND	ug/L	U
2,4,5-Trichlorophenol	95-95-4	1	1.8	5.0	ND	ug/L	U
2-Chloronaphthalene	91-58-7	1	0.5	1.0	ND	ug/L	U
2-Nitroaniline	88-74-4	1	2.0	3.0	ND	ug/L	U
Dimethylphthalate	131-11-3	1	0.4	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.3	1.0	ND	ug/L	U
2,6-Dinitrotoluene	606-20-2	1	2.1	3.0	ND	ug/L	U
3-Nitroaniline	99-09-2	1	2.2	3.0	ND	ug/L	U
Acenaphthene	83-32-9	1	0.3	1.0	ND	ug/L	U
2,4-Dinitrophenol	51-28-5	1	4.9	20.0	ND	ug/L	U

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Miller B

18C0394-04 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 03/23/2018 12:25

Instrument: NT12 — Analyzed: 30-Mar-2018 19:42

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dibenzofuran	132-64-9	1	0.3	1.0	ND	ug/L	U
4-Nitrophenol	100-02-7	1	1.0	10.0	ND	ug/L	U
2,4-Dinitrotoluene	121-14-2	1	2.0	3.0	ND	ug/L	U
Fluorene	86-73-7	1	0.3	1.0	ND	ug/L	U
Diethyl phthalate	84-66-2	1	0.4	1.0	ND	ug/L	U
4-Chlorophenylphenyl ether	7005-72-3	1	0.4	1.0	ND	ug/L	U
4-Nitroaniline	100-01-6	1	1.9	3.0	ND	ug/L	U
4,6-Dinitro-2-methylphenol	534-52-1	1	5.0	10.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.4	1.0	ND	ug/L	U
4-Bromophenyl phenyl ether	101-55-3	1	0.3	1.0	ND	ug/L	U
Hexachlorobenzene	118-74-1	1	0.4	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	2.6	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	0.2	1.0	ND	ug/L	U
Anthracene	120-12-7	1	0.4	1.0	ND	ug/L	U
Carbazole	86-74-8	1	0.6	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.5	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	0.4	1.0	ND	ug/L	U
Pyrene	129-00-0	1	0.3	1.0	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.4	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.4	1.0	ND	ug/L	U
3,3'-Dichlorobenzidine	91-94-1	1	1.6	5.0	ND	ug/L	U
Chrysene	218-01-9	1	0.4	1.0	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.5	3.0	ND	ug/L	U
Di-n-Octylphthalate	117-84-0	1	0.4	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.5	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.4	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.4	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.5	1.0	ND	ug/L	U
Benzofluoranthenes, Total		1	0.8	2.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.3	1.0	ND	ug/L	U
Surrogate: 2-Fluorophenol				*33-120 %*	*73.6*	*%*	
Surrogate: Phenol-d5				*38-120 %*	*78.1*	*%*	
Surrogate: 2-Chlorophenol-d4				*41-120 %*	*75.2*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*20-120 %*	*64.5*	*%*	
Surrogate: Nitrobenzene-d5				*27-120 %*	*82.6*	*%*	
Surrogate: 2-Fluorobiphenyl				*33-120 %*	*69.1*	*%*	
Surrogate: 2,4,6-Tribromophenol				*52-120 %*	*76.9*	*%*	
Surrogate: p-Terphenyl-d14				*28-120 %*	*101*	*%*	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Miller B

18C0394-04 (Water)

Metals and Metallic Compounds

Method: EPA 200.7 — Sampled: 03/23/2018 12:25

Instrument: ICP2 — Analyzed: 27-Mar-2018 16:56

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGC0670 — Sample Size: 25 mL
Prepared: 26-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0051	0.0500	**33.3**	mg/L	
Magnesium	7439-95-4	1	0.0160	0.0500	**1.14**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Miller B

18C0394-04 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 — Sampled: 03/23/2018 12:25

Instrument: ICPMS1 — Analyzed: 27-Mar-2018 22:41

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0666 — Sample Size: 25 mL
Prepared: 26-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Miller B

18C0394-04 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 03/23/2018 12:25

Instrument: ICPMS1 — Analyzed: 27-Mar-2018 22:41

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0666 — Sample Size: 25 mL
Prepared: 26-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper	7440-50-8	1	0.340	0.500	**5.58**	ug/L	
Zinc	7440-66-6	1	0.820	4.00	**2.38**	ug/L	J

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Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Miller B

18C0394-04 (Water)

Wet Chemistry

Method: EPA 160.2 — Sampled: 03/23/2018 12:25

Instrument: BAL2 — Analyzed: 26-Mar-2018 09:06

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0671 — Sample Size: 910 mL
Prepared: 26-Mar-2018 — Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	ND	mg/L	U

Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Miller B

18C0394-04 (Water)

Wet Chemistry

Method: SM 4500-P E-99 — Sampled: 03/23/2018 12:25

Instrument: UV1800-1 — Analyzed: 26-Mar-2018 16:38

Sample Preparation: Preparation Method: SM 4500-P B-5 Persulfate
Preparation Batch: BGC0661 — Sample Size: 25 mL
Prepared: 24-Mar-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Phosphorus	7723-14-0	1	0.0080	0.0080	**0.0220**	mg-P/L	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Miller B

18C0394-04 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 03/23/2018 12:25

Instrument: [CALC] — Analyzed: 27-Mar-2018 16:56

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 26-Mar-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1	0.331	**87.9**	mg/L	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Miller B

18C0394-04 (Water)

Microbiology

Method: SM 9222D — Sampled: 03/23/2018 12:25

Instrument: N/A — Analyzed: 24-Mar-2018 16:35

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0651 — Sample Size: 75 mL
Prepared: 23-Mar-2018 — Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Fecal Coliforms		1		1	**63**	CFU/100 ml	

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Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris A

18C0394-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 03/23/2018 10:40

Instrument: ICPMS2 — Analyzed: 03-Apr-2018 22:49

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0037 — Sample Size: 25 mL
Prepared: 03-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
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Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris A

18C0394-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 03/23/2018 10:40

Instrument: ICPMS2 — Analyzed: 03-Apr-2018 22:49

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0037 — Sample Size: 25 mL
Prepared: 03-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.340	0.500	**4.00**	ug/L	
Zinc, Dissolved	7440-66-6	1	0.820	4.00	**14.6**	ug/L	

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Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris B

18C0394-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 03/23/2018 11:50

Instrument: ICPMS2 — Analyzed: 03-Apr-2018 22:54

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0037 — Sample Size: 25 mL
Prepared: 03-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Bobby Morris B

18C0394-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 03/23/2018 11:50

Instrument: ICPMS2 — Analyzed: 03-Apr-2018 22:54

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0037 — Sample Size: 25 mL
Prepared: 03-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.340	0.500	**6.40**	ug/L	
Zinc, Dissolved	7440-66-6	1	0.820	4.00	**23.2**	ug/L	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Miller A

18C0394-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 03/23/2018 11:15

Instrument: ICPMS2 — Analyzed: 03-Apr-2018 23:38

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0037 — Sample Size: 25 mL
Prepared: 03-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Miller A

18C0394-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 03/23/2018 11:15

Instrument: ICPMS2 — Analyzed: 03-Apr-2018 23:38

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0037 — Sample Size: 25 mL
Prepared: 03-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.340	0.500	**4.66**	ug/L	
Zinc, Dissolved	7440-66-6	1	0.820	4.00	**2.38**	ug/L	J

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Miller B

18C0394-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 03/23/2018 12:25

Instrument: ICPMS2 — Analyzed: 03-Apr-2018 23:43

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0037 — Sample Size: 25 mL
Prepared: 03-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Miller B

18C0394-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 03/23/2018 12:25

Instrument: ICPMS2 — Analyzed: 03-Apr-2018 23:43

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0037 — Sample Size: 25 mL
Prepared: 03-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.340	0.500	**5.18**	ug/L	
Zinc, Dissolved	7440-66-6	1	0.820	4.00	**2.28**	ug/L	J

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Semivolatile Organic Compounds - Quality Control

Batch BGC0751 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0751-BLK1)				Prepared: 28-Mar-2018 Analyzed: 30-Mar-2018 16:54							
Phenol	ND	0.2	1.0	ug/L							U
bis(2-chloroethyl) ether	ND	0.4	1.0	ug/L							U
2-Chlorophenol	ND	0.4	1.0	ug/L							U
1,3-Dichlorobenzene	ND	0.3	1.0	ug/L							U
1,4-Dichlorobenzene	ND	0.3	1.0	ug/L							U
Benzyl Alcohol	ND	1.0	2.0	ug/L							U
1,2-Dichlorobenzene	ND	0.3	1.0	ug/L							U
2-Methylphenol	ND	0.3	1.0	ug/L							U
2,2'-Oxybis(1-chloropropane)	ND	0.5	1.0	ug/L							U
4-Methylphenol	ND	0.4	2.0	ug/L							U
N-Nitroso-di-n-Propylamine	ND	0.2	1.0	ug/L							U
Hexachloroethane	ND	0.3	2.0	ug/L							U
Nitrobenzene	ND	0.4	1.0	ug/L							U
Isophorone	ND	0.5	1.0	ug/L							U
2-Nitrophenol	ND	0.5	3.0	ug/L							U
2,4-Dimethylphenol	ND	1.0	3.0	ug/L							U
Bis(2-Chloroethoxy)methane	ND	0.6	1.0	ug/L							U
Benzoic acid	ND	3.4	20.0	ug/L							U
2,4-Dichlorophenol	ND	1.9	3.0	ug/L							U
1,2,4-Trichlorobenzene	ND	0.3	1.0	ug/L							U
Naphthalene	ND	0.2	1.0	ug/L							U
4-Chloroaniline	ND	1.9	5.0	ug/L							U
Hexachlorobutadiene	ND	0.1	3.0	ug/L							U
4-Chloro-3-Methylphenol	ND	2.0	3.0	ug/L							U
2-Methylnaphthalene	ND	0.2	1.0	ug/L							U
Hexachlorocyclopentadiene	ND	2.5	5.0	ug/L							U
2,4,6-Trichlorophenol	ND	1.9	3.0	ug/L							U
2,4,5-Trichlorophenol	ND	1.8	5.0	ug/L							U
2-Chloronaphthalene	ND	0.5	1.0	ug/L							U
2-Nitroaniline	ND	2.0	3.0	ug/L							U
Dimethylphthalate	ND	0.4	1.0	ug/L							U
Acenaphthylene	ND	0.3	1.0	ug/L							U
2,6-Dinitrotoluene	ND	2.1	3.0	ug/L							U
3-Nitroaniline	ND	2.2	3.0	ug/L							U
Acenaphthene	ND	0.3	1.0	ug/L							U

Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Semivolatile Organic Compounds - Quality Control

Batch BGC0751 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0751-BLK1)				Prepared: 28-Mar-2018 Analyzed: 30-Mar-2018 16:54							
2,4-Dinitrophenol	ND	4.9	20.0	ug/L							U
Dibenzofuran	ND	0.3	1.0	ug/L							U
4-Nitrophenol	ND	1.0	10.0	ug/L							U
2,4-Dinitrotoluene	ND	2.0	3.0	ug/L							U
Fluorene	ND	0.3	1.0	ug/L							U
Diethyl phthalate	ND	0.4	1.0	ug/L							U
4-Chlorophenylphenyl ether	ND	0.4	1.0	ug/L							U
4-Nitroaniline	ND	1.9	3.0	ug/L							U
4,6-Dinitro-2-methylphenol	ND	5.0	10.0	ug/L							U
N-Nitrosodiphenylamine	ND	0.4	1.0	ug/L							U
4-Bromophenyl phenyl ether	ND	0.3	1.0	ug/L							U
Hexachlorobenzene	ND	0.4	1.0	ug/L							U
Pentachlorophenol	ND	2.6	10.0	ug/L							U
Phenanthrene	ND	0.2	1.0	ug/L							U
Anthracene	ND	0.4	1.0	ug/L							U
Carbazole	ND	0.6	1.0	ug/L							U
Di-n-Butylphthalate	ND	0.5	1.0	ug/L							U
Fluoranthene	ND	0.4	1.0	ug/L							U
Pyrene	ND	0.3	1.0	ug/L							U
Butylbenzylphthalate	ND	0.4	1.0	ug/L							U
Benzo(a)anthracene	ND	0.4	1.0	ug/L							U
3,3'-Dichlorobenzidine	ND	1.6	5.0	ug/L							U
Chrysene	ND	0.4	1.0	ug/L							U
bis(2-Ethylhexyl)phthalate	ND	0.5	3.0	ug/L							U
Di-n-Octylphthalate	ND	0.4	1.0	ug/L							U
Benzo(a)pyrene	ND	0.5	1.0	ug/L							U
Indeno(1,2,3-cd)pyrene	ND	0.4	1.0	ug/L							U
Dibenzo(a,h)anthracene	ND	0.4	1.0	ug/L							U
Benzo(g,h,i)perylene	ND	0.5	1.0	ug/L							U
Benzofluoranthenes, Total	ND	0.8	2.0	ug/L							U
1-Methylnaphthalene	ND	0.3	1.0	ug/L							U
Surrogate: 2-Fluorophenol	30.5			ug/L	*37.5*		*81.3*	*33-120*			
Surrogate: Phenol-d5	33.3			ug/L	*37.5*		*88.7*	*38-120*			
Surrogate: 2-Chlorophenol-d4	31.6			ug/L	*37.5*		*84.4*	*41-120*			
Surrogate: 1,2-Dichlorobenzene-d4	18.2			ug/L	*25.0*		*73.0*	*20-120*			

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Semivolatile Organic Compounds - Quality Control

Batch BGC0751 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0751-BLK1)				Prepared: 28-Mar-2018 Analyzed: 30-Mar-2018 16:54							
Surrogate: Nitrobenzene-d5	23.3			ug/L	*25.0*		*93.0*	*27-120*			
Surrogate: 2-Fluorobiphenyl	19.7			ug/L	*25.0*		*78.7*	*33-120*			
Surrogate: 2,4,6-Tribromophenol	31.2			ug/L	*37.5*		*83.2*	*52-120*			
Surrogate: p-Terphenyl-d14	31.3			ug/L	*25.0*		*125*	*28-120*			*
LCS (BGC0751-BS1)				Prepared: 28-Mar-2018 Analyzed: 30-Mar-2018 17:28							
Phenol	15.3	0.2	1.0	ug/L	25.0		61.1	35-120			
bis(2-chloroethyl) ether	19.3	0.4	1.0	ug/L	25.0		77.2	46.5-120			
2-Chlorophenol	16.4	0.4	1.0	ug/L	25.0		65.6	48-120			
1,3-Dichlorobenzene	11.5	0.3	1.0	ug/L	25.0		46.1	34.2-120			
1,4-Dichlorobenzene	11.9	0.3	1.0	ug/L	25.0		47.5	36-120			
Benzyl Alcohol	19.0	1.0	2.0	ug/L	25.0		76.1	27.4-120			
1,2-Dichlorobenzene	12.7	0.3	1.0	ug/L	25.0		50.8	38.4-120			
2-Methylphenol	17.6	0.3	1.0	ug/L	25.0		70.3	47.8-120			
2,2'-Oxybis(1-chloropropane)	22.0	0.5	1.0	ug/L	25.0		87.8	40.4-120			
4-Methylphenol	18.7	0.4	2.0	ug/L	25.0		74.7	52.3-120			
N-Nitroso-di-n-Propylamine	22.4	0.2	1.0	ug/L	25.0		89.4	51.4-120			
Hexachloroethane	10.5	0.3	2.0	ug/L	25.0		42.1	29.5-120			
Nitrobenzene	19.3	0.4	1.0	ug/L	25.0		77.1	51.5-120			
Isophorone	24.4	0.5	1.0	ug/L	25.0		97.6	62.3-128			
2-Nitrophenol	18.1	0.5	3.0	ug/L	25.0		72.2	58.6-124			
2,4-Dimethylphenol	48.1	1.0	3.0	ug/L	75.0		64.1	38.5-120			
Bis(2-Chloroethoxy)methane	21.4	0.6	1.0	ug/L	25.0		85.4	52.9-120			
Benzoic acid	124	3.4	20.0	ug/L	138		90.2	38.2-120			
2,4-Dichlorophenol	52.8	1.9	3.0	ug/L	75.0		70.4	43.6-120			
1,2,4-Trichlorobenzene	11.9	0.3	1.0	ug/L	25.0		47.4	38.6-120			
Naphthalene	15.6	0.2	1.0	ug/L	25.0		62.3	40.5-120			
4-Chloroaniline	47.3	1.9	5.0	ug/L	75.0		63.0	42.7-120			
Hexachlorobutadiene	9.4	0.1	3.0	ug/L	25.0		37.4	32.3-120			
4-Chloro-3-Methylphenol	61.3	2.0	3.0	ug/L	75.0		81.7	51.9-120			
2-Methylnaphthalene	14.7	0.2	1.0	ug/L	25.0		58.6	47.3-120			
Hexachlorocyclopentadiene	48.8	2.5	5.0	ug/L	75.0		65.1	23.3-120			
2,4,6-Trichlorophenol	52.7	1.9	3.0	ug/L	75.0		70.2	47-120			
2,4,5-Trichlorophenol	54.8	1.8	5.0	ug/L	75.0		73.1	48.4-120			
2-Chloronaphthalene	16.4	0.5	1.0	ug/L	25.0		65.7	47.7-123			

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Semivolatile Organic Compounds - Quality Control

Batch BGC0751 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BGC0751-BS1)					Prepared: 28-Mar-2018 Analyzed: 30-Mar-2018 17:28						
2-Nitroaniline	69.0	2.0	3.0	ug/L	75.0		91.9	56.8-120			
Dimethylphthalate	20.8	0.4	1.0	ug/L	25.0		83.2	65.2-125			
Acenaphthylene	17.9	0.3	1.0	ug/L	25.0		71.6	44.1-120			
2,6-Dinitrotoluene	67.9	2.1	3.0	ug/L	75.0		90.5	69.3-140			
3-Nitroaniline	64.4	2.2	3.0	ug/L	75.0		85.8	60.9-120			
Acenaphthene	18.5	0.3	1.0	ug/L	25.0		74.1	50.4-120			
2,4-Dinitrophenol	109	4.9	20.0	ug/L	138		78.9	33.7-183			
Dibenzofuran	17.6	0.3	1.0	ug/L	25.0		70.2	49.9-120			
4-Nitrophenol	64.2	1.0	10.0	ug/L	75.0		85.5	50.2-136			
2,4-Dinitrotoluene	66.6	2.0	3.0	ug/L	75.0		88.8	66.8-132			
Fluorene	18.7	0.3	1.0	ug/L	25.0		75.0	57.8-120			
Diethyl phthalate	21.3	0.4	1.0	ug/L	25.0		85.0	68.1-120			
4-Chlorophenylphenyl ether	18.7	0.4	1.0	ug/L	25.0		74.9	59.1-127			
4-Nitroaniline	63.9	1.9	3.0	ug/L	75.0		85.1	56-122			
4,6-Dinitro-2-methylphenol	120	5.0	10.0	ug/L	138		87.5	37.9-162			
N-Nitrosodiphenylamine	19.5	0.4	1.0	ug/L	25.0		77.9	59.6-120			
4-Bromophenyl phenyl ether	20.2	0.3	1.0	ug/L	25.0		81.0	59.6-120			
Hexachlorobenzene	18.6	0.4	1.0	ug/L	25.0		74.3	53.7-120			
Pentachlorophenol	54.8	2.6	10.0	ug/L	75.0		73.0	40.3-128			
Phenanthrene	19.7	0.2	1.0	ug/L	25.0		78.8	58.8-120			
Anthracene	18.6	0.4	1.0	ug/L	25.0		74.2	60.5-120			
Carbazole	17.3	0.6	1.0	ug/L	25.0		69.3	59.7-120			
Di-n-Butylphthalate	22.0	0.5	1.0	ug/L	25.0		87.9	71-120			
Fluoranthene	19.5	0.4	1.0	ug/L	25.0		77.8	66.7-120			
Pyrene	24.3	0.3	1.0	ug/L	25.0		97.3	62.7-127			
Butylbenzylphthalate	25.1	0.4	1.0	ug/L	25.0		100	67.4-128			
Benzo(a)anthracene	20.3	0.4	1.0	ug/L	25.0		81.1	58.3-128			
3,3'-Dichlorobenzidine	49.8	1.6	5.0	ug/L	75.0		66.4	34.1-120			
Chrysene	20.5	0.4	1.0	ug/L	25.0		82.2	58.9-120			
bis(2-Ethylhexyl)phthalate	23.7	0.5	3.0	ug/L	25.0		94.7	68.3-123			
Di-n-Octylphthalate	20.6	0.4	1.0	ug/L	25.0		82.4	61.5-120			
Benzo(a)pyrene	21.3	0.5	1.0	ug/L	25.0		85.3	70.6-120			
Indeno(1,2,3-cd)pyrene	23.3	0.4	1.0	ug/L	25.0		93.1	46.5-120			
Dibenzo(a,h)anthracene	23.4	0.4	1.0	ug/L	25.0		93.5	49.6-120			
Benzo(g,h,i)perylene	24.3	0.5	1.0	ug/L	25.0		97.3	37-120			

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Semivolatile Organic Compounds - Quality Control

Batch BGC0751 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BGC0751-BS1)					Prepared: 28-Mar-2018 Analyzed: 30-Mar-2018 17:28						
Benzofluoranthenes, Total	39.9	0.8	2.0	ug/L	50.0		79.8	66.5-120			
1-Methylnaphthalene	16.8	0.3	1.0	ug/L	25.0		67.3	46.9-120			
Surrogate: 2-Fluorophenol	27.7			ug/L	*37.5*		*73.7*	*33-120*			
Surrogate: Phenol-d5	31.2			ug/L	*37.5*		*83.3*	*38-120*			
Surrogate: 2-Chlorophenol-d4	29.6			ug/L	*37.5*		*78.9*	*41-120*			
Surrogate: 1,2-Dichlorobenzene-d4	16.8			ug/L	*25.0*		*67.2*	*20-120*			
Surrogate: Nitrobenzene-d5	22.1			ug/L	*25.0*		*88.2*	*27-120*			
Surrogate: 2-Fluorobiphenyl	19.5			ug/L	*25.0*		*77.8*	*33-120*			
Surrogate: 2,4,6-Tribromophenol	33.3			ug/L	*37.5*		*88.7*	*52-120*			
Surrogate: p-Terphenyl-d14	28.9			ug/L	*25.0*		*115*	*28-120*			

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Metals and Metallic Compounds - Quality Control

Batch BGC0666 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0666-BLK1)					Prepared: 26-Mar-2018 Analyzed: 26-Mar-2018 15:38							
Lead	208	ND	0.0680	0.100	ug/L							U
Copper	63	ND	0.340	0.500	ug/L							U
Copper	65	ND	0.350	0.500	ug/L							U
Zinc	66	ND	0.820	4.00	ug/L							U
Zinc	67	ND	0.940	4.00	ug/L							U
LCS (BGC0666-BS1)					Prepared: 26-Mar-2018 Analyzed: 26-Mar-2018 16:20							
Lead	208	26.1	0.0680	0.100	ug/L	25.0		104	80-120			
Copper	63	26.5	0.340	0.500	ug/L	25.0		106	80-120			
Copper	65	26.7	0.350	0.500	ug/L	25.0		107	80-120			
Zinc	66	86.2	0.820	4.00	ug/L	80.0		108	80-120			
Zinc	67	73.6	0.940	4.00	ug/L	80.0		92.0	80-120			

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Metals and Metallic Compounds - Quality Control

Batch BGC0670 - TWC EPA 3010A

Instrument: ICP2 Analyst: TCH

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0670-BLK1)				Prepared: 26-Mar-2018 Analyzed: 27-Mar-2018 15:20							
Calcium	0.0111	0.0051	0.0500	mg/L							J
Magnesium	ND	0.0160	0.0500	mg/L							U
LCS (BGC0670-BS1)				Prepared: 26-Mar-2018 Analyzed: 27-Mar-2018 16:04							
Calcium	10.0	0.0051	0.0500	mg/L	10.0		100	80-120			
Magnesium	10.6	0.0160	0.0500	mg/L	10.0		106	80-120			

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGD0037 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: CC

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0037-BLK2)					Prepared: 03-Apr-2018 Analyzed: 03-Apr-2018 17:08							
Lead, Dissolved	208	ND	0.0680	0.100	ug/L							U
Copper, Dissolved	63	ND	0.340	0.500	ug/L							U
Copper, Dissolved	65	ND	0.350	0.500	ug/L							U
Zinc, Dissolved	66	2.24	0.820	4.00	ug/L							J
Zinc, Dissolved	67	1.96	0.940	4.00	ug/L							J
LCS (BGD0037-BS2)					Prepared: 03-Apr-2018 Analyzed: 03-Apr-2018 17:28							
Lead, Dissolved	208	23.5	0.0680	0.100	ug/L	25.0		94.1	80-120			
Copper, Dissolved	63	25.6	0.340	0.500	ug/L	25.0		102	80-120			
Copper, Dissolved	65	25.3	0.350	0.500	ug/L	25.0		101	80-120			
Zinc, Dissolved	66	84.8	0.820	4.00	ug/L	80.0		106	80-120			
Zinc, Dissolved	67	78.8	0.940	4.00	ug/L	80.0		98.5	80-120			

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Wet Chemistry - Quality Control

Batch BGC0661 - SM 4500-P B-5 Persulfate

Instrument: UV1800-1 Analyst: RLM

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0661-BLK1)				Prepared: 24-Mar-2018 Analyzed: 26-Mar-2018 16:33							
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
Blank (BGC0661-BLK2)				Prepared: 24-Mar-2018 Analyzed: 26-Mar-2018 16:38							
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
LCS (BGC0661-BS1)				Prepared: 24-Mar-2018 Analyzed: 26-Mar-2018 16:33							
Total Phosphorus	0.151	0.0080	0.0080	mg-P/L	0.150		101	90-110			
LCS (BGC0661-BS2)				Prepared: 24-Mar-2018 Analyzed: 26-Mar-2018 16:39							
Total Phosphorus	0.151	0.0080	0.0080	mg-P/L	0.150		101	90-110			
Duplicate (BGC0661-DUP1)		**Source: 18C0394-02**		Prepared: 24-Mar-2018 Analyzed: 26-Mar-2018 16:36							
Total Phosphorus	0.122	0.0080	0.0080	mg-P/L		0.120			1.65	20	
Matrix Spike (BGC0661-MS1)		**Source: 18C0394-02**		Prepared: 24-Mar-2018 Analyzed: 26-Mar-2018 16:36							
Total Phosphorus	0.308	0.0080	0.0080	mg-P/L	0.200	0.120	94.1	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Wet Chemistry - Quality Control

Batch BGC0663 - SM 4500-P B-4 Strong Acid

Instrument: UV1800-1 Analyst: RLM

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0663-BLK1)				Prepared: 24-Mar-2018 Analyzed: 26-Mar-2018 17:48							
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
Blank (BGC0663-BLK2)				Prepared: 24-Mar-2018 Analyzed: 26-Mar-2018 17:58							
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
Blank (BGC0663-BLK3)				Prepared: 24-Mar-2018 Analyzed: 26-Mar-2018 18:00							
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
LCS (BGC0663-BS1)				Prepared: 24-Mar-2018 Analyzed: 26-Mar-2018 17:49							
Total Phosphorus	0.154	0.0080	0.0080	mg-P/L	0.150		103	90-110			
LCS (BGC0663-BS2)				Prepared: 24-Mar-2018 Analyzed: 26-Mar-2018 17:58							
Total Phosphorus	0.155	0.0080	0.0080	mg-P/L	0.150		103	90-110			
LCS (BGC0663-BS3)				Prepared: 24-Mar-2018 Analyzed: 26-Mar-2018 18:01							
Total Phosphorus	0.153	0.0080	0.0080	mg-P/L	0.150		102	90-110			

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Wet Chemistry - Quality Control

Batch BGC0671 - No Prep Wet Chem

Instrument: BAL2 Analyst: KLE

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0671-BLK1)				Prepared: 26-Mar-2018 Analyzed: 26-Mar-2018 09:06							
Suspended Solids	ND	1	1	mg/L							U
LCS (BGC0671-BS1)				Prepared: 26-Mar-2018 Analyzed: 26-Mar-2018 09:06							
Suspended Solids	49	1	1	mg/L	50.00		98.6	90-110			
Duplicate (BGC0671-DUP1)		**Source: 18C0394-01**		Prepared: 26-Mar-2018 Analyzed: 26-Mar-2018 09:06							
Suspended Solids	93	5	5	mg/L		100			7.25	20	

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Microbiology - Quality Control

Batch BGC0651 - No Prep Wet Chem

Instrument: N/A

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0651-BLK1)				Prepared: 23-Mar-2018 Analyzed: 24-Mar-2018 16:35							
Fecal Coliforms	ND		1	CFU/100 ml							U

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Certified Analyses included in this Report

Analyte	Certifications
EPA 200.7 in Water	
Calcium	WADOE,NELAP,DoD-ELAP,WA-DW
Magnesium	WADOE,NELAP,DoD-ELAP,WA-DW
EPA 200.8 in Water	
Lead-208	NELAP,WADOE,WA-DW,DoD-ELAP
Lead-208	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 200.8 UCT-KED in Water	
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 8270D in Water	
Phenol	CALAP,WADOE,DoD-ELAP,NELAP
bis(2-chloroethyl) ether	CALAP,WADOE,DoD-ELAP,NELAP
2-Chlorophenol	CALAP,WADOE,DoD-ELAP,NELAP
1,3-Dichlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP
1,4-Dichlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP
Benzyl Alcohol	CALAP,WADOE,DoD-ELAP,NELAP
1,2-Dichlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP
2-Methylphenol	CALAP,WADOE,DoD-ELAP,NELAP
4-Methylphenol	CALAP,WADOE,DoD-ELAP,NELAP
N-Nitroso-di-n-Propylamine	CALAP,WADOE,DoD-ELAP,NELAP
Hexachloroethane	CALAP,WADOE,DoD-ELAP,NELAP
Nitrobenzene	CALAP,WADOE,DoD-ELAP,NELAP
Isophorone	CALAP,WADOE,DoD-ELAP,NELAP
2-Nitrophenol	CALAP,WADOE,DoD-ELAP,NELAP
2,4-Dimethylphenol	CALAP,WADOE,DoD-ELAP,NELAP
Bis(2-Chloroethoxy)methane	CALAP,WADOE,DoD-ELAP,NELAP
Benzoic acid	CALAP,WADOE,DoD-ELAP,NELAP
2,4-Dichlorophenol	CALAP,WADOE,DoD-ELAP,NELAP
1,2,4-Trichlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Naphthalene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
4-Chloroaniline	CALAP,WADOE,DoD-ELAP,NELAP
Hexachlorobutadiene	CALAP,WADOE,DoD-ELAP,NELAP
4-Chloro-3-Methylphenol	CALAP,WADOE,DoD-ELAP,NELAP
2-Methylnaphthalene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Hexachlorocyclopentadiene	CALAP,WADOE,DoD-ELAP,NELAP
2,4,6-Trichlorophenol	CALAP,WADOE,DoD-ELAP,NELAP
2,4,5-Trichlorophenol	CALAP,WADOE,DoD-ELAP,NELAP
2-Chloronaphthalene	CALAP,WADOE,DoD-ELAP,NELAP
2-Nitroaniline	CALAP,WADOE,DoD-ELAP,NELAP
Dimethylphthalate	CALAP,WADOE,DoD-ELAP,NELAP
Acenaphthylene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
2,6-Dinitrotoluene	CALAP,WADOE,DoD-ELAP,NELAP
3-Nitroaniline	CALAP,WADOE,DoD-ELAP,NELAP
Acenaphthene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
2,4-Dinitrophenol	CALAP,WADOE,DoD-ELAP,NELAP
Dibenzofuran	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
4-Nitrophenol	CALAP,WADOE,DoD-ELAP,NELAP
2,4-Dinitrotoluene	CALAP,WADOE,DoD-ELAP,NELAP
Fluorene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Diethyl phthalate	CALAP,WADOE,DoD-ELAP,NELAP
4-Chlorophenylphenyl ether	CALAP,WADOE,DoD-ELAP,NELAP
4-Nitroaniline	CALAP,WADOE,DoD-ELAP,NELAP
4,6-Dinitro-2-methylphenol	CALAP,WADOE,DoD-ELAP,NELAP
4-Bromophenyl phenyl ether	CALAP,WADOE,DoD-ELAP,NELAP
Hexachlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP
Pentachlorophenol	CALAP,WADOE,DoD-ELAP,NELAP
Phenanthrene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Anthracene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Carbazole	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Di-n-Butylphthalate	CALAP,WADOE,DoD-ELAP,NELAP
Fluoranthene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Pyrene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Butylbenzylphthalate	CALAP,WADOE,DoD-ELAP,NELAP
Benzo(a)anthracene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Chrysene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
bis(2-Ethylhexyl)phthalate	CALAP,WADOE,DoD-ELAP,NELAP
Di-n-Octylphthalate	CALAP,WADOE,DoD-ELAP,NELAP
Benzo(b)fluoranthene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Benzo(k)fluoranthene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Benzo(a)pyrene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Indeno(1,2,3-cd)pyrene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Dibenzo(a,h)anthracene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Benzo(g,h,i)perylene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Benzofluoranthenes, Total	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
1-Methylnaphthalene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
N-Nitrosodimethylamine	CALAP,WADOE,DoD-ELAP,NELAP
Aniline	CALAP,WADOE,DoD-ELAP,NELAP
Benzidine	CALAP,WADOE,DoD-ELAP,NELAP
Retene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Perylene	CALAP,WADOE,ADEC
Pyridine	CALAP,WADOE,DoD-ELAP,NELAP
N-Nitrosomethylethylamine	CALAP
2,6-Dichlorophenol	CALAP,WADOE
alpha-Terpineol	CALAP,WADOE,DoD-ELAP,NELAP
1,4-Dioxane	CALAP,WADOE,DoD-ELAP,NELAP
2,3,4,6-Tetrachlorophenol	CALAP,WADOE,DoD-ELAP
Triphenyl Phosphate	CALAP,WADOE,DoD-ELAP,NELAP
Butyl Diphenyl Phosphate	CALAP,WADOE,DoD-ELAP,NELAP
Dibutyl Phenyl Phosphate	CALAP,WADOE,DoD-ELAP,NELAP
Tributyl Phosphate	CALAP,WADOE,DoD-ELAP,NELAP
Butylated Hydroxytoluene	CALAP,WADOE,DoD-ELAP,NELAP
Azobenzene (1,2-DP-Hydrazine)	CALAP,WADOE,DoD-ELAP,NELAP
Tetrachloroguaiacol	CALAP,WADOE,DoD-ELAP
3,4,5-Trichloroguaiacol	CALAP,WADOE,DoD-ELAP
3,4,6-Trichloroguaiacol	CALAP,WADOE,DoD-ELAP
4,5,6-Trichloroguaiacol	CALAP,WADOE,DoD-ELAP
Guaiacol	CALAP,WADOE,DoD-ELAP
1,2,4,5-Tetrachlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP
SM 4500-P E-99 in Water	
Total Phosphorus	WADOE,NELAP
SM 9222D in Water	
Fecal Coliforms	WADOE

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	05/11/2018
CALAP	California Department of Public Health CAELAP	2748	06/30/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018

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Herrera Environmental Consultants	Project: Bobby Moris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	09-Apr-2018 14:34

Notes and Definitions

U	This analyte is not detected above the applicable reporting or detection limit.
M	Estimated value for a GC/MS analyte detected and confirmed by an analyst but with low spectral match parameters.
J	Estimated concentration value detected below the reporting limit.
D	The reported value is from a dilution
B	This analyte was detected in the method blank.
*	Flagged value is not within established control limits.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

20 April 2018

Rob Zisette
Herrera Environmental Consultants
2200 6th Avenue, Suite 1100
Seattle, WA 98121

RE: Bobby Morris Playfield

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
18D0106	N/A

Amanda Volgardsen

Digitally signed by Amanda Volgardsen
DN: c=US, st=Washington, l=Tukwila, o=Analytical Resources, Inc., ou=Project Manager, cn=Amanda Volgardsen, email=amanda.volgardsen@arilabs.com
Date: 2018.04.20 15:27:23 -07'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in it entirety.

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006

PJLA Testing
Accreditation # 66169

HERRERA
2200 Sixth Avenue | Suite 1100
Seattle, Washington | 98121
p 206 441 9080 | f 206 441 9108

18D0106

Chain of Custody Record

Project Name:	Project Number:	Client:
Bobby Morris Playfield Monitoring	18-06769-000	Herrera Environmental

Report To: Rob Zisette

Page: 1/2

Sampled By: Alex Svindsw

Delivery Method: in cooler w/ ice

Laboratory: Analytical Resources, Inc.

Requested Completion Date:

Total No. of Containers: 36

Lab Use:

Sample ID	Date	Time	Sample Type (see codes)	Preservative? (Y/N)	Matrix (see codes)	Analyses Requested: Total Suspended Solids- EPA 160.2	Total Hardness as CaCO3-SM 2340B	Total phosphorus - SM 4500P-F	Lead, dissolved - EPA 200.8	Lead, total - EPA 200.8	Copper, dissolved - EPA 200.8	Copper, total - EPA 200.8	Zinc, dissolved - EPA 200.8	Zinc, total - EPA 200.8	Fecal coliform bacteria – SM 9222D	SVOCs, EPA 8270	BOD_5, SM 5210B
Bobby Morris A			G	N	SW	X	X	X	X	X	X	X	X	X	X	X	X
Bobby Morris B			G	N	SW	X	X	X	X	X	X	X	X	X	X	X	X
Miller A			G	N	SW	X	X	X	X	X	X	X	X	X	X	X	X
Miller B			G	N	SW	X	X	X	X	X	X	X	X	X	X	X	X

Comments/Special Instructions:

Relinquished by (Name/CO)	Signature	Date/Time		Received By (Name/CO)	Signature	Date/Time
Alex Svindsw/ Asc		4/7/18 1130		ARI	Jacobshalter	04/07/18 1130
Relinquished by (Name/CO)	Signature	Date/Time		Received By (Name/CO)	Signature	Date/Time

3.9°C
1.2°C

Sample Type: G=Grab C=Composite

Matrix Codes: A=Air GW=Groundwater SE=Sediment SO=Soil SW=Surface Water W=Water (blanks) M=Material O=Other (specify)

HERRERA
2200 Sixth Avenue | Suite 1100
Seattle, Washington | 98121
p 206 441 9080 | f 206 441 9108

18D0106

Chain of Custody Record

Project Name:	Project Number:	Client:
Bobby Morris Playfield Monitoring	18-06769-000	Herrera Environmental

Report To:	Page:
Rob Zisette	2/2
Sampled By:	Delivery Method:

Laboratory:	Requested Completion Date:	Total No. of Containers:
Analytical Resources, Inc.		

Lab Use:

Analyses Requested

Sample ID	Date	Time	Sample Type (see codes)	Preservative? (Y/N)	Matrix (see codes)	Total Nitrogen, SM 4500 N	Nitrate+Nitrite N SM 4500 NO3E	Soluble Reactive Phosphorus, SM 4500-P F										
Bobby Morris A			G	N	SW	X	X	X										
Bobby Morris B			G	N	SW	X	X	X										
Miller A			G	N	SW	X	X	X										
Miller B			G	N	SW	X	X	X										

Comments/Special Instructions:

Relinquished by (Name/CO)	Signature	Date/Time		Received By (Name/CO)	Signature	Date/Time
Alex Swanson/HEC		4/7/18 1130		Jacob Walter/ARI		04/07/18 1130
Relinquished by (Name/CO)	Signature	Date/Time		Received By (Name/CO)	Signature	Date/Time

3.9°C
1.7°F

Sample Type: G=Grab C=Composite

Matrix Codes: A=Air GW=Groundwater SE=Sediment SO=Soil SW=Surface Water W=Water (blanks) M=Material O=Other (specify)

Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Bobby Morris A	18D0106-01	Water	07-Apr-2018 08:50	07-Apr-2018 11:30
Bobby Morris A	18D0106-02	Water	07-Apr-2018 08:50	07-Apr-2018 11:30
Bobby Morris B	18D0106-03	Water	07-Apr-2018 10:00	07-Apr-2018 11:30
Bobby Morris B	18D0106-04	Water	07-Apr-2018 10:00	07-Apr-2018 11:30
Miller A	18D0106-05	Water	07-Apr-2018 09:30	07-Apr-2018 11:30
Miller A	18D0106-06	Water	07-Apr-2018 09:30	07-Apr-2018 11:30
Miller B	18D0106-07	Water	07-Apr-2018 10:35	07-Apr-2018 11:30
Miller B	18D0106-08	Water	07-Apr-2018 10:35	07-Apr-2018 11:30

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Case Narrative

Sample receipt

Samples as listed on the preceding page were received April 7, 2018 under ARI work order 18D0106. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Semivolatiles - EPA Method SW8270D

The samples were extracted and analyzed within the recommended holding times.

Initial calibrations were within method requirements.

The initial calibration verification (ICV) is outside of control limits high for Butylybenzylphthalate. The samples are all non-detect, so only the QC is flagged with a "Q" qualifier. No further corrective action was taken.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank was clean at the reporting limits.

The LCS has low percent recovery for 4-Chloroaniline. The samples are non-detect. All other LCS percent recoveries were within control limits. No corrective action was taken.

Total and Dissolved Metals - EPA Method 200.8

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

Total Hardness - EPA Method 6010C

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank was clean at the reporting limits.

The LCS percent recoveries were within control limits.

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Wet Chemistry (BOD, O-Phos, TSS, T-Phos, TKN, NO2+NO3, Fecal Coliform)

The samples were prepared and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

A O-Phos matrix spike and duplicate were prepared in conjunction with sample Bobby Morris A. The matrix spike percent recovery and duplicate RPD were within QC limits.

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WORK ORDER

18D0106

Client: Herrera Environmental Consultants	**Project Manager: Amanda Volgardsen**
Project: Bobby Moris Playfield	**Project Number: Bobby Moris Playfield**

Preservation Confirmation

Container ID	Container Type	pH	
18D0106-01 A	Large OJ, 1000 mL		
18D0106-01 B	Large OJ, 1000 mL		
18D0106-01 C	Corning Plastic, 125 mL, Na2S2O3		
18D0106-01 D	Small OJ, 500 mL, 9N H2SO4	<2	Pass
18D0106-01 E	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
18D0106-01 F	Glass NM, Amber, 500 mL		
18D0106-01 G	Glass NM, Amber, 500 mL		
18D0106-01 H	Glass NM, Amber, 500 mL		
18D0106-02 A	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
18D0106-03 A	Large OJ, 1000 mL		
18D0106-03 B	Large OJ, 1000 mL		
18D0106-03 C	Corning Plastic, 125 mL, Na2S2O3		
18D0106-03 D	Small OJ, 500 mL, 9N H2SO4	<2	Pass
18D0106-03 E	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
18D0106-03 F	Glass NM, Amber, 500 mL		
18D0106-03 G	Glass NM, Amber, 500 mL		
18D0106-03 H	Glass NM, Amber, 500 mL		
18D0106-04 A	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
18D0106-05 A	Large OJ, 1000 mL		
18D0106-05 B	Large OJ, 1000 mL		
18D0106-05 C	Corning Plastic, 125 mL, Na2S2O3		
18D0106-05 D	Small OJ, 500 mL, 9N H2SO4	<2	Pass
18D0106-05 E	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
18D0106-05 F	Glass NM, Amber, 500 mL		
18D0106-05 G	Glass NM, Amber, 500 mL		
18D0106-05 H	Glass NM, Amber, 500 mL		
18D0106-06 A	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
18D0106-07 A	Large OJ, 1000 mL		
18D0106-07 B	Large OJ, 1000 mL		
18D0106-07 C	Corning Plastic, 125 mL, Na2S2O3		
18D0106-07 D	Small OJ, 500 mL, 9N H2SO4	<2	Pass
18D0106-07 E	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
18D0106-07 F	Glass NM, Amber, 500 mL		
18D0106-07 G	Glass NM, Amber, 500 mL		
18D0106-07 H	Glass NM, Amber, 500 mL		

Reviewed By

Date

WORK ORDER

18D0106

Client: Herrera Environmental Consultants | **Project Manager:** Amanda Volgardsen

Project: Bobby Moris Playfield | **Project Number:** Bobby Moris Playfield

18D0106-08 A	HDPE NM, 500 mL, 1:1 HNO3	C2	Pass

JSW
Preservation Confirmed By

04/07/18
Date

Reviewed By

Date

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Herrera Project Name: _____

COC No(s): _____ NA Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 18D0106 Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry): 3.9 1.2

Time: 1130

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: D0005206

Cooler Accepted by: JBW Date: 04/07/18 Time: 1130

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used?	(Bubble Wrap) (Wet Ice) Gel Packs (Baggies) (Foam Block) Paper Other: _____		
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
Were all bottles sealed in individual plastic bags?		YES	(NO)
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)	NA	(YES)	NO
Were all VOC vials free of air bubbles?	(NA)	YES	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	(NA)		

Was Sample Split by ARI : (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: JBW Date: 04/07/18 Time: 1138

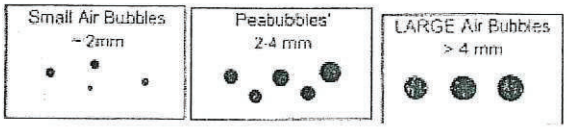
*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

COC missing sample Date/Time

By: JBW Date: 04/07/18



Small → "sm" (< 2 mm)

Peabubbles → "pb" (2 to < 4 mm)

Large → "lg" (4 to < 6 mm)

Headspace → "hs" (> 6 mm)

Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris A

18D0106-01 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 04/07/2018 08:50

Instrument: NT6 — Analyzed: 13-Apr-2018 13:05

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGD0097 — Sample Size: 500 mL
Prepared: 09-Apr-2018 — Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	0.2	1.0	ND	ug/L	U
bis(2-chloroethyl) ether	111-44-4	1	0.4	1.0	ND	ug/L	U
2-Chlorophenol	95-57-8	1	0.4	1.0	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.3	1.0	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.3	1.0	ND	ug/L	U
Benzyl Alcohol	100-51-6	1	1.0	2.0	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.3	1.0	ND	ug/L	U
2-Methylphenol	95-48-7	1	0.3	1.0	ND	ug/L	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	0.5	1.0	ND	ug/L	U
4-Methylphenol	106-44-5	1	0.4	2.0	ND	ug/L	U
N-Nitroso-di-n-Propylamine	621-64-7	1	0.2	1.0	ND	ug/L	U
Hexachloroethane	67-72-1	1	0.3	2.0	ND	ug/L	U
Nitrobenzene	98-95-3	1	0.4	1.0	ND	ug/L	U
Isophorone	78-59-1	1	0.5	1.0	ND	ug/L	U
2-Nitrophenol	88-75-5	1	0.5	3.0	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	1.0	3.0	ND	ug/L	U
Bis(2-Chloroethoxy)methane	111-91-1	1	0.6	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	3.4	20.0	ND	ug/L	U
2,4-Dichlorophenol	120-83-2	1	1.9	3.0	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.3	1.0	ND	ug/L	U
Naphthalene	91-20-3	1	0.2	1.0	ND	ug/L	U
4-Chloroaniline	106-47-8	1	1.9	5.0	ND	ug/L	U
Hexachlorobutadiene	87-68-3	1	0.1	3.0	ND	ug/L	U
4-Chloro-3-Methylphenol	59-50-7	1	2.0	3.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	0.2	1.0	ND	ug/L	U
Hexachlorocyclopentadiene	77-47-4	1	2.5	5.0	ND	ug/L	U
2,4,6-Trichlorophenol	88-06-2	1	1.9	3.0	ND	ug/L	U
2,4,5-Trichlorophenol	95-95-4	1	1.8	5.0	ND	ug/L	U
2-Chloronaphthalene	91-58-7	1	0.5	1.0	ND	ug/L	U
2-Nitroaniline	88-74-4	1	2.0	3.0	ND	ug/L	U
Dimethylphthalate	131-11-3	1	0.4	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.3	1.0	ND	ug/L	U
2,6-Dinitrotoluene	606-20-2	1	2.1	3.0	ND	ug/L	U
3-Nitroaniline	99-09-2	1	2.2	3.0	ND	ug/L	U
Acenaphthene	83-32-9	1	0.3	1.0	ND	ug/L	U
2,4-Dinitrophenol	51-28-5	1	4.9	20.0	ND	ug/L	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris A

18D0106-01 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 04/07/2018 08:50

Instrument: NT6 — Analyzed: 13-Apr-2018 13:05

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dibenzofuran	132-64-9	1	0.3	1.0	ND	ug/L	U
4-Nitrophenol	100-02-7	1	1.0	10.0	ND	ug/L	U
2,4-Dinitrotoluene	121-14-2	1	2.0	3.0	ND	ug/L	U
Fluorene	86-73-7	1	0.3	1.0	ND	ug/L	U
Diethyl phthalate	84-66-2	1	0.4	1.0	ND	ug/L	U
4-Chlorophenylphenyl ether	7005-72-3	1	0.4	1.0	ND	ug/L	U
4-Nitroaniline	100-01-6	1	1.9	3.0	ND	ug/L	U
4,6-Dinitro-2-methylphenol	534-52-1	1	5.0	10.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.4	1.0	ND	ug/L	U
4-Bromophenyl phenyl ether	101-55-3	1	0.3	1.0	ND	ug/L	U
Hexachlorobenzene	118-74-1	1	0.4	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	2.6	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	0.2	1.0	ND	ug/L	U
Anthracene	120-12-7	1	0.4	1.0	ND	ug/L	U
Carbazole	86-74-8	1	0.6	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.5	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	0.4	1.0	ND	ug/L	U
Pyrene	129-00-0	1	0.3	1.0	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.4	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.4	1.0	ND	ug/L	U
3,3'-Dichlorobenzidine	91-94-1	1	1.6	5.0	ND	ug/L	U
Chrysene	218-01-9	1	0.4	1.0	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.5	3.0	ND	ug/L	U
Di-n-Octylphthalate	117-84-0	1	0.4	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.5	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.4	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.4	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.5	1.0	ND	ug/L	U
Benzofluoranthenes, Total		1	0.8	2.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.3	1.0	ND	ug/L	U
Surrogate: 2-Fluorophenol				*33-120 %*	*60.6*	*%*	
Surrogate: Phenol-d5				*38-120 %*	*56.8*	*%*	
Surrogate: 2-Chlorophenol-d4				*41-120 %*	*61.9*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*20-120 %*	*59.5*	*%*	
Surrogate: Nitrobenzene-d5				*27-120 %*	*65.2*	*%*	
Surrogate: 2-Fluorobiphenyl				*33-120 %*	*58.1*	*%*	
Surrogate: 2,4,6-Tribromophenol				*52-120 %*	*72.3*	*%*	
Surrogate: p-Terphenyl-d14				*28-120 %*	*51.8*	*%*	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris A

18D0106-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.7 — Sampled: 04/07/2018 08:50

Instrument: ICP2 — Analyzed: 16-Apr-2018 14:50

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGD0215 — Sample Size: 25 mL
Prepared: 11-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0051	0.0500	**17.0**	mg/L	
Magnesium	7439-95-4	1	0.0160	0.0500	**4.40**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris A

18D0106-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 — Sampled: 04/07/2018 08:50

Instrument: ICPMS2 — Analyzed: 10-Apr-2018 14:26

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0171 — Sample Size: 25 mL
Prepared: 10-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead	7439-92-1	1	0.0680	0.100	**0.794**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris A

18D0106-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 04/07/2018 08:50

Instrument: ICPMS2 — Analyzed: 10-Apr-2018 14:26

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0171 — Sample Size: 25 mL
Prepared: 10-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper	7440-50-8	1	0.340	0.500	**8.47**	ug/L	
Zinc	7440-66-6	1	0.820	4.00	**32.9**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris A

18D0106-01 (Water)

Wet Chemistry

Method: EPA 160.2 — Sampled: 04/07/2018 08:50

Instrument: BAL2 — Analyzed: 09-Apr-2018 10:08

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0135 — Sample Size: 840 mL
Prepared: 09-Apr-2018 — Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	**8**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris A

18D0106-01 (Water)

Wet Chemistry

Method: SM 4500-Norg D-97 — Sampled: 04/07/2018 08:50

Instrument: LACHAT2 — Analyzed: 17-Apr-2018 13:30

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0237 — Sample Size: 25 mL
Prepared: 11-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Kjeldahl Nitrogen		1	0.5	0.5	**0.8**	mg-N/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris A

18D0106-01 (Water)

Wet Chemistry

Method: SM 4500-P E-99 — Sampled: 04/07/2018 08:50

Instrument: UV1800-2 — Analyzed: 07-Apr-2018 17:25

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0131 — Sample Size: 50 mL
Prepared: 07-Apr-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Orthophosphorus	1426-54-42	1	0.0040	0.0040	**0.0370**	mg-P/L	

Sample Preparation: Preparation Method: SM 4500-P B-4 Strong Acid
Preparation Batch: BGD0184 — Sample Size: 25 mL
Prepared: 10-Apr-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Phosphorus	7723-14-0	1	0.0080	0.0080	**0.150**	mg-P/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris A

18D0106-01 (Water)

Wet Chemistry

Method: SM 5210 B-01 — Sampled: 04/07/2018 08:50

Instrument: BOD1 — Analyzed: 12-Apr-2018 10:42

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0129 — Sample Size: 250 mL
Prepared: 07-Apr-2018 — Final Volume: 300 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
BOD		1	1.2	1.2	**1.4**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris A

18D0106-01 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 04/07/2018 08:50

Instrument: [CALC] — Analyzed: 16-Apr-2018 14:50

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 11-Apr-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1	0.331	**60.5**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris A

18D0106-01 (Water)

Microbiology

Method: SM 9222D — Sampled: 04/07/2018 08:50

Instrument: N/A — Analyzed: 08-Apr-2018 12:55

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0128 — Sample Size: 1 mL
Prepared: 07-Apr-2018 — Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Fecal Coliforms		1		100	**3300**	CFU/100 ml	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris A

18D0106-01RE1 (Water)

Wet Chemistry

Method: SM 4500-$NO3^-$ I-00 — Sampled: 04/07/2018 08:50

Instrument: LACHAT2 — Analyzed: 18-Apr-2018 17:44

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0302 — Sample Size: 10 mL
Prepared: 13-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	**0.574**	mg-N/L	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris A

18D0106-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 04/07/2018 08:50

Instrument: ICPMS2 — Analyzed: 17-Apr-2018 14:58

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0352 — Sample Size: 25 mL
Prepared: 17-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris A

18D0106-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 04/07/2018 08:50

Instrument: ICPMS2 — Analyzed: 17-Apr-2018 14:58

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0352 — Sample Size: 25 mL
Prepared: 17-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.340	0.500	**5.49**	ug/L	
Zinc, Dissolved	7440-66-6	1	0.820	4.00	**26.6**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris B

18D0106-03 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 04/07/2018 10:00

Instrument: NT6 — Analyzed: 13-Apr-2018 13:38

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGD0097 — Sample Size: 500 mL
Prepared: 09-Apr-2018 — Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	0.2	1.0	ND	ug/L	U
bis(2-chloroethyl) ether	111-44-4	1	0.4	1.0	ND	ug/L	U
2-Chlorophenol	95-57-8	1	0.4	1.0	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.3	1.0	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.3	1.0	ND	ug/L	U
Benzyl Alcohol	100-51-6	1	1.0	2.0	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.3	1.0	ND	ug/L	U
2-Methylphenol	95-48-7	1	0.3	1.0	ND	ug/L	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	0.5	1.0	ND	ug/L	U
4-Methylphenol	106-44-5	1	0.4	2.0	ND	ug/L	U
N-Nitroso-di-n-Propylamine	621-64-7	1	0.2	1.0	ND	ug/L	U
Hexachloroethane	67-72-1	1	0.3	2.0	ND	ug/L	U
Nitrobenzene	98-95-3	1	0.4	1.0	ND	ug/L	U
Isophorone	78-59-1	1	0.5	1.0	ND	ug/L	U
2-Nitrophenol	88-75-5	1	0.5	3.0	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	1.0	3.0	ND	ug/L	U
Bis(2-Chloroethoxy)methane	111-91-1	1	0.6	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	3.4	20.0	ND	ug/L	U
2,4-Dichlorophenol	120-83-2	1	1.9	3.0	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.3	1.0	ND	ug/L	U
Naphthalene	91-20-3	1	0.2	1.0	ND	ug/L	U
4-Chloroaniline	106-47-8	1	1.9	5.0	ND	ug/L	U
Hexachlorobutadiene	87-68-3	1	0.1	3.0	ND	ug/L	U
4-Chloro-3-Methylphenol	59-50-7	1	2.0	3.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	0.2	1.0	ND	ug/L	U
Hexachlorocyclopentadiene	77-47-4	1	2.5	5.0	ND	ug/L	U
2,4,6-Trichlorophenol	88-06-2	1	1.9	3.0	ND	ug/L	U
2,4,5-Trichlorophenol	95-95-4	1	1.8	5.0	ND	ug/L	U
2-Chloronaphthalene	91-58-7	1	0.5	1.0	ND	ug/L	U
2-Nitroaniline	88-74-4	1	2.0	3.0	ND	ug/L	U
Dimethylphthalate	131-11-3	1	0.4	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.3	1.0	ND	ug/L	U
2,6-Dinitrotoluene	606-20-2	1	2.1	3.0	ND	ug/L	U
3-Nitroaniline	99-09-2	1	2.2	3.0	ND	ug/L	U
Acenaphthene	83-32-9	1	0.3	1.0	ND	ug/L	U
2,4-Dinitrophenol	51-28-5	1	4.9	20.0	ND	ug/L	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris B

18D0106-03 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 04/07/2018 10:00

Instrument: NT6 — Analyzed: 13-Apr-2018 13:38

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dibenzofuran	132-64-9	1	0.3	1.0	ND	ug/L	U
4-Nitrophenol	100-02-7	1	1.0	10.0	ND	ug/L	U
2,4-Dinitrotoluene	121-14-2	1	2.0	3.0	ND	ug/L	U
Fluorene	86-73-7	1	0.3	1.0	ND	ug/L	U
Diethyl phthalate	84-66-2	1	0.4	1.0	ND	ug/L	U
4-Chlorophenylphenyl ether	7005-72-3	1	0.4	1.0	ND	ug/L	U
4-Nitroaniline	100-01-6	1	1.9	3.0	ND	ug/L	U
4,6-Dinitro-2-methylphenol	534-52-1	1	5.0	10.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.4	1.0	ND	ug/L	U
4-Bromophenyl phenyl ether	101-55-3	1	0.3	1.0	ND	ug/L	U
Hexachlorobenzene	118-74-1	1	0.4	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	2.6	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	0.2	1.0	ND	ug/L	U
Anthracene	120-12-7	1	0.4	1.0	ND	ug/L	U
Carbazole	86-74-8	1	0.6	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.5	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	0.4	1.0	ND	ug/L	U
Pyrene	129-00-0	1	0.3	1.0	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.4	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.4	1.0	ND	ug/L	U
3,3'-Dichlorobenzidine	91-94-1	1	1.6	5.0	ND	ug/L	U
Chrysene	218-01-9	1	0.4	1.0	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.5	3.0	ND	ug/L	U
Di-n-Octylphthalate	117-84-0	1	0.4	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.5	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.4	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.4	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.5	1.0	ND	ug/L	U
Benzofluoranthenes, Total		1	0.8	2.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.3	1.0	ND	ug/L	U
Surrogate: 2-Fluorophenol				*33-120 %*	*61.4*	*%*	
Surrogate: Phenol-d5				*38-120 %*	*57.3*	*%*	
Surrogate: 2-Chlorophenol-d4				*41-120 %*	*62.5*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*20-120 %*	*59.1*	*%*	
Surrogate: Nitrobenzene-d5				*27-120 %*	*66.5*	*%*	
Surrogate: 2-Fluorobiphenyl				*33-120 %*	*60.4*	*%*	
Surrogate: 2,4,6-Tribromophenol				*52-120 %*	*76.3*	*%*	
Surrogate: p-Terphenyl-d14				*28-120 %*	*62.3*	*%*	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris B

18D0106-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.7 — Sampled: 04/07/2018 10:00

Instrument: ICP2 — Analyzed: 16-Apr-2018 14:54

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGD0215 — Sample Size: 25 mL
Prepared: 11-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0051	0.0500	**16.6**	mg/L	
Magnesium	7439-95-4	1	0.0160	0.0500	**4.30**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris B

18D0106-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 — Sampled: 04/07/2018 10:00

Instrument: ICPMS2 — Analyzed: 10-Apr-2018 14:30

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0171 — Sample Size: 25 mL
Prepared: 10-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead	7439-92-1	1	0.0680	0.100	**0.894**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris B

18D0106-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 04/07/2018 10:00

Instrument: ICPMS2 — Analyzed: 10-Apr-2018 14:30

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0171 — Sample Size: 25 mL
Prepared: 10-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper	7440-50-8	1	0.340	0.500	**9.34**	ug/L	
Zinc	7440-66-6	1	0.820	4.00	**36.8**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris B

18D0106-03 (Water)

Wet Chemistry

Method: EPA 160.2 — Sampled: 04/07/2018 10:00

Instrument: BAL2 — Analyzed: 09-Apr-2018 10:08

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0135 — Sample Size: 910 mL
Prepared: 09-Apr-2018 — Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	**12**	mg/L	

Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris B

18D0106-03 (Water)

Wet Chemistry

Method: SM 4500-Norg D-97 — Sampled: 04/07/2018 10:00

Instrument: LACHAT2 — Analyzed: 17-Apr-2018 13:31

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0237 — Sample Size: 25 mL
Prepared: 11-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Kjeldahl Nitrogen		1	0.5	0.5	**0.8**	mg-N/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris B

18D0106-03 (Water)

Wet Chemistry

Method: SM 4500-P E-99 — Sampled: 04/07/2018 10:00

Instrument: UV1800-2 — Analyzed: 07-Apr-2018 17:26

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0131 — Sample Size: 50 mL
Prepared: 07-Apr-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Orthophosphorus	1426-54-42	1	0.0040	0.0040	**0.0390**	mg-P/L	

Sample Preparation: Preparation Method: SM 4500-P B-5 Persulfate
Preparation Batch: BGD0183 — Sample Size: 25 mL
Prepared: 10-Apr-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Phosphorus	7723-14-0	1	0.0080	0.0080	**0.0980**	mg-P/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris B

18D0106-03 (Water)

Wet Chemistry

Method: SM 5210 B-01 — Sampled: 04/07/2018 10:00

Instrument: BOD1 — Analyzed: 12-Apr-2018 10:42

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0129 — Sample Size: 250 mL
Prepared: 07-Apr-2018 — Final Volume: 300 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
BOD		1	1.2	1.2	**1.5**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris B

18D0106-03 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 04/07/2018 10:00

Instrument: [CALC] — Analyzed: 16-Apr-2018 14:54

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 11-Apr-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1	0.331	**59.2**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris B

18D0106-03 (Water)

Microbiology

Method: SM 9222D — Sampled: 04/07/2018 10:00

Instrument: N/A — Analyzed: 08-Apr-2018 12:55

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0128 — Sample Size: 4 mL
Prepared: 07-Apr-2018 — Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Fecal Coliforms		1		25	**550**	CFU/100 ml	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris B

18D0106-03RE1 (Water)

Wet Chemistry

Method: SM 4500-$NO3^-$ I-00 — Sampled: 04/07/2018 10:00

Instrument: LACHAT2 — Analyzed: 18-Apr-2018 17:45

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0302 — Sample Size: 10 mL
Prepared: 13-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	**0.539**	mg-N/L	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris B

18D0106-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 04/07/2018 10:00

Instrument: ICPMS2 — Analyzed: 17-Apr-2018 15:02

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0352 — Sample Size: 25 mL
Prepared: 17-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Bobby Morris B

18D0106-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 04/07/2018 10:00

Instrument: ICPMS2 — Analyzed: 17-Apr-2018 15:02

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0352 — Sample Size: 25 mL
Prepared: 17-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.340	0.500	**5.95**	ug/L	
Zinc, Dissolved	7440-66-6	1	0.820	4.00	**29.8**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller A

18D0106-05 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 04/07/2018 09:30

Instrument: NT6 — Analyzed: 13-Apr-2018 14:11

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGD0097 — Sample Size: 500 mL
Prepared: 09-Apr-2018 — Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	0.2	1.0	ND	ug/L	U
bis(2-chloroethyl) ether	111-44-4	1	0.4	1.0	ND	ug/L	U
2-Chlorophenol	95-57-8	1	0.4	1.0	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.3	1.0	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.3	1.0	ND	ug/L	U
Benzyl Alcohol	100-51-6	1	1.0	2.0	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.3	1.0	ND	ug/L	U
2-Methylphenol	95-48-7	1	0.3	1.0	ND	ug/L	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	0.5	1.0	ND	ug/L	U
4-Methylphenol	106-44-5	1	0.4	2.0	ND	ug/L	U
N-Nitroso-di-n-Propylamine	621-64-7	1	0.2	1.0	ND	ug/L	U
Hexachloroethane	67-72-1	1	0.3	2.0	ND	ug/L	U
Nitrobenzene	98-95-3	1	0.4	1.0	ND	ug/L	U
Isophorone	78-59-1	1	0.5	1.0	ND	ug/L	U
2-Nitrophenol	88-75-5	1	0.5	3.0	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	1.0	3.0	ND	ug/L	U
Bis(2-Chloroethoxy)methane	111-91-1	1	0.6	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	3.4	20.0	ND	ug/L	U
2,4-Dichlorophenol	120-83-2	1	1.9	3.0	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.3	1.0	ND	ug/L	U
Naphthalene	91-20-3	1	0.2	1.0	ND	ug/L	U
4-Chloroaniline	106-47-8	1	1.9	5.0	ND	ug/L	U
Hexachlorobutadiene	87-68-3	1	0.1	3.0	ND	ug/L	U
4-Chloro-3-Methylphenol	59-50-7	1	2.0	3.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	0.2	1.0	ND	ug/L	U
Hexachlorocyclopentadiene	77-47-4	1	2.5	5.0	ND	ug/L	U
2,4,6-Trichlorophenol	88-06-2	1	1.9	3.0	ND	ug/L	U
2,4,5-Trichlorophenol	95-95-4	1	1.8	5.0	ND	ug/L	U
2-Chloronaphthalene	91-58-7	1	0.5	1.0	ND	ug/L	U
2-Nitroaniline	88-74-4	1	2.0	3.0	ND	ug/L	U
Dimethylphthalate	131-11-3	1	0.4	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.3	1.0	ND	ug/L	U
2,6-Dinitrotoluene	606-20-2	1	2.1	3.0	ND	ug/L	U
3-Nitroaniline	99-09-2	1	2.2	3.0	ND	ug/L	U
Acenaphthene	83-32-9	1	0.3	1.0	ND	ug/L	U
2,4-Dinitrophenol	51-28-5	1	4.9	20.0	ND	ug/L	U

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller A

18D0106-05 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 04/07/2018 09:30

Instrument: NT6 — Analyzed: 13-Apr-2018 14:11

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dibenzofuran	132-64-9	1	0.3	1.0	ND	ug/L	U
4-Nitrophenol	100-02-7	1	1.0	10.0	ND	ug/L	U
2,4-Dinitrotoluene	121-14-2	1	2.0	3.0	ND	ug/L	U
Fluorene	86-73-7	1	0.3	1.0	ND	ug/L	U
Diethyl phthalate	84-66-2	1	0.4	1.0	ND	ug/L	U
4-Chlorophenylphenyl ether	7005-72-3	1	0.4	1.0	ND	ug/L	U
4-Nitroaniline	100-01-6	1	1.9	3.0	ND	ug/L	U
4,6-Dinitro-2-methylphenol	534-52-1	1	5.0	10.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.4	1.0	ND	ug/L	U
4-Bromophenyl phenyl ether	101-55-3	1	0.3	1.0	ND	ug/L	U
Hexachlorobenzene	118-74-1	1	0.4	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	2.6	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	0.2	1.0	ND	ug/L	U
Anthracene	120-12-7	1	0.4	1.0	ND	ug/L	U
Carbazole	86-74-8	1	0.6	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.5	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	0.4	1.0	ND	ug/L	U
Pyrene	129-00-0	1	0.3	1.0	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.4	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.4	1.0	ND	ug/L	U
3,3'-Dichlorobenzidine	91-94-1	1	1.6	5.0	ND	ug/L	U
Chrysene	218-01-9	1	0.4	1.0	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.5	3.0	ND	ug/L	U
Di-n-Octylphthalate	117-84-0	1	0.4	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.5	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.4	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.4	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.5	1.0	ND	ug/L	U
Benzofluoranthenes, Total		1	0.8	2.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.3	1.0	ND	ug/L	U
Surrogate: 2-Fluorophenol				*33-120 %*	*70.1*	*%*	
Surrogate: Phenol-d5				*38-120 %*	*67.4*	*%*	
Surrogate: 2-Chlorophenol-d4				*41-120 %*	*71.2*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*20-120 %*	*66.0*	*%*	
Surrogate: Nitrobenzene-d5				*27-120 %*	*73.9*	*%*	
Surrogate: 2-Fluorobiphenyl				*33-120 %*	*70.4*	*%*	
Surrogate: 2,4,6-Tribromophenol				*52-120 %*	*86.9*	*%*	
Surrogate: p-Terphenyl-d14				*28-120 %*	*81.6*	*%*	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller A

18D0106-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.7 — Sampled: 04/07/2018 09:30

Instrument: ICP2 — Analyzed: 16-Apr-2018 14:58

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGD0215 — Sample Size: 25 mL
Prepared: 11-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0051	0.0500	**36.4**	mg/L	
Magnesium	7439-95-4	1	0.0160	0.0500	**1.15**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller A

18D0106-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 — Sampled: 04/07/2018 09:30

Instrument: ICPMS2 — Analyzed: 10-Apr-2018 14:35

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0171 — Sample Size: 25 mL
Prepared: 10-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead	7439-92-1	1	0.0680	0.100	**0.0970**	ug/L	J

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller A

18D0106-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 04/07/2018 09:30

Instrument: ICPMS2 — Analyzed: 10-Apr-2018 14:35

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0171 — Sample Size: 25 mL
Prepared: 10-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper	7440-50-8	1	0.340	0.500	**6.22**	ug/L	
Zinc	7440-66-6	1	0.820	4.00	**2.41**	ug/L	J

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller A

18D0106-05 (Water)

Wet Chemistry

Method: EPA 160.2 — Sampled: 04/07/2018 09:30

Instrument: BAL2 — Analyzed: 09-Apr-2018 10:08

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0135 — Sample Size: 860 mL
Prepared: 09-Apr-2018 — Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	**2**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller A

18D0106-05 (Water)

Wet Chemistry

Method: SM 4500-Norg D-97 — Sampled: 04/07/2018 09:30

Instrument: LACHAT2 — Analyzed: 17-Apr-2018 13:32

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0237 — Sample Size: 25 mL
Prepared: 11-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Kjeldahl Nitrogen		1	0.5	0.5	ND	mg-N/L	U

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller A

18D0106-05 (Water)

Wet Chemistry

Method: SM 4500-P E-99 — Sampled: 04/07/2018 09:30

Instrument: UV1800-2 — Analyzed: 07-Apr-2018 17:27

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0131 — Sample Size: 50 mL
Prepared: 07-Apr-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Orthophosphorus	1426-54-42	1	0.0040	0.0040	**0.0090**	mg-P/L	

Sample Preparation: Preparation Method: SM 4500-P B-5 Persulfate
Preparation Batch: BGD0183 — Sample Size: 25 mL
Prepared: 10-Apr-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Phosphorus	7723-14-0	1	0.0080	0.0080	**0.0140**	mg-P/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller A

18D0106-05 (Water)

Wet Chemistry

Method: SM 5210 B-01 — Sampled: 04/07/2018 09:30

Instrument: BOD1 — Analyzed: 12-Apr-2018 10:42

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0129 — Sample Size: 250 mL
Prepared: 07-Apr-2018 — Final Volume: 300 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
BOD		1	1.2	1.2	ND	mg/L	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller A

18D0106-05 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 04/07/2018 09:30

Instrument: [CALC] — Analyzed: 16-Apr-2018 14:58

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 11-Apr-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1	0.331	**95.5**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller A

18D0106-05 (Water)

Microbiology

Method: SM 9222D — Sampled: 04/07/2018 09:30

Instrument: N/A — Analyzed: 08-Apr-2018 12:55

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0128 — Sample Size: 100 mL
Prepared: 07-Apr-2018 — Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Fecal Coliforms		1		1	**13**	CFU/100 ml	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller A

18D0106-05RE1 (Water)

Wet Chemistry

Method: SM 4500-NO_3^- I-00 — Sampled: 04/07/2018 09:30

Instrument: LACHAT2 — Analyzed: 18-Apr-2018 17:46

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0302 — Sample Size: 10 mL
Prepared: 13-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	**0.290**	mg-N/L	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller A

18D0106-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 04/07/2018 09:30

Instrument: ICPMS2 — Analyzed: 17-Apr-2018 15:07

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0352 — Sample Size: 25 mL
Prepared: 17-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller A

18D0106-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 04/07/2018 09:30

Instrument: ICPMS2 — Analyzed: 17-Apr-2018 15:07

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0352 — Sample Size: 25 mL
Prepared: 17-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.340	0.500	**5.61**	ug/L	
Zinc, Dissolved	7440-66-6	1	0.820	4.00	**2.39**	ug/L	J

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller B

18D0106-07 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 04/07/2018 10:35

Instrument: NT6 — Analyzed: 13-Apr-2018 14:45

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGD0097 — Sample Size: 500 mL
Prepared: 09-Apr-2018 — Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	0.2	1.0	ND	ug/L	U
bis(2-chloroethyl) ether	111-44-4	1	0.4	1.0	ND	ug/L	U
2-Chlorophenol	95-57-8	1	0.4	1.0	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.3	1.0	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.3	1.0	ND	ug/L	U
Benzyl Alcohol	100-51-6	1	1.0	2.0	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.3	1.0	ND	ug/L	U
2-Methylphenol	95-48-7	1	0.3	1.0	ND	ug/L	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	0.5	1.0	ND	ug/L	U
4-Methylphenol	106-44-5	1	0.4	2.0	ND	ug/L	U
N-Nitroso-di-n-Propylamine	621-64-7	1	0.2	1.0	ND	ug/L	U
Hexachloroethane	67-72-1	1	0.3	2.0	ND	ug/L	U
Nitrobenzene	98-95-3	1	0.4	1.0	ND	ug/L	U
Isophorone	78-59-1	1	0.5	1.0	ND	ug/L	U
2-Nitrophenol	88-75-5	1	0.5	3.0	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	1.0	3.0	ND	ug/L	U
Bis(2-Chloroethoxy)methane	111-91-1	1	0.6	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	3.4	20.0	ND	ug/L	U
2,4-Dichlorophenol	120-83-2	1	1.9	3.0	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.3	1.0	ND	ug/L	U
Naphthalene	91-20-3	1	0.2	1.0	ND	ug/L	U
4-Chloroaniline	106-47-8	1	1.9	5.0	ND	ug/L	U
Hexachlorobutadiene	87-68-3	1	0.1	3.0	ND	ug/L	U
4-Chloro-3-Methylphenol	59-50-7	1	2.0	3.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	0.2	1.0	ND	ug/L	U
Hexachlorocyclopentadiene	77-47-4	1	2.5	5.0	ND	ug/L	U
2,4,6-Trichlorophenol	88-06-2	1	1.9	3.0	ND	ug/L	U
2,4,5-Trichlorophenol	95-95-4	1	1.8	5.0	ND	ug/L	U
2-Chloronaphthalene	91-58-7	1	0.5	1.0	ND	ug/L	U
2-Nitroaniline	88-74-4	1	2.0	3.0	ND	ug/L	U
Dimethylphthalate	131-11-3	1	0.4	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.3	1.0	ND	ug/L	U
2,6-Dinitrotoluene	606-20-2	1	2.1	3.0	ND	ug/L	U
3-Nitroaniline	99-09-2	1	2.2	3.0	ND	ug/L	U
Acenaphthene	83-32-9	1	0.3	1.0	ND	ug/L	U
2,4-Dinitrophenol	51-28-5	1	4.9	20.0	ND	ug/L	U

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller B

18D0106-07 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 04/07/2018 10:35

Instrument: NT6 — Analyzed: 13-Apr-2018 14:45

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dibenzofuran	132-64-9	1	0.3	1.0	ND	ug/L	U
4-Nitrophenol	100-02-7	1	1.0	10.0	ND	ug/L	U
2,4-Dinitrotoluene	121-14-2	1	2.0	3.0	ND	ug/L	U
Fluorene	86-73-7	1	0.3	1.0	ND	ug/L	U
Diethyl phthalate	84-66-2	1	0.4	1.0	ND	ug/L	U
4-Chlorophenylphenyl ether	7005-72-3	1	0.4	1.0	ND	ug/L	U
4-Nitroaniline	100-01-6	1	1.9	3.0	ND	ug/L	U
4,6-Dinitro-2-methylphenol	534-52-1	1	5.0	10.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.4	1.0	ND	ug/L	U
4-Bromophenyl phenyl ether	101-55-3	1	0.3	1.0	ND	ug/L	U
Hexachlorobenzene	118-74-1	1	0.4	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	2.6	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	0.2	1.0	ND	ug/L	U
Anthracene	120-12-7	1	0.4	1.0	ND	ug/L	U
Carbazole	86-74-8	1	0.6	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.5	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	0.4	1.0	ND	ug/L	U
Pyrene	129-00-0	1	0.3	1.0	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.4	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.4	1.0	ND	ug/L	U
3,3'-Dichlorobenzidine	91-94-1	1	1.6	5.0	ND	ug/L	U
Chrysene	218-01-9	1	0.4	1.0	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.5	3.0	ND	ug/L	U
Di-n-Octylphthalate	117-84-0	1	0.4	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.5	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.4	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.4	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.5	1.0	ND	ug/L	U
Benzofluoranthenes, Total		1	0.8	2.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.3	1.0	ND	ug/L	U
Surrogate: 2-Fluorophenol				*33-120 %*	*66.0*	*%*	
Surrogate: Phenol-d5				*38-120 %*	*64.1*	*%*	
Surrogate: 2-Chlorophenol-d4				*41-120 %*	*68.3*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*20-120 %*	*61.8*	*%*	
Surrogate: Nitrobenzene-d5				*27-120 %*	*71.5*	*%*	
Surrogate: 2-Fluorobiphenyl				*33-120 %*	*67.7*	*%*	
Surrogate: 2,4,6-Tribromophenol				*52-120 %*	*82.2*	*%*	
Surrogate: p-Terphenyl-d14				*28-120 %*	*87.3*	*%*	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller B

18D0106-07 (Water)

Metals and Metallic Compounds

Method: EPA 200.7 — Sampled: 04/07/2018 10:35

Instrument: ICP2 — Analyzed: 16-Apr-2018 15:02

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGD0215 — Sample Size: 25 mL
Prepared: 11-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0051	0.0500	**37.1**	mg/L	
Magnesium	7439-95-4	1	0.0160	0.0500	**1.18**	mg/L	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller B

18D0106-07 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 — Sampled: 04/07/2018 10:35

Instrument: ICPMS2 — Analyzed: 10-Apr-2018 14:39

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0171 — Sample Size: 25 mL
Prepared: 10-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller B

18D0106-07 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 04/07/2018 10:35

Instrument: ICPMS2 — Analyzed: 10-Apr-2018 14:39

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0171 — Sample Size: 25 mL
Prepared: 10-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper	7440-50-8	1	0.340	0.500	**5.88**	ug/L	
Zinc	7440-66-6	1	0.820	4.00	**2.67**	ug/L	J

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Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller B

18D0106-07 (Water)

Wet Chemistry

Method: EPA 160.2 — Sampled: 04/07/2018 10:35

Instrument: BAL2 — Analyzed: 09-Apr-2018 10:08

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0135 — Sample Size: 870 mL
Prepared: 09-Apr-2018 — Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	ND	mg/L	U

Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller B

18D0106-07 (Water)

Wet Chemistry

Method: SM 4500-Norg D-97 — Sampled: 04/07/2018 10:35

Instrument: LACHAT2 — Analyzed: 17-Apr-2018 13:34

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0237 — Sample Size: 25 mL
Prepared: 11-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Kjeldahl Nitrogen		1	0.5	0.5	ND	mg-N/L	U

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller B

18D0106-07 (Water)

Wet Chemistry

Method: SM 4500-P E-99 — Sampled: 04/07/2018 10:35

Instrument: UV1800-2 — Analyzed: 07-Apr-2018 17:27

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0131 — Sample Size: 50 mL
Prepared: 07-Apr-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Orthophosphorus	1426-54-42	1	0.0040	0.0040	**0.0070**	mg-P/L	

Sample Preparation: Preparation Method: SM 4500-P B-5 Persulfate
Preparation Batch: BGD0183 — Sample Size: 25 mL
Prepared: 10-Apr-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Phosphorus	7723-14-0	1	0.0080	0.0080	**0.0140**	mg-P/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller B

18D0106-07 (Water)

Wet Chemistry

Method: SM 5210 B-01 — Sampled: 04/07/2018 10:35

Instrument: BOD1 — Analyzed: 12-Apr-2018 10:42

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0129 — Sample Size: 250 mL
Prepared: 07-Apr-2018 — Final Volume: 300 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
BOD		1	1.2	1.2	**2.4**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller B

18D0106-07 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 04/07/2018 10:35

Instrument: [CALC] — Analyzed: 16-Apr-2018 15:02

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 11-Apr-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1	0.331	**97.6**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller B

18D0106-07 (Water)

Microbiology

Method: SM 9222D — Sampled: 04/07/2018 10:35

Instrument: N/A — Analyzed: 08-Apr-2018 12:55

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0128 — Sample Size: 100 mL
Prepared: 07-Apr-2018 — Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Fecal Coliforms		1		1	**15**	CFU/100 ml	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller B

18D0106-07RE1 (Water)

Wet Chemistry

Method: SM 4500-$NO3^-$ I-00 — Sampled: 04/07/2018 10:35

Instrument: LACHAT2 — Analyzed: 18-Apr-2018 17:48

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0302 — Sample Size: 10 mL
Prepared: 13-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	**0.259**	mg-N/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller B

18D0106-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 04/07/2018 10:35

Instrument: ICPMS2 — Analyzed: 17-Apr-2018 15:12

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0352 — Sample Size: 25 mL
Prepared: 17-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Miller B

18D0106-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 04/07/2018 10:35

Instrument: ICPMS2 — Analyzed: 17-Apr-2018 15:12

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0352 — Sample Size: 25 mL
Prepared: 17-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.340	0.500	**5.00**	ug/L	
Zinc, Dissolved	7440-66-6	1	0.820	4.00	**1.70**	ug/L	J

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Semivolatile Organic Compounds - Quality Control

Batch BGD0097 - EPA 3520C (Liq Liq)

Instrument: NT6 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0097-BLK1)				Prepared: 09-Apr-2018 Analyzed: 13-Apr-2018 11:25							
Phenol	ND	0.2	1.0	ug/L							U
bis(2-chloroethyl) ether	ND	0.4	1.0	ug/L							U
2-Chlorophenol	ND	0.4	1.0	ug/L							U
1,3-Dichlorobenzene	ND	0.3	1.0	ug/L							U
1,4-Dichlorobenzene	ND	0.3	1.0	ug/L							U
Benzyl Alcohol	ND	1.0	2.0	ug/L							U
1,2-Dichlorobenzene	ND	0.3	1.0	ug/L							U
2-Methylphenol	ND	0.3	1.0	ug/L							U
2,2'-Oxybis(1-chloropropane)	ND	0.5	1.0	ug/L							U
4-Methylphenol	ND	0.4	2.0	ug/L							U
N-Nitroso-di-n-Propylamine	ND	0.2	1.0	ug/L							U
Hexachloroethane	ND	0.3	2.0	ug/L							U
Nitrobenzene	ND	0.4	1.0	ug/L							U
Isophorone	ND	0.5	1.0	ug/L							U
2-Nitrophenol	ND	0.5	3.0	ug/L							U
2,4-Dimethylphenol	ND	1.0	3.0	ug/L							U
Bis(2-Chloroethoxy)methane	ND	0.6	1.0	ug/L							U
Benzoic acid	ND	3.4	20.0	ug/L							U
2,4-Dichlorophenol	ND	1.9	3.0	ug/L							U
1,2,4-Trichlorobenzene	ND	0.3	1.0	ug/L							U
Naphthalene	ND	0.2	1.0	ug/L							U
4-Chloroaniline	ND	1.9	5.0	ug/L							U
Hexachlorobutadiene	ND	0.1	3.0	ug/L							U
4-Chloro-3-Methylphenol	ND	2.0	3.0	ug/L							U
2-Methylnaphthalene	ND	0.2	1.0	ug/L							U
Hexachlorocyclopentadiene	ND	2.5	5.0	ug/L							U
2,4,6-Trichlorophenol	ND	1.9	3.0	ug/L							U
2,4,5-Trichlorophenol	ND	1.8	5.0	ug/L							U
2-Chloronaphthalene	ND	0.5	1.0	ug/L							U
2-Nitroaniline	ND	2.0	3.0	ug/L							U
Dimethylphthalate	ND	0.4	1.0	ug/L							U
Acenaphthylene	ND	0.3	1.0	ug/L							U
2,6-Dinitrotoluene	ND	2.1	3.0	ug/L							U
3-Nitroaniline	ND	2.2	3.0	ug/L							U
Acenaphthene	ND	0.3	1.0	ug/L							U

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Semivolatile Organic Compounds - Quality Control

Batch BGD0097 - EPA 3520C (Liq Liq)

Instrument: NT6 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0097-BLK1)				Prepared: 09-Apr-2018 Analyzed: 13-Apr-2018 11:25							
2,4-Dinitrophenol	ND	4.9	20.0	ug/L							U
Dibenzofuran	ND	0.3	1.0	ug/L							U
4-Nitrophenol	ND	1.0	10.0	ug/L							U
2,4-Dinitrotoluene	ND	2.0	3.0	ug/L							U
Fluorene	ND	0.3	1.0	ug/L							U
Diethyl phthalate	ND	0.4	1.0	ug/L							U
4-Chlorophenylphenyl ether	ND	0.4	1.0	ug/L							U
4-Nitroaniline	ND	1.9	3.0	ug/L							U
4,6-Dinitro-2-methylphenol	ND	5.0	10.0	ug/L							U
N-Nitrosodiphenylamine	ND	0.4	1.0	ug/L							U
4-Bromophenyl phenyl ether	ND	0.3	1.0	ug/L							U
Hexachlorobenzene	ND	0.4	1.0	ug/L							U
Pentachlorophenol	ND	2.6	10.0	ug/L							U
Phenanthrene	ND	0.2	1.0	ug/L							U
Anthracene	ND	0.4	1.0	ug/L							U
Carbazole	ND	0.6	1.0	ug/L							U
Di-n-Butylphthalate	ND	0.5	1.0	ug/L							U
Fluoranthene	ND	0.4	1.0	ug/L							U
Pyrene	ND	0.3	1.0	ug/L							U
Butylbenzylphthalate	ND	0.4	1.0	ug/L							U
Benzo(a)anthracene	ND	0.4	1.0	ug/L							U
3,3'-Dichlorobenzidine	ND	1.6	5.0	ug/L							U
Chrysene	ND	0.4	1.0	ug/L							U
bis(2-Ethylhexyl)phthalate	ND	0.5	3.0	ug/L							U
Di-n-Octylphthalate	ND	0.4	1.0	ug/L							U
Benzo(a)pyrene	ND	0.5	1.0	ug/L							U
Indeno(1,2,3-cd)pyrene	ND	0.4	1.0	ug/L							U
Dibenzo(a,h)anthracene	ND	0.4	1.0	ug/L							U
Benzo(g,h,i)perylene	ND	0.5	1.0	ug/L							U
Benzofluoranthenes, Total	ND	0.8	2.0	ug/L							U
1-Methylnaphthalene	ND	0.3	1.0	ug/L							U
Surrogate: 2-Fluorophenol	29.2			ug/L	*37.5*		*77.9*	*33-120*			
Surrogate: Phenol-d5	28.1			ug/L	*37.5*		*75.0*	*38-120*			
Surrogate: 2-Chlorophenol-d4	29.5			ug/L	*37.5*		*78.7*	*41-120*			
Surrogate: 1,2-Dichlorobenzene-d4	18.3			ug/L	*25.0*		*73.2*	*20-120*			

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Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Semivolatile Organic Compounds - Quality Control

Batch BGD0097 - EPA 3520C (Liq Liq)

Instrument: NT6 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0097-BLK1)				Prepared: 09-Apr-2018 Analyzed: 13-Apr-2018 11:25							
Surrogate: Nitrobenzene-d5	21.1			ug/L	*25.0*		*84.4*	*27-120*			
Surrogate: 2-Fluorobiphenyl	18.5			ug/L	*25.0*		*73.9*	*33-120*			
Surrogate: 2,4,6-Tribromophenol	32.3			ug/L	*37.5*		*86.2*	*52-120*			
Surrogate: p-Terphenyl-d14	24.3			ug/L	*25.0*		*97.3*	*28-120*			
LCS (BGD0097-BS1)				Prepared: 09-Apr-2018 Analyzed: 13-Apr-2018 11:58							
Phenol	15.3	0.2	1.0	ug/L	25.0		61.3	35-120			
bis(2-chloroethyl) ether	17.3	0.4	1.0	ug/L	25.0		69.1	46.5-120			
2-Chlorophenol	14.5	0.4	1.0	ug/L	25.0		58.2	48-120			
1,3-Dichlorobenzene	12.9	0.3	1.0	ug/L	25.0		51.6	34.2-120			
1,4-Dichlorobenzene	13.1	0.3	1.0	ug/L	25.0		52.6	36-120			
Benzyl Alcohol	18.4	1.0	2.0	ug/L	25.0		73.5	27.4-120			
1,2-Dichlorobenzene	14.0	0.3	1.0	ug/L	25.0		55.8	38.4-120			
2-Methylphenol	15.8	0.3	1.0	ug/L	25.0		63.4	47.8-120			
2,2'-Oxybis(1-chloropropane)	16.6	0.5	1.0	ug/L	25.0		66.5	40.4-120			
4-Methylphenol	17.0	0.4	2.0	ug/L	25.0		68.1	52.3-120			
N-Nitroso-di-n-Propylamine	18.9	0.2	1.0	ug/L	25.0		75.6	51.4-120			
Hexachloroethane	12.6	0.3	2.0	ug/L	25.0		50.6	29.5-120			
Nitrobenzene	17.3	0.4	1.0	ug/L	25.0		69.1	51.5-120			
Isophorone	22.5	0.5	1.0	ug/L	25.0		90.2	62.3-128			
2-Nitrophenol	18.4	0.5	3.0	ug/L	25.0		73.6	58.6-124			
2,4-Dimethylphenol	41.4	1.0	3.0	ug/L	75.0		55.2	38.5-120			
Bis(2-Chloroethoxy)methane	19.0	0.6	1.0	ug/L	25.0		75.9	52.9-120			
Benzoic acid	107	3.4	20.0	ug/L	138		77.9	38.2-120			
2,4-Dichlorophenol	46.6	1.9	3.0	ug/L	75.0		62.1	43.6-120			
1,2,4-Trichlorobenzene	13.7	0.3	1.0	ug/L	25.0		54.8	38.6-120			
Naphthalene	15.8	0.2	1.0	ug/L	25.0		63.2	40.5-120			
4-Chloroaniline	25.3	1.9	5.0	ug/L	75.0		33.8	42.7-120			*
Hexachlorobutadiene	12.9	0.1	3.0	ug/L	25.0		51.7	32.3-120			
4-Chloro-3-Methylphenol	55.0	2.0	3.0	ug/L	75.0		73.3	51.9-120			
2-Methylnaphthalene	15.4	0.2	1.0	ug/L	25.0		61.5	47.3-120			
Hexachlorocyclopentadiene	46.3	2.5	5.0	ug/L	75.0		61.7	23.3-120			
2,4,6-Trichlorophenol	50.7	1.9	3.0	ug/L	75.0		67.6	47-120			
2,4,5-Trichlorophenol	53.4	1.8	5.0	ug/L	75.0		71.2	48.4-120			
2-Chloronaphthalene	16.1	0.5	1.0	ug/L	25.0		64.5	47.7-123			

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Semivolatile Organic Compounds - Quality Control

Batch BGD0097 - EPA 3520C (Liq Liq)

Instrument: NT6 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BGD0097-BS1)					Prepared: 09-Apr-2018 Analyzed: 13-Apr-2018 11:58						
2-Nitroaniline	62.1	2.0	3.0	ug/L	75.0		82.7	56.8-120			
Dimethylphthalate	20.5	0.4	1.0	ug/L	25.0		82.1	65.2-125			
Acenaphthylene	17.3	0.3	1.0	ug/L	25.0		69.0	44.1-120			
2,6-Dinitrotoluene	62.7	2.1	3.0	ug/L	75.0		83.6	69.3-140			
3-Nitroaniline	58.2	2.2	3.0	ug/L	75.0		77.6	60.9-120			
Acenaphthene	17.7	0.3	1.0	ug/L	25.0		70.8	50.4-120			
2,4-Dinitrophenol	127	4.9	20.0	ug/L	138		92.0	33.7-183			
Dibenzofuran	17.3	0.3	1.0	ug/L	25.0		69.4	49.9-120			
4-Nitrophenol	51.8	1.0	10.0	ug/L	75.0		69.1	50.2-136			
2,4-Dinitrotoluene	62.4	2.0	3.0	ug/L	75.0		83.2	66.8-132			
Fluorene	18.6	0.3	1.0	ug/L	25.0		74.5	57.8-120			
Diethyl phthalate	21.1	0.4	1.0	ug/L	25.0		84.4	68.1-120			
4-Chlorophenylphenyl ether	18.6	0.4	1.0	ug/L	25.0		74.5	59.1-127			
4-Nitroaniline	64.8	1.9	3.0	ug/L	75.0		86.4	56-122			
4,6-Dinitro-2-methylphenol	133	5.0	10.0	ug/L	138		96.8	37.9-162			
N-Nitrosodiphenylamine	17.6	0.4	1.0	ug/L	25.0		70.6	59.6-120			
4-Bromophenyl phenyl ether	19.8	0.3	1.0	ug/L	25.0		79.1	59.6-120			
Hexachlorobenzene	18.8	0.4	1.0	ug/L	25.0		75.2	53.7-120			
Pentachlorophenol	61.2	2.6	10.0	ug/L	75.0		81.6	40.3-128			
Phenanthrene	18.7	0.2	1.0	ug/L	25.0		74.6	58.8-120			
Anthracene	17.4	0.4	1.0	ug/L	25.0		69.7	60.5-120			
Carbazole	17.6	0.6	1.0	ug/L	25.0		70.6	59.7-120			
Di-n-Butylphthalate	22.9	0.5	1.0	ug/L	25.0		91.7	71-120			
Fluoranthene	20.6	0.4	1.0	ug/L	25.0		82.5	66.7-120			
Pyrene	20.7	0.3	1.0	ug/L	25.0		82.7	62.7-127			
Butylbenzylphthalate	24.8	0.4	1.0	ug/L	25.0		99.1	67.4-128			Q
Benzo(a)anthracene	19.4	0.4	1.0	ug/L	25.0		77.8	58.3-128			
3,3'-Dichlorobenzidine	51.4	1.6	5.0	ug/L	75.0		68.5	34.1-120			
Chrysene	19.5	0.4	1.0	ug/L	25.0		77.9	58.9-120			
bis(2-Ethylhexyl)phthalate	27.5	0.5	3.0	ug/L	25.0		110	68.3-123			
Di-n-Octylphthalate	24.6	0.4	1.0	ug/L	25.0		98.4	61.5-120			
Benzo(a)pyrene	19.7	0.5	1.0	ug/L	25.0		78.7	70.6-120			
Indeno(1,2,3-cd)pyrene	15.6	0.4	1.0	ug/L	25.0		62.5	46.5-120			
Dibenzo(a,h)anthracene	15.7	0.4	1.0	ug/L	25.0		62.7	49.6-120			
Benzo(g,h,i)perylene	15.0	0.5	1.0	ug/L	25.0		59.9	37-120			

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Semivolatile Organic Compounds - Quality Control

Batch BGD0097 - EPA 3520C (Liq Liq)

Instrument: NT6 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BGD0097-BS1)					Prepared: 09-Apr-2018 Analyzed: 13-Apr-2018 11:58						
Benzofluoranthenes, Total	39.0	0.8	2.0	ug/L	50.0		77.9	66.5-120			
1-Methylnaphthalene	17.1	0.3	1.0	ug/L	25.0		68.5	46.9-120			
Surrogate: 2-Fluorophenol	25.5			ug/L	*37.5*		*68.0*	*33-120*			
Surrogate: Phenol-d5	26.9			ug/L	*37.5*		*71.8*	*38-120*			
Surrogate: 2-Chlorophenol-d4	26.7			ug/L	*37.5*		*71.1*	*41-120*			
Surrogate: 1,2-Dichlorobenzene-d4	15.6			ug/L	*25.0*		*62.3*	*20-120*			
Surrogate: Nitrobenzene-d5	19.2			ug/L	*25.0*		*77.0*	*27-120*			
Surrogate: 2-Fluorobiphenyl	18.0			ug/L	*25.0*		*72.1*	*33-120*			
Surrogate: 2,4,6-Tribromophenol	35.7			ug/L	*37.5*		*95.3*	*52-120*			
Surrogate: p-Terphenyl-d14	22.2			ug/L	*25.0*		*88.9*	*28-120*			

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Metals and Metallic Compounds - Quality Control

Batch BGD0171 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0171-BLK1)					Prepared: 10-Apr-2018 Analyzed: 10-Apr-2018 12:26							
Lead	208	ND	0.0680	0.100	ug/L							U
Copper	63	ND	0.340	0.500	ug/L							U
Copper	65	ND	0.350	0.500	ug/L							U
Zinc	66	ND	0.820	4.00	ug/L							U
Zinc	67	ND	0.940	4.00	ug/L							U
LCS (BGD0171-BS1)					Prepared: 10-Apr-2018 Analyzed: 10-Apr-2018 13:08							
Lead	208	25.9	0.0680	0.100	ug/L	25.0		104	80-120			
Copper	63	25.8	0.340	0.500	ug/L	25.0		103	80-120			
Copper	65	25.4	0.350	0.500	ug/L	25.0		102	80-120			
Zinc	66	79.4	0.820	4.00	ug/L	80.0		99.2	80-120			
Zinc	67	77.1	0.940	4.00	ug/L	80.0		96.3	80-120			

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Metals and Metallic Compounds - Quality Control

Batch BGD0215 - TWC EPA 3010A

Instrument: ICP2 Analyst: MCB

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0215-BLK1)				Prepared: 11-Apr-2018 Analyzed: 11-Apr-2018 13:44							
Calcium	ND	0.0051	0.0500	mg/L							U
Magnesium	ND	0.0160	0.0500	mg/L							U
LCS (BGD0215-BS1)				Prepared: 11-Apr-2018 Analyzed: 11-Apr-2018 14:05							
Calcium	9.86	0.0051	0.0500	mg/L	10.0		98.6	80-120			
Magnesium	10.2	0.0160	0.0500	mg/L	10.0		102	80-120			

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGD0352 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0352-BLK1)					Prepared: 17-Apr-2018 Analyzed: 17-Apr-2018 14:53							
Lead, Dissolved	208	ND	0.0680	0.100	ug/L							U
Copper, Dissolved	63	ND	0.340	0.500	ug/L							U
Copper, Dissolved	65	ND	0.350	0.500	ug/L							U
Zinc, Dissolved	66	ND	0.820	4.00	ug/L							U
Zinc, Dissolved	67	ND	0.940	4.00	ug/L							U
LCS (BGD0352-BS1)					Prepared: 17-Apr-2018 Analyzed: 17-Apr-2018 15:36							
Lead, Dissolved	208	28.2	0.0680	0.100	ug/L	25.0		113	80-120			
Copper, Dissolved	63	26.7	0.340	0.500	ug/L	25.0		107	80-120			
Copper, Dissolved	65	26.1	0.350	0.500	ug/L	25.0		104	80-120			
Zinc, Dissolved	66	83.5	0.820	4.00	ug/L	80.0		104	80-120			
Zinc, Dissolved	67	78.3	0.940	4.00	ug/L	80.0		97.9	80-120			

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Wet Chemistry - Quality Control

Batch BGD0129 - No Prep Wet Chem

Instrument: BOD1 Analyst: RLM

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0129-BLK1)				Prepared: 07-Apr-2018 Analyzed: 12-Apr-2018 10:42							
BOD	ND	1.0	1.0	mg/L							U
LCS (BGD0129-BS1)				Prepared: 07-Apr-2018 Analyzed: 12-Apr-2018 10:42							
BOD	181	50.0	50.0	mg/L	198		91.3	84.6-115.4			

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Wet Chemistry - Quality Control

Batch BGD0131 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: KK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0131-BLK1)				Prepared: 07-Apr-2018 Analyzed: 07-Apr-2018 17:24							
Orthophosphorus	ND	0.0040	0.0040	mg-P/L							U
LCS (BGD0131-BS1)				Prepared: 07-Apr-2018 Analyzed: 07-Apr-2018 17:24							
Orthophosphorus	0.149	0.0040	0.0040	mg-P/L	0.150		99.3	90-110			
Duplicate (BGD0131-DUP1)		**Source: 18D0106-01**		Prepared: 07-Apr-2018 Analyzed: 07-Apr-2018 17:25							
Orthophosphorus	0.0390	0.0040	0.0040	mg-P/L		0.0370			5.26	20	
Matrix Spike (BGD0131-MS1)		**Source: 18D0106-01**		Prepared: 07-Apr-2018 Analyzed: 07-Apr-2018 17:26							
Orthophosphorus	0.134	0.0040	0.0040	mg-P/L	0.0999	0.0370	97.1	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Wet Chemistry - Quality Control

Batch BGD0135 - No Prep Wet Chem

Instrument: BAL2 Analyst: KLE

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0135-BLK1)				Prepared: 09-Apr-2018 Analyzed: 09-Apr-2018 10:08							
Suspended Solids	ND	1	1	mg/L							U
LCS (BGD0135-BS1)				Prepared: 09-Apr-2018 Analyzed: 09-Apr-2018 10:08							
Suspended Solids	49	1	1	mg/L	50.00		97.0	90-110			

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Wet Chemistry - Quality Control

Batch BGD0183 - SM 4500-P B-5 Persulfate

Instrument: UV1800-2 Analyst: RLM

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0183-BLK1)				Prepared: 10-Apr-2018 Analyzed: 11-Apr-2018 15:12							
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
Blank (BGD0183-BLK2)				Prepared: 10-Apr-2018 Analyzed: 11-Apr-2018 15:30							
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
LCS (BGD0183-BS1)				Prepared: 10-Apr-2018 Analyzed: 11-Apr-2018 15:12							
Total Phosphorus	0.153	0.0080	0.0080	mg-P/L	0.150		102	90-110			
LCS (BGD0183-BS2)				Prepared: 10-Apr-2018 Analyzed: 11-Apr-2018 15:30							
Total Phosphorus	0.152	0.0080	0.0080	mg-P/L	0.150		101	90-110			

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Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Wet Chemistry - Quality Control

Batch BGD0184 - SM 4500-P B-4 Strong Acid

Instrument: UV1800-2 Analyst: RLM

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0184-BLK1)				Prepared: 10-Apr-2018 Analyzed: 11-Apr-2018 14:06							
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
Blank (BGD0184-BLK2)				Prepared: 10-Apr-2018 Analyzed: 11-Apr-2018 14:17							
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
Blank (BGD0184-BLK3)				Prepared: 10-Apr-2018 Analyzed: 11-Apr-2018 14:28							
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
LCS (BGD0184-BS1)				Prepared: 10-Apr-2018 Analyzed: 11-Apr-2018 14:07							
Total Phosphorus	0.160	0.0080	0.0080	mg-P/L	0.150		107	90-110			
LCS (BGD0184-BS2)				Prepared: 10-Apr-2018 Analyzed: 11-Apr-2018 14:17							
Total Phosphorus	0.159	0.0080	0.0080	mg-P/L	0.150		106	90-110			
LCS (BGD0184-BS3)				Prepared: 10-Apr-2018 Analyzed: 11-Apr-2018 14:28							
Total Phosphorus	0.162	0.0080	0.0080	mg-P/L	0.150		108	90-110			

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Wet Chemistry - Quality Control

Batch BGD0237 - No Prep Wet Chem

Instrument: LACHAT2 Analyst: KK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0237-BLK1)				Prepared: 11-Apr-2018 Analyzed: 17-Apr-2018 13:14							
Total Kjeldahl Nitrogen	ND	0.5	0.5	mg-N/L							U
LCS (BGD0237-BS1)				Prepared: 11-Apr-2018 Analyzed: 17-Apr-2018 13:15							
Total Kjeldahl Nitrogen	5.0	0.5	0.5	mg-N/L	5.00		99.9	90-110			
LCS (BGD0237-BS2)				Prepared: 11-Apr-2018 Analyzed: 17-Apr-2018 13:16							
Total Kjeldahl Nitrogen	5.2	0.5	0.5	mg-N/L	5.00		103	90-110			

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Wet Chemistry - Quality Control

Batch BGD0302 - No Prep Wet Chem

Instrument: LACHAT2 Analyst: GM

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0302-BLK1)				Prepared: 13-Apr-2018 Analyzed: 18-Apr-2018 17:11							
Nitrate + Nitrite as N	ND	0.010	0.010	mg-N/L							U
LCS (BGD0302-BS1)				Prepared: 13-Apr-2018 Analyzed: 18-Apr-2018 17:13							
Nitrate + Nitrite as N	0.485	0.010	0.010	mg-N/L	0.500		97.0	90-110			

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Microbiology - Quality Control

Batch BGD0128 - No Prep Wet Chem

Instrument: N/A

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0128-BLK1)				Prepared: 07-Apr-2018 Analyzed: 08-Apr-2018 12:55							
Fecal Coliforms	ND		1	CFU/100 ml							U

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Certified Analyses included in this Report

Analyte	Certifications
EPA 200.7 in Water	
Calcium	WADOE,NELAP,DoD-ELAP,WA-DW
Magnesium	WADOE,NELAP,DoD-ELAP,WA-DW
EPA 200.8 in Water	
Lead-208	NELAP,WADOE,WA-DW,DoD-ELAP
Lead-208	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 200.8 UCT-KED in Water	
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 8270D in Water	
Phenol	CALAP,WADOE,DoD-ELAP,NELAP
bis(2-chloroethyl) ether	CALAP,WADOE,DoD-ELAP,NELAP
2-Chlorophenol	CALAP,WADOE,DoD-ELAP,NELAP
1,3-Dichlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP
1,4-Dichlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP
Benzyl Alcohol	CALAP,WADOE,DoD-ELAP,NELAP
1,2-Dichlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP
2-Methylphenol	CALAP,WADOE,DoD-ELAP,NELAP
4-Methylphenol	CALAP,WADOE,DoD-ELAP,NELAP
N-Nitroso-di-n-Propylamine	CALAP,WADOE,DoD-ELAP,NELAP
Hexachloroethane	CALAP,WADOE,DoD-ELAP,NELAP
Nitrobenzene	CALAP,WADOE,DoD-ELAP,NELAP
Isophorone	CALAP,WADOE,DoD-ELAP,NELAP
2-Nitrophenol	CALAP,WADOE,DoD-ELAP,NELAP
2,4-Dimethylphenol	CALAP,WADOE,DoD-ELAP,NELAP
Bis(2-Chloroethoxy)methane	CALAP,WADOE,DoD-ELAP,NELAP
Benzoic acid	CALAP,WADOE,DoD-ELAP,NELAP
2,4-Dichlorophenol	CALAP,WADOE,DoD-ELAP,NELAP
1,2,4-Trichlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP

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Naphthalene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
4-Chloroaniline	CALAP,WADOE,DoD-ELAP,NELAP
Hexachlorobutadiene	CALAP,WADOE,DoD-ELAP,NELAP
4-Chloro-3-Methylphenol	CALAP,WADOE,DoD-ELAP,NELAP
2-Methylnaphthalene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Hexachlorocyclopentadiene	CALAP,WADOE,DoD-ELAP,NELAP
2,4,6-Trichlorophenol	CALAP,WADOE,DoD-ELAP,NELAP
2,4,5-Trichlorophenol	CALAP,WADOE,DoD-ELAP,NELAP
2-Chloronaphthalene	CALAP,WADOE,DoD-ELAP,NELAP
2-Nitroaniline	CALAP,WADOE,DoD-ELAP,NELAP
Dimethylphthalate	CALAP,WADOE,DoD-ELAP,NELAP
Acenaphthylene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
2,6-Dinitrotoluene	CALAP,WADOE,DoD-ELAP,NELAP
3-Nitroaniline	CALAP,WADOE,DoD-ELAP,NELAP
Acenaphthene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
2,4-Dinitrophenol	CALAP,WADOE,DoD-ELAP,NELAP
Dibenzofuran	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
4-Nitrophenol	CALAP,WADOE,DoD-ELAP,NELAP
2,4-Dinitrotoluene	CALAP,WADOE,DoD-ELAP,NELAP
Fluorene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Diethyl phthalate	CALAP,WADOE,DoD-ELAP,NELAP
4-Chlorophenylphenyl ether	CALAP,WADOE,DoD-ELAP,NELAP
4-Nitroaniline	CALAP,WADOE,DoD-ELAP,NELAP
4,6-Dinitro-2-methylphenol	CALAP,WADOE,DoD-ELAP,NELAP
4-Bromophenyl phenyl ether	CALAP,WADOE,DoD-ELAP,NELAP
Hexachlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP
Pentachlorophenol	CALAP,WADOE,DoD-ELAP,NELAP
Phenanthrene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Anthracene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Carbazole	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Di-n-Butylphthalate	CALAP,WADOE,DoD-ELAP,NELAP
Fluoranthene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Pyrene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Butylbenzylphthalate	CALAP,WADOE,DoD-ELAP,NELAP
Benzo(a)anthracene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Chrysene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
bis(2-Ethylhexyl)phthalate	CALAP,WADOE,DoD-ELAP,NELAP
Di-n-Octylphthalate	CALAP,WADOE,DoD-ELAP,NELAP
Benzo(b)fluoranthene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Benzo(k)fluoranthene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP

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Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Benzo(a)pyrene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Indeno(1,2,3-cd)pyrene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Dibenzo(a,h)anthracene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Benzo(g,h,i)perylene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Benzofluoranthenes, Total	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
1-Methylnaphthalene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
N-Nitrosodimethylamine	CALAP,WADOE,DoD-ELAP,NELAP
Aniline	CALAP,WADOE,DoD-ELAP,NELAP
Benzidine	CALAP,WADOE,DoD-ELAP,NELAP
Retene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Perylene	CALAP,WADOE,ADEC
Pyridine	CALAP,WADOE,DoD-ELAP,NELAP
N-Nitrosomethylethylamine	CALAP
2,6-Dichlorophenol	CALAP,WADOE
alpha-Terpineol	CALAP,WADOE,DoD-ELAP,NELAP
1,4-Dioxane	CALAP,WADOE,DoD-ELAP,NELAP
2,3,4,6-Tetrachlorophenol	CALAP,WADOE,DoD-ELAP
Triphenyl Phosphate	CALAP,WADOE,DoD-ELAP,NELAP
Butyl Diphenyl Phosphate	CALAP,WADOE,DoD-ELAP,NELAP
Dibutyl Phenyl Phosphate	CALAP,WADOE,DoD-ELAP,NELAP
Tributyl Phosphate	CALAP,WADOE,DoD-ELAP,NELAP
Butylated Hydroxytoluene	CALAP,WADOE,DoD-ELAP,NELAP
Azobenzene (1,2-DP-Hydrazine)	CALAP,WADOE,DoD-ELAP,NELAP
Tetrachloroguaiacol	CALAP,WADOE,DoD-ELAP
3,4,5-Trichloroguaiacol	CALAP,WADOE,DoD-ELAP
3,4,6-Trichloroguaiacol	CALAP,WADOE,DoD-ELAP
4,5,6-Trichloroguaiacol	CALAP,WADOE,DoD-ELAP
Guaiacol	CALAP,WADOE,DoD-ELAP
1,2,4,5-Tetrachlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP
SM 4500-NO3¯ I-00 in Water	
Nitrate + Nitrite as N	DoD-ELAP,NELAP,WADOE
SM 4500-Norg D-97 in Water	
Total Kjeldahl Nitrogen	DoD-ELAP,WADOE
SM 4500-P E-99 in Water	
Orthophosphorus	WADOE,NELAP
Total Phosphorus	WADOE,NELAP
SM 5210 B-01 in Water	
BOD	WADOE,NELAP

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

SM 9222D in Water

Fecal Coliforms WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	05/11/2018
CALAP	California Department of Public Health CAELAP	2748	06/30/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	20-Apr-2018 15:25

Notes and Definitions

*	Flagged value is not within established control limits.
B	This analyte was detected in the method blank.
D	The reported value is from a dilution
J	Estimated concentration value detected below the reporting limit.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
U	This analyte is not detected above the applicable reporting or detection limit.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

30 April 2018

Rob Zisette
Herrera Environmental Consultants
2200 6th Avenue, Suite 1100
Seattle, WA 98121

RE: Bobby Morris Playfield

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
18D0219	N/A

Amanda Volgardsen

Digitally signed by Amanda Volgardsen
DN: c=US, st=Washington, l=Tukwila, o=Analytical Resources, Inc., ou=Project Manager, cn=Amanda Volgardsen, email=amanda.volgardsen@arilabs.com
Date: 2018.04.30 14:17:08 -07'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in it entirety.

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006

PJLA Testing
Accreditation # 66169

HERRERA
2200 Sixth Avenue | Suite 1100
Seattle, Washington | 98121
p 206 441 9080 | f 206 441 9108

18D0219

Chain of Custody Record

Project Name:	Project Number:	Client:
Bobby Morris Playfield Monitoring	18-06769-000	Herrera Environmental
Report To: Rob Zisette		Page: 1/2
Sampled By: Alex Svendsen		Delivery Method: IN COOLER W/ ICE
Laboratory: Analytical Resources, Inc.	Requested Completion Date:	Total No. of Containers: 36

Sample ID	Date	Time	Sample Type (see codes)	Preserv ative? (Y/N)	Matrix (see codes)	Total Suspended Solids- EPA 160.2	Total Hardness as CaCO3-SM 2340B	Total phosphorus - SM 4500-P	Lead, dissolved - EPA 200.8	Lead, total - EPA 200.8	Copper, dissolved - EPA 200.8	Copper, total - EPA 200.8	Zinc, dissolved - EPA 200.8	Zinc, total - EPA 200.8	Fecal coliform bacteria – SM 9222D	SVOCs, EPA 8270	BOD_5, SM 5210B
Bobby Morris A	4/14/18	0630	G	N	SW	X	X	X	X	X	X	X	X	X	X	X	X
Bobby Morris B	4/14/18	0740	G	N	SW	X	X	X	X	X	X	X	X	X	X	X	X
Miller A	4/14/18	0705	G	N	SW	X	X	X	X	X	X	X	X	X	X	X	X
Miller B	4/14/18	0820	G	N	SW	X	X	X	X	X	X	X	X	X	X	X	X

Comments/Special Instructions: DISS. METALS + SRP SAMPLES FIELD FILTERED

0.4°C - 0.2°C

Relinquished by (Name/CO)	Signature	Date/Time		Received By (Name/CO)	Signature	Date/Time
Rob Zisette/Herrera		4/14/18 1045		Jacklyn Hall/ARI		04/14/18 1045
Relinquished by (Name/CO)	Signature	Date/Time		Received By (Name/CO)	Signature	Date/Time

Sample Type: G=Grab C=Composite **Matrix Codes:** A=Air GW=Groundwater SE=Sediment SO=Soil SW=Surface Water W=Water (blanks) M=Material O=Other (specify)

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2200 Sixth Avenue | Suite 1100
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18D0219

Chain of Custody Record

Project Name:	Project Number:	Client:
Bobby Morris Playfield Monitoring	18-06769-000	Herrera Environmental

Report To:	Page:
Rob Zisette	2/2

Sampled By:	Delivery Method:
ALEX SVENDSEN	IN COOLER W/ ICE

Laboratory:	Requested Completion Date:	Total No. of Containers:
Analytical Resources, Inc.		36

Sample ID	Date	Time	Sample Type (see codes)	Preservative? (Y/N)	Matrix (see codes)	Analyses Requested: Total Kjeldahl Nitrogen, SM 4500-N	Nitrate+Nitrite N, SM 4500-N	Soluble Reactive Phosphorus, SM 4500
Bobby Morris A	4/14/18	0630	G	N	SW	X	X	X
Bobby Morris B		0740	G	N	SW	X	X	X
Miller A		0705	G	N	SW	X	X	X
Miller B		0820	G	N	SW	X	X	X

Comments/Special Instructions:

0.4°C -0.2°C

Relinquished by (Name/CO)	Signature	Date/Time		Received By (Name/CO)	Signature	Date/Time
Rob Zisette/Herrera		4/14/18 10:45		JacobLaMARI		04/14/18 1045
Relinquished by (Name/CO)	Signature	Date/Time		Received By (Name/CO)	Signature	Date/Time

Sample Type: G=Grab C=Composite

Matrix Codes: A=Air GW=Groundwater SE=Sediment SO=Soil SW=Surface Water W=Water (blanks) M=Material O=Other (specify)

Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Bobby Morris A	18D0219-01	Water	14-Apr-2018 06:30	14-Apr-2018 10:45
Bobby Morris A	18D0219-02	Water	14-Apr-2018 06:30	14-Apr-2018 10:45
Bobby Morris B	18D0219-03	Water	14-Apr-2018 07:40	14-Apr-2018 10:45
Bobby Morris B	18D0219-04	Water	14-Apr-2018 07:40	14-Apr-2018 10:45
Miller A	18D0219-05	Water	14-Apr-2018 07:05	14-Apr-2018 10:45
Miller A	18D0219-06	Water	14-Apr-2018 07:05	14-Apr-2018 10:45
Miller B	18D0219-07	Water	14-Apr-2018 08:20	14-Apr-2018 10:45
Miller B	18D0219-08	Water	14-Apr-2018 08:20	14-Apr-2018 10:45

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4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Case Narrative

Sample receipt

Samples as listed on the preceding page were received April 14, 2018 under ARI work order 18D0219. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Semivolatiles - EPA Method SW8270D

The samples were extracted and analyzed within the recommended holding times.

Initial calibrations were within method requirements.

The initial calibration verification (ICV) is outside of control limits high for Butylybenzylphthalate. The samples are all non-detect, so only the QC is flagged with a "Q" qualifier. No further corrective action was taken.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank was clean at the reporting limits.

The LCS percent recoveries were within control limits.

Total and Dissolved Metals - EPA Method 200.8

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

A dissolved matrix spike and duplicate were prepared in conjunction with sample Bobby Morris A . The matrix spike percent recoveries and duplicate RPD were within QC limits.

Total Hardness - EPA Method 200.7

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank has Calcium detected below the reporting limit, but above the method detection limit. The Calcium has been flagged with a "J" qualifier on the method blank. There were no metals detected above the reporting limits. No further corrective action was taken.

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

The LCS percent recoveries were within control limits.

Wet Chemistry (BOD, O-Phos, TSS, T-Phos, TKN, NO2+NO3, Fecal Coliform)

The samples were prepared and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The T-Phos method blank BGD0568 has contamination above the reporting limit. Associated detected results and QC have been flagged with "B" qualifiers. Samples with concentration greater than 10x the contamination will be reported as is. Samples with less than 10x the contamination will be reanalyzed with new QC. All other method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

A O-Phos matrix spike and duplicate were prepared in conjunction with sample Bobby Morris A. The matrix spike percent recovery and duplicate RPD were within QC limits.

A T-Phos matrix spike and duplicate were prepared in conjunction with sample Bobby Morris A. The matrix spike percent recovery was within QC limits. The duplicate has high RPD. The results are advisory. No corrective action was taken.

A TKN matrix spike and duplicate were prepared in conjunction with sampel Bobby Morris A. The duplicate RPD was within QC limits. The matrix spike has low spike recovery. The matrix spike was re-read to verify, with data reported as is. The results are advisory. No further corrective action was taken.

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Herrera

Project Name: _____

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 18D0219

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO

Were custody papers included with the cooler? ..... YES NO

Were custody papers properly filled out (ink, signed, etc.) ..... YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)
Time: 1045 cooler # 1: 0.4°C 2: -0.8°C

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: D005206

Cooler Accepted by: JBu Date: 04/14/18 Time: 1045

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? ..... YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? ..... NA YES NO

Were all bottles sealed in individual plastic bags? ..... YES NO

Did all bottles arrive in good condition (unbroken)? ..... YES NO

Were all bottle labels complete and legible? ..... YES NO

Did the number of containers listed on COC match with the number of containers received? ..... YES NO

Did all bottle labels and tags agree with custody papers? ..... YES NO

Were all bottles used correct for the requested analyses? ..... YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? ..... NA YES NO

Was sufficient amount of sample sent in each bottle? ..... YES NO

Date VOC Trip Blank was made at ARI..... NA _____

Was Sample Split by ARI : NA YES Date/Time: _____ Equipment: _____ Split by: _____

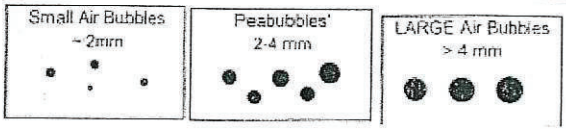
Samples Logged by: JBu Date: 04/14/18 Time: 1057

*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:



Small → "sm" (< 2 mm)
Peabubbles → "pb" (2 to < 4 mm)
Large → "lg" (4 to < 6 mm)
Headspace → "hs" (> 6 mm)

WORK ORDER

18D0219

Client: Herrera Environmental Consultants | **Project Manager:** Amanda Volgardsen

Project: Bobby Morris Playfield | **Project Number:** Bobby Moris Playfield

Preservation Confirmation

Container ID	Container Type	pH	
18D0219-01 A	Large OJ, 1000 mL		
18D0219-01 B	Large OJ, 1000 mL		
18D0219-01 C	HDPE NM, 500 mL		
18D0219-01 D	Small OJ, 500 mL, 9N H2SO4	<2	Pass
18D0219-01 E	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
18D0219-01 F	Corning Plastic, 125 mL, Na2S2O3		
18D0219-01 G	Glass NM, Amber, 500 mL		
18D0219-01 H	Glass NM, Amber, 500 mL		
18D0219-02 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2	Pass
18D0219-03 A	Large OJ, 1000 mL		
18D0219-03 B	Large OJ, 1000 mL		
18D0219-03 C	HDPE NM, 500 mL		
18D0219-03 D	Small OJ, 500 mL, 9N H2SO4	<2	Pass
18D0219-03 E	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
18D0219-03 F	Corning Plastic, 125 mL, Na2S2O3		
18D0219-03 G	Glass NM, Amber, 500 mL		
18D0219-03 H	Glass NM, Amber, 500 mL		
18D0219-04 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2	Pass
18D0219-05 A	Large OJ, 1000 mL		
18D0219-05 B	Large OJ, 1000 mL		
18D0219-05 C	HDPE NM, 500 mL		
18D0219-05 D	Small OJ, 500 mL, 9N H2SO4	<2	Pass
18D0219-05 E	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
18D0219-05 F	Corning Plastic, 125 mL, Na2S2O3		
18D0219-05 G	Glass NM, Amber, 500 mL		
18D0219-05 H	Glass NM, Amber, 500 mL		
18D0219-06 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2	Pass
18D0219-07 A	Large OJ, 1000 mL		
18D0219-07 B	Large OJ, 1000 mL		
18D0219-07 C	HDPE NM, 500 mL		
18D0219-07 D	Small OJ, 500 mL, 9N H2SO4	<2	Pass
18D0219-07 E	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
18D0219-07 F	Corning Plastic, 125 mL, Na2S2O3		
18D0219-07 G	Glass NM, Amber, 500 mL		
18D0219-07 H	Glass NM, Amber, 500 mL		

Reviewed By

Date

WORK ORDER

18D0219

Client: Herrera Environmental Consultants | **Project Manager:** Amanda Volgardsen

Project: Bobby Morris Playfield | **Project Number:** Bobby Moris Playfield

18D0219-08 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	CJ	Pass

JBV
Preservation Confirmed By

04/4/18
Date

Reviewed By

Date

Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris A

18D0219-01 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 04/14/2018 06:30

Instrument: NT6 — Analyzed: 20-Apr-2018 16:16

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGD0320 — Sample Size: 500 mL
Prepared: 19-Apr-2018 — Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	0.2	1.0	ND	ug/L	U
bis(2-chloroethyl) ether	111-44-4	1	0.4	1.0	ND	ug/L	U
2-Chlorophenol	95-57-8	1	0.4	1.0	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.3	1.0	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.3	1.0	ND	ug/L	U
Benzyl Alcohol	100-51-6	1	1.0	2.0	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.3	1.0	ND	ug/L	U
2-Methylphenol	95-48-7	1	0.3	1.0	ND	ug/L	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	0.5	1.0	ND	ug/L	U
4-Methylphenol	106-44-5	1	0.4	2.0	ND	ug/L	U
N-Nitroso-di-n-Propylamine	621-64-7	1	0.2	1.0	ND	ug/L	U
Hexachloroethane	67-72-1	1	0.3	2.0	ND	ug/L	U
Nitrobenzene	98-95-3	1	0.4	1.0	ND	ug/L	U
Isophorone	78-59-1	1	0.5	1.0	ND	ug/L	U
2-Nitrophenol	88-75-5	1	0.5	3.0	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	1.0	3.0	ND	ug/L	U
Bis(2-Chloroethoxy)methane	111-91-1	1	0.6	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	3.4	20.0	ND	ug/L	U
2,4-Dichlorophenol	120-83-2	1	1.9	3.0	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.3	1.0	ND	ug/L	U
Naphthalene	91-20-3	1	0.2	1.0	ND	ug/L	U
4-Chloroaniline	106-47-8	1	1.9	5.0	ND	ug/L	U
Hexachlorobutadiene	87-68-3	1	0.1	3.0	ND	ug/L	U
4-Chloro-3-Methylphenol	59-50-7	1	2.0	3.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	0.2	1.0	ND	ug/L	U
Hexachlorocyclopentadiene	77-47-4	1	2.5	5.0	ND	ug/L	U
2,4,6-Trichlorophenol	88-06-2	1	1.9	3.0	ND	ug/L	U
2,4,5-Trichlorophenol	95-95-4	1	1.8	5.0	ND	ug/L	U
2-Chloronaphthalene	91-58-7	1	0.5	1.0	ND	ug/L	U
2-Nitroaniline	88-74-4	1	2.0	3.0	ND	ug/L	U
Dimethylphthalate	131-11-3	1	0.4	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.3	1.0	ND	ug/L	U
2,6-Dinitrotoluene	606-20-2	1	2.1	3.0	ND	ug/L	U
3-Nitroaniline	99-09-2	1	2.2	3.0	ND	ug/L	U
Acenaphthene	83-32-9	1	0.3	1.0	ND	ug/L	U
2,4-Dinitrophenol	51-28-5	1	4.9	20.0	ND	ug/L	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris A

18D0219-01 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 04/14/2018 06:30

Instrument: NT6 — Analyzed: 20-Apr-2018 16:16

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dibenzofuran	132-64-9	1	0.3	1.0	ND	ug/L	U
4-Nitrophenol	100-02-7	1	1.0	10.0	ND	ug/L	U
2,4-Dinitrotoluene	121-14-2	1	2.0	3.0	ND	ug/L	U
Fluorene	86-73-7	1	0.3	1.0	ND	ug/L	U
Diethyl phthalate	84-66-2	1	0.4	1.0	ND	ug/L	U
4-Chlorophenylphenyl ether	7005-72-3	1	0.4	1.0	ND	ug/L	U
4-Nitroaniline	100-01-6	1	1.9	3.0	ND	ug/L	U
4,6-Dinitro-2-methylphenol	534-52-1	1	5.0	10.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.4	1.0	ND	ug/L	U
4-Bromophenyl phenyl ether	101-55-3	1	0.3	1.0	ND	ug/L	U
Hexachlorobenzene	118-74-1	1	0.4	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	2.6	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	0.2	1.0	ND	ug/L	U
Anthracene	120-12-7	1	0.4	1.0	ND	ug/L	U
Carbazole	86-74-8	1	0.6	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.5	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	0.4	1.0	ND	ug/L	U
Pyrene	129-00-0	1	0.3	1.0	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.4	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.4	1.0	ND	ug/L	U
3,3'-Dichlorobenzidine	91-94-1	1	1.6	5.0	ND	ug/L	U
Chrysene	218-01-9	1	0.4	1.0	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.5	3.0	**0.6**	ug/L	
Di-n-Octylphthalate	117-84-0	1	0.4	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.5	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.4	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.4	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.5	1.0	ND	ug/L	U
Benzofluoranthenes, Total		1	0.8	2.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.3	1.0	ND	ug/L	U
Surrogate: 2-Fluorophenol				*33-120 %*	*73.2*	*%*	
Surrogate: Phenol-d5				*38-120 %*	*80.8*	*%*	
Surrogate: 2-Chlorophenol-d4				*41-120 %*	*76.4*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*20-120 %*	*53.0*	*%*	
Surrogate: Nitrobenzene-d5				*27-120 %*	*77.4*	*%*	
Surrogate: 2-Fluorobiphenyl				*33-120 %*	*64.0*	*%*	
Surrogate: 2,4,6-Tribromophenol				*52-120 %*	*93.9*	*%*	
Surrogate: p-Terphenyl-d14				*28-120 %*	*83.8*	*%*	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris A

18D0219-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.7 — Sampled: 04/14/2018 06:30

Instrument: ICP2 — Analyzed: 18-Apr-2018 14:57

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGD0349 — Sample Size: 25 mL
Prepared: 17-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0051	0.0500	**16.4**	mg/L	
Magnesium	7439-95-4	1	0.0160	0.0500	**4.20**	mg/L	

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4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris A

18D0219-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 — Sampled: 04/14/2018 06:30

Instrument: ICPMS2 — Analyzed: 16-Apr-2018 14:21

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0312 — Sample Size: 25 mL
Prepared: 16-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead	7439-92-1	1	0.0680	0.100	**2.73**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris A

18D0219-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 04/14/2018 06:30

Instrument: ICPMS2 — Analyzed: 16-Apr-2018 14:21

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0312 — Sample Size: 25 mL
Prepared: 16-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper	7440-50-8	1	0.340	0.500	**6.87**	ug/L	
Zinc	7440-66-6	1	0.820	4.00	**32.9**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris A

18D0219-01 (Water)

Wet Chemistry

Method: EPA 160.2 — Sampled: 04/14/2018 06:30

Instrument: BAL2 — Analyzed: 17-Apr-2018 07:34

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0351 — Sample Size: 390 mL
Prepared: 17-Apr-2018 — Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	3	3	**46**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris A

18D0219-01 (Water)

Wet Chemistry

Method: SM 4500-$NO3^-$ I-00 — Sampled: 04/14/2018 06:30

Instrument: LACHAT2 — Analyzed: 18-Apr-2018 17:39

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0302 — Sample Size: 10 mL
Prepared: 18-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	**0.256**	mg-N/L	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris A

18D0219-01 (Water)

Wet Chemistry

Method: SM 4500-Norg D-97 — Sampled: 04/14/2018 06:30

Instrument: LACHAT2 — Analyzed: 26-Apr-2018 14:45

Sample Preparation: Preparation Method: LACHAT 10-107-06-1-I
Preparation Batch: BGD0571 — Sample Size: 25 mL
Prepared: 24-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Kjeldahl Nitrogen		1	0.5	0.5	ND	mg-N/L	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris A

18D0219-01 (Water)

Wet Chemistry

Method: SM 4500-P E-99 — Sampled: 04/14/2018 06:30

Instrument: UV1800-2 — Analyzed: 14-Apr-2018 17:59

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0311 — Sample Size: 50 mL
Prepared: 14-Apr-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Orthophosphorus	1426-54-42	1	0.0040	0.0040	**0.0400**	mg-P/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris A

18D0219-01 (Water)

Wet Chemistry

Method: SM 5210 B-01 — Sampled: 04/14/2018 06:30

Instrument: BOD1 — Analyzed: 19-Apr-2018 15:14

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0309 — Sample Size: 250 mL
Prepared: 14-Apr-2018 — Final Volume: 300 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
BOD		1	1.2	1.2	**2.0**	mg/L	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris A

18D0219-01 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 04/14/2018 06:30

Instrument: [CALC] — Analyzed: 18-Apr-2018 14:57

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 17-Apr-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1	0.331	**58.2**	mg/L	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris A

18D0219-01 (Water)

Microbiology

Method: SM 9222D — Sampled: 04/14/2018 06:30

Instrument: N/A — Analyzed: 15-Apr-2018 12:30

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0308 — Sample Size: 4 mL
Prepared: 14-Apr-2018 — Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Fecal Coliforms		1		25	**925**	CFU/100 ml	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris A

18D0219-01RE1 (Water)

Wet Chemistry

Method: SM 4500-P E-99 — Sampled: 04/14/2018 06:30

Instrument: UV1800-2 — Analyzed: 27-Apr-2018 17:31

Sample Preparation: Preparation Method: SM 4500-P B-4 Strong Acid
Preparation Batch: BGD0660 — Sample Size: 25 mL
Prepared: 26-Apr-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Phosphorus	7723-14-0	1	0.0080	0.0080	**0.174**	mg-P/L	

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Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris A

18D0219-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 04/14/2018 06:30

Instrument: ICPMS2 — Analyzed: 18-Apr-2018 13:56

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0385 — Sample Size: 25 mL
Prepared: 18-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris A

18D0219-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 04/14/2018 06:30

Instrument: ICPMS2 — Analyzed: 18-Apr-2018 13:56

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0385 — Sample Size: 25 mL
Prepared: 18-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.340	0.500	**2.64**	ug/L	
Zinc, Dissolved	7440-66-6	1	0.820	4.00	**16.2**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris B

18D0219-03 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 04/14/2018 07:40

Instrument: NT6 — Analyzed: 20-Apr-2018 16:49

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGD0320 — Sample Size: 500 mL
Prepared: 19-Apr-2018 — Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	0.2	1.0	ND	ug/L	U
bis(2-chloroethyl) ether	111-44-4	1	0.4	1.0	ND	ug/L	U
2-Chlorophenol	95-57-8	1	0.4	1.0	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.3	1.0	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.3	1.0	ND	ug/L	U
Benzyl Alcohol	100-51-6	1	1.0	2.0	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.3	1.0	ND	ug/L	U
2-Methylphenol	95-48-7	1	0.3	1.0	ND	ug/L	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	0.5	1.0	ND	ug/L	U
4-Methylphenol	106-44-5	1	0.4	2.0	ND	ug/L	U
N-Nitroso-di-n-Propylamine	621-64-7	1	0.2	1.0	ND	ug/L	U
Hexachloroethane	67-72-1	1	0.3	2.0	ND	ug/L	U
Nitrobenzene	98-95-3	1	0.4	1.0	ND	ug/L	U
Isophorone	78-59-1	1	0.5	1.0	ND	ug/L	U
2-Nitrophenol	88-75-5	1	0.5	3.0	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	1.0	3.0	ND	ug/L	U
Bis(2-Chloroethoxy)methane	111-91-1	1	0.6	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	3.4	20.0	ND	ug/L	U
2,4-Dichlorophenol	120-83-2	1	1.9	3.0	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.3	1.0	ND	ug/L	U
Naphthalene	91-20-3	1	0.2	1.0	ND	ug/L	U
4-Chloroaniline	106-47-8	1	1.9	5.0	ND	ug/L	U
Hexachlorobutadiene	87-68-3	1	0.1	3.0	ND	ug/L	U
4-Chloro-3-Methylphenol	59-50-7	1	2.0	3.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	0.2	1.0	ND	ug/L	U
Hexachlorocyclopentadiene	77-47-4	1	2.5	5.0	ND	ug/L	U
2,4,6-Trichlorophenol	88-06-2	1	1.9	3.0	ND	ug/L	U
2,4,5-Trichlorophenol	95-95-4	1	1.8	5.0	ND	ug/L	U
2-Chloronaphthalene	91-58-7	1	0.5	1.0	ND	ug/L	U
2-Nitroaniline	88-74-4	1	2.0	3.0	ND	ug/L	U
Dimethylphthalate	131-11-3	1	0.4	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.3	1.0	ND	ug/L	U
2,6-Dinitrotoluene	606-20-2	1	2.1	3.0	ND	ug/L	U
3-Nitroaniline	99-09-2	1	2.2	3.0	ND	ug/L	U
Acenaphthene	83-32-9	1	0.3	1.0	ND	ug/L	U
2,4-Dinitrophenol	51-28-5	1	4.9	20.0	ND	ug/L	U

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris B

18D0219-03 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 04/14/2018 07:40

Instrument: NT6 — Analyzed: 20-Apr-2018 16:49

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dibenzofuran	132-64-9	1	0.3	1.0	ND	ug/L	U
4-Nitrophenol	100-02-7	1	1.0	10.0	ND	ug/L	U
2,4-Dinitrotoluene	121-14-2	1	2.0	3.0	ND	ug/L	U
Fluorene	86-73-7	1	0.3	1.0	ND	ug/L	U
Diethyl phthalate	84-66-2	1	0.4	1.0	ND	ug/L	U
4-Chlorophenylphenyl ether	7005-72-3	1	0.4	1.0	ND	ug/L	U
4-Nitroaniline	100-01-6	1	1.9	3.0	ND	ug/L	U
4,6-Dinitro-2-methylphenol	534-52-1	1	5.0	10.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.4	1.0	ND	ug/L	U
4-Bromophenyl phenyl ether	101-55-3	1	0.3	1.0	ND	ug/L	U
Hexachlorobenzene	118-74-1	1	0.4	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	2.6	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	0.2	1.0	ND	ug/L	U
Anthracene	120-12-7	1	0.4	1.0	ND	ug/L	U
Carbazole	86-74-8	1	0.6	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.5	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	0.4	1.0	ND	ug/L	U
Pyrene	129-00-0	1	0.3	1.0	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.4	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.4	1.0	ND	ug/L	U
3,3'-Dichlorobenzidine	91-94-1	1	1.6	5.0	ND	ug/L	U
Chrysene	218-01-9	1	0.4	1.0	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.5	3.0	ND	ug/L	U
Di-n-Octylphthalate	117-84-0	1	0.4	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.5	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.4	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.4	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.5	1.0	ND	ug/L	U
Benzofluoranthenes, Total		1	0.8	2.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.3	1.0	ND	ug/L	U
Surrogate: 2-Fluorophenol				*33-120 %*	*65.4*	*%*	
Surrogate: Phenol-d5				*38-120 %*	*73.8*	*%*	
Surrogate: 2-Chlorophenol-d4				*41-120 %*	*70.4*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*20-120 %*	*59.7*	*%*	
Surrogate: Nitrobenzene-d5				*27-120 %*	*70.2*	*%*	
Surrogate: 2-Fluorobiphenyl				*33-120 %*	*66.3*	*%*	
Surrogate: 2,4,6-Tribromophenol				*52-120 %*	*78.9*	*%*	
Surrogate: p-Terphenyl-d14				*28-120 %*	*71.4*	*%*	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris B

18D0219-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.7 — Sampled: 04/14/2018 07:40

Instrument: ICP2 — Analyzed: 18-Apr-2018 15:01

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGD0349 — Sample Size: 25 mL
Prepared: 17-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0051	0.0500	**17.3**	mg/L	
Magnesium	7439-95-4	1	0.0160	0.0500	**4.39**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris B

18D0219-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 — Sampled: 04/14/2018 07:40

Instrument: ICPMS2 — Analyzed: 16-Apr-2018 14:26

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0312 — Sample Size: 25 mL
Prepared: 16-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead	7439-92-1	1	0.0680	0.100	**0.580**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris B

18D0219-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 04/14/2018 07:40

Instrument: ICPMS2 — Analyzed: 16-Apr-2018 14:26

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0312 — Sample Size: 25 mL
Prepared: 16-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper	7440-50-8	1	0.340	0.500	**4.88**	ug/L	
Zinc	7440-66-6	1	0.820	4.00	**24.4**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris B

18D0219-03 (Water)

Wet Chemistry

Method: EPA 160.2 — Sampled: 04/14/2018 07:40

Instrument: BAL2 — Analyzed: 17-Apr-2018 07:34

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0351 — Sample Size: 880 mL
Prepared: 17-Apr-2018 — Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	**6**	mg/L	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris B

18D0219-03 (Water)

Wet Chemistry

Method: SM 4500-$NO3^-$ I-00 — Sampled: 04/14/2018 07:40

Instrument: LACHAT2 — Analyzed: 18-Apr-2018 17:40

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0302 — Sample Size: 10 mL
Prepared: 18-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	**0.241**	mg-N/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris B

18D0219-03 (Water)

Wet Chemistry

Method: SM 4500-Norg D-97 — Sampled: 04/14/2018 07:40

Instrument: LACHAT2 — Analyzed: 26-Apr-2018 14:49

Sample Preparation: Preparation Method: LACHAT 10-107-06-1-I
Preparation Batch: BGD0571 — Sample Size: 25 mL
Prepared: 24-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Kjeldahl Nitrogen		1	0.5	0.5	ND	mg-N/L	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris B

18D0219-03 (Water)

Wet Chemistry

Method: SM 4500-P E-99 — Sampled: 04/14/2018 07:40

Instrument: UV1800-2 — Analyzed: 14-Apr-2018 18:00

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0311 — Sample Size: 50 mL
Prepared: 14-Apr-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Orthophosphorus	1426-54-42	1	0.0040	0.0040	**0.0420**	mg-P/L	

Sample Preparation: Preparation Method: SM 4500-P B-5 Persulfate
Preparation Batch: BGD0569 — Sample Size: 25 mL
Prepared: 24-Apr-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Phosphorus	7723-14-0	1	0.0080	0.0080	**0.0720**	mg-P/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris B

18D0219-03 (Water)

Wet Chemistry

Method: SM 5210 B-01 — Sampled: 04/14/2018 07:40

Instrument: BOD1 — Analyzed: 19-Apr-2018 15:14

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0309 — Sample Size: 250 mL
Prepared: 14-Apr-2018 — Final Volume: 300 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
BOD		1	1.2	1.2	**15.5**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris B

18D0219-03 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 04/14/2018 07:40

Instrument: [CALC] — Analyzed: 18-Apr-2018 15:01

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 17-Apr-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1	0.331	**61.3**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris B

18D0219-03 (Water)

Microbiology

Method: SM 9222D — Sampled: 04/14/2018 07:40

Instrument: N/A — Analyzed: 15-Apr-2018 12:30

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0308 — Sample Size: 20 mL
Prepared: 14-Apr-2018 — Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Fecal Coliforms		1		5	**275**	CFU/100 ml	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris B

18D0219-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 04/14/2018 07:40

Instrument: ICPMS2 — Analyzed: 19-Apr-2018 14:25

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0385 — Sample Size: 25 mL
Prepared: 18-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Bobby Morris B

18D0219-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 04/14/2018 07:40

Instrument: ICPMS2 — Analyzed: 19-Apr-2018 14:25

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0385 — Sample Size: 25 mL
Prepared: 18-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.340	0.500	**3.24**	ug/L	
Zinc, Dissolved	7440-66-6	1	0.820	4.00	**23.3**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller A

18D0219-05 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 04/14/2018 07:05

Instrument: NT6 — Analyzed: 20-Apr-2018 17:21

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGD0320 — Sample Size: 500 mL
Prepared: 19-Apr-2018 — Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	0.2	1.0	ND	ug/L	U
bis(2-chloroethyl) ether	111-44-4	1	0.4	1.0	ND	ug/L	U
2-Chlorophenol	95-57-8	1	0.4	1.0	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.3	1.0	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.3	1.0	ND	ug/L	U
Benzyl Alcohol	100-51-6	1	1.0	2.0	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.3	1.0	ND	ug/L	U
2-Methylphenol	95-48-7	1	0.3	1.0	ND	ug/L	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	0.5	1.0	ND	ug/L	U
4-Methylphenol	106-44-5	1	0.4	2.0	ND	ug/L	U
N-Nitroso-di-n-Propylamine	621-64-7	1	0.2	1.0	ND	ug/L	U
Hexachloroethane	67-72-1	1	0.3	2.0	ND	ug/L	U
Nitrobenzene	98-95-3	1	0.4	1.0	ND	ug/L	U
Isophorone	78-59-1	1	0.5	1.0	ND	ug/L	U
2-Nitrophenol	88-75-5	1	0.5	3.0	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	1.0	3.0	ND	ug/L	U
Bis(2-Chloroethoxy)methane	111-91-1	1	0.6	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	3.4	20.0	ND	ug/L	U
2,4-Dichlorophenol	120-83-2	1	1.9	3.0	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.3	1.0	ND	ug/L	U
Naphthalene	91-20-3	1	0.2	1.0	ND	ug/L	U
4-Chloroaniline	106-47-8	1	1.9	5.0	ND	ug/L	U
Hexachlorobutadiene	87-68-3	1	0.1	3.0	ND	ug/L	U
4-Chloro-3-Methylphenol	59-50-7	1	2.0	3.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	0.2	1.0	ND	ug/L	U
Hexachlorocyclopentadiene	77-47-4	1	2.5	5.0	ND	ug/L	U
2,4,6-Trichlorophenol	88-06-2	1	1.9	3.0	ND	ug/L	U
2,4,5-Trichlorophenol	95-95-4	1	1.8	5.0	ND	ug/L	U
2-Chloronaphthalene	91-58-7	1	0.5	1.0	ND	ug/L	U
2-Nitroaniline	88-74-4	1	2.0	3.0	ND	ug/L	U
Dimethylphthalate	131-11-3	1	0.4	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.3	1.0	ND	ug/L	U
2,6-Dinitrotoluene	606-20-2	1	2.1	3.0	ND	ug/L	U
3-Nitroaniline	99-09-2	1	2.2	3.0	ND	ug/L	U
Acenaphthene	83-32-9	1	0.3	1.0	ND	ug/L	U
2,4-Dinitrophenol	51-28-5	1	4.9	20.0	ND	ug/L	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller A

18D0219-05 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 04/14/2018 07:05

Instrument: NT6 — Analyzed: 20-Apr-2018 17:21

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dibenzofuran	132-64-9	1	0.3	1.0	ND	ug/L	U
4-Nitrophenol	100-02-7	1	1.0	10.0	ND	ug/L	U
2,4-Dinitrotoluene	121-14-2	1	2.0	3.0	ND	ug/L	U
Fluorene	86-73-7	1	0.3	1.0	ND	ug/L	U
Diethyl phthalate	84-66-2	1	0.4	1.0	ND	ug/L	U
4-Chlorophenylphenyl ether	7005-72-3	1	0.4	1.0	ND	ug/L	U
4-Nitroaniline	100-01-6	1	1.9	3.0	ND	ug/L	U
4,6-Dinitro-2-methylphenol	534-52-1	1	5.0	10.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.4	1.0	ND	ug/L	U
4-Bromophenyl phenyl ether	101-55-3	1	0.3	1.0	ND	ug/L	U
Hexachlorobenzene	118-74-1	1	0.4	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	2.6	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	0.2	1.0	ND	ug/L	U
Anthracene	120-12-7	1	0.4	1.0	ND	ug/L	U
Carbazole	86-74-8	1	0.6	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.5	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	0.4	1.0	ND	ug/L	U
Pyrene	129-00-0	1	0.3	1.0	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.4	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.4	1.0	ND	ug/L	U
3,3'-Dichlorobenzidine	91-94-1	1	1.6	5.0	ND	ug/L	U
Chrysene	218-01-9	1	0.4	1.0	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.5	3.0	ND	ug/L	U
Di-n-Octylphthalate	117-84-0	1	0.4	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.5	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.4	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.4	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.5	1.0	ND	ug/L	U
Benzofluoranthenes, Total		1	0.8	2.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.3	1.0	ND	ug/L	U
Surrogate: 2-Fluorophenol				*33-120 %*	*74.4*	*%*	
Surrogate: Phenol-d5				*38-120 %*	*82.0*	*%*	
Surrogate: 2-Chlorophenol-d4				*41-120 %*	*77.9*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*20-120 %*	*66.6*	*%*	
Surrogate: Nitrobenzene-d5				*27-120 %*	*78.3*	*%*	
Surrogate: 2-Fluorobiphenyl				*33-120 %*	*72.7*	*%*	
Surrogate: 2,4,6-Tribromophenol				*52-120 %*	*93.9*	*%*	
Surrogate: p-Terphenyl-d14				*28-120 %*	*90.6*	*%*	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller A

18D0219-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.7 — Sampled: 04/14/2018 07:05

Instrument: ICP2 — Analyzed: 18-Apr-2018 15:05

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGD0349 — Sample Size: 25 mL
Prepared: 17-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0051	0.0500	**28.2**	mg/L	
Magnesium	7439-95-4	1	0.0160	0.0500	**0.883**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller A

18D0219-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 — Sampled: 04/14/2018 07:05

Instrument: ICPMS2 — Analyzed: 16-Apr-2018 14:30

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0312 — Sample Size: 25 mL
Prepared: 16-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead	7439-92-1	1	0.0680	0.100	**0.269**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller A

18D0219-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 04/14/2018 07:05

Instrument: ICPMS2 — Analyzed: 16-Apr-2018 14:30

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0312 — Sample Size: 25 mL
Prepared: 16-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper	7440-50-8	1	0.340	0.500	**3.97**	ug/L	
Zinc	7440-66-6	1	0.820	4.00	**1.30**	ug/L	J

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller A

18D0219-05 (Water)

Wet Chemistry

Method: EPA 160.2 — Sampled: 04/14/2018 07:05

Instrument: BAL2 — Analyzed: 17-Apr-2018 07:34

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0351 — Sample Size: 870 mL
Prepared: 17-Apr-2018 — Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	ND	mg/L	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller A

18D0219-05 (Water)

Wet Chemistry

Method: SM 4500-$NO3^-$ I-00 — Sampled: 04/14/2018 07:05

Instrument: LACHAT2 — Analyzed: 18-Apr-2018 17:42

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0302 — Sample Size: 10 mL
Prepared: 18-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	**0.146**	mg-N/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller A

18D0219-05 (Water)

Wet Chemistry

Method: SM 4500-Norg D-97 — Sampled: 04/14/2018 07:05

Instrument: LACHAT2 — Analyzed: 26-Apr-2018 14:50

Sample Preparation: Preparation Method: LACHAT 10-107-06-1-I
Preparation Batch: BGD0571 — Sample Size: 25 mL
Prepared: 24-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Kjeldahl Nitrogen		1	0.5	0.5	ND	mg-N/L	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller A

18D0219-05 (Water)

Wet Chemistry

Method: SM 4500-P E-99 — Sampled: 04/14/2018 07:05

Instrument: UV1800-2 — Analyzed: 14-Apr-2018 18:01

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0311 — Sample Size: 50 mL
Prepared: 14-Apr-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Orthophosphorus	1426-54-42	1	0.0040	0.0040	**0.0100**	mg-P/L	

Sample Preparation: Preparation Method: SM 4500-P B-5 Persulfate
Preparation Batch: BGD0569 — Sample Size: 25 mL
Prepared: 24-Apr-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Phosphorus	7723-14-0	1	0.0080	0.0080	**0.0140**	mg-P/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller A

18D0219-05 (Water)

Wet Chemistry

Method: SM 5210 B-01 — Sampled: 04/14/2018 07:05

Instrument: BOD1 — Analyzed: 19-Apr-2018 15:14

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0309 — Sample Size: 250 mL
Prepared: 14-Apr-2018 — Final Volume: 300 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
BOD		1	1.2	1.2	ND	mg/L	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller A

18D0219-05 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 04/14/2018 07:05

Instrument: [CALC] — Analyzed: 18-Apr-2018 15:05

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 17-Apr-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1	0.331	**74.1**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller A

18D0219-05 (Water)

Microbiology

Method: SM 9222D — Sampled: 04/14/2018 07:05

Instrument: N/A — Analyzed: 15-Apr-2018 12:30

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0308 — Sample Size: 100 mL
Prepared: 14-Apr-2018 — Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Fecal Coliforms		1		1	ND	CFU/100 ml	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller A

18D0219-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 04/14/2018 07:05

Instrument: ICPMS2 — Analyzed: 19-Apr-2018 14:30

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0385 — Sample Size: 25 mL
Prepared: 18-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller A

18D0219-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 04/14/2018 07:05

Instrument: ICPMS2 — Analyzed: 19-Apr-2018 14:30

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0385 — Sample Size: 25 mL
Prepared: 18-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.340	0.500	**2.93**	ug/L	
Zinc, Dissolved	7440-66-6	1	0.820	4.00	**1.20**	ug/L	J

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller B

18D0219-07 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 04/14/2018 08:20

Instrument: NT6 — Analyzed: 20-Apr-2018 17:54

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGD0320 — Sample Size: 500 mL
Prepared: 19-Apr-2018 — Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	0.2	1.0	ND	ug/L	U
bis(2-chloroethyl) ether	111-44-4	1	0.4	1.0	ND	ug/L	U
2-Chlorophenol	95-57-8	1	0.4	1.0	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.3	1.0	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.3	1.0	ND	ug/L	U
Benzyl Alcohol	100-51-6	1	1.0	2.0	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.3	1.0	ND	ug/L	U
2-Methylphenol	95-48-7	1	0.3	1.0	ND	ug/L	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	0.5	1.0	ND	ug/L	U
4-Methylphenol	106-44-5	1	0.4	2.0	ND	ug/L	U
N-Nitroso-di-n-Propylamine	621-64-7	1	0.2	1.0	ND	ug/L	U
Hexachloroethane	67-72-1	1	0.3	2.0	ND	ug/L	U
Nitrobenzene	98-95-3	1	0.4	1.0	ND	ug/L	U
Isophorone	78-59-1	1	0.5	1.0	ND	ug/L	U
2-Nitrophenol	88-75-5	1	0.5	3.0	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	1.0	3.0	ND	ug/L	U
Bis(2-Chloroethoxy)methane	111-91-1	1	0.6	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	3.4	20.0	ND	ug/L	U
2,4-Dichlorophenol	120-83-2	1	1.9	3.0	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.3	1.0	ND	ug/L	U
Naphthalene	91-20-3	1	0.2	1.0	ND	ug/L	U
4-Chloroaniline	106-47-8	1	1.9	5.0	ND	ug/L	U
Hexachlorobutadiene	87-68-3	1	0.1	3.0	ND	ug/L	U
4-Chloro-3-Methylphenol	59-50-7	1	2.0	3.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	0.2	1.0	ND	ug/L	U
Hexachlorocyclopentadiene	77-47-4	1	2.5	5.0	ND	ug/L	U
2,4,6-Trichlorophenol	88-06-2	1	1.9	3.0	ND	ug/L	U
2,4,5-Trichlorophenol	95-95-4	1	1.8	5.0	ND	ug/L	U
2-Chloronaphthalene	91-58-7	1	0.5	1.0	ND	ug/L	U
2-Nitroaniline	88-74-4	1	2.0	3.0	ND	ug/L	U
Dimethylphthalate	131-11-3	1	0.4	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.3	1.0	ND	ug/L	U
2,6-Dinitrotoluene	606-20-2	1	2.1	3.0	ND	ug/L	U
3-Nitroaniline	99-09-2	1	2.2	3.0	ND	ug/L	U
Acenaphthene	83-32-9	1	0.3	1.0	ND	ug/L	U
2,4-Dinitrophenol	51-28-5	1	4.9	20.0	ND	ug/L	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller B

18D0219-07 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 04/14/2018 08:20

Instrument: NT6 — Analyzed: 20-Apr-2018 17:54

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dibenzofuran	132-64-9	1	0.3	1.0	ND	ug/L	U
4-Nitrophenol	100-02-7	1	1.0	10.0	ND	ug/L	U
2,4-Dinitrotoluene	121-14-2	1	2.0	3.0	ND	ug/L	U
Fluorene	86-73-7	1	0.3	1.0	ND	ug/L	U
Diethyl phthalate	84-66-2	1	0.4	1.0	ND	ug/L	U
4-Chlorophenylphenyl ether	7005-72-3	1	0.4	1.0	ND	ug/L	U
4-Nitroaniline	100-01-6	1	1.9	3.0	ND	ug/L	U
4,6-Dinitro-2-methylphenol	534-52-1	1	5.0	10.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.4	1.0	ND	ug/L	U
4-Bromophenyl phenyl ether	101-55-3	1	0.3	1.0	ND	ug/L	U
Hexachlorobenzene	118-74-1	1	0.4	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	2.6	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	0.2	1.0	ND	ug/L	U
Anthracene	120-12-7	1	0.4	1.0	ND	ug/L	U
Carbazole	86-74-8	1	0.6	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.5	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	0.4	1.0	ND	ug/L	U
Pyrene	129-00-0	1	0.3	1.0	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.4	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.4	1.0	ND	ug/L	U
3,3'-Dichlorobenzidine	91-94-1	1	1.6	5.0	ND	ug/L	U
Chrysene	218-01-9	1	0.4	1.0	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.5	3.0	ND	ug/L	U
Di-n-Octylphthalate	117-84-0	1	0.4	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.5	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.4	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.4	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.5	1.0	ND	ug/L	U
Benzofluoranthenes, Total		1	0.8	2.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.3	1.0	ND	ug/L	U
Surrogate: 2-Fluorophenol				*33-120 %*	*60.3*	*%*	
Surrogate: Phenol-d5				*38-120 %*	*69.0*	*%*	
Surrogate: 2-Chlorophenol-d4				*41-120 %*	*63.5*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*20-120 %*	*51.2*	*%*	
Surrogate: Nitrobenzene-d5				*27-120 %*	*64.5*	*%*	
Surrogate: 2-Fluorobiphenyl				*33-120 %*	*60.1*	*%*	
Surrogate: 2,4,6-Tribromophenol				*52-120 %*	*83.5*	*%*	
Surrogate: p-Terphenyl-d14				*28-120 %*	*81.1*	*%*	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller B

18D0219-07 (Water)

Metals and Metallic Compounds

Method: EPA 200.7 — Sampled: 04/14/2018 08:20

Instrument: ICP2 — Analyzed: 18-Apr-2018 15:09

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGD0349 — Sample Size: 25 mL
Prepared: 17-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0051	0.0500	**28.1**	mg/L	
Magnesium	7439-95-4	1	0.0160	0.0500	**0.872**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller B

18D0219-07 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 — Sampled: 04/14/2018 08:20

Instrument: ICPMS2 — Analyzed: 16-Apr-2018 14:35

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0312 — Sample Size: 25 mL
Prepared: 16-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller B

18D0219-07 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 04/14/2018 08:20

Instrument: ICPMS2 — Analyzed: 16-Apr-2018 14:35

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0312 — Sample Size: 25 mL
Prepared: 16-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper	7440-50-8	1	0.340	0.500	**3.63**	ug/L	
Zinc	7440-66-6	1	0.820	4.00	**1.18**	ug/L	J

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller B

18D0219-07 (Water)

Wet Chemistry

Method: EPA 160.2 — Sampled: 04/14/2018 08:20

Instrument: BAL2 — Analyzed: 17-Apr-2018 07:34

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0351 — Sample Size: 890 mL
Prepared: 17-Apr-2018 — Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	ND	mg/L	U

Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller B

18D0219-07 (Water)

Wet Chemistry

Method: SM 4500-$NO3^-$ I-00 — Sampled: 04/14/2018 08:20

Instrument: LACHAT2 — Analyzed: 18-Apr-2018 17:43

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0302 — Sample Size: 10 mL
Prepared: 18-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	**0.136**	mg-N/L	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller B

18D0219-07 (Water)

Wet Chemistry

Method: SM 4500-Norg D-97 — Sampled: 04/14/2018 08:20

Instrument: LACHAT2 — Analyzed: 26-Apr-2018 14:51

Sample Preparation: Preparation Method: LACHAT 10-107-06-1-I
Preparation Batch: BGD0571 — Sample Size: 25 mL
Prepared: 24-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Kjeldahl Nitrogen		1	0.5	0.5	ND	mg-N/L	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller B

18D0219-07 (Water)

Wet Chemistry

Method: SM 4500-P E-99 — Sampled: 04/14/2018 08:20

Instrument: UV1800-2 — Analyzed: 14-Apr-2018 18:01

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0311 — Sample Size: 50 mL
Prepared: 14-Apr-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Orthophosphorus	1426-54-42	1	0.0040	0.0040	**0.0100**	mg-P/L	

Sample Preparation: Preparation Method: SM 4500-P B-5 Persulfate
Preparation Batch: BGD0569 — Sample Size: 25 mL
Prepared: 24-Apr-2018 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Phosphorus	7723-14-0	1	0.0080	0.0080	**0.0100**	mg-P/L	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller B

18D0219-07 (Water)

Wet Chemistry

Method: SM 5210 B-01 — Sampled: 04/14/2018 08:20

Instrument: BOD1 — Analyzed: 19-Apr-2018 15:14

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0309 — Sample Size: 250 mL
Prepared: 14-Apr-2018 — Final Volume: 300 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
BOD		1	1.2	1.2	ND	mg/L	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller B

18D0219-07 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 04/14/2018 08:20

Instrument: [CALC] — Analyzed: 18-Apr-2018 15:09

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 17-Apr-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1	0.331	**73.7**	mg/L	

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller B

18D0219-07 (Water)

Microbiology

Method: SM 9222D — Sampled: 04/14/2018 08:20

Instrument: N/A — Analyzed: 15-Apr-2018 12:30

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0308 — Sample Size: 100 mL
Prepared: 14-Apr-2018 — Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Fecal Coliforms		1		1	**3**	CFU/100 ml	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller B

18D0219-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 04/14/2018 08:20

Instrument: ICPMS2 — Analyzed: 19-Apr-2018 14:35

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0385 — Sample Size: 25 mL
Prepared: 18-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Miller B

18D0219-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 04/14/2018 08:20

Instrument: ICPMS2 — Analyzed: 19-Apr-2018 14:35

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0385 — Sample Size: 25 mL
Prepared: 18-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.340	0.500	**3.53**	ug/L	
Zinc, Dissolved	7440-66-6	1	0.820	4.00	**2.60**	ug/L	J

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Semivolatile Organic Compounds - Quality Control

Batch BGD0320 - EPA 3520C (Liq Liq)

Instrument: NT6 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0320-BLK1)				Prepared: 19-Apr-2018 Analyzed: 20-Apr-2018 13:22							
Phenol	ND	0.2	1.0	ug/L							U
bis(2-chloroethyl) ether	ND	0.4	1.0	ug/L							U
2-Chlorophenol	ND	0.4	1.0	ug/L							U
1,3-Dichlorobenzene	ND	0.3	1.0	ug/L							U
1,4-Dichlorobenzene	ND	0.3	1.0	ug/L							U
Benzyl Alcohol	ND	1.0	2.0	ug/L							U
1,2-Dichlorobenzene	ND	0.3	1.0	ug/L							U
2-Methylphenol	ND	0.3	1.0	ug/L							U
2,2'-Oxybis(1-chloropropane)	ND	0.5	1.0	ug/L							U
4-Methylphenol	ND	0.4	2.0	ug/L							U
N-Nitroso-di-n-Propylamine	ND	0.2	1.0	ug/L							U
Hexachloroethane	ND	0.3	2.0	ug/L							U
Nitrobenzene	ND	0.4	1.0	ug/L							U
Isophorone	ND	0.5	1.0	ug/L							U
2-Nitrophenol	ND	0.5	3.0	ug/L							U
2,4-Dimethylphenol	ND	1.0	3.0	ug/L							U
Bis(2-Chloroethoxy)methane	ND	0.6	1.0	ug/L							U
Benzoic acid	ND	3.4	20.0	ug/L							U
2,4-Dichlorophenol	ND	1.9	3.0	ug/L							U
1,2,4-Trichlorobenzene	ND	0.3	1.0	ug/L							U
Naphthalene	ND	0.2	1.0	ug/L							U
4-Chloroaniline	ND	1.9	5.0	ug/L							U
Hexachlorobutadiene	ND	0.1	3.0	ug/L							U
4-Chloro-3-Methylphenol	ND	2.0	3.0	ug/L							U
2-Methylnaphthalene	ND	0.2	1.0	ug/L							U
Hexachlorocyclopentadiene	ND	2.5	5.0	ug/L							U
2,4,6-Trichlorophenol	ND	1.9	3.0	ug/L							U
2,4,5-Trichlorophenol	ND	1.8	5.0	ug/L							U
2-Chloronaphthalene	ND	0.5	1.0	ug/L							U
2-Nitroaniline	ND	2.0	3.0	ug/L							U
Dimethylphthalate	ND	0.4	1.0	ug/L							U
Acenaphthylene	ND	0.3	1.0	ug/L							U
2,6-Dinitrotoluene	ND	2.1	3.0	ug/L							U
3-Nitroaniline	ND	2.2	3.0	ug/L							U
Acenaphthene	ND	0.3	1.0	ug/L							U

Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Semivolatile Organic Compounds - Quality Control

Batch BGD0320 - EPA 3520C (Liq Liq)

Instrument: NT6 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0320-BLK1)				Prepared: 19-Apr-2018 Analyzed: 20-Apr-2018 13:22							
2,4-Dinitrophenol	ND	4.9	20.0	ug/L							U
Dibenzofuran	ND	0.3	1.0	ug/L							U
4-Nitrophenol	ND	1.0	10.0	ug/L							U
2,4-Dinitrotoluene	ND	2.0	3.0	ug/L							U
Fluorene	ND	0.3	1.0	ug/L							U
Diethyl phthalate	ND	0.4	1.0	ug/L							U
4-Chlorophenylphenyl ether	ND	0.4	1.0	ug/L							U
4-Nitroaniline	ND	1.9	3.0	ug/L							U
4,6-Dinitro-2-methylphenol	ND	5.0	10.0	ug/L							U
N-Nitrosodiphenylamine	ND	0.4	1.0	ug/L							U
4-Bromophenyl phenyl ether	ND	0.3	1.0	ug/L							U
Hexachlorobenzene	ND	0.4	1.0	ug/L							U
Pentachlorophenol	ND	2.6	10.0	ug/L							U
Phenanthrene	ND	0.2	1.0	ug/L							U
Anthracene	ND	0.4	1.0	ug/L							U
Carbazole	ND	0.6	1.0	ug/L							U
Di-n-Butylphthalate	ND	0.5	1.0	ug/L							U
Fluoranthene	ND	0.4	1.0	ug/L							U
Pyrene	ND	0.3	1.0	ug/L							U
Butylbenzylphthalate	ND	0.4	1.0	ug/L							U
Benzo(a)anthracene	ND	0.4	1.0	ug/L							U
3,3'-Dichlorobenzidine	ND	1.6	5.0	ug/L							U
Chrysene	ND	0.4	1.0	ug/L							U
bis(2-Ethylhexyl)phthalate	ND	0.5	3.0	ug/L							U
Di-n-Octylphthalate	ND	0.4	1.0	ug/L							U
Benzo(a)pyrene	ND	0.5	1.0	ug/L							U
Indeno(1,2,3-cd)pyrene	ND	0.4	1.0	ug/L							U
Dibenzo(a,h)anthracene	ND	0.4	1.0	ug/L							U
Benzo(g,h,i)perylene	ND	0.5	1.0	ug/L							U
Benzofluoranthenes, Total	ND	0.8	2.0	ug/L							U
1-Methylnaphthalene	ND	0.3	1.0	ug/L							U
Surrogate: 2-Fluorophenol	28.1			ug/L	*37.5*		*75.0*	*33-120*			
Surrogate: Phenol-d5	31.3			ug/L	*37.5*		*83.6*	*38-120*			
Surrogate: 2-Chlorophenol-d4	29.5			ug/L	*37.5*		*78.6*	*41-120*			
Surrogate: 1,2-Dichlorobenzene-d4	16.5			ug/L	*25.0*		*66.0*	*20-120*			

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Semivolatile Organic Compounds - Quality Control

Batch BGD0320 - EPA 3520C (Liq Liq)

Instrument: NT6 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0320-BLK1)				Prepared: 19-Apr-2018 Analyzed: 20-Apr-2018 13:22							
Surrogate: Nitrobenzene-d5	20.4			ug/L	*25.0*		*81.6*	*27-120*			
Surrogate: 2-Fluorobiphenyl	17.9			ug/L	*25.0*		*71.6*	*33-120*			
Surrogate: 2,4,6-Tribromophenol	32.9			ug/L	*37.5*		*87.7*	*52-120*			
Surrogate: p-Terphenyl-d14	24.0			ug/L	*25.0*		*96.2*	*28-120*			
LCS (BGD0320-BS1)				Prepared: 19-Apr-2018 Analyzed: 20-Apr-2018 13:55							
Phenol	17.0	0.2	1.0	ug/L	25.0		67.9	35-120			
bis(2-chloroethyl) ether	18.7	0.4	1.0	ug/L	25.0		74.7	46.5-120			
2-Chlorophenol	15.9	0.4	1.0	ug/L	25.0		63.6	48-120			
1,3-Dichlorobenzene	13.3	0.3	1.0	ug/L	25.0		53.1	34.2-120			
1,4-Dichlorobenzene	13.6	0.3	1.0	ug/L	25.0		54.2	36-120			
Benzyl Alcohol	20.6	1.0	2.0	ug/L	25.0		82.6	27.4-120			
1,2-Dichlorobenzene	14.6	0.3	1.0	ug/L	25.0		58.3	38.4-120			
2-Methylphenol	17.5	0.3	1.0	ug/L	25.0		69.9	47.8-120			
2,2'-Oxybis(1-chloropropane)	17.4	0.5	1.0	ug/L	25.0		69.8	40.4-120			
4-Methylphenol	19.7	0.4	2.0	ug/L	25.0		78.8	52.3-120			
N-Nitroso-di-n-Propylamine	21.3	0.2	1.0	ug/L	25.0		85.3	51.4-120			
Hexachloroethane	12.7	0.3	2.0	ug/L	25.0		50.7	29.5-120			
Nitrobenzene	18.8	0.4	1.0	ug/L	25.0		75.3	51.5-120			
Isophorone	23.8	0.5	1.0	ug/L	25.0		95.0	62.3-128			
2-Nitrophenol	20.8	0.5	3.0	ug/L	25.0		83.2	58.6-124			
2,4-Dimethylphenol	49.1	1.0	3.0	ug/L	75.0		65.4	38.5-120			
Bis(2-Chloroethoxy)methane	20.6	0.6	1.0	ug/L	25.0		82.4	52.9-120			
Benzoic acid	120	3.4	20.0	ug/L	138		87.6	38.2-120			
2,4-Dichlorophenol	51.3	1.9	3.0	ug/L	75.0		68.4	43.6-120			
1,2,4-Trichlorobenzene	14.1	0.3	1.0	ug/L	25.0		56.2	38.6-120			
Naphthalene	16.4	0.2	1.0	ug/L	25.0		65.7	40.5-120			
4-Chloroaniline	38.8	1.9	5.0	ug/L	75.0		51.7	42.7-120			
Hexachlorobutadiene	12.6	0.1	3.0	ug/L	25.0		50.5	32.3-120			
4-Chloro-3-Methylphenol	57.8	2.0	3.0	ug/L	75.0		77.1	51.9-120			
2-Methylnaphthalene	16.3	0.2	1.0	ug/L	25.0		65.2	47.3-120			
Hexachlorocyclopentadiene	42.2	2.5	5.0	ug/L	75.0		56.2	23.3-120			
2,4,6-Trichlorophenol	53.8	1.9	3.0	ug/L	75.0		71.7	47-120			
2,4,5-Trichlorophenol	56.4	1.8	5.0	ug/L	75.0		75.2	48.4-120			
2-Chloronaphthalene	17.3	0.5	1.0	ug/L	25.0		69.3	47.7-123			

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Semivolatile Organic Compounds - Quality Control

Batch BGD0320 - EPA 3520C (Liq Liq)

Instrument: NT6 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BGD0320-BS1)					Prepared: 19-Apr-2018 Analyzed: 20-Apr-2018 13:55						
2-Nitroaniline	63.7	2.0	3.0	ug/L	75.0		85.0	56.8-120			
Dimethylphthalate	20.8	0.4	1.0	ug/L	25.0		83.4	65.2-125			
Acenaphthylene	18.5	0.3	1.0	ug/L	25.0		73.9	44.1-120			
2,6-Dinitrotoluene	65.8	2.1	3.0	ug/L	75.0		87.7	69.3-140			
3-Nitroaniline	60.1	2.2	3.0	ug/L	75.0		80.1	60.9-120			
Acenaphthene	18.6	0.3	1.0	ug/L	25.0		74.5	50.4-120			
2,4-Dinitrophenol	122	4.9	20.0	ug/L	138		88.9	33.7-183			
Dibenzofuran	18.4	0.3	1.0	ug/L	25.0		73.5	49.9-120			
4-Nitrophenol	51.4	1.0	10.0	ug/L	75.0		68.5	50.2-136			
2,4-Dinitrotoluene	65.4	2.0	3.0	ug/L	75.0		87.2	66.8-132			
Fluorene	19.5	0.3	1.0	ug/L	25.0		78.1	57.8-120			
Diethyl phthalate	21.0	0.4	1.0	ug/L	25.0		84.1	68.1-120			
4-Chlorophenylphenyl ether	19.7	0.4	1.0	ug/L	25.0		78.9	59.1-127			
4-Nitroaniline	65.4	1.9	3.0	ug/L	75.0		87.2	56-122			
4,6-Dinitro-2-methylphenol	130	5.0	10.0	ug/L	138		94.5	37.9-162			
N-Nitrosodiphenylamine	17.7	0.4	1.0	ug/L	25.0		70.6	59.6-120			
4-Bromophenyl phenyl ether	20.4	0.3	1.0	ug/L	25.0		81.6	59.6-120			
Hexachlorobenzene	18.7	0.4	1.0	ug/L	25.0		74.9	53.7-120			
Pentachlorophenol	60.6	2.6	10.0	ug/L	75.0		80.9	40.3-128			
Phenanthrene	19.0	0.2	1.0	ug/L	25.0		75.8	58.8-120			
Anthracene	18.0	0.4	1.0	ug/L	25.0		71.9	60.5-120			
Carbazole	18.4	0.6	1.0	ug/L	25.0		73.5	59.7-120			
Di-n-Butylphthalate	23.1	0.5	1.0	ug/L	25.0		92.3	71-120			
Fluoranthene	20.5	0.4	1.0	ug/L	25.0		82.0	66.7-120			
Pyrene	21.2	0.3	1.0	ug/L	25.0		84.7	62.7-127			
Butylbenzylphthalate	25.9	0.4	1.0	ug/L	25.0		104	67.4-128			Q
Benzo(a)anthracene	19.8	0.4	1.0	ug/L	25.0		79.3	58.3-128			
3,3'-Dichlorobenzidine	33.2	1.6	5.0	ug/L	75.0		44.2	34.1-120			
Chrysene	19.0	0.4	1.0	ug/L	25.0		76.1	58.9-120			
bis(2-Ethylhexyl)phthalate	27.8	0.5	3.0	ug/L	25.0		111	68.3-123			
Di-n-Octylphthalate	24.1	0.4	1.0	ug/L	25.0		96.5	61.5-120			
Benzo(a)pyrene	19.7	0.5	1.0	ug/L	25.0		79.0	70.6-120			
Indeno(1,2,3-cd)pyrene	19.7	0.4	1.0	ug/L	25.0		78.6	46.5-120			
Dibenzo(a,h)anthracene	20.3	0.4	1.0	ug/L	25.0		81.1	49.6-120			
Benzo(g,h,i)perylene	19.0	0.5	1.0	ug/L	25.0		75.8	37-120			

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Semivolatile Organic Compounds - Quality Control

Batch BGD0320 - EPA 3520C (Liq Liq)

Instrument: NT6 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BGD0320-BS1)					Prepared: 19-Apr-2018 Analyzed: 20-Apr-2018 13:55						
Benzofluoranthenes, Total	37.9	0.8	2.0	ug/L	50.0		75.9	66.5-120			
1-Methylnaphthalene	18.1	0.3	1.0	ug/L	25.0		72.4	46.9-120			
Surrogate: 2-Fluorophenol	26.8			ug/L	*37.5*		*71.4*	*33-120*			
Surrogate: Phenol-d5	29.1			ug/L	*37.5*		*77.5*	*38-120*			
Surrogate: 2-Chlorophenol-d4	28.4			ug/L	*37.5*		*75.8*	*41-120*			
Surrogate: 1,2-Dichlorobenzene-d4	14.9			ug/L	*25.0*		*59.4*	*20-120*			
Surrogate: Nitrobenzene-d5	20.5			ug/L	*25.0*		*81.8*	*27-120*			
Surrogate: 2-Fluorobiphenyl	18.3			ug/L	*25.0*		*73.0*	*33-120*			
Surrogate: 2,4,6-Tribromophenol	36.4			ug/L	*37.5*		*97.1*	*52-120*			
Surrogate: p-Terphenyl-d14	23.1			ug/L	*25.0*		*92.3*	*28-120*			

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Metals and Metallic Compounds - Quality Control

Batch BGD0312 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0312-BLK1)					Prepared: 16-Apr-2018 Analyzed: 16-Apr-2018 12:01							
Lead	208	ND	0.0680	0.100	ug/L							U
Copper	63	ND	0.340	0.500	ug/L							U
Copper	65	ND	0.350	0.500	ug/L							U
Zinc	66	ND	0.820	4.00	ug/L							U
Zinc	67	ND	0.940	4.00	ug/L							U
LCS (BGD0312-BS1)					Prepared: 16-Apr-2018 Analyzed: 16-Apr-2018 12:43							
Lead	208	28.9	0.0680	0.100	ug/L	25.0		116	80-120			
Copper	63	28.5	0.340	0.500	ug/L	25.0		114	80-120			
Copper	65	28.2	0.350	0.500	ug/L	25.0		113	80-120			
Zinc	66	85.4	0.820	4.00	ug/L	80.0		107	80-120			
Zinc	67	83.2	0.940	4.00	ug/L	80.0		104	80-120			

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Metals and Metallic Compounds - Quality Control

Batch BGD0349 - TWC EPA 3010A

Instrument: ICP2 Analyst: MCB

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0349-BLK1)				Prepared: 17-Apr-2018 Analyzed: 18-Apr-2018 12:29							
Calcium	0.0062	0.0051	0.0500	mg/L							J
Magnesium	ND	0.0160	0.0500	mg/L							U
LCS (BGD0349-BS1)				Prepared: 17-Apr-2018 Analyzed: 18-Apr-2018 13:07							
Calcium	9.54	0.0051	0.0500	mg/L	10.0		95.4	80-120			
Magnesium	9.89	0.0160	0.0500	mg/L	10.0		98.9	80-120			

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGD0385 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0385-BLK1)					Prepared: 18-Apr-2018 Analyzed: 18-Apr-2018 13:28							
Lead, Dissolved	208	ND	0.0680	0.100	ug/L							U
Copper, Dissolved	63	ND	0.340	0.500	ug/L							U
Copper, Dissolved	65	ND	0.350	0.500	ug/L							U
Blank (BGD0385-BLK2)					Prepared: 18-Apr-2018 Analyzed: 19-Apr-2018 11:52							
Zinc, Dissolved	66	ND	0.820	4.00	ug/L							U
Zinc, Dissolved	67	ND	0.940	4.00	ug/L							U
LCS (BGD0385-BS1)					Prepared: 18-Apr-2018 Analyzed: 18-Apr-2018 14:04							
Lead, Dissolved	208	26.3	0.0680	0.100	ug/L	25.0		105	80-120			
Copper, Dissolved	63	26.4	0.340	0.500	ug/L	25.0		106	80-120			
Copper, Dissolved	65	25.8	0.350	0.500	ug/L	25.0		103	80-120			
LCS (BGD0385-BS2)					Prepared: 18-Apr-2018 Analyzed: 19-Apr-2018 12:35							
Zinc, Dissolved	66	88.2	0.820	4.00	ug/L	80.0		110	80-120			
Zinc, Dissolved	67	79.7	0.940	4.00	ug/L	80.0		99.6	80-120			
Duplicate (BGD0385-DUP1)			Source: 18D0219-02		Prepared: 18-Apr-2018 Analyzed: 18-Apr-2018 13:52							
Lead, Dissolved	208	ND	0.0680	0.100	ug/L		ND					U
Copper, Dissolved	63	2.69	0.340	0.500	ug/L		2.64			1.69	20	
Duplicate (BGD0385-DUP2)			Source: 18D0219-02		Prepared: 18-Apr-2018 Analyzed: 19-Apr-2018 13:30							
Zinc, Dissolved	66	15.6	0.820	4.00	ug/L		16.2			3.64	20	
Matrix Spike (BGD0385-MS1)			Source: 18D0219-02		Prepared: 18-Apr-2018 Analyzed: 18-Apr-2018 14:00							
Lead, Dissolved	208	25.9	0.0680	0.100	ug/L	25.0	ND	104	75-125			
Copper, Dissolved	63	27.6	0.340	0.500	ug/L	25.0	2.64	99.9	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike (BGD0385-MS2)			Source: 18D0219-02		Prepared: 18-Apr-2018 Analyzed: 19-Apr-2018 13:39							
Zinc, Dissolved	66	93.5	0.820	4.00	ug/L	80.0	16.2	96.6	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Wet Chemistry - Quality Control

Batch BGD0302 - No Prep Wet Chem

Instrument: LACHAT2 Analyst: GM

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0302-BLK1)				Prepared: 13-Apr-2018 Analyzed: 18-Apr-2018 17:11							
Nitrate + Nitrite as N	ND	0.010	0.010	mg-N/L							U
LCS (BGD0302-BS1)				Prepared: 13-Apr-2018 Analyzed: 18-Apr-2018 17:13							
Nitrate + Nitrite as N	0.485	0.010	0.010	mg-N/L	0.500		97.0	90-110			

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4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Wet Chemistry - Quality Control

Batch BGD0309 - No Prep Wet Chem

Instrument: BOD1 Analyst: KK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0309-BLK1)				Prepared: 14-Apr-2018 Analyzed: 19-Apr-2018 15:14							
BOD	ND	1.0	1.0	mg/L							*, U
LCS (BGD0309-BS1)				Prepared: 14-Apr-2018 Analyzed: 19-Apr-2018 15:14							
BOD	170	50.0	50.0	mg/L	198		85.9	84.6-115.4			

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Wet Chemistry - Quality Control

Batch BGD0311 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: KK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0311-BLK1)				Prepared: 14-Apr-2018 Analyzed: 14-Apr-2018 17:58							
Orthophosphorus	ND	0.0040	0.0040	mg-P/L							U
LCS (BGD0311-BS1)				Prepared: 14-Apr-2018 Analyzed: 14-Apr-2018 17:59							
Orthophosphorus	0.153	0.0040	0.0040	mg-P/L	0.150		102	90-110			
Duplicate (BGD0311-DUP1)		**Source: 18D0219-01**		Prepared: 14-Apr-2018 Analyzed: 14-Apr-2018 17:59							
Orthophosphorus	0.0390	0.0040	0.0040	mg-P/L		0.0400			2.53	20	
Matrix Spike (BGD0311-MS1)		**Source: 18D0219-01**		Prepared: 14-Apr-2018 Analyzed: 14-Apr-2018 18:00							
Orthophosphorus	0.137	0.0040	0.0040	mg-P/L	0.0999	0.0400	97.1	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Wet Chemistry - Quality Control

Batch BGD0351 - No Prep Wet Chem

Instrument: BAL2 Analyst: KLE

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0351-BLK1)				Prepared: 17-Apr-2018 Analyzed: 17-Apr-2018 07:34							
Suspended Solids	ND	1	1	mg/L							U
LCS (BGD0351-BS1)				Prepared: 17-Apr-2018 Analyzed: 17-Apr-2018 07:34							
Suspended Solids	50	1	1	mg/L	50.00		99.0	90-110			

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Wet Chemistry - Quality Control

Batch BGD0568 - SM 4500-P B-4 Strong Acid

Instrument: UV1800-2 Analyst: SK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0568-BLK1)				Prepared: 24-Apr-2018 Analyzed: 26-Apr-2018 10:38							
Total Phosphorus	0.0180	0.0080	0.0080	mg-P/L							*
Blank (BGD0568-BLK2)				Prepared: 24-Apr-2018 Analyzed: 26-Apr-2018 11:00							
Total Phosphorus	0.0190	0.0080	0.0080	mg-P/L							*
LCS (BGD0568-BS1)				Prepared: 24-Apr-2018 Analyzed: 26-Apr-2018 10:39							
Total Phosphorus	0.149	0.0080	0.0080	mg-P/L	0.150		99.3	90-110			B
LCS (BGD0568-BS2)				Prepared: 24-Apr-2018 Analyzed: 26-Apr-2018 11:01							
Total Phosphorus	0.157	0.0080	0.0080	mg-P/L	0.150		105	90-110			B

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Wet Chemistry - Quality Control

Batch BGD0569 - SM 4500-P B-5 Persulfate

Instrument: UV1800-2 Analyst: SK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0569-BLK1)				Prepared: 24-Apr-2018 Analyzed: 26-Apr-2018 11:35							
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
Blank (BGD0569-BLK2)				Prepared: 24-Apr-2018 Analyzed: 26-Apr-2018 11:42							
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
LCS (BGD0569-BS1)				Prepared: 24-Apr-2018 Analyzed: 26-Apr-2018 11:35							
Total Phosphorus	0.148	0.0080	0.0080	mg-P/L	0.150		98.7	90-110			
LCS (BGD0569-BS2)				Prepared: 24-Apr-2018 Analyzed: 26-Apr-2018 11:43							
Total Phosphorus	0.148	0.0080	0.0080	mg-P/L	0.150		98.7	90-110			

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Wet Chemistry - Quality Control

Batch BGD0571 - LACHAT 10-107-06-1-I

Instrument: LACHAT2 Analyst: SK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0571-BLK1)				Prepared: 24-Apr-2018 Analyzed: 26-Apr-2018 14:41							
Total Kjeldahl Nitrogen	ND	0.5	0.5	mg-N/L							U
LCS (BGD0571-BS1)				Prepared: 24-Apr-2018 Analyzed: 26-Apr-2018 14:43							
Total Kjeldahl Nitrogen	5.1	0.5	0.5	mg-N/L	5.00		102	90-110			
LCS (BGD0571-BS2)				Prepared: 24-Apr-2018 Analyzed: 26-Apr-2018 14:44							
Total Kjeldahl Nitrogen	5.2	0.5	0.5	mg-N/L	5.00		103	90-110			
Duplicate (BGD0571-DUP1)		**Source: 18D0219-01**		Prepared: 24-Apr-2018 Analyzed: 26-Apr-2018 14:47							
Total Kjeldahl Nitrogen	ND	0.5	0.5	mg-N/L		ND					U
Matrix Spike (BGD0571-MS1)		**Source: 18D0219-01**		Prepared: 24-Apr-2018 Analyzed: 26-Apr-2018 14:48							
Total Kjeldahl Nitrogen	5.9	0.5	0.5	mg-N/L	10.0	ND	58.8	75-125			*

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Wet Chemistry - Quality Control

Batch BGD0660 - SM 4500-P B-4 Strong Acid

Instrument: UV1800-2 Analyst: SK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0660-BLK1)				Prepared: 26-Apr-2018 Analyzed: 27-Apr-2018 17:30							
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
Blank (BGD0660-BLK2)				Prepared: 26-Apr-2018 Analyzed: 27-Apr-2018 17:47							
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
LCS (BGD0660-BS1)				Prepared: 26-Apr-2018 Analyzed: 27-Apr-2018 17:30							
Total Phosphorus	0.146	0.0080	0.0080	mg-P/L	0.150		97.3	90-110			
LCS (BGD0660-BS2)				Prepared: 26-Apr-2018 Analyzed: 27-Apr-2018 17:48							
Total Phosphorus	0.145	0.0080	0.0080	mg-P/L	0.150		96.7	90-110			
Duplicate (BGD0660-DUP1)		**Source: 18D0219-01RE1**		Prepared: 26-Apr-2018 Analyzed: 27-Apr-2018 17:32							
Total Phosphorus	0.138	0.0080	0.0080	mg-P/L		0.174			23.10	20	*
Matrix Spike (BGD0660-MS1)		**Source: 18D0219-01RE1**		Prepared: 26-Apr-2018 Analyzed: 27-Apr-2018 17:32							
Total Phosphorus	2.10	0.0400	0.0400	mg-P/L	2.00	0.174	96.4	75-125			D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Microbiology - Quality Control

Batch BGD0308 - No Prep Wet Chem

Instrument: N/A

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0308-BLK1)				Prepared: 14-Apr-2018 Analyzed: 15-Apr-2018 12:30							
Fecal Coliforms	ND		1	CFU/100 ml							U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Certified Analyses included in this Report

Analyte	Certifications
EPA 200.7 in Water	
Calcium	WADOE,NELAP,DoD-ELAP,WA-DW
Magnesium	WADOE,NELAP,DoD-ELAP,WA-DW
EPA 200.8 in Water	
Lead-208	NELAP,WADOE,WA-DW,DoD-ELAP
Lead-208	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 200.8 UCT-KED in Water	
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 8270D in Water	
Phenol	CALAP,WADOE,DoD-ELAP,NELAP
bis(2-chloroethyl) ether	CALAP,WADOE,DoD-ELAP,NELAP
2-Chlorophenol	CALAP,WADOE,DoD-ELAP,NELAP
1,3-Dichlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP
1,4-Dichlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP
Benzyl Alcohol	CALAP,WADOE,DoD-ELAP,NELAP
1,2-Dichlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP
2-Methylphenol	CALAP,WADOE,DoD-ELAP,NELAP
4-Methylphenol	CALAP,WADOE,DoD-ELAP,NELAP
N-Nitroso-di-n-Propylamine	CALAP,WADOE,DoD-ELAP,NELAP
Hexachloroethane	CALAP,WADOE,DoD-ELAP,NELAP
Nitrobenzene	CALAP,WADOE,DoD-ELAP,NELAP
Isophorone	CALAP,WADOE,DoD-ELAP,NELAP
2-Nitrophenol	CALAP,WADOE,DoD-ELAP,NELAP
2,4-Dimethylphenol	CALAP,WADOE,DoD-ELAP,NELAP
Bis(2-Chloroethoxy)methane	CALAP,WADOE,DoD-ELAP,NELAP
Benzoic acid	CALAP,WADOE,DoD-ELAP,NELAP
2,4-Dichlorophenol	CALAP,WADOE,DoD-ELAP,NELAP
1,2,4-Trichlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Naphthalene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
4-Chloroaniline	CALAP,WADOE,DoD-ELAP,NELAP
Hexachlorobutadiene	CALAP,WADOE,DoD-ELAP,NELAP
4-Chloro-3-Methylphenol	CALAP,WADOE,DoD-ELAP,NELAP
2-Methylnaphthalene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Hexachlorocyclopentadiene	CALAP,WADOE,DoD-ELAP,NELAP
2,4,6-Trichlorophenol	CALAP,WADOE,DoD-ELAP,NELAP
2,4,5-Trichlorophenol	CALAP,WADOE,DoD-ELAP,NELAP
2-Chloronaphthalene	CALAP,WADOE,DoD-ELAP,NELAP
2-Nitroaniline	CALAP,WADOE,DoD-ELAP,NELAP
Dimethylphthalate	CALAP,WADOE,DoD-ELAP,NELAP
Acenaphthylene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
2,6-Dinitrotoluene	CALAP,WADOE,DoD-ELAP,NELAP
3-Nitroaniline	CALAP,WADOE,DoD-ELAP,NELAP
Acenaphthene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
2,4-Dinitrophenol	CALAP,WADOE,DoD-ELAP,NELAP
Dibenzofuran	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
4-Nitrophenol	CALAP,WADOE,DoD-ELAP,NELAP
2,4-Dinitrotoluene	CALAP,WADOE,DoD-ELAP,NELAP
Fluorene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Diethyl phthalate	CALAP,WADOE,DoD-ELAP,NELAP
4-Chlorophenylphenyl ether	CALAP,WADOE,DoD-ELAP,NELAP
4-Nitroaniline	CALAP,WADOE,DoD-ELAP,NELAP
4,6-Dinitro-2-methylphenol	CALAP,WADOE,DoD-ELAP,NELAP
4-Bromophenyl phenyl ether	CALAP,WADOE,DoD-ELAP,NELAP
Hexachlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP
Pentachlorophenol	CALAP,WADOE,DoD-ELAP,NELAP
Phenanthrene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Anthracene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Carbazole	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Di-n-Butylphthalate	CALAP,WADOE,DoD-ELAP,NELAP
Fluoranthene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Pyrene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Butylbenzylphthalate	CALAP,WADOE,DoD-ELAP,NELAP
Benzo(a)anthracene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Chrysene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
bis(2-Ethylhexyl)phthalate	CALAP,WADOE,DoD-ELAP,NELAP
Di-n-Octylphthalate	CALAP,WADOE,DoD-ELAP,NELAP
Benzo(b)fluoranthene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Benzo(k)fluoranthene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Benzo(a)pyrene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Indeno(1,2,3-cd)pyrene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Dibenzo(a,h)anthracene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Benzo(g,h,i)perylene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Benzofluoranthenes, Total	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
1-Methylnaphthalene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
N-Nitrosodimethylamine	CALAP,WADOE,DoD-ELAP,NELAP
Aniline	CALAP,WADOE,DoD-ELAP,NELAP
Benzidine	CALAP,WADOE,DoD-ELAP,NELAP
Retene	CALAP,WADOE,ADEC,DoD-ELAP,NELAP
Perylene	CALAP,WADOE,ADEC
Pyridine	CALAP,WADOE,DoD-ELAP,NELAP
N-Nitrosomethylethylamine	CALAP
2,6-Dichlorophenol	CALAP,WADOE
alpha-Terpineol	CALAP,WADOE,DoD-ELAP,NELAP
1,4-Dioxane	CALAP,WADOE,DoD-ELAP,NELAP
2,3,4,6-Tetrachlorophenol	CALAP,WADOE,DoD-ELAP
Triphenyl Phosphate	CALAP,WADOE,DoD-ELAP,NELAP
Butyl Diphenyl Phosphate	CALAP,WADOE,DoD-ELAP,NELAP
Dibutyl Phenyl Phosphate	CALAP,WADOE,DoD-ELAP,NELAP
Tributyl Phosphate	CALAP,WADOE,DoD-ELAP,NELAP
Butylated Hydroxytoluene	CALAP,WADOE,DoD-ELAP,NELAP
Azobenzene (1,2-DP-Hydrazine)	CALAP,WADOE,DoD-ELAP,NELAP
Tetrachloroguaiacol	CALAP,WADOE,DoD-ELAP
3,4,5-Trichloroguaiacol	CALAP,WADOE,DoD-ELAP
3,4,6-Trichloroguaiacol	CALAP,WADOE,DoD-ELAP
4,5,6-Trichloroguaiacol	CALAP,WADOE,DoD-ELAP
Guaiacol	CALAP,WADOE,DoD-ELAP
1,2,4,5-Tetrachlorobenzene	CALAP,WADOE,DoD-ELAP,NELAP
SM 4500-NO3¯ I-00 in Water	
Nitrate + Nitrite as N	DoD-ELAP,NELAP,WADOE
SM 4500-Norg D-97 in Water	
Total Kjeldahl Nitrogen	DoD-ELAP,WADOE
SM 4500-P E-99 in Water	
Orthophosphorus	WADOE,NELAP
Total Phosphorus	WADOE,NELAP
SM 5210 B-01 in Water	
BOD	WADOE,NELAP

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

SM 9222D in Water

Fecal Coliforms WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	05/11/2018
CALAP	California Department of Public Health CAELAP	2748	06/30/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018

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2200 6th Avenue, Suite 1100	Project Number: 18-06769-000	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	30-Apr-2018 14:14

Notes and Definitions

*	Flagged value is not within established control limits.
B	This analyte was detected in the method blank.
D	The reported value is from a dilution
J	Estimated concentration value detected below the reporting limit.
M	Estimated value for a GC/MS analyte detected and confirmed by an analyst but with low spectral match parameters.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
U	This analyte is not detected above the applicable reporting or detection limit.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

May 10, 2018

Rob Zisette
Herrera Environmental Consultants, Inc.
2200 Sixth Avenue, Suite 1100
Seattle, WA 98121

NVL LABS
INDUSTRIAL HYGIENE SERVICES
Laboratory | Management | Training

RE: Metals Analysis; NVL Batch # 1808660.00

Dear Mr. Zisette,

Enclosed please find the test results for samples submitted to our laboratory for analysis. Preparation of these samples was conducted following protocol outlined in EPA Method SW 846 -3051 unless stated otherwise. Analysis of these samples was performed using analytical instruments in accordance with U.S. EPA, NIOSH, OSHA and other ASTM methods.

For matrix materials submitted as paint, dust wipe, soil or TCLP samples, analysis for the presence of total metals is conducted using published U.S. EPA Methods. Paint and soil results are usually expressed in mg/Kg which is equivalent to parts per million (ppm). Lead (Pb) in paint is usually expressed in mg/Kg (ppm) , Percent (%) or mg/cm^2 by area. Dust wipe sample results are usually expressed in ug/wipe and ug/ft^2. TCLP samples are reported in mg/L (ppm). For air filter samples, analyses are conducted using NIOSH and OSHA Methods. Results are expressed in ug/filter and ug/m^3. Other matrix materials are analyzed accordingly using published methods or specified by client. The reported test results pertain only to items tested and are not blank corrected.

For recent regulation updates pertaining to current regulatory levels or permissible exposure levels, please call your local regulatory agencies for more details.

This report is considered highly confidential and will not be released without your approval. Samples are archived for two weeks following analysis. Samples that are not retrieved by the client are discarded after two weeks.

Thank you for using our laboratory services. if you need further assistance please feel free to call us at 206-547-0100 or 1-888-NVLLABS.

Sincerely,

Shalini Patel, Laboratory Analyst

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LAB # 101861

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
p 206.547.0100 | f 206.634.1936 | www.nvllabs.com

Analysis Report

Total Lead (Pb)

Client: Herrera Environmental Consultants, Inc.
Address: 2200 Sixth Avenue, Suite 1100
Seattle, WA 98121

Attention: **Mr. Rob Zisette**
Project Location: Bobby Morris & Miller Playfields

Batch #: 1808660.00
Matrix: Wipe
Method: EPA 3051/7000B
Client Project #: 18-06769-000
Date Received: 5/7/2018
Samples Received: 7
Samples Analyzed: 7

Lab ID	Client Sample #	Element	Sample sq ft	RL ug/ sq ft	Results in ug/wipe	Results in ug/sq. ft
18045553	BM-W-1	Lead (Pb)	1.00	5.0	< 5.0	< 5.0
18045554	BM-W-2	Lead (Pb)	1.00	5.0	< 5.0	< 5.0
18045555	BM-W-3	Lead (Pb)	1.00	5.0	< 5.0	< 5.0
18045556	M-W-1	Lead (Pb)	1.00	5.0	< 5.0	< 5.0
18045557	M-W-2	Lead (Pb)	1.00	5.0	< 5.0	< 5.0
18045558	M-W-3	Lead (Pb)	1.00	5.0	< 5.0	< 5.0
18045559	FB-1	Lead (Pb)	0.00	N/A	< 5.0	

Comments: No area given, Used 1 ft^2 as default except for field blank.

Sampled by: Client
Analyzed by: Yasuyuki Hida Date Analyzed: 05/10/2018
Reviewed by: Shalini Patel Date Issued: 05/10/2018

Shalini Patel, Laboratory Analyst

ug/ sq. ft. =Micrograms per square foot
ug / wipe = Micrograms per wipe

RL = Reporting Limit
'<' = Below the reporting Limit

Note : Method QC results are acceptable unless stated otherwise. Concentration (ug/ft^2) not reported if sample area is zero. Unless otherwise indicated, the condition of all samples was acceptable at time of receipt.

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
p 206.547.0100 | f 206.634.1936 | www.nvllabs.com

LEAD LABORATORY SERVICES

Company Herrera Environmental Consultants, Inc.
Address 2200 Sixth Avenue, Suite 1100
Seattle, WA 98121
Project Manager Mr. Rob Zisette
Phone (206) 441-9080

NVL Batch Number **1808660.00**
TAT 5 Days **AH** No
Rush TAT
Due Date 5/14/2018 **Time** 4:25 PM
Email rzisette@herrerainc.com
Fax (206) 441-9108

Project Name/Number: 18-06769-000 **Project Location:** Bobby Morris & Miller Playfields

Subcategory Flame AA (FAA)
Item Code FAA-04 EPA 7000B Lead by FAA <wipe>

Total Number of Samples 7 Rush Samples

	Lab ID	Sample ID	Description	A/R
1	18045553	BM-W-1		A
2	18045554	BM-W-2		A
3	18045555	BM-W-3		A
4	18045556	M-W-1		A
5	18045557	M-W-2		A
6	18045558	M-W-3		A
7	18045559	FB-1		A

	Print Name	Signature	Company	Date	Time
Sampled by	Client				
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Nicholas Dossegger		NVL	5/7/18	1625
Analyzed by	Yasuyuki Hida		NVL	5/10/18	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 5/7/2018
Time: 4:44 PM
Entered By: Nicholas Dossegger

1808660

NVL
INDUSTRIAL HYGIENE SERVICES
LABORATORY + MANAGEMENT + TRAINING

METALS CHAIN OF CUSTODY

Turn Around Time
- ❑ 2 Hour
- ❑ 4 Hours
- ❑ 24 Hours
- ❑ 2 Days
- ❑ 3 Days
- ❑ 4 Days
- ☒ 5 Days
- ❑ 6-10 Days

Please call for TAT less than 24 Hours

Company Herrera Env
Address 2200 6th AVE
Seattle, WA 98121
Phone (206) 441-9080

Project Manager Rob Zisette
Cell ( ) -
Email rzisette@herrerainc.com
Fax ( ) -

Project Name/Number 180669-000
Project Location Bobby Morris & Miller Playfields

- ☑ Total Metals
- ❑ TCLP
- ☑ FAA (ppm
- ❑ ICP (PPM
- ❑ GFAA (ppb)
- ❑ CVAA (ppb)
- ❑ Air Filter
- ❑ Paint Chips (cm)
- ❑ Drinking Water
- ❑ Other
- ❑ Paint Chips (%)
- ☑ Dust Wipes
- ❑ Waste Water
- ❑ Soil

RCRA 8
- ❑ Barium
- ❑ Arsenic
- ❑ Selenium
- ❑ Chromium
- ❑ Mercury
- ❑ Cadmium
- ❑ Silver
- ☑ Lead

RCRA 11
- ❑ Copper
- ❑ Zinc
- ❑ Other

Reporting Instructions Rob Zisette
❑ Call ( ) - ❑ Fax ( ) - ☑ Email RZisette@herrerainc.com

Total Number of Samples 7

	Sample ID	Description	A/R
1	BM-W-1	Bobby Morris - yellow center circle @ 1440	
2	BM-W-2	Bobby Morris - turf center circle @ 1445	
3	BM-W-3	Bobby Morris - white outfield @ 1455	
4	M-W-1	Miller - white goal box @ ~~1525~~ 1530	
5	M-W-2	Miller - yellow field @ ~~1540~~ ~~1525~~ 1535	
6	M-W-3	Miller - turf center circle @ 1545	
7	FB-1	Field blank - Miller @ 1550	
8			
9			
10			
11			
12			
13			
14			
15			

PAID CC NO 5/7

	Print Name	Signature	Company	Date	Time
Sampled by	Gina Catarra	GC	Herrera	5/7/18	
Relinquish by	Gina Catarra	GC	Herrera	5/7/18	1625

Office Use Only

	Print Name	Signature	Company	Date	Time
Received by	NICK D		NL	5/7	1625
Analyzed by					
Called by					
Faxed/Email by					

May 8, 2018

Rob Zisette
Herrera Environmental Consultants, Inc.
2200 Sixth Avenue, Suite 1100
Seattle, WA 98121

NVL LABS
INDUSTRIAL HYGIENE SERVICES
Laboratory | Management | Training

RE: Bulk Mold Analysis, NVL Batch # 1808658.00

Client Project: 18-06769-000
Location: Bobby Morris & Miller Playfields

Dear Mr. Zisette,

Enclosed please find test results for samples you submitted for fungal analysis.

The analysis was performed by light microscopy at 400x magnification. Each sample was dissected into material components, or "layers." Samples from each layer were mounted on slides, in a clear liquid medium, either directly or following transfer to clear tape.

Fungi were identified by the colors, shapes, and sizes of spores and spore forming structures, with reference to authoritative texts and slides prepared from EMPAT (Environmental Microbiology Proficiency Analytical Test) cultures.

'Sample Description' indicates visual appearance of the sample before analysis. 'Microscopic Observations' include features that identify the fungus and a general description of the surrounding matrix. Percentage values (%, if given) are based strictly on the fungal content of the sample, and might vary, depending on the sampling plan.

This report is considered highly confidential and will not be released without your approval. Samples are archived for two weeks following analysis. Samples that are not retrieved by the client are discarded after two weeks.

Thank you for using our laboratory services. Please do not hesitate to call if there is anything further we can assist you with.

Sincerely,

Nick Ly, Technical Director

Enc.: Sample Results

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
p 206.547.0100 | f 206.634.1936 | www.nvllabs.com

Non-viable Fungal ID
Direct Exam
Analytical Results

Client: Herrera Environmental Consultants, Inc.
Address: 2200 Sixth Avenue, Suite 1100
Seattle, WA 98121

Attention: Mr. Rob Zisette
Project Location: Bobby Morris & Miller Playfields

NVL Batch #: 1808658.00
Client Project: 18-06769-000
Date Received: 5/7/2018
Samples Received: 4
Samples Analyzed: 4

Client Sample ID	Lab ID	Sample Description	Fungal Growth
BM-B-1	18045544	Bobby Morris - Center circle at 1435	No fungal growth detected.
Comments: Normal trapping.			

Client Sample ID	Lab ID	Sample Description	Fungal Growth
BM-B-2	18045545	Bobby Morris - Goal box at 1450	No fungal growth detected.
Comments: Normal trapping.			

Client Sample ID	Lab ID	Sample Description	Fungal Growth
M-B-1	18045546	Miller - Goal box at 1525	No fungal growth detected.
Comments: Normal trapping.			

Sampled by: Client
Analyzed by: Aaron Brown **Date:** 05/08/2018
Reviewed by: Nick Ly **Date:** 05/08/2018

Nick Ly, Technical Director

Materials from bulk samples or tape lifts were prepared in lactophenol cotton blue or other liquid and in some cases transfer to transparent tape prior to analysis. Fungal spores and fragments were identified based on characteristic colors, sizes and shapes at magnifications of 150x to 1500x in accordance to NVL SOP 12.130.1. Percentage values were estimated strictly on fungal content in each sample. Results relate only to the samples listed in this report. Interpretation of these results is strictly the responsibility of client. If the sample was not collected by NVL personnel, the accuracy of the results will be affected by the methodology and acuity of the sample collector. Unless stated otherwise, the condition of all samples was acceptable at time of receipt.

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
p 206.547.0100 | f 206.634.1936 | www.nvllabs.com

Non-viable Fungal ID
Direct Exam
Analytical Results

Client: Herrera Environmental Consultants, Inc.
Address: 2200 Sixth Avenue, Suite 1100
Seattle, WA 98121

Attention: Mr. Rob Zisette
Project Location: Bobby Morris & Miller Playfields

NVL Batch #: 1808658.00
Client Project: 18-06769-000
Date Received: 5/7/2018
Samples Received: 4
Samples Analyzed: 4

Client Sample ID	Lab ID	Sample Description	Fungal Growth
M-B-2	18045547	Miller - Center circle at 1540	No fungal growth detected.
Comments: Normal trapping.			

Sampled by: Client
Analyzed by: Aaron Brown **Date:** 05/08/2018
Reviewed by: Nick Ly **Date:** 05/08/2018

Nick Ly, Technical Director

Materials from bulk samples or tape lifts were prepared in lactophenol cotton blue or other liquid and in some cases transfer to transparent tape prior to analysis. Fungal spores and fragments were identified based on characteristic colors, sizes and shapes at magnifications of 150x to 1500x in accordance to NVL SOP 12.130.1. Percentage values were estimated strictly on fungal content in each sample. Results relate only to the samples listed in this report. Interpretation of these results is strictly the responsibility of client. If the sample was not collected by NVL personnel, the accuracy of the results will be affected by the methodology and acuity of the sample collector. Unless stated otherwise, the condition of all samples was acceptable at time of receipt.

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
p 206.547.0100 | f 206.634.1936 | www.nvllabs.com

MOLD/ENVIRONMENTAL MICROBIOLOGY LABORATORY SERVICES

Company Herrera Environmental Consultants, Inc.
Address 2200 Sixth Avenue, Suite 1100
Seattle, WA 98121
Project Manager Mr. Rob Zisette
Phone (206) 441-9080

NVL Batch Number **1808658.00**
TAT 5 Days **AH** No
Rush TAT
Due Date 5/14/2018 **Time** 4:25 PM
Email rzisette@herrerainc.com
Fax (206) 441-9108

Project Name/Number: 18-06769-000 **Project Location:** Bobby Morris & Miller Playfields

Subcategory Bulk - Non-viable - Direct Exam
Item Code MOL-03 Mold Bulk Direct Exam <bulk>

Total Number of Samples 4 Rush Samples

	Lab ID	Sample ID	Description	A/R
1	18045544	BM-B-1		A
2	18045545	BM-B-2		A
3	18045546	M-B-1		A
4	18045547	M-B-2		A

	Print Name	Signature	Company	Date	Time
Sampled by	Client				
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Nicholas Dossegger		NVL	5/7/18	1625
Analyzed by	Aaron Brown		NVL	5/8/18	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 5/7/2018
Time: 4:28 PM
Entered By: Nicholas Dossegger

1808658

NVL
INDUSTRIAL HYGIENE SERVICES
LABORATORY + MANAGEMENT + TRAINING

MOLD CHAIN OF CUSTODY

Turn Around Time
- ❑ 4 Hours
- ❑ 24 Hours
- ❑ 2 Days
- ❑ 3 Days
- ❑ 4 Days
- ☒ ~~5~~ Days
- ❑ 6-10 Days

Please call for TAT less than 24 Hours

Company Herrera
Address 2200 6th AVE
Seattle, WA 98121
Phone 206-441-9080

Project Manager Rob Zisette
Cell ( ) -
Email rzisette@herrerainc.com
Fax ( ) -

Project Name/Number 18-~~0679~~-000 06769
Project Location Bobby Morris & Miller Playfields

- Air – Non-Viable – Direct Exam
  - ❑ Mold Spore Count, Non-viable <air>
  - ❑ Mold Spore Count + Particulates <air>
- Bulk – Non-Viable – Direct Exam
  - ☑ Mold Bulk Direct Exam <bulk>
  - ❑ Particulates ID <tape/wipe>
- Air – Viable
  - ❑ Mold Air Viable (ID and quantitation of culturable fungi) <air>
  - ❑ Mold Bulk Viable (Quantitative) <bulk, dust, swab>)

Reporting Instructions Send results to Rob Zisette
❑ Call ( ) - ❑ Fax ( ) - ☑ Email RZisette@herrerainc.com

Total Number of Samples 4

	Sample ID	Description	A/R
1	BM-B-1	Bobby Morris - center circle at ~~1440~~ 1435	
2	BM-B-2	Bobby Morris - goal box at 1450	
3	M-B-1	Miller - goal box at 1525	
4	M-B-2	Miller - center circle at 1540	
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

	Print Name	Signature	Company	Date	Time
Sampled by	Gina Catarra	GC	Herrera	5/7/18	
Relinquish by	Gina Catarra	GC	Herrera	5/7/18	1625

Office Use Only

	Print Name	Signature	Company	Date	Time
Received by	Nick D		NVL	5/7	1625
Analyzed by					
Called by					
Faxed/Email by					

June 27, 2018

Rob Zisette
Herrera Environmental Consultants, Inc.
2200 Sixth Avenue, Suite 1100
Seattle, WA 98121

NVL LABS
INDUSTRIAL HYGIENE SERVICES
Laboratory | Management | Training

RE: Bulk Mold Analysis, NVL Batch # 1811633.00

Client Project: 18-06769-000
Location: Bobby Morris & Miller Playfields

Dear Mr. Zisette,

Enclosed please find test results for samples you submitted for fungal analysis.

The analysis was performed by light microscopy at 400x magnification. Each sample was dissected into material components, or "layers." Samples from each layer were mounted on slides, in a clear liquid medium, either directly or following transfer to clear tape.

Fungi were identified by the colors, shapes, and sizes of spores and spore forming structures, with reference to authoritative texts and slides prepared from EMPAT (Environmental Microbiology Proficiency Analytical Test) cultures.

'Sample Description' indicates visual appearance of the sample before analysis. 'Microscopic Observations' include features that identify the fungus and a general description of the surrounding matrix. Percentage values (%, if given) are based strictly on the fungal content of the sample, and might vary, depending on the sampling plan.

This report is considered highly confidential and will not be released without your approval. Samples are archived for two weeks following analysis. Samples that are not retrieved by the client are discarded after two weeks.

Thank you for using our laboratory services. Please do not hesitate to call if there is anything further we can assist you with.

Sincerely,

Nick Ly, Technical Director

Enc.: Sample Results

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
p 206.547.0100 | f 206.634.1936 | www.nvllabs.com

Non-viable Fungal ID
Direct Exam
Analytical Results

Client: Herrera Environmental Consultants, Inc.
Address: 2200 Sixth Avenue, Suite 1100
Seattle, WA 98121

Attention: Mr. Rob Zisette
Project Location: Bobby Morris & Miller Playfields

NVL Batch #: 1811633.00
Client Project: 18-06769-000
Date Received: 6/20/2018
Samples Received: 2
Samples Analyzed: 2

Client Sample ID	Lab ID	Sample Description	Fungal Growth
BM-B-3	18060557	Bulk material - Bobby Morris - Center circle @ 1451	No fungal growth detected
Comments: Normal trapping.			

Client Sample ID	Lab ID	Sample Description	Fungal Growth
M-B-3	18060558	Bulk material - Miller - Center circle @ 1410	No fungal growth detected
Comments: Normal trapping.			

Sampled by: Client
Analyzed by: Aaron Brown **Date:** 06/27/2018
Reviewed by: Nick Ly **Date:** 06/27/2018

Nick Ly, Technical Director

Materials from bulk samples or tape lifts were prepared in lactophenol cotton blue or other liquid and in some cases transfer to transparent tape prior to analysis. Fungal spores and fragments were identified based on characteristic colors, sizes and shapes at magnifications of 150x to 1500x in accordance to NVL SOP 12.130.1. Percentage values were estimated strictly on fungal content in each sample. Results relate only to the samples listed in this report. Interpretation of these results is strictly the responsibility of client. If the sample was not collected by NVL personnel, the accuracy of the results will be affected by the methodology and acuity of the sample collector. Unless stated otherwise, the condition of all samples was acceptable at time of receipt.

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
p 206.547.0100 | f 206.634.1936 | www.nvllabs.com

MOLD/ENVIRONMENTAL MICROBIOLOGY LABORATORY SERVICES

Company Herrera Environmental Consultants, Inc.
Address 2200 Sixth Avenue, Suite 1100
Seattle, WA 98121
Project Manager Mr. Rob Zisette
Phone (206) 441-9080

NVL Batch Number **1811633.00**
TAT 5 Days **AH** No
Rush TAT
Due Date 6/27/2018 **Time** 3:55 PM
Email rzisette@herrerainc.com
Fax (206) 441-9108

Project Name/Number: 18-06769-000 **Project Location:** Bobby Morris & Miller Playfields

Subcategory Bulk - Non-viable - Direct Exam
Item Code MOL-03 Mold Bulk Direct Exam <bulk>

Total Number of Samples 2 Rush Samples

	Lab ID	Sample ID	Description	A/R
1	18060557	BM-B-3		A
2	18060558	M-B-3		A

	Print Name	Signature	Company	Date	Time
Sampled by	Client				
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Nicholas Dossegger		NVL	6/20/18	1555
Analyzed by	Aaron Brown		NVL	6/27/18	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 6/20/2018
Time: 4:01 PM
Entered By: Nicholas Dossegger

1811633

NVL
INDUSTRIAL HYGIENE SERVICES
LABORATORY + MANAGEMENT + TRAINING

MOLD CHAIN OF CUSTODY

Turn Around Time
- ❑ 4 Hours
- ❑ 24 Hours
- ❑ 2 Days
- ❑ 3 Days
- ❑ 4 Days
- ☒ 5 Days
- ❑ 6-10 Days

Please call for TAT less than 24 Hours

Company Herrera
Address 2200 6th AVE
Seattle, WA 98121
Phone (206) 441-9080

Project Manager Rob Zisette
Cell (206) 930-6585
Email rzisette@herrerainc.com
Fax ( ) -

Project Name/Number 18-06769-000
Project Location Bobby Morris & Miller Playfields

- Air – Non-Viable – Direct Exam
  - ❑ Mold Spore Count, Non-viable <air>
  - ❑ Mold Spore Count + Particulates <air>
- Bulk – Non-Viable – Direct Exam
  - ☒ Mold Bulk Direct Exam <bulk>
  - ❑ Particulates ID <tape/wipe>
- Air – Viable
  - ❑ Mold Air Viable (ID and quantitation of culturable fungi) <air>
  - ❑ Mold Bulk Viable (Quantitative) <bulk, dust, swab>

Reporting Instructions results to Rob Zisette
❑ Call ( ) - ❑ Fax ( ) - ☑ Email rzisette@herrerainc.com

Total Number of Samples _____

	Sample ID	Description	A/R
1	BM-B-3	Bobby Morris - Center Circle @ 1451	
2	M-B-3	Miller - Center Circle @ 1410	
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

PAID
ND 620 cc

	Print Name	Signature	Company	Date	Time
Sampled by	Gina Catarra		Herrera	6/20/18	1500
Relinquish by	Gina Catarra		Herrera	6/20/18	1555

Office Use Only

	Print Name	Signature	Company	Date	Time
Received by			NM	6/20	1555
Analyzed by					
Called by					
Faxed/Email by					

Analytical Resources, Incorporated
Analytical Chemists and Consultants

22 February 2019

Rob Zisette
Herrera Environmental Consultants
2200 6th Avenue, Suite 1100
Seattle, WA 98121

RE: Bobby Morris Playfield

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
19B0010	N/A

Shelly Fishel

Digitally signed by Shelly Fishel
DN: c=US, st=Washington, l=Tukwila, o=Analytical Resources, Inc., cn=Shelly Fishel, email=shelly.fishel@arilabs.com
Date: 2019.02.22 15:47:05 -08'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in it entirety.

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006

PJLA Testing
Accreditation # 66169

HERRERA
2200 Sixth Avenue | Suite 1100
Seattle, Washington | 98121
p 206 441 9080 | f 206 441 9108

19B0010

Chain of Custody Record

Project Name:	Project Number:	Client:
Bobby Morris Playfield Monitoring	18-06769-001	Herrera Environmental

Report To:	Page:
Rob Zisette	1/1
Sampled By: Rob Zisette	Delivery Method: Hand
Laboratory: Analytical Resources, Inc.	Requested Completion Date: Standard
Lab Use:	Total No. of Containers: 19

Sample ID	Date	Time	Sample Type (see codes)	Preservative? (Y/N)	Matrix (see codes)	Total Suspended Solids- EPA 160.2	Total Hardness as CaCO3-SM 2340B	Total phosphorus - SM 4500-P	Soluble Reactive Phosphorus, SM 4500-P (field filtered)	Total Kjeldahl Nitrogen, SM 4500-N	Nitrate+Nitrite N, SM 4500-N	Total Copper and Lead, - EPA 200.8	Dissolved Copper and Lead, EPA 200.8 (field filtered)	Fecal coliform bacteria – SM 9222D	BOD5, SM 5210B	SPLC - TP, SRP, Total/Diss Zn, Total/Diss Cu *	Fecal Coliform SM9222D
Bobby Morris A	2/1/19	1130	G	N/Y	SW	X	X	X	X	X	X	X	X	X	X	X	
Bobby Morris B		1230	G	N/Y	SW	X	X	X	X	X	X	X	X	X	X	X	
Bobby Infill		0935	C	N	Cork											X	X
Miller Infill		1035	C	N	Rubber											X	X

Comments/Special Instructions:
* For SPLC extract analyses to include: Total P, Soluble Reactive P, Total & Diss Zn, and Total & Diss Cu

Relinquished by (Name/CO)	Signature	Date/Time		Received By (Name/CO)	Signature	Date/Time
Rob Zisette	Rob Zisette	2/1/19 1340	4.8°C	Jacob Walter/ARI		02/01/19 1340
Relinquished by (Name/CO)	Signature	Date/Time		Received By (Name/CO)	Signature	Date/Time

Sample Type: G=Grab C=Composite **Matrix Codes:** A=Air GW=Groundwater SE=Sediment SO=Soil SW=Surface Water W=Water (blanks) M=Material O=Other (specify)

Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Bobby Morris A	19B0010-01	Water	01-Feb-2019 11:30	01-Feb-2019 13:40
Bobby Morris B	19B0010-02	Water	01-Feb-2019 12:30	01-Feb-2019 13:40
Bobby Infill	19B0010-03	Solid	01-Feb-2019 09:35	01-Feb-2019 13:40
Bobby Infill	19B0010-04	Water	01-Feb-2019 09:35	01-Feb-2019 13:40
Miller Infill	19B0010-05	Solid	01-Feb-2019 10:35	01-Feb-2019 13:40
Miller Infill	19B0010-06	Water	01-Feb-2019 10:35	01-Feb-2019 13:40

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Work Order Case Narrative

Total and Dissolved Metals - EPA Method 200.8 and 200.7

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

Wet Chemistry

The sample(s) were prepared and analyzed within the recommended holding times with the exception of orthophosphorus which was analyzed outside of the method holding time.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

SPLP Metals

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The MS percent recoveries were within control limits.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

WORK ORDER

19B0010

Client: Herrera Environmental Consultants | **Project Manager:** Amanda Volgardsen

Project: Bobby Morris Playfield | **Project Number:** Bobby Moris Playfield

Analysis	Due	TAT	Expires	Comments
Coliform, Fecal (MF) SM 9222D	02/15/2019	10	2/1/2019	
Phosphorus, Sol Ortho-P, IC, SM 4110 B-00,	02/15/2019	10	2/3/2019	
Phosphorus, Total, SM 4500-P E-99	02/15/2019	10	3/1/2019	
Solids, Total, Dried at 103 -105 °C, Solid	02/15/2019	10	3/1/2019	
SPLP (DI) 200.8 - Cu	02/15/2019	10	7/31/2019	
SPLP 1312	02/15/2019	10	3/1/2019	
SPLP (DI) 200.8 - Zn	02/15/2019	10	7/31/2019	
19B0010-06 Miller Infill [Solid] Sampled 01-Feb-2019 10:35				
SPLP 1312 (DI)	02/15/2019	10	3/1/2019	
Solids, Total, Dried at 103 -105 °C, Solid	02/15/2019	10	3/1/2019	
SPLP 1312	02/15/2019	10	3/1/2019	

Analysis groups included in this work order

Hardness, Calculated (200.7)

Met 200.7 - Mg Met 200.7 - Ca

Preservation Confirmation

Container ID	Container Type	pH
19B0010-01 A	Large OJ, 1000 mL	
19B0010-01 B	Large OJ, 1000 mL	
19B0010-01 C	Small OJ, 500 mL, 9N H2SO4	L2pan
19B0010-01 D	HDPE NM, 500 mL, 1:1 HNO3	L2pan
19B0010-01 E	Corning Plastic, 125 mL, Na2S2O3	
19B0010-02 A	Large OJ, 1000 mL	
19B0010-02 B	Large OJ, 1000 mL	
19B0010-02 C	Small OJ, 500 mL, 9N H2SO4	L2pan
19B0010-02 D	HDPE NM, 500 mL, 1:1 HNO3	L2pan
19B0010-02 E	Corning Plastic, 125 mL, Na2S2O3	
19B0010-03 A	Glass WM, Clear, 8 oz	
19B0010-03 B	Glass WM, Clear, 4 oz	
19B0010-04 A	Glass WM, Clear, 8 oz	
19B0010-05 A	Glass WM, Clear, 8 oz	
19B0010-05 B	Glass WM, Clear, 4 oz	
19B0010-06 A	Glass WM, Clear, 8 oz	

SES
Preservation Confirmed By

2-1-19
Date

Reviewed By Date

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Herrera Project Name: Bobby Morris

COC No(s): NA Delivered by: Fed-Ex UPS Courier Hand Delivered Other:

Assigned ARI Job No: 19B0010 Tracking No: NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	NO
Were custody papers included with the cooler?	YES	NO
Were custody papers properly filled out (ink, signed, etc.)	YES	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 1340 4.8°C

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: D00052006

Cooler Accepted by: JGM Date: 02/01/19 Time: 1340

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used?	Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other:		
Was sufficient ice used (if appropriate)?	NA	YES	NO
Were all bottles sealed in individual plastic bags?		YES	NO
Did all bottles arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		YES	NO
Did the number of containers listed on COC match with the number of containers received?		YES	NO
Did all bottle labels and tags agree with custody papers?		YES	NO
Were all bottles used correct for the requested analyses?		YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)	NA	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO
Date VOC Trip Blank was made at ARI	NA		

Was Sample Split by ARI : NA YES Date/Time: Equipment: Split by:

Samples Logged by: SC Date: 2-1-19 Time: 1357 Labels checked by: JGM

***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC
Bobby A	Bobby Morris A		
Bobby B	Bobby Morris B		

Additional Notes, Discrepancies, & Resolutions:

By: Date:

Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Morris A

19B0010-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.7 — Sampled: 02/01/2019 11:30
Instrument: ICP2 Analyst: TCH — Analyzed: 02/15/2019 13:53

Sample Preparation: Preparation Method: TWC EPA 3010A — Extract ID: 19B0010-01 D 02
Preparation Batch: BHB0281 — Sample Size: 25 mL
Prepared: 14-Feb-2019 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0051	0.0500	**17.3**	mg/L	
Magnesium	7439-95-4	1	0.0160	0.0500	**4.37**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Morris A

19B0010-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 — Sampled: 02/01/2019 11:30
Instrument: ICPMS2 Analyst: MCB — Analyzed: 02/12/2019 22:28

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix — Extract ID: 19B0010-01 D 01
Preparation Batch: BHB0234 — Sample Size: 25 mL
Prepared: 12-Feb-2019 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead	7439-92-1	1	0.0680	0.100	**4.67**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Morris A

19B0010-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 02/01/2019 11:30
Instrument: ICPMS2 Analyst: MCB — Analyzed: 02/12/2019 22:28

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix — Extract ID: 19B0010-01 D 01
Preparation Batch: BHB0234 — Sample Size: 25 mL
Prepared: 12-Feb-2019 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper	7440-50-8	1	0.340	0.500	**10.9**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Morris A

19B0010-01 (Water)

Wet Chemistry

Method: EPA 160.2 — Sampled: 02/01/2019 11:30
Instrument: BAL2 Analyst: UW — Analyzed: 02/05/2019 10:14

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 19B0010-01
Preparation Batch: BHB0065 — Sample Size: 1000 mL
Prepared: 05-Feb-2019 — Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	**68**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Morris A

19B0010-01 (Water)

Wet Chemistry

Method: SM 4500-Norg D-97 — Sampled: 02/01/2019 11:30
Instrument: LACHAT2 Analyst: AGW — Analyzed: 02/12/2019 17:52

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 19B0010-01 C
Preparation Batch: BHB0120 — Sample Size: 25 mL
Prepared: 06-Feb-2019 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Kjeldahl Nitrogen		1	0.5	0.5	**1.5**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Morris A

19B0010-01 (Water)

Wet Chemistry

Method: SM 4500-P E-99 — Sampled: 02/01/2019 11:30

Instrument: UV1800-2 Analyst: YK — Analyzed: 02/15/2019 11:09

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 19B0010-01 C

Preparation Batch: BHB0298 — Sample Size: 25 mL

Prepared: 14-Feb-2019 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Phosphorus	7723-14-0	1	0.0160	0.0160	**0.338**	mg-P/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Morris A

19B0010-01 (Water)

Wet Chemistry

Method: SM 5210 B-01 — Sampled: 02/01/2019 11:30
Instrument: BOD1 Analyst: WCW — Analyzed: 02/06/2019 15:00

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 19B0010-01
Preparation Batch: BHB0029 — Sample Size: 250 mL
Prepared: 01-Feb-2019 — Final Volume: 300 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
BOD		1	1.2	1.2	**4.9**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Morris A

19B0010-01 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 02/01/2019 11:30

Instrument: [CALC] Analyst: TCH — Analyzed: 02/15/2019 13:53

Sample Preparation: Preparation Method: [CALC] — Extract ID: 19B0010-01

Preparation Batch: [CALC]

Prepared: 14-Feb-2019 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1	0.331	**61.2**	mg/L CaCO3	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Morris A

19B0010-01 (Water)

Microbiology

Method: SM 9222D — Sampled: 02/01/2019 11:30
Instrument: N/A Analyst: UW — Analyzed: 02/02/2019 15:27

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 19B0010-01
Preparation Batch: BHB0025 — Sample Size: 4 mL
Prepared: 01-Feb-2019 — Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Fecal Coliforms		1		25	**1480**	CFU/100 ml	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Morris A

19B0010-01RE1 (Water)

Wet Chemistry

Method: SM 4500-$NO3^-$ I-00 — Sampled: 02/01/2019 11:30
Instrument: LACHAT2 Analyst: BF — Analyzed: 02/13/2019 16:38

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 19B0010-01RE1 C
Preparation Batch: BHB0256 — Sample Size: 10 mL
Prepared: 13-Feb-2019 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		2	0.020	0.020	**1.20**	mg/L	D

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Morris B

19B0010-02 (Water)

Metals and Metallic Compounds

Method: EPA 200.7 — Sampled: 02/01/2019 12:30
Instrument: ICP2 Analyst: TCH — Analyzed: 02/15/2019 13:57

Sample Preparation: Preparation Method: TWC EPA 3010A — Extract ID: 19B0010-02 D 02
Preparation Batch: BHB0281 — Sample Size: 25 mL
Prepared: 14-Feb-2019 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0051	0.0500	**21.0**	mg/L	
Magnesium	7439-95-4	1	0.0160	0.0500	**5.75**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Morris B

19B0010-02 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 — Sampled: 02/01/2019 12:30
Instrument: ICPMS2 Analyst: MCB — Analyzed: 02/12/2019 22:32

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix — Extract ID: 19B0010-02 D 01
Preparation Batch: BHB0234 — Sample Size: 25 mL
Prepared: 12-Feb-2019 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead	7439-92-1	1	0.0680	0.100	**4.59**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Morris B

19B0010-02 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 02/01/2019 12:30
Instrument: ICPMS2 Analyst: MCB — Analyzed: 02/12/2019 22:32

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix — Extract ID: 19B0010-02 D 01
Preparation Batch: BHB0234 — Sample Size: 25 mL
Prepared: 12-Feb-2019 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper	7440-50-8	1	0.340	0.500	**10.7**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Morris B

19B0010-02 (Water)

Wet Chemistry

Method: EPA 160.2 — Sampled: 02/01/2019 12:30
Instrument: BAL2 Analyst: UW — Analyzed: 02/05/2019 10:14

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 19B0010-02
Preparation Batch: BHB0065 — Sample Size: 1000 mL
Prepared: 05-Feb-2019 — Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	**60**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Morris B

19B0010-02 (Water)

Wet Chemistry

Method: SM 4500-NO_3^- I-00 — Sampled: 02/01/2019 12:30
Instrument: LACHAT2 Analyst: BF — Analyzed: 02/13/2019 16:39

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 19B0010-02 C
Preparation Batch: BHB0256 — Sample Size: 10 mL
Prepared: 13-Feb-2019 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	**0.950**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Morris B

19B0010-02 (Water)

Wet Chemistry

Method: SM 4500-Norg D-97 — Sampled: 02/01/2019 12:30
Instrument: LACHAT2 Analyst: AGW — Analyzed: 02/19/2019 13:24

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 19B0010-02 C
Preparation Batch: BHB0273 — Sample Size: 25 mL
Prepared: 13-Feb-2019 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Kjeldahl Nitrogen		1	0.5	0.5	**1.0**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Morris B

19B0010-02 (Water)

Wet Chemistry

Method: SM 4500-P E-99 — Sampled: 02/01/2019 12:30

Instrument: UV1800-2 Analyst: YK — Analyzed: 02/15/2019 11:10

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 19B0010-02 C

Preparation Batch: BHB0298 — Sample Size: 25 mL

Prepared: 14-Feb-2019 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Phosphorus	7723-14-0	1	0.0160	0.0160	**0.268**	mg-P/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Morris B

19B0010-02 (Water)

Wet Chemistry

Method: SM 5210 B-01 — Sampled: 02/01/2019 12:30
Instrument: BOD1 Analyst: WCW — Analyzed: 02/06/2019 15:00

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 19B0010-02
Preparation Batch: BHB0029 — Sample Size: 250 mL
Prepared: 01-Feb-2019 — Final Volume: 300 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
BOD		1	1.2	1.2	**2.6**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Morris B

19B0010-02 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 02/01/2019 12:30

Instrument: [CALC] Analyst: TCH — Analyzed: 02/15/2019 13:57

Sample Preparation: Preparation Method: [CALC] — Extract ID: 19B0010-02

Preparation Batch: [CALC]

Prepared: 14-Feb-2019 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1	0.331	**76.0**	mg/L CaCO3	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Morris B

19B0010-02 (Water)

Microbiology

Method: SM 9222D — Sampled: 02/01/2019 12:30
Instrument: N/A Analyst: UW — Analyzed: 02/02/2019 15:27

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 19B0010-02
Preparation Batch: BHB0025 — Sample Size: 4 mL
Prepared: 01-Feb-2019 — Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Fecal Coliforms		1		25	**700**	CFU/100 ml	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Infill

19B0010-03 (Solid)

SPLP Metals and Metallic Compounds

Method: EPA 200.8 — Sampled: 02/01/2019 09:35
Instrument: ICPMS2 Analyst: MCB — Analyzed: 02/15/2019 16:10

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix — Extract ID: 19B0010-03 A 02
Preparation Batch: BHB0310 — Sample Size: 25 mL (wet) — Dry Weight:6.61 mL
Prepared: 15-Feb-2019 — Final Volume: 25 mL — % Solids: 26.43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper	7440-50-8	1	0.0003	0.0005	**0.0007**	mg/L	
Zinc	7440-66-6	1	0.001	0.004	**0.002**	mg/L	J

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Infill

19B0010-03 (Solid)

Wet Chemistry

Method: SM 2540 G-97 — Sampled: 02/01/2019 09:35

Instrument: BAL2 Analyst: KLE — Analyzed: 02/05/2019 13:08

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 19B0010-03

Preparation Batch: BHB0083 — Sample Size: 10 g (wet) — Dry Weight:2.64 g

Prepared: 05-Feb-2019 — Final Volume: 10 g — % Solids: 26.43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	**26.43**	%	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Infill

19B0010-03 (Solid)

Microbiology

Method: SM 9222D — Sampled: 02/01/2019 09:35
Instrument: N/A Analyst: UW — Analyzed: 02/02/2019 15:27

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 19B0010-03
Preparation Batch: BHB0026 — Sample Size: 10.01 g (wet) — Dry Weight:2.65 g
Prepared: 01-Feb-2019 — Final Volume: 100 g — % Solids: 26.43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Fecal Coliforms		1	8	8	ND	CFU/g	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Infill

19B0010-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/01/2019 09:35
Instrument: ICPMS2 Analyst: TCH — Analyzed: 02/18/2019 15:39

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix — Extract ID: 19B0010-04 A 02
Preparation Batch: BHB0324 — Sample Size: 25 mL
Prepared: 15-Feb-2019 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.340	0.500	**0.565**	ug/L	
Zinc, Dissolved	7440-66-6	1	0.820	4.00	**1.00**	ug/L	J

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Infill

19B0010-04 (Water)

Wet Chemistry

Method: SM 4500-P E-99 — Sampled: 02/01/2019 09:35

Instrument: UV1800-2 Analyst: YK — Analyzed: 02/15/2019 14:23

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 19B0010-04 A 01

Preparation Batch: BHB0328 — Sample Size: 50 mL

Prepared: 15-Feb-2019 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Orthophosphorus	1426-54-42	1	0.0040	0.0040	ND	mg/L	H, U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Bobby Infill

19B0010-04RE1 (Water)

Wet Chemistry

Method: SM 4500-P E-99 — Sampled: 02/01/2019 09:35

Instrument: UV1800-2 Analyst: YK — Analyzed: 02/15/2019 14:08

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 19B0010-04RE1 C

Preparation Batch: BHB0321 — Sample Size: 25 mL

Prepared: 14-Feb-2019 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Phosphorus	7723-14-0	1	0.0080	0.0080	ND	mg-P/L	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Miller Infill

19B0010-05 (Solid)

SPLP Metals and Metallic Compounds

Method: EPA 200.8 — Sampled: 02/01/2019 10:35

Instrument: ICPMS2 Analyst: MCB — Analyzed: 02/15/2019 16:05

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix — Extract ID: 19B0010-05 A 02

Preparation Batch: BHB0310 — Sample Size: 25 mL (wet) — Dry Weight:21.61 mL

Prepared: 15-Feb-2019 — Final Volume: 25 mL — % Solids: 86.44

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper	7440-50-8	1	0.0003	0.0005	**0.002**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Miller Infill

19B0010-05 (Solid)

Wet Chemistry

Method: SM 2540 G-97 — Sampled: 02/01/2019 10:35
Instrument: BAL2 Analyst: KLE — Analyzed: 02/05/2019 13:08

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 19B0010-05
Preparation Batch: BHB0083 — Sample Size: 10 g (wet) — Dry Weight:8.64 g
Prepared: 05-Feb-2019 — Final Volume: 10 g — % Solids: 86.44

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	**86.44**	%	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Miller Infill

19B0010-05 (Solid)

Microbiology

Method: SM 9222D — Sampled: 02/01/2019 10:35

Instrument: N/A Analyst: UW — Analyzed: 02/02/2019 15:27

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 19B0010-05

Preparation Batch: BHB0026 — Sample Size: 10.03 g (wet) — Dry Weight:8.67 g

Prepared: 01-Feb-2019 — Final Volume: 100 g — % Solids: 86.44

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Fecal Coliforms		1	2	2	ND	CFU/g	U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Miller Infill

19B0010-05RE1 (Solid)

SPLP Metals and Metallic Compounds

Method: EPA 200.8 — Sampled: 02/01/2019 10:35

Instrument: ICPMS2 Analyst: TCH — Analyzed: 02/21/2019 16:50

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix — Extract ID: 19B0010-05RE1 A 03

Preparation Batch: BHB0456 — Sample Size: 25 mL (wet) — Dry Weight:21.61 mL

Prepared: 21-Feb-2019 — Final Volume: 25 mL — % Solids: 86.44

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Zinc	7440-66-6	1	0.0009	0.004	**0.148**	mg/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Miller Infill

19B0010-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/01/2019 10:35

Instrument: ICPMS2 Analyst: TCH — Analyzed: 02/18/2019 15:34

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix — Extract ID: 19B0010-06 A 02

Preparation Batch: BHB0324 — Sample Size: 25 mL

Prepared: 15-Feb-2019 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.340	0.500	**1.27**	ug/L	
Zinc, Dissolved	7440-66-6	1	0.820	4.00	**34.8**	ug/L	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Miller Infill

19B0010-06 (Water)

Wet Chemistry

Method: SM 4500-P E-99 — Sampled: 02/01/2019 10:35

Instrument: UV1800-2 Analyst: YK — Analyzed: 02/15/2019 14:24

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 19B0010-06 A 01

Preparation Batch: BHB0328 — Sample Size: 50 mL

Prepared: 15-Feb-2019 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Orthophosphorus	1426-54-42	1	0.0040	0.0040	**0.0060**	mg/L	H

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Miller Infill

19B0010-06RE1 (Water)

Wet Chemistry

Method: SM 4500-P E-99 — Sampled: 02/01/2019 10:35

Instrument: UV1800-2 Analyst: YK — Analyzed: 02/15/2019 14:10

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 19B0010-06RE1 C

Preparation Batch: BHB0321 — Sample Size: 25 mL

Prepared: 14-Feb-2019 — Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Phosphorus	7723-14-0	1	0.0080	0.0080	**0.0160**	mg-P/L	

Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Metals and Metallic Compounds - Quality Control

Batch BHB0234 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHB0234-BLK1)					Prepared: 12-Feb-2019 Analyzed: 12-Feb-2019 21:10							
Lead	208	ND	0.0680	0.100	ug/L							U
Copper	63	ND	0.340	0.500	ug/L							U
Copper	65	ND	0.350	0.500	ug/L							U
LCS (BHB0234-BS1)					Prepared: 12-Feb-2019 Analyzed: 12-Feb-2019 21:14							
Lead	208	26.9	0.0680	0.100	ug/L	25.0		108	80-120			
Copper	63	26.5	0.340	0.500	ug/L	25.0		106	80-120			
Copper	65	25.7	0.350	0.500	ug/L	25.0		103	80-120			

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Metals and Metallic Compounds - Quality Control

Batch BHB0281 - TWC EPA 3010A

Instrument: ICP2 Analyst: TCH

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHB0281-BLK1)				Prepared: 14-Feb-2019 Analyzed: 15-Feb-2019 11:37							
Calcium	ND	0.0051	0.0500	mg/L							U
Magnesium	ND	0.0160	0.0500	mg/L							U
LCS (BHB0281-BS1)				Prepared: 14-Feb-2019 Analyzed: 15-Feb-2019 12:14							
Calcium	9.67	0.0051	0.0500	mg/L	10.0		96.7	80-120			
Magnesium	10.1	0.0160	0.0500	mg/L	10.0		101	80-120			

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BHB0324 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHB0324-BLK1)						Prepared: 15-Feb-2019 Analyzed: 18-Feb-2019 15:24						
Copper, Dissolved	63	ND	0.340	0.500	ug/L							U
Copper, Dissolved	65	ND	0.350	0.500	ug/L							U
Zinc, Dissolved	66	ND	0.820	4.00	ug/L							U
Zinc, Dissolved	67	ND	0.940	4.00	ug/L							U
LCS (BHB0324-BS1)						Prepared: 15-Feb-2019 Analyzed: 18-Feb-2019 15:29						
Copper, Dissolved	63	26.3	0.340	0.500	ug/L	25.0		105	80-120			
Copper, Dissolved	65	25.8	0.350	0.500	ug/L	25.0		103	80-120			
Zinc, Dissolved	66	64.2	0.820	4.00	ug/L	80.0		80.2	80-120			
Duplicate (BHB0324-DUP1)			**Source: 19B0010-04**			Prepared: 15-Feb-2019 Analyzed: 18-Feb-2019 15:44						
Copper, Dissolved	63	0.478	0.340	0.500	ug/L		0.565			16.70	20	J
Zinc, Dissolved	66	1.03	0.820	4.00	ug/L		1.00			3.15	20	J
Matrix Spike (BHB0324-MS1)			**Source: 19B0010-04**			Prepared: 15-Feb-2019 Analyzed: 18-Feb-2019 15:49						
Copper, Dissolved	63	25.0	0.340	0.500	ug/L	25.0	0.565	97.7	75-125			
Zinc, Dissolved	66	64.2	0.820	4.00	ug/L	80.0	1.00	79.0	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

SPLP Metals and Metallic Compounds - Quality Control

Batch BHB0310 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHB0310-BLK1)					Prepared: 15-Feb-2019 Analyzed: 15-Feb-2019 15:55							
Copper	63	ND	0.0003	0.0005	mg/L							U
Copper	65	ND	0.0004	0.0005	mg/L							U
Zinc	66	0.002	0.001	0.004	mg/L							J
Zinc	67	0.003	0.0009	0.004	mg/L							J
LCS (BHB0310-BS1)					Prepared: 15-Feb-2019 Analyzed: 15-Feb-2019 18:26							
Copper	63	0.263	0.002	0.003	mg/L	0.250		105	80-120			D
Copper	65	0.259	0.002	0.003	mg/L	0.250		104	80-120			D
Zinc	66	0.760	0.006	0.020	mg/L	0.800		95.1	80-120			D
Zinc	67	0.749	0.005	0.020	mg/L	0.800		93.6	80-120			D
Duplicate (BHB0310-DUP1)			**Source: 19B0010-03**		Prepared: 15-Feb-2019 Analyzed: 15-Feb-2019 16:15							
Copper	63	0.0005	0.0003	0.0005	mg/L		0.0007			30.30	20	L
Zinc	66	ND	0.001	0.004	mg/L		0.002					U
Matrix Spike (BHB0310-MS1)			**Source: 19B0010-03**		Prepared: 15-Feb-2019 Analyzed: 15-Feb-2019 18:21							
Copper	63	0.272	0.002	0.003	mg/L	0.250	0.0007	109	75-125			D
Zinc	66	0.785	0.006	0.020	mg/L	0.800	0.002	98.1	75-125			D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

SPLP Metals and Metallic Compounds - Quality Control

Batch BHB0456 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHB0456-BLK1)					Prepared: 21-Feb-2019 Analyzed: 21-Feb-2019 16:45							
Zinc	66	0.002	0.001	0.004	mg/L							J
Zinc	67	0.003	0.0009	0.004	mg/L							J
LCS (BHB0456-BS1)					Prepared: 21-Feb-2019 Analyzed: 21-Feb-2019 17:09							
Zinc	66	1.78	0.026	0.080	mg/L	1.60		112	80-120			D
Zinc	67	1.65	0.019	0.080	mg/L	1.60		103	80-120			D
Duplicate (BHB0456-DUP1)			**Source: 19B0010-03RE1**		Prepared: 21-Feb-2019 Analyzed: 21-Feb-2019 16:55							
Zinc	66	ND	0.001	0.004	mg/L		ND					U
Matrix Spike (BHB0456-MS1)			**Source: 19B0010-03RE1**		Prepared: 21-Feb-2019 Analyzed: 21-Feb-2019 17:04							
Zinc	66	1.80	0.026	0.080	mg/L	1.60	ND	113	75-125			D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Wet Chemistry - Quality Control

Batch BHB0029 - No Prep Wet Chem

Instrument: BOD1 Analyst: WCW

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHB0029-BLK1)				Prepared: 01-Feb-2019 Analyzed: 06-Feb-2019 15:00							
BOD	ND	1.0	1.0	mg/L							U
LCS (BHB0029-BS1)				Prepared: 01-Feb-2019 Analyzed: 06-Feb-2019 15:00							
BOD	216	50.0	50.0	mg/L	198		109	84.6-115.4			

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Wet Chemistry - Quality Control

Batch BHB0065 - No Prep Wet Chem

Instrument: BAL2 Analyst: UW

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHB0065-BLK1)					Prepared: 05-Feb-2019 Analyzed: 05-Feb-2019 10:14						
Suspended Solids	ND	1	1	mg/L							U
LCS (BHB0065-BS1)					Prepared: 05-Feb-2019 Analyzed: 05-Feb-2019 10:14						
Suspended Solids	48	1	1	mg/L	50.00		95.4	90-110			
Duplicate (BHB0065-DUP1)		**Source: 19B0010-01**			Prepared: 05-Feb-2019 Analyzed: 05-Feb-2019 10:14						
Suspended Solids	61	1	1	mg/L		68			11.10	20	

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Wet Chemistry - Quality Control

Batch BHB0083 - No Prep Wet Chem

Instrument: BAL2 Analyst: KLE

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHB0083-BLK1)				Prepared: 05-Feb-2019 Analyzed: 05-Feb-2019 13:08							
Total Solids	ND	0.04	0.04	%							U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Wet Chemistry - Quality Control

Batch BHB0120 - No Prep Wet Chem

Instrument: LACHAT2 Analyst: AGW

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHB0120-BLK1)				Prepared: 06-Feb-2019 Analyzed: 12-Feb-2019 17:45							
Total Kjeldahl Nitrogen	ND	0.5	0.5	mg/L							U
LCS (BHB0120-BS1)				Prepared: 06-Feb-2019 Analyzed: 12-Feb-2019 17:46							
Total Kjeldahl Nitrogen	4.9	0.5	0.5	mg/L	5.00		98.2	90-110			
LCS (BHB0120-BS2)				Prepared: 06-Feb-2019 Analyzed: 12-Feb-2019 17:48							
Total Kjeldahl Nitrogen	4.9	0.5	0.5	mg/L	5.00		98.0	90-110			

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Wet Chemistry - Quality Control

Batch BHB0256 - No Prep Wet Chem

Instrument: LACHAT2 Analyst: BF

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHB0256-BLK1)				Prepared: 13-Feb-2019 Analyzed: 13-Feb-2019 16:23							
Nitrate + Nitrite as N	ND	0.010	0.010	mg/L							U
LCS (BHB0256-BS2)				Prepared: 13-Feb-2019 Analyzed: 13-Feb-2019 16:29							
Nitrate + Nitrite as N	0.470	0.010	0.010	mg/L	0.500		94.0	90-110			

Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Wet Chemistry - Quality Control

Batch BHB0273 - No Prep Wet Chem

Instrument: LACHAT2 Analyst: AGW

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHB0273-BLK1)					Prepared: 13-Feb-2019 Analyzed: 19-Feb-2019 13:12						
Total Kjeldahl Nitrogen	ND	0.5	0.5	mg/L							U
LCS (BHB0273-BS1)					Prepared: 13-Feb-2019 Analyzed: 19-Feb-2019 13:22						
Total Kjeldahl Nitrogen	4.6	0.5	0.5	mg/L	5.00		92.6	90-110			
LCS (BHB0273-BS2)					Prepared: 13-Feb-2019 Analyzed: 19-Feb-2019 13:23						
Total Kjeldahl Nitrogen	4.7	0.5	0.5	mg/L	5.00		94.8	90-110			
Duplicate (BHB0273-DUP1)		**Source: 19B0010-02**			Prepared: 13-Feb-2019 Analyzed: 19-Feb-2019 13:26						
Total Kjeldahl Nitrogen	0.9	0.5	0.5	mg/L		1.0			8.81	20	
Matrix Spike (BHB0273-MS1)		**Source: 19B0010-02**			Prepared: 13-Feb-2019 Analyzed: 19-Feb-2019 13:27						
Total Kjeldahl Nitrogen	10.6	1.0	1.0	mg/L	10.0	1.0	106	75-125			D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Wet Chemistry - Quality Control

Batch BHB0298 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: YK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHB0298-BLK1)				Prepared: 14-Feb-2019 Analyzed: 15-Feb-2019 11:07							
Total Phosphorus	ND	0.0160	0.0160	mg-P/L							U
Blank (BHB0298-BLK2)				Prepared: 14-Feb-2019 Analyzed: 15-Feb-2019 11:12							
Total Phosphorus	ND	0.0160	0.0160	mg-P/L							U
Blank (BHB0298-BLK3)				Prepared: 14-Feb-2019 Analyzed: 15-Feb-2019 11:13							
Total Phosphorus	ND	0.0160	0.0160	mg-P/L							U
LCS (BHB0298-BS1)				Prepared: 14-Feb-2019 Analyzed: 15-Feb-2019 11:08							
Total Phosphorus	0.302	0.0160	0.0160	mg-P/L	0.300		101	90-110			
LCS (BHB0298-BS2)				Prepared: 14-Feb-2019 Analyzed: 15-Feb-2019 11:12							
Total Phosphorus	0.300	0.0160	0.0160	mg-P/L	0.300		100	90-110			
LCS (BHB0298-BS3)				Prepared: 14-Feb-2019 Analyzed: 15-Feb-2019 11:14							
Total Phosphorus	0.298	0.0160	0.0160	mg-P/L	0.300		99.3	90-110			
Duplicate (BHB0298-DUP1)		**Source: 19B0010-01**		Prepared: 14-Feb-2019 Analyzed: 15-Feb-2019 11:09							
Total Phosphorus	0.360	0.0160	0.0160	mg-P/L		0.338			6.30	20	
Matrix Spike (BHB0298-MS1)		**Source: 19B0010-01**		Prepared: 14-Feb-2019 Analyzed: 15-Feb-2019 11:09							
Total Phosphorus	2.24	0.320	0.320	mg-P/L	2.00	0.338	95.2	75-125			D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Wet Chemistry - Quality Control

Batch BHB0321 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: YK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHB0321-BLK1)				Prepared: 15-Feb-2019 Analyzed: 15-Feb-2019 14:07							
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
Blank (BHB0321-BLK2)				Prepared: 15-Feb-2019 Analyzed: 15-Feb-2019 14:10							
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
LCS (BHB0321-BS1)				Prepared: 15-Feb-2019 Analyzed: 15-Feb-2019 14:08							
Total Phosphorus	0.294	0.0080	0.0080	mg-P/L	0.300		98.0	90-110			
LCS (BHB0321-BS2)				Prepared: 15-Feb-2019 Analyzed: 15-Feb-2019 14:10							
Total Phosphorus	0.300	0.0080	0.0080	mg-P/L	0.300		100	90-110			
Duplicate (BHB0321-DUP1)		**Source: 19B0010-04RE1**		Prepared: 15-Feb-2019 Analyzed: 15-Feb-2019 14:08							
Total Phosphorus	ND	0.0080	0.0080	mg-P/L		ND					U
Matrix Spike (BHB0321-MS1)		**Source: 19B0010-04RE1**		Prepared: 15-Feb-2019 Analyzed: 15-Feb-2019 14:09							
Total Phosphorus	0.182	0.0080	0.0080	mg-P/L	0.200	ND	91.1	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Wet Chemistry - Quality Control

Batch BHB0328 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: YK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHB0328-BLK1)				Prepared: 15-Feb-2019 Analyzed: 15-Feb-2019 14:22							
Orthophosphorus	ND	0.0040	0.0040	mg/L							U
Blank (BHB0328-BLK2)				Prepared: 15-Feb-2019 Analyzed: 15-Feb-2019 14:25							
Orthophosphorus	ND	0.0040	0.0040	mg/L							U
LCS (BHB0328-BS1)				Prepared: 15-Feb-2019 Analyzed: 15-Feb-2019 14:23							
Orthophosphorus	0.154	0.0040	0.0040	mg/L	0.150		103	90-110			
LCS (BHB0328-BS2)				Prepared: 15-Feb-2019 Analyzed: 15-Feb-2019 14:25							
Orthophosphorus	0.154	0.0040	0.0040	mg/L	0.150		103	90-110			
Duplicate (BHB0328-DUP1)		**Source: 19B0010-04**		Prepared: 15-Feb-2019 Analyzed: 15-Feb-2019 14:23							
Orthophosphorus	ND	0.0040	0.0040	mg/L		ND					H, U
Matrix Spike (BHB0328-MS1)		**Source: 19B0010-04**		Prepared: 15-Feb-2019 Analyzed: 15-Feb-2019 14:24							
Orthophosphorus	0.0970	0.0040	0.0040	mg/L	0.0999	ND	97.1	75-125			H

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Microbiology - Quality Control

Batch BHB0025 - No Prep Wet Chem

Instrument: N/A

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHB0025-BLK1)				Prepared: 01-Feb-2019 Analyzed: 02-Feb-2019 15:27							
Fecal Coliforms	ND		1	CFU/100 ml							U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Microbiology - Quality Control

Batch BHB0026 - No Prep Wet Chem

Instrument: N/A

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHB0026-BLK1)				Prepared: 01-Feb-2019 Analyzed: 02-Feb-2019 15:27							
Fecal Coliforms	ND	2	2	CFU/g							U

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Certified Analyses included in this Report

Analyte	Certifications
EPA 200.7 in Water	
Calcium	WADOE,NELAP,DoD-ELAP,WA-DW
Magnesium	WADOE,NELAP,DoD-ELAP,WA-DW
EPA 200.8 in Solid	
Copper-63	NELAP,DoD-ELAP,WADOE
Copper-65	NELAP,DoD-ELAP,WADOE
Zinc-66	NELAP
Zinc-67	NELAP
EPA 200.8 in Water	
Lead-208	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 200.8 UCT-KED in Water	
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
SM 4500-$NO3^-$ I-00 in Water	
Nitrate + Nitrite as N	DoD-ELAP,NELAP,WADOE
SM 4500-Norg D-97 in Water	
Total Kjeldahl Nitrogen	DoD-ELAP,WADOE
SM 4500-P E-99 in Water	
Orthophosphorus	WADOE,NELAP
Total Phosphorus	WADOE,NELAP
SM 5210 B-01 in Water	
BOD	WADOE,NELAP
SM 9222D in Water	
Fecal Coliforms	WADOE

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	02/07/2019
CALAP	California Department of Public Health CAELAP	2748	06/30/2019
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	01/01/2021
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-011	05/12/2019
WADOE	WA Dept of Ecology	C558	06/30/2019
WA-DW	Ecology - Drinking Water	C558	06/30/2019

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Herrera Environmental Consultants	Project: Bobby Morris Playfield	
2200 6th Avenue, Suite 1100	Project Number: 18-06769-001	**Reported:**
Seattle WA, 98121	Project Manager: Rob Zisette	22-Feb-2019 14:43

Notes and Definitions

D	The reported value is from a dilution
H	Hold time violation - Hold time was exceeded.
J	Estimated concentration value detected below the reporting limit.
L	Analyte concentration is <=5 times the reporting limit and the replicate control limit defaults to +/- RL instead of 20% RPD
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

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Dog Fecal Quantification ID

Detection and quantification of the fecal associated Dog gene biomarker by real-time quantitative Polymerase Chain Reaction (qPCR) DNA analytical technology

Submitter: Herrera Environmental
Date Received: February 2, 2019
Report Generated: February 7, 2019

SM #	Sample ID	Analysis Requested	Marker Quantified (copies/100 ml)	DNA Analytical Results
SM-9B02003	Bobby A	Dog Bacteroidetes ID: Target 1	1.67E+04	Detected

Limitation of Damages – Repayment of Service Price
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Revision 1.3
Effective Date 9/25/18

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Preliminary Interpretation of Dog Fecal "Quantification" ID Results

Detection and quantification of the fecal associated Dog gene biomarker by real-time quantitative Polymerase Chain Reaction (qPCR) DNA analytical technology

Submitter: Herrera Environmental
Date Received: February 2, 2019
Report Generated: February 7, 2019

Sample ID	INTERPRETATION	
	Concentration of Dog Fecal Pollution in Sample	Comment
Bobby A	**Moderate Concentration**	Moderate levels of Dog fecal biomarker(s)

The opinions/interpretations identified/expressed in this report are outside the scope of this organization's A2LA Accreditation.

Laboratory Comments

Submitter: Herrera Environmental

Report Generated: February 7, 2019

Non-Detect Results
In sample(s) classified as non-detect, the host-associated fecal gene biomarker(s) was either not detected in test replicates, one replicate was detected at a cycle threshold greater than 35 and the other was not, or one replicate was detected at a cycle threshold less than 35 and the other was not after repeated analysis.

Detected Results
In sample(s) classified as detected, the host-associated fecal gene biomarker(s) was detected in both test replicates suggesting that the host's fecal contamination is present in the sample(s). Copy number measurements reported are relative, not absolute, quantification.

Detected Not Quantified (DNQ) Results
In sample(s) classified as Detected Not Quantified (DNQ), the host-associated fecal biomarker was detected in both test replicates but in quantities below the limit of quantification. This result indicates that fecal indicators associated with the respective host was present in the sample(s) but in low concentrations.

Fecal Reference Samples
The client is encouraged to submit fecal samples from suspected sources in the surrounding area in order to gain a better understanding of the concentration of the host-associated biomarker with the regional population. A more precise interpretation would be available to the client with the submittal of such baseline samples.

Result Interpretations
Quantitative results are reported along with interpretations. Interpretations are given as "non-detect", "low concentration", "moderate concentration", or "high concentration" based on the concentration of the genetic markers found in the sample(s).

The presence of the biomarker does not signify the presence or absence of that form of fecal pollution conclusively. Only repeated sampling will enable you to draw more definitive conclusions as to the contributor(s) of fecal pollution.

Additional Testing
A portion of all samples has been frozen and will be archived for 3 months. The client is encouraged to perform additional tests on the sample(s) for other hosts suspected of contributing to the fecal contamination. A list of available tests can be found at **sourcemolecular.com/tests**

DNA Analytical Method Explanation

Water Samples: Each submitted water sample is filtered through 0.45 micron membrane filter(s). Each filter is placed in a separate, sterile 2ml disposable tube containing a unique mix of beads and lysis buffer. The sample is homogenized for 1min and the DNA extracted using the Generite DNA-EZ ST1 extraction kit (GeneRite, NJ), as per manufacturer's protocol. Devitations to these procedures may occur at the client's request.

Non-Water Samples: Each non-water sample submitted by the client is processed as per internal laboratory extraction procedures. An extracted DNA sample is proceed directly to PCR analysis. Details available upon request.

Amplifications to detect the target gene biomarker were run on an Applied Biosystems StepOnePlus real-time thermal cycler (Applied Biosystems, Foster City, CA) in a final reaction volume of 20ul sample extract, forward primer, reverse primer, probe and an optimized buffer. All assays are run in duplicate. Quantification is achieved by extrapolating target gene copy numbers from a standard curve generated from serial dilutions of known gene copy numbers.

For quality control purposes, a positive control and a negative control, were run alongside the sample(s) to ensure a properly functioning reaction and reveal any false negatives or false positives.

Theory Explanation of Dog Bacteroidetes "Quantification" ID™

The phylum *Bacteroidetes* is composed of three large groups of bacteria with the best-known category being *Bacteroidaceae*. This family of gram-negative bacteria is found primarily in the intestinal tracts and mucous membranes of warm-blooded animals and is sometimes considered pathogenic.

Comprising *Bacteroidaceae* are the genus *Bacteroides* and *Prevotella*. The latter genus was originally classified within the former (i.e. *Bacteroides*), but since the 1990's it has been classified in a separate genus because of new chemical and biochemical findings. *Bacteroides* and *Prevotella* are gram-negative, anaerobic, rod-shaped bacteria that inhabitant of the oral, respiratory, intestinal, and urogenital cavities of humans, animals, and insects. They are sometimes pathogenic.

Fecal *Bacteroidetes* are considered for several reasons an interesting alternative to more traditional indicator organisms such as *E. coli* and *Enterococci*.[1] Since they are strict anaerobes, they are indicative of recent fecal contamination when found in water systems. This is a particularly strong reference point when trying to determine recent outbreaks in fecal pollution. They are also more abundant in feces of warm-blooded animals than *E. coli* and *Enterococci*. Furthermore, these latter two organisms are facultative anaerobes and as such they can be problematic for monitoring purposes since it has been shown that they are able to proliferate in soil, sand and sediments.

The Dog Bacteroidetes ID™ service is designed around the principle that fecal *Bacteroidetes* are found in large quantities in feces of warm-blooded animals.[2,3,4,5,6] Furthermore, certain categories of *Bacteroidetes* have been shown to be predominately detected in dog. Within these *Bacteroidetes*, certain strains of the *Bacteroides* and *Prevotella* genus have been found in dog.[2,3,5,6] As such, these bacterial strains can be used as indicators of dog fecal contamination.

One of the advantages of the Dog Bacteroidetes ID™ service is that the entire water is sampled and filtered for fecal *Bacteroidetes*. As such, this method avoids the randomness effect of culturing and selecting bacterial isolates off a petri dish. This is a particular advantage for highly contaminated water systems with potential multiple sources of fecal contamination.

Accuracy of the results is possible because the method uses PCR DNA technology. PCR allows quantities of DNA to be amplified into large number of small copies of DNA sequences. This is accomplished with small pieces of DNA called primers that are complementary and specific to the genomes to be detected.

Through a heating process called thermal cycling, the double stranded DNA is denatured and inserted with complementary primers to create exact copies of the DNA fragment desired. This process is repeated rapidly many times ensuring an exponential progression in the number of copied DNA. If the primers are successful in finding a site on the DNA fragment that is specific to the genome to be studied, then billions of copies of the DNA fragment will be available and detected in real-time. The accumulation of DNA product is plotted as an amplification curve. The absence of an amplification curve would indicate that the dog *Bacteroidetes* gene biomarker is not present.

References

[1] Scott, Troy M., Rose, Joan B., Jenkins, Tracie M., Farrah, Samuel R., Lukasik, Jerzy **Microbial Source Tracking: Current Methodology and Future Directions.** Appl. Environ. Microbiol. (2002) 68: 5796-5803.

[2] Bernhard, A.E., and K.G. Field (2000a). **Identification of nonpoint sources of fecal pollution in coastal waters by using host-specific 16S ribosomal DNA genetic markers from fecal anaerobes.** Applied and Environmental Microbiology, 66: 1,587-1,594.

[3] Bernhard, A.E., and K.G. Field (2000b). **A PCR assay to discriminate human and ruminant feces on the basis of host differences in Bacteroides-Prevotella genes encoding 16S rRNA.** Applied and Environmental Microbiology, 66: 4,571-4,574.

[4] Kreader, C.A. (1995). **Design and evaluation of Bacteroides DNA probes for the specific detection of human fecal pollution.** Applied and Environmental Microbiology, 61: 1,171-1,179.

[5] Fogarty, Lisa R., Voytek, Mary **A.Comparison of Bacteroides-Prevotella 16S rRNA Genetic Markers for Fecal Samples from Different Animal Species** Appl. Environ. Microbiol. 2005 71: 5999-6007.

[6] Dick, Linda K., Bernhard, Anne E., Brodeur, Timothy J., Santo Domingo, Jorge W., Simpson, Joyce M., Walters, Sarah P., Field, Katharine G. **Host Distributions of Uncultivated Fecal Bacteroidales Bacteria Reveal Genetic Markers for Fecal Source Identification** Appl. Environ. Microbiol. 2005 71: 3184-3191.

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Human Fecal Quantification ID

Detection and quantification of the fecal associated Human gene biomarker by real-time quantitative Polymerase Chain Reaction (qPCR) DNA analytical technology

Submitter: Herrera Environmental
Date Received: February 2, 2019
Report Generated: February 7, 2019

ND: Not Detected

SM #	Sample ID	Analysis Requested	Marker Quantified (copies/100 ml)	DNA Analytical Results
SM-9B02002	Bobby A	Human Bacteroidetes ID: Dorei	ND	Not Detected

Limitation of Damages – Repayment of Service Price
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Revision 1.3
Effective Date 9/25/18

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Preliminary Interpretation of Human Fecal "Quantification" ID Results

Detection and quantification of the fecal associated Human gene biomarker by real-time quantitative Polymerase Chain Reaction (qPCR) DNA analytical technology

Submitter: Herrera Environmental
Date Received: February 2, 2019
Report Generated: February 7, 2019

Sample ID	INTERPRETATION	
	Concentration of Human Fecal Pollution in Sample	Comment
Bobby A	Not Detected	Human fecal biomarker not detected

The opinions/interpretations identified/expressed in this report are outside the scope of this organization's A2LA Accreditation.

Laboratory Comments

Submitter: Herrera Environmental

Report Generated: February 7, 2019

Non-Detect Results
In sample(s) classified as non-detect, the host-associated fecal gene biomarker(s) was either not detected in test replicates, one replicate was detected at a cycle threshold greater than 35 and the other was not, or one replicate was detected at a cycle threshold less than 35 and the other was not after repeated analysis.

Detected Results
In sample(s) classified as detected, the host-associated fecal gene biomarker(s) was detected in both test replicates suggesting that the host's fecal contamination is present in the sample(s). Copy number measurements reported are relative, not absolute, quantification.

Detected Not Quantified (DNQ) Results
In sample(s) classified as Detected Not Quantified (DNQ), the host-associated fecal biomarker was detected in both test replicates but in quantities below the limit of quantification. This result indicates that fecal indicators associated with the respective host was present in the sample(s) but in low concentrations.

Fecal Reference Samples
The client is encouraged to submit fecal samples from suspected sources in the surrounding area in order to gain a better understanding of the concentration of the host-associated biomarker with the regional population. A more precise interpretation would be available to the client with the submittal of such baseline samples.

Result Interpretations
Quantitative results are reported along with interpretations. Interpretations are given as "non-detect", "low concentration", "moderate concentration", or "high concentration" based on the concentration of the genetic markers found in the sample(s).

The presence of the biomarker does not signify the presence or absence of that form of fecal pollution conclusively. Only repeated sampling will enable you to draw more definitive conclusions as to the contributor(s) of fecal pollution.

Additional Testing
A portion of all samples has been frozen and will be archived for 3 months. The client is encouraged to perform additional tests on the sample(s) for other hosts suspected of contributing to the fecal contamination. A list of available tests can be found at **sourcemolecular.com/tests**

DNA Analytical Method Explanation

Water Samples: Each submitted water sample is filtered through 0.45 micron membrane filter(s). Each filter is placed in a separate, sterile 2ml disposable tube containing a unique mix of beads and lysis buffer. The sample is homogenized for 1min and the DNA extracted using the Generite DNA-EZ ST1 extraction kit (GeneRite, NJ), as per manufacturer's protocol. Devitations to these procedures may occur at the client's request.

Non-Water Samples: Each non-water sample submitted by the client is processed as per internal laboratory extraction procedures. An extracted DNA sample is proceed directly to PCR analysis. Details available upon request.

Amplifications to detect the target gene biomarker were run on an Applied Biosystems StepOnePlus real-time thermal cycler (Applied Biosystems, Foster City, CA) in a final reaction volume of 20ul sample extract, forward primer, reverse primer, probe and an optimized buffer. All assays are run in duplicate. Quantification is achieved by extrapolating target gene copy numbers from a standard curve generated from serial dilutions of known gene copy numbers.

For quality control purposes, a positive control and a negative control, were run alongside the sample(s) to ensure a properly functioning reaction and reveal any false negatives or false positives.

Human Bacteroidetes ID™ Species*: B. dorei*

The **Human Bacteroidetes ID™ Species*: B. dorei*** service targets the species *Bacteroides dorei*. *B. dorei* is an anaerobe that is frequently shed from the gastrointestinal tract and isolated from human feces worldwide. It is a newly discovered species that is widely distributed in the USA.[1,2] The human-associated marker DNA sequence is located on the 16S rRNA gene of *B. dorei*.[3] The marker is the microbial source tracking (MST) marker of choice for detecting human fecal pollution due to its exceptional sensitivity and specificity. Internal validations have been conducted on hundreds of sewage, septage, human and animal host fecal samples collected from throughout the U.S and archived in the Source Molecular fecal bank. The marker has also been evaluated in both inland and coastal waters. A recent, comprehensive, multi-laboratory MST method evaluation study, exploring the performance of current MST methods, concluded the *B. dorei* qPCR assay to be the top performing human-associated assay amongst those tested. The success and consistency of this marker in numerous studies around the world[1,3,4] makes the **Human Bacteroidetes ID™ Species*: B. dorei*** service the primary service for identifying human fecal pollution at Source Molecular.

Fecal *Bacteroidetes* are considered for several reasons an interesting alternative to more traditional indicator organisms such as *E. coli* and *Enterococci*.[5] Since they are strict anaerobes, they are indicative of recent fecal contamination when found in water systems. This is a particularly strong reference point when trying to determine recent outbreaks in fecal pollution. They are also more abundant in feces of warm-blooded animals than *E. coli* and *Enterococci*.

The Human Bacteroidetes ID™ service is designed around the principle that fecal *Bacteroidetes* are found in large quantities in feces of warm-blooded animals.[3,5,6,7,8] Furthermore, certain strains of *Bacteroidetes* have been found to be associated with humans.[3,6] As such, these bacterial strains can be used as indicators of human fecal contamination.

Accuracy of the results is possible because the method amplifies DNA into a large number of small copies of the gene biomarker of interest. This is accomplished with small pieces of DNA called primers that are complementary and specific to the unique *B. dorei* DNA sequence. Through a heating process called thermal cycling, the double stranded DNA is denatured, hybridized to the complementary primers and amplified to create many copies of the DNA fragment desired. If the primers are successful in finding a site on the DNA fragment that is specific to the *B. dorei* DNA sequence, then billions of copies of the DNA fragment will be available and detected in real-time. The accumulation of DNA product is plotted as an amplification curve by the qPCR software. The absence of an amplification curve indicates that the *B. dorei* gene biomarker is not detected in the water sample because it is either not present or present at concentrations below the analytical detection limit.

To strengthen the validity of the results, additional tests targeting other high-ranking, human-associated *Bacteroidetes* species should be performed, such as
Human Bacteroidetes ID™ Species*: B. stercoris*,
Human Bacteroidetes ID™ Species*: B. fragilis,* and
Human Bacteroidetes ID™ Species*: B. thetaiotaomicron*.

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[3] Bernhard, A., Field, K. **A PCR assay to discriminate human and ruminant feces on the basis of host differences in Bacteroides-Prevotella genes encoding 16S rRNA.** Appl. Environ. Microbiol. 2000b 66: 4571-4574.
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[5] Scott, T., Rose, J., Jenkins, T., Farrah, S., Lukasik, J. **Microbial Source Tracking: Current Methodology and Future Directions.** Appl. Environ. Microbiol. 2002 68: 5796-5803.
[6] Bernhard, A., Field, K. **Identification of nonpoint sources of fecal pollution in coastal waters by using host-specific 16S ribosomal DNA genetic markers from fecal anaerobes.** Appl. Environ. Microbiol. 2000a 66: 1587-1594.
[7] Fogarty, L., Voytek, M. **A Comparison of Bacteroides-Prevotella 16S rRNA Genetic Markers for Fecal Samples from Different Animal Species.** Appl. Environ. Microbiol. 2005 71: 5999-6007.
[8] Dick, L., Bernhard, A., Brodeur, T., Santo Domingo, J., *et al*. **Host Distributions of Uncultivated Fecal Bacteroidales Bacteria Reveal Genetic Markers for Fecal Source Identification.** Appl. Environ. Microbiol. 2005 71: 3184-3191.

APPENDIX D

Water Quality Database

Table D-1. Water Quality Monitoring Database for the Bobby Morris Playfield Environmental Monitoring Project.

Station ID	Sample Type	Date	Time	Round	Flow (gpm)	Hardness (mg CaCO3/L)	Total Suspended Solids (mg/L)	Fecal Coliform Bacteria (CFU/ 100 mL)	Total Phosphorus (µg/L)	Ortho-phosphorus (µg/L)	Nitrate+ Nitrite (mg/L)	TKN (mg/L)	BOD (mg/L)	Copper, Total (µg/L)	Copper, Dissolved (µg/L)
Bobby Morris	Field drainage	3/8/2018	1340	1	3	61.4	30	**600** J	206	--	--	--	--	7.89	2.98
Bobby Morris	Field drainage	3/8/2018	1445	2	23	63.8	29	**205** J	132	--	--	--	--	5.00	2.82
Bobby Morris	Field drainage	3/23/2018	1040	1	20	41.6	100	**825**	340	--	--	--	--	10.3	4.00
Bobby Morris	Field drainage	3/23/2018	1150	2	33	47.6	20	**145**	120	--	--	--	--	11.7	6.40
Bobby Morris	Field drainage	4/7/2018	0850	1	40	60.5	8	**3300**	150	37	0.574	0.8	1.4	8.47	5.49
Bobby Morris	Field drainage	4/7/2018	1000	2	70	59.2	12	**550**	98	39	0.539	0.8	1.5	9.34	5.95
Bobby Morris	Field drainage	4/14/2018	0630	1	40	58.2	46	**925**	174 J	40	0.256	0.5 UJ	2.0	6.87	2.64
Bobby Morris	Field drainage	4/14/2018	0740	2	40	61.3	6	**275**	72	42	0.241	0.5 U	15.5	4.88	3.24
Bobby Morris	Field drainage	2/1/2019	1130	1	0.5	61.2	68	**1480**	338	--	1.20	1.5	4.9	10.9	--
Bobby Morris	Field drainage	2/1/2019	1230	2	3	76.0	60	**700**	268	--	0.950	1.0	2.6	10.7	--
Miller	Field drainage	3/23/2018	1115	1	80	91.4	2	32	14	--	--	--	--	6.00	4.66
Miller	Field drainage	3/23/2018	1225	2	80	87.9	1 U	**63**	22	--	--	--	--	5.58	5.18
Miller	Field drainage	4/7/2018	0930	1	100	95.5	2	13 J	14	9	0.290	0.5 U	1.2 U	6.22	5.61
Miller	Field drainage	4/7/2018	1130	2	80	97.6	1 U	15 J	14	7	0.259	0.5 U	2.4	5.88	5.00
Miller	Field drainage	4/14/2018	0705	1	40	74.1	1 U	1 U	14	10	0.146	0.5 U	1.2 U	3.97	2.93
Miller	Field drainage	4/14/2018	0820	2	35	73.7	1 U	3 J	10	10	0.136	0.5 U	1.2 U	3.63	3.53
QC1	Field filter blank	3/8/2018	1500	--	--	--	--	--	--	--	--	--	--	--	0.34 U
Bobby Infill	SPLP leachate	2/1/2019	0935	--	--	--	--	8 U[a]	8 U	4 U	--	--	--	0.70	0.57
Miller Infill	SPLP leachate	2/1/2019	1035	--	--	--	--	2 U[a]	16	6	--	--	--	2.0	1.27

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-- = Value was not determined.
U = The analyte was not detected at the associated quantitation or detection limit.
J = The associated value is an estimated quantity.
[a] Fecal coliform measured in bulk infill sample with result in CFU/gram
Bold values exceed Washington State water quality criteria
SPLP = Synthetic precipiation leaching procedure

Table D-1. Water Quality Monitoring Database for the Bobby Morris Playfield Environmental Monitoring Project.

Station ID	Sample Type	Date	Time	Round	Lead, Total (µg/L)	Lead, Dis-solved (µg/L)	Zinc, Total (µg/L)	Zinc, Dis-solved (µg/L)	1,2,4-Trichloro-benzene (µg/L)	1,2-Dichloro-benzene (µg/L)	1,3-Dichloro-benzene (µg/L)	1,4-Dichloro-benzene (µg/L)	1-Methyl-naphthalene (µg/L)	2,2'-Oxybis(1-chloropro-pane) (µg/L)	2,4,5-Trichloro-phenol (µg/L)
Bobby Morris	Field drainage	3/8/2018	1340	1	2.89	0.071	50.6	20.1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Bobby Morris	Field drainage	3/8/2018	1445	2	1.75	0.068 U	32.0	21.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Bobby Morris	Field drainage	3/23/2018	1040	1	3.38	0.068 U	44.0	14.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Bobby Morris	Field drainage	3/23/2018	1150	2	0.94	0.068 U	36.1	23.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Bobby Morris	Field drainage	4/7/2018	0850	1	0.79	0.068 U	32.9	26.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Bobby Morris	Field drainage	4/7/2018	1000	2	0.89	0.068 U	36.8	29.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Bobby Morris	Field drainage	4/14/2018	0630	1	2.73	0.068 U	32.9	16.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Bobby Morris	Field drainage	4/14/2018	0740	2	0.58	0.068 U	24.4	23.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Bobby Morris	Field drainage	2/1/2019	1130	1	4.67	--	--	--	--	--	--	--	--	--	--
Bobby Morris	Field drainage	2/1/2019	1230	2	4.59	--	--	--	--	--	--	--	--	--	--
Miller	Field drainage	3/23/2018	1115	1	0.126	0.068 U	2.64	2.38	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Miller	Field drainage	3/23/2018	1225	2	0.068 U	0.068 U	2.38	2.28	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Miller	Field drainage	4/7/2018	0930	1	0.097	0.068 U	2.41	2.39	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Miller	Field drainage	4/7/2018	1130	2	0.068 U	0.068 U	2.67	1.70	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Miller	Field drainage	4/14/2018	0705	1	0.269	0.068 U	1.30	1.20	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Miller	Field drainage	4/14/2018	0820	2	0.068 U	0.068 U	1.18	2.60	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
QC1	Field filter blank	3/8/2018	1500	--	--	0.068 U	--	0.82 U	--	--	--	--	--	--	--
Bobby Infill	SPLP leachate	2/1/2019	0935	--	--	--	2.00 J	1.00 J	--	--	--	--	--	--	--
Miller Infill	SPLP leachate	2/1/2019	1035	--	--	--	148	34.8	--	--	--	--	--	--	--

Table D-1. Water Quality Monitoring Database for the Bobby Morris Playfield Environmental Monitoring Project.

Station ID	Sample Type	Date	Time	Round	2,4,6-Trichloro-phenol (µg/L)	2,4-Dichloro-phenol (µg/L)	2,4-Dimethyl-phenol (µg/L)	2,4-Dinitro-phenol (µg/L)	2,4-Dinitrotoluene (µg/L)	2,6-Dinitrotoluene (µg/L)	2-Chloronaphthalene (µg/L)	2-Chlorophenol (µg/L)	2-Methylnaphthalene (µg/L)	2-Methylphenol (µg/L)	2-Nitroaniline (µg/L)
Bobby Morris	Field drainage	3/8/2018	1340	1	3.0 U	3.0 U	3.0 U	20.0 U	3.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Bobby Morris	Field drainage	3/8/2018	1445	2	3.0 U	3.0 U	3.0 U	20.0 U	3.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Bobby Morris	Field drainage	3/23/2018	1040	1	3.0 U	3.0 U	3.0 U	20.0 U	3.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Bobby Morris	Field drainage	3/23/2018	1150	2	3.0 U	3.0 U	3.0 U	20.0 U	3.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Bobby Morris	Field drainage	4/7/2018	0850	1	3.0 U	3.0 U	3.0 U	20.0 U	3.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Bobby Morris	Field drainage	4/7/2018	1000	2	3.0 U	3.0 U	3.0 U	20.0 U	3.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Bobby Morris	Field drainage	4/14/2018	0630	1	3.0 U	3.0 U	3.0 U	20.0 U	3.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Bobby Morris	Field drainage	4/14/2018	0740	2	3.0 U	3.0 U	3.0 U	20.0 U	3.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Bobby Morris	Field drainage	2/1/2019	1130	1	--	--	--	--	--	--	--	--	--	--	--
Bobby Morris	Field drainage	2/1/2019	1230	2	--	--	--	--	--	--	--	--	--	--	--
Miller	Field drainage	3/23/2018	1115	1	3.0 U	3.0 U	3.0 U	20.0 U	3.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Miller	Field drainage	3/23/2018	1225	2	3.0 U	3.0 U	3.0 U	20.0 U	3.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Miller	Field drainage	4/7/2018	0930	1	3.0 U	3.0 U	3.0 U	20.0 U	3.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Miller	Field drainage	4/7/2018	1130	2	3.0 U	3.0 U	3.0 U	20.0 U	3.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Miller	Field drainage	4/14/2018	0705	1	3.0 U	3.0 U	3.0 U	20.0 U	3.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Miller	Field drainage	4/14/2018	0820	2	3.0 U	3.0 U	3.0 U	20.0 U	3.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
QC1	Field filter blank	3/8/2018	1500	--	--	--	--	--	--	--	--	--	--	--	--
Bobby Infill	SPLP leachate	2/1/2019	0935	--	--	--	--	--	--	--	--	--	--	--	--
Miller Infill	SPLP leachate	2/1/2019	1035	--	--	--	--	--	--	--	--	--	--	--	--

Table D-1. Water Quality Monitoring Database for the Bobby Morris Playfield Environmental Monitoring Project.

Station ID	Sample Type	Date	Time	Round	2-Nitrophenol (µg/L)	3,3'-Dichlorobenzidine (µg/L)	3-Nitroaniline (µg/L)	4,6-Dinitro-2-methylphenol (µg/L)	4-Bromophenyl phenyl ether (µg/L)	4-Chloro-3-Methylphenol (µg/L)	4-Chloroaniline (µg/L)	4-Chlorophenylphenyl ether (µg/L)	4-Methylphenol (µg/L)	4-Nitroaniline (µg/L)	4-Nitrophenol (µg/L)	Acenaphthene (µg/L)
Bobby Morris	Field drainage	3/8/2018	1340	1	3.0 U	5.0 U	3.0 U	10.0 U	1.0 U	3.0 U	5.0 U	1.0 U	2.0 U	3.0 U	10.0 U	1.0 U
Bobby Morris	Field drainage	3/8/2018	1445	2	3.0 U	5.0 U	3.0 U	10.0 U	1.0 U	3.0 U	5.0 U	1.0 U	2.0 U	3.0 U	10.0 U	1.0 U
Bobby Morris	Field drainage	3/23/2018	1040	1	3.0 U	5.0 U	3.0 U	10.0 U	1.0 U	3.0 U	5.0 U	1.0 U	2.0 U	3.0 U	10.0 U	1.0 U
Bobby Morris	Field drainage	3/23/2018	1150	2	3.0 U	5.0 U	3.0 U	10.0 U	1.0 U	3.0 U	5.0 U	1.0 U	2.0 U	3.0 U	10.0 U	1.0 U
Bobby Morris	Field drainage	4/7/2018	0850	1	3.0 U	5.0 U	3.0 U	10.0 U	1.0 U	3.0 UJ	5.0 U	1.0 U	2.0 U	3.0 U	10.0 U	1.0 U
Bobby Morris	Field drainage	4/7/2018	1000	2	3.0 U	5.0 U	3.0 U	10.0 U	1.0 U	3.0 UJ	5.0 U	1.0 U	2.0 U	3.0 U	10.0 U	1.0 U
Bobby Morris	Field drainage	4/14/2018	0630	1	3.0 U	5.0 U	3.0 U	10.0 U	1.0 U	3.0 U	5.0 U	1.0 U	2.0 U	3.0 U	10.0 U	1.0 U
Bobby Morris	Field drainage	4/14/2018	0740	2	3.0 U	5.0 U	3.0 U	10.0 U	1.0 U	3.0 U	5.0 U	1.0 U	2.0 U	3.0 U	10.0 U	1.0 U
Bobby Morris	Field drainage	2/1/2019	1130	1	--	--	--	--	--	--	--	--	--	--	--	--
Bobby Morris	Field drainage	2/1/2019	1230	2	--	--	--	--	--	--	--	--	--	--	--	--
Miller	Field drainage	3/23/2018	1115	1	3.0 U	5.0 U	3.0 U	10.0 U	1.0 U	3.0 U	5.0 U	1.0 U	2.0 U	3.0 U	10.0 U	1.0 U
Miller	Field drainage	3/23/2018	1225	2	3.0 U	5.0 U	3.0 U	10.0 U	1.0 U	3.0 U	5.0 U	1.0 U	2.0 U	3.0 U	10.0 U	1.0 U
Miller	Field drainage	4/7/2018	0930	1	3.0 U	5.0 U	3.0 U	10.0 U	1.0 U	3.0 UJ	5.0 U	1.0 U	2.0 U	3.0 U	10.0 U	1.0 U
Miller	Field drainage	4/7/2018	1130	2	3.0 U	5.0 U	3.0 U	10.0 U	1.0 U	3.0 UJ	5.0 U	1.0 U	2.0 U	3.0 U	10.0 U	1.0 U
Miller	Field drainage	4/14/2018	0705	1	3.0 U	5.0 U	3.0 U	10.0 U	1.0 U	3.0 U	5.0 U	1.0 U	2.0 U	3.0 U	10.0 U	1.0 U
Miller	Field drainage	4/14/2018	0820	2	3.0 U	5.0 U	3.0 U	10.0 U	1.0 U	3.0 U	5.0 U	1.0 U	2.0 U	3.0 U	10.0 U	1.0 U
QC1	Field filter blank	3/8/2018	1500	--	--	--	--	--	--	--	--	--	--	--	--	--
Bobby Infill	SPLP leachate	2/1/2019	0935	--	--	--	--	--	--	--	--	--	--	--	--	--
Miller Infill	SPLP leachate	2/1/2019	1035	--	--	--	--	--	--	--	--	--	--	--	--	--

Table D-1. Water Quality Monitoring Database for the Bobby Morris Playfield Environmental Monitoring Project.

Station ID	Sample Type	Date	Time	Round	Acenaphthylene (µg/L)	Anthracene (µg/L)	Benzo(a)anthracene (µg/L)	Benzo(a)pyrene (µg/L)	Benzo(g,h,i)perylene (µg/L)	Benzofluoranthenes, Total (µg/L)	Benzoic acid (µg/L)	Benzyl Alcohol (µg/L)	Bis(2-Chloroethoxy)methane (µg/L)	bis(2-chloroethyl) ether (µg/L)	bis(2-Ethylhexyl) phthalate (µg/L)	Butylbenzyl phthalate (µg/L)
Bobby Morris	Field drainage	3/8/2018	1340	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	20.0 U	2.0 U	1.0 U	1.0 U	3.0 U	1.0 U
Bobby Morris	Field drainage	3/8/2018	1445	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	20.0 U	2.0 U	1.0 U	1.0 U	3.0 U	1.0 U
Bobby Morris	Field drainage	3/23/2018	1040	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	20.0 U	2.0 U	1.0 U	1.0 U	3.0 U	1.0 U
Bobby Morris	Field drainage	3/23/2018	1150	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	20.0 U	2.0 U	1.0 U	1.0 U	3.0 U	1.0 U
Bobby Morris	Field drainage	4/7/2018	0850	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	20.0 U	2.0 U	1.0 U	1.0 U	3.0 U	1.0 U
Bobby Morris	Field drainage	4/7/2018	1000	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	20.0 U	2.0 U	1.0 U	1.0 U	3.0 U	1.0 U
Bobby Morris	Field drainage	4/14/2018	0630	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	20.0 U	2.0 U	1.0 U	1.0 U	0.6 J	1.0 U
Bobby Morris	Field drainage	4/14/2018	0740	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	20.0 U	2.0 U	1.0 U	1.0 U	3.0 U	1.0 U
Bobby Morris	Field drainage	2/1/2019	1130	1	--	--	--	--	--	--	--	--	--	--	--	--
Bobby Morris	Field drainage	2/1/2019	1230	2	--	--	--	--	--	--	--	--	--	--	--	--
Miller	Field drainage	3/23/2018	1115	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	20.0 U	2.0 U	1.0 U	1.0 U	1.2 J	1.0 U
Miller	Field drainage	3/23/2018	1225	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	20.0 U	2.0 U	1.0 U	1.0 U	3.0 U	1.0 U
Miller	Field drainage	4/7/2018	0930	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	20.0 U	2.0 U	1.0 U	1.0 U	3.0 U	1.0 U
Miller	Field drainage	4/7/2018	1130	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	20.0 U	2.0 U	1.0 U	1.0 U	3.0 U	1.0 U
Miller	Field drainage	4/14/2018	0705	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	20.0 U	2.0 U	1.0 U	1.0 U	3.0 U	1.0 U
Miller	Field drainage	4/14/2018	0820	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	20.0 U	2.0 U	1.0 U	1.0 U	3.0 U	1.0 U
QC1	Field filter blank	3/8/2018	1500	--	--	--	--	--	--	--	--	--	--	--	--	--
Bobby Infill	SPLP leachate	2/1/2019	0935	--	--	--	--	--	--	--	--	--	--	--	--	--
Miller Infill	SPLP leachate	2/1/2019	1035	--	--	--	--	--	--	--	--	--	--	--	--	--

Table D-1. Water Quality Monitoring Database for the Bobby Morris Playfield Environmental Monitoring Project.

Station ID	Sample Type	Date	Time	Round	Carbazole (µg/L)	Chrysene (µg/L)	Dibenzo(a, h)anthracene (µg/L)	Dibenzofuran (µg/L)	Diethyl phthalate (µg/L)	Dimethylphthalate (µg/L)	Di-n-Butylphthalate (µg/L)	Di-n-Octylphthalate (µg/L)	Fluoranthene (µg/L)	Fluorene (µg/L)	Hexachlorobenzene (µg/L)	Hexachlorobutadiene (µg/L)
Bobby Morris	Field drainage	3/8/2018	1340	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Bobby Morris	Field drainage	3/8/2018	1445	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Bobby Morris	Field drainage	3/23/2018	1040	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Bobby Morris	Field drainage	3/23/2018	1150	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Bobby Morris	Field drainage	4/7/2018	0850	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Bobby Morris	Field drainage	4/7/2018	1000	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Bobby Morris	Field drainage	4/14/2018	0630	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Bobby Morris	Field drainage	4/14/2018	0740	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Bobby Morris	Field drainage	2/1/2019	1130	1	--	--	--	--	--	--	--	--	--	--	--	--
Bobby Morris	Field drainage	2/1/2019	1230	2	--	--	--	--	--	--	--	--	--	--	--	--
Miller	Field drainage	3/23/2018	1115	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Miller	Field drainage	3/23/2018	1225	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Miller	Field drainage	4/7/2018	0930	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Miller	Field drainage	4/7/2018	1130	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Miller	Field drainage	4/14/2018	0705	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
Miller	Field drainage	4/14/2018	0820	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U
QC1	Field filter blank	3/8/2018	1500	--	--	--	--	--	--	--	--	--	--	--	--	--
Bobby Infill	SPLP leachate	2/1/2019	0935	--	--	--	--	--	--	--	--	--	--	--	--	--
Miller Infill	SPLP leachate	2/1/2019	1035	--	--	--	--	--	--	--	--	--	--	--	--	--

Table D-1. Water Quality Monitoring Database for the Bobby Morris Playfield Environmental Monitoring Project.

Station ID	Sample Type	Date	Time	Round	Hexachlorocyclopentadiene (µg/L)	Hexachloroethane (µg/L)	Indeno(1,2,3-cd)pyrene (µg/L)	Isophorone (µg/L)	Naphthalene (µg/L)	Nitrobenzene (µg/L)	N-Nitroso-di-n-Propylamine (µg/L)	N-Nitrosodiphenylamine (µg/L)	Pentachlorophenol (µg/L)	Phenanthrene (µg/L)		Phenol (µg/L)	Pyrene (µg/L)
Bobby Morris	Field drainage	3/8/2018	1340	1	5.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0	U	1.0 U	1.0 U
Bobby Morris	Field drainage	3/8/2018	1445	2	5.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0	U	1.0 U	1.0 U
Bobby Morris	Field drainage	3/23/2018	1040	1	5.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0	U	1.0 U	1.0 U
Bobby Morris	Field drainage	3/23/2018	1150	2	5.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0	U	1.0 U	1.0 U
Bobby Morris	Field drainage	4/7/2018	0850	1	5.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0	U	1.0 U	1.0 U
Bobby Morris	Field drainage	4/7/2018	1000	2	5.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0	U	1.0 U	1.0 U
Bobby Morris	Field drainage	4/14/2018	0630	1	5.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0	U	1.0 U	1.0 U
Bobby Morris	Field drainage	4/14/2018	0740	2	5.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0	U	1.0 U	1.0 U
Bobby Morris	Field drainage	2/1/2019	1130	1	--	--	--	--	--	--	--	--	--	--		--	--
Bobby Morris	Field drainage	2/1/2019	1230	2	--	--	--	--	--	--	--	--	--	--		--	--
Miller	Field drainage	3/23/2018	1115	1	5.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0	U	1.0 U	1.0 U
Miller	Field drainage	3/23/2018	1225	2	5.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0	U	1.0 U	1.0 U
Miller	Field drainage	4/7/2018	0930	1	5.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0	U	1.0 U	1.0 U
Miller	Field drainage	4/7/2018	1130	2	5.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0	U	1.0 U	1.0 U
Miller	Field drainage	4/14/2018	0705	1	5.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0	U	1.0 U	1.0 U
Miller	Field drainage	4/14/2018	0820	2	5.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0	U	1.0 U	1.0 U
QC1	Field filter blank	3/8/2018	1500	--	--	--	--	--	--	--	--	--	--	--		--	--
Bobby Infill	SPLP leachate	2/1/2019	0935	--	--	--	--	--	--	--	--	--	--	--		--	--
Miller Infill	SPLP leachate	2/1/2019	1035	--	--	--	--	--	--	--	--	--	--	--		--	--