

Atlantic Richfield Company

Nicholas Onufrak
Project Manager

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September 17, 2013

June Feng
New York State Department of Environmental Conservation
Spill Prevention & Response Section
47-40 21st Street
Long Island City, NY 11101-5407

Re: Bioremediation Work Plan Update
NYSDEC Spill Number 97-13442
BP Station No. 03887, 164 4th Avenue, Brooklyn, NY

Dear Ms. Feng:

Atlantic Richfield Company, a BP affiliated company (Atlantic Richfield), is pleased to submit the enclosed Bioremediation Work Plan Update (Work Plan Update) for BP Station No. 03887 located at 164 4th Avenue, Brooklyn, New York. The Work Plan Update was prepared by Antea™ Group (Antea Group) on behalf of Atlantic Richfield.

Should you have any questions, please do not hesitate to contact me at (410) 825-8213.

Sincerely,



for N.O.

Nick Onufrak
Project Manager
Atlantic Richfield Company

Enc.: Bioremediation Work Plan Update

cc: Christopher Meyer - Antea Group
Roe Wiczek
Kevin Kleaka - Impact Environmental Consulting, Inc.

A BP affiliated company





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Valhalla, New York 10595 USA
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September 17, 2013

Nicholas Onufrak
Atlantic Richfield Company
1 West Pennsylvania Avenue
Suite 440
Towson, MD 21204-0527

**Re: Bioremediation Application Program Work Plan Update
NYSDEC Spill Number 97-13442
BP Station Number 03887
164 4th Avenue
Brooklyn, New York**

Dear Mr. Onufrak:

Antea™Group (Antea Group), on behalf of Atlantic Richfield Company (Atlantic Richfield), a BP Affiliated company, is submitting the following Bioremediation Work Plan Update for BP Station Number 03887, located at 164 Fourth Avenue, Brooklyn, New York (the "subject site"). The site features are shown on the Site Plan, Figure 1. This document is intended to supplement the Bioremediation Pilot Study Summary and Full-Scale Application Work Plan, dated July 31, 2010, and the Bioremediation Application Program Work Plan Addendum, dated August 14, 2012.

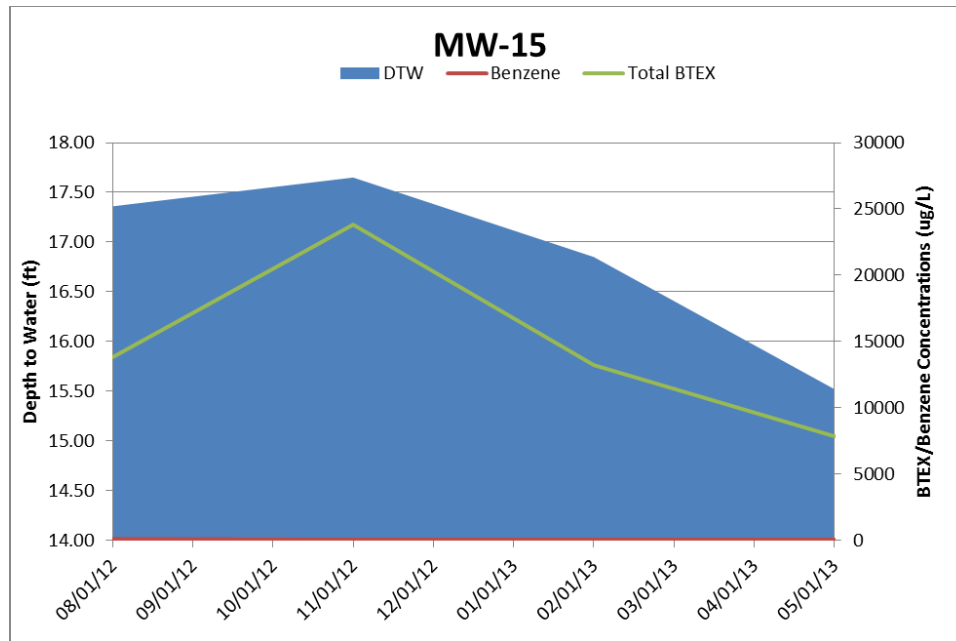
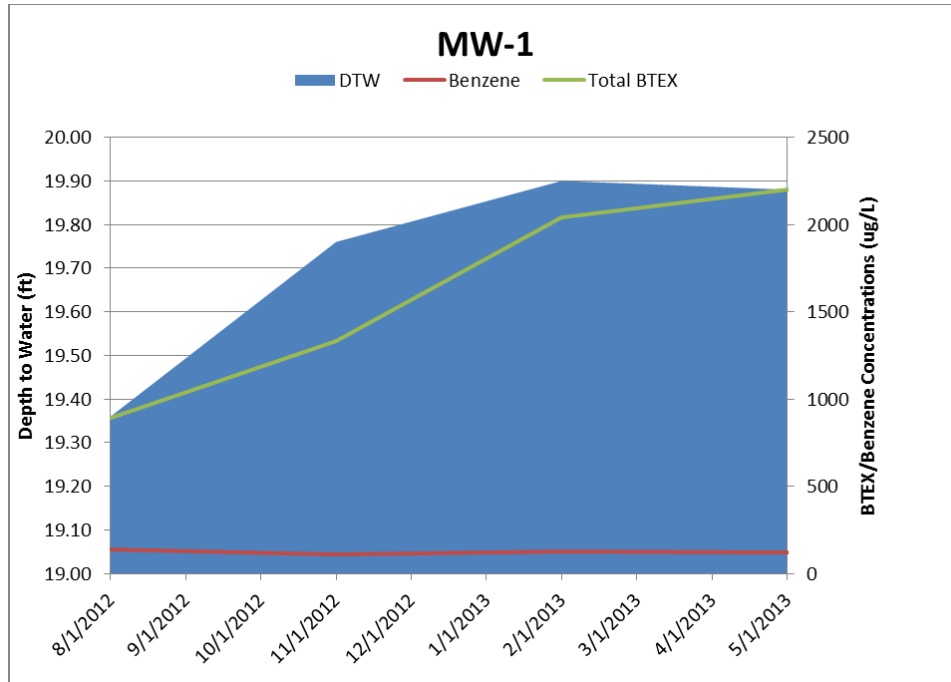
The overall goal of the approved bioremediation program was to effectively supplement the terminal electron acceptors (TEAs), by increasing sulfate concentrations within the aquifer to enhance the bioremediation. To do so, the Work Plan prescribed the application of a sulfate solution at a concentration of 25,000 milligrams per liter (mg/L) into application wells MW-1 and MW-15 during 12 application events conducted over a 36 month application period.

Evaluation of Aquifer Conditions

Since 2012, five application events have delivered 10,000-gallons of 25,000 mg/L concentration sulfate solution into the aquifer. Laboratory data obtained during this application program have been presented to the NYSDEC in routine Quarterly Ground Water Monitoring Report submittals.

Since the initiation of full-scale applications in September 2012, an increase in BTEX concentration has been observed in application well MW-1 while a decrease in BTEX concentrations has been observed in application well MW-15. The figures below show ground water trends for application wells MW-1 and MW-15 since the initiation of full-scale application at the subject site.





To further evaluate biostimulation in the area east of the canopy and continue to treat the dissolved phase impacts in the areas surrounding MW-1 and MW-15, Antea Group proposes to incorporate well MW-4 and MW-6 in the application well network at the subject site. Additionally, an increase in sulfate concentration from 25,000 mg/L to 75,000 mg/L is proposed. During future events the application of 2,000-gallons of 75,000mg/L sulfate solution will be applied into wells MW-1, MW-4, MW-6 and MW-15.

The revised monitoring program will include the sampling of monitoring wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, MW-12, MW-14, MW-15, and MW-16 and will be conducted according to the schedule outlined in the table below. The monitoring program will be continually evaluated throughout the application program and the frequency of post-application sampling may be reduced based on the transport and persistence of sulfate in the aquifer.

Interval	Sampling
Baseline pre-application	sulfate
Application day	sulfate
Week 4	sulfate
Week 8/Baseline for Next Application	sulfate

A revised US Environmental Protection Agency Injection Well Inventory notification letter will be submitted to reflect the changes detailed above.

The next application event is scheduled for October 15, 2013.

Should you have any questions or comments, please do not hesitate to contact Christopher Meyer at 914.495.9937 or Mark Hutson at 914.495.9947.

Sincerely,
Antea Group



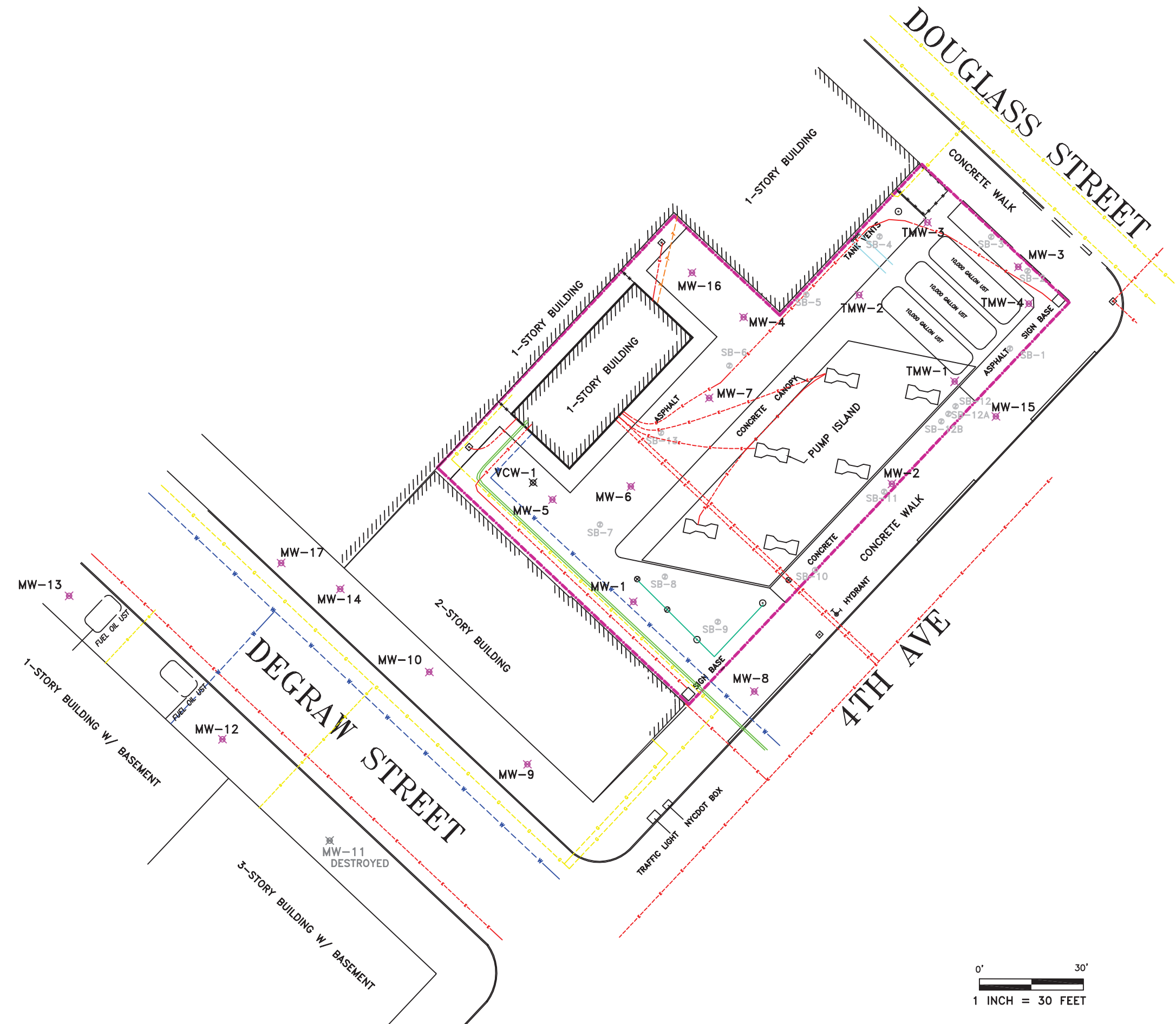
Christopher Meyer
Senior Project Manager
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Mark Hutson
Project Manager
mark.hutson@anteagroup.com

Attachments:

- Figure 1 – Site Plan



LEGEND:

- MW-1 MONITORING WELL LOCATION
- MW-11 ABANDONED MONITORING WELL
- SB-1 FORMER SOIL BORING LOCATION
- VAPOR CLUSTER WELL LOCATION
- FENCE
- PROPERTY LINE
- MANHOLE
- LIGHT POLE
- DRAIN
- WATER LINE
- TELEPHONE LINE
- ELECTRICAL LINE
- GAS LINE
- SEWER LINE

FIGURE 1
SITE MAP

BP STATION NUMBER 03887
164 4TH AVENUE
BROOKLYN, NEW YORK

PROJECT NO.: 03887	DRAWN BY: -/LKO
REVIEWED BY: CG/MH	DATE: 5/29/2013
FILE NAME: 03887_MAY-2013	

