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October 7, 2011

Mr. Brian Jankauskas
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York

Re: Revised Full Scale ISCO Work Plan
Voluntary Cleanup Program Site Code #347-1

Dear Mr. Jankauskas

This letter serves as the 2nd revision for the approved Remediation Plan, dated March 2, 2010 prepared by Impact Environmental for the abovementioned Site. The revisions were made based on the NYSDEC comments letter, dated August 22, 2011.

The locations of the existing wells and the proposed injection points can be referenced with **Plate 1**.

Selected Oxidant

RemOX (potassium permanganate) was selected as the oxidant for the full scale ISCO. This decision is based on the results of the pilot test and cost evaluation analysis.

Full Scale Injection Summary

A total of three (3) injection well clusters will be installed. Each injection well cluster consists of two well borings with screen at 25-45 ft and 60-80 ft respectively. A total of thirty (30) shallow Geoprobe injection points will be installed. Each shallow injection points will be installed to 100 ft below existing grade (BEG). A total of eleven (11) deep Geoprobe injection points will be installed. Each deep injection points will be installed to 160 ft BEG. For each Georpobe injection point, a bottom-up injection will be performed from terminating depth to approximately 30 ft BEG (soil-groundwater interface).

The injection rate through wells will be 10 lbs RemOX per linear ft of screen. The injection rate through Geoprobe will be 5 lbs RemOX per linear ft. All injection will be performed with 4%

solution. All together, the oxidant loading rate will be in the order of 1 g per 1 kg soil, and the pore volume replacement rate will be approximately 0.2.

Full Scale Injection Breakdown in Zones

In-situ chemical oxidation injections will be performed in three zones. Zone-1 covers the previous leaching structures of Melody Cleaners. Zone-2 covers the leaching structures associated with Laundry Mat. Zone-3 is hydraulically down-gradient to Zone-1 and Zone-2.

At Zone-1, the detected levels of PCE were marginally above the applicable guidance value, and therefore the ISCO application in Zone-1 is unlikely to be cost-effective. Accordingly, the ISCO application at Zone-1 will be reduced to one (1) injection well cluster and four (4) Geoprobe injection points. Said injection well cluster will be installed in the vicinity of the previous secondary leaching cesspool. Three (3) deep Geoprobe injection points and one (1) shallow point will be installed in the vicinity of the injection well cluster.

At Zone-2, the full scale ISCO application will be performed with focus in the vicinity of the former leaching structures. Two (2) injection well clusters will be installed for potential repeat injections. Said injection well clusters will be installed at the former leaching structures of the Laundry Mat. In addition, Twenty-four (24) shallow Geoprobe injection points and eight (8) deep Geoprobe injection points will be installed at Zone-2.

At Zone-3, a total of six (6) shallow Geoprobe injection points will be installed.

During the pilot test, it was noted that 15 ft horizontal injection spacing is inadequate to address the groundwater contamination. Accordingly, for the full scale ISCO, a tighter spacing of 10 ft will be utilized in Zone-1 and Zone-2. For Zone-3, a spacing of 20 ft will be utilized. The injection points will be placed in a staggered pattern to ensure the most effective coverage of the areas need to be treated.

Implementation Sequence

Step 1, Well Installation

Three (3) injection well clusters will be installed on the Site. Each well cluster will consist of two independent 2-inch PVC wells (Schedule 80), with screen depth at 25-45 ft BEG and 60-80 ft BEG, respectively. The injection wells will be installed on the Site using a hollow stem auger system. The wells will be constructed of twenty (20) linear feet of 2-inch diameter slotted (0.040 inch) schedule 80 PVC screen. The large size screen slot will minimize the risk of clogging by

precipitated MnO_2 crystal. The balance of the well will be constructed with 2-inch diameter schedule 80 PVC riser. The outside of the well from its base to a point one foot above the highest screen section will be packed with clean filtration media (#2 Morie sand). A two foot bentonite seal will be packed around the casing above the filtration media. The wells will be grout up to grade. The wells will be finished with a cast iron manhole with an access cover.

In addition, one sentinel well will be installed hydraulically down-gradient at the property boundary. The screen depth of said sentinel well will be from 70-80 ft BEG. The sentinel well will be constructed of ten (10) linear feet of 2-inch diameter slotted (0.010 inch) schedule 80 PVC screen. The balance of the well will be constructed with 2-inch diameter schedule 80 PVC riser. The outside of the well from its base to a point one foot above the highest screen section will be packed with clean filtration media (#2 Morie sand). A two foot bentonite seal will be packed around the casing above the filtration media. The wells will be grout up to grade. The wells will be finished with a cast iron manhole with an access cover.

All drill cutting media will first be placed in an on-site container and then transported for off-site disposal.

Step 2, Injection Wells Baseline Sampling

The installed injection well clusters will be sampled for baseline condition. A total of (6) additional baseline groundwater samples will be collected. The groundwater samples will be analyzed utilizing USEPA Test Method 8260 for volatile organic compounds (VOCs).

Step 3, ISCO via Injection Wells

Pressurized injection will be conducted through the injection well clusters. Pressure gauges and flow rate meters will be utilized. Upon completion of the injection, the injection wells will be flushed with water to make sure the precipitated MnO_2 crystal (one of the by product) does not clog the well screens.

Step 4, ISCO via Geoprobe Injection

Geoprobe injection will start with Zone-1 and end with Zone-3. Within each zone, injection will start with outside points and finish with inner points to minimize expansion of the plume. A Geoprobe 8400 unit will be utilized for the points that go to 160 ft BEG. A Geoprobe 6600 unit will be utilized for the points that go to 100 ft BEG. Pressure gauges and flow rate meters will be utilized.

Step 5, Contingency Injection

During the pilot test, it was noted that a significant rebound was observed subsequent to the RemOX injection. Accordingly, it is anticipated that multiple injection will be required. If deemed necessary by on-site monitoring data, multiple injections will be conducted through the installed injection wells. Upon consulting with the NYSDEC, other existing wells may also be utilized for injection.

Groundwater Monitoring

Levels of contaminants and metals will be closely monitored via the on-site wells (including the newly installed sentinel well) throughout the full scale application.

Please feel free to contact us with any questions or comments regarding this revision.

Sincerely,

Impact Environmental

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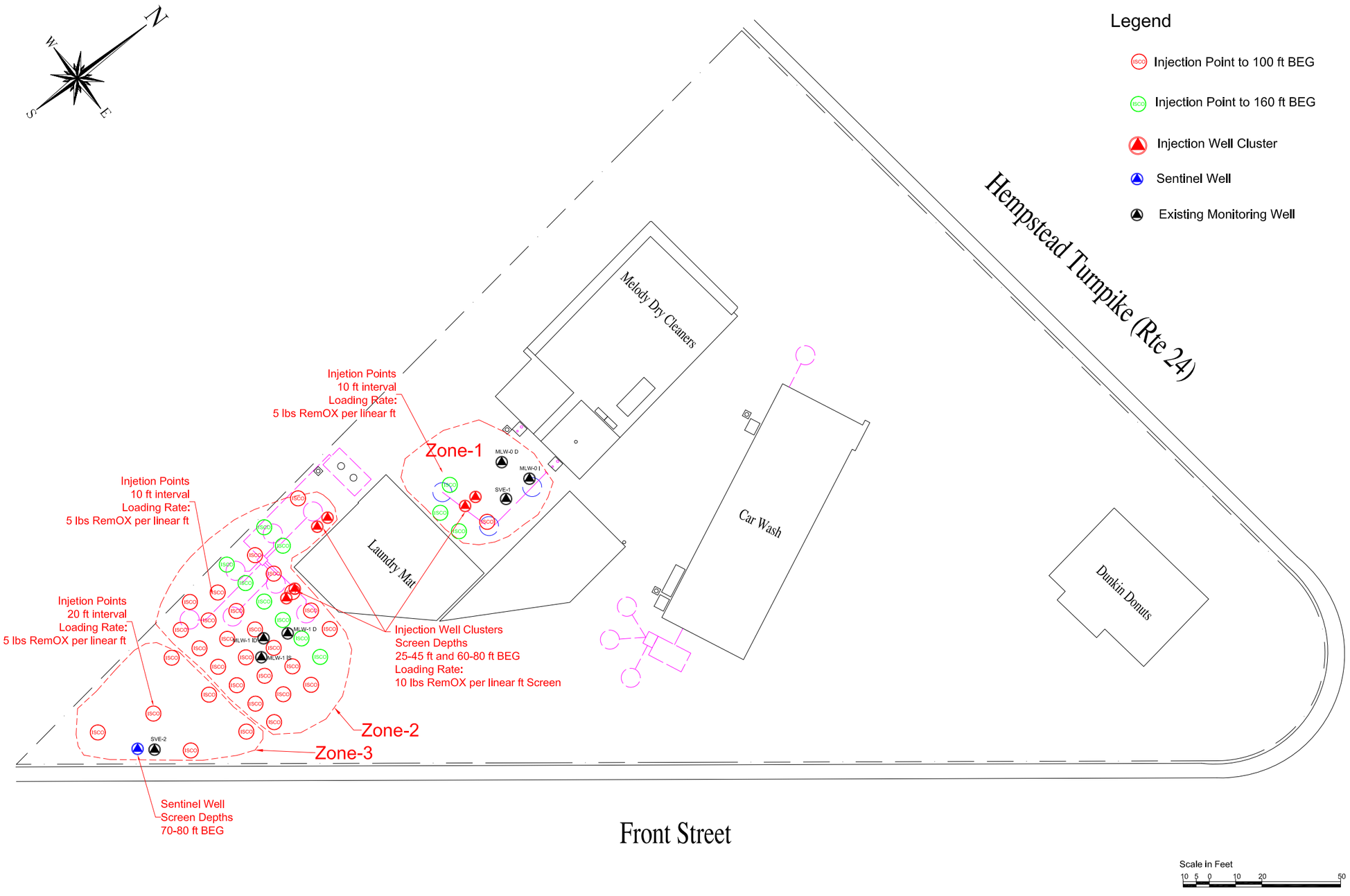
Wenqing Fang

Environmental Engineer



PROJECT # 04-455

Figure # 01

TITLE: Revised ISCO Implementation Plan

Melody Cleaners Site
East Meadow, New York

DRAWN BY:	WF
CHECKED BY:	KK
DATE:	10-4-2011
SCALE:	1" = 40'

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