

Executive Summary:

This supplemental assessment was conducted for the purpose of evaluating the groundwater monitoring program at Site A/Plot M to determine if there are existing wells that could be plugged and abandoned without compromising the objectives of the monitoring program defined in the Site LTSP.

The assessment identifies eight groundwater monitoring wells that could be plugged and abandoned at Site A / Plot M based on water monitoring data presented in the *Groundwater Monitoring Assessment for Site A / Plot M* (DOE 2011), without jeopardizing the LTSP objectives.

Background:

Monitoring at Site A / Plot M has been ongoing for 32 years (1980 to 2012). It has been 9 years since the last monitoring program change was implemented in 2004. The current LTSP for Site A / Plot M directs quarterly and semiannual sampling for tritium and strontium-90 at 27 wells and 9 surface locations to achieve two major monitoring objectives:

1. Ensure that existing contaminant concentrations continue to decrease as expected due to radioactive decay and other natural processes, and
2. Detect any potential future releases.

Data collected from 2004 thru 2009 for the two remaining constituents of concern (tritium and strontium-90) resulted in the recommendation to reduce the sampling frequency of several locations to annual (DOE 2011).

This supplemental assessment looks at sampling locations, and concludes that data collected from 2004 thru 2009 also indicate that eight of the 27 monitoring wells currently being sampled could be removed from the program without compromising the two monitoring objectives listed above.

The wells identified for plugging and abandonment are located at Site A and near Red Gate Woods, specifically,

- Site A: Monitoring wells BH-41, BH-54, BH-52, and BH-51.
- Red Gate Woods: Monitoring wells D-10, D09, D17, and D13.

It should be noted that consistently elevated tritium concentrations in the glacial drift wells at Plot M indicate that no wells should be plugged and abandoned at this time at Plot M. Specifics concerning Site A and Red Gate Woods are provided below.

Site A

Six wells are currently sampled quarterly for tritium and strontium-90 at Site A. It was recently recommended that the sampling frequency of all 6 wells be reduced to annual. The recommendation is based on low tritium and strontium-90 concentrations and the consistency of the concentrations trends since 2004 (DOE 2011).

The six wells at Site A are completed in the glacial till or drift, which is a fine grained (silty-clay) with discontinuous lenses of coarse material (sandy silt and gravel) that may contain perched water (DOE 2004). The six wells range in depth from 26 feet bgs to 165 feet bgs (Attached Figure 3.3). The wide range in depths is consistent with the heterogeneous nature of the till.

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Monitoring wells BH-55 and BH-56 are the two wells closest to the buried reactors, and as shown in Figure 2 and 3 of the 2011 GW assessment (attached) Monitoring Wells BH55 and BH56 have higher tritium and strontium concentrations and larger historical ranges for both constituents than the other four wells do. Since these two wells are nearest to potential sources, they are best positioned to detect any future releases.

It is therefore proposed that Monitoring Wells BH41, BH54, BH52, and BH51 be plugged and abandoned and that monitoring wells BH55 and BH56 remain and be sampled annually for tritium and strontium-90. If 10 additional years of sampling shows that the groundwater does not pose a threat to human health and the environment based on Illinois EPA Class 1 Groundwater Quality Standards, then these remaining two wells at Site A should also be plugged and abandoned.

Red Gate Woods

Ten monitoring wells completed in the dolomite aquifer are currently being monitored for tritium quarterly. As shown in attached Figure 3.4, eight of these wells are located next to Red Gate Woods. The depths of the dolomite wells are fairly consistent, 78 feet bgs to 120 feet bgs. Concentration versus time plots for these wells are attached. The plots indicate that concentrations are decreasing and trending in a consistent similar pattern. Given the close proximity of these 8 wells to each other, and that they all target the same aquifer, it is proposed that the four wells with the lowest tritium concentrations and historical range be plugged and abandoned (DH-10, DH-09, DH-17, and DH-13) and that the four wells with the highest tritium concentrations and historical range be sampled annually (DH-11, DH-12, DH-14, and DH-15).

References Cited:

DOE 2004, Environmental Monitoring Program at Site A and Plot M, Palos Forest Preserve, Cook county, Illinois, GJO-2004-558-TAC, United States Department of Energy Office of Legacy Management (DOE-LM), Grand Junction, Colorado, February 2004.

DOE 2011, Groundwater and Surface Water Monitoring Activities at Site A / Plot M, LMS/SAM/S07581, United States Department of Energy Office of Legacy Management (DOE-LM), Grand Junction, Colorado, March 2011.

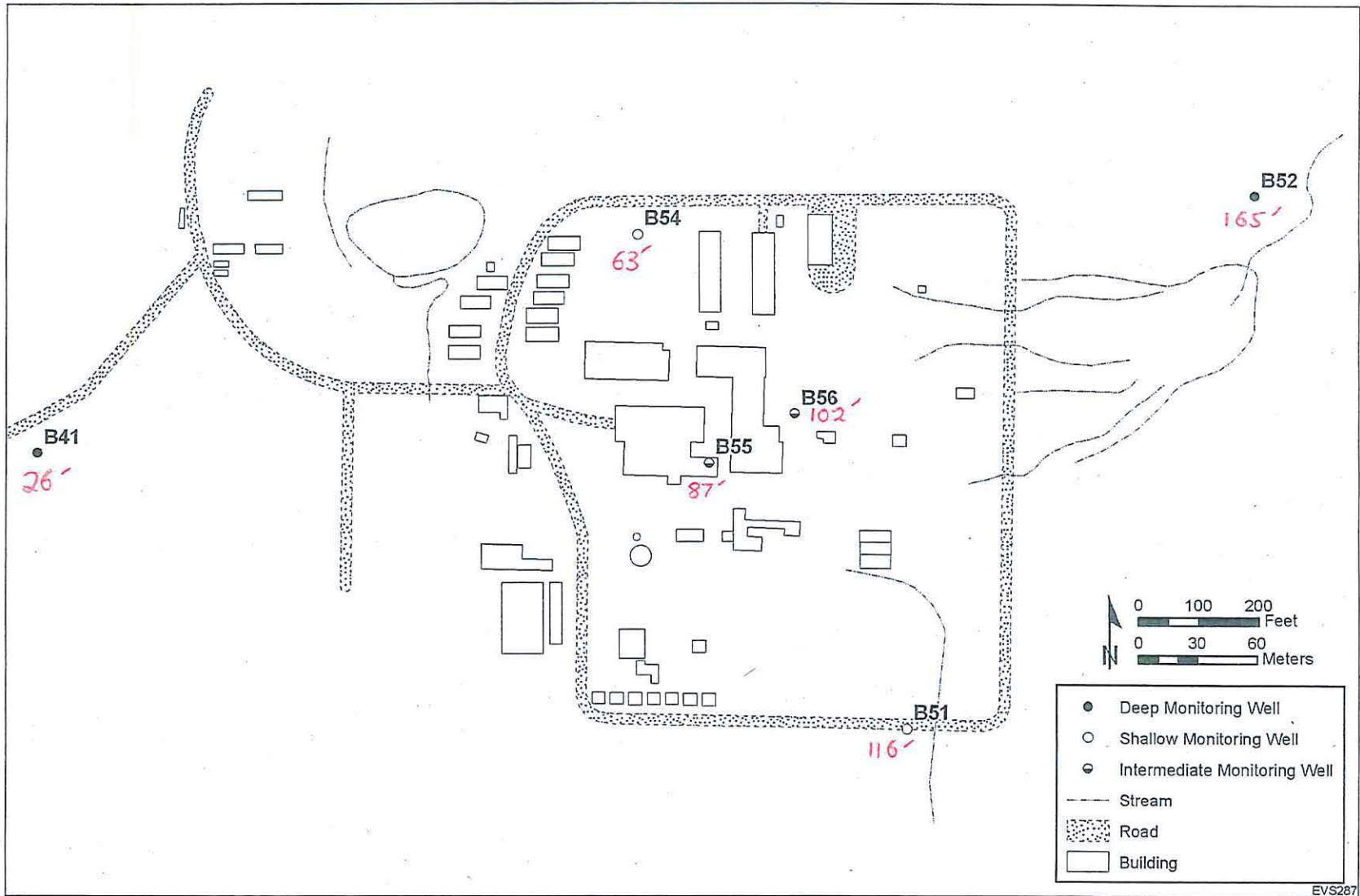


Figure 3.3 Monitoring Wells at Site A

Figure 2
Tritium Concentrations in Six Glacial Drift Wells at Site A

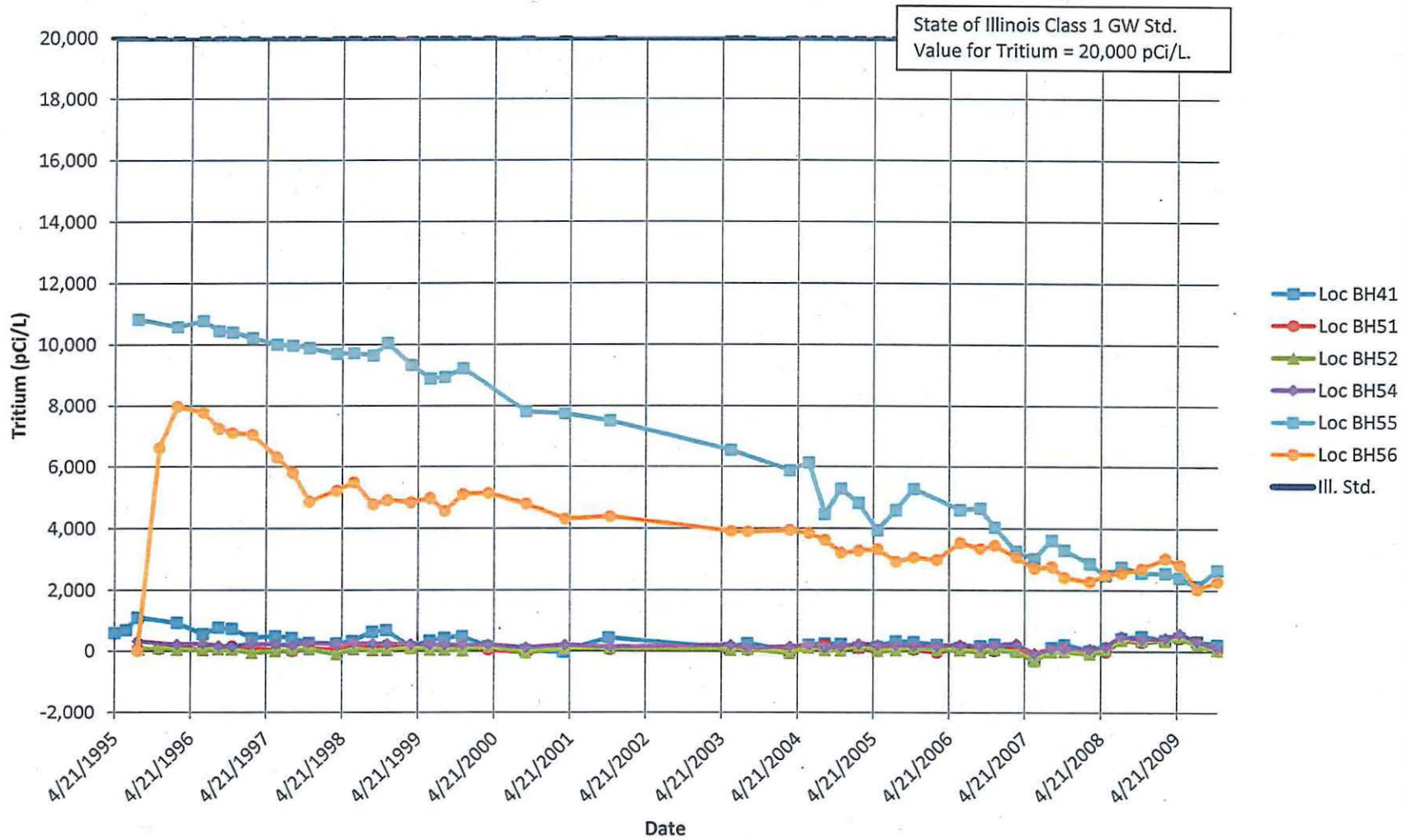
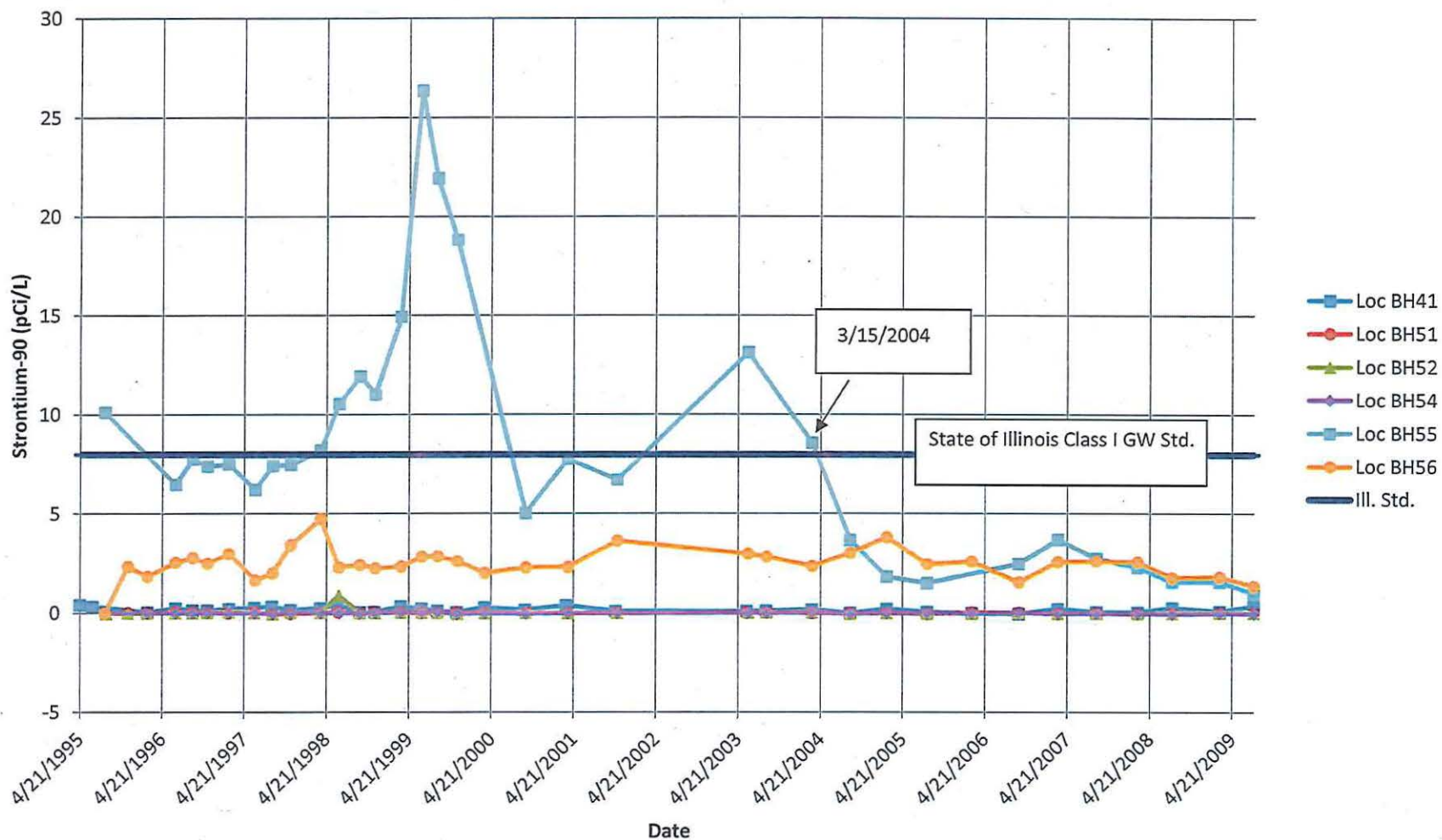


Figure 3
Strontium-90 Concentrations in Six Glacial Drift Wells at Site A



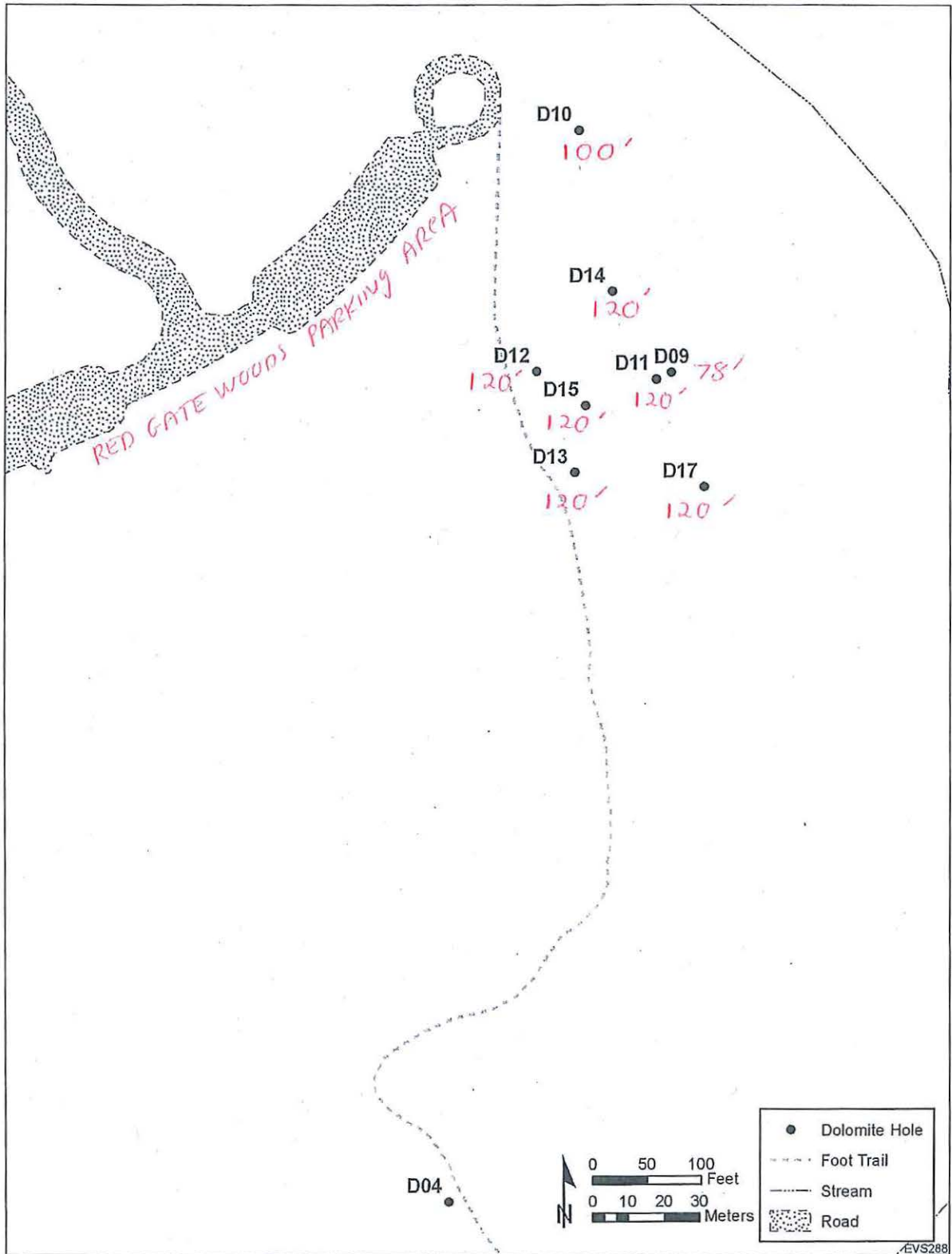


Figure 3.4 Locations of Dolomite Holes North of Plot M

Figure 7
Tritium Concentrations in Ten Dolomite Wells at, and north of Plot M

