Eco
Compliance
Corporation

Environmental Scientists, Planners and Consultants

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July 20, 2014

Mr. Todd Meadows
Seattle Parks and Recreation
800 Maynard Avenue South, 3rd Floor
Seattle, Washington 98134

Re: Soil sample results for Duwamish Waterway Park.

Dear Todd:

On Wednesday, July 2, 2014, shallow soil samples were collected from the Duwamish Waterway Park located at 7900 South Elmgrove Street in Seattle. Future plans call for removal of the upper approximate 3 inches of grass/soil to create an approximate 5-foot wide, 600-foot long gravel path within the park (Figure 1). The purpose of this sampling was to characterize this soil for possible chemical contamination.

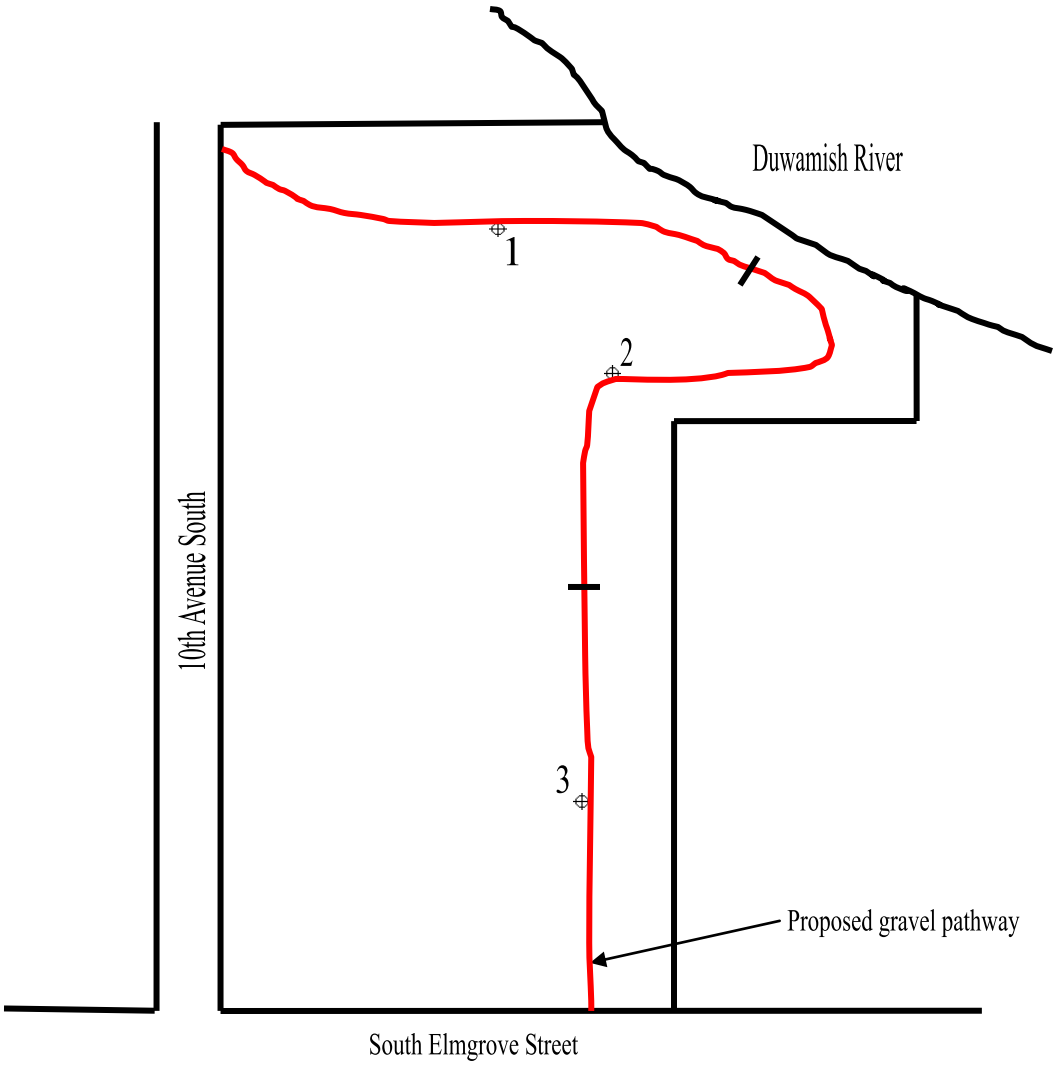
SOIL SAMPLING AND ANALYTICAL RESULTS

The subject path area was divided into 3 approximate 200-foot-long sections (see Figure 1). One soil sample was collected within each section (3 samples total) (sample numbers 1, 2 and 3) (see Figure 1). Each sample was a composite of soil from 3 random locations within each section.

Samples were collected using hand equipment from the upper approximate 3 inches of grass/soil. All samples were analyzed for 8 RCRA (Resource Conservation and Recovery Act) metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver). Sample numbers 1, 2 and 3 were also composited into one container and analyzed for carcinogenic PAHs (cPAHs), and dioxins/furans as 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) (sample 1 – 3 Composite).

Soil analytical results are attached and summarized below in Table 1. Table 1 also lists cleanup standards established by the Washington State Department of Ecology (Ecology) under their MTCA (Model Toxics Control Act) regulations based on unrestricted (residential) land use.

Figure 1. Approximate location of proposed pathway and soil sampling locations. Duwamish Waterway Park. July 2, 2014.



⌖ Composite sample from 3 random locations within this section of the proposed pathway.

N

Not to scale

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Table 1. Shallow soil sampling results. Duwamish Waterway Park, Seattle. July 2, 2014.

Sample Number	Sample Location/Description	Analytical Result (ppm)	MTCA Cleanup Standard (ppm)
1	Northern section of proposed pathway. Composite of soil from the upper approximate 3 inches of grass/soil from 3 separate locations. Silty soil.	**61 arsenic** 70.8 barium 0.6 cadmium 26.3 chromium 89 lead 0.06 mercury ND(5) selenium ND(0.3) silver	**20 arsenic** 16,000 barium 2 cadmium 2,000 chromium[a] 250 lead 2 mercury 400 selenium 400 silver
2	Central section of proposed pathway. Composite of soil from the upper approximate 3 inches of grass/soil from 3 separate locations. Silty soil.	**69 arsenic** 104 barium 0.9 cadmium 42.4 chromium 135 lead 0.09 mercury ND(5) selenium ND(0.3) silver	**20 arsenic** 16,000 barium 2 cadmium 2,000 chromium[a] 250 lead 2 mercury 400 selenium 400 silver
3	Southern section of proposed pathway. Composite of soil from the upper approximate 3 inches of grass/soil from 3 separate locations. Silty soil.	7 arsenic 82 barium 0.7 cadmium 28.6 chromium 32 lead 0.08 mercury ND(5) selenium ND(0.3) silver	20 arsenic 16,000 barium 2 cadmium 2,000 chromium[a] 250 lead 2 mercury 400 selenium 400 silver
1 – 3 Composite	Composite of sample numbers 1, 2 and 3 .	0.027 cPAHs[b] 1.85EE-6 2,3,7,8-TCDD	0.1 cPAHs[c] 1.28EE-5 2,3,7,8-TCDD[d]

ND(5) Not detected at the analytical detection limit of 5 parts-per-million (ppm).

a MTCA Method A cleanup standard based on chromium III.

b Total toxic equivalent concentration of carcinogenic PAHs (benzo[a]anthracene, total benzofluoranthenes, benzo[a]pyrene, chrysene, dibenzo[a,h]anthracene and indeno[1,2,3-cd]pyrene). WAC 173-340-708(8)(e)(ii) and -708(8)(e)(iii).

c MTCA Method A cleanup standard for carcinogenic PAHs based on benzo(a)pyrene. WAC 173-340-708(8)(e)(iii).

d MTCA Method B cleanup standard for dioxins/furans based on 2,3,7,8-TCDD. WAC 173-340-708(8)(d)(ii).

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As indicated in Table 1, arsenic was detected in sample numbers 1 and 2 at concentrations that are above Ecology's MTCA cleanup standard based on unrestricted (residential) land use.

Various other metals were detected in samples 1, 2 and 3, but at concentrations that are below the MTCA cleanup standards.

Carcinogenic PAHs were detected in sample 1 – 3 Composite, but at a concentration that is below the MTCA cleanup standard.

Dioxins/furans were detected in sample 1 – 3 Composite as 2,3,7,8-TCDD, but at a concentration that is below the MTCA cleanup standard.

It was a pleasure assisting you with this sampling project. Please call me if you have any questions.

Sincerely,

ECO COMPLIANCE CORPORATION

Bill Kane

Bill Kane
President
bill@ecocompliance.biz

Attachment

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: 1
SAMPLE

Lab Sample ID: YQ29A
LIMS ID: 14-13092
Matrix: Soil
Data Release Authorized:
Reported: 07/10/14

QC Report No: YQ29-Eco Compliance Corporation
Project: Duwamish Park

Date Sampled: 07/02/14
Date Received: 07/02/14

Percent Total Solids: 94.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	07/03/14	6010C	07/08/14	**7440-38-2**	**Arsenic**	5	**61**	
3050B	07/03/14	6010C	07/08/14	**7440-39-3**	**Barium**	0.3	**70.8**	
3050B	07/03/14	6010C	07/08/14	**7440-43-9**	**Cadmium**	0.2	**0.6**	
3050B	07/03/14	6010C	07/08/14	**7440-47-3**	**Chromium**	0.5	**26.3**	
3050B	07/03/14	6010C	07/08/14	**7439-92-1**	**Lead**	2	**89**	
CLP	07/03/14	7471A	07/09/14	**7439-97-6**	**Mercury**	0.02	**0.06**	
3050B	07/03/14	6010C	07/08/14	7782-49-2	Selenium	5	5	U
3050B	07/03/14	6010C	07/08/14	7440-22-4	Silver	0.3	0.3	U

U-Analyte undetected at given LOQ
LOQ-Limit of Quantitation

FORM-I

YQ29:00020

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ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: 2
SAMPLE

Lab Sample ID: YQ29B
LIMS ID: 14-13093
Matrix: Soil
Data Release Authorized:
Reported: 07/10/14

QC Report No: YQ29-Eco Compliance Corporation
Project: Duwamish Park

Date Sampled: 07/02/14
Date Received: 07/02/14

Percent Total Solids: 95.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	07/03/14	6010C	07/08/14	**7440-38-2**	**Arsenic**	5	**69**	
3050B	07/03/14	6010C	07/08/14	**7440-39-3**	**Barium**	0.3	**104**	
3050B	07/03/14	6010C	07/08/14	**7440-43-9**	**Cadmium**	0.2	**0.9**	
3050B	07/03/14	6010C	07/08/14	**7440-47-3**	**Chromium**	0.5	**42.4**	
3050B	07/03/14	6010C	07/08/14	**7439-92-1**	**Lead**	2	**135**	
CLP	07/03/14	7471A	07/09/14	**7439-97-6**	**Mercury**	0.02	**0.09**	
3050B	07/03/14	6010C	07/08/14	7782-49-2	Selenium	5	5	U
3050B	07/03/14	6010C	07/08/14	7440-22-4	Silver	0.3	0.3	U

U=Analyte undetected at given LOQ
LOQ=Limit of Quantitation

FORM-I

YQ29:00023

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ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: 3**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YQ29C
LIMS ID: 14-13094
Matrix: Soil
Data Release Authorized:
Reported: 07/10/14

QC Report No: YQ29-Eco Compliance Corporation
Project: Duwamish Park

Date Sampled: 07/02/14
Date Received: 07/02/14

Percent Total Solids: 92.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	ug/kg-dry	Q
3050B	07/03/14	6010C	07/08/14	**7440-38-2**	**Arsenic**	5	**7**	
3050B	07/03/14	6010C	07/08/14	**7440-39-3**	**Barium**	0.3	**82.0**	
3050B	07/03/14	6010C	07/08/14	**7440-43-9**	**Cadmium**	0.2	**0.7**	
3050B	07/03/14	6010C	07/08/14	**7440-47-3**	**Chromium**	0.5	**28.6**	
3050B	07/03/14	6010C	07/08/14	**7439-92-1**	**Lead**	2	**32**	
CLP	07/03/14	7471A	07/09/14	**7439-97-6**	**Mercury**	0.02	**0.08**	
3050B	07/03/14	6010C	07/08/14	7782-49-2	Selenium	5	5	U
3050B	07/03/14	6010C	07/08/14	7440-22-4	Silver	0.3	0.3	U

U-Analyte undetected at given LOQ
LOQ-Limit of Quantitation

FORM-I

YQ29:00024

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ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D GC/MS
Page 1 of 1

Sample ID: 1-3 Composite
SAMPLE

Lab Sample ID: YQ29D
LIMS ID: 14-13160
Matrix: Soil
Data Release Authorized: NW
Reported: 07/14/14

QC Report No: YQ29-Eco Compliance Corporation
Project: Duamish Park

Date Sampled: 07/02/14
Date Received: 07/02/14

Date Extracted: 07/07/14
Date Analyzed: 07/11/14 18:58
Instrument/Analyst: NT6/JZ
GPC Cleanup: No
Alumina: No
Silica Gel: No

Sample Amount: 8.43 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 3.00
Percent Moisture: 6.6%

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	180	< 180 U
218-01-9	**Chrysene**	**180**	**200**
50-32-8	Benzo(a)pyrene	180	< 180 U
193-39-5	Indeno(1,2,3-cd)pyrene	180	< 180 U
53-70-3	Dibenz(a,h)anthracene	180	< 180 U
TOTBFA	**Total Benzofluoranthenes**	**180**	**250**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery	
d14-p-Terphenyl	82.7%
2-Fluorobiphenyl	80.2%

FORM I

YQ29:00010

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ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: 1-3 Composite**
Page 1 of 1

Lab Sample ID: YQ29D
LIMS ID: 14-13160
Matrix: Soil
Data Release Authorized:
Reported: 07/18/14

QC Report No: YQ29-Eco Compliance Corporation
Project: Duamish Park
NA
Date Sampled: 07/02/14
Date Received: 07/02/14

Date Extracted: 07/09/14
Date Analyzed: 07/17/14 12:41
Instrument/Analyst: AS1/PK
Acid Cleanup: Yes
Silica-Carbon Cleanup: No

Sample Amount: 10.1 g-dry-wt
Final Extract Volume: 20 uL
Extract Split: 1.00
Silica-Florisil Cleanup: Yes
Dilution Factor: 1.00

Analyte	Ion Ratio	Ratio Limits	EDL	RL	Result
2,3,7,8-TCDD	0.67	0.65-0.89		0.991	1.85

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC): 1.85

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 1.85

Reported in pg/g

YQ29:00018

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Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

ARI Assigned Number: YQ29	Turn-around Requested: Standard	Page: 1 of 1	
ARI Client Company: Eco Compliance	Phone: 425-271-5629	Date: 7-2-14	Ice Present?
Client Contact: Bill Kane		No. of Coolers:	Cooler Temps:
Client Project Name: Duwamish Park			
Client Project #:	Samplers: Bill Kane		

Sample ID	Date	Time	Matrix	No. Containers	8 RCRA Metals	Dioxins + Furans						Notes/Comments
1	7-2-14		soil	2	X	X						
2	|		|	2	X	X						
3	|		|	2	X	X						

Comments/Special Instructions	Relinquished by	Received by	Relinquished by	Received by
Bill to: Mr. Todd Meadows, Seattle Parks + Rec., 800 Maynard Ave S, 3rd Fl., Seattle 98134	(Signature) Bill Kane	(Signature) [signature]	(Signature)	(Signature)
	Printed Name: Bill Kane	Printed Name: Mark D. Harris	Printed Name:	Printed Name:
	Company: Eco Compliance	Company: ARI	Company:	Company:
	Date & Time: 7-2-14, 9:30 AM	Date & Time: 7/2/14 0930	Date & Time	Date & Time

YQ29:00002

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.