

ADDENDUM TO GROUNDWATER MONITORING PLAN

CAPITAL INDUSTRIES, INC.

5801 3rd AVENUE SOUTH

SEATTLE, WASHINGTON

AGREED ORDER NO. DE 5348

Submitted by:

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Issaquah, Washington 98027

Farallon PN: 457-004

For:

Mr. Ron Taylor

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5801 3rd Avenue South

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December 30, 2010

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1.0 INTRODUCTION

Farallon Consulting, L.L.C. (Farallon) has prepared this Addendum to the Groundwater Monitoring Plan (Addendum) on behalf of Capital Industries, Inc. (Capital) for the groundwater monitoring program to be conducted in 2011 for the Remedial Investigation (RI) at the Capital Area of Investigation (Figure 1). This Addendum amends the scope of work in the *Groundwater Monitoring Plan, Capital Industries, Inc., 5801 3rd Avenue South, Seattle, Washington* dated May 19, 2010, prepared by Farallon (Groundwater Monitoring Plan), in accordance with the requirements of Section 350 of Chapter 173-340 of the Washington Administrative Code (WAC 173-340-350) and in accordance with Exhibit A of Agreed Order No. DE 5348 entered into by Capital and the Washington State Department of Ecology (Ecology) on January 24, 2008 (Agreed Order). This Addendum provides a schedule of groundwater monitoring activities and a brief discussion of the groundwater monitoring protocols to be conducted in 2011. Groundwater monitoring protocols and procedures will be conducted in accordance with the Groundwater Monitoring Plan.

Background information pertaining to the Capital Area of Investigation (Figure 2), adjacent properties land use, environmental setting, hydrogeology, and previous investigations is presented in the *Remedial Investigation Work Plan, Capital Industries, Inc., 5801 Third Avenue South, Seattle, Washington* dated September 16, 2008 (RI Work Plan) (Farallon 2008a). Historical and background data for the Capital Property, Philip Service Corporation (PSC) facility, Art Brass Plating (ABP) facility, and Blaser Die Casting (BDC) facility are discussed in detail in both the *Data Summary Report, West of 4th Groundwater Investigation Area, Seattle, Washington* dated January 2008 (Farallon et al. 2008) and the RI Work Plan.

1.1 OBJECTIVES

The objectives of groundwater monitoring have been determined based on the data objectives for the RI under WAC 173-340-350. Data objectives include determining the nature and extent of concentrations of constituents of concern (COCs) in groundwater above the regulatory cleanup levels, identifying sources of COCs to groundwater, and collecting sufficient information to evaluate and select technically feasible cleanup alternatives.

The data objectives for groundwater monitoring for the RI are to:

- Determine the groundwater flow direction, horizontal and vertical gradients, seasonal impacts, and tidal influence from the Duwamish Waterway;
- Define and determine the nature and extent of concentrations of the COCs that exceed regulatory cleanup levels applicable to the Capital RI;
- Determine the correlation between concentrations of COCs detected in reconnaissance groundwater samples collected from reconnaissance borings (Farallon 2009) with concentrations of COCs detected in groundwater samples collected from monitoring wells;
- Evaluate the analytical results that will meet the Data Quality Objectives (DQOs) for evaluation and selection of technically feasible cleanup alternatives;
- Determine seasonal impacts on groundwater flow directions, horizontal and vertical gradients, and on the nature and extent of concentrations of COCs in groundwater over four consecutive quarters;
- Identify trends, if any, in concentrations of COCs in groundwater over four consecutive quarters of groundwater monitoring;
- Define the boundaries of the “Capital Site” in accordance with the definition of WAC 173-240-200 based on the nature and extent of the COCs in groundwater that exceed the cleanup levels;
- Collect sufficient groundwater geochemistry data to support the evaluation of natural attenuation; and
- Analyze groundwater samples collected from monitoring wells in the Water Table Zone to meet the requirements of the Capital Vapor Intrusion (VI) Assessment program, as defined in the *Vapor Intrusion Assessment Work Plan, Capital Industries, Inc., 5801 Third Avenue South, Seattle, Washington* dated September 16, 2008 (VI Assessment Work Plan) (Farallon 2008b) and in Section 3, Vapor Intrusion Assessment Requirements, below.

Four consecutive quarters of groundwater monitoring have been completed at the Capital Area of Investigation since March 2010. The groundwater quality data collected for the RI have provided adequate information to meet the DQOs defined for the RI. Since not all of the monitoring wells were sampled in March 2010 and there is a technical benefit for conducting an out-of-scope fifth quarter of groundwater monitoring, Capital will conduct a fifth quarter of groundwater monitoring from all of the monitoring wells located within the Capital Area of Investigation in March 2011 even though this is not within the approved and agreed to scope of work.

1.2 REPORT ORGANIZATION

The Addendum has been organized into the following sections:

- **Section 1—Introduction.** This section presents a brief introduction and the objectives of Capital groundwater monitoring.
- **Section 2—Groundwater Monitoring.** This section describes the procedures and protocols associated with groundwater monitoring within the Capital Area of Investigation.
- **Section 3—Vapor Intrusion Assessment Requirements.** This section presents the requirements associated with vapor intrusion based on the results of groundwater monitoring.
- **Section 4—Reporting.** The section discusses the reporting requirements associated with groundwater monitoring.
- **Section 5—Bibliography.** This section lists the materials used in preparation of the Addendum.

2.0 GROUNDWATER MONITORING

Locations of the monitoring wells included in the Capital monitoring well network are presented on Figure 3. Specific depths and well-screen intervals are presented in Table 1. Groundwater monitoring will be conducted in accordance with the Sampling and Analysis Plan (Appendix A of the Groundwater Monitoring Plan) and the Quality Assurance Project Plan (Appendix B of the Groundwater Monitoring Plan).

2.1 GROUNDWATER MONITORING WELL NETWORK

The Capital monitoring well network consists of 40 monitoring wells that have been installed by Capital and/or PSC. The monitoring well locations were selected to assess groundwater in the three water-bearing zones defined for the Capital Area of Investigation (Farallon 2008a). The water-bearing zones are defined as:

- The Water Table Zone, the water-bearing zone from first-encountered groundwater to approximately 20 feet below ground surface (bgs);
- The Shallow Zone, the water-bearing zone from 20 to 40 feet bgs; and
- The Intermediate Zone, the upper portion of the intermediate water-bearing zone between 40 and approximately 70 feet bgs.

2.2 GROUNDWATER MONITORING PROGRAM SCHEDULE

The groundwater monitoring program for 2011 includes one quarter of groundwater monitoring scheduled for March 2011. Groundwater monitoring and sampling will be conducted in accordance with SOP No. FAR-103 as described in Attachment 1 of Appendix A of the Groundwater Monitoring Plan.

2.3 LABORATORY ANALYSES

Groundwater samples collected in the March 2011 groundwater monitoring event will be analyzed for HVOCs. Concentrations of 1,4-dioxane have been detected above the laboratory detection limits only in groundwater samples collected from monitoring wells CI-8-40, CI-7-40, and CI-7-60. Therefore groundwater samples collected from monitoring wells CI-7-40, CI-8-40,

CI-9-40 (located down-gradient of the edge of the 1,4-dioxane plume), CI-7-60, CI-8-60, and CI-9-60 will be analyzed for 1,4-dioxane based on the analytical results of groundwater samples collected in 2010. Table summarizes the laboratory analyses by monitoring well for the March 2011 groundwater monitoring event. The analytical methods, sampling containers, and number of samples are described in the Sampling and Analysis Plan (Appendix A of the Groundwater Monitoring Plan).

2.4 FIELD DOCUMENTATION

Field documentation will be prepared in accordance with the forms provided in Attachment 2 of Appendix A of the Groundwater Monitoring Plan. Other documentation will be prepared in accordance with the RI Work Plan.

2.5 INVESTIGATION-DERIVED WASTE MANAGEMENT

Purge water removed from monitoring wells will be collected and returned to the Capital Property where it will be stored in sealed and labeled 55-gallon drums and secured pending waste profiling results. The purge water will be consolidated for disposal. Disposable sampling and health and safety equipment will be discarded in appropriate waste dumpsters.

3.0 VAPOR INTRUSION ASSESSMENT REQUIREMENTS

Groundwater monitoring results from the March 2011 groundwater monitoring event will be evaluated in accordance with the Capital VI Assessment Work Plan (Farallon 2008b).

4.0 REPORTING

Results of the 2011 groundwater monitoring event will be provided in a quarterly Progress Report prepared in accordance with the requirements of the RI Work Plan. The results of the 2010 and 2011 groundwater monitoring events completed for the RI will be included in the RI Report.

5.0 BIBLIOGRAPHY

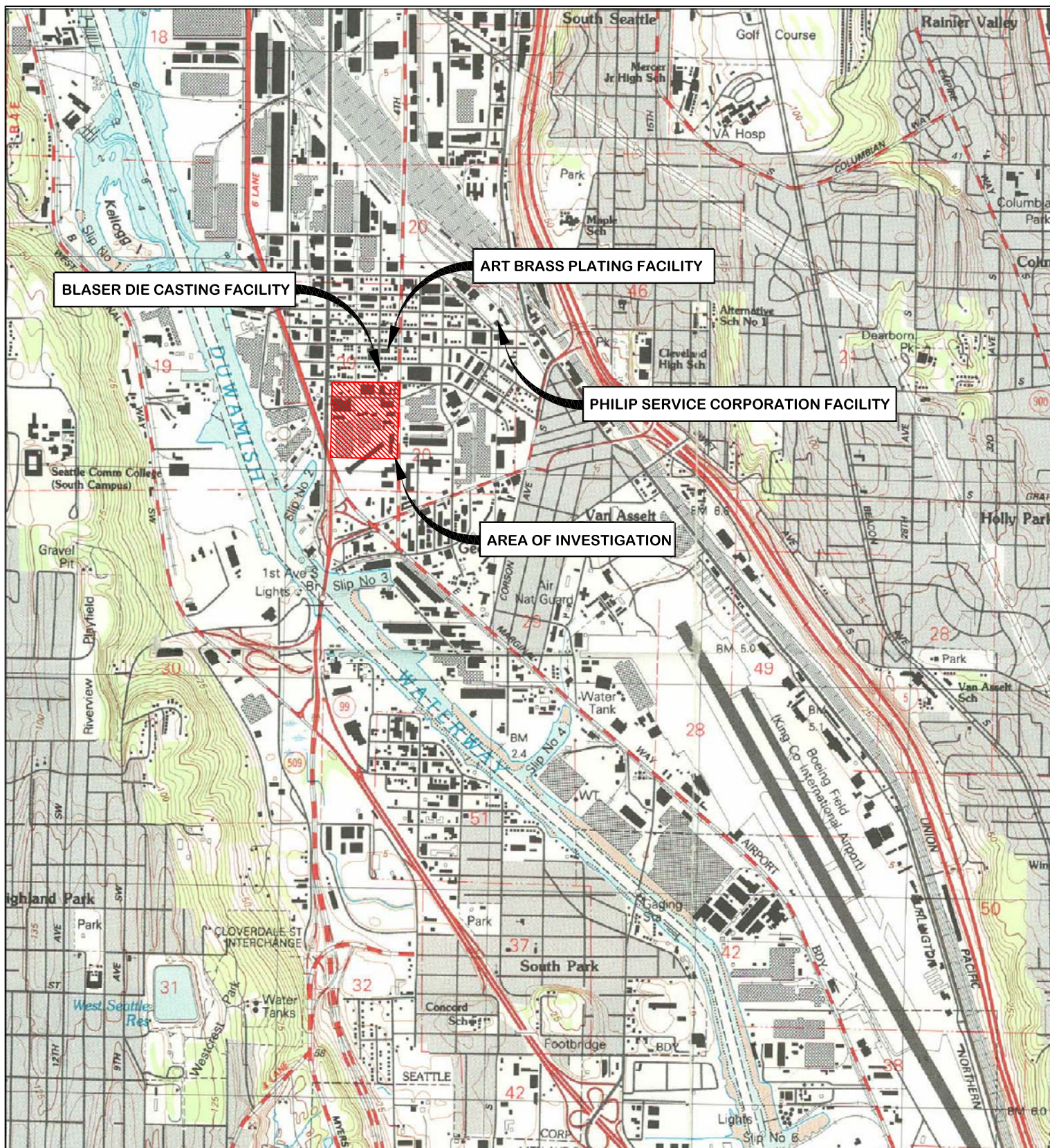
- Farallon Consulting, L.L.C. (Farallon). 2008a. *Remedial Investigation Work Plan, Capital Industries, Inc., 5801 Third Avenue South, Seattle, Washington*. Prepared for Mr. Ron Taylor, Capital Industries, Inc. September 16.
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- Farallon Consulting, L.L.C., Aspect Consulting, Arrow Environmental, and Pacific Groundwater Group (Farallon et al.). 2008. *Data Summary Report, West of 4th Groundwater Investigation Area, Seattle, Washington*. Prepared for Capital Industries, Art Brass Plating, Blaser Die Casting, and Philip Services Corporation. January.

FIGURES

ADDENDUM TO GROUNDWATER MONITORING PLAN

Capital Industries, Inc.
5801 3rd Avenue South
Seattle, Washington

Farallon PN: 457-004



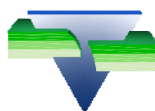
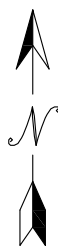
REFERENCE: 7.5 MINUTE USGS QUADRANGLE SOUTH SEATTLE, WASHINGTON. DATED 1983

0 500

APPROXIMATE SCALE IN METERS



WASHINGTON



FARALLON CONSULTING
975 5th Avenue Northwest
Issaquah, WA 98027

FIGURE 1

CAPITAL AREA OF INVESTIGATION
LOCATION MAP
ADDENDUM TO GROUNDWATER MONITORING PLAN
CAPITAL INDUSTRIES, INC.
SEATTLE, WASHINGTON

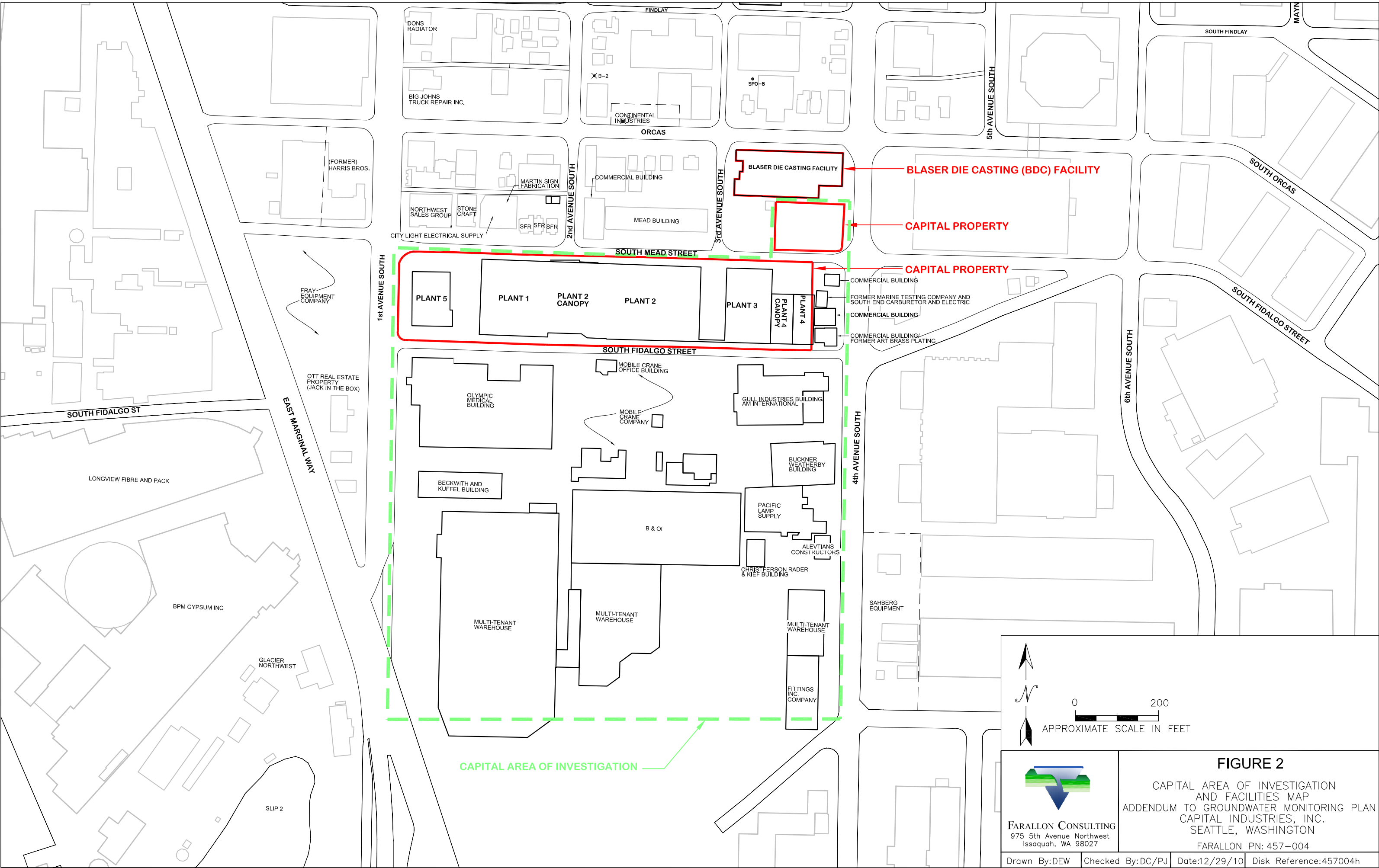
FARALLON PN: 457-004

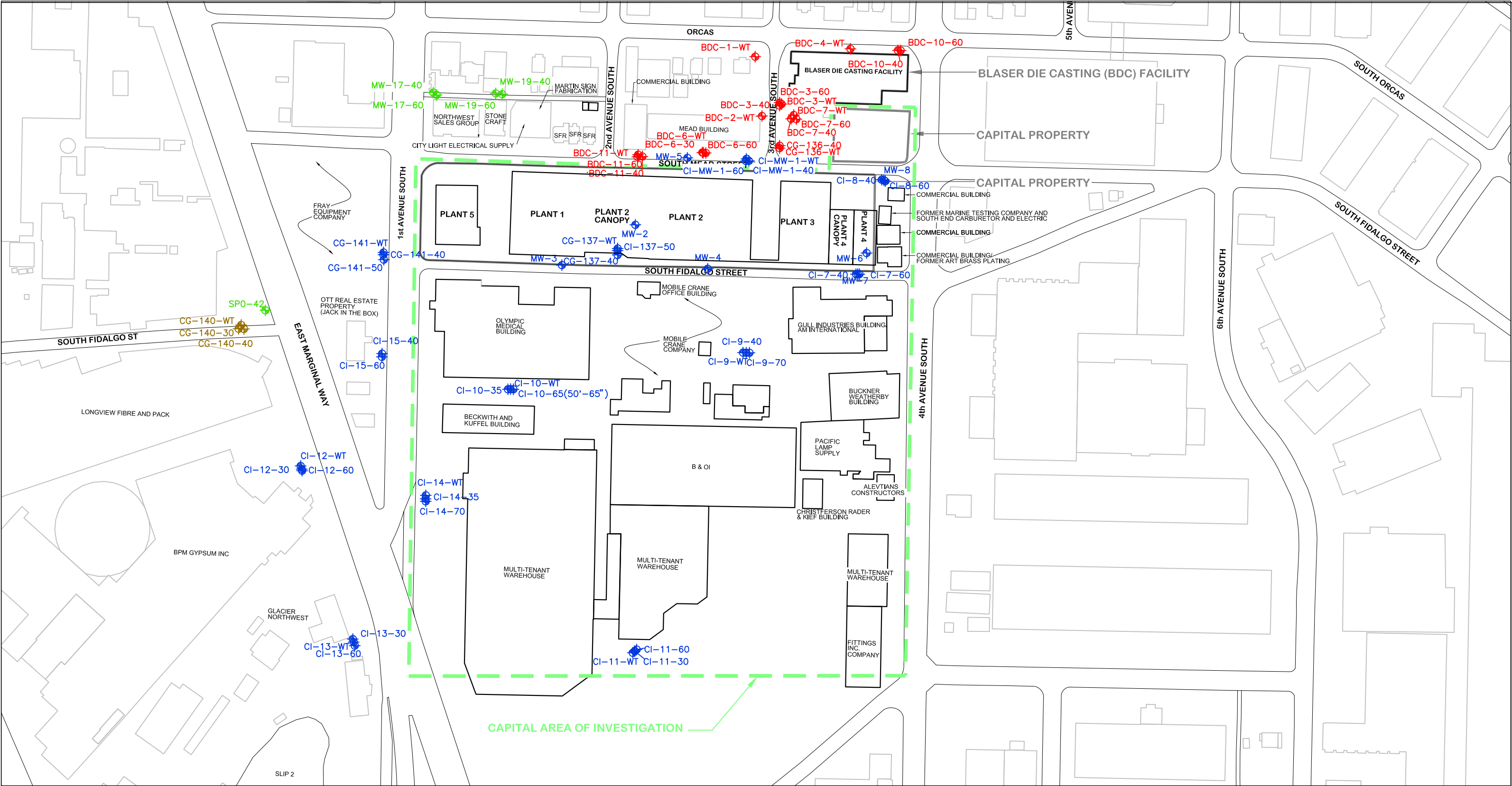
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Checked By: DC

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LEGEND


CAPITAL INDUSTRIES MONITORING WELL

BLASER DIE CASTING BORING MONITORING WELL

ART BRASS PLATING BORING MONITORING WELL

PSC MONITORING WELL

ALL LOCATIONS ARE APPROXIMATE



FARALLON CONSULTING
975 5th Avenue Northwest
Issaquah, WA 98027

FIGURE 3

SITE PLAN SHOWING
MONITORING WELL NETWORK LOCATIONS
ADDENDUM TO GROUNDWATER MONITORING PLAN
CAPITAL INDUSTRIES, INC.,
SEATTLE, WASHINGTON

FARALLON PN: 457-004

Drawn By:DEW

Checked By:DC/PJ

Date:12/29/10

Disk Reference:457004h

TABLES

ADDENDUM TO GROUNDWATER MONITORING PLAN

Capital Industries, Inc.
5801 3rd Avenue South
Seattle, Washington

Farallon PN: 457-004

Table 1
Groundwater Monitoring Well Network Details
Capital Industries
Seattle, Washington
Farallon PN: 457-004

Monitoring Well or Well Cluster	Installed By	Location Name ¹	Total Depth (feet bgs)	Screen Interval (feet bgs)	Screen Length (feet)	Aquifer Zone ¹
CI-1	Capital	MW-1	20	10 to 20	10	Water Table
	Blaser	CI-MW-1-40	40	30 to 40	10	Shallow
	Blaser	CI-MW-1-60	60	50 to 60	10	Intermediate
MW-2	Capital	MW-2	20	10 to 20	10	Water Table
MW-3	Capital	MW-3	20	10 to 20	10	Water Table
MW-4	Capital	MW-4	20	10 to 20	10	Water Table
MW-5	Capital	MW-5	20	10 to 20	10	Water Table
MW-6	Capital	MW-6	20	10 to 20	10	Water Table
CI-7	Capital	MW-7	20	10 to 20	10	Water Table
	Capital	CI-7-40	40	30 to 40	10	Shallow
	Capital	CI-7-60	60	50 to 60	10	Intermediate
CI-8	Capital	MW-8	20	10 to 20	10	Water Table
	Capital	CI-8-40	40	30 to 40	10	Shallow
	Capital	CI-8-60	60	50 to 60	10	Intermediate
CI-9	Capital	CI-9-WT	20	10 to 20	10	Water Table
	Capital	CI-9-40	40	30 to 40	10	Shallow
	Capital	CI-9-70	70	60 to 70	10	Intermediate
CI-10	Capital	CI-10-WT	20	10 to 20	10	Water Table
	Capital	CI-10-35	35	25 to 35	10	Shallow
	Capital	CI-10-65	65	50 to 65	15	Intermediate
CI-11	Capital	CI-11-WT	20	10 to 20	10	Water Table
	Capital	CI-11-30	30	20 to 30	10	Shallow
	Capital	CI-11-60	60	50 to 60	10	Intermediate
CI-12	Capital	CI-12-WT	20	10 to 20	10	Water Table
	Capital	CI-12-30	30	20 to 30	10	Shallow
	Capital	CI-12-60	60	50 to 60	10	Intermediate
CI-13	Capital	CI-13-WT	20	10 to 20	10	Water Table
	Capital	CI-13-30	30	20 to 30	10	Shallow
	Capital	CI-13-60	60	50 to 60	10	Intermediate
CI-14	Capital	CI-14-WT	20	10 to 20	10	Water Table
	Capital	CI-14-35	35	25 to 35	10	Shallow
	Capital	CI-14-70	70	60 to 70	10	Intermediate
CI-15	Capital	CI-15-40	40	40 to 50	10	Shallow
	Capital	CI-15-60	60	50 to 60	10	Intermediate
CI-137	PSC	CG-137-WT	20	10 to 20	10	Water Table
	PSC	CG-137-40	40	30 to 40	10	Shallow
	Capital	CI-137-50	50	40 to 50	10	Intermediate
CG-141	PSC	CG-141-WT	20	10 to 20	10	Water Table
	PSC	CG-141-40	40	30 to 40	10	Shallow
	PSC	CG-141-50	50	40 to 50	10	Intermediate

NOTES:

¹Aquifer zones are defined as Water Table = approximately 10 to 20 feet below ground surface (bgs),
Shallow = 20 to 40 feet bgs, and Intermediate = 40 to 70 feet bgs.

Blaser = Blaser Die Casting
Capital = Capital Industries, Inc.
PSC = Philip Service Corporation

Table 2
Groundwater Monitoring Analysis Schedule
Capital Industries
Seattle, Washington
Farallon PN: 457-004

Well Identification	Remedial Investigation Period ^{1,2}			
	Quarter 5 - Winter 2011			
	HVOCs ³	1,4-Dioxane ⁴	Redox Metals ⁵	NA Parameters ⁶
Water Table Zone				
MW-2	x			
MW-3	x			
MW-4	x			
MW-5	x			
MW-6	x			
MW-7	x			
MW-8	x			
CI-9-WT	x			
CI-10-WT	x			
CI-11-WT	x			
CI-12-WT	x			
CI-13-WT	x			
CI-14-WT	x			
CG-137-WT	x			
CG-141-WT	x			
CI-MW-1-WT	x			
Shallow Zone				
CI-7-40	x	x		
CI-8-40	x	x		
CI-9-40	x	x		
CI-10-35	x			
CI-11-30	x			
CI-12-30	x			
CI-13-30	x			
CI-14-35	x			
CI-15-40	x			
CI-16-35	x			
CG-137-40	x			
CG-141-40	x			
CI-MW-1-40	x			

Table 2
Groundwater Monitoring Analysis Schedule
Capital Industries
Seattle, Washington
Farallon PN: 457-004

Well Identification	Remedial Investigation Period ^{1,2}			
	Quarter 5 - Winter 2011			
	HVOCs ³	1,4-Dioxane ⁴	Redox Metals ⁵	NA Parameters ⁶
Intermediate Zone				
CI-7-60	X	X		
CI-8-60	X	X		
CI-9-70	X	X		
CI-10-70	X			
CI-11-60	X			
CI-12-60	X			
CI-13-60	X			
CI-14-70	X			
CI-15-60	X			
CI-137-50	X			
CG-141-50	X			
CI-MW-1-60	X	X		

NOTES:

¹The Remedial Investigation period and sampling schedule is based on the anticipated well installation schedule.

²Field parameters will be collected from wells that are sampled for groundwater quality. Parameters will include turbidity, temperature, pH, conductivity, dissolved oxygen, and oxidation-reduction potential.

³HVOCs (halogenated volatile organic compounds) will be analyzed with standard detection limits by U.S. Environmental Protection Agency (EPA) Method 8260B.

⁴1,4-Dioxane will be analyzed by EPA Method 8270C Modified.

⁵Redox metals include ferrous iron, ferric iron, and manganese analyzed by EPA Method 8260B or 6020.

⁶NA Parameters (Natural attenuation parameters) include nitrate, nitrite, and sulfate for analysis by EPA Method 300.0; alkalinity for analysis by EPA Method SM2320B; ethane, ethene, and methane for analysis by EPA Method 8015B; total organic carbon for analysis by EPA Method 415.1; sulfide for analysis by EPA Method 376.1; and chloride for analysis by EPA Method 325.2/325.3/MSA 10-3.

⁷Proposed monitoring well locations for sampling and analysis of redox metals for the fourth quarterly monitoring event are preliminary only. Final sampling and analysis locations will be determined based on the second quarterly groundwater monitoring event. Proposed locations will be discussed with the Washington State Department of Ecology prior to finalizing fourth quarter monitoring locations.