

# Addendum

To the July, 2004

## Pierce County Child Use Area Study

**Prepared for:**

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Toxics Cleanup Program  
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**By:**

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# Metro Parks of Tacoma

## Arsenic and Lead in Soils Summary

February 3, 2006  
Revised August 1, 2006

### Overview

ASARCO operated a copper smelter in Ruston, Washington for nearly a century, from 1896 until 1986. That smelter, referred to as the Tacoma Smelter, specialized in the smelting of high-arsenic ores. Smelter plume emissions have settled into soils over much of the Puget Sound basin, especially in parts of King and Pierce Counties. Concerns over smelter emissions of arsenic, lead, and other contaminants has led to numerous studies dating back to the early 1970s.

Between March and September of 2005, the Tacoma-Pierce County Health Department (TPCHD) collected and analyzed soil samples from 18 child use areas (CUAs) that were identified within 10 Metro Parks. The primary objective for sampling soils in CUAs was to identify locations where smelter-related contamination poses the greatest exposure risks to young children. Young children (up to the age of 6) are considered to be at higher risk of exposure because they come into frequent contact with soil, exhibit more mouthing behaviors, and are more biologically sensitive to contaminants. Sampling soil on properties that have been disturbed by development activities can be complex because contaminants can extend to much deeper levels than found in undisturbed soils. Sampling at child use areas was not intended to fully characterize soil contamination at selected properties, or to necessarily identify the maximum concentrations occurring at any depth. The sampling emphasized collection of near-surface soils where soil contact is most likely to occur. For this reason, this study is considered to be a "health screening level" study rather than a Model Toxics Control Act, (MTCA) site characterization study or remedial investigation.

The MTCA Method A Cleanup Standard was used as a means to classify sites that have elevated levels of arsenic and/or lead. Parks with arsenic levels above 20 parts per million (ppm), and lead levels above 250 ppm are considered sites with levels above urban background. Sampling results found that five parks have elevated levels of arsenic and/or lead. These are: Point Defiance Park, Vassault Playfield, Titlow Park, Optimist Park, and Kandle Playfield. Four parks were found with no elevated results, these are Jefferson, Delong, Brown's Point, and Dash Point. Puget Park had one boring with an elevated arsenic result, but the average of all six borings was below 20 ppm. The following pages provide results for each park along with a corresponding map(s) showing location of each boring. There were two samples taken from each boring, soil from 0 to 2 inches, and 2 to 6 inches. Decision Units (DUs) were determined by use, such as ball fields, playgrounds, and open play fields.

Three other Metro Parks were given access but were not sampled. The China Lake Park, and the Centre at Norpoint, was not sampled because no established play areas existed at these locations. And the Heidelberg Athletic Field was found to be outside of the CUA boundary.

**SUMMARY OF FOOTPRINT STUDY RESULTS 2002**

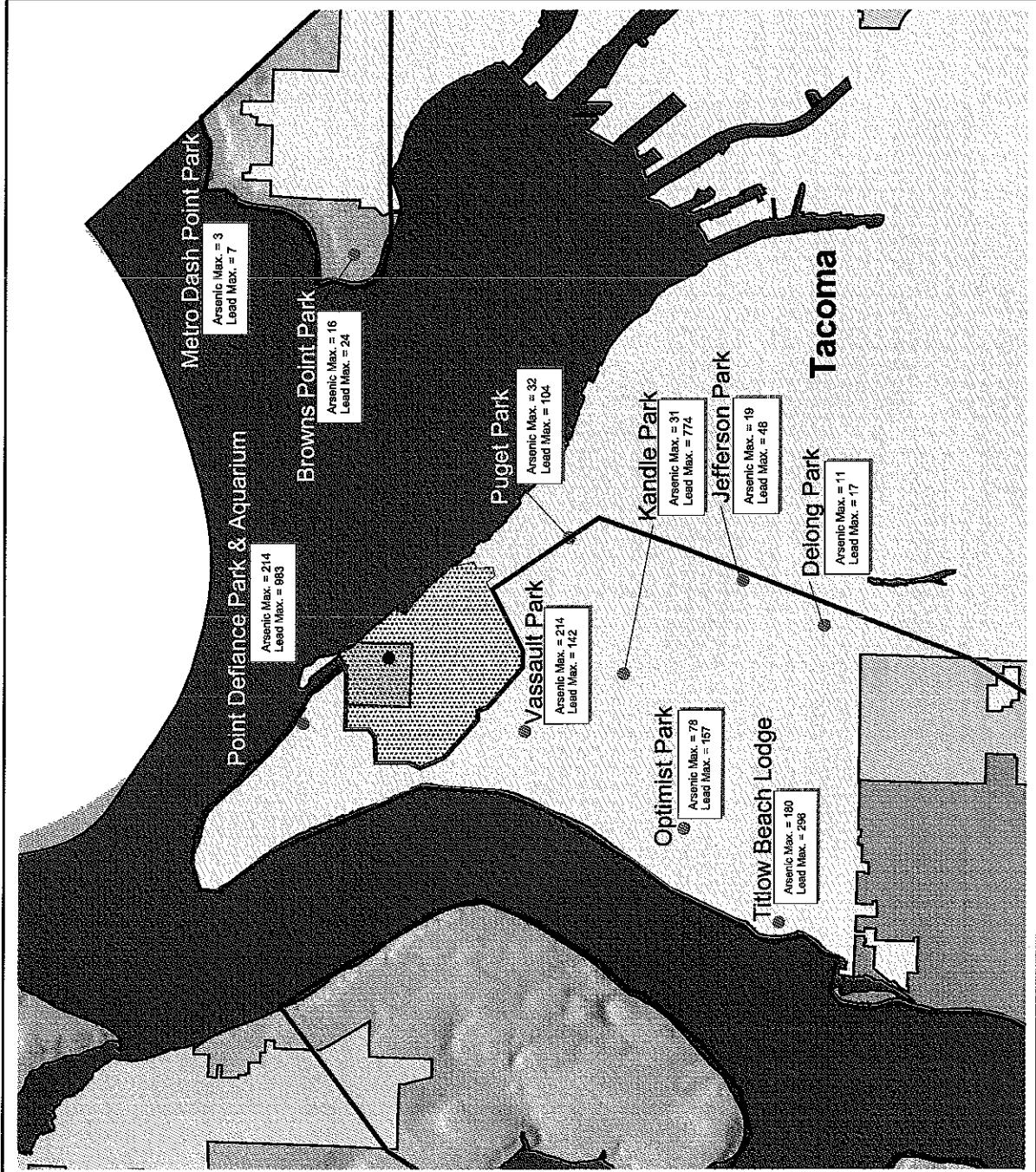
<b>Study</b>	<b>Metals</b>	<b>Highest Found</b>	<b>State Standard</b>
King County Mainland Footprint Studies	Arsenic	260 ppm	20 ppm
	Lead	790 ppm	250 ppm
Vashon-Maury Island Footprint Study	Arsenic	460 ppm	20 ppm
	Lead	1,300 ppm	250 ppm
Pierce County Footprint Studies	Arsenic	1,050 ppm	20 ppm
	Lead	6,670 ppm	250 ppm
Kitsap County Footprint Study	Arsenic	36.9 ppm	20 ppm
	Lead	198 ppm	250 ppm
Thurston County Footprint Study	Arsenic	159 ppm	20 ppm
	Lead	1,110 ppm	250 ppm

Metro Park Names	Decision Unit	Average Arsenic (ppm)	Maximum Arsenic (ppm)	Average Lead (ppm)	Maximum Lead (ppm)	
Point Defiance	Decision Unit 1					
	0 - 2 inches	45.92	214	157.55	983	
	2 - 6 inches	42.06	115	82.7	158	
	Decision Unit 2					
	0 - 2 inches	65.27	128	233.7	483	
	2 - 6 inches	84.76	197	83.99	222	
Vassault	Decision Unit 1					
	0 - 2 inches	65.49	214	54.6	142	
	2 - 6 inches	50.68	96	52.35	122	
	Decision Unit 2					
	0 - 2 inches	35.41	114	36.8	128	
	2 - 6 inches	42.17	115	41.65	110	
	Decision Unit 3					
	0 - 2 inches	4.03	4.57	12.63	19.5	
	2 - 6 inches	7.73	11.1	19.68	24.5	
	Titlow	Decision Unit 1				
		0 - 2 inches	42.3	180	75.87	296
		2 - 6 inches	48.73	151	76.44	206
Decision Unit 2						
0 - 2 inches		12.61	26.8	48.9	100	
2 - 6 inches		23.38	31.3	81.13	181	
Decision Unit 3						
0 - 2 inches		16.38	22.5	32.38	48.2	
2 - 6 inches		26.75	40.7	52.2	81.3	
Optimist		Decision Unit 1				
		0 - 2 inches	25.42	72.9	43.12	157
		2 - 6 inches	28.44	77.6	26.34	60.7

Metro Park Names	Decision Unit	Average Arsenic (ppm)	Maximum Arsenic (ppm)	Average Lead (ppm)	Maximum Lead (ppm)
Kandle	Decision Unit 1				
	0 - 2 inches	18.66	56.1	36.59	98.6
	2 - 6 inches	31.21	63.7	38.82	78
	Decision Unit 2				
	0 - 2 inches	8.91	12.6	14.46	20.3
	2 - 6 inches	9.86	12.7	206.85	774
Puget	Decision Unit 3				
	0 - 2 inches	11.08	30.2	25.87	70.6
	2 - 6 inches	18.22	42.7	27.78	53.7
	Decision Unit 1				
	0 - 2 inches	15.28	32.5	48.08	101
	2 - 6 inches	17.52	31.9	54.55	104
Jefferson	Decision Unit 1				
	0 - 2 inches	10.26	17.6	23.71	48.5
	2 - 6 inches	11.26	18	23.78	36
	Decision Unit 2				
	0 - 2 inches	9.91	19	19.86	38.8
	2 - 6 inches	10.06	19.4	19.74	40.1
Delong	Decision Unit 3				
	0 - 2 inches	7.58	17.5	14.65	33.9
	2 - 6 inches	7.56	12.3	12.45	23
	Decision Unit 1				
	0 - 2 inches	3.48	9.78	9.46	16.2
	2 - 6 inches	3.48	11.2	6.63	17.4
Browns Point	Decision Unit 1				
	0 - 2 inches	5.78	9.5	15.17	24
	2 - 6 inches	6.15	8.9	15.82	23
	Decision Unit 1				
	0 - 2 inches	2.6	2.8	3.55	6.9
	2 - 6 inches	2.5	2.6	3.23	6
Dash Point	Decision Unit 1				
	0 - 2 inches	2.6	2.8	3.55	6.9
	2 - 6 inches	2.5	2.6	3.23	6
	Decision Unit 1				
	0 - 2 inches	2.6	2.8	3.55	6.9
	2 - 6 inches	2.5	2.6	3.23	6

# Metro Parks Arsenic and Lead Soil Results

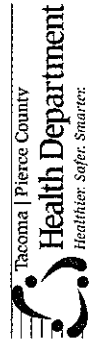
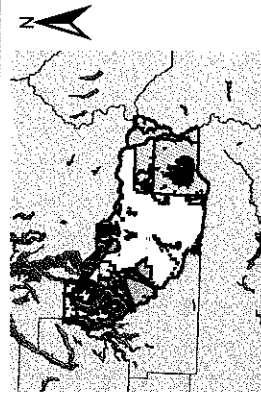
Taken from March thru September, 2005



## MAP LEGEND

- Asarco Stack Location
- ▨ Asarco Study Area
- Child Use Area Boundary
- ⊙ Parks

Scale 1:83427



8:05 Feb 6, 2006



414 Point Defiance Park, 5400 N. Pearl Street

**Arsenic Results**

Boring	Decision Unit 1		Decision Unit 2	
	0-2"	2-6"	0-2"	2-6"
1	71.30	34.20	82.30	124.00
2	5.18	11.30	128.00	24.90
3	6.54	23.40	23.00	39.80
4	15.50	15.60	50.60	75.20
5	12.90	23.00	84.50	105.00
6	24.20	59.90	51.70	197.00
7	17.70	54.10	36.80	27.40
8	214.00	115.00		
Average	45.92	42.06	65.27	84.76
Max	214.00	115.00	128.00	197.00
Min	5.18	11.30	23.00	24.90

**Lead Results**

Boring	Decision Unit 1		Decision Unit 2	
	0-2"	2-6"	0-2"	2-6"
1	64.70	29.10	420.00	75.10
2	20.50	63.90	197.00	34.20
3	26.20	61.40	28.90	45.80
4	48.10	54.70	209.00	74.30
5	31.60	49.50	483.00	106.00
6	42.70	103.00	181.00	222.00
7	43.60	158.00	117.00	30.50
8	983.00	142.00		
Average	157.55	82.70	233.70	83.99
Max	983.00	158.00	483.00	222.00
Min	20.50	29.10	28.90	30.50



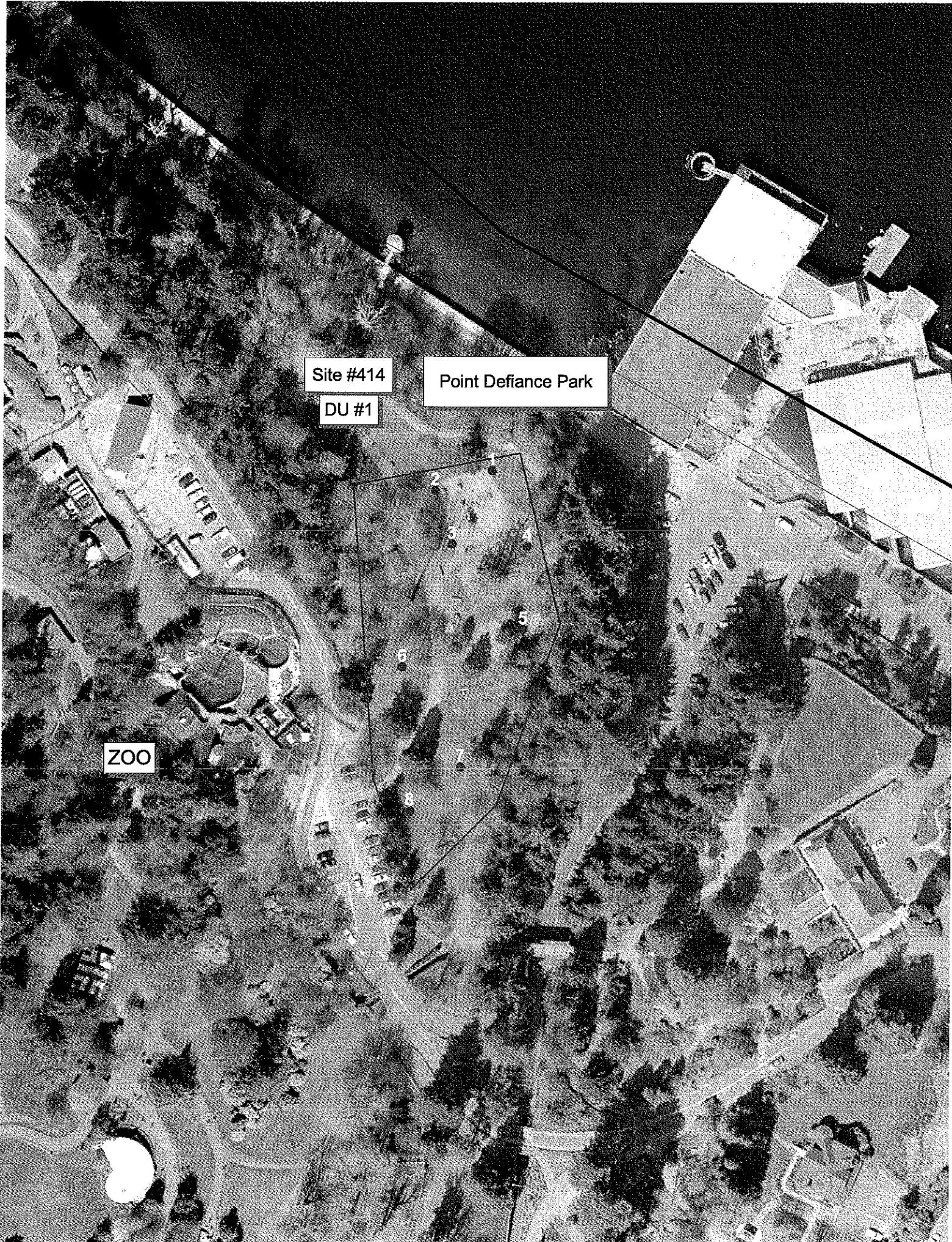


Point Defiance Park

Never Never Land Playground

Playground North of Zoo





Site #414

DU #1

Point Defiance Park

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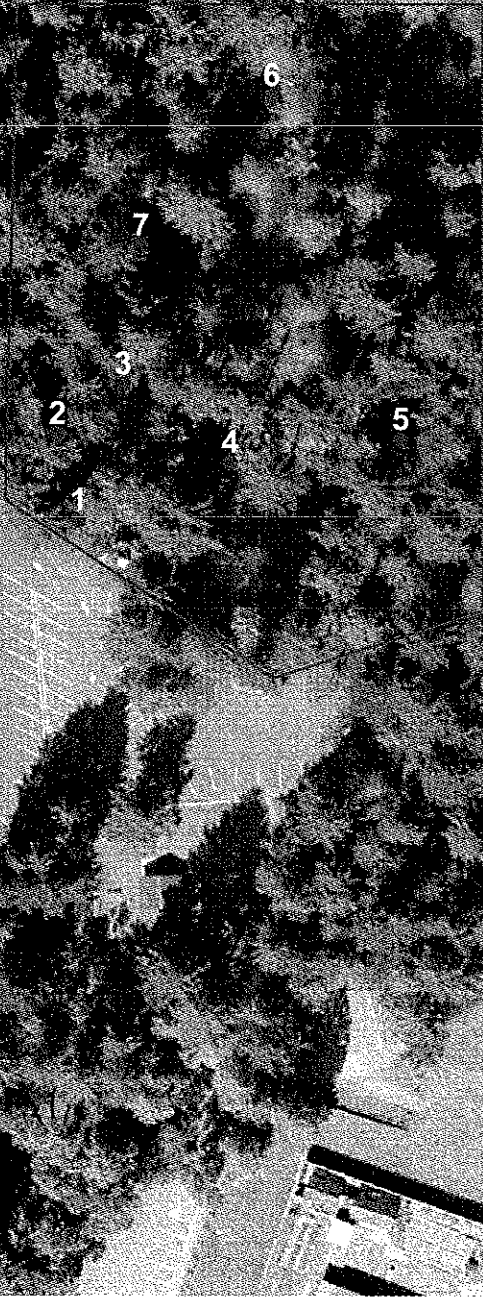
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Site #414

DU #2

Point Defiance Park, Never Never Land Play Area



413 Vassault Playfield, 6200 N. 37th Street

**Arsenic Results**

Boring	Decision Unit 1		Decision Unit 2		Decision Unit 3	
	0-2"	2-6"	0-2"	2-6"	0-2"	2-6"
1	6.73	63.80	14.50	56.50	2.90	11.10
2	5.11	23.20	9.41	12.20	4.57	10.70
3	14.60	16.90	4.79	4.62	4.27	4.56
4	12.50	31.00	33.70	115.00	4.39	4.57
5	214.00	73.20	86.40	37.70		
6	140.00	96.00	114.00	65.80		
7			10.70	25.90		
8			9.74	19.60		
Average	65.49	50.68	35.41	42.17	4.03	7.73
Max	214.00	96.00	114.00	115.00	4.57	11.10
Min	5.11	16.90	4.79	4.62	2.90	4.56

**Lead Results**

Boring	Decision Unit 1		Decision Unit 2		Decision Unit 3	
	0-2"	2-6"	0-2"	2-6"	0-2"	2-6"
1	7.41	59.50	12.90	58.80	5.15	24.50
2	5.38	27.30	9.25	7.79	8.46	16.70
3	15.80	12.50	4.61	4.14	17.40	19.40
4	15.00	18.40	48.30	110.00	19.50	18.10
5	142.00	74.40	70.20	18.30		
6	142.00	122.00	128.00	89.80		
7			10.10	29.40		
8			11.00	15.00		
Average	54.60	52.35	36.80	41.65	12.63	19.68
Max	142.00	122.00	128.00	110.00	19.50	24.50
Min	5.38	12.50	4.61	4.14	5.15	16.70





VASSAULT PARK

DU #3

DU #2

DU #1

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2

416 Titlow Park, 8355 6th Avenue

**Arsenic Results**

Boring	Decision Unit 1		Decision Unit 2		Decision Unit 3	
	0-2"	2-6"	0-2"	2-6"	0-2"	2-6"
1	39.60	36.60	2.82	25.10	19.20	29.90
2	9.24	29.30	5.03	31.30	12.70	27.90
3	4.02	27.80	15.80	11.20	11.10	8.48
4	42.30	151.00	26.80	25.90	22.50	40.70
5	36.70	17.20				
6	180.00	84.60				
7	24.80	33.40				
8	1.72	9.90				
Average	42.30	48.73	12.61	23.38	16.38	26.75
Max	180.00	151.00	26.80	31.30	22.50	40.70
Min	1.72	9.90	2.82	11.20	11.10	8.48

**Lead Results**

Boring	Decision Unit 1		Decision Unit 2		Decision Unit 3	
	0-2"	2-6"	0-2"	2-6"	0-2"	2-6"
1	78.40	69.10	10.60	40.50	48.20	81.30
2	15.10	42.60	17.30	181.00	28.30	48.30
3	5.63	48.00	100.00	54.30	14.60	14.00
4	67.20	206.00	67.70	48.70	38.40	65.20
5	89.50	28.30				
6	296.00	124.00				
7	53.60	55.20				
8	1.54	38.30				
Average	75.87	76.44	48.90	81.13	32.38	52.20
Max	296.00	206.00	100.00	181.00	48.20	81.30
Min	1.54	28.30	10.60	40.50	14.60	14.00





DU #3

TITLOW BEACH LODGE & PUBLIC POOL

DU #2

DU #1

435 Optimst Park, 1300 N. Harmon

**Arsenic Results**

Boring	Decision Unit 1	
	0-2"	2-6"
1	5.70	5.31
2	72.90	58.60
3	7.89	5.34
4	54.10	77.60
5	5.64	6.17
6	6.30	17.60
Average	25.42	28.44
Max	72.90	77.60
Min	5.64	5.31

**Lead Results**

Boring	Decision Unit 1	
	0-2"	2-6"
1	20.40	11.60
2	157.00	58.50
3	7.36	4.66
4	59.60	60.70
5	5.85	7.35
6	8.53	15.20
Average	43.12	26.34
Max	157.00	60.70
Min	5.85	4.66





OPTIMIST PARK

DU #1

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419 Kandle Playfield, 2323 N. Shirley

**Arsenic Results**

Boring	Decision Unit 1		Decision Unit 2		Decision Unit 3	
	0-2"	2-6"	0-2"	2-6"	0-2"	2-6"
1	5.66	25.80	12.60	12.70	30.20	42.70
2	4.89	8.93	6.56	8.19	3.71	15.10
3	3.96	13.10	4.56	7.04	3.19	5.97
4	6.06	18.90	11.90	11.50	7.22	9.09
5	35.30	56.80				
6	56.10	63.70				
Average	18.66	31.21	8.91	9.86	11.08	18.22
Max	56.10	63.70	12.60	12.70	30.20	42.70
Min	3.96	8.93	4.56	7.04	3.19	5.97

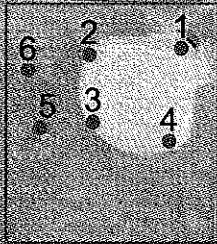
**Lead Results**

Boring	Decision Unit 1		Decision Unit 2		Decision Unit 3	
	0-2"	2-6"	0-2"	2-6"	0-2"	2-6"
1	7.05	42.70	20.30	21.60	70.60	53.70
2	5.70	10.80	12.20	13.50	5.37	26.70
3	3.65	12.00	7.45	774.00	15.00	15.80
4	6.53	23.00	17.90	18.30	12.50	14.90
5	98.00	78.00				
6	98.60	66.40				
Average	36.59	38.82	14.46	206.85	25.87	27.78
Max	98.60	78.00	20.30	774.00	70.60	53.70
Min	3.65	10.80	7.45	13.50	5.37	14.90



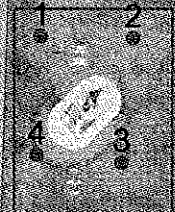


DU #1

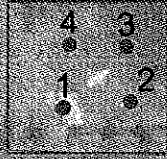


KANDLE PARK

DU #3



DU #2



MOUNT

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415 Puget Park, 3700 N. 31st Street

**Arsenic Results**

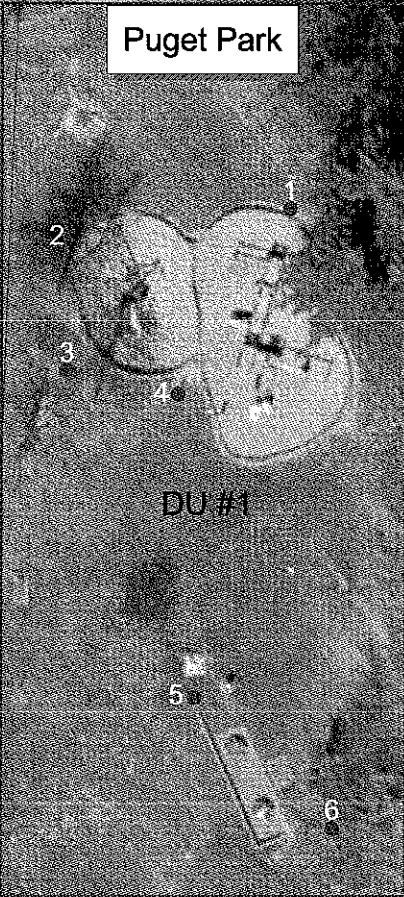
Boring	Decision Unit 1	
	0-2"	2-6"
1	10.40	9.91
2	22.80	23.80
3	3.99	22.70
4	5.67	5.13
5	16.30	11.70
6	32.50	31.90
Average	15.28	17.52
Max	32.50	31.90
Min	3.99	5.13

**Lead Results**

Boring	Decision Unit 1	
	0-2"	2-6"
1	22.20	20.50
2	101.00	104.00
3	12.00	65.80
4	18.10	14.00
5	39.80	31.70
6	95.40	91.30
Average	48.08	54.55
Max	101.00	104.00
Min	12.00	14.00



Puget Park



DU #1

440 Jefferson Park, 3920 N. 8th Street

**Arsenic Results**

Boring	Decision Unit 1		Decision Unit 2		Decision Unit 3	
	0-2"	2-6"	0-2"	2-6"	0-2"	2-6"
1	17.60	18.00	3.61	2.57	3.20	4.26
2	15.40	16.80	6.31	8.40	3.06	2.94
3	4.60	6.52	5.63	4.84	2.84	4.84
4	9.06	11.60	6.10	7.63	3.06	4.57
5	10.30	8.16	11.10	11.60	8.14	9.99
6	4.60	6.47	19.00	13.30	11.80	10.60
7			16.90	19.40	11.00	12.30
8			10.60	12.70	17.50	11.00
Average	10.26	11.26	9.91	10.06	7.58	7.56
Max	17.60	18.00	19.00	19.40	17.50	12.30
Min	4.60	6.47	3.61	2.57	2.84	2.94

**Lead Results**

Boring	Decision Unit 1		Decision Unit 2		Decision Unit 3	
	0-2"	2-6"	0-2"	2-6"	0-2"	2-6"
1	48.50	36.00	7.04	4.04	4.34	4.61
2	30.10	32.90	12.00	18.80	3.14	3.33
3	9.44	14.10	11.70	7.10	2.80	5.82
4	18.40	25.50	10.30	14.10	2.90	5.96
5	24.40	16.50	22.90	24.00	17.40	18.60
6	11.40	17.70	38.80	24.50	30.50	20.90
7			33.90	40.10	22.20	23.00
8			22.20	25.30	33.90	17.40
Average	23.71	23.78	19.86	19.74	14.65	12.45
Max	48.50	36.00	38.80	40.10	33.90	23.00
Min	9.44	14.10	7.04	4.04	2.80	3.33



JEFFERSON PARK COMMUNITY CENTER

DU #1

DU #3

DU #2



437 Delong Park, 4700 S. 12th Street

**Arsenic Results**

Boring	Decision Unit 1	
	0-2"	2-6"
1	1.76	1.35
2	2.57	1.46
3	2.44	1.59
4	2.19	1.53
5	2.84	3.40
6	3.50	4.65
7	9.78	11.20
8	2.78	2.65
Average	3.48	3.48
Max	9.78	11.20
Min	1.76	1.35

**Lead Results**

Boring	Decision Unit 1	
	0-2"	2-6"
1	3.55	1.45
2	10.90	2.83
3	7.22	2.58
4	7.08	2.17
5	14.40	9.47
6	11.20	11.90
7	16.20	17.40
8	5.12	5.25
Average	9.46	6.63
Max	16.20	17.40
Min	3.55	1.45





DELONG PARK

DELONG ELEMENTARY SCHOOL

DU #1

Wetland Reclamation Area

6 3 2  
5 4 1  
7 8

1 3 4  
2 5 6

2 1  
4 3

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7  
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426 Brown's Point Park, 401 Hi-Ab-La Place N.E.

**Arsenic Results**

Boring	Decision Unit 1	
	0-2"	2-6"
1	7.20	7.20
2	2.20	2.80
3	7.10	8.00
4	4.30	5.20
5	9.50	8.90
6	4.40	4.80
Average	5.78	6.15
Max	9.50	8.90
Min	2.20	2.80

**Lead Results**

Boring	Decision Unit 1	
	0-2"	2-6"
1	24.00	23.00
2	4.80	5.60
3	17.00	19.00
4	7.20	9.30
5	18.00	16.00
6	20.00	22.00
Average	15.17	15.82
Max	24.00	23.00
Min	4.80	5.60



Browns Point Park

DU #1

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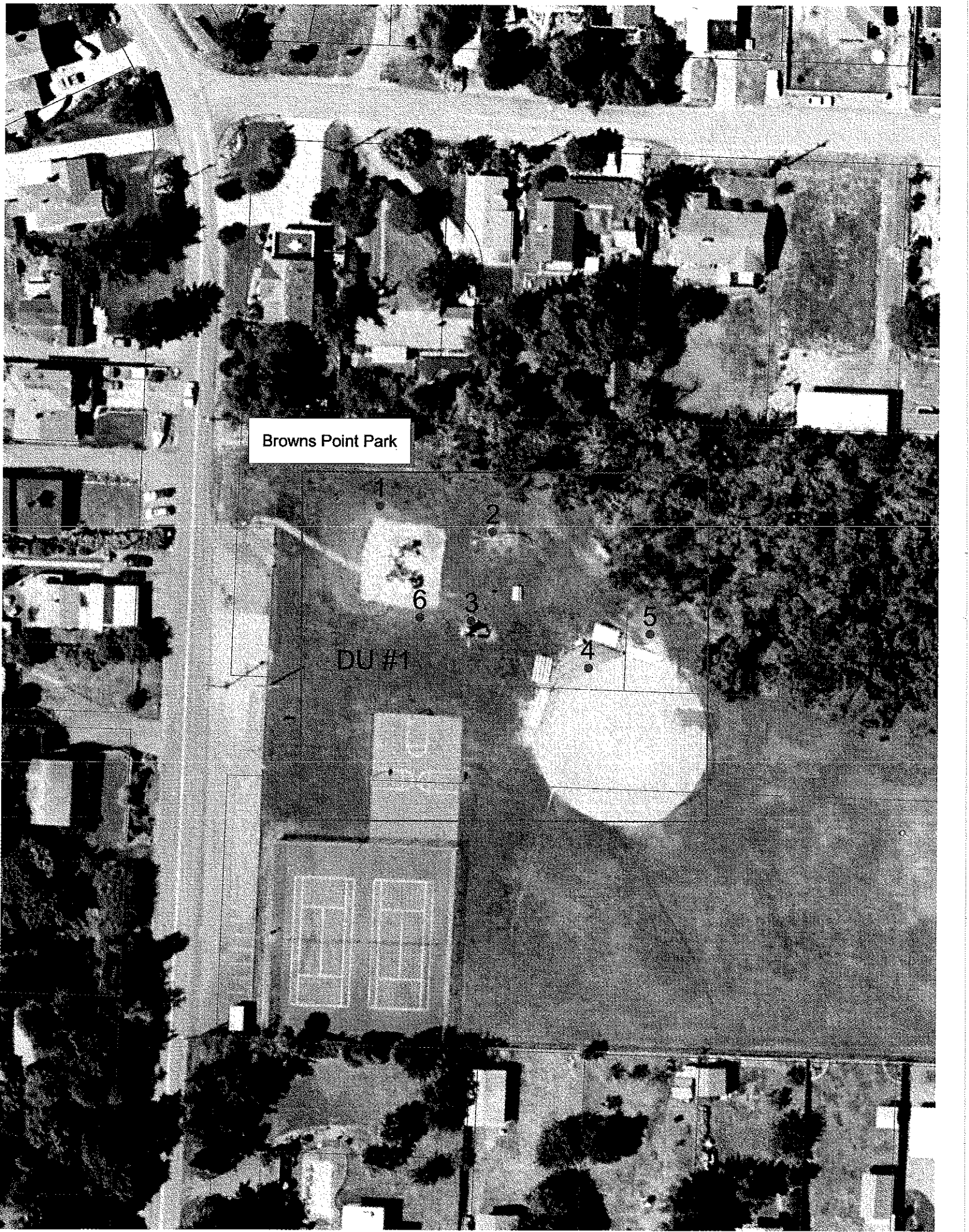
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412 Dash Point Park, 1425 Beach Drive N.E.

**Arsenic Results**

Boring	Decision Unit 1	
	0-2"	2-6"
1	2.70	ND
2	2.80	ND
3	ND	2.40
4	2.30	2.60
Average	2.60	2.50
Max	2.80	2.60
Min	2.30	2.40

**Lead Results**

Boring	Decision Unit 1	
	0-2"	2-6"
1	6.90	6.00
2	2.40	2.20
3	2.20	2.00
4	2.70	2.70
Average	3.55	3.23
Max	6.90	6.00
Min	2.20	2.00



Dash Point Park

