



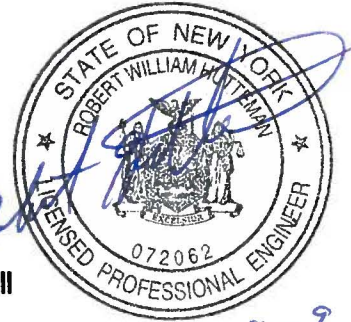
Lu Engineers

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Technical Memorandum

To: Frank Sowers, P.E., NYSDEC Region 8
From: Lu Engineers
Date: 9/4/09
Project: Former Churchville Ford: Site #V00658-8

Re: Remedial Action Work Plan Addendum; Proposed Additional Injection Well
Lu Project No.: 5701-11



Frank,

As previously discussed, we have dealt with several issues during the implementation of the remedial actions described in the approved Remedial Action Work Plan (RAWP), dated December 2008. Initial problems encountered were primarily associated with injection well installation quality. This issue has since been resolved and the five injection wells appear to be functioning as intended. We have also worked with site personnel to resolve access and logistical problems during the injection process.

The issue we have had the most difficulty dealing with has been the injection of permanganate at the pre-existing monitoring wells where lower than anticipated permeabilities have greatly slowed the acceptance of oxidant. As a result, less than half of the permanganate planned for injection at the pre-existing well locations has been introduced to the subsurface. The low permeability soils have complicated the process of achieving planned vertical and lateral dispersion of the chemical oxidant solution into the source area through the 5 shallow interior injection wells and monitoring wells MW-1, MW-3 and MW-6. On August 25, 2009 colormetric testing conducted in the source area at MW-JCL-2 revealed no change in groundwater color since injection activities began in June 2009. It appears that the permanganate solution has not yet migrated vertically to 25 feet below ground surface, the top of the sandpack in MW-JCL-2.

As outlined in the RAWP, all 8 wells were intended to receive the same volume of 3% permanganate solution (22.7 gallons each) per injection event. As mentioned previously, due to the tight soils and relatively slow mobility of groundwater across the Site we have been unable to introduce the full 22.7 gallons per well per event in the source area by gravity. The volume of solution introduced into these three (3) wells per event has averaged approximately 5 gallons at MW-3 and MW-6 and 10 gallons at MW-1. Based on the construction of these three wells, Lu Engineers has determined that it would be impractical

to perform pressurized injection at these 3 well locations. To date, a total of approximately 535 gallons of 3% permanganate solution has been introduced into the groundwater, leaving approximately 694 gallons of 3% permanganate solution to be injected during the remaining injection events among the 8 wells.

A recent groundwater sample (July 2009) from MW-JCL-2 indicates that the permanganate solution is freeing PCE from the soil and releasing it into solution in the groundwater where it can be more readily oxidized. This is indicated by an apparent increase in contaminant level at MW-JCL-2 since groundwater testing was last conducted in 2007 (134 ug/l in 2007 versus 306 ug/l in July 2009). It should be noted that this rise in VOCs is not approaching the 2006 level at this well of 1090 ug/l.

Although the effects of the permanganate are apparently indicated by this increase in VOC contamination the material needs to reach this source location to oxidize the VOCs. It is apparent that both the gravity and pressurized injection of permanganate is not dispersing vertically and laterally through the aquifer as quickly as anticipated based on the slug testing conducted for this project.

As discussed with NYSDEC, Lu Engineers has installed a deeper injection well within the source area to complete the injection process by more effectively dispersing the permanganate material into the subsurface during each remaining injection event. This new injection well will also serve to accept more permanganate than the wells installed to date and the monitoring wells used as injection points. The new injection well will accept the planned volume of permanganate, which would have been injected at the site monitoring wells. The new injection well's location within the source area will also provide more direct and effective access to the highest contaminant levels, and thereby expedite the remedial process.

Figure 1 illustrates the well construction detail for the proposed additional well while Figure 2 indicates the new well location within the source area. The well design is consistent with the injection wells outlined in the approved RAWP but screened at a deeper interval. As indicated on Figure 2 the deep injection well was installed in the source area adjacent to monitoring well MW-JCL-2.

The new injection well is screened from 17 to 12 feet below ground surface with a one foot thick bentonite seal and grouted to within one foot of the ground surface. This leaves sufficient room for the appropriate cam-lock completion for connection to the approved Geoprobe GS-2000 injection pump. Through use of this deeper injection well, the permanganate solution can be more effectively introduced in the contaminant source area to allow for enhanced vertical and lateral dispersion of the permanganate solution and to complete the injection process. Lu Engineers will continue to gravity-feed monitoring wells MW-1, MW-3 and MW-6 with permanganate solution during each remaining injection event.

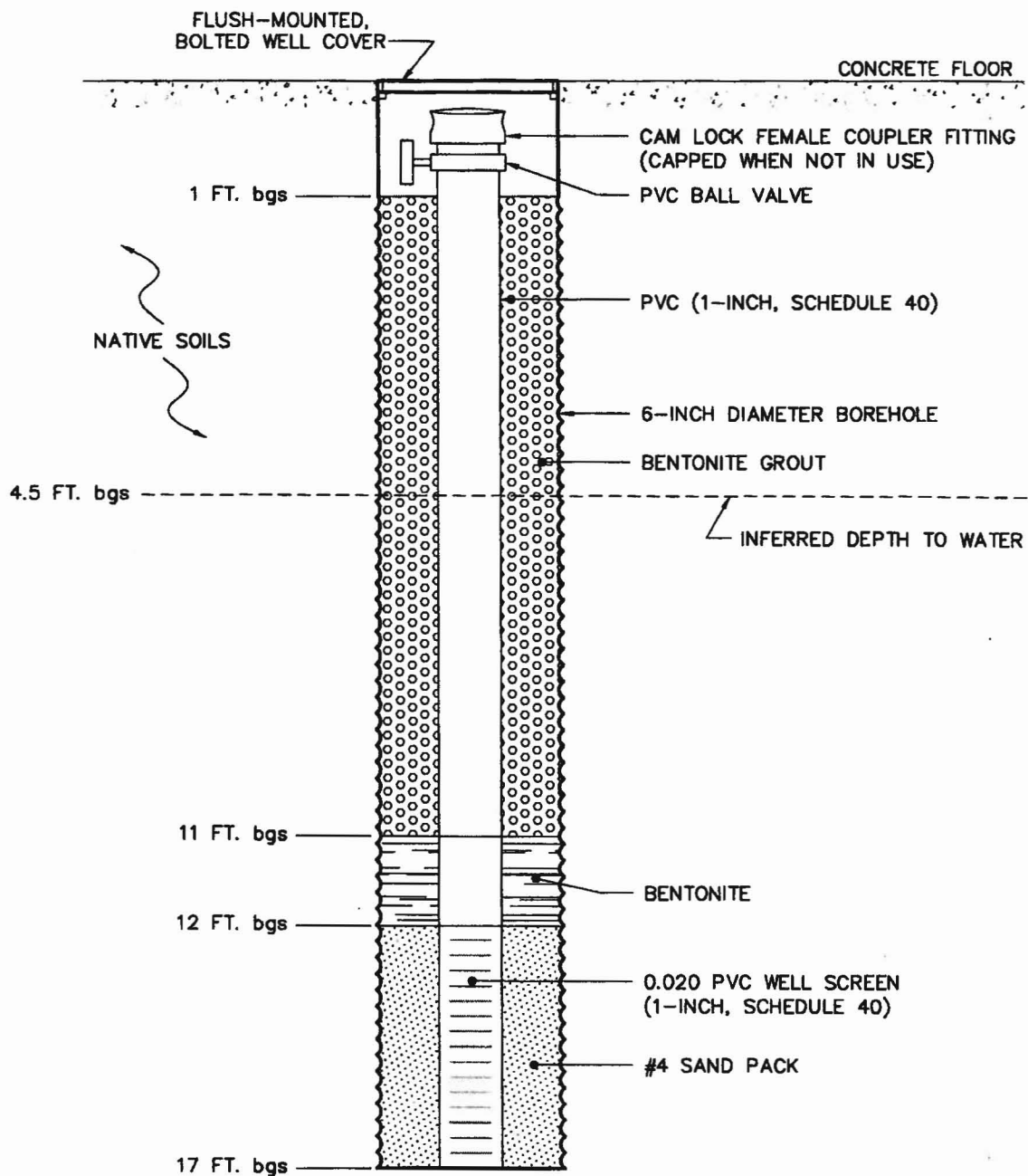
Please call or e-mail with any questions or concerns.

Sincerely,

A handwritten signature in black ink, appearing to read "Eric Detweiler". The signature is fluid and cursive, with the first name "Eric" and last name "Detweiler" clearly distinguishable.

Eric Detweiler
Project Geologist

attachments



INJECTION WELL DETAIL
NOT TO SCALE

bgs = Below Ground Surface



Lu Engineers

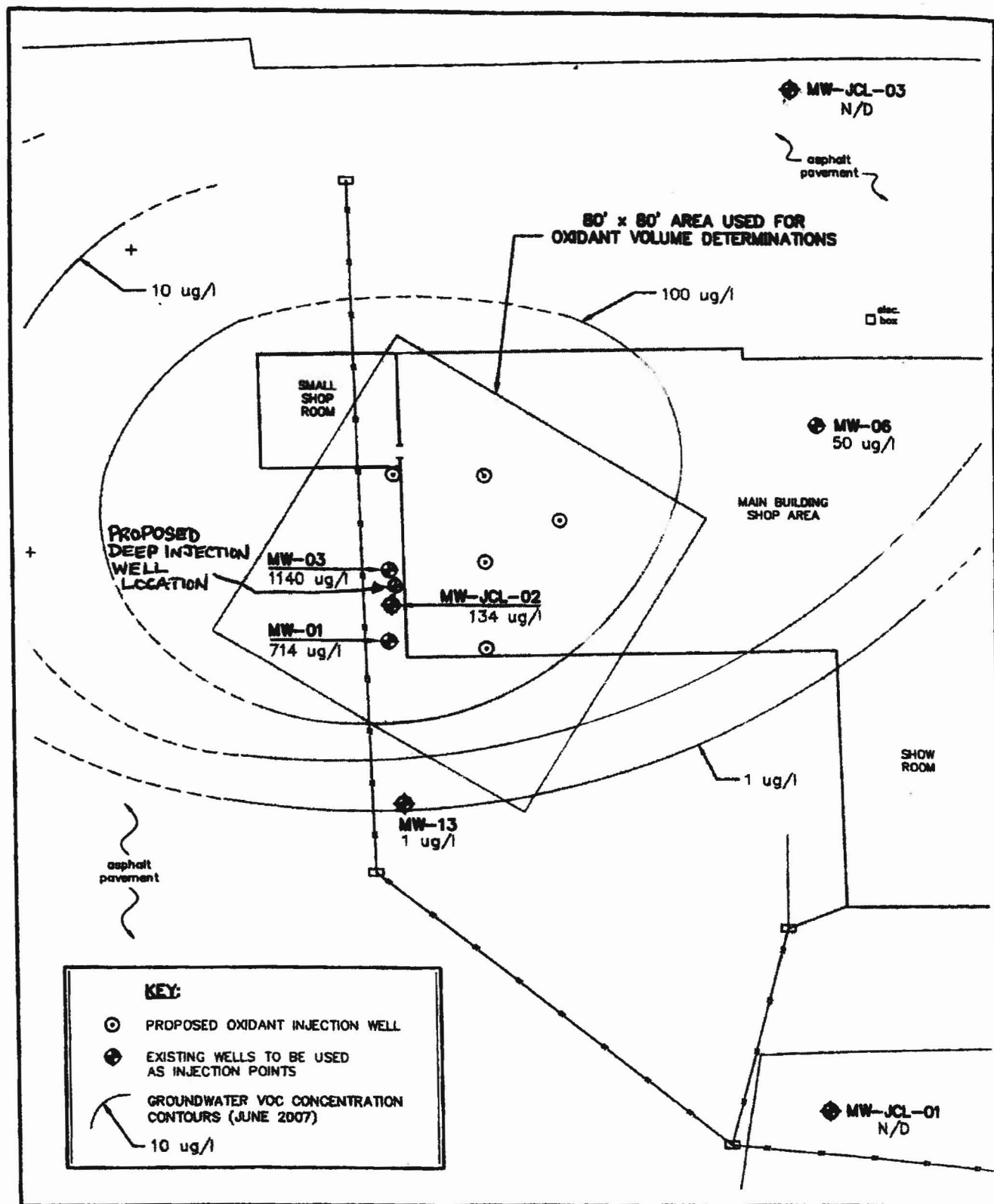
FIGURE 1.
INJECTION WELL DETAIL

CHURCHVILLE FORD
REMEDIAL ACTION WORK PLAN

DATE:	AUGUST 2009
SCALE:	NONE
DESIGNED/DRAWN/CHECKED	ED/DS/GA
P.N.	5701-11

5701-11: Olan/Camp/Remedial WorkArea.dwg, 8/25/2008 2:23:49 PM, DAME

5701-11



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FIGURE 2.
PROPOSED INJECTION WELL LOCATIONS
CHURCHVILLE FORD
REMEDIAL ACTION WORK PLAN

DATE: DECEMBER 2007
SCALE: 1" = 30'
DESIGNED/DRAWN/CHECKED: CA/DS/JS
P.J. 5701-11