Hilton Seattle Hotel
Cleanup Action Plan
Seattle, Washington

July 18, 2012

Submitted To:
Mr. Zahoor Ahmed
R.C. Hedreen Company
217 Pine Street, Suite 200
Seattle, Washington 98101

By:
Shannon & Wilson, Inc.
400 N 34th Street, Suite 100
Seattle, Washington 98103

21-1-12341-004

TABLE OF CONTENTS

FIGURES

HILTON SEATTLE HOTEL
CLEANUP ACTION PLAN
SEATTLE, WASHINGTON

1.0 INTRODUCTION

This cleanup action plan (CAP) has been prepared to describe proposed groundwater cleanup activities for the Hilton Seattle Hotel in Seattle, Washington (the Hotel). The work will be conducted on behalf of the Hotel to recover free-floating petroleum product to the extent possible from one monitoring well (MW-5) located in the sidewalk right-of-way (ROW) adjacent east of the Hotel. Product recovery will be accomplished using the selected cleanup alternative of a single-phase skimmer pump recovery system.

The CAP describes procedures for installing, operating, maintaining, and decommissioning the product recovery system; disposal of generated waste; follow-up groundwater treatment; and compliance groundwater monitoring. This plan was developed for use in directing the field operations.

2.0 BACKGROUND

The Site is located at 1301 6th Avenue in downtown Seattle, Washington, and occupies the southeast quarter of the city block bounded by Union and University Streets, and Fifth and Sixth Avenues (Figure 1). The Hotel was built over a parking structure in approximately 1970. Two 2,000-gallon gasoline underground storage tanks (USTs) were installed along the eastern property line during construction of the Hotel. Approximately two years after installation, it was reported that one of the two USTs developed a leak and was replaced. The two tanks were abandoned in place in 1985 by filling with cement slurry. Although a service station occupied the main level of the parking structure that occupied the site prior to the Hotel's construction, no other fuel tanks are known to be present beneath the property.

In the early 1990s, gasoline vapors were encountered in an excavation to extend the Hotel's elevator shaft down to the depth of the pedestrian concourse leading toward Rainier Tower. In 1994, Environmental Associates, Inc. drilled a boring adjacent to the abandoned USTs and confirmed the presence of gasoline-related contamination in soil samples from the boring. In 1997 and 1998, Shannon & Wilson conducted site investigations and data evaluations related to closure of the two former USTs beneath the Hotel. At the time, no soil contamination was detected in borings advanced at the Hotel, but over 1 foot of floating product was observed in the

upgradient well (MW-5) and dissolved gasoline-range petroleum hydrocarbons were detected in groundwater at MW-5 and also at the downgradient wells (MW-2, MW-3, and MW-4).

Because floating product was found upgradient of the abandoned USTs and groundwater flow was interpreted to be to the west-northwest at a relatively steep gradient, the source of the gasoline was attributed to an offsite source. The Shannon & Wilson July 1998 report also assessed risks and found no complete exposure pathways exist at the Hotel. Based on the available site information the Washington State Department of Ecology (Ecology) issued a No Further Action (NFA) letter in October 1998.

In a periodic review conducted in February 2010, Ecology rescinded the NFA, citing the presence of free-floating petroleum product in MW-5 as a risk to environmental health. In response to Ecology's concern, an investigation was conducted by Shannon & Wilson in August 2011 to assess current groundwater conditions at the Hotel. The investigation confirmed the presence of free product in MW-5 and dissolved gasoline-range petroleum hydrocarbons in downgradient wells (MW-2, MW-3, and MW-4). The purpose of this cleanup action is to improve groundwater conditions at the Hotel by removing source free product from MW-5. The removal of free product using a single-phase skimmer pump recovery system was selected as the preferred cleanup action.

3.0 FIELD COORDINATION

Shannon & Wilson will coordinate the fieldwork before and during the cleanup effort. Prior to field activities, the field coordinator will perform the following:

- Obtain necessary street use permits from the Seattle Department of Transportation (SDOT), including establishing temporary no-parking zones from SDOT for the parking and taxi zones adjacent to work area on 6th Avenue.
- Obtain electrical permits for installing a dedicated circuit for the product recovery system.

4.0 HEALTH AND SAFETY

Shannon & Wilson has prepared a site-specific health and safety plan for the project that all field personnel will read and initial to acknowledge the potential job hazards and associated safe job practices prior to their involvement in field activities. Subcontractors to Shannon & Wilson have their own health and safety standard operating procedures that will govern their work. Prior to

the start of each work day, a tailgate safety meeting will be held to identify potential job hazards and to remind personnel to be aware of their surroundings.

5.0 PRODUCT RECOVERY SYSTEM INSTALLATION

Under subcontract to Shannon & Wilson, Clearcreek Contractors of Everett, Washington, will install a product recovery system in MW-5 at the Hotel (Figure 2). System components will include:

- Pneumatic, single-phase skimmer pump
- Adjustable cycle timer to adjust extraction rates
- Oil-less air compressor
- Product recovery tank
- Tank full shut-off sensor
- Leak detection sensor

The pump will be installed in MW-5 and the tubing routed under the sidewalk ROW into the garage as shown in Figures 2 and 3. The skimmer attachment on the pump is capable of tracking water level fluctuations up to 12 inches (Figure 2). The floating skimmer buoy incorporates a density float and an oleophilic/hydrophobic filter which keeps the intake screen at the water/product interface, allowing the system to recover product down to a sheen.

System components in the garage will be protected from potential damage using temporary chain-link fencing and one 3-inch-diameter steel bollard. System installation will meet the requirements of Section 4-5 of the National Fire Protection Association 30 – Flammable and Combustible Liquids Code.

5.1 Water Level and Product Measurements

Prior to system installation, initial water level and product thickness measurements will be collected. A portable electronic oil/water interface indicator will be used to measure the depth to water and product thickness in MW-5. Additionally, a photoionization detector will be used to monitor well headspace for volatile organic compounds during the collection of measurements to assess if efforts are needed to control vapors during subsequent tasks. Water level and product thickness measurements will be recorded in a similar manner throughout the cleanup action to monitor the rate of recovery.

5.2 Installation Procedures

Procedures for installing the product recovery system are briefly described in the steps outlined below:

- Demolish and remove the sidewalk section surrounding MW-5. Remove existing well monument.
- Bore a 2.5-inch-diameter hole into the 12-inch-thick exterior concrete wall and 8-inch cinder block interior wall leading to equipment pad.
- Install 12-inch-square concrete vault box at MW-5.
- Install 2-inch-diameter, schedule 40 polyvinyl chloride (PVC) pipe from concrete vault box to equipment pad. The section of pipe under the stairwell slab will be supported by hangers.
- Fill annular space around PVC pipe at the exterior and interior walls using mastic sealant.
- Restore sidewalk ROW to original conditions.
- Pour 4- by 5-foot concrete equipment pad with a 6-inch-high, 4-inch-thick lip to provide secondary containment. (Allow at least three days for concrete to cure before installing equipment at the pad.)
- Install 3-inch-diameter steel bollard.
- Route electrical power to the equipment pad.
- Install 2-inch-diameter skimmer pump and well cap assembly at MW-5.
- Route air supply and product discharge tubing to equipment pad.
- Install product recovery system components at the equipment pad.
- Connect pump tubing to product recovery system components.
- Bore a 2.5-inch-diameter hole into the 8-inch cinder block wall and install 2-inch-diameter, schedule 40 PVC pipe vent pipe from the recovery tank to the building exterior. Vent pipe will terminate above the breathing zone and will be screened at the end.
- Install a leak detection sensor at the base of the concrete equipment pad.
- Install temporary fencing around equipment pad. Enclosure will have a locked gate.

6.0 PRODUCT RECOERY SYSTEM OPERATION AND MAINTENANCE

6.1 System Startup

The soil formation in the vicinity of MW-5 is comprised of silty, fine sands. After removing product within the well casing and filter pack, it is anticipated that product removal will be maximized at lower pumping rates. During startup, the pump cycle rate will be adjusted in a step-wise fashion as necessary to maintain steady removal of floating product. Optimizing the rate of product recovery is expected to take up to two days.

6.2 System Maintenance

The product recovery system selected does not require extensive maintenance. During the first week after startup, the system will be monitored daily for general performance and the rate of recovery will be adjusted as needed to maximize product removal. After the first week, the system will be monitored on a weekly basis. Maintenance of the system will include:

- Adjusting the pump rate to maximize product removal.
- Performing routine maintenance of system equipment in accordance with manufacturer's recommendations.
- Inspecting system equipment for damage.
- Monitoring and coordinating disposal of recovered product as required.

6.3 Product Disposal

Prior to disposal, the approximate volume of free product in the recovery tank that was removed from MW-5 will be measured and recorded. If groundwater is present, a disposable bailer and/or water and oil finding pastes will be used to measure the relative fluid levels in the recovery tank.

Recovered product generated during the cleanup action will be transported to Marine Vacuum Services, Inc. in Seattle, Washington, for fuel blending. Shannon & Wilson will coordinate disposal of the product in accordance with applicable local, state, and federal regulations and permits.

7.0 FOLLOW-UP GROUNDWATER TREATMENT

Groundwater treatment will likely be required after product recovery to remove residual contamination and degrade dissolved contamination at MW-5. Since treatment will be

dependent upon product recovery system performance, the method of treatment will be selected after the product recovery phase is completed.

8.0 GROUNDWATER MONITORING

8.1 Groundwater Sampling Procedures

Quarterly groundwater monitoring will be conducted after product recovery and groundwater treatment to evaluate groundwater conditions at the site. Monitoring is anticipated to be conducted for at least two years, with the goal of obtaining four consecutive quarters of results showing groundwater contamination below cleanup levels. The cleanup action will be reevaluated if the cleanup standard has not been met within the two-year timeframe.

Groundwater samples will be collected from monitoring wells MW-2, MW-3, MW-4, and MW-5 using a low-flow sampling techniques. Field personnel will purge each well using a low-flow (less than 500 milliliters per minute) pumping rate prior to sampling. Purge water will be monitored using a water quality meter until measured groundwater quality parameters (pH, conductivity, temperature, etc.) have stabilized to ± 5 percent for three consecutive readings taken at three- to five-minute intervals. The purge water will be collected in a bucket and later transferred to a drum for storage pending disposal.

Following purging, groundwater samples will be collected by filling three clean, laboratory-supplied, 40-milliliter vials pre-preserved with methanol and one clean, laboratory-supplied, 0.5-liter polyethylene bottle. Following sampling, the samples will be placed in a cooler and maintained at approximately 4 degrees Celsius for transport to the laboratory.

Groundwater samples will be submitted under chain-of-custody procedures to Fremont Analytical for analysis of gasoline by Method Northwest Total Petroleum Hydrocarbon-Gasoline; benzene, toluene, ethylbenzene, and xylenes by U.S. Environmental Protection Agency (EPA) Method 8021B; and total lead by EPA Method 6020/200.8.

8.2 Decontamination Procedures

The decontamination procedures that will be followed are in accordance with approved procedures. Decontamination of sampling equipment must be conducted consistently, so as to assure the quality of samples collected. All equipment that comes into contact with potentially contaminated groundwater will be decontaminated. Disposable equipment intended for one-time use will not be decontaminated, but will be packaged for appropriate disposal. Decontamination

will occur prior to and after each use of a piece of equipment. All non-disposable sampling equipment will be pre-cleaned prior to field activities. Items such as hand tools and other reusable equipment will be decontaminated prior to arrival in the field and between uses at different sampling locations.

The decontamination procedures for re-usable sampling equipment are as follows:

- Scrape off the gross material from sampler, if necessary.
- Wash and scrub in diluted laboratory grade detergent such as Alconox.
- Rinse with tap water.
- Rinse with distilled water.
- Change gloves.

The wash and rinse water will be collected in five-gallon buckets and transferred to a drum for storage pending disposal.

8.3 Investigation-derived Waste (IDW)

IDW generated by this work will consist of purged groundwater, decontamination water, and disposable sampling equipment. Purge and decontamination waters will be containerized in drums by Shannon & Wilson field staff. Shannon & Wilson will coordinate disposal of the IDW following receipt and review of analytical test results in accordance with applicable local, state, and federal regulations and permits. Disposable sampling equipment will be disposed as solid waste.

9.0 PRODUCT RECOVERY SYSTEM DECOMMISSIONING

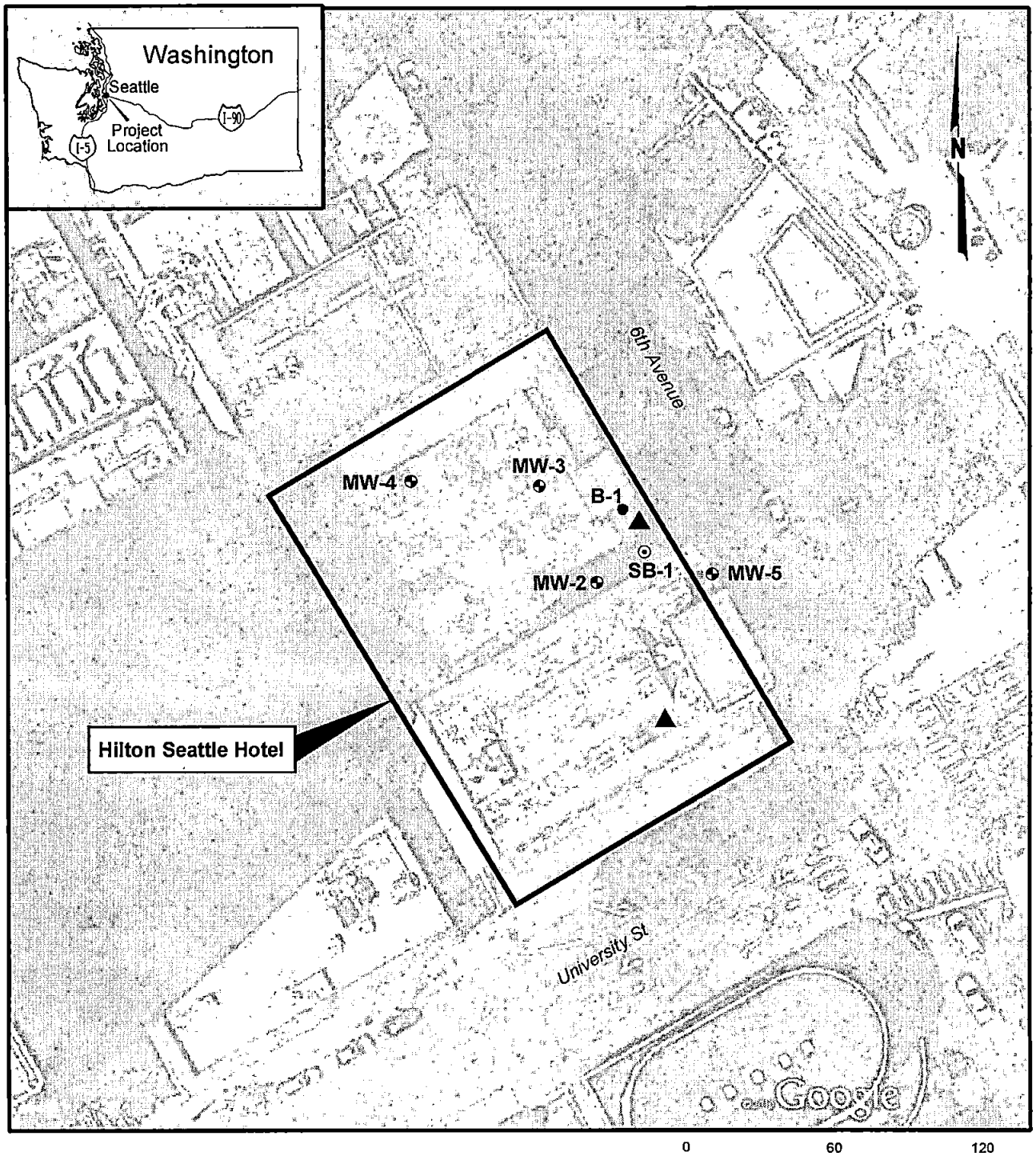
The product recovery system will be decommissioned once the cleanup action is considered to be complete. Decommissioning of the system will include:

- Remove temporary fencing and system equipment, including piping.
- Remove recovery pump and tubing; install new slip cap on well.
- Patch holes in interior and exterior concrete walls.
- Remove concrete equipment pad and bollard; restore surface to original condition.
- Dispose of product waste in accordance with Section 6.3.

10.0 FIELD VARIANCES

As conditions in the field may vary, it may become necessary to implement minor modifications to the work as presented in this CAP. When appropriate, the project manager will be notified and a verbal approval will be obtained before implementing the changes.

MSR:MRW/msr



LEGEND

- Approximate Parcel Boundary
- MW-2 — Monitoring Well Designation and Approximate Location (Shannon & Wilson, 1998)
- SB-1 — Boring Designation and Approximate Location (Shannon & Wilson, 1998)
- B-1 — Boring Designation and Approximate Location (Environmental Associates, Inc., 1994)
- ▲ Approximate Historical Location of Underground Storage Tank (UST)

NOTE

Parcels adapted from *"kcproperty_mapper2101634819006.pdf"* downloaded 7-22-11 from http://www5.kingcounty.gov. Aerial imagery provided by Google Earth Pro, reproduced by permission granted by Google Earth™ Mapping Service.

0 60 120

Approximate Scale in Feet

Hilton Seattle Hotel
Seattle, Washington

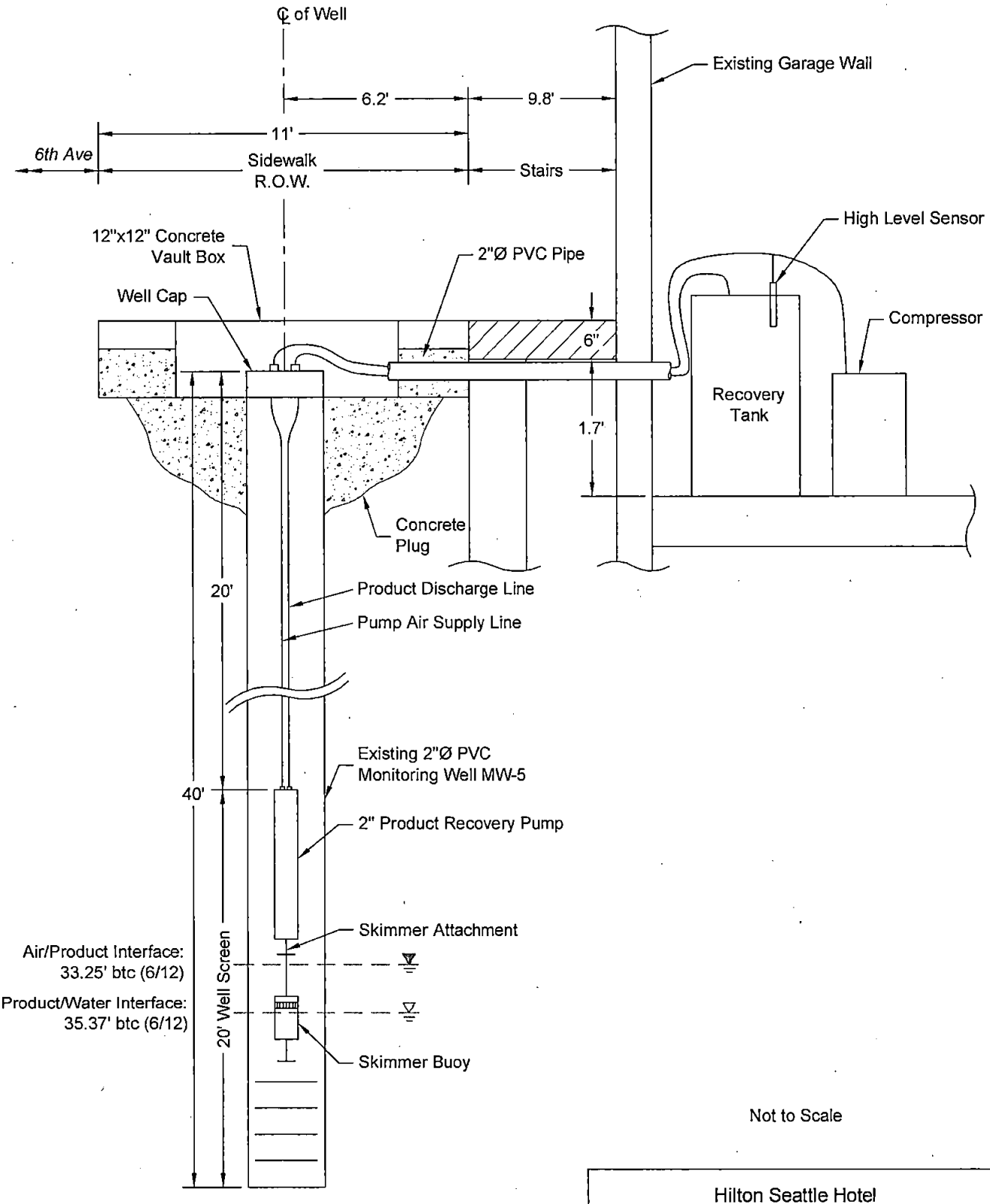
SITE AND EXPLORATION PLAN

July 2012 21-1-12341-004

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. 1

Filename: J:\21\12341-004\21-1-12341-004 Fig 1.dwg Date: 07-11-2012 Login: bac



Not to Scale

NOTES

1. Dedicated 110 volt electrical service required for air compressor.
2. System equipment to be protected by temporary fencing and bollards.
3. Secondary containment to be provided for recovery tank to control spills.
4. Recovery tank to be vented through stairwell above breathing zone.

Hilton Seattle Hotel
Seattle, Washington

PRODUCT RECOVERY SYSTEM SECTION

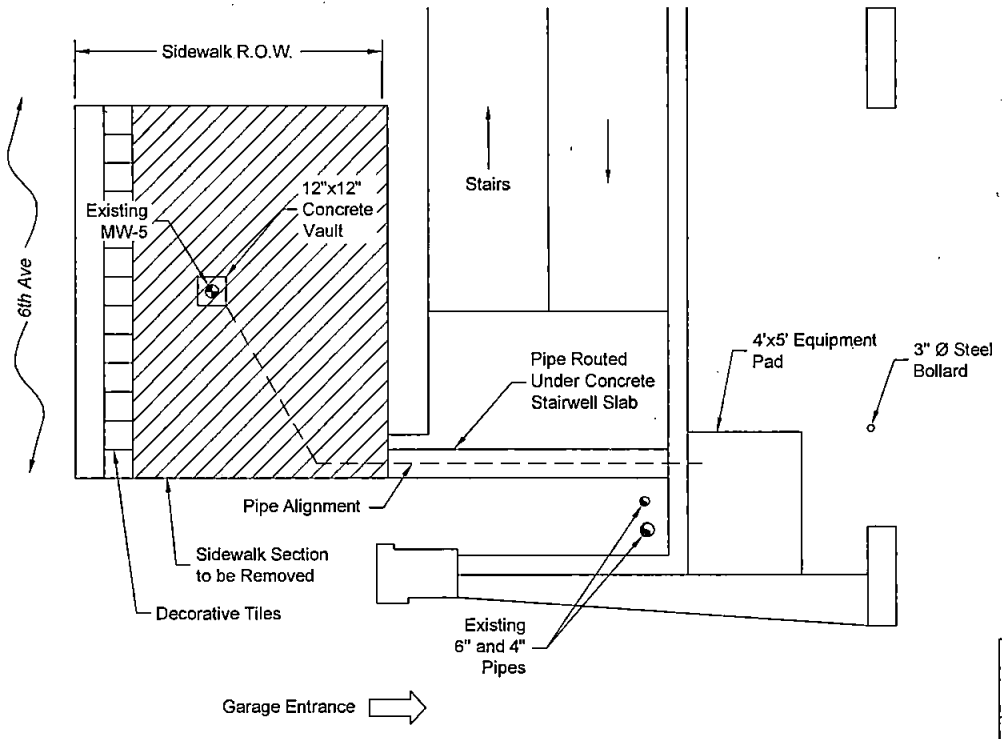
July 2012 21-1-12341-004

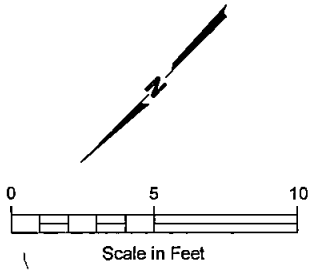
SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. 2

Filename: J:\21\12341-004\21-1-12341-004 Fig 2.dwg Date: 07-12-2012 Login: bac

Filename: J:\211\12341-004\21-1-12341-004 Fig 3.dwg Date: 07-12-2012 Login: bac





LEGEND

Monitoring Well

Demolition Limits

NOTES

1. Right-of-way sidewalk section to be restored to original condition.
2. Decorative tiles in sidewalk right-of-way to be protected during construction.

Hilton Seattle Hotel
Seattle, Washington

PRODUCT RECOVERY SYSTEM LAYOUT

July 2012 21-1-12341-004

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. 3

FIG. 3