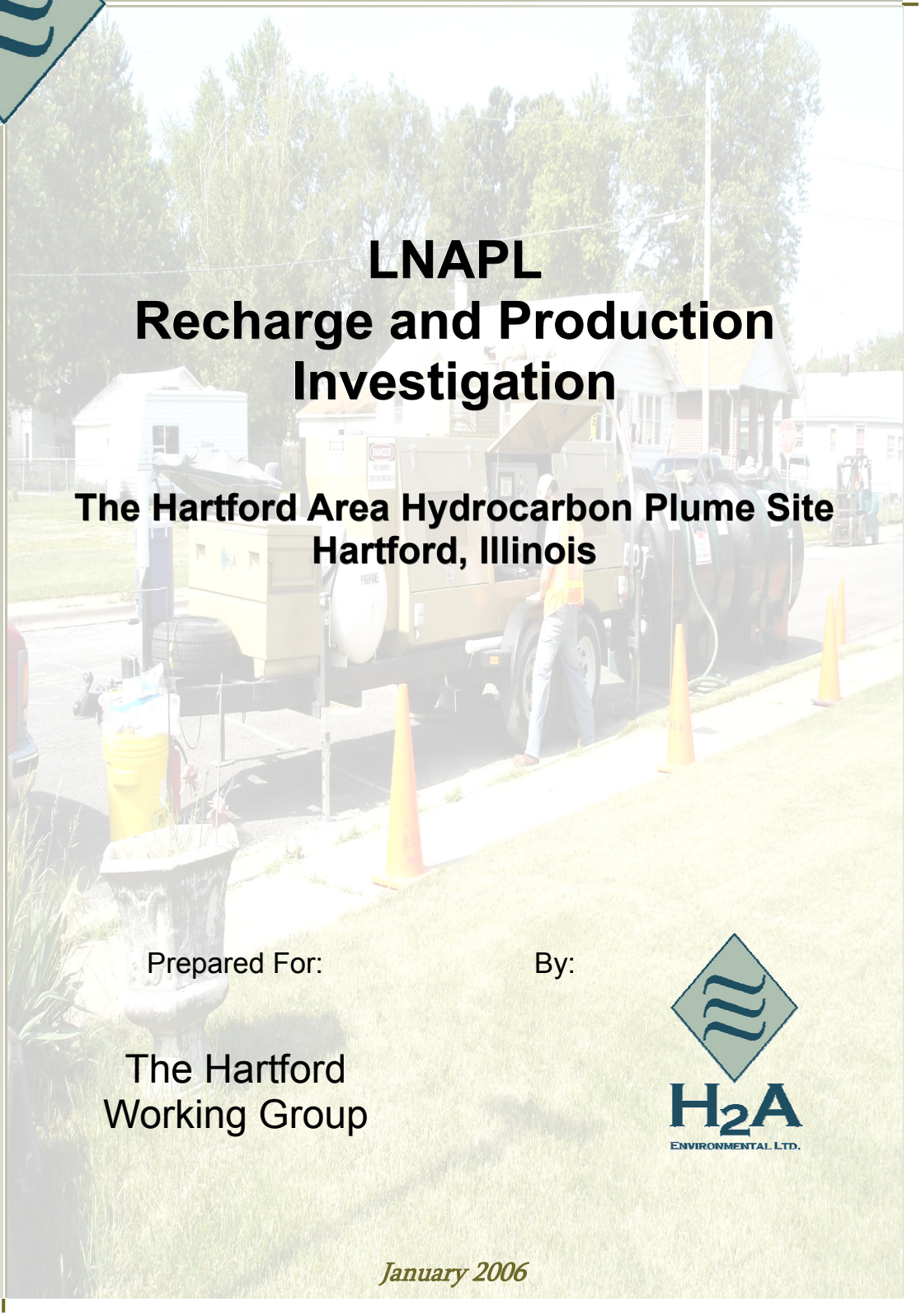
APPENDIX E

H_2A REPORT

H2A Environmental, Ltd.



LNAPL Recharge and Production Investigation

The Hartford Area Hydrocarbon Plume Site
Hartford, Illinois

Prepared For:

The Hartford Working Group

By:

H2A Environmental Ltd.

January 2006

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Table 1 Multi-Site Daily Rate and Recovery Report
Table 2 HVR Extraction Event Summary Data

LNAPL RECHARGE AND PRODUCTION INVESTIGATION

H_2A conducted MPE pilot testing on nineteen existing wells with LNAPL in Hartford, Illinois from May 9 through November 4, 2005. H_2A used a mobile MPE system to extract LNAPL from each well. H_2A's testing accomplished vacuum-enhanced fluid recovery by applying negative pressure to a well via a stinger pipe set at or near the LNAPL surface. The pilot testing initially consisted of five cycles of daily MPE pilot testing from 10 wells to evaluate LNAPL production and recharge characteristics across North Hartford. Subsequently, additional daily and sequential daily MPE pilot tests were performed from selected wells out of the original 10 and nine additional existing wells with LNAPL.

The pilot testing was performed utilizing MPE equipment with the flexibility to operate in different applications. During the initial five cycles of screening pilot testing, various vacuum levels, stinger levels, and other operating parameters were tested to obtain preliminary data on LNAPL production and recharge levels that result from different operating parameters. The scope of operating parameters and equipment selection for the 2005 MPE pilot tests were selected based on information gained from the 2004 MPE pilot tests and represent a more efficient technology application. In general, this MPE pilot testing was implemented to maximize LNAPL production while minimizing water production by minimizing drawdown.

This pilot testing was subsequently extended to target specific wells (the sequential daily MPE wells noted above) to better understand their LNAPL production capabilities on a sustained basis as the regional aquifer water levels fluctuated.

1.0 OBJECTIVES

Objectives of the H_2A MPE pilot testing activities included the following:

- Identify LNAPL removal rates via MPE throughout the Hartford LNAPL plume.
- Compare the relation of apparent LNAPL thickness to recoverable LNAPL for different hydrogeologic conditions via removal rates and LNAPL/water ratios.
- Assess effects of source location, water table elevation, and site stratigraphy on LNAPL recovery.
- Delineate the range of liquid LNAPL recovery.
- Use measured recharge data to calculate LNAPL/water transmissivities and hydraulic

conductivities.

- Utilize MPE pilot testing in conjunction with baildown testing and LNAPL saturation investigation results to identify sustainability of recovery.

2.0 LOCATIONS

Wells identified for pilot testing in the Remedy Selection Technical Memorandum dated March 9, 2005 were the initial focus of HVR daily pilot testing. These wells included:

MP-29D	MP-56C
MP-47C	HMW-19
MP-50C	HMW-20
MP-53C	HMW-44C
MP-55C	HMW-48C

Wells that were previously tested were:

RW-4A	RW-5

Following conclusion of HVR daily pilot testing of the above wells, extended pilot testing was performed on selected wells to support the LNAPL production and recharge characterization tasks.

Wells identified for extended pilot testing included:

HMW-19	MP-52C
HMW-20	MP-54C
HMW-44C	MP-55C
MP-39C	MP-57C
MP-47C	MP-79C
MP-49C	RW-4A

MP-50C	RW-5
MP-51D	

These wells were selected to add to understanding of LNAPL recovery and recharge from the wells investigated to date, to support and extend the plume-wide LNAPL investigation, and to facilitate LNAPL removal technology comparisons.

3.0 EQUIPMENT

Equipment necessary to undertake these pilot tests included:

- Internal combustion engine (ICE)-based mobile trailer-mounted HVR system with total fluids knock out tank, and transfer pump and vapor abatement via ICE. Maximum vacuum generation of 21-inches mercury (Hg) (max 15 inches Hg applied to well), max flow rate of approximately 60 standard cubic feet per minute (SCFM) combined flow.
- Electric submersible total fluids pumps.
- In Situ® MiniTroll and BaroTroll Dataloggers.
- External temporary storage tank(s) for produced groundwater and LNAPL.
- Vacuum truck for transport and recycling of produced fluids.
- Hand-held digital manometer to measure well vacuum.
- Thermal anemometer to measure airflow in air dilution valves (ADVs).
- Electronic interface probe (EIP) to measure LNAPL thickness and depths to LNAPL and water in wells.
- Data logger and pressure transducers.
- Vacuum transmitters and data logger.
- Various piping and hose configurations to seal and apply vacuum to wells, transmit produced vapors and fluids to the trailer, and transfer produced fluids into the external storage tank(s).
- Forklift or other appropriate vehicle to move the storage tank(s).
- Support trucks.
- Traffic control equipment.
- Summa canisters for air sampling of influent concentrations.

- Photoionization detector (PID) to monitor influent versus effluent engine vapor concentrations.
- Various system-specific systems to measure system operating parameters (vacuums, flow rates, revolutions per minute [RPM], British Thermal Units [BTUs], etc.).
- Miscellaneous support equipment and tools.

4.0 PILOT TESTING PROTOCOL

4.1 Daily HVR Pilot Testing

The operational protocol for the initial five cycles of daily HVR pilot tests that began on May 9, 2005 was also followed for daily HVR pilot tests conducted on the other wells. This protocol was as follows: upon arriving at a test site, the HVR system was set as near the extraction well as possible, but at a location so as to minimize disruption to traffic flow or an inconvenience to local residences. The area was marked off with traffic cones and/or safety barriers. The extraction well was then opened and gauged for depth to product (DTP) and depth to water (DTW) using an EIP.

The extraction well was capped with a sanitary seal allowing installation of the extraction stinger and ambient air valve. Once all the hoses were in place, the system was started, and optimized for product recovery in the extraction well. Produced media were separated in an onboard knockout tank. Vapors were treated (burned) in the ICE while the liquid product and produced water were temporarily stored in an external storage tank for subsequent transportation to Ecological Systems, Inc. (ESI), Indianapolis, Indiana for blending and beneficial re-use.

During the daily pilot testing, system operating parameters were automatically tracked by an onboard logging system. Vapor recovery was quantified by the logging system based on produced BTUs per hour and other relevant operating parameters. Water and liquid product recovery quantities were quantified manually by gauging the external storage tank with a measuring rod and water-finding paste.

Air samples were collected in SUMMA canisters, packaged, and shipped to Columbia Analytical Services (CAS) in Simi Valley, California. The air samples were analyzed for total petroleum hydrocarbons (TPH) and methane using a modified EPA Method TO-3. Samples were also analyzed for a select list of compounds under EPA Method TO-15. During the sample collection, the influent vapor concentration was monitored with a PID.

Following the completion of the extraction event, the external storage tank was gauged for water and LNAPL quantities. The well was gauged for DTP and DTW for approximately 6 to 8 hours to obtain recharge data on the well. Arrangements were made for the pickup of the fluids from the external tank. The barricades and/or traffic cones were picked up, and the system was demobilized.

4.2 Sequential Daily Pilot Testing

Following completion of the initial five cycles of daily HVR pilot testing described previously, sequential daily HVR pilot tests were conducted for HMW-19, HMW-44C, MP-47C, MP-50C and MP-55C to identify the sustainability of LNAPL production and recharge in these wells, which exhibited moderate to significant LNAPL production and recharge during the initial 5 cycles of daily HVR pilot testing. Sequential daily HVR pilot testing was also performed for HMW-20 to document the limits of LNAPL production and recharge apparently attained during the initial five cycles of daily HVR pilot testing. Sequential daily HVR pilot testing was performed for wells RW-4A and RW-5 to establish baseline and optimal LNAPL production characteristics for these wells prior to conducting the daily and continuous DPE and continuous HVR pilot tests from these two wells. Finally, daily HVR pilot tests were conducted from MP-39C, MP-49C, MP-51D, MP-52C, MP-54C, MP-57C and MP-79C to evaluate LNAPL production and recharge characteristics across areas of the LNAPL plume not previously investigated.

The sequential daily HVR pilot tests were conducted in general accordance with the previously described daily HVR pilot test protocol, though traffic control for the tests at wells RW-4A and RW-5 were not required since these wells are in controlled access space. The skimmer pumps that had been operating at RW-4A and RW-5 were removed prior to initiation of the HVR tests. The fluid recharge in these wells was measured following removal of the skimmer pumps and approximately daily thereafter, prior to initiation of the sequential daily HVR pilot tests in order to ensure documentation of baseline recharge conditions.

4.3 Continuous DPE Pilot Testing

In addition to the various HVR pilot tests that were conducted on RW-4A and RW-5, DPE pilot tests were performed to compare HVR, DPE and skimming from these wells with respect to LNAPL production and recharge rates and radii of influence. Results from these tests were used to calibrate NAPL modeling.

Following completion of the sequential daily and continuous HVR pilot tests from RW-4A and RW-5, the continuous DPE pilot tests were initiated. The wells were allowed to recharge prior to initiating the continuous DPE pilot tests in order to minimize any diminishing LNAPL recharge and production effects that occurred.

Prior to conducting any of the pilot tests, select wells surrounding the extraction well were gauged for product thickness and groundwater levels. The extraction well and four surrounding monitoring wells were equipped with MiniTroll® fluid level pressure transducers and BaroTroll® vacuum transducers to measure piezometric levels (drawdown) and applied well vacuum, which were recorded via automated data loggers. Barometric pressure data was initially obtained from the site's local weather monitoring station, but was augmented with an additional BaroTroll pressure transducer in a protected open area adjacent to RW-5.

To conduct the continuous DPE pilot tests, the extraction well was equipped with a wellhead through which the vacuum hose (stinger) and pump lines, and fluid and pressure transducers were placed. The continuous DPE pilot test was initialized utilizing the ICE system onboard generator to power the downhole submersible pump. The downhole stinger was placed at a very shallow position in the well (<10 feet below TOC) and utilized solely for extraction of vapors / application of vacuum to the well. During the continuous DPE pilot tests, fluid production rates, vacuum measurements and fluid levels were obtained on a closely spaced schedule for the extraction well and select surrounding monitoring wells with transducers. Additional surrounding monitoring wells were measured for vacuum influence periodically and gauged near the conclusion of the tests.

Influent air samples were collected during the pilot tests to confirm vapor recovery rates. The air samples were collected in Summa canisters and analyzed using EPA Methods TO-3 and TO-15.

At the completion of each continuous DPE pilot test, the extraction and selected monitoring wells were monitored to obtain recharge data utilizing the transducers. In addition, for selected wells without transducers, the wellheads were removed, and the wells were gauged for water levels as well as product thickness to determine recharge to the wells.

4.4 Continuous HVR Pilot Testing

In addition to the continuous DPE pilot tests and recharge data collection, continuous HVR pilot tests

from wells RW-4A and RW-5 were conducted according to essentially the same protocol as applied to the continuous DPE pilot tests, with the exception that a downhole stinger was utilized instead of a downhole submersible pump to extract fluids and vapor. Operation was conducted in such a manner as to minimize water and maximize LNAPL production. Operating parameters, fluid production rates and ratios, and select well fluid levels and vacuum data were obtained on essentially the same pumping test schedule as the continuous DPE pilot tests.

5.0 PILOT TESTING RESULTS

5.1 Daily and Sequential Daily HVR Pilot Tests

Daily and sequential daily HVR pilot tests were performed at nineteen wells across the plume in order to characterize hydrocarbon production potential as both LNAPL and vapor, to identify well-specific and plume-wide trends influencing production, and to develop well-specific LNAPL aquifer properties to support the API LNAPL modeling.

5.1.1 Total Hydrocarbon, LNAPL, Vapor and Water Removal by Well

HMW-19

HMW-19 is a 2-inch diameter PVC well located in an alleyway just west of N. Delmar and midway between W. Elm and W. Date Streets near the southwestern boundary of LNAPL occurrence. As detailed in Table 1, 15 HVR pilot test events were conducted for this well, for a total of 123.6 hours of operation between May 23, 2005 and August 23, 2005.

HMW-19							
Hydrocarbon Recovery (gal)			Total Water Recovery (gal)	Average % Hydrocarbon	Total Hydrocarbon Rate of Recovery (gph)		
Total	Vapor Phase	LNAPL Phase			Average	Max	Min
713.4	210.4	503	1,077	39.8%	5.8	9.4	2.1

Hydrocarbon recovery is shown on Figure 1. Water and hydrocarbon production for each individual HVR event is shown on Figure 2. The hydrocarbon rate of recovery is shown on Figure 3.

A comparison of BTU derived vapor production and laboratory sample derived vapor production indicates a reasonably close match between the two methods (Figure 4). The average, minimum and maximum BTUs per hour of influent vapor production from the well are shown on Figure 5. Graphs of engine, stinger and well casing vacuums and fuel flow, air flow and well flow in SCFM are provided as Figure 6 and Figure 7. Figure 8 (HC with 3 elevs v water and LNAPL production graph) shows the range of operating stinger depths and water and LNAPL production versus the well screen elevation, top of LNAPL elevation and top of water elevation. Various operational parameters for the events, including stinger and well casing vacuums versus groundwater and hydrocarbon production; and stinger immersion (as a percentage of LNAPL thickness) and wellhead air dilution valve settings versus water and LNAPL production are provided as Figure 9 and Figure 10. LNAPL recharge graphs as a percentage of the pre-HVR event LNAPL thickness and in feet of LNAPL are provided as Figure 11 and Figure 12. A production hydro-stratigraph showing top of LNAPL and water elevations, top of well screen elevation, stratigraphic contacts and types versus hydrocarbon production is provided as Figure 13. Daily pilot test summary pages providing a concise record of production, operating parameters, and water and LNAPL recharge for each day of operation are provided in Attachment A.

An analysis of the various production, operating, and recharge graphs for this well indicates the following trends:

- A scatter plot of depth to top of LNAPL versus LNAPL thickness indicates conformance with the Dual Optimal LNAPL Response (DOLR) model described in Section 6.0 for the site as LNAPL thicknesses initially decrease with increasing depth then increase again (Figure 14).
- The well exhibited a relatively consistent rate of recovery overall, but with small scale production declines over time, which suggests the sustainable production rate during continuous pumping might be lower.
- During initial HVR events (HVR 01 through HVR 07) this well produced substantially greater quantities of hydrocarbon than groundwater (with the exception of HVR 04 and HVR 05, where a much lower stinger depth resulted in the production of greater quantities of groundwater). However, during the remaining events (HVR 08 through HVR 15) the well produced slightly more groundwater than hydrocarbon.
- The well generally recharged to approximately 90% of original product thickness within 2 hours.
- The Production Hydro-Stratigraph clearly exhibits the dual LNAPL thickness increase trend common to the site. In approximately June 2005 the LNAPL was confined by the overlying silt layer and consequently LNAPL thickness increased. Subsequently, from July through September, fluid levels in the well dropped 2+ feet below the confining layer and exhibited the more “normal” trend of increasing LNAPL thickness with decreasing fluid elevations. A technical explanation of these trends is provided in Section 6.0.

- Hydrocarbon production rates generally increased with increased periods of LNAPL thickness, though conformance was not perfect. In general, hydrocarbon production was maximized under either of two aquifer conditions: slightly confining conditions or unconfined conditions when approximately two feet or more of separation existed below the base of the confining layer and the top of LNAPL.

HMW-20

HMW-20 is a 2-inch diameter PVC well located in an alleyway just east of N. Market Street and midway between E. Elm and E. Forest Streets at the southeastern boundary of LNAPL occurrence. As detailed in Table 1, six HVR pilot test events were conducted from this well for a total of 44.5 hours of operation between May 16, 2005 and October 26, 2005.

HMW-20							
Hydrocarbon Recovery (gal)			Total Water Recovery (gal)	Average % Hydrocarbon	Total Hydrocarbon Rate of Recovery (gph)		
Total	Vapor Phase	LNAPL Phase			Average	Max	Min
74.1	34.1	40	5,925	1.2%	1.7	3.6	0.6

Hydrocarbon recovery is shown on Figure 15. Water and hydrocarbon production for each individual HVR event is shown on Figure 16. The hydrocarbon rate of recovery is shown on Figure 17.

A comparison of BTU derived vapor production and laboratory sample derived vapor production indicates a reasonably close match between the two methods (Figure 18). The average, minimum and maximum BTUs per hour of influent vapor production from the well are shown on Figure 19. Graphs of engine, stinger and well casing vacuums and fuel flow, air flow and well flow in SCFM are provided as Figure 20 and Figure 21. Figure 22 (HC with 3 elevs v water and LNAPL production graph) shows the range of operating stinger depths and water and LNAPL production versus the well screen elevation, top of LNAPL elevation and top of water elevation. Various operational parameters for the events, including stinger and well casing vacuums versus groundwater and hydrocarbon production; and stinger immersion (as a percentage of LNAPL thickness) and wellhead air dilution valve settings versus water and LNAPL production are provided as Figure 23 and Figure 24. LNAPL recharge graphs as a percentage of the pre-HVR event LNAPL thickness and in feet of LNAPL are provided as Figure 25 and Figure 26. A production hydro-stratigraph showing top of LNAPL and water elevations, top of well screen elevation, stratigraphic contacts and types versus hydrocarbon production is provided as Figure 27. Daily pilot test

summary pages providing a concise record of production, operating parameters, and water and LNAPL recharge for each day of operation are provided in Attachment A.

An analysis of the various production, operating, and recharge graphs for this well indicates the following trends:

- A scatter plot of depth to top of LNAPL versus LNAPL thickness indicates a relatively clear linear trend of decreasing LNAPL thickness with increasing depth as fluid levels drop in the well, but complex outliers occur in the data set (Figure 28).
- Product recovery rates were variable.
- The well produced significantly more groundwater than hydrocarbon.
- Recharge was poor, averaging less than 50% of original product thickness after 7 hours.
- The production hydro-stratigraph for HMW-20 clearly shows the continuous confining conditions for fluids in the well. Moreover, unlike HMW-19, HMW-44C and other wells with partial confining conditions from silt layers, the confining layer for HMW-20 is clay. Furthermore, the fluid piezometric levels are higher into the confining layer in this well than is typical in other wells.
- HMW-20 does exhibit the expected increase in LNAPL thickness as a result of the confining conditions. However, because the LNAPL/water interface piezometric surface is above the base of the confining clay, LNAPL does not recharge into the well quickly after it has been removed.
- The initial HVR event exhibited the highest recovery rate, in all probability because it was the first event and the maximum available mobile hydrocarbon was present. Subsequent HVR events during confining conditions appeared to deplete much of the available mobile hydrocarbon as evidenced by the reduced recoveries during these events and the failure of the well to recharge to pre-HVR event levels.
- However, as fluid levels across the site dropped, the LNAPL/water interface dropped below the base of the confining layer. LNAPL was thereby able to enter the well more easily, and the result was the second highest HVR event production rate.
- This data confirms the hypothesis that large LNAPL thicknesses do not necessarily translate into large LNAPL recoveries, but also demonstrates that well and formation conditions must be understood in order to predict and explain the observed relationship between LNAPL thickness and hydrocarbon production.
- Optimal conditions for hydrocarbon extraction from HMW-20 appear to occur when the LNAPL/water interface is below the base of the confining clay, but the LNAPL itself is still partially confined by the clay. These conditions provide a force to drive LNAPL into the well for recovery while also allowing open migration pathways into the well for the LNAPL.

HMW-44C

HMW-44C is a 2-inch diameter PVC well located along N. Olive Street midway between E. Elm and E.

Forest Streets at the southeastern edge of the study area. As detailed in Table 1, 17 HVR pilot test events were conducted from this well for a total of 137.0 hours of operation between May 13, 2005 and November 4, 2005.

HMW-44C							
Hydrocarbon Recovery (gal)			Total Water Recovery (gal)	Average % Hydrocarbon	Total Hydrocarbon Rate of Recovery (gph)		
Total	Vapor Phase	LNAPL Phase			Average	Max	Min
3,274.6	252.6	3,022.0	2,334	58.4%	23.9	29.3	11.9

Hydrocarbon recovery is shown on Figure 29. Water and hydrocarbon production for each individual HVR event is shown on Figure 30. The hydrocarbon rate of recovery is shown on Figure 31.

A comparison of BTU derived vapor production and laboratory sample derived vapor production indicates a reasonably close match between the two methods (Figure 32). The average, minimum and maximum BTUs per hour of influent vapor production from the well are shown on Figure 33. Graphs of engine, stinger and well casing vacuums and fuel flow, air flow and well flow in SCFM are provided as Figure 34 and Figure 35. Figure 36 (HC with 3 elevs v water and LNAPL production graph) shows the range of operating stinger depths and water and LNAPL production versus the well screen elevation, top of LNAPL elevation and top of water elevation. Various operational parameters for the events, including stinger and well casing vacuums versus groundwater and hydrocarbon production; and stinger immersion (as a percentage of LNAPL thickness) and wellhead air dilution valve settings versus water and LNAPL production are provided as Figure 37 and Figure 38. LNAPL recharge graphs as a percentage of the pre-HVR event LNAPL thickness and in feet of LNAPL are provided as Figure 39 and Figure 40. A production hydro-stratigraph showing top of LNAPL and water elevations, top of well screen elevation, stratigraphic contacts and types versus hydrocarbon production is provided as Figure 41. Daily pilot test summary pages providing a concise record of production, operating parameters, and water and LNAPL recharge for each day of operation are provided in Attachment A.

An analysis of the various production, operating, and recharge graphs for this well indicates the following trends:

- A scatter plot of depth to top of LNAPL versus LNAPL thickness indicates an LNAPL thickness

trend in general conformance with the Dual Optimal LNAPL Response model for the site as LNAPL thickness initially decreases with increasing depth then increases as fluid levels drop in the well (Figure 42).

- Cumulative data indicate a consistently very high rate of product recovery over time with a slight decrease in successive production rates during the sequential daily HVR events. HMW-44C exhibited by far the highest hydrocarbon production rates of any of the wells tested.

- Generally the well tended to produce substantially more hydrocarbon than groundwater, with a few notable exceptions (HVR 08 through HVR 10).

- The well consistently recharged quickly, to 90% to 100% of original product thickness within 1 hour.

- The production hydro-stratigraph for HMW-44C identifies the presence of an “additional” sand layer above the Main Sand in which fluids primarily occur. An overlying clay layer rarely provides very slight confining conditions for the LNAPL.

- The greatest LNAPL thickness in this well during HVR pilot testing occurred during the slight confining conditions identified above (June 2005). Maximum hydrocarbon production rates appear to occur during periods of maximum LNAPL thickness.

- LNAPL production did decline slightly during sequential daily HVR pilot testing performed at this well from over 200 gallons per day to approximately 180 gallons per day. However, this decline coincided with a steady drop in fluid elevations and associated drop in LNAPL thickness. The production reduction is likely related to the drop in fluid elevations, rather than being due to a significant reduction in available mobile hydrocarbon in the well vicinity by the HVR events.

- The unconfined limb of the LNAPL thickness increase curve is not readily observable in the production hydro-stratigraph for this well as fluid levels dropped. The presence of a stratigraphic boundary (silty sand [SM] to sand [SP]) may have affected the manifestation of this trend.

HMW-48C

HMW-48C is a 2-inch diameter PVC well located along N. Olive Street midway between E. Rand Avenue and E. Birch Street at the northeastern edge of the study area. As detailed in Table 1, five HVR pilot test events were conducted from this well for a total of 39.2 hours of operation between May 20, 2005 and July 21, 2005.

HMW-48C							
Hydrocarbon Recovery (gal)			Total Water Recovery (gal)	Average % Hydrocarbon	Total Hydrocarbon Rate of Recovery (gph)		
Total	Vapor Phase	LNAPL Phase			Average	Max	Min
80.1	16.6	63.5	2,238	3.5%	2.0	4.0	1.1

Hydrocarbon recovery is shown on Figure 43. Water and hydrocarbon production for each individual HVR event is shown on Figure 44. The hydrocarbon rate of recovery is shown on Figure 45.

A comparison of BTU derived vapor production and laboratory sample derived vapor production indicates a fair match between the two methods (Figure 46). The average, minimum and maximum BTUs per hour of influent vapor production from the well are shown on Figure 47. Graphs of engine, stinger and well casing vacuums and fuel flow, air flow and well flow in SCFM are provided as Figure 48 and Figure 49. Figure 50 (HC with 3 elevs v water and LNAPL production graph) shows the range of operating stinger depths and water and LNAPL production versus the well screen elevation, top of LNAPL elevation and top of water elevation. Various operational parameters for the events, including stinger and well casing vacuums versus groundwater and hydrocarbon production; and stinger immersion (as a percentage of LNAPL thickness) and wellhead air dilution valve settings versus water and LNAPL production are provided as Figure 51 and Figure 52. LNAPL recharge graphs as a percentage of the pre-HVR event LNAPL thickness and in feet of LNAPL are provided as Figure 53 and Figure 54. A production hydro-stratigraph showing top of LNAPL and water elevations, top of well screen elevation, stratigraphic contacts and types versus hydrocarbon production is provided as Figure 55. Daily pilot test summary pages providing a concise record of production, operating parameters, and water and LNAPL recharge for each day of operation are provided in Attachment A.

An analysis of the various production, operating, and recharge graphs for this well indicates the following trends:

- A scatter plot of depth to top of LNAPL versus LNAPL thickness indicates an LNAPL thickness trend in probable conformance with the Dual Optimal LNAPL Response model with initially decreasing LNAPL thickness followed by increasing LNAPL thickness with increasing depth as fluid levels drop in the well (Figure 56). However, the early portion of the data set is incomplete.

- Product recovery rates were variable.
- Groundwater production was consistently more than an order of magnitude greater than hydrocarbon production in part because fluid levels were above the well screen and stinger depths during HVR operation were greater than other wells in order to expose the screen and allow LNAPL and airflow entry.
- Recharge was variable but slow, typically taking at least 4 hours to reach 50% of original product thickness.
- The production hydro-stratigraph for HMW-48C clearly identifies both the significant confining fluid conditions for this well and submersion of the screen.
- The confining layer in this well is clay. The top of fluid piezometric surface is above the top of the clay. However, the LNAPL/water interface varies from within, to above, to below the base of the confining clay.
- As observed in HMW-20, the significant confining conditions produced increased LNAPL thicknesses, but the LNAPL did not readily recharge to pre-HVR event levels, likely due to restricted mobility pathways for the LNAPL.
- Significant drawdown of fluid to expose the well-screen did result in significant hydrocarbon production. The highest rate of hydrocarbon production occurred during a relatively thin LNAPL thickness time period when the HVR system was operated with the stinger at a stinger immersion percentage (relative to LNAPL thickness) of approximately 900%. Hydrocarbon production was approximately double the production during other HVR events with lower stinger immersion percentages.
- Subsequent to the final HVR event in July, fluid levels dropped until the LNAPL/water interface is below the base of the confining clay but the LNAPL is still confined. The conceptual model for LNAPL recovery for this site would suggest that this represents optimum conditions for LNAPL production from this well.

MP-29D

MP-29D is a 2-inch diameter PVC well located along N. Market Street just northeast of its intersection with E. Birch Street in the northeastern portion of the study area. As detailed in Table 1, five HVR pilot test events were conducted from this well for a total of 37.4 hours of operation between May 11, 2005 and July 11, 2005.

MP-29D							
Hydrocarbon Recovery (gal)			Total Water Recovery (gal)	Average % Hydrocarbon	Total Hydrocarbon Rate of Recovery (gph)		
Total	Vapor Phase	LNAPL Phase			Average	Max	Min
170.2	19.5	150.7	6.757	2.5%	4.5	11.5	1.4

Hydrocarbon recovery is shown on Figure 57. Water and hydrocarbon production for each individual HVR event is shown on Figure 58. The hydrocarbon rate of recovery is shown on Figure 59.

A comparison of BTU derived vapor production and laboratory sample derived vapor production indicates a reasonably close match between the two methods (Figure 60). The average, minimum and maximum BTUs per hour of influent vapor production from the well are shown on Figure 61. Graphs of engine, stinger and well casing vacuums and fuel flow, air flow and well flow in SCFM are provided as Figure 62 and Figure 63. Figure 64 (HC with 3 elevs v water and LNAPL production graph) shows the range of operating stinger depths and water and LNAPL production versus the well screen elevation, top of LNAPL elevation and top of water elevation. Various operational parameters for the events, including stinger and well casing vacuums versus groundwater and hydrocarbon production; and stinger immersion (as a percentage of LNAPL thickness) and wellhead air dilution valve settings versus water and LNAPL production are provided as Figure 65 and Figure 66. LNAPL recharge graphs as a percentage of the pre-HVR event LNAPL thickness and in feet of LNAPL are provided as Figure 67 and Figure 68. A production hydro-stratigraph showing top of LNAPL and water elevations, top of well screen elevation, stratigraphic contacts and types versus hydrocarbon production is provided as Figure 69. Daily pilot test summary pages providing a concise record of production, operating parameters, and water and LNAPL recharge for each day of operation are provided in Attachment A.

An analysis of the various production, operating, and recharge graphs for this well indicates the following trends:

- A scatter plot of depth to top of LNAPL versus LNAPL thickness indicates conformance with the Dual Optimal LNAPL Response model for the site as LNAPL thickness initially decreases with increasing depth then increases as fluid levels drop in the well (Figure 70).
- Rates of product recovery were inconsistent, varying by approximately an order of magnitude.
- Groundwater production was consistently much greater than hydrocarbon production in part because fluid levels were above the well screen requiring greater stinger depths during HVR operations to expose the screen and allow LNAPL and airflow entry.
- Recharge was quite slow, typically 10% or less of original product thickness after 7 hours.
- The production hydro-stratigraph for MP-29D demonstrates the confining conditions that existed throughout HVR pilot testing duration. The confining layer is silt. The screen was submerged. The confining conditions resulted in increased LNAPL thickness in the well, as predicted by the site LNAPL distribution, occurrence and recovery model.

- Hydrocarbon production was generally low and water production was generally high with the exception of event HVR-03 on June 8, 2005. During this event, the LNAPL/water interface was below the base of the confining silt and the stinger was set near the top of the LNAPL. As noted in other wells, this provided optimum conditions for hydrocarbon recovery as the LNAPL was under confining pressure to move into the well and the LNAPL/water interface was below the screen allowing ready migration of LNAPL into the well for removal. This resulted in the highest hydrocarbon production rate from this well, more than double the next closest event.

- Subsequent to the last HVR event in July 2005, fluid levels dropped in the well such that unconfined conditions have existed in this well from August through October of 2005. As the fluid levels dropped and the unconfined conditions developed, the second limb of the LNAPL thickness increase trend (the unconfined portion) manifested with a significant increase in LNAPL thickness in the well.

- The unconfined LNAPL thickness increase zone may represent a period of optimal hydrocarbon production from the well as observed under similar conditions in other wells at the site.

MP-39C

MP-39C is a 2-inch diameter PVC well located in an alleyway just east of Old St. Louis and Alton Road and midway between W. Cherry and W. Date Streets near the western boundary of LNAPL occurrence. As detailed in Table 1, one HVR pilot test event was conducted from this well for a total of 8.2 hours of operation on October 24, 2005.

MP-39C							
Hydrocarbon Recovery (gal)			Total Water Recovery (gal)	Average % Hydrocarbon	Total Hydrocarbon Rate of Recovery (gph)		
Total	Vapor Phase	LNAPL Phase			Average	Max	Min
18.2	13.2	5.0	126	12.6%	2.2	N/M	N/M

Hydrocarbon recovery is shown on Figure 71. The hydrocarbon rate of recovery is shown on Figure 72.

A comparison of BTU derived vapor production and laboratory sample derived vapor production indicates a good match between the two methods (Figure 73). Various operational parameters for the events, including stinger and well casing vacuums versus groundwater and hydrocarbon production; and stinger immersion (as a percentage of LNAPL thickness) and wellhead air dilution valve settings versus water and LNAPL production are provided as Figure 74 and Figure 75. LNAPL recharge graphs as a percentage of the pre-HVR event LNAPL thickness and in feet of LNAPL are provided as Figure 76 and Figure 77. A production hydro-stratigraph showing top of LNAPL and water elevations, top of well screen

elevation, stratigraphic contacts and types versus hydrocarbon production is provided as Figure 78. Daily pilot test summary pages providing a concise record of production, operating parameters, and water and LNAPL recharge for each day of operation are provided in Attachment A.

An analysis of the various production, operating, and recharge graphs for this well indicates the following trends:

- A scatter plot of depth to top of LNAPL versus LNAPL thickness indicates apparent inconsistency with the Dual Optimal LNAPL Response model as LNAPL thicknesses initially increase with increasing depth then decrease as fluid levels drop in the well (Figure 79). However, an examination of the data points suggests that the well is consistent with the model but has a limited data set that does not encompass the initial confined condition leg.
- The well produced substantially more groundwater than hydrocarbon during the one event conducted.
- Recharge was slow, approximately 20% to 40% of original product thickness after 4 hours.
- The production hydro-stratigraph for this single-HVR event well is not available due to insufficient gauging data.

MP-47C

MP-47C is a 2-inch diameter PVC well located along E. Date Street just west of its intersection with N. Olive Street near the eastern boundary of the study area. As detailed in Table 1, seven HVR pilot test events were conducted from this well for a total of 50.3 hours of operation between May 9, 2005 and October 25, 2005.

MP-47C							
Hydrocarbon Recovery (gal)			Total Water Recovery (gal)	Average % Hydrocarbon	Total Hydrocarbon Rate of Recovery (gph)		
Total	Vapor Phase	LNAPL Phase			Average	Max	Min
278.6	94.1	184.5	3,449	7.5%	5.5	8.6	2.7

Hydrocarbon recovery is shown on Figure 80. Water and hydrocarbon production for each individual HVR event is shown on Figure 81. The hydrocarbon rate of recovery is shown on Figure 82.

A comparison of BTU derived vapor production and laboratory sample derived vapor production indicates a reasonably close match between the two methods (Figure 83). The average, minimum and maximum

BTUs per hour of influent vapor production from the well are shown on Figure 84. Graphs of engine, stinger and well casing vacuums and fuel flow, air flow and well flow in SCFM are provided as Figure 85 and Figure 86. Figure 87 (HC with 3 elevs v water and LNAPL production graph) shows the range of operating stinger depths and water and LNAPL production versus the well screen elevation, top of LNAPL elevation and top of water elevation. Various operational parameters for the events, including stinger and well casing vacuums versus groundwater and hydrocarbon production; and stinger immersion (as a percentage of LNAPL thickness) and wellhead air dilution valve settings versus water and LNAPL production are provided as Figure 88 and Figure 89. LNAPL recharge graphs as a percentage of the pre-HVR event LNAPL thickness and in feet of LNAPL are provided as Figure 90 and Figure 91. A production hydro-stratigraph showing top of LNAPL and water elevations, top of well screen elevation, stratigraphic contacts and types versus hydrocarbon production is provided as Figure 92. Daily pilot test summary pages providing a concise record of production, operating parameters, and water and LNAPL recharge for each day of operation are provided in Attachment A.

An analysis of the various production, operating, and recharge graphs for this well indicates the following trends:

- A scatter plot of depth to top of LNAPL versus LNAPL thickness indicates conformity with the Dual Optimal LNAPL Response model for the site as LNAPL thicknesses initially decrease, then increase then decrease again with increasing depth as fluid levels drop in the well (Figure 93).
- Product recovery rates exhibited significant variability, directly tied to fluid elevations and LNAPL thickness increases.
- The well almost always produced more groundwater than hydrocarbon, but by varying amounts – ranging from approximately twice as much to approximately 50 times as much.
- Recharge was generally good, typically 80% to 90% of original product thickness after 2 hours.
- The production hydro-stratigraph for MP-47C exhibits general conformance with the Dual Optimal LNAPL Response model for the site. During initial HVR events from this well, the top of LNAPL was slightly below the base of the subsequent confining silt layer. This intermediate zone between confined and unconfined conditions typically represents a lower hydrocarbon production zone from the wells and the production during the early events reflected this. Subsequently, fluid levels rose slightly, the LNAPL underwent confining conditions but the LNAPL/water interface was below the confining layer and optimal hydrocarbon production conditions developed as reflected in HVR-05, which exhibited the highest hydrocarbon production rate from this well. Fluid levels then dropped and HVR-06 occurred during the intermediate period of hydrocarbon production, resulting in a lower hydrocarbon removal rate. Fluid levels continued to drop, LNAPL thicknesses increased, and HVR-07 was conducted during this unconfined portion of the dual-optimal LNAPL production model. HVR-07 exhibited the second highest rate of hydrocarbon removal, nearly identical to the removal in HVR-05 under confined conditions.

MP-49C

MP-49C is a 2-inch diameter PVC well located along N. Delmar Avenue just south of its intersection with W. Date Street near the southwestern boundary of LNAPL occurrence. As detailed in Table 1, one HVR pilot test event was conducted from this well for a total of 7.9 hours of operation on November 3, 2005.

MP-49C							
Hydrocarbon Recovery (gal)			Total Water Recovery (gal)	Average % Hydrocarbon	Total Hydrocarbon Rate of Recovery (gph)		
Total	Vapor Phase	LNAPL Phase			Average	Max	Min
15.8	13.9	2.0	181	8.1%	2.0	N/M	N/M

Water and hydrocarbon production for each individual HVR event is shown on Figure 94. The hydrocarbon rate of recovery is shown on Figure 95.

Various operational parameters for the events, including stinger and well casing vacuums versus groundwater and hydrocarbon production; and stinger immersion (as a percentage of LNAPL thickness) and wellhead air dilution valve settings versus water and LNAPL production are provided as Figure 96 and Figure 97. LNAPL recharge graphs as a percentage of the pre-HVR event LNAPL thickness and in feet of LNAPL are provided as Figure 98 and Figure 99. Daily pilot test summary pages providing a concise record of production, operating parameters, and water and LNAPL recharge for each day of operation are provided in Attachment A.

An analysis of the various production, operating, and recharge graphs for this well indicates the following trends:

- A scatter plot of depth to top of LNAPL versus LNAPL thickness indicates conformity with the Dual Optimal LNAPL Response model for the site as LNAPL thicknesses initially decrease then increase then decrease again with increasing depth as fluid levels drop in the well (Figure 100).
- The well produced significantly more groundwater than hydrocarbon in the one HVR event that was conducted.
- Recharge was slow, ranging from <5 to 40 percent after 7 to 8 hours.
- The production hydro-stratigraph for this single-HVR event well is not available due to insufficient gauging data.

MP-50C

MP-50C is a 2-inch diameter PVC well located along N. Market Street just south of its intersection with E. Date Street near the southern boundary of LNAPL occurrence. As detailed in Table 1, nine HVR pilot test events were conducted from this well for a total of 69.5 hours of operation between May 12, 2005 and August 29, 2005.

MP-50C							
Hydrocarbon Recovery (gal)			Total Water Recovery (gal)	Average % Hydrocarbon	Total Hydrocarbon Rate of Recovery (gph)		
Total	Vapor Phase	LNAPL Phase			Average	Max	Min
472.2	112.7	359.5	7,437	6%	6.8	35.9	1.9

Hydrocarbon recovery is shown on Figure 101. Water and hydrocarbon production for each individual HVR event is shown on Figure 102. The hydrocarbon rate of recovery is shown on Figure 103.

A comparison of BTU derived vapor production and laboratory sample derived vapor production indicates a good match between the two methods (Figure 104). The average, minimum and maximum BTUs per hour of influent vapor production from the well are shown on Figure 105. Graphs of engine, stinger and well casing vacuums and fuel flow, air flow and well flow in SCFM are provided as Figure 106 and Figure 107. Figure 108 (HC with 3 elevs v water and LNAPL production graph) shows the range of operating stinger depths and water and LNAPL production versus the well screen elevation, top of LNAPL elevation and top of water elevation. Various operational parameters for the events, including stinger and well casing vacuums versus groundwater and hydrocarbon production; and stinger immersion (as a percentage of LNAPL thickness) and wellhead air dilution valve settings versus water and LNAPL production are provided as Figure 109 and Figure 110. LNAPL recharge graphs as a percentage of the pre-HVR event LNAPL thickness and in feet of LNAPL are provided as Figure 111 and Figure 112. A production hydro-stratigraph showing top of LNAPL and water elevations, top of well screen elevation, stratigraphic contacts and types versus hydrocarbon production is provided as Figure 113. Daily pilot test summary pages providing a concise record of production, operating parameters, and water and LNAPL recharge for each day of operation are provided in Attachment A.

An analysis of the various production, operating, and recharge graphs for this well indicates the following trends:

- A scatter plot of depth to top of LNAPL versus LNAPL thickness indicates a clear trend of decreasing LNAPL thickness with increasing depth then increasing LNAPL thickness as fluid levels drop in the well (Figure 114).

- Rates of product recovery were fairly consistent with the exception of one event, which exhibited a recovery rate almost an order of magnitude higher. This one event was the single highest hydrocarbon recovery rate attained during any of the pilot tests, but it could not be duplicated from this well.

- Groundwater production typically exceeded hydrocarbon production by one to two orders of magnitude.

- Recharge was generally consistent, to approximately 90% of original product thickness after 2 hours, with two notable exceptions of quite slow recharge (5% to 35% after 4 hours, 15% to 75% after 7 hours).

- The production hydro-stratigraph for MP-50C demonstrates the Dual Optimal LNAPL Response model for the site, with some variation in the unconfined production rate. Early HVR events were conducted in the low production zone immediately below the confining clay layer. HVR-03 was conducted just as confining conditions were developing, the LNAPL/water interface was below the base of the confining layer, and LNAPL thickness was increasing. A very shallow stinger immersion percentage of negative 80% (stinger above the top of LNAPL) was utilized. The combination of optimal confined fluids and negative stinger resulted in the highest hydrocarbon production rate from any HVR event or well at the site. However, a subsequent HVR event during confined conditions did not result in optimal recovery. Moreover, as the fluid levels declined and LNAPL thickness increased in the unconfined portion of the Dual Optimal LNAPL Response Model, hydrocarbon production from the well still remained at low levels. The failure of this well to respond as the model predicts is not clearly understood at this time. However, the failure of the well to recharge quickly from HVR-06 and HVR-07 on August 24-25, 2005 during unconfined conditions with large LNAPL thickness may be indicative of a formation or LNAPL distribution limitation on mobility that restricts recovery.

- Optimal conditions for hydrocarbon recovery from MP-50C appear to occur only during the confining phase of the Dual Optimal LNAPL Response Model, even though the unconfined phase exhibits the expected LNAPL thickness increase.

MP-51D

MP-51D is a 2-inch diameter PVC well located in an alleyway east of N. Market Street midway between E. Elm and E. Date Streets in the southeastern portion of the study area. As detailed in Table 1, one HVR pilot test event was conducted from this well for a total of 8.1 hours of operation on November 1, 2005.

MP-51D							
Hydrocarbon Recovery (gal)			Total Water Recovery (gal)	Average % Hydrocarbon	Total Hydrocarbon Rate of Recovery (gph)		
Total	Vapor Phase	LNAPL Phase			Average	Max	Min
17.2	9.4	7.8	343	4.8%	2.1	N/M	N/M

Water and hydrocarbon production for each individual HVR event is shown on Figure 115. The hydrocarbon rate of recovery is shown on Figure 116.

Various operational parameters for the events, including stinger and well casing vacuums versus groundwater and hydrocarbon production; and stinger immersion (as a percentage of LNAPL thickness) and wellhead air dilution valve settings versus water and LNAPL production are provided as Figure 117 and Figure 118. LNAPL recharge graphs as a percentage of the pre-HVR event LNAPL thickness and in feet of LNAPL are provided as Figure 119 and Figure 120. Daily pilot test summary pages providing a concise record of production, operating parameters, and water and LNAPL recharge for each day of operation are provided in Attachment A.

An analysis of the various production, operating, and recharge graphs for this well indicates the following trends:

- A scatter plot of depth to top of LNAPL versus LNAPL thickness indicates a decreasing/increasing/decreasing trend in conformance with the Dual Optimal LNAPL Response model (Figure 121).
- Groundwater production exceeded hydrocarbon production by approximately an order of magnitude in the one HVR event conducted.
- Recharge was fairly slow, reaching 100% of original product thickness after 6 hours.
- The production hydro-stratigraph for this single-HVR event well is not available due to insufficient gauging data.

MP-52C

MP-52C is a 2-inch diameter PVC well located along N. Market Street just north of its intersection with Elm Street near the southern boundary of LNAPL occurrence. As detailed in Table 1, one HVR pilot test

event was conducted from this well for a total of 8.0 hours of operation on October 31, 2005.

MP-52C							
Hydrocarbon Recovery (gal)			Total Water Recovery (gal)	Average % Hydrocarbon	Total Hydrocarbon Rate of Recovery (gph)		
Total	Vapor Phase	LNAPL Phase			Average	Max	Min
16.9	14.0	3.0	212	7.4%	2.1	N/M	N/M

Water and hydrocarbon production for each individual HVR event is shown on Figure 122. The hydrocarbon rate of recovery is shown on Figure 123.

Various operational parameters for the events, including stinger and well casing vacuums versus groundwater and hydrocarbon production; and stinger immersion (as a percentage of LNAPL thickness) and wellhead air dilution valve settings versus water and LNAPL production are provided as Figure 124 and Figure 125. LNAPL recharge graphs as a percentage of the pre-HVR event LNAPL thickness and in feet of LNAPL are provided as Figure 126 and Figure 127. Daily pilot test summary pages providing a concise record of production, operating parameters, and water and LNAPL recharge for each day of operation are provided in Attachment A.

An analysis of the various production, operating, and recharge graphs for this well indicates the following trends:

- A scatter plot of depth to top of LNAPL versus LNAPL thickness indicates clear conformance with the Dual Optimal LNAPL Response model as LNAPL thicknesses trend downward initially with increasing depth then upward as fluid levels drop in the well (Figure 128).
- Groundwater production exceeded hydrocarbon production by approximately an order of magnitude in the one HVR event conducted.
- Recharge was quite slow (5% after 6 hours).
- The production hydro-stratigraph for this single-HVR event well is not available due to insufficient gauging data.

MP-53C

MP-53C is a 2-inch diameter PVC well located along E. Elm Street midway between N. Market and N.

Olive Streets near the southeastern boundary of LNAPL occurrence. As detailed in Table 1, five HVR pilot test events were conducted from this well for a total of 37.3 hours of operation between May 17, 2005 and July 19, 2005.

MP-53C							
Hydrocarbon Recovery (gal)			Total Water Recovery (gal)	Average % Hydrocarbon	Total Hydrocarbon Rate of Recovery (gph)		
Total	Vapor Phase	LNAPL Phase			Average	Max	Min
185.1	60.0	125.0	4,592	3.9%	5.0	8.6	2.4

Hydrocarbon recovery is shown on Figure 129. Water and hydrocarbon production for each individual HVR event is shown on Figure 130. The hydrocarbon rate of recovery is shown on Figure 131.

A comparison of BTU derived vapor production and laboratory sample derived vapor production indicates a reasonably close match between the two methods (Figure 132). The average, minimum and maximum BTUs per hour of influent vapor production from the well are shown on Figure 133. Graphs of engine, stinger and well casing vacuums and fuel flow, air flow and well flow in SCFM are provided as Figure 134 and Figure 135. Figure 136 (HC with 3 elevs v water and LNAPL production graph) shows the range of operating stinger depths and water and LNAPL production versus the well screen elevation, top of LNAPL elevation and top of water elevation. Various operational parameters for the events, including stinger and well casing vacuums versus groundwater and hydrocarbon production; and stinger immersion (as a percentage of LNAPL thickness) and wellhead air dilution valve settings versus water and LNAPL production are provided as Figure 137 and Figure 138. LNAPL recharge graphs as a percentage of the pre-HVR event LNAPL thickness and in feet of LNAPL are provided as Figure 139 and Figure 140. A production hydro-stratigraph showing top of LNAPL and water elevations, top of well screen elevation, stratigraphic contacts and types versus hydrocarbon production is provided as Figure 141. Daily pilot test summary pages providing a concise record of production, operating parameters, and water and LNAPL recharge for each day of operation are provided in Attachment A.

An analysis of the various production, operating, and recharge graphs for this well indicates the following trends:

- A scatter plot of depth to top of LNAPL versus LNAPL thickness indicates a cyclical

decrease/increase/decrease/increase in LNAPL thickness with increasing depth as fluid levels drop in the well (Figure 142).

- Rates of hydrocarbon recovery were variable over time, with the maximum rate occurring in HVR02, with a general decrease in production thereafter.
- Groundwater production exceeded hydrocarbon production by approximately one to two orders of magnitude.
- This well exhibited complex recharge characteristics. In two events, recharge was fairly good (to 80% to 90% of original product thickness after 4 hours). However, in one event recharge was extremely poor, and in the remaining two events the well exhibited ”step recharge” characteristics.
- The production hydro-stratigraph for MP-53C demonstrates that this well rarely encountered confining conditions from an overlying silt layer. LNAPL thickness variations tracked the Dual Optimal LNAPL Response model expectations, with larger thicknesses under slight confining conditions in June 2005 followed by a decrease in LNAPL thickness as fluid levels dropped then a corresponding increase in LNAPL thickness as fluids continued to drop under unconfined conditions. Hydrocarbon production in general tracks the model but does not track perfectly with model expectations, possibly related to variations in the operational parameters of the HVR system during the pilot tests.
- Optimal conditions for hydrocarbon production from MP-53C may occur closer to the base of the overlying confining layer than in other wells at the site as evidenced by the significantly higher hydrocarbon production from HVR-02 on June 1, 2005.

MP-54C

MP-54C is a 2-inch diameter PVC well located along E. Elm Street midway between N. Market and N. Olive Streets near the southeastern boundary of LNAPL occurrence. As detailed in Table 1, one HVR pilot test event was conducted from this well for a total of 8.1 hours of operation on November 2, 2005.

MP-54C							
Hydrocarbon Recovery (gal)			Total Water Recovery (gal)	Average % Hydrocarbon	Total Hydrocarbon Rate of Recovery (gph)		
Total	Vapor Phase	LNAPL Phase			Average	Max	Min
7.4	4.4	3.0	345	2.1%	0.9	N/M	N/M

Water and hydrocarbon production for each individual HVR event is shown on Figure 143. The hydrocarbon rate of recovery is shown on Figure 144.

Various operational parameters for the events, including stinger and well casing vacuums versus groundwater and hydrocarbon production; and stinger immersion (as a percentage of LNAPL thickness) and wellhead air dilution valve settings versus water and LNAPL production are provided as Figure 145 and Figure 146. LNAPL recharge graphs as a percentage of the pre-HVR event LNAPL thickness and in feet of LNAPL are provided as Figure 147 and Figure 148. Daily pilot test summary pages providing a concise record of production, operating parameters, and water and LNAPL recharge for each day of operation are provided in Attachment A.

An analysis of the various production, operating, and recharge graphs for this well indicates the following trends:

- A scatter plot of depth to top of LNAPL versus LNAPL thickness indicates a decreasing/increasing LNAPL thickness trend with increasing depth as fluid levels drop in the well (Figure 149).
- This well produced substantially more groundwater (more than an order of magnitude greater) than hydrocarbon in the one HVR event conducted.
- Recharge was very slow, less than 10% of original product thickness after 6 hours.
- The production hydro-stratigraph for this single-HVR event well is not available due to insufficient gauging data.

MP-55C

MP-55C is a 2-inch diameter PVC well located along E. Elm Street just west of its intersection with N. Olive Street near the eastern boundary of the study area. As detailed in Table 1, six HVR pilot test events were conducted from this well for a total of 49.0 hours of operation between May 19, 2005 and October 27, 2005.

MP-55C							
Hydrocarbon Recovery (gal)			Total Water Recovery (gal)	Average % Hydrocarbon	Total Hydrocarbon Rate of Recovery (gph)		
Total	Vapor Phase	LNAPL Phase			Average	Max	Min
393.9	90.8	303.1	3,174	11%	8.0	12.0	4.9

Hydrocarbon recovery is shown on Figure 150. Water and hydrocarbon production for each individual

HVR event is shown on Figure 151. The hydrocarbon rate of recovery is shown on Figure 152.

A comparison of BTU derived vapor production and laboratory sample derived vapor production indicates a reasonably close match between the two methods (Figure 153). The average, minimum and maximum BTUs per hour of influent vapor production from the well are shown on Figure 154. Graphs of engine, stinger and well casing vacuums and fuel flow, air flow and well flow in SCFM are provided as Figure 155 and Figure 156. Figure 157 (HC with 3 elevs v water and LNAPL production graph) shows the range of operating stinger depths and water and LNAPL production versus the well screen elevation, top of LNAPL elevation and top of water elevation. Various operational parameters for the events, including stinger and well casing vacuums versus groundwater and hydrocarbon production; and stinger immersion (as a percentage of LNAPL thickness) and wellhead air dilution valve settings versus water and LNAPL production are provided as Figure 158 and Figure 159. LNAPL recharge graphs as a percentage of the pre-HVR event LNAPL thickness and in feet of LNAPL are provided as Figure 160 and Figure 161. A production hydro-stratigraph showing top of LNAPL and water elevations, top of well screen elevation, stratigraphic contacts and types versus hydrocarbon production is provided as Figure 162. Daily pilot test summary pages providing a concise record of production, operating parameters, and water and LNAPL recharge for each day of operation are provided in Attachment A.

An analysis of the various production, operating, and recharge graphs for this well indicates the following trends:

- A scatter plot of depth to top of LNAPL versus LNAPL thickness indicates a general decrease / increase / decrease in LNAPL thickness with increasing depth as fluid levels drop in the well (Figure 163).
- Product recovery rates increased then decreased substantially over time.
- The well consistently produced significantly more groundwater than hydrocarbon (up to an order of magnitude more).
- This well exhibited complex, divergent recharge characteristics. In two events, recharge was good (to 80% to 90% of original product thickness after 1 hour). One event exhibited fair recharge (75% after 8 hours). One event exhibited poor recharge (15% after 7 hours). One event exhibited a “step recharge.” And one event exhibited a declining recharge rate.
- The production hydro-stratigraph for MP-55C demonstrates the clear conformance of this well to the Dual Optimal LNAPL Response model in both LNAPL thickness trends and hydrocarbon production. HVR events in May through early July occurred during slight confining conditions by an overlying clay layer. These confining conditions resulted in increased LNAPL thicknesses and hydrocarbon production rates. Subsequently as fluid levels dropped and unconfined conditions developed, the largest LNAPL thicknesses observed occurred and hydrocarbon production rates

remained high. As fluid levels subsequently rose, the LNAPL thickness declined as did hydrocarbon production (though production remained appreciable for this well much like HMW-44C).

- MP-55C appears to demonstrate high hydrocarbon recovery rates regardless of fluid elevations, but does exhibit optimal recovery in accordance with the Dual Optimal LNAPL Response model for the site.

MP-56C

MP-56C is a 2-inch diameter PVC well located in an alleyway midway between N. Market and N. Olive Streets and midway between E. Elm and E. Forest Streets near the southern boundary of LNAPL occurrence. As detailed in Table 1, five HVR pilot test events were conducted from this well for a total of 35.4 hours of operation between May 18, 2005 and July 18, 2005.

MP-56C							
Hydrocarbon Recovery (gal)			Total Water Recovery (gal)	Average % Hydrocarbon	Total Hydrocarbon Rate of Recovery (gph)		
Total	Vapor Phase	LNAPL Phase			Average	Max	Min
12.9	7.9	5.0	5,871	0.2%	0.4	0.6	0.2

Hydrocarbon recovery is shown on Figure 164. Water and hydrocarbon production for each individual HVR event is shown on Figure 165. The hydrocarbon rate of recovery is shown on Figure 166.

A comparison of BTU derived vapor production and laboratory sample derived vapor production indicates a fair match between the two methods (Figure 167). The average, minimum and maximum BTUs per hour of influent vapor production from the well are shown on Figure 168. Graphs of engine, stinger and well casing vacuums and fuel flow, air flow and well flow in SCFM are provided as Figure 169 and Figure 170. Figure 171 (HC with 3 elevs v water and LNAPL production graph) shows the range of operating stinger depths and water and LNAPL production versus the well screen elevation, top of LNAPL elevation and top of water elevation. Various operational parameters for the events, including stinger and well casing vacuums versus groundwater and hydrocarbon production; and stinger immersion (as a percentage of LNAPL thickness) and wellhead air dilution valve settings versus water and LNAPL production are provided as Figure 172 and Figure 173. LNAPL recharge graphs as a percentage of the pre-HVR event LNAPL thickness and in feet of LNAPL are provided as Figure 174 and Figure 175. A production hydro-stratigraph showing top of LNAPL and water elevations, top of well screen elevation,

stratigraphic contacts and types versus hydrocarbon production is provided as Figure 176. Daily pilot test summary pages providing a concise record of production, operating parameters, and water and LNAPL recharge for each day of operation are provided in Attachment A.

An analysis of the various production, operating, and recharge graphs for this well indicates the following trends:

- A scatter plot of depth to top of LNAPL versus LNAPL thickness indicates a clear trend of decreasing then increasing LNAPL thickness with increasing depth as fluid levels drop in the well (Figure 177).
- Product recovery rates generally declined slightly through time.
- This well produced substantially greater amounts of groundwater than hydrocarbon (1 to 2+ orders of magnitude more); hydrocarbon production was negligible.
- This well exhibited consistently poor recharge (15% to 30% after 7 hours).
- The production hydro-stratigraph for MP-56C is complex to evaluate against the Dual Optimal LNAPL Response model for the site because the well was completed with the top of screen below the silt confining layer. Consequently, well effects alter the LNAPL recharge rates into the well. This well does exhibit the increased LNAPL thicknesses expected during confined conditions and subsequent unconfined conditions. And hydrocarbon production rates do generally increase in accordance with the Dual Optimal LNAPL Response model for the site. However, hydrocarbon production rates for this well are very low, regardless of model trend conformance.

MP-57C

MP-57C is a 2-inch diameter PVC well located along E. Forest Street west of its intersection with N. Olive Street near the southeastern boundary of LNAPL occurrence. As detailed in Table 1, one HVR pilot test event was conducted from this well for a total of 8.0 hours of operation on October 28, 2005.

MP-57C							
Hydrocarbon Recovery (gal)			Total Water Recovery (gal)	Average % Hydrocarbon	Total Hydrocarbon Rate of Recovery (gph)		
Total	Vapor Phase	LNAPL Phase			Average	Max	Min
4.3	2.3	2.0	275	1.5%	0.5	N/M	N/M

Water and hydrocarbon production for each individual HVR event is shown on Figure 178. The hydrocarbon rate of recovery is shown on Figure 179.

Various operational parameters for the events, including stinger and well casing vacuums versus groundwater and hydrocarbon production; and stinger immersion (as a percentage of LNAPL thickness) and wellhead air dilution valve settings versus water and LNAPL production are provided as Figure 180 and Figure 181. LNAPL recharge graphs as a percentage of the pre-HVR event LNAPL thickness and in feet of LNAPL are provided as Figure 182 and Figure 183. Daily pilot test summary pages providing a concise record of production, operating parameters, and water and LNAPL recharge for each day of operation are provided in Attachment A.

An analysis of the various production, operating, and recharge graphs for this well indicates the following trends:

- A scatter plot of depth to top of LNAPL versus LNAPL thickness indicates a generally decreasing then increasing LNAPL thickness with increasing depth as fluid levels drop in the well (Figure 184).
- Groundwater production significantly exceeded hydrocarbon production in the one HVR event conducted (64 times as much water).
- Recharge was very slow (5% after 8 hours).
- The production hydro-stratigraph for this single-HVR event well is not available due to insufficient gauging data.

MP-79C

MP-79C is a 2-inch diameter PVC well located along W. Birch Street midway between N. Delmar Avenue and Old St. Louis and Alton Road near the northwestern boundary of LNAPL occurrence. As detailed in Table 1, three HVR pilot test events were conducted from this well for a total of 22.7 hours of operation between October 19, 2005 and October 21, 2005.

MP-79C							
Hydrocarbon Recovery (gal)			Total Water Recovery (gal)	Average % Hydrocarbon	Total Hydrocarbon Rate of Recovery (gph)		
Total	Vapor Phase	LNAPL Phase			Average	Max	Min
64.7	38.3	26.4	829	7.2%	2.9	3.7	2.2

Hydrocarbon recovery is shown on Figure 185. Water and hydrocarbon production for each individual HVR event is shown on Figure 186. The hydrocarbon rate of recovery is shown on Figure 187.

The average, minimum and maximum BTUs per hour of influent vapor production from the well are shown on Figure 188. Graphs of engine, stinger and well casing vacuums and fuel flow, air flow and well flow in SCFM are provided as Figure 189 and Figure 190. Figure 191 (HC with 3 elevs v water and LNAPL production graph) shows the range of operating stinger depths and water and LNAPL production versus the well screen elevation, top of LNAPL elevation and top of water elevation. Various operational parameters for the events, including stinger and well casing vacuums versus groundwater and hydrocarbon production; and stinger immersion (as a percentage of LNAPL thickness) and wellhead air dilution valve settings versus water and LNAPL production are provided as Figure 192 and Figure 193. LNAPL recharge graphs as a percentage of the pre-HVR event LNAPL thickness and in feet of LNAPL are provided as Figure 194 and Figure 195. A production hydro-stratigraph showing top of LNAPL and water elevations, top of well screen elevation, stratigraphic contacts and types versus hydrocarbon production is provided as Figure 196. Daily pilot test summary pages providing a concise record of production, operating parameters, and water and LNAPL recharge for each day of operation are provided in Attachment A.

An analysis of the various production, operating, and recharge graphs for this well indicates the following trends :

- A scatter plot of depth to top of LNAPL versus LNAPL thickness indicates an accelerating decreasing LNAPL thickness trend with increasing depth as fluid levels drop in the well (Figure 197).
- Product recovery rates declined steadily during three days of sequential daily HVR testing.
- Groundwater produced exceeded hydrocarbon produced by approximately an order of magnitude.
- Recharge was variable and inconsistent, ranging from 25 to >120 percent of original product thickness after 6 hours following each of the three events.
- The production hydro-stratigraph for this well is not available due to insufficient gauging data.

RW-4A

RW-4A is a 4-inch diameter PVC well located at the southeast corner of the intersection of E. Birch and N. Market Streets near the northeastern boundary of the study area. As detailed in Table 1, 14 HVR and

DPE pilot test events were conducted from this well between September 9, 2005 and September 17, 2005.

RW-4A							
Hydrocarbon Recovery (gal)			Total Water Recovery (gal)	Average % Hydrocarbon	Total Hydrocarbon Rate of Recovery (gph)		
Total	Vapor Phase	LNAPL Phase			Average	Max	Min
130.5	57.2	73.3	8401	1.5%	0.5	5.1	0.1

Hydrocarbon recovery is shown on Figure 198. Water and hydrocarbon production for each individual HVR event is shown on Figure 199. The hydrocarbon rate of recovery is shown on Figure 200.

The average, minimum and maximum BTUs per hour of influent vapor production from the well are shown on Figure 201. Graphs of engine, stinger and well casing vacuums and fuel flow, air flow and well flow in SCFM are provided as Figure 202 and Figure 203. Figure 204 (HC with 3 elevs v water and LNAPL production graph) shows the range of operating stinger depths and water and LNAPL production versus the well screen elevation, top of LNAPL elevation and top of water elevation. Various operational parameters for the events, including stinger and well casing vacuums versus groundwater and hydrocarbon production; and stinger immersion (as a percentage of LNAPL thickness) and wellhead air dilution valve settings versus water and LNAPL production are provided as Figure 205 and Figure 206. Daily pilot test summary pages providing a concise record of production, operating parameters, and water and LNAPL recharge for each day of operation are provided in Attachment A.

An analysis of the various production, operating, and recharge graphs for this well indicates the following trends:

- A scatter plot of depth to top of LNAPL versus LNAPL thickness indicates a decreasing / increasing / decreasing LNAPL thickness trend with increasing depth as fluid levels drop in the well (Figure 207).
- Rates of product recovery varied greatly, but after an initial increase, decreased steadily through subsequent events.
- Groundwater production varied greatly, but was always substantially more than hydrocarbon production.

- The production hydro-stratigraph for this well is not available due to insufficient gauging data for this remediation well.

RW-5

RW-5 is a 4-inch diameter PVC well located just northwest of the intersection of N. Olive and E. Cherry Streets near the northeastern boundary of the study area. As detailed in Table 1, 19 HVR and DPE pilot test events were conducted from this well between September 28, 2005 and October 14, 2005.

RW-5							
Hydrocarbon Recovery (gal)			Total Water Recovery (gal)	Average % Hydrocarbon	Total Hydrocarbon Rate of Recovery (gph)		
Total	Vapor Phase	LNAPL Phase			Average	Max	Min
162.4	105.6	56.7	17,449	0.9%	1.6	2.8	0.5

Hydrocarbon recovery is shown on Figure 208. Water and hydrocarbon production for each individual HVR event is shown on Figure 209. The hydrocarbon rate of recovery is shown on Figure 210.

A comparison of BTU derived vapor production and laboratory sample derived vapor production indicates a reasonably close match between the two methods (Figure 211). The average, minimum and maximum BTUs per hour of influent vapor production from the well are shown on Figure 212. Graphs of engine, stinger and well casing vacuums and fuel flow, air flow and well flow in SCFM are provided as Figure 213 and Figure 214. Figure 215 (HC with 3 elevs v water and LNAPL production graph) shows the range of operating stinger depths and water and LNAPL production versus the well screen elevation, top of LNAPL elevation and top of water elevation. Various operational parameters for the events, including stinger and well casing vacuums versus groundwater and hydrocarbon production; and stinger immersion (as a percentage of LNAPL thickness) and wellhead air dilution valve settings versus water and LNAPL production are provided as Figure 216 and Figure 217. Daily pilot test summary pages providing a concise record of production, operating parameters, and water and LNAPL recharge for each day of operation are provided in Attachment A.

An analysis of the various production, operating, and recharge graphs for this well indicates the following trends:

- A scatter plot of depth to top of LNAPL versus LNAPL thickness indicates a decreasing then increasing LNAPL thickness trend with increasing depth as fluid levels drop in the well (Figure 218).
- Product recovery rates consistently ranged from 1.5 to 2.8 gph throughout testing.
- Groundwater recovery varied greatly, but always exceeded hydrocarbon recovery by a large amount.
- The production hydro-stratigraph for this well is not available due to insufficient gauging data for this remediation well.

5.1.2 Site-wide Analyses of Total HC, LNAPL, Vapor & Water Removal

5.1.2.1 General Observations

From May 9, 2005 through November 4, 2005 a total of approximately 122 HVR or DPE pilot test events were conducted from the wells identified above in section 5.1.1. The tests were conducted for a total of approximately 1041 hours of operation. Figure 219 shows the cumulative LNAPL and vapor removal achieved during these events. A total of 6,092.6 gallon equivalents of Total Hydrocarbon were removed from the site, with 1,157.1 gallon equivalents in the vapor phase and 4,935.5 gallons as LNAPL (Figure 220 Stacked Column Vapor/LNAPL graph). The overall average hydrocarbon removal per hour was 5.9 gallons. 71,013 gallons of water were also removed for an overall hydrocarbon to water percentage of 7.9 percent (Figure 221 HC v Water). Table 2 (HVR Extraction Event Summary Data) provides various statistical summaries for each well.

The HVR Fluid Production Summary Graph (Figure 222) summarizes the average total hydrocarbon, average LNAPL, and average vapor phase recoveries versus water production, all in gallons per hour, to allow for direct well to well comparisons. The data is sorted in order of increasing average total hydrocarbon production, with values ranging from less than 0.25 gallons per hour in RW-4A to over 22 gallons per hour in HMW-44C. Generally, the largest water-producing wells were some of the smallest hydrocarbon-producing wells. Notable exceptions to this trend include MP-29D and MP-50C. However, these wells exhibited submerged screen intervals during some or all of the HVR events, and by necessity operations were conducted with greater stinger depths and consequently larger water production volumes during these time periods. This graph also compares LNAPL and vapor average production from each well to illustrate those wells that produce hydrocarbon predominantly in the liquid or vapor phase.

The Fluid Maximum and Minimum Comparison Graph (Figure 223) summarizes LNAPL, vapor and water production on a daily (approximately 8 hour) basis. Maximum and minimum production values for LNAPL, vapor and water are provided for each well. Only one HVR event was conducted for six of the wells, so the maximum and minimum values are identical for these wells. This graph emphasizes the significant variation in hydrocarbon production among the wells. Several interesting trends are apparent. Vapor phase production varied to a lesser degree than LNAPL production. Five of the top seven hydrocarbon-producing wells produced minimal amounts of water. All wells with multiple HVR events exhibited significant variation in LNAPL production as reflected in the minimum / maximum offset. The variation in production rates appears to be related primarily to seasonal fluid level variations in the aquifer, although it may also be related to depletion of available mobile LNAPL in the vicinity of the wells (Figure 224 Average Max Min Hydrograph). Of the top seven hydrocarbon producing wells, MP-50C is notable for being the well with the highest single daily hydrocarbon production rate, yet also being the only well that produced no LNAPL during one daily event, demonstrating the significant variability in hydrocarbon production that is possible due to changing fluid levels in the formation.

5.1.2.2 Water Production

The varying average water production rate for each well is attributable to a complex relationship between aquifer hydraulic properties and HVR operational protocols. Consequently, water production from each well is potentially highly variable. However, the average water production map (Figure 225) is useful to identify areas within the LNAPL plume that preferentially produce water versus those that preferentially produce hydrocarbon (low average water production rates). Generally this data is interpreted to represent decreasing water production inward towards the LNAPL plume, partly reflecting an operational bias in the pilot tests towards maximization of hydrocarbon and minimization of water. Average Total Hydrocarbon as a percentage of water production for each well is plotted and contoured in Figure 226. This map documents the general trend that wells which produce significant quantities of hydrocarbon tend to produce less water. This trend is particularly evident in three of the wells with the highest levels of sustainable hydrocarbon production (HMW-44C, HMW 55C, and HMW-19).

5.1.2.3 Total Hydrocarbon Production

To evaluate relative hydrocarbon production capability of the various pilot test wells, total hydrocarbon was plotted as a stacked LNAPL/vapor graph of average hourly production rates sorted by total hydrocarbon production (Figure 227). The graph was then evaluated to identify natural breaks in production rates between the wells. These natural breaks were utilized to categorize the wells as having Low (<1 gph), Moderate (1-3 gph), High (3-9 gph), or Very High (>9 gph) hydrocarbon production potential. Stacked LNAPL/vapor graphs also allow a graphical evaluation of relative vapor/LNAPL contributions to total hydrocarbon recovery in evaluating the predominant production phase for individual wells. It should be noted that HMW-44C exhibited a significantly higher hydrocarbon production potential than any other well tested. Figure 228 is a map of the wells, categorized with respect to hydrocarbon production potential. Wells identified with High to Very High total hydrocarbon production potential include MP-29D, MP-50C, HMW-19, MP-53C, MP-47C, MP-55C and HMW-44C.

Contour maps of average, minimum and maximum total hydrocarbon production as gallons per hour are presented as Figures 229 through 231. These maps allow the identification of specific wells or clusters of wells likely to exhibit higher sustainable hydrocarbon production rates. Such wells include HMW-44C, MP-55C, MP-47C, MP-53C, MP-50C and HMW-19. The average hydrocarbon recovery rates shown might reasonably be expected to reflect recovery rates at least initially attainable from the wells during remediation efforts. HMW-44C, MP-55C and possibly HMW-19 and MP-47C represent anomalous wells in that they will likely sustain hydrocarbon production more consistently than other wells. This is indicated by the cumulative graphs of hydrocarbon production for these wells discussed previously, and the minimum hydrocarbon production rate map, which identifies HMW-44C and MP-55C in particular as wells with likely sustainable production. The maximum hydrocarbon production rate map identifies additional wells that may be amenable to periodic LNAPL recovery based on the DOLR model (Section 6.0) (HMW-48C, MP-29D, MP-50C, and MP-53C).

5.1.2.4 Vapor Phase Hydrocarbon Production

Figure 232 is a graph of the average vapor production rate for each well sorted by increasing vapor production in gallons per hour. The curve artificially deflects and becomes asymptotic at approximately 1.6 to 1.9 gallons per hour, representing the maximum thermal destruction capability of the pilot testing equipment utilized. This graph demonstrates that vapor phase removal at the site is successful for virtually every well tested. Wells with vapor recoveries along the asymptotic portion of the curve likely

represent areas of high vapor phase recovery potential. The Average Vapor Phase Production Map (Figure 233) represents reasonable potential vapor phase extraction rates across the plume, with the majority of the plume area exhibiting a probable vapor recovery rate of 1.5 gph or higher. The Minimum Daily Vapor Production Map (Figure 234) illustrates that even at minimum production conditions, vapor extraction can achieve reasonable hydrocarbon recovery from the site. The Maximum Daily Vapor Production Map (Figure 235) represents likely minimum production capabilities across the site if larger capacity thermal abatement equipment is utilized for sustained vacuum-enhanced remediation technologies.

5.1.2.5 LNAPL Production

To evaluate the relative LNAPL recovery capability of the various pilot test wells, each was sorted according to LNAPL production volume (Figure 236). The graph was then evaluated to identify natural breaks in production rates between the wells. These natural breaks were utilized to categorize the wells as having Low (<0.75 gph), Moderate (0.75-2.5 gph), High (2.5-7.5 gph), or Very High (>7.5 gph) LNAPL production potential. HMW-44C exhibited a significantly higher LNAPL production potential than any other well tested. Figure 237 is a map of the categorized wells with respect to LNAPL production potential. Wells identified with High to Very High LNAPL production potential include MP-29D, MP-50C, HMW-19, MP-53C, MP-47C, MP-55C and HMW-44C.

The Average Hourly LNAPL Production Rate Map (Figure 238) and the Maximum Daily LNAPL Production Map (Figure 239) identify MP-29D, MP50C, HMW-19, MP-53C, MP-47C, MP-55C and HMW-44C as wells with good LNAPL production potential. However, the Minimum Daily LNAPL Production Map (Figure 240) suggests that most of the plume area will not sustain high levels of LNAPL recovery on a continuous basis. HMW-44C and MP-55C are notable exceptions that likely represent areas of potentially sustainable high LNAPL recovery.

5.1.2.6 Synthesis of LNAPL versus Vapor Phase Production Potential

Figure 241 is a map of the plume areas subdivided into those that produced predominantly vapor recovery (on average) or predominantly LNAPL recovery (on average) during the HVR pilot testing. The map clearly shows that the majority of the plume area exhibited primarily vapor phase recovery. Wells that exhibited higher LNAPL recovery include HMW-48C, MP-29D, MP-50C, HMW-19, MP-53C, MP-47C,

MP-55C, and HMW-44C. A graph of LNAPL production rate versus vapor phase production rate (Figure 242) shows that wells with higher vapor phase production typically produce less than 1 gph of LNAPL, while wells producing greater than 2 gph of LNAPL produce more LNAPL than vapor.

5.2 Continuous HVR and Continuous DPE Pilot Testing

Continuous HVR and DPE Pilot Tests were performed at wells RW-4A and RW-5 in order to characterize aquifer parameters necessary for the API LNAPL modeling and to compare recovery rates for these two technology applications to skimming techniques previously performed at these wells. The Pilot Test Protocol consisted of a series of step tests, one continuous HVR test, and one continuous DPE Test for each well. All these tests followed the general sequence: step test; continuous HVR test and continuous DPE test. The wells were allowed to recharge to at least 90% in between tests.

Prior to conducting the pilot tests, In-Situ® MiniTroll submersible water level transducers/data loggers and In-Situ® BaroTroll pressure transducers/data loggers were installed in the extraction well and each of four adjacent monitoring wells to electronically measure and log well liquid levels and pressures. The MiniTroll transducer was set approximately one foot above the bottom of the extraction well as measured in the field. Well RW-4A contained several feet of apparent silt, and the MiniTroll was placed approximately one foot above the top of this silt. The BaroTroll was installed inside the well, approximately 4 to 5 feet below the wellhead. For the test at RW-5, an additional BaroTroll was set in the vicinity of the well to document atmospheric pressure changes during the continuous HVR and DPE tests. Barometric pressure data for the tests at RW-4A was obtained from the on-site Clayton weather station maintained by Clayton.

Readings of water column pressure, wellhead pressure, atmospheric pressure, and temperature were obtained by the transducers every 10 seconds during the step tests and 20 seconds during the continuous HVR and DPE tests. H_2A manifold wellheads were constructed to complement transducer specifications. Water levels were manually gauged with an EIP at the start and completion of each test. All fluids recovered were pumped into Baker tanks onsite, and gauged immediately following the conclusion of each test to measure the amount of LNAPL and water recovered.

5.2.1 RW-4A

5.2.1.1 Continuous HVR Pilot Testing

Well RW-4A was set up as the extraction well and wells RW-4, HMW-30, HMW-31, and HMW-32 served as monitoring wells with transducers installed. In addition, wells HB-32, HMW-08, HMW-21, HMW-33, MP-29D, and RW-03 were monitored for well casing pressure to determine the vacuum radius of influence.

Step Testing

HVR Step tests were conducted from September 9, 2005 through September 13, 2005 on monitoring well RW-4A. These tests were conducted by operating the HVR system at various vacuum settings and stinger depths to determine optimal settings to maximize hydrocarbon production and minimize water production. The following table presents the settings and information from the step tests.

Well	Stinger (%)	Controller Vacuum	ADV %	Date	Duration	Water (gal)	LNAPL (gal)
RW-4A	0	50	25	9/09/2005	1 hour	0	0
RW-4A	25	50	25	9/09/2005	1 hour	0	0.049
RW-4A	50	50	25	9/09/2005	2 hours 9 min	0	0.049
RW-4A	75	50	25	9/10/2005	1 hour	0	0.098
RW-4A	0	100	25	9/10/2005	1 hour	0.25	2.75
RW-4A	25	100	25	9/10/2005	1 hour	9	1.5
RW-4A	0	150	25	9/11/2005	1 hour 1 min	86	2
RW-4A	50	100	25	9/12/2005	1 hour	11	1
RW-4A	75	150	varies	9/12/2005	2 hours 30 min	178	4
RW-4A	25	50	25	9/13/2005	59 min	64.5	2

Operations

Upon completion of the step tests, a continuous HVR test was initiated. The continuous HVR test began on September 14, 2005 at 12:00 P.M., and concluded on September 17, 2005 at 3:58 P.M., running for a total of 76.97 hours. Based on the results obtained from the Step Tests, selected operational settings for the Continuous test were: a vacuum setting of 100 inches H_20; a stinger immersion of 0%; and an ADV setting of 25%.

Total HC, Vapor, LNAPL and Water Recoveries

The continuous HVR test resulted in recovery of 11 gallons of LNAPL and 25.5 gallons of vapor, for a

total of 36.5-gallons of total hydrocarbons recovered (Figure 243, Figure 244). The system was operated to minimize water production, removing total fluids at an average pumping rate of 0.09 gallons per minute. The following table summarizes the continuous HVR test recoveries and operational data for well RW-4A.

Well	Stinger %	Controller Vacuum	ADV %	Dates	Duration	Water (gal)	LNAPL (gal)	Vapor (gal)
RW-4A	0	100	25	10/14/2005 - 10/17/2005	76.97 hours	401	11	25.5

ROI

Monitoring wells RW-4, HMW-30, HMW-31, HMW-32, HMW-33, RW-3, HMW-33, HB-32, HMW-21, MP-29D and HMW-08 were all manually monitored for vacuum ROI throughout the test in addition to the fluid level and vacuum transducers installed in RW-4, HMW-30, HMW-31, and HMW-32. The following table summarizes the maximum manual vacuum data and the transducer derived maximum drawdown, where available, as observed in these wells.

Well	Distance from Pumping Well (feet)	Drawdown (feet)	Vacuum (inches water)
RW-4A	0	0	17.7
RW-4	6	0	2.8
HMW-30	15	0	2.8
HMW-31	25	0	2.8
HMW-32	40	0	3.8
RW-03	4	---	3.3
HMW-33	59	---	2.4
HB-32	77	---	0.05
HMW-21	100	---	2.9
MP-29D	76	---	1.5
HMW-08	55	---	2.3

Liquid phase ROI cannot be measured during HVR as the vacuum is the driving force pulling LNAPL into the extraction well rather than drawdown, and vacuum cannot be measured in the field in fluids (Figure 245). The vacuum ROI was observed to be a distance of 100 feet (Figures 246 and 247).

5.2.1.2 Continuous DPE Pilot Testing

Operations

The continuous DPE Pilot Test was specifically designed to create a cone of depression in the formation surrounding the extraction well while simultaneously applying vacuum to the formation via the extraction well. The fluid drawdown in the well was achieved by placing a downhole submersible electric Grundfos pump powered by the HVR system. The vacuum was applied to the extraction well via a shallow-set stinger from the HVR system that removed solely vapor phase media from the extraction well (Figure 248). The drawdown test was initiated on monitoring well RW-4A on September 22, 2005 at 9:09 A.M., and concluded on September 23, 2005 at 5:52 AM.

Total HC, Vapor, LNAPL and Water Recoveries

The continuous DPE Pilot Test was operated at an average pumping rate of 4.89 gallons per minute throughout the test, which resulted in a recovery of approximately 12 gallons of LNAPL, 15.2 gallons of hydrocarbon vapors, and 6,085 gallons of water (Figures 249 and 250). The test was terminated when the 6,000 gallon temporary storage tank provided was full. The following table summarizes the settings and results from the drawdown test on monitoring well RW-4A.

Well	Stinger %	Controller Vacuum	ADV %	Stinger	Date	Duration	Water (gal)	LNAPL (gal)	Vapor (gal)
RW-4A	5 feet below TOC	Variable	0% - 25%	5 feet	9/22/05 - 9/23/05	20.73 hours	6085	12	15.2

The intake of the pump was set in monitoring well RW-4A near the bottom of the well, approximately one foot above the installed transducer measuring drawdown. The stinger was set at approximately 5 feet below the H_2A wellhead, with another transducer set just inside the well to measure pressure.

ROI

Monitoring wells HMW-30, HMW-31, HMW-32, HMW-33, RW-03, RW-04, HB-32, HMW-21, MP-29D and HMW-08 were all manually monitored for vacuum ROI throughout the test in addition to the fluid level and vacuum transducers installed in RW-4, HMW-30, HMW-31, and HMW-32. The following table summarizes the maximum vacuum data observed in these wells and the maximum drawdown from the transducer data, where available.

Well	Distance from Pumping Well (feet)	Drawdown (feet)	Vacuum (inches water)
RW-4A	0	2.25	243.9
RW-4	6	0.13	4.42
HMW-30	15	0.08	7.09
HMW-31	25	0.06	2.3
HMW-32	40	0.05	1.55
RW-03	4	---	5.1
HMW-33	59	---	1.05
HB-32	77	---	
HMW-21	100	---	
MP-29D	76	---	
HMW-08	55	---	

Liquid-phase ROI is complex to accurately measure in vacuum enhanced applications because the vacuum alters the formation drawdown response. Consequently, the liquid-phase ROI for the DPE pilot test is conservatively identified as the maximum observed distance at which drawdown was observed in monitoring wells – approximately 40 feet (Figures 251 and 252). The vacuum ROI was observed out to a distance of 59 feet from the extraction well (Figures 253 and 254).

Recharge T & K Analyses

Transmissivity (T) and Hydraulic Conductivity (K) were calculated for the formation around well RW-4A by analyzing the recharge data obtained immediately following completion of the continuous DPE test. Due to the vacuum applied during the pilot test, the pumping duration / drawdown data cannot be accurately analyzed for aquifer properties (because the vacuum alters the formation drawdown response). However, the recharge data, obtained after pumping has ceased and the vacuum has dissipated, can be analyzed for aquifer properties.

The time / drawdown / distance data was imported into a commercial aquifer test analysis software package and analyzed by the Agarwal + Theis with Jacob correction method. The data for the pumping well, RW-4A, was not utilized because water leaked back through the pump upon shutdown and artificially recharged this well. However, the monitoring wells with transducers (RW-4, HMW-30, HMW-31, HMW-32) all exhibited excellent matches to the type recharge curves (Figure 255). Calculated T and K values are as follows:

Well	Transmissivity T (ft^2/d))	Hydraulic Conductivity K (ft/d)
HMW-30	7.51E+02	1.50E+01
HMW-31	9.82E+02	1.96E+01
HMW-32	9.34E+02	1.87E+01
RW-4	3.45E+02	6.91E+00
Average	7.53E+02	1.51E+01

5.2.1.3 Comparison of Continuous HVR and DPE Pilot Testing Results

Neither the continuous HVR nor the continuous DPE tests were successful at extracting significant volumes of hydrocarbon from well RW-4A. Due to the low recharge rates and correspondingly lengthy times to recharge between tests, this is likely related to the lack of significant mobile volumes of hydrocarbon in the vicinity of this well during the tests.

A comparison of production data from the Continuous HVR and Continuous DPE test indicates the following:

Test	Duration (hrs)	Water (gal)	LNAPL (gal)	Vapor (gal)	Total Hydrocarbon (gal)
HVR	77	401	11	25.5	36.5
DPE	21	6085	12	15.2	27.2

The DPE test was terminated when available tankage for storage of produced water was exhausted. Consequently, it was run for a shorter duration than the HVR test. However, field observations indicate that for both tests an estimated 80-90% of the total recovery occurred within the first four hours. The LNAPL recoveries between the two tests were comparable, but hours of operation and volume of water generated were not. The HVR test ran for more than three times as long as the DPE test but was able to achieve comparable LNAPL recovery with only 401 gallons of water. The DPE test required pumping 6085 gallons of water in less than one day but only recovered a similar amount of LNAPL (Figure 256). Regardless of how the technologies compare – the LNAPL recovery rate achieved with both was quite low compared to other more productive wells at the site.

5.2.2 RW-5

Well RW-5 was chosen for pilot testing because it had previously been utilized for skimmer remediation and a multiphase extraction test had previously been performed at this well. MiniTroll and BaroTroll transducers were installed in RW-5 and also in monitoring wells HMW-34, HMW-35, HMW-36, and HMW-37. Monitoring wells HMW-01, HMW-02, HMW-10, and MP-42C were gauged prior to and after the conclusion of the tests and were also measured for vacuum response periodically during the tests.

5.2.2.1 Continuous HVR Pilot Testing

Step Testing

HVR Step tests were conducted from September 28, 2005 through October 6, 2005 on monitoring well RW-5. These tests were conducted by operating the HVR system at various vacuum settings and stinger depths to determine optimal settings to maximize hydrocarbon production and minimize water production. The following table presents the settings and information from the step tests. The following table presents the settings and information from the step tests.

Well	Stinger (%)	Controller Vacuum	ADV %	Stinger	Date	Duration	Water (gal)	LNAPL (gal)
RW-5	0	50	25	4-hole	9/28/2005	1 hour	0	0
RW-5	0	100	25	4-hole	9/28/2005	1 hour	0	0
RW-5	0	150	25	4-hole	9/28/2005	1 hour	0	0
RW-5	25	50	25	4-hole	9/29/2005	1 hour	0	0
RW-5	75	150	25	4-hole	9/29/2005	1 hour	0	1
RW-5	0	150	25	4-hole	10/1/2005	1 hour	71	2
RW-5	75	150	25	12-hole	10/1/2005	1 hour	90	1
RW-5	50	100	25	12-hole	10/2/2005	1 hour	8	1
RW-5	6" above product	150	0% - 25%	No-hole	10/2/2005	2 hours	137	2
RW-5	75	50	25	12-hole	10/3/2005	1 hour	2	1
RW-5	4.82' above product	Maximum Vacuum	25	No-hole	10/3/2005	1 hour	0	0
RW-5	25	100	25	4-hole	10/3/2005	1 hour	8	1
RW-5	50	100	10	12-hole	10/4/2005	1 hour	5	2
RW-5	50	100	50	12-hole	10/5/2005	1 hour	6	2
RW-5	50	100	100	12-hole	10/6/2005	1 hour	11	1

Operations

Upon completion of the step tests, a continuous HVR test was initiated. The continuous HVR test began on October 7, 2005 at 7:38 P.M., and concluded on October 8, 2005 at 6:05 P.M., running for a total of 22.45 hours. Based on the results obtained from the Step Tests, selected operational settings for the Continuous test were: a vacuum setting of 100 inches of water column and a stinger immersion of 50%.

Total HC, Vapor, LNAPL and Water Recoveries

The continuous HVR test resulted in a recovery of 3 gallons of LNAPL and 13.6 gallons of vapor, for a

total of 16.6 gallons of total hydrocarbons recovered and 9 gallons of water (Figures 257 and 258). The system was operated to minimize water production, removing total fluids at an average pumping rate of 0.01 gallons per minute. The following table summarizes the continuous HVR test recoveries and operational data for well RW-5.

Well	Stinger %	Controller Vacuum	ADV %	Stinger	Date	Duration	Water (gal)	LNAPL (gal)	Vapor (gal)
RW-5	50	100	10	12-hole	10/7/2005 - 10/08/05	20.45 hours	9	3	13.6

ROI

Monitoring wells HMW-34, HMW-35, HMW-36 AND HMW-37, HMW-01, HMW-02, HMW-10 and MP-42C were all manually monitored for vacuum radius of influence throughout the test in addition to the fluid level and vacuum transducers installed in HMW-34, HMW-35, HMW-36 AND HMW-37. The following table summarizes the maximum manual vacuum data and the transducer-derived maximum drawdown, where available, as observed in these wells.

Well	Distance from Pumping Well (feet)	Drawdown (feet)	Vacuum (inches water)
RW-5	0	0	3.00
HMW-34	13	0	1.00
HMW-35	23	0	0.80
HMW-36	37	0	0.75
HMW-37	57	0	0.60
HMW-10	34	---	0.20
MP-42C	61	---	0.02
HMW-02	62	---	0.0
HMW-01	62	---	0.0

The continuous HVR pilot test was apparently operating at the margin of liquid recovery with the selected Step Test operating parameters (Figure 259). Although an excellent ratio of hydrocarbon to water was attained, overall recovery and air flow rates were low. Observed vacuums in monitored non-extraction wells were relatively low – with a vacuum of 0.02 inches of water column measured at a distance of 61 feet and a vacuum of 0.60 inches of water column measured at a distance of 57 feet from the extraction

well.

5.2.2.2 Continuous DPE Pilot Testing

Operations

The continuous DPE pilot test was specifically designed to create a cone of depression in the formation surrounding the extraction well while simultaneously applying vacuum to the formation via the extraction well. The fluid drawdown in the well was achieved by placing a downhole submersible electric Grundfos pump powered by the HVR system. The vacuum was applied to the extraction well via a shallow-set stinger from the HVR system that removed solely vapor phase media from the extraction well. The drawdown test was initiated on monitoring well RW-5 on October 13, 2005 at 11:07 A.M., and concluded on October 14, 2005 at 3:30 P.M.

The Grundfos pump was set at 3.275 feet above the bottom of the well. One foot below the pump, a transducer was set to measure drawdown. The barometric transducer was placed inside the well, 4 feet below the manifold. The stinger was set at 5 feet below the H_2A wellhead manifold to ensure the extraction of vapor only (Figure 262).

Total HC, Vapor, LNAPL and Water Recoveries

The continuous DPE pilot test was operated at an average pumping rate of 9.4 gallons per minute throughout the test, which resulted in a recovery of approximately 15 gallons of LNAPL, 46.2 gallons of hydrocarbon vapors, and 16,086 gallons of water (Figures 263 and 264). The test was terminated when the available temporary storage tanks provided were full. The following table summarizes the settings and results from the drawdown test on monitoring well RW-5.

Well	Stinger %	Controller Vacuum	ADV %	Stinger	Date	Duration	Water (gal)	LNAPL (gal)	Vapor (gal)
RW-5	5 feet below TOC	Variable	0% - 25%	Unknown	10/13/2005 - 10/14/05	28.62 hours	16,086	15	24.5

ROI

Monitoring wells HMW-34, HMW-35, HMW-36 AND HMW-37, HMW-01, HMW-02, HMW-10 and MP-42C were all manually monitored for vacuum radius of influence throughout the test in addition to the fluid level and vacuum transducers installed in HMW-34, HMW-35, HMW-36 AND HMW-37. The following table summarizes the maximum manual vacuum data and the transducer derived maximum drawdown, where available, as observed in these wells.

Well	Distance from Pumping Well (feet)	Drawdown (feet)	Vacuum (inches water)
RW-5	0	2.1	50.4
HMW-34	13	0.14	3.8
HMW-35	23	0.075	3.0
HMW-36	37	0.05	2.6
HMW-37	57	0.06	1.3
HMW-10	34	---	1.15
MP-42C	61	---	0.45
HMW-02	62	---	0.2
HMW-01	62	---	0.1

Liquid-phase ROI is complex to accurately measure in vacuum enhanced applications because the vacuum alters the formation drawdown response. Consequently, the liquid-phase ROI for the DPE pilot test is conservatively identified as the maximum observed distance at which drawdown was observed in monitoring wells – approximately 57 feet (Figures 265 and 266). The vacuum ROI was observed to be a distance of 61 feet (Figures 267 and 268).

5.2.2.3 Recharge T & K Analyses

T and K were calculated for the formation around well RW-5 by analyzing the recharge data obtained immediately following completion of the continuous DPE test. Due to the vacuum applied during the pilot test, the pumping duration / drawdown data cannot be accurately analyzed for aquifer properties (because the vacuum alters the formation drawdown response). However, the recharge data, obtained after pumping has ceased and the vacuum has dissipated, can be analyzed for aquifer properties.

The time / drawdown / distance data was imported into a commercial aquifer test analysis software package and analyzed by the Agarwal + Theis with Jacob correction method. The data for the pumping well, RW-5, was not utilized because water recharged too quickly and an adequate curve for analysis was not present. The data for HMW-37 was also not analyzed because insufficient drawdown was developed in this well to establish a recharge curve sufficient for analysis. However, the other monitoring wells with transducers (HMW-34, HMW-35 and HMW-36) exhibited adequate matches to the type recharge curves (Figure 269). Calculated T and K values are as follows:

Well	Transmissivity T (ft2/d))	Hydraulic Conductivity K (ft/d)
HMW-34	2.42E+03	4.84E+01
HMW-35	4.25E+03	8.50E+01
HMW-36	4.37E+03	8.75E+01
Average	3.68E+03	7.36E+01

5.2.2.4 Comparison of Continuous HVR and DPE Pilot Testing Results

Neither the continuous HVR nor the continuous DPE tests were successful at extracting significant volumes of hydrocarbon from well RW-5. Due to the low recharge rates and correspondingly lengthy times to recharge between tests, this is likely related to the lack of significant mobile volumes of hydrocarbon in the vicinity of this well during the tests.

A comparison of production data from the Continuous HVR and Continuous DPE test indicates the following:

Test	Duration (hrs)	Water (gal)	LNAPL (gal)	Vapor (gal)	Total Hydrocarbon (gal)

HVR	21	9	3	13.6	16.6
DPE	29	16,086	15	24.5	39.5

The DPE test was terminated when available tankage for storage of produced water was exhausted. The test results do not compare well in terms of hydrocarbon recovery. However, that is likely the result of operating in HVR mode at the limits of liquid recovery, as discussed previously. More importantly, the DPE test required pumping of more than 16,000 gallons of water to recover only 15 gallons of LNAPL (an LNAPL percentage relative to water of only 0.09%)(Figure 270). Regardless of how the technologies compare – the LNAPL recovery rate achieved with both was quite low compared to other more productive wells at the site.

6.0 DUAL OPTIMAL LNAPL RESPONSE (DOLR) MODEL

This section includes a description of the model developed to explain the nature and occurrence of LNAPL at the site due to fluctuating water table conditions and its relationship to LNAPL production from individual wells. The model was developed primarily based on evidence exhibited in the Production Hydro-stratigraphs. DOLR can be used to predict the relative LNAPL production capacity of wells on the basis of the site water table elevation and historical well production during HVR Pilot Testing in 2005.

6.1 Dual Optimal LNAPL Response (DOLR) Model

The DOLR model conforms to both site evidence and theory of LNAPL response to fluctuating water table conditions that periodically create confined and unconfined conditions for the LNAPL and water in the Main Sand. Basically, the DOLR model states that LNAPL thicknesses and production rates increase in response to two conditions:

- Confining conditions that create a hydrostatic head driving LNAPL into the wells, which act as pressure relief points for LNAPL accumulation
- Unconfined conditions that allow drainage of LNAPL (above residual LNAPL concentrations) from the upper portion of the Main Sand as the water table falls and the accumulation of this LNAPL at the Water / LNAPL / Air interface zone

Intermediate or excessively high water table elevations in the Main Sand tend to adversely impact the recharge and production capacity of the wells though relatively significant LNAPL thicknesses may

stabilize in the wells under excessively high water table conditions.

The exception to the DOLR model primarily occurs in the area of HMW-44C where apparently the available source mass of LNAPL creates significant recovery potential regardless of water table elevation, though similar fluctuations of LNAPL thickness and production capacity in conformance to the DOLR model are observed. In addition, in areas where very little mobile LNAPL is available the wells predictably exhibit only subtle LNAPL fluctuations in conformance to the DOLR Model.

6.2 DOLR Model Theoretical Basis

The theoretical basis for the DOLR Model at the site addresses the two key conditions (confined and unconfined) as the water table fluctuates in response to climatological factors and the Mississippi River stage. Intermediate and excessively high water table conditions are also discussed in the theoretical basis below. One key concept to understanding the theoretical basis for the DOLR Model is the concept of submerged versus vadose zone residual LNAPL. Greater volumes of LNAPL can be submerged and entrapped underneath rising water tables than can be retained in the vadose zone above falling water tables (submerged residual LNAPL is typically greater than vadose residual LNAPL).

6.2.1 Confined Conditions

As the water table rises and confined conditions develop in the Main Sand, hydrostatic pressure on the LNAPL increases. The monitoring and recovery wells represent points of pressure relief as the confining layers do not exist in the wells. Consequently, the LNAPL is forced into the wells in response to the hydrostatic pressure creating thicker LNAPL accumulations, even though the mass of available mobile LNAPL is minimal since much of the LNAPL mass is trapped underneath this high water table. These conditions can also increase the LNAPL production capacity of the wells as the hydrostatic pressure can be greater than the gravity forces that promote the flow of LNAPL into the wells under unconfined conditions. In fact, even though the available mobile LNAPL mass is minimized, confined conditions may produce the highest attainable recovery rates because the hydrostatic pressure is such a powerful driving force. As long as the mass of mobile LNAPL in the vicinity of the well is sufficient and the flow paths for the LNAPL from the formation into the well are not interrupted, then LNAPL production should be relatively higher than during unconfined conditions.

6.2.2 Unconfined Conditions

As the water table falls and unconfined conditions develop in the Main Sand, the initial response is for LNAPL thicknesses to reduce because the hydrostatic forces driving LNAPL into the well under confined conditions no longer exist, simple gravity drainage into the wells predominates, and the available mass of mobile LNAPL is relatively low. The mass of available mobile LNAPL is low under these conditions because much of the LNAPL is still submerged and entrapped under the water table, which is still relatively high even though it is falling. Typically, larger volumes of LNAPL can be trapped by rising water table conditions (submerged residual LNAPL) than can be retained during falling water table conditions (vadose residual LNAPL). Consequently, as the water table continues to fall and much of the submerged residual LNAPL drains from the Main Sand, larger volumes of mobile LNAPL are available to accumulate in the wells. Greater LNAPL thicknesses occur and relatively larger LNAPL production capacities are observed.

6.2.3 Excessively High Water Table Conditions

If the rise in water table elevation is high enough, then excessive hydrostatic pressures occur and the water / LNAPL potentiometric interface may rise above the base of the confining layer and the top of the well screen. Under these conditions, water can preferentially recharge rather than LNAPL and consequently interrupt the flow paths for LNAPL into the wells. Theory under these conditions would anticipate relatively high initial LNAPL recovery followed by slow recharge and much lower recovery rates.

6.2.4 Intermediate Water Table Elevation Conditions

As noted above in the Unconfined Conditions section, as the water table falls and confined conditions no longer exist, the driving hydrostatic forces to “push” LNAPL into the wells no longer exist and the mass of available mobile LNAPL is relatively lower. Consequently, LNAPL thicknesses would be predictably lower and production rates would decline.

6.3 DOLR Model Production Hydro-Stratigraph Evidence

The Production Hydro-stratigraphs document conformance of the majority of the site wells to the predictive DOLR model. The Production Hydro-stratigraph (Figure 92) for well MP-47C is discussed as a conforming example to the DOLR Model.

- A scatter plot of depth to top of LNAPL versus LNAPL thickness indicates conformity with the Dual Optimal LNAPL Production model for the site (Figure 93).
- Product recovery rates exhibited significant variability, directly tied to fluid elevations and LNAPL thickness increases.
- The well almost always produced more groundwater than hydrocarbon, but by varying amounts – ranging from approximately twice as much to approximately 50 times as much.
- Recharge was generally good, typically 80% to 90% of original product thickness after 2 hours.
- The production hydro-stratigraph for MP-47C exhibits general conformance with the Dual Optimal LNAPL Production model for the site. During initial HVR events from this well, the top of LNAPL was slightly below the base of the overlying confining silt layer. This intermediate zone between confined and unconfined conditions typically represents a lower hydrocarbon production zone from the wells and the production during the early events reflected this. Subsequently, fluid levels rose slightly, the LNAPL underwent confining conditions but the LNAPL/water interface was below the confining layer and optimal hydrocarbon production conditions developed as reflected in HVR-05, which exhibited the highest hydrocarbon production rate from this well. Fluid levels then dropped and HVR-06 occurred during the intermediate period of hydrocarbon production, resulting in a lower hydrocarbon removal rate. Fluid levels continued to drop, LNAPL thicknesses increased, and HVR-07 was conducted during this unconfined portion of the dual-optimal LNAPL production model. HVR-07 (unconfined) exhibited the second highest rate of hydrocarbon removal, nearly identical to the removal in HVR-05 (confined).

6.4 Summary

LNAPL thicknesses and production capacities are at their highest during slight to moderate confined conditions and during unconfined conditions when water table elevations have dropped sufficiently to release submerged residual LNAPL to accumulate. LNAPL thicknesses, recharge rates, and production capacities are lower during excessive water table elevations when LNAPL flow paths may be interrupted and during intermediate water table elevations when lower mobile LNAPL volumes are available and the driving force for LNAPL drainage into the wells is minimized. For those wells with sufficient mobile LNAPL in their vicinity to warrant LNAPL (as liquid) extraction but with insufficient mobile LNAPL mass to sustain significant LNAPL extraction rates, the DOLR model can be used to identify and predict optimal LNAPL extraction time periods based on water table elevation relative to the base of the confining layer and top of well screen.

The DOLR Model explains the variations in LNAPL thickness and LNAPL Production capacity observed in the Main Sand wells as a result of water table fluctuations, and can also be utilized to predict relative LNAPL production rates based on water table elevations, stratigraphic contact elevations, and well construction details. Therefore, the DOLR Model represents not just an explanatory model of site LNAPL conditions, but also a predictive tool for the management and implementation of remediation options at the site.

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Table 1 Multi-Site Daily Rate and Recovery Report
Table 2 HVR Extraction Event Summary Data

Figure 1: HMW-19
Multi-Site Cumulative Product Recovery (Gallons)

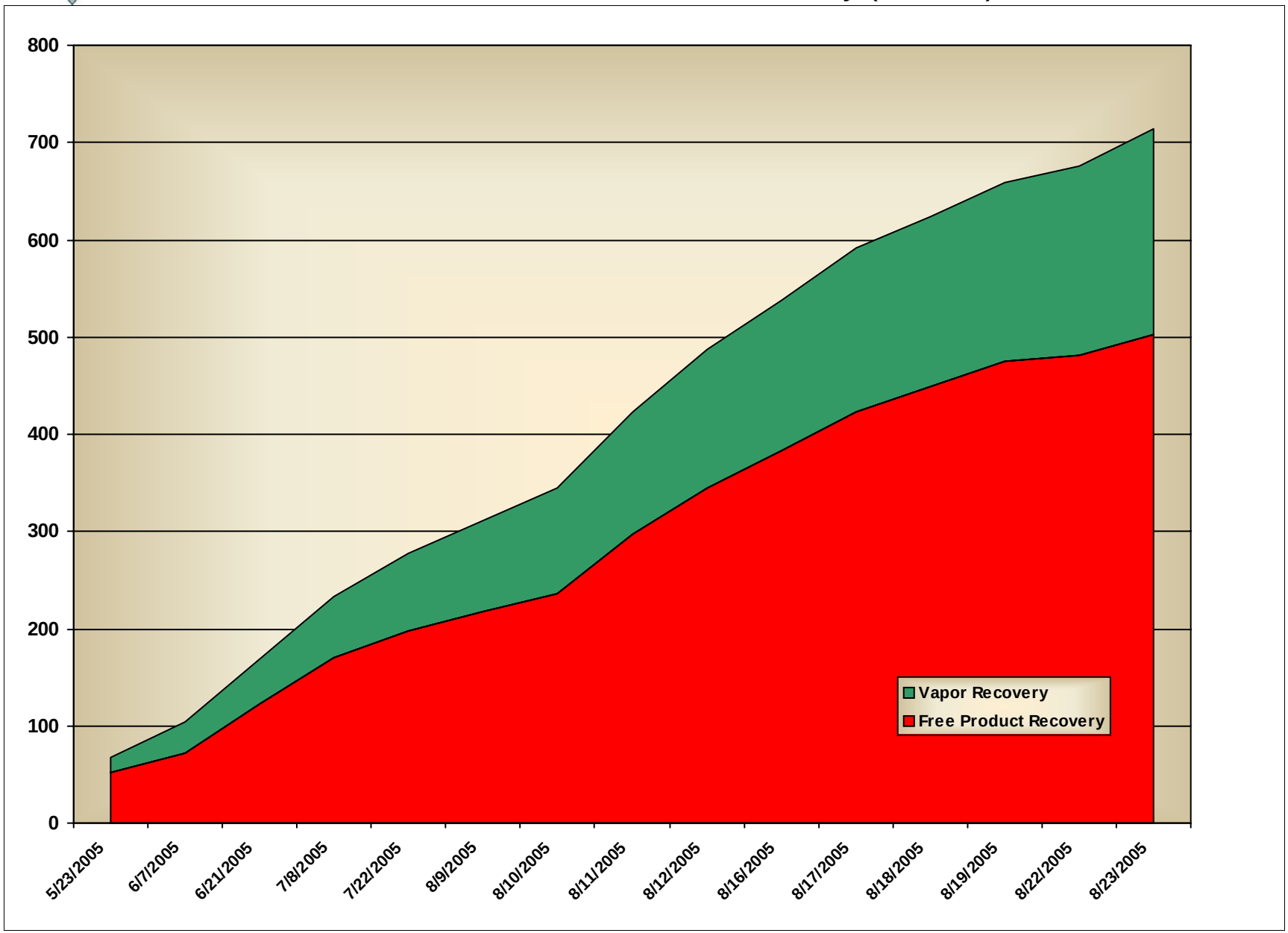

Figure 2: HMW-19
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

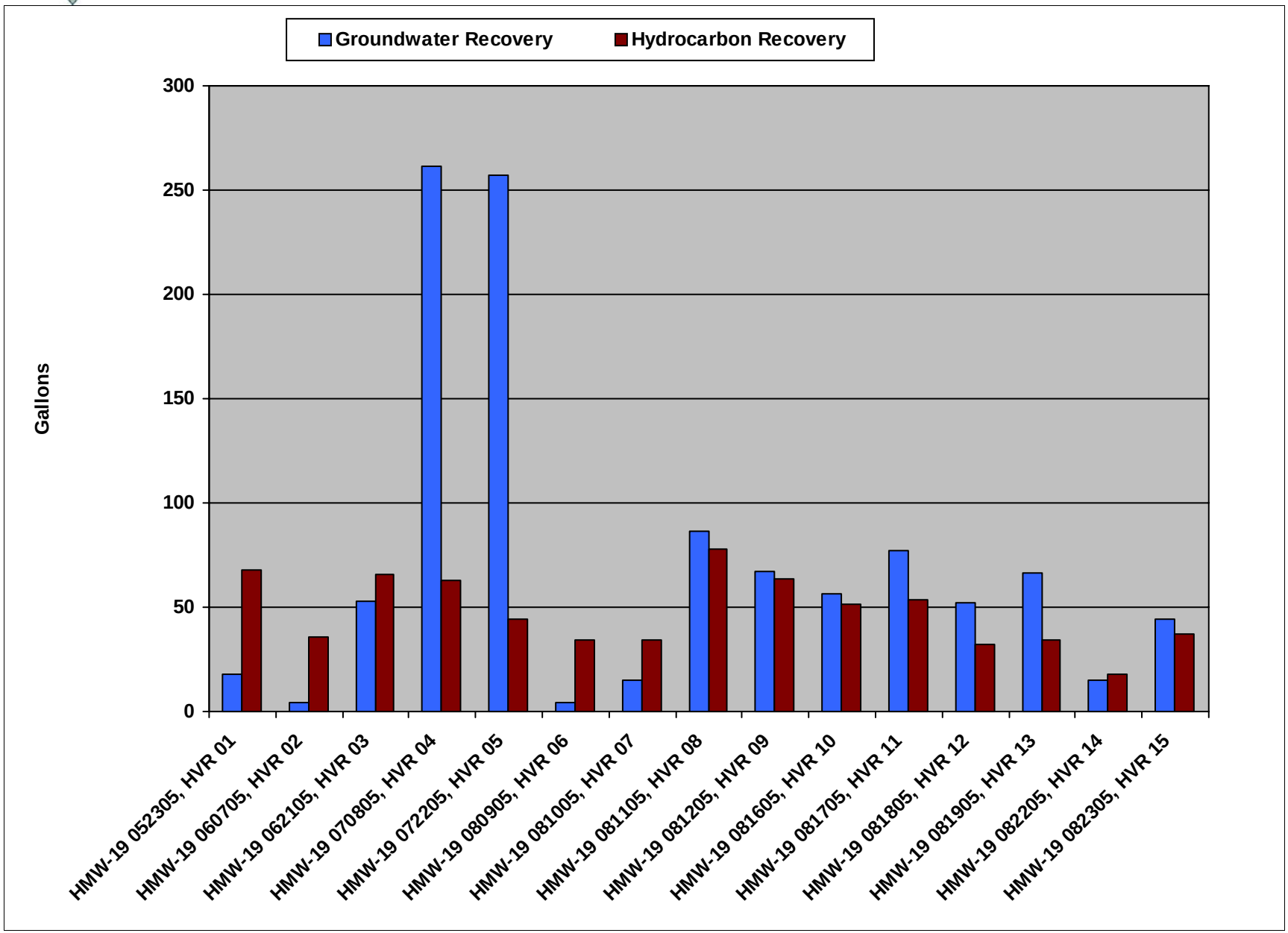

Figure 3: HMW-19
Multi-Site Hydrocarbon Recovery Rate (Gal/Hr) - Grouped by Site

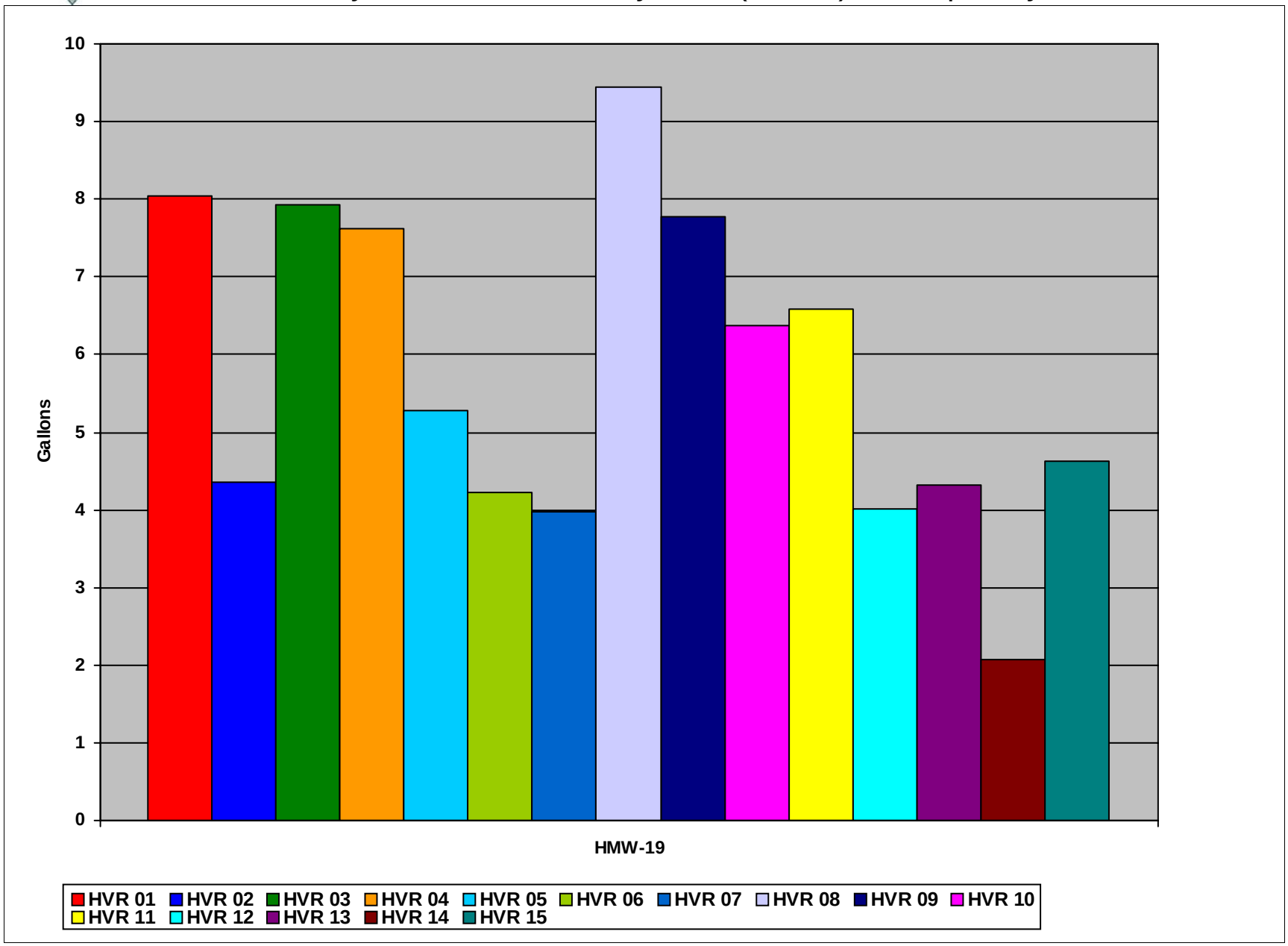

Figure 4: HMW-19
Multi-Site LB per Hour - ICE Calculated vs. Lab Sample

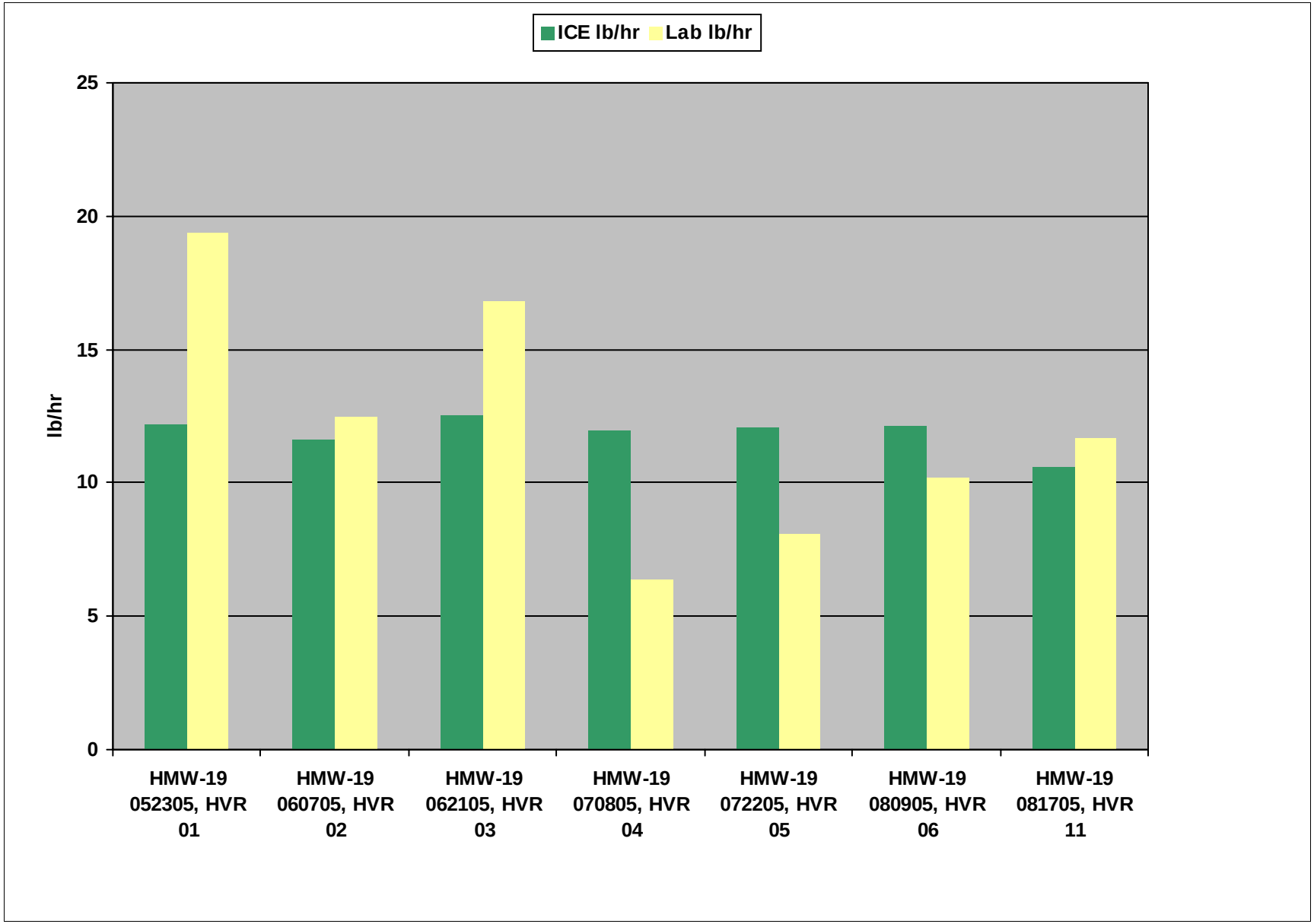

Figure 5: HMW-19
BTU per Hour

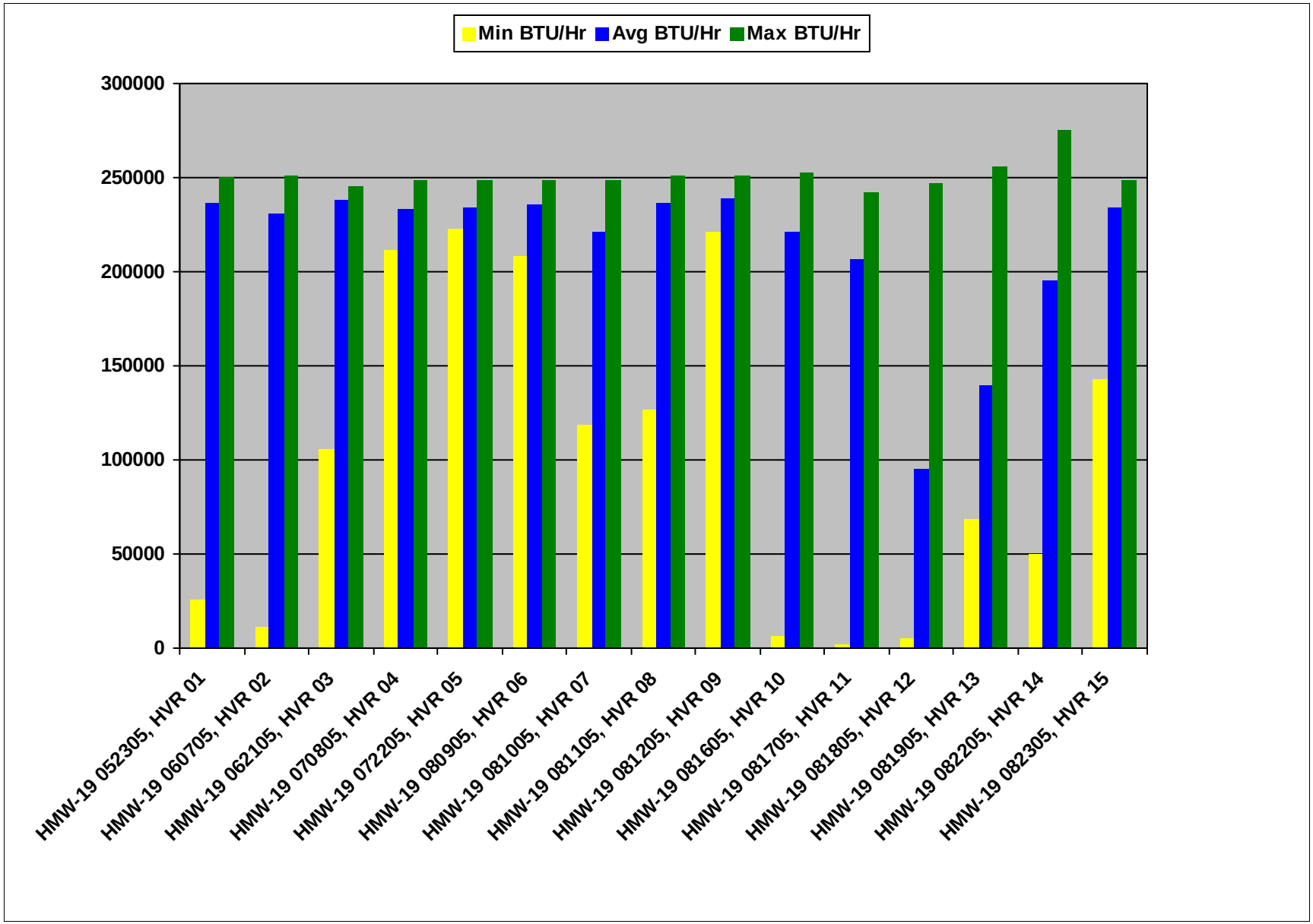

Figure 6: HMW-19
Multi-Site Vacuums

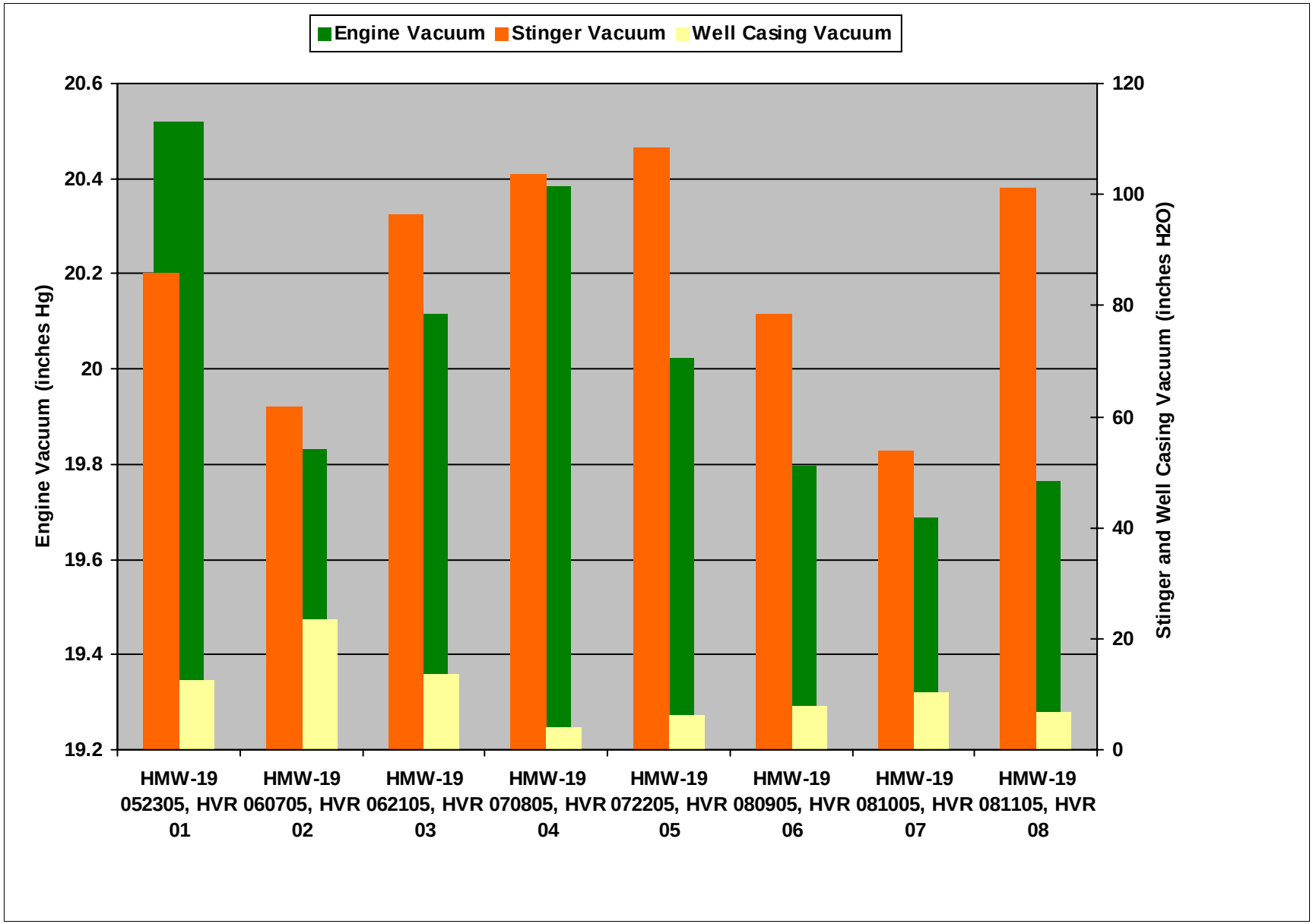

Figure 7: HMW-19
Multi-Site Air, Well and Fuel Flows

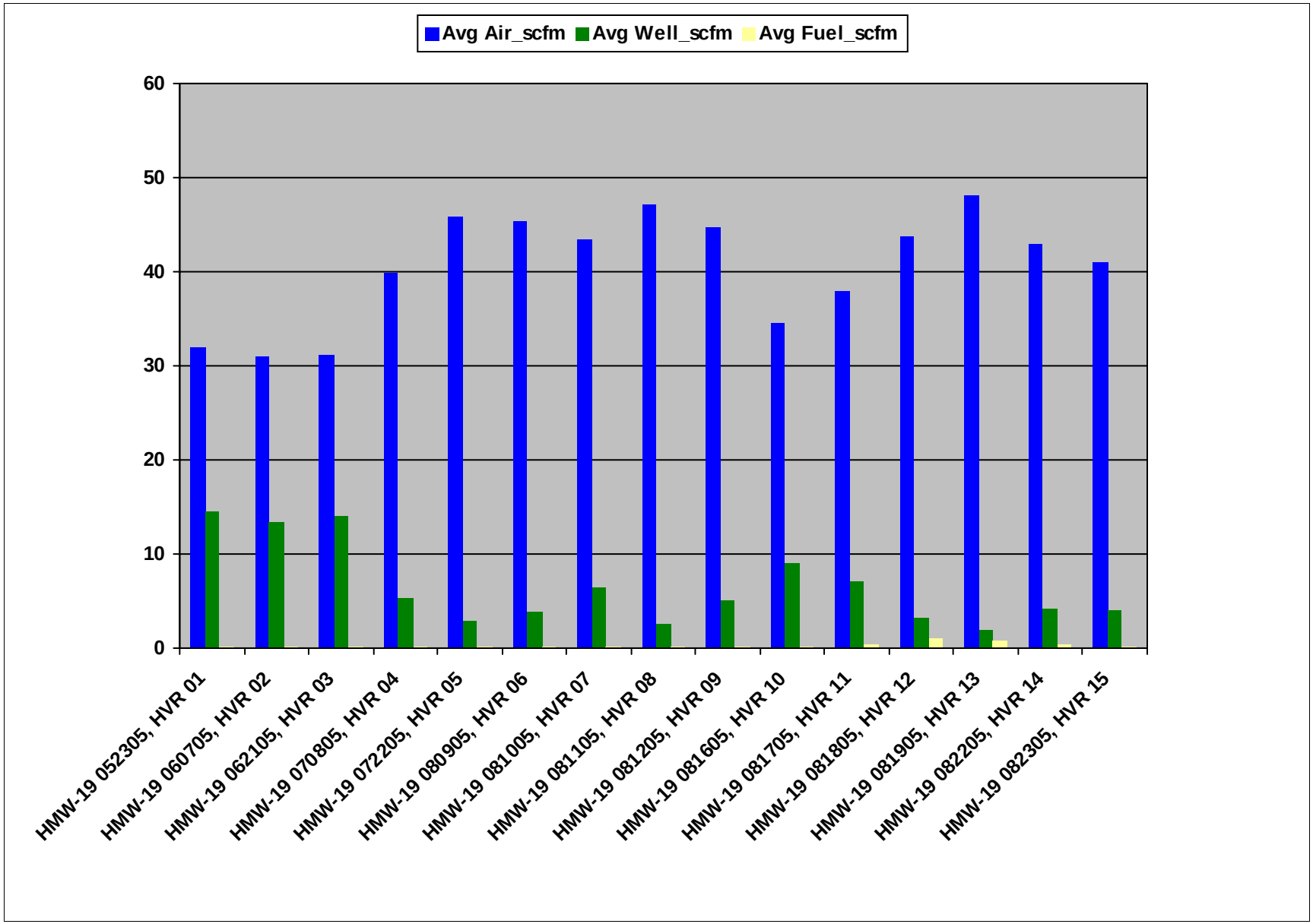

Figure 8: HMW-19 Gauging, Stinger and Production Data
Hydrocarbon Recovery vs. Groundwater Recovery - with Elevations

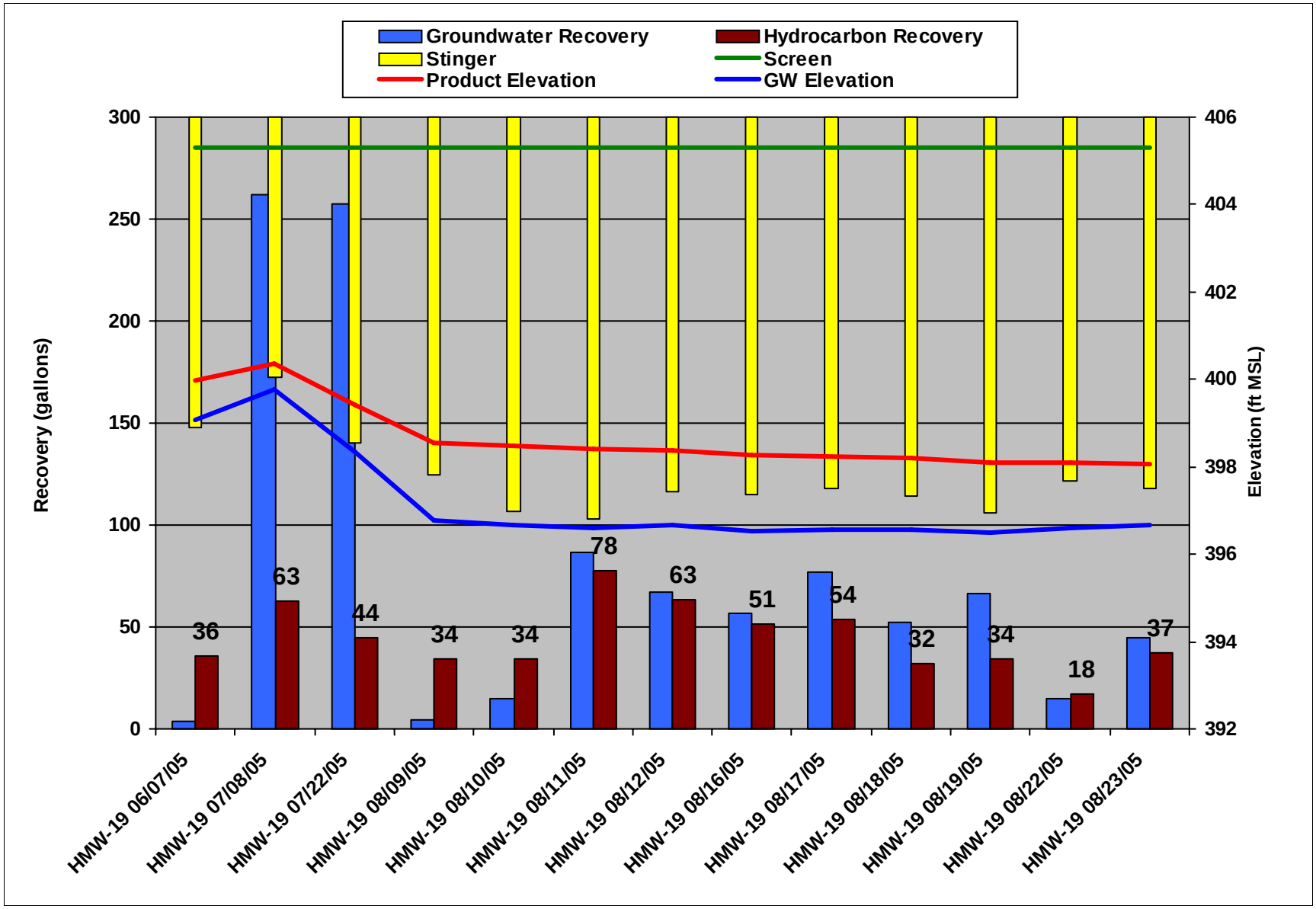

Figure 9: HMW-19
Hydrocarbon Recovery vs. Groundwater Recovery - with Vacuums

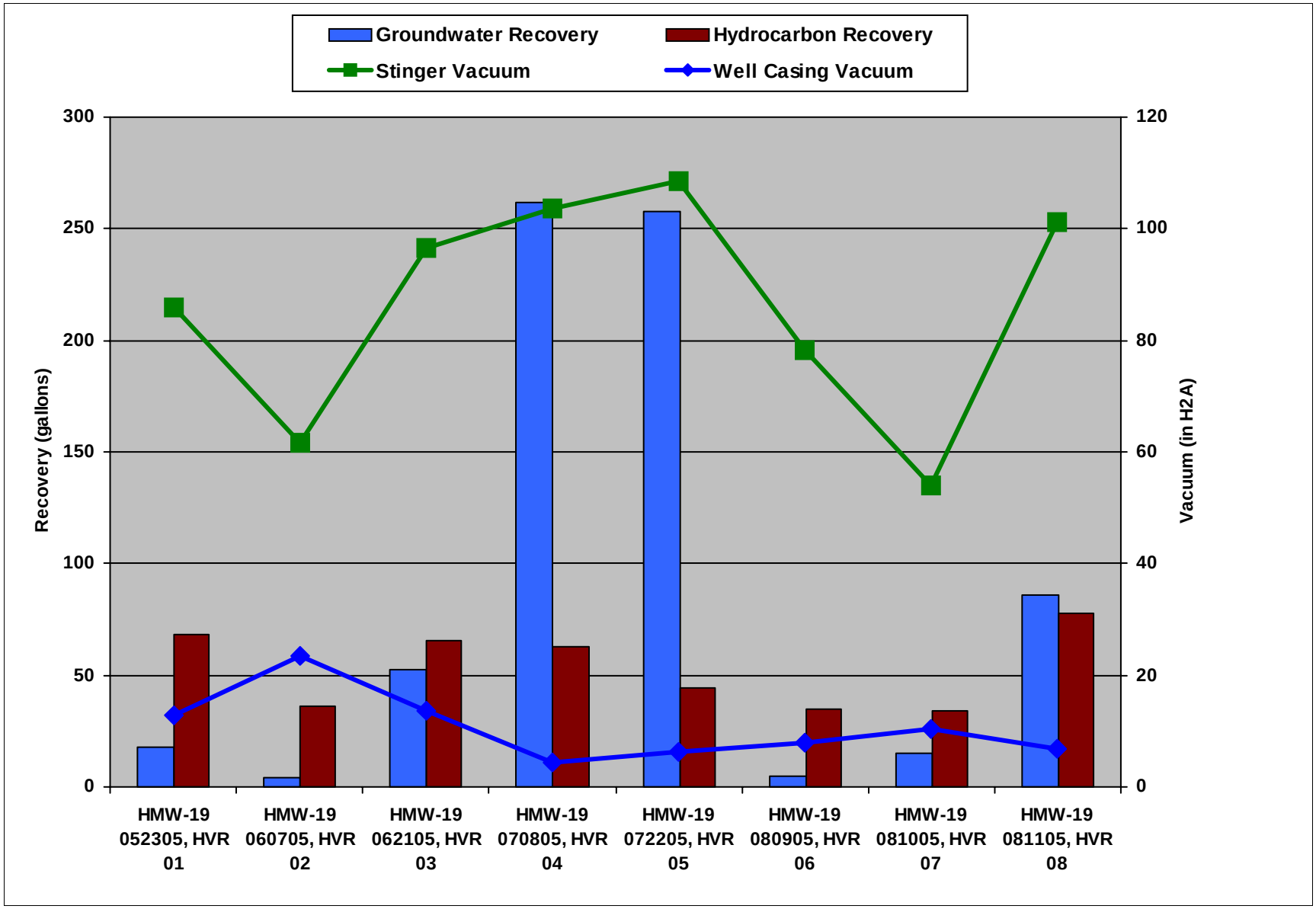

Figure 10: HMW-19
Hydrocarbon Recovery vs. Groundwater Recovery - with Percentages

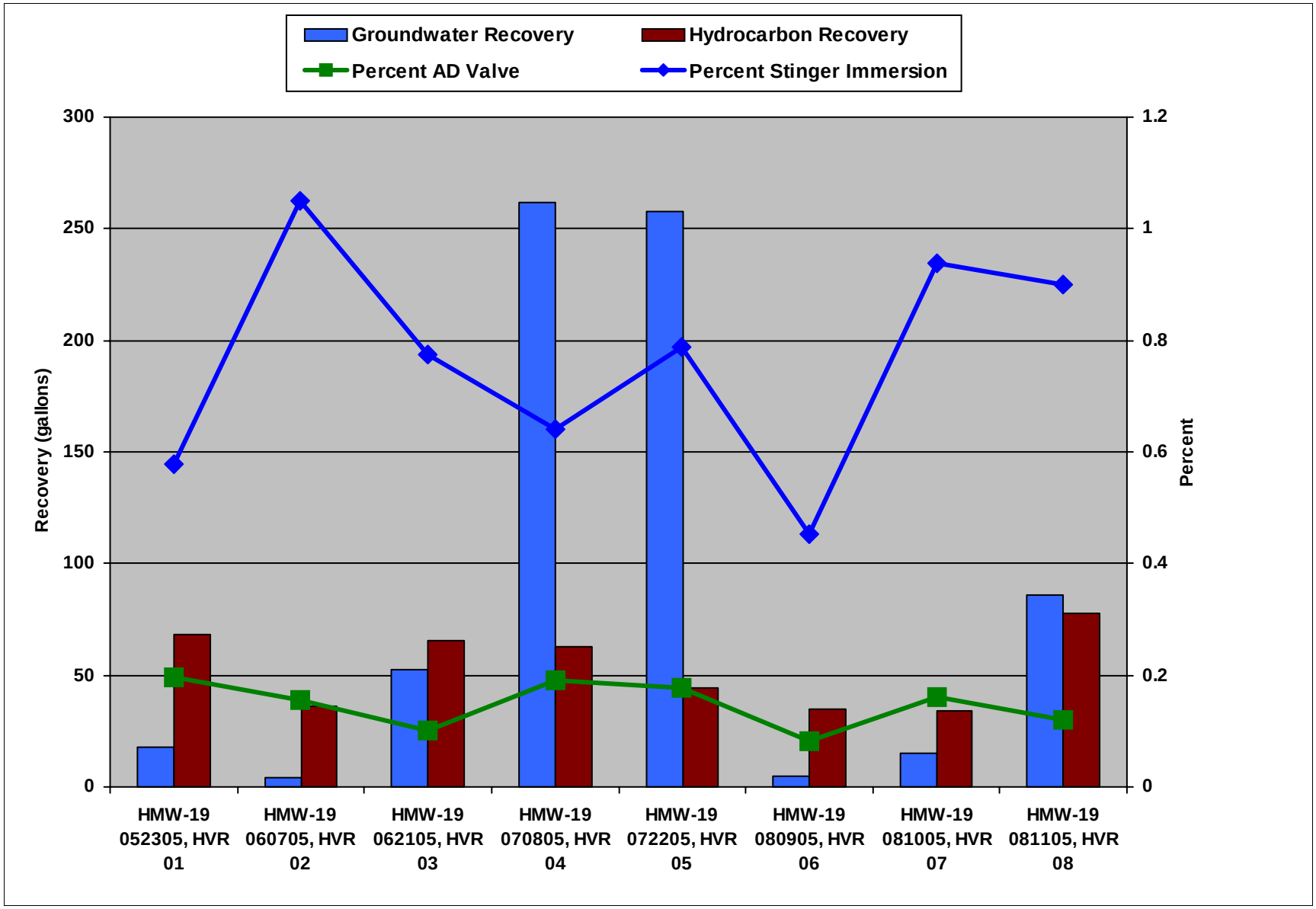

Figure 11: HMW-19
HiVac Event Recharge as a Percentage of Original Product Thickness

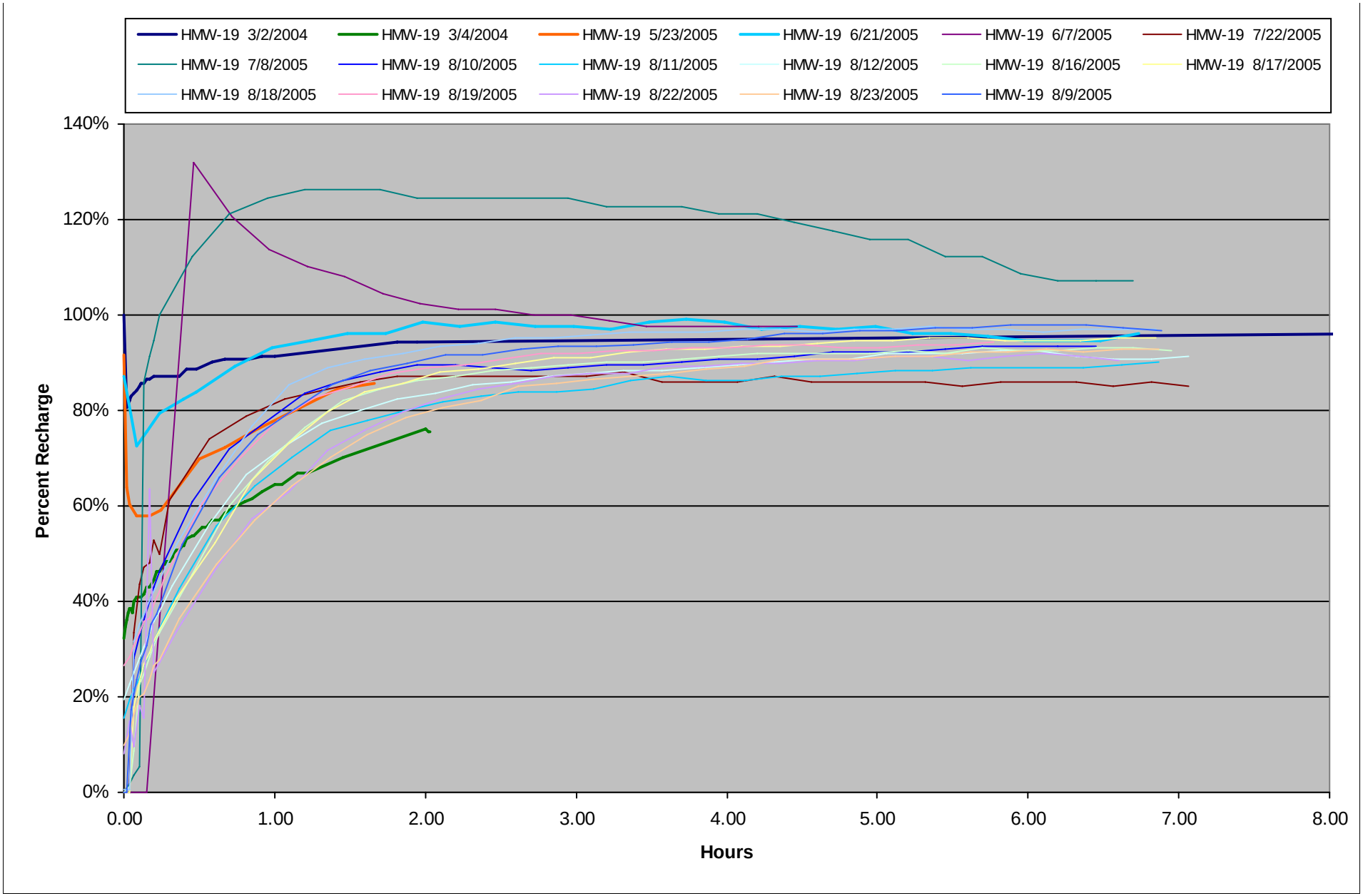

Figure 12: HMW-19
HiVac Event Recharge as Product Thickness in Feet

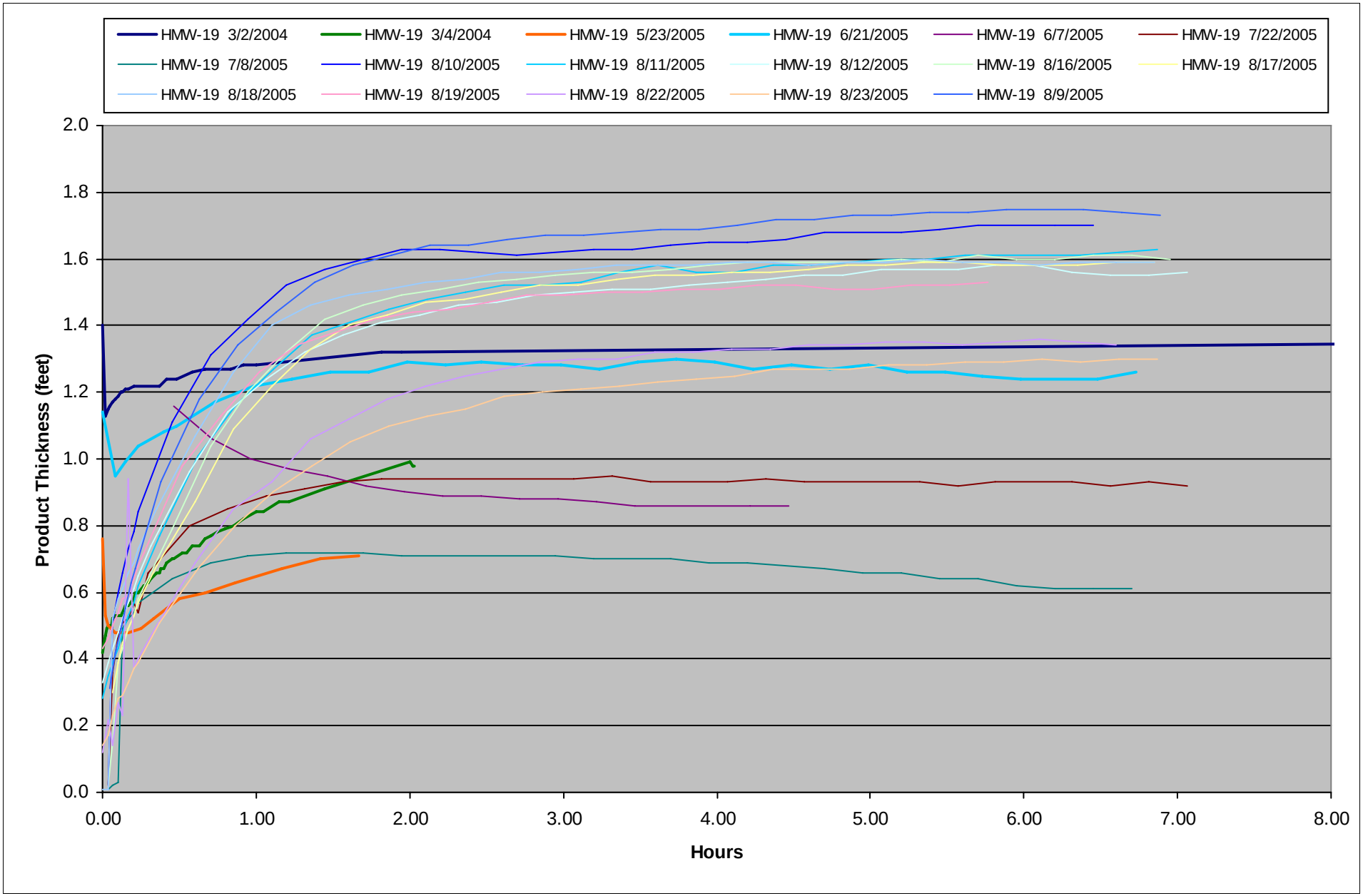

Figure 13: Production Hydrostratigraph

HMW-19

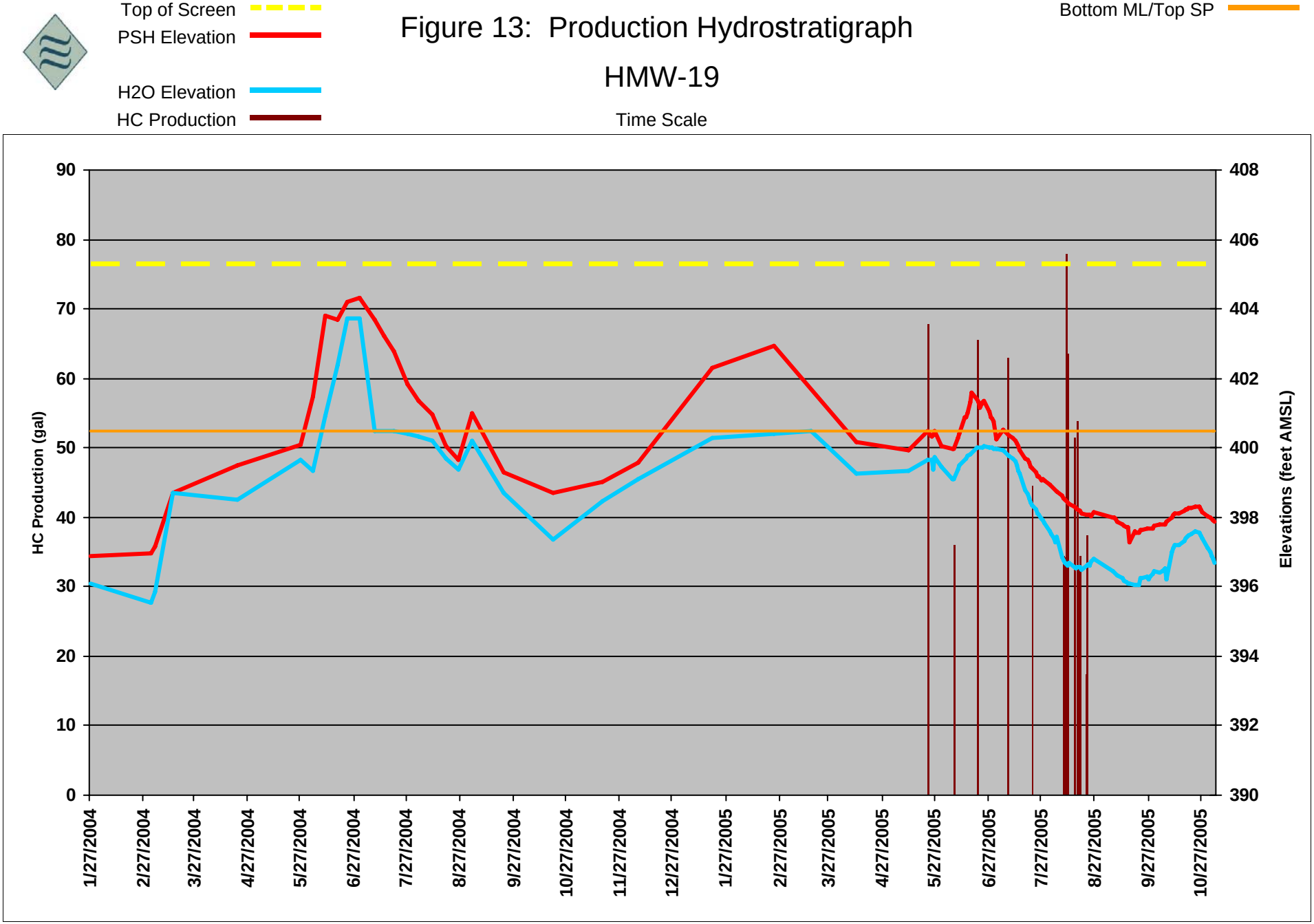

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Figure 14: HMW-19
Depth to Top of LNAPL vs. LNAPL Thickness 2004-2005

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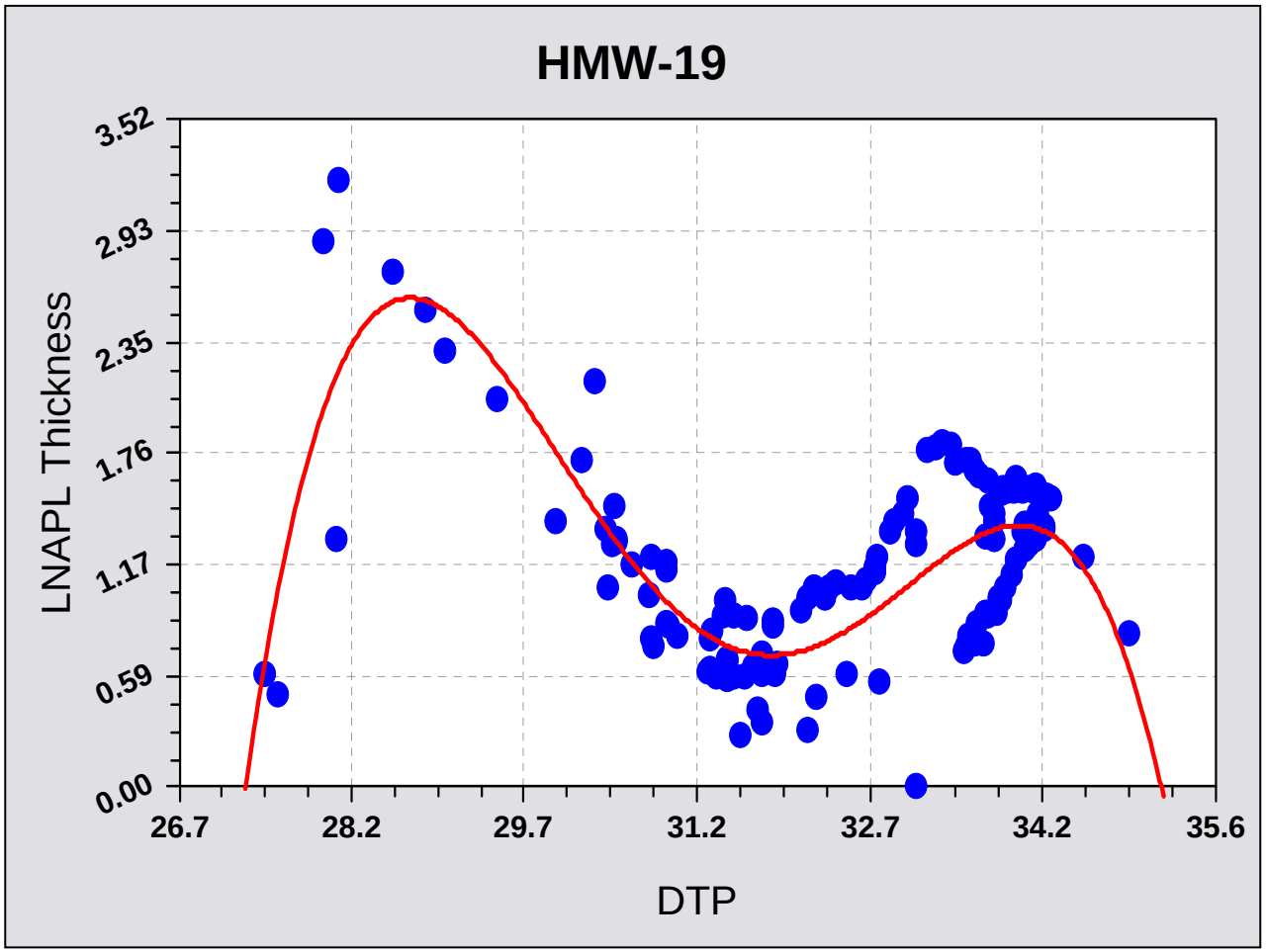

Figure 15: HMW-20
Multi-Site Cumulative Product Recovery (Gallons)

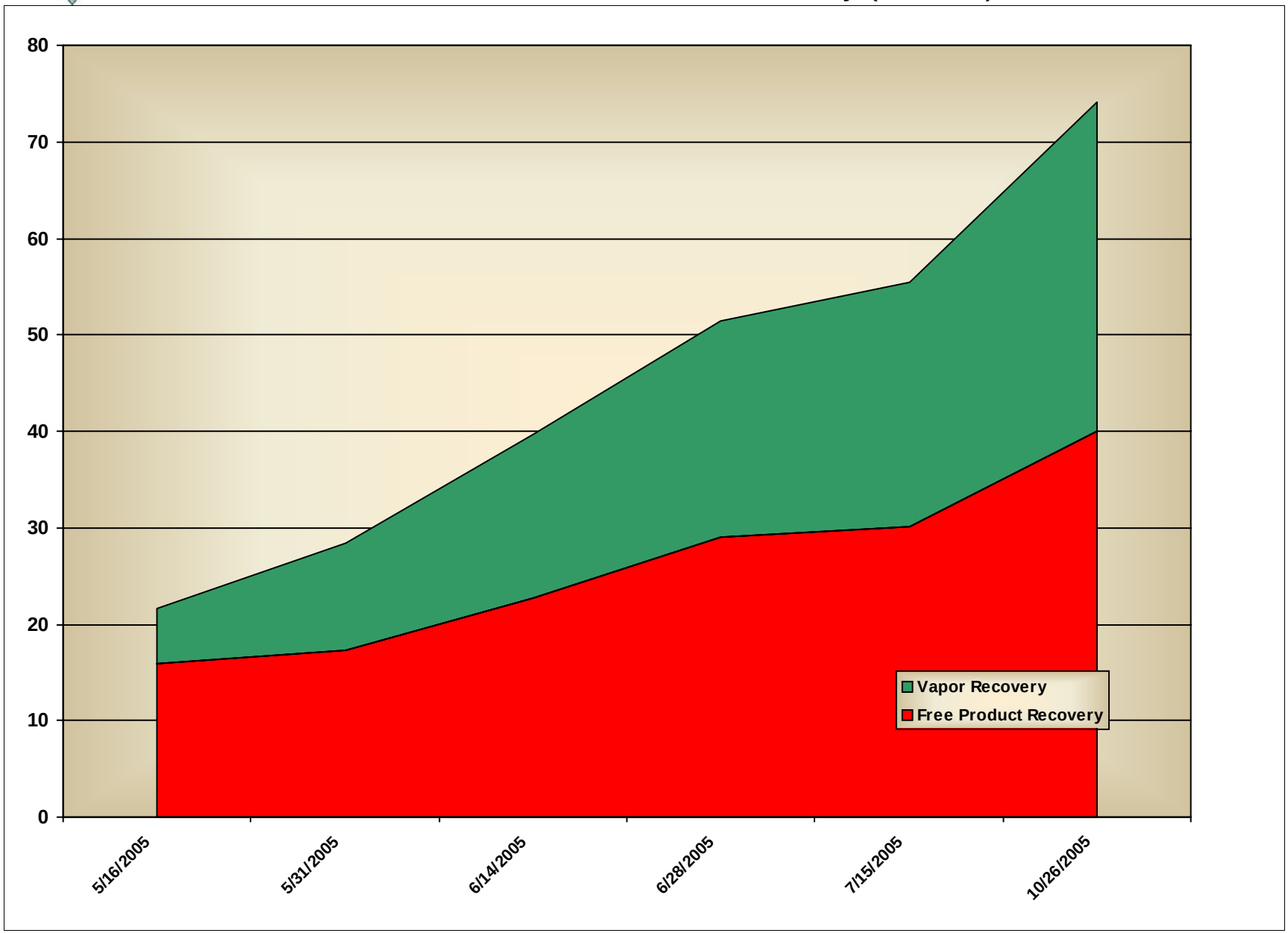

Figure 16: HMW-20
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

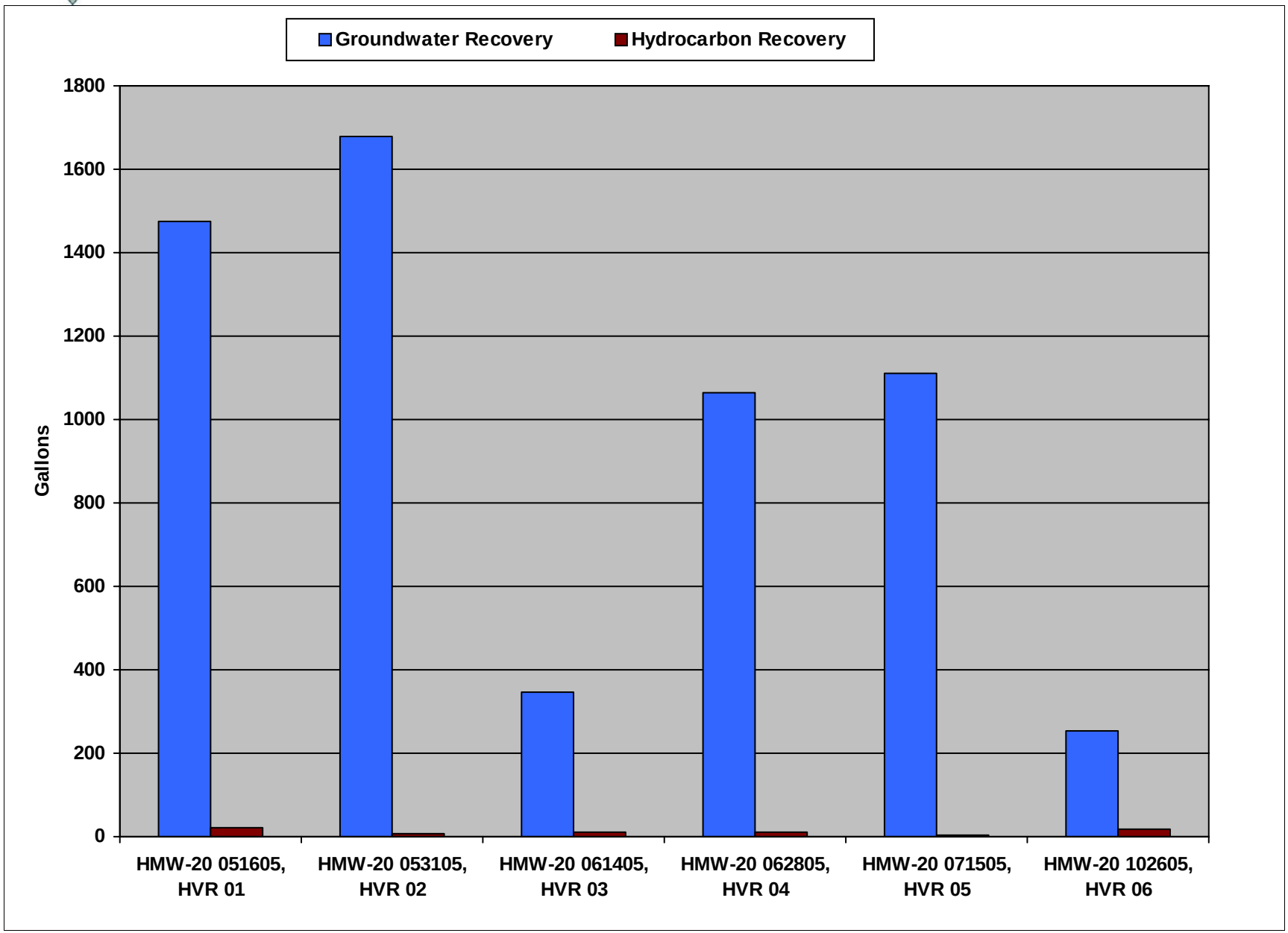

Figure 17: HMW-20
Multi-Site Hydrocarbon Recovery Rate (Gal/Hr) - Grouped by Site

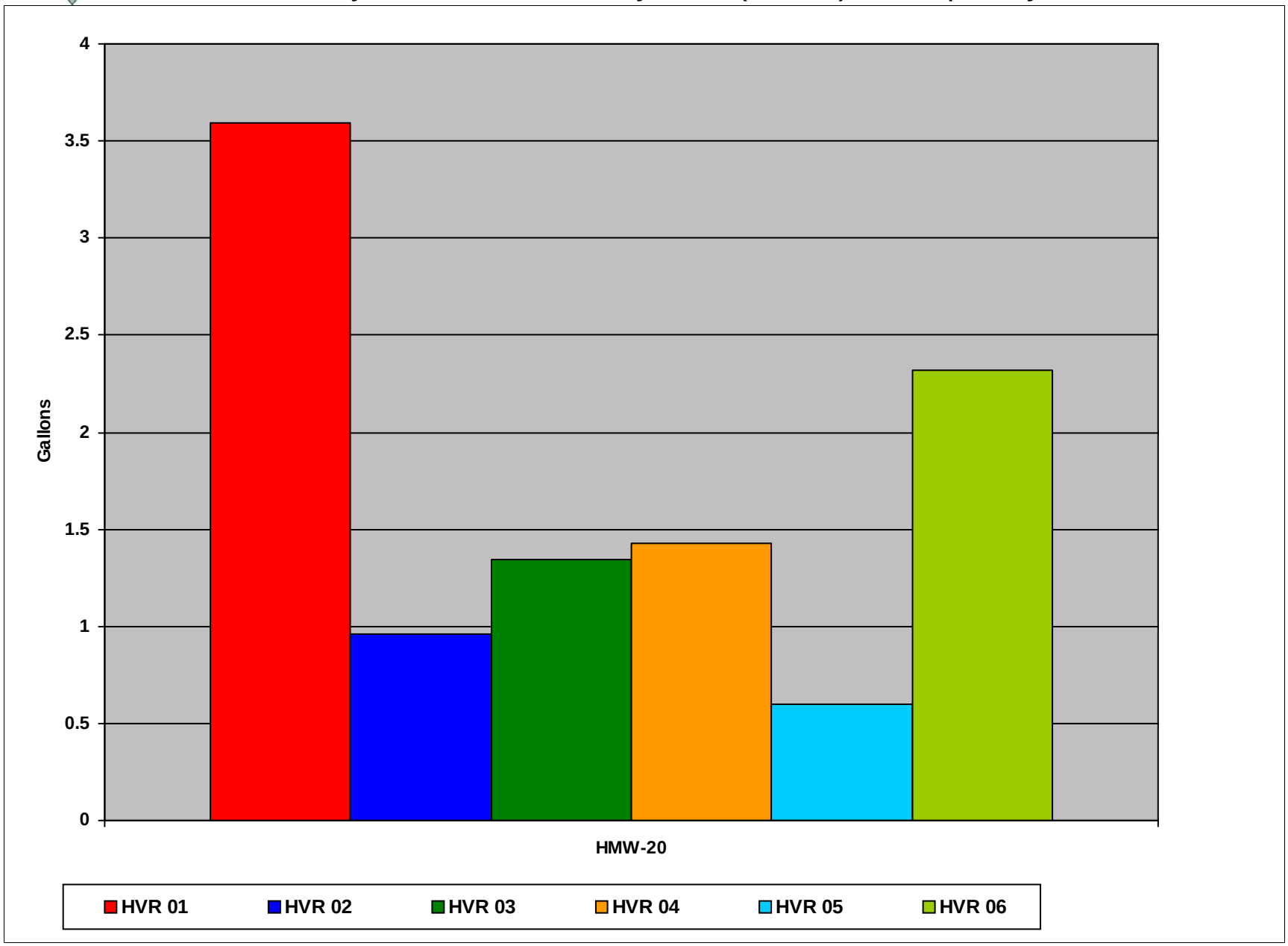

Figure 18: HMW-20
Multi-Site LB per Hour - ICE Calculated vs. Lab Sample

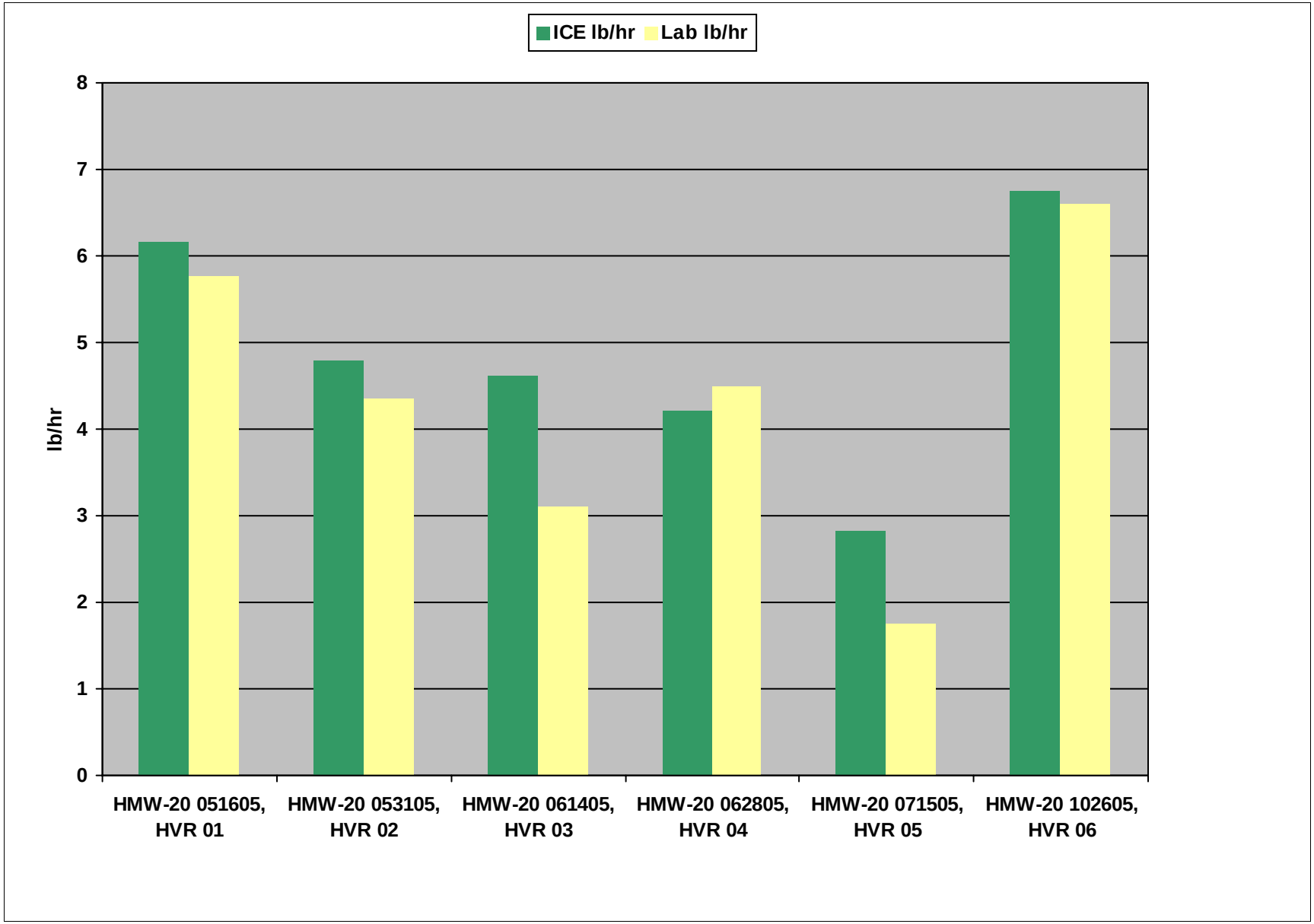

Figure 19: HMW-20
BTU per Hour

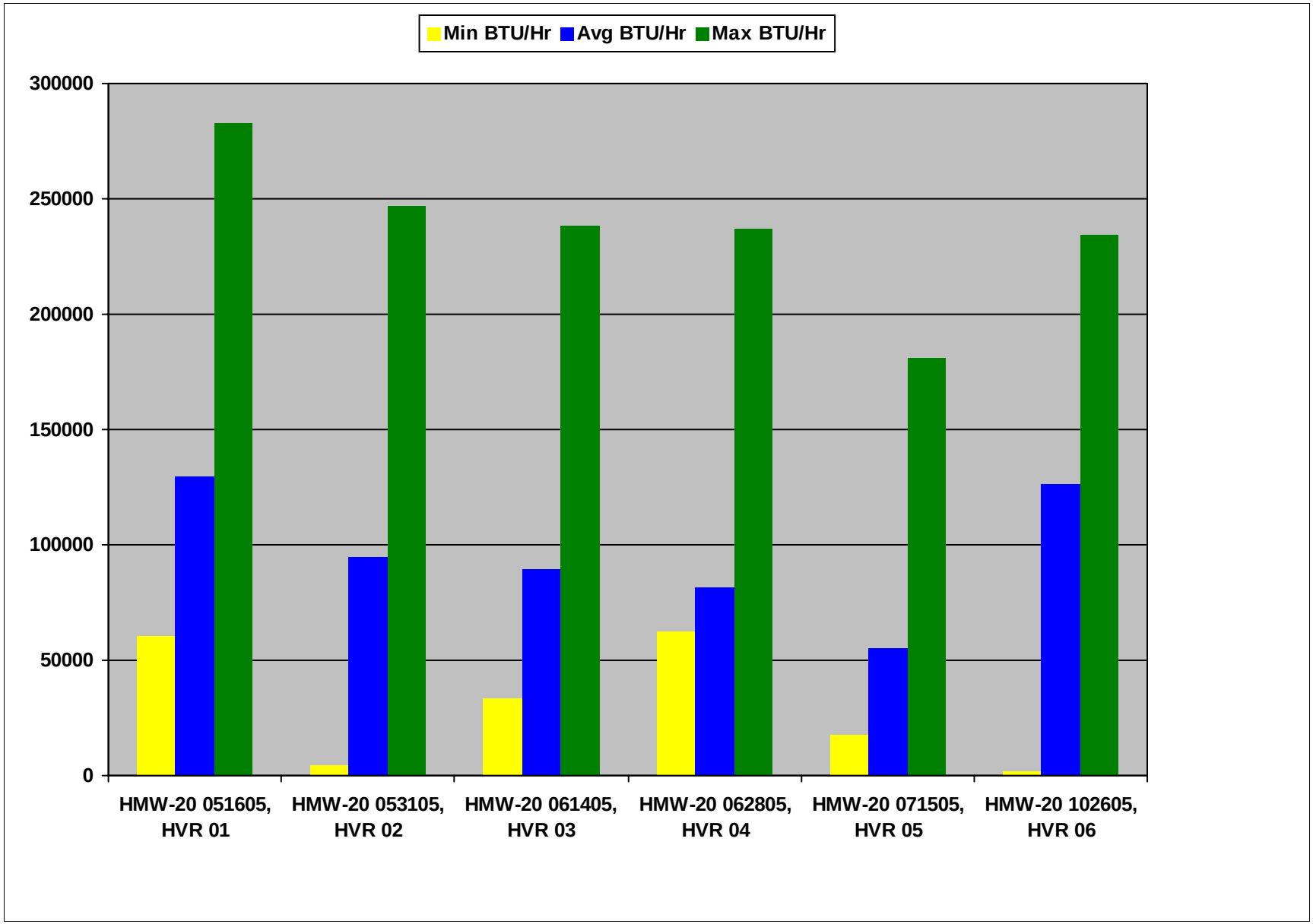

Figure 20: HMW-20
Multi-Site Vacuums

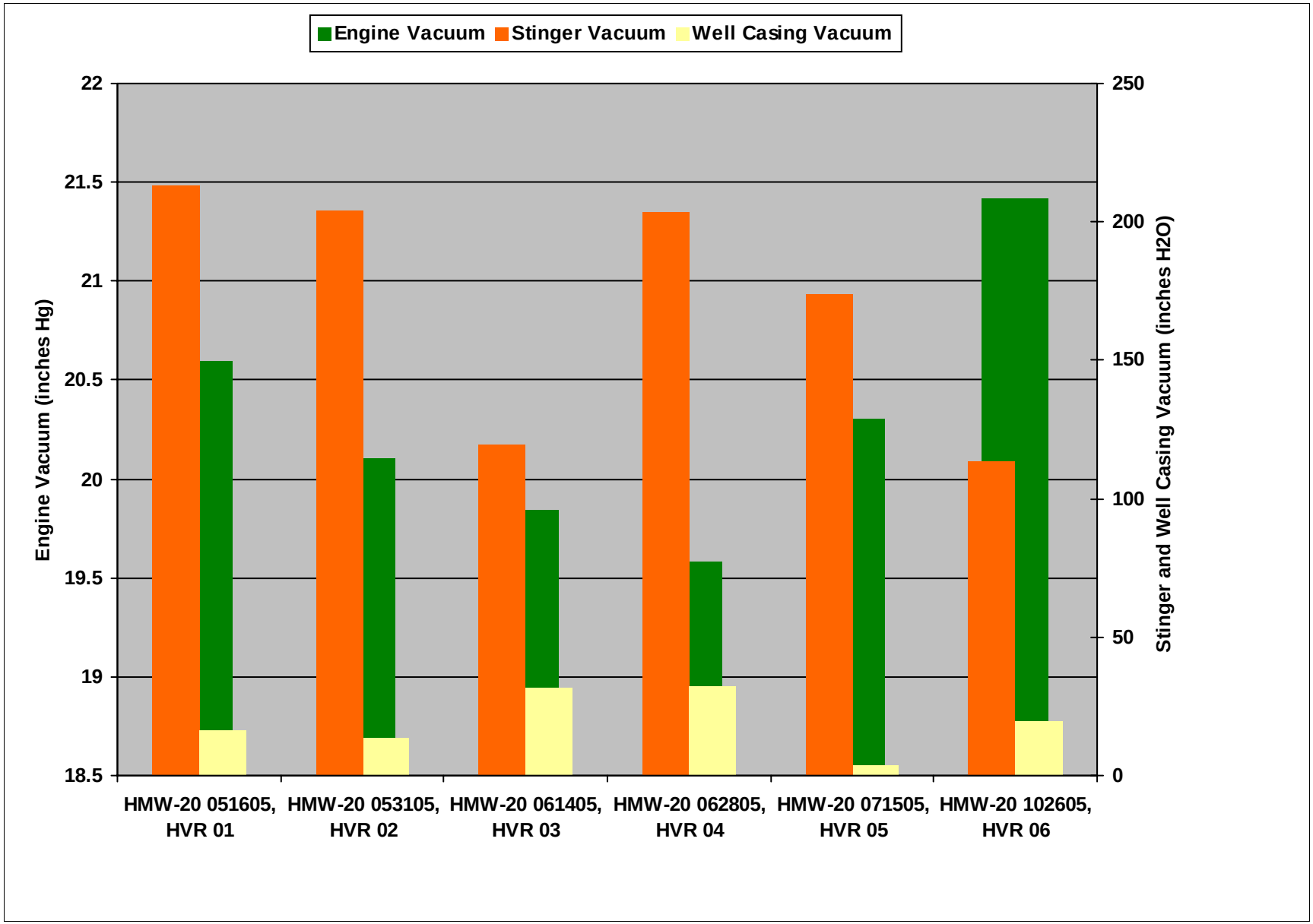

Figure 21: HMW-20
Multi-Site Air, Well and Fuel Flows

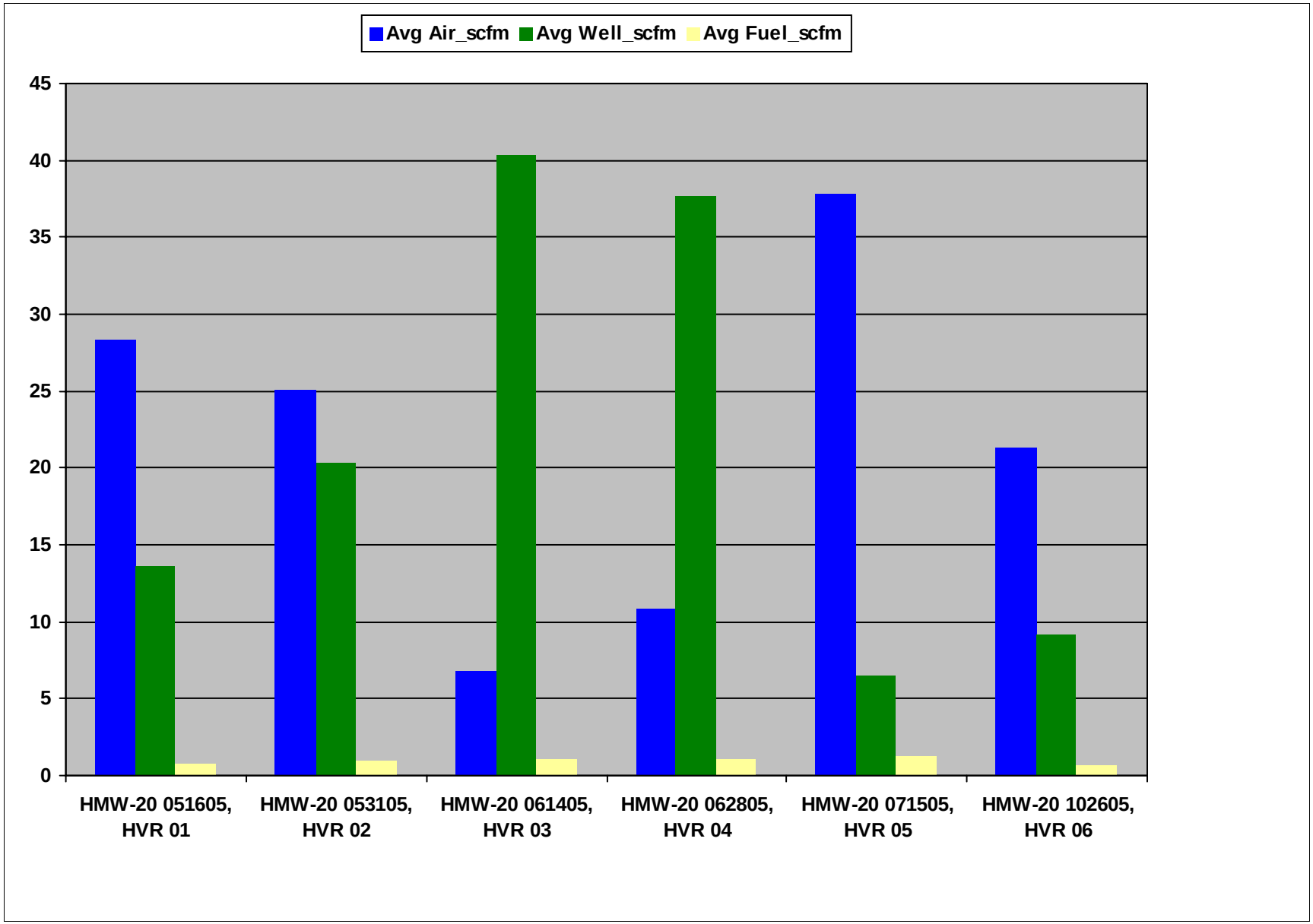

Figure 22: HMW-20 Gauging, Stinger and Production Data
Hydrocarbon Recovery vs. Groundwater Recovery - with Elevations

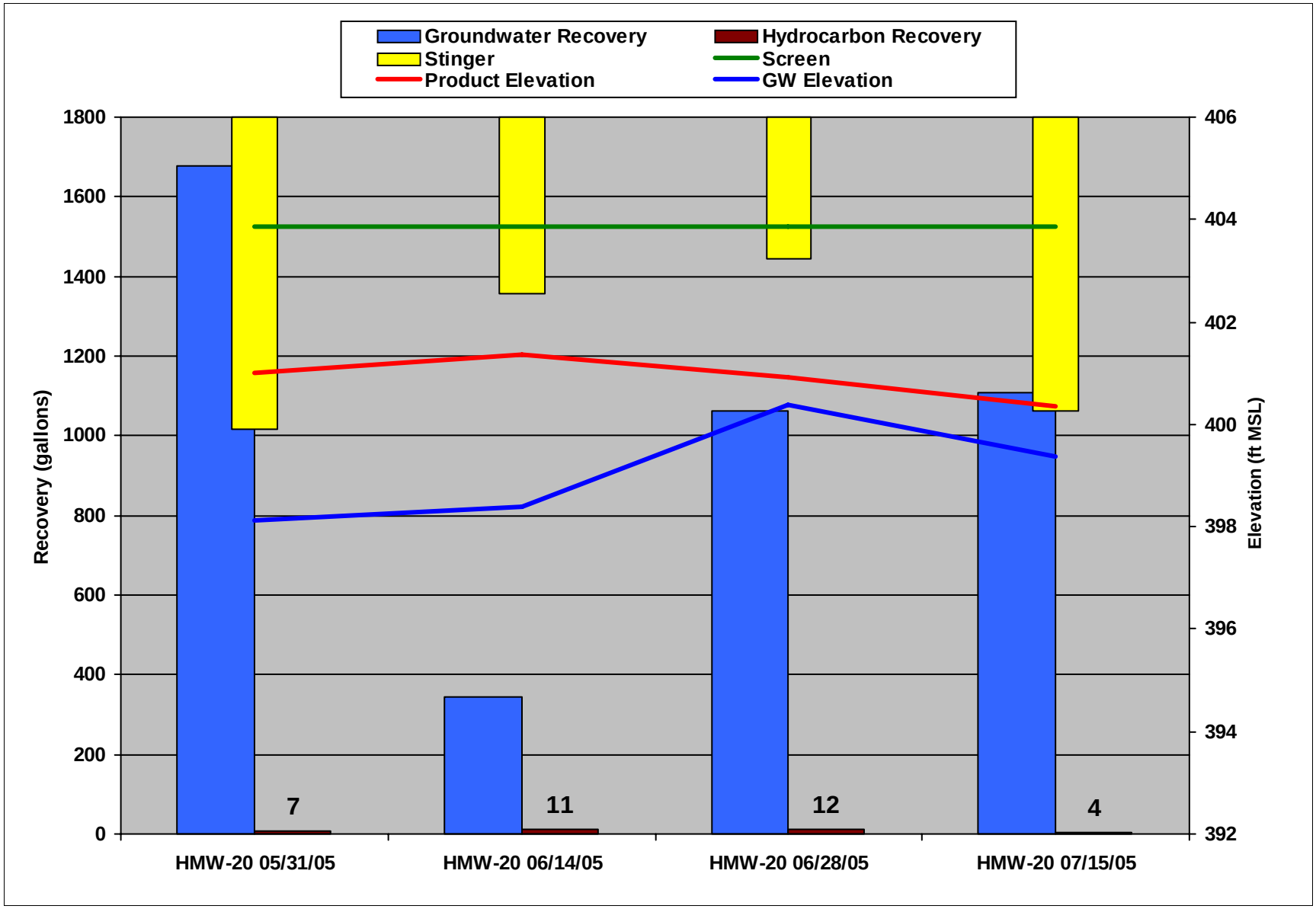

Figure 23: HMW-20
Hydrocarbon Recovery vs. Groundwater Recovery - with Vacuums

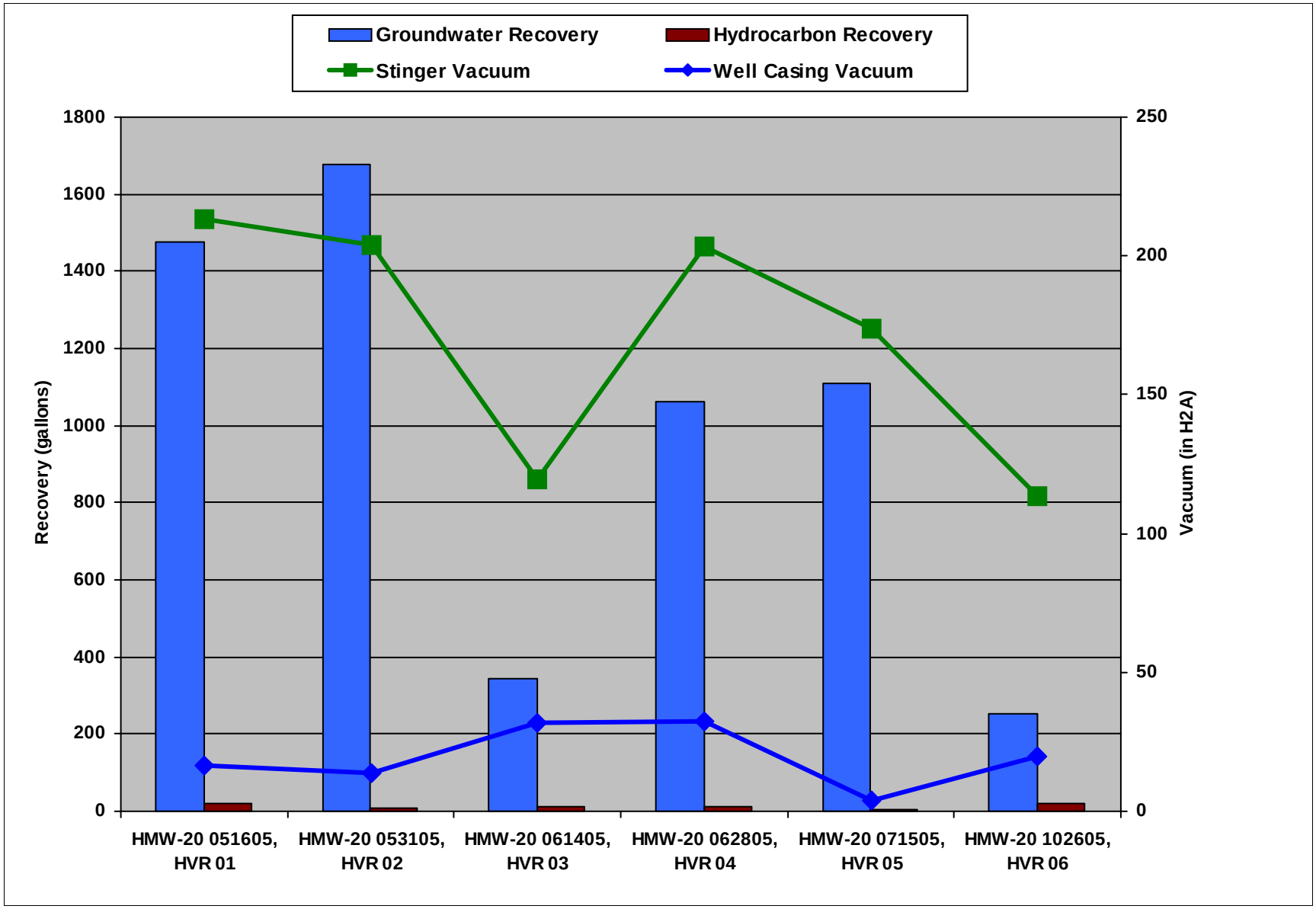

Figure 24: HMW-20
Hydrocarbon Recovery vs. Groundwater Recovery - with Percentages

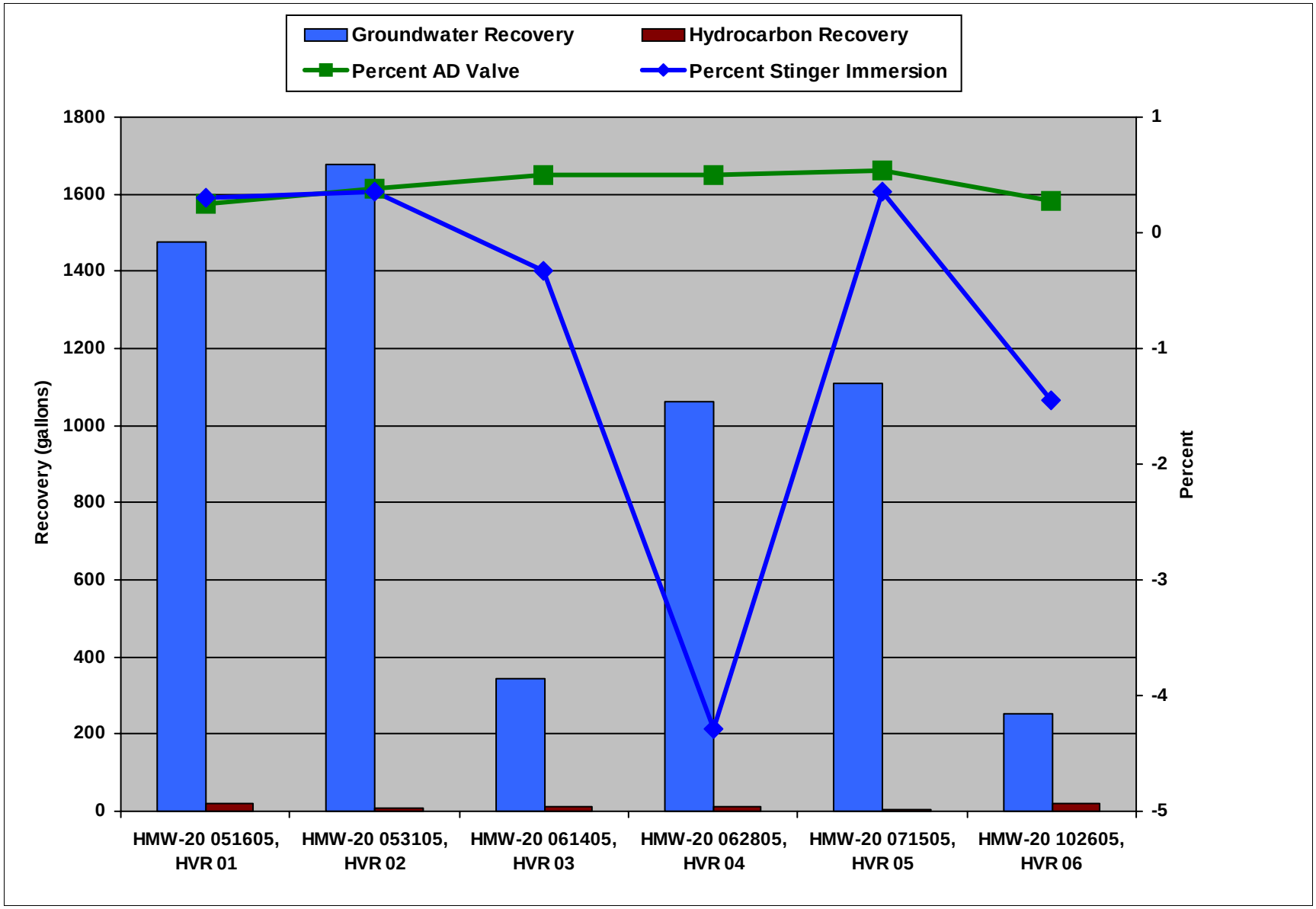

Figure 25: HMW-20
HiVac Event Recharge as a Percentage of Original Product Thickness

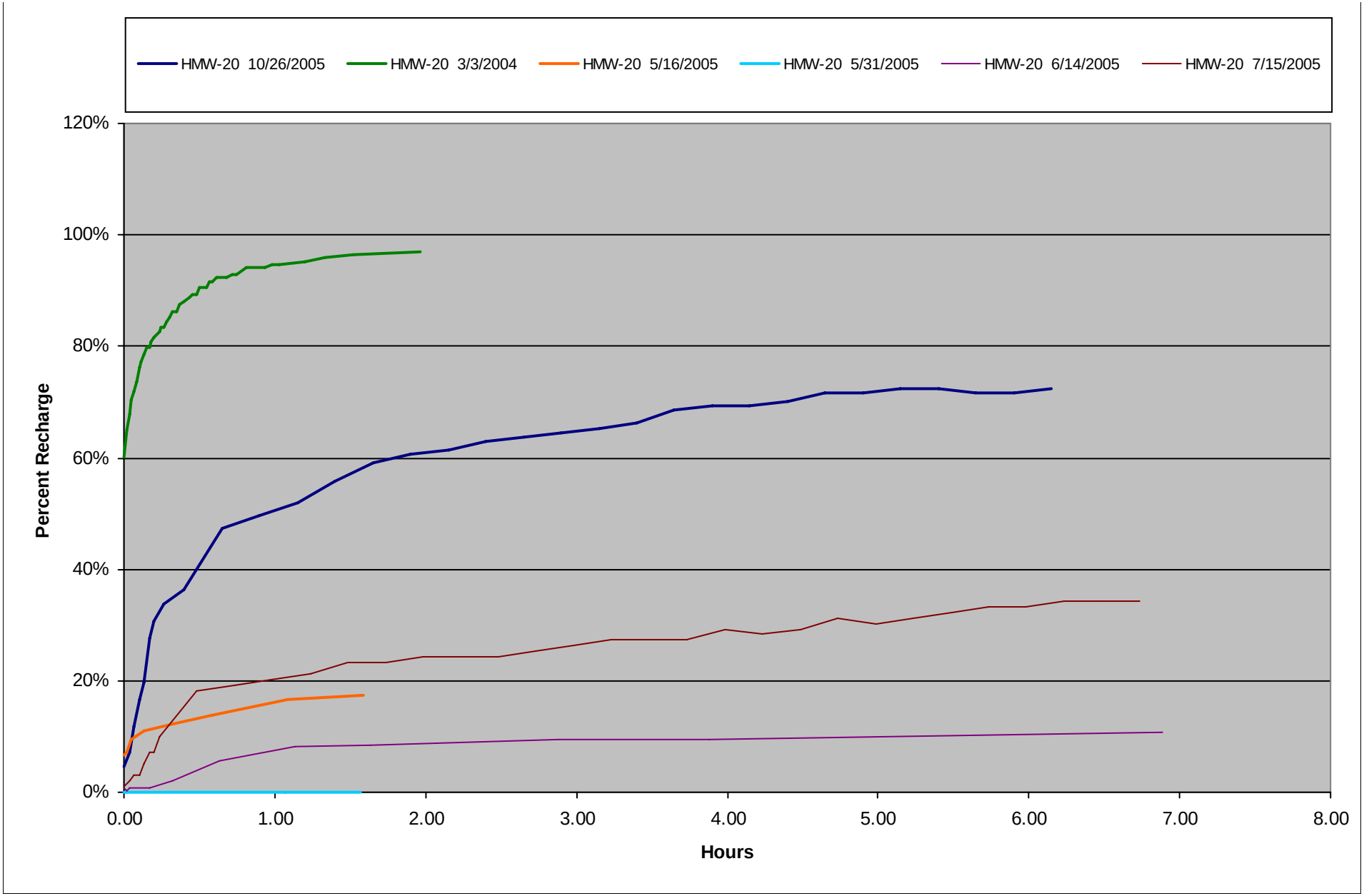

Figure 26: HMW-20
HiVac Event Recharge as Product Thickness in Feet

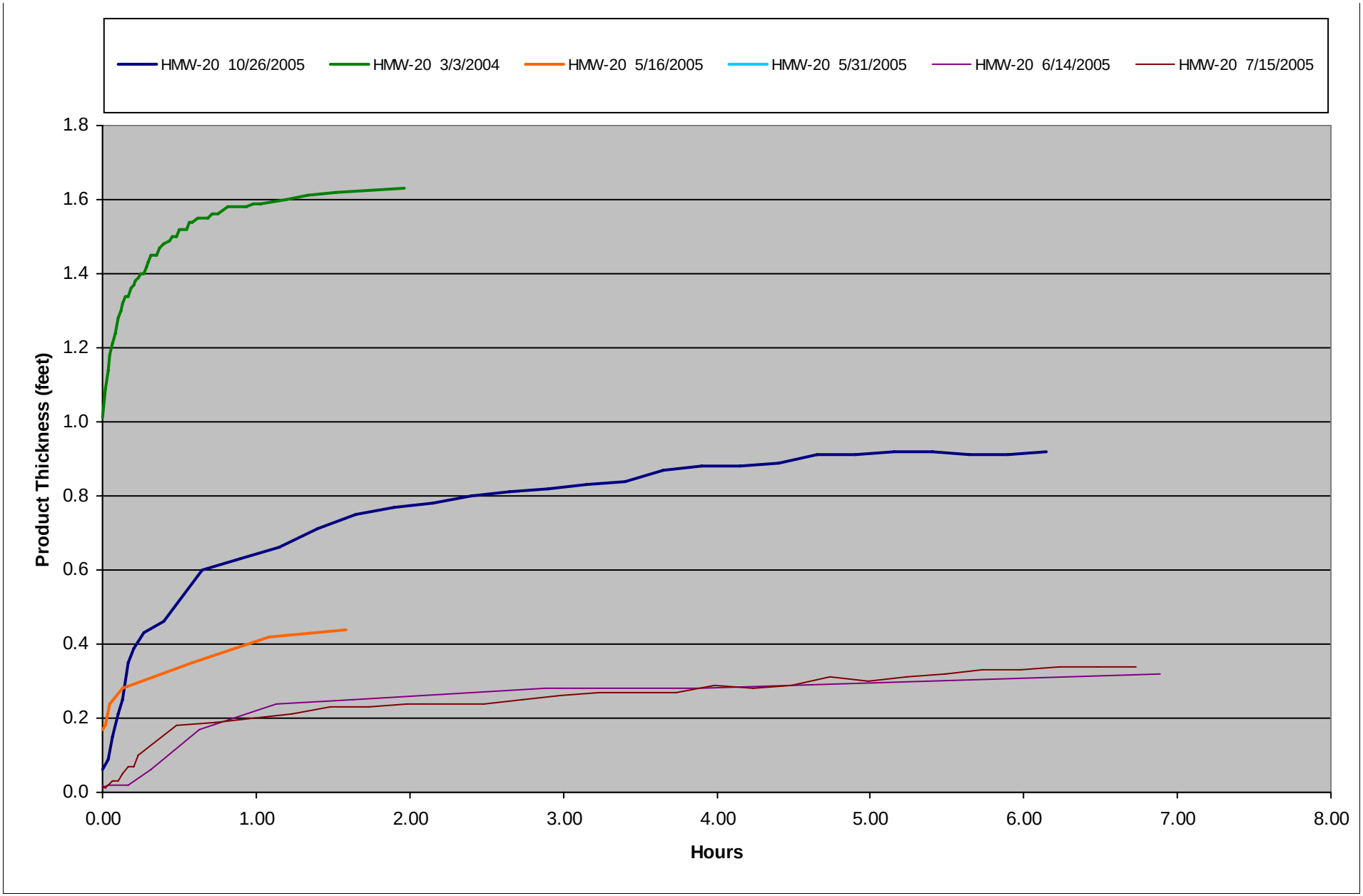

Figure 27: Production Hydrostratigraph

HMW-20

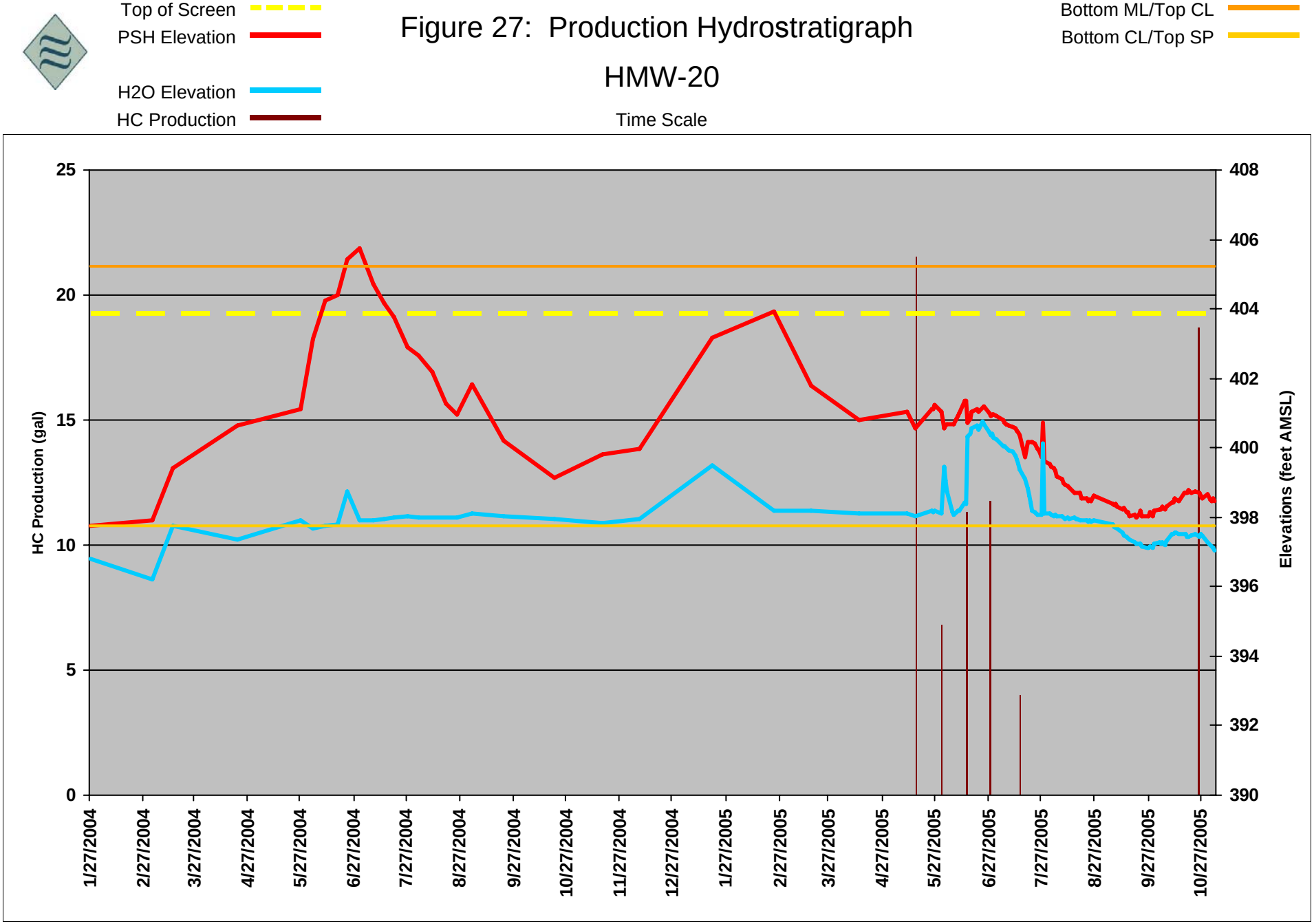

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Figure 28: HMW-20
Depth to Top of LNAPL vs. LNAPL Thickness 2004-2005

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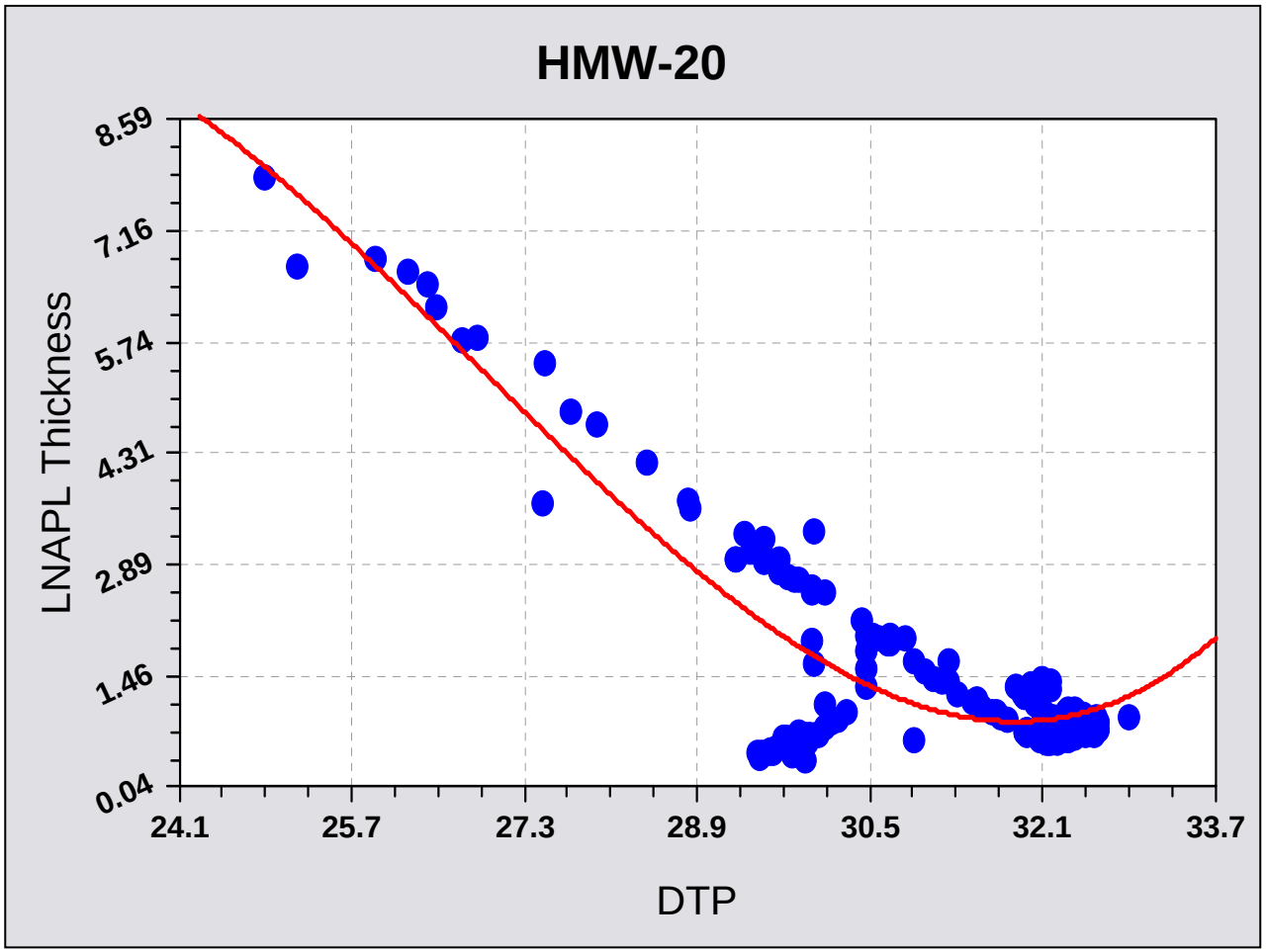

Figure 29: HMW-44C
Multi-Site Cumulative Product Recovery (Gallons)

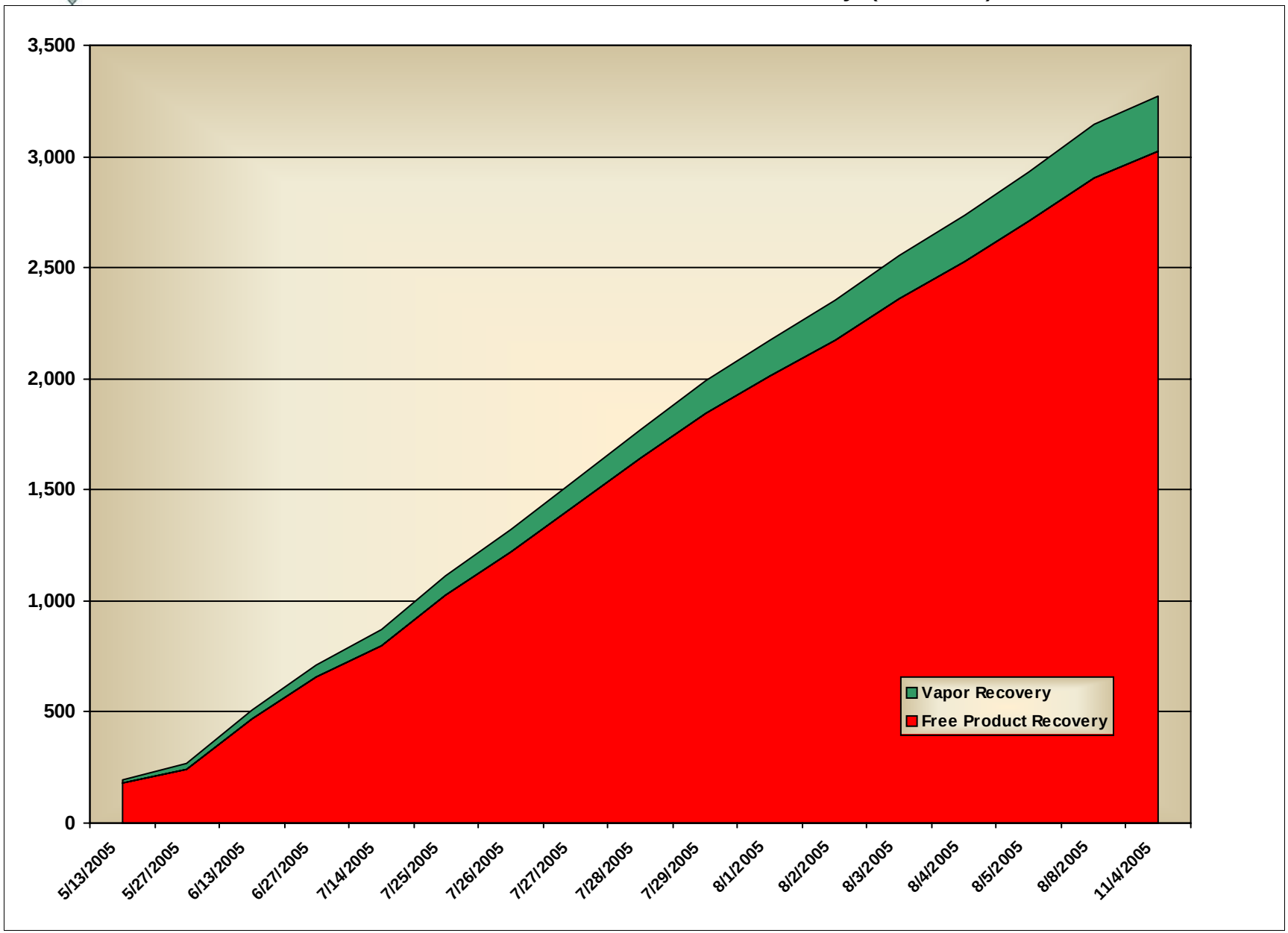

Figure 30: HMW-44C
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

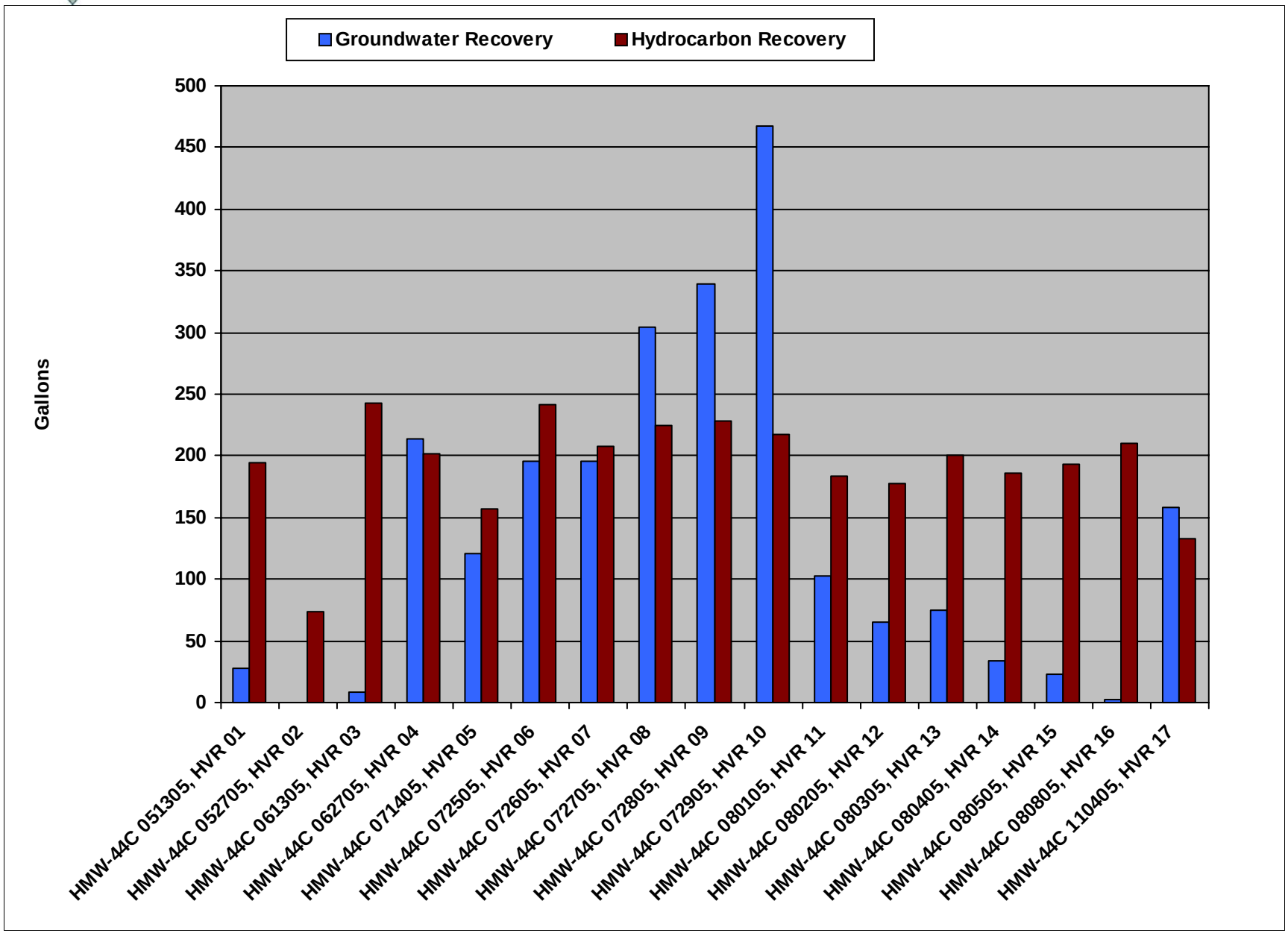

Figure 31: HMW-44C
Multi-Site Hydrocarbon Recovery Rate (Gal/Hr) - Grouped by Site

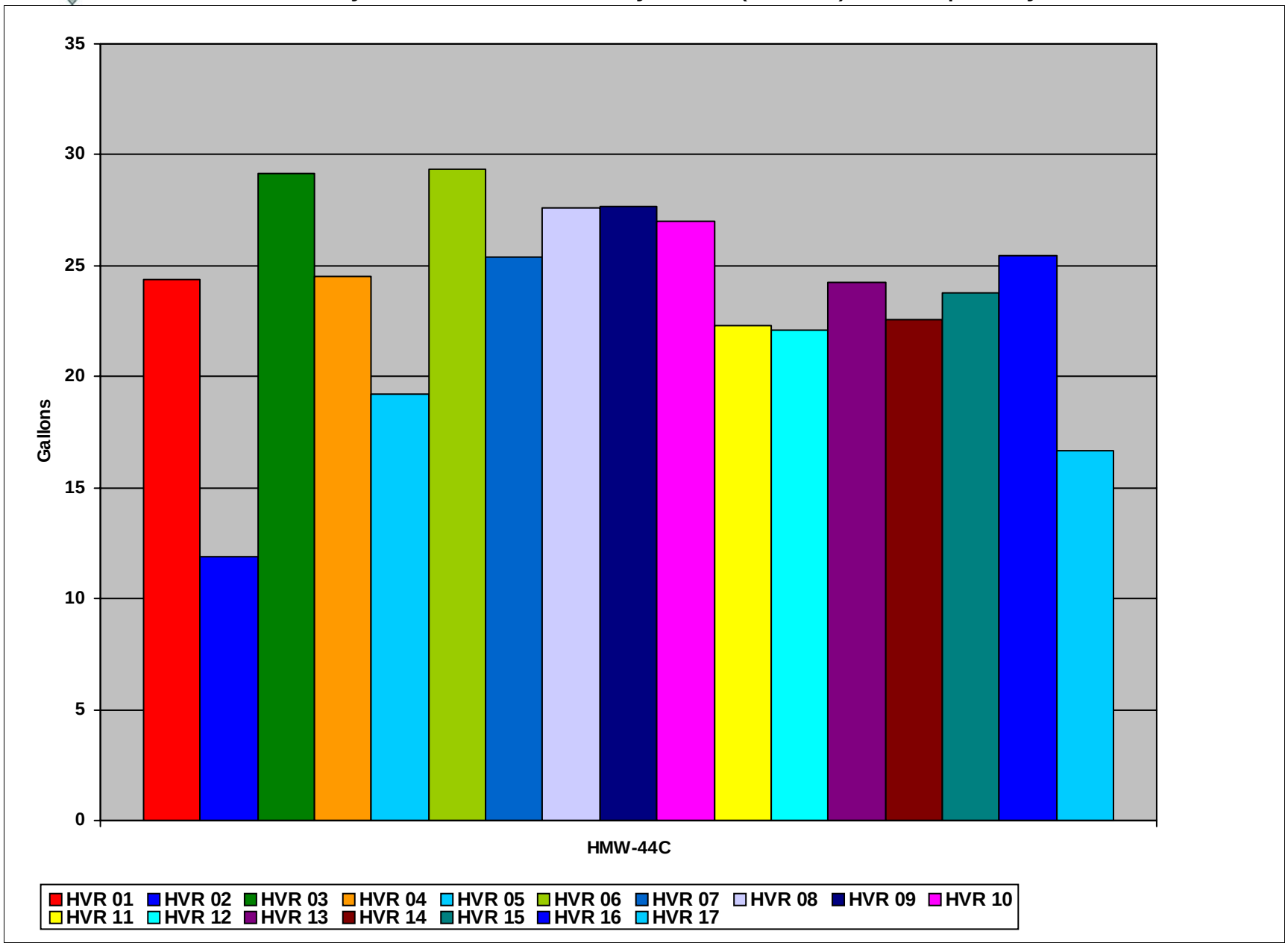

Figure 32: HMW-44C
Multi-Site LB per Hour - ICE Calculated vs. Lab Sample

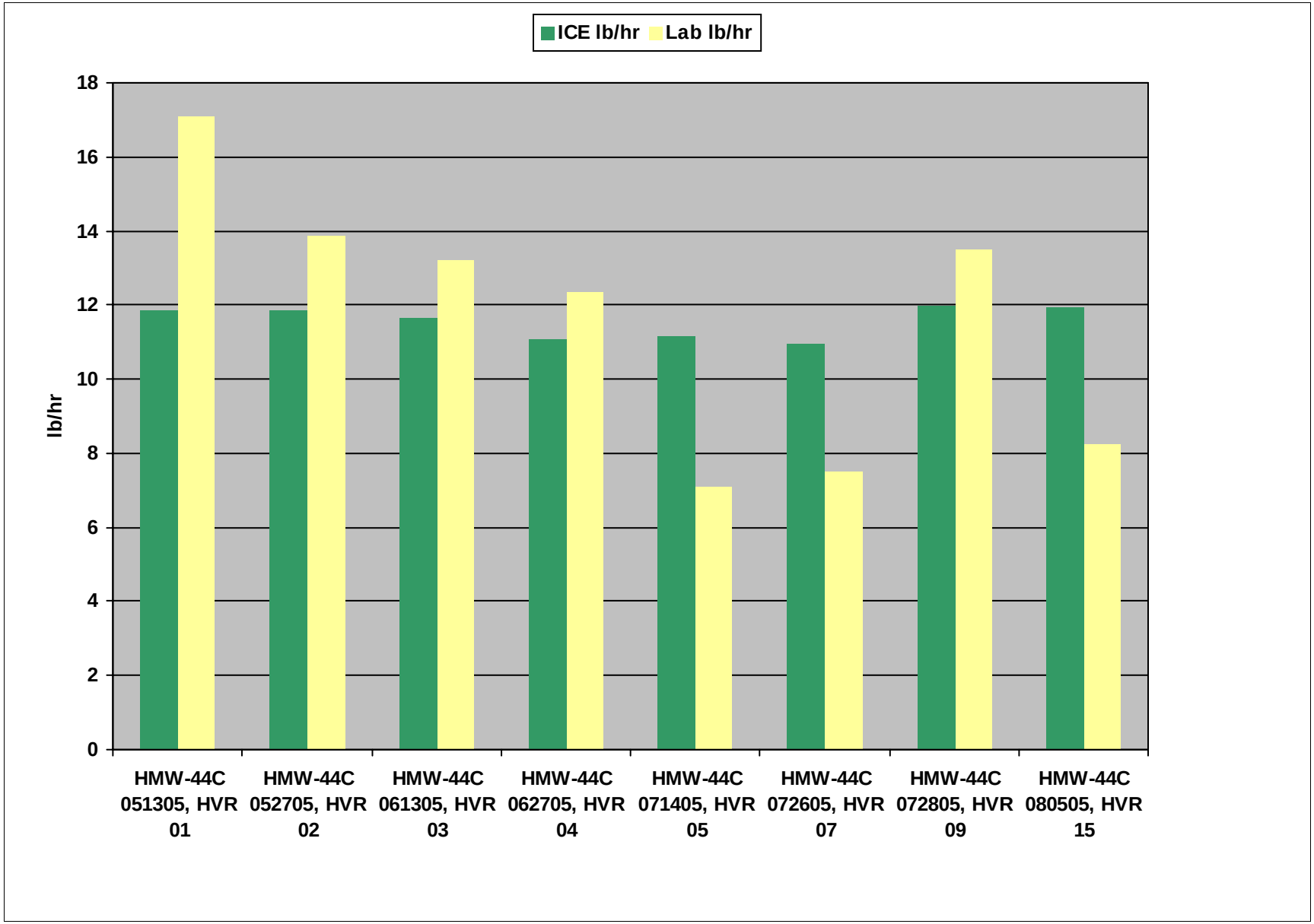

Figure 33: HMW-44C
BTU per Hour

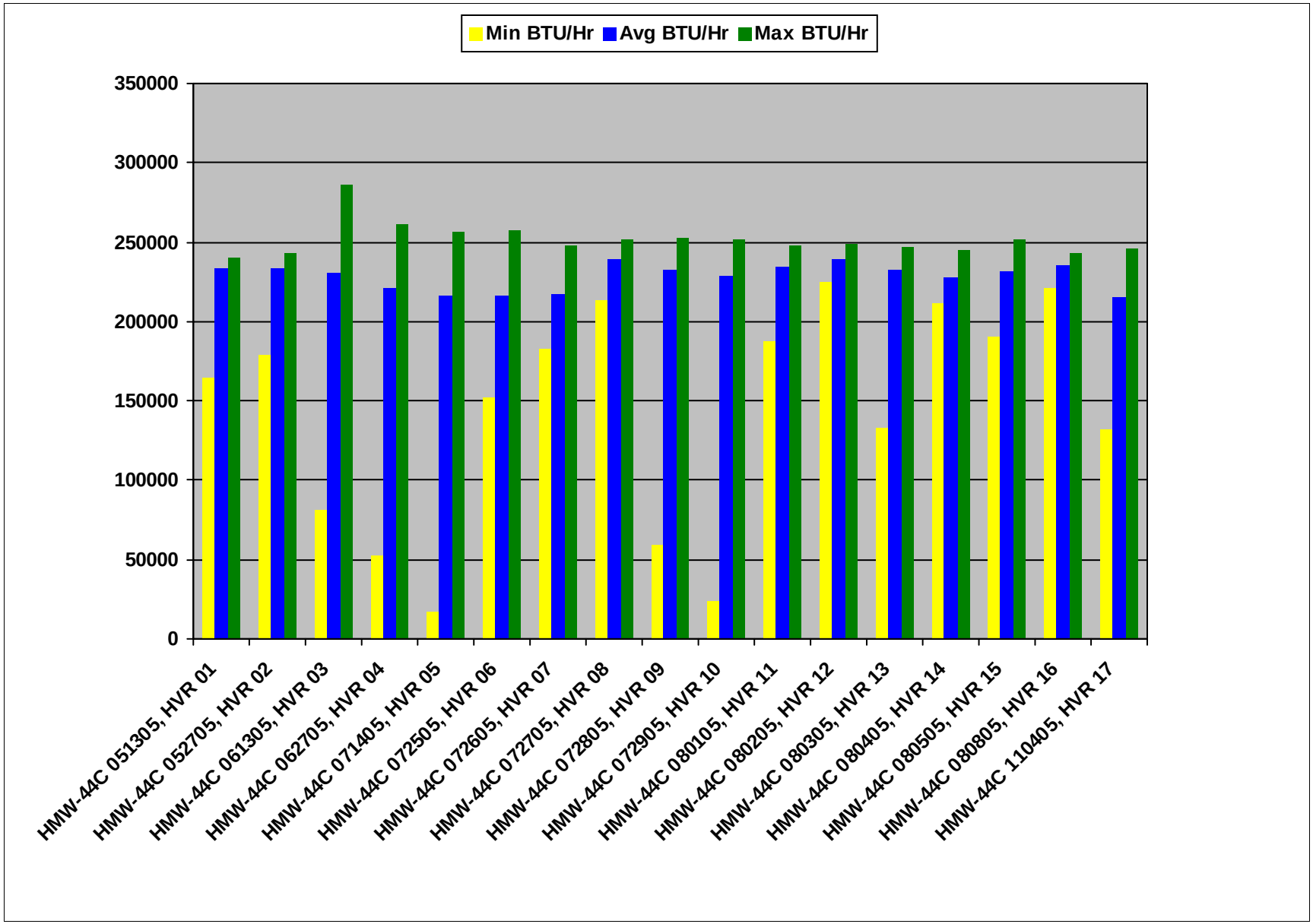

Figure 34: HMW-44C
Multi-Site Vacuums

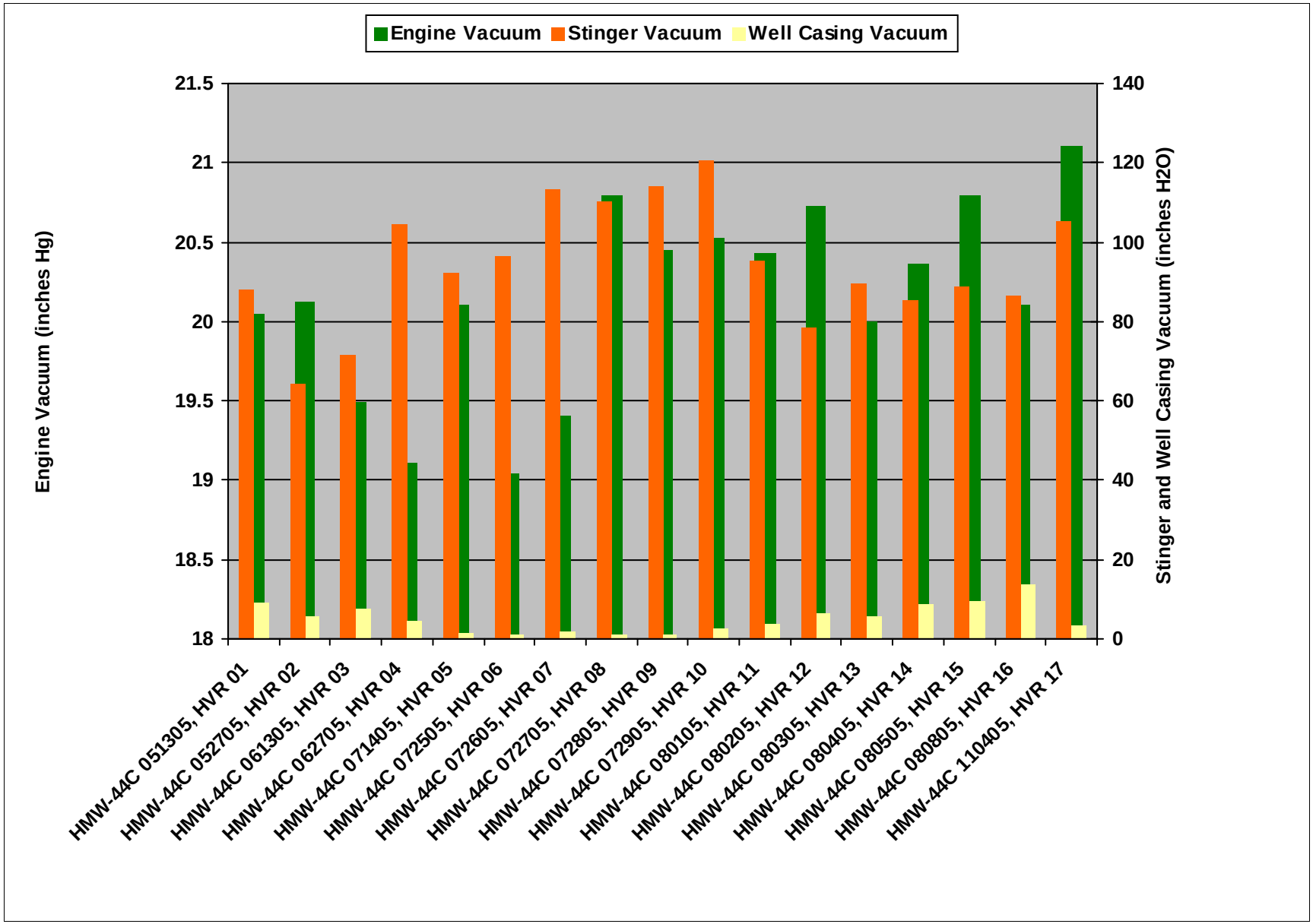

Figure 35: HMW-44C
Multi-Site Air, Well and Fuel Flows

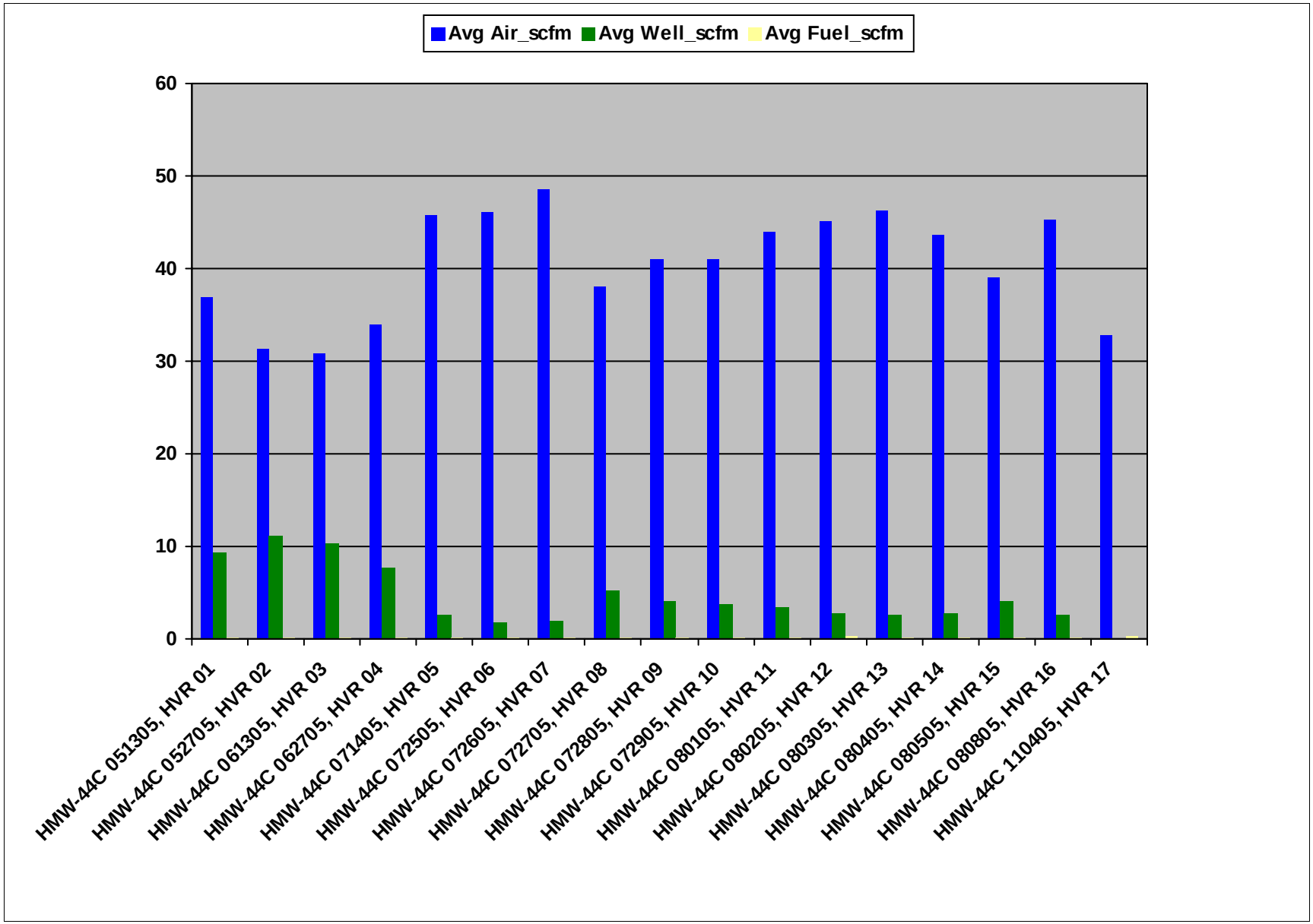

Figure 36: HMW-44C Gauging, Stinger and Production Data
Hydrocarbon Recovery vs. Groundwater Recovery - with Elevations

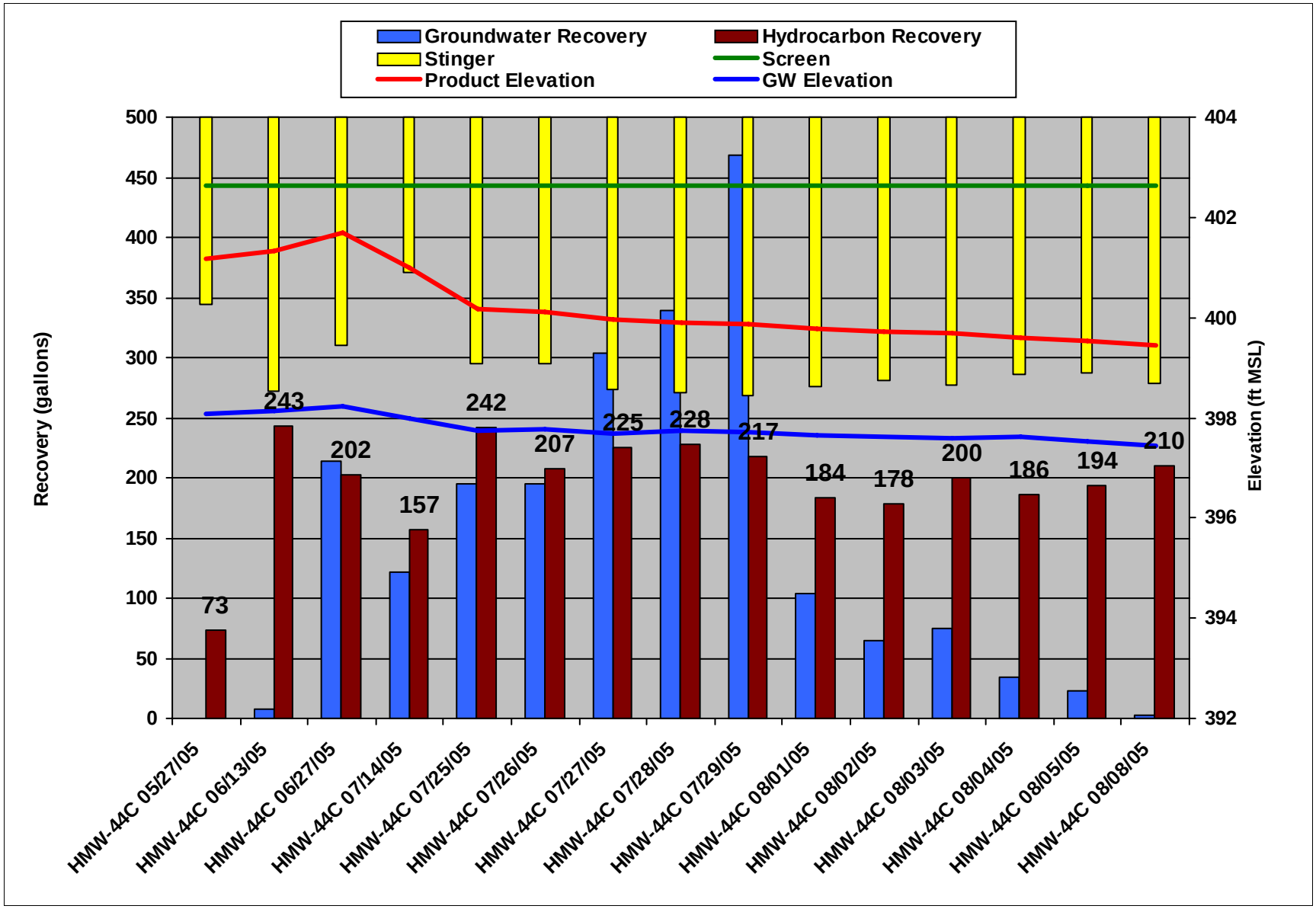

Figure 37: HMW-44C
Hydrocarbon Recovery vs. Groundwater Recovery - with Vacuums

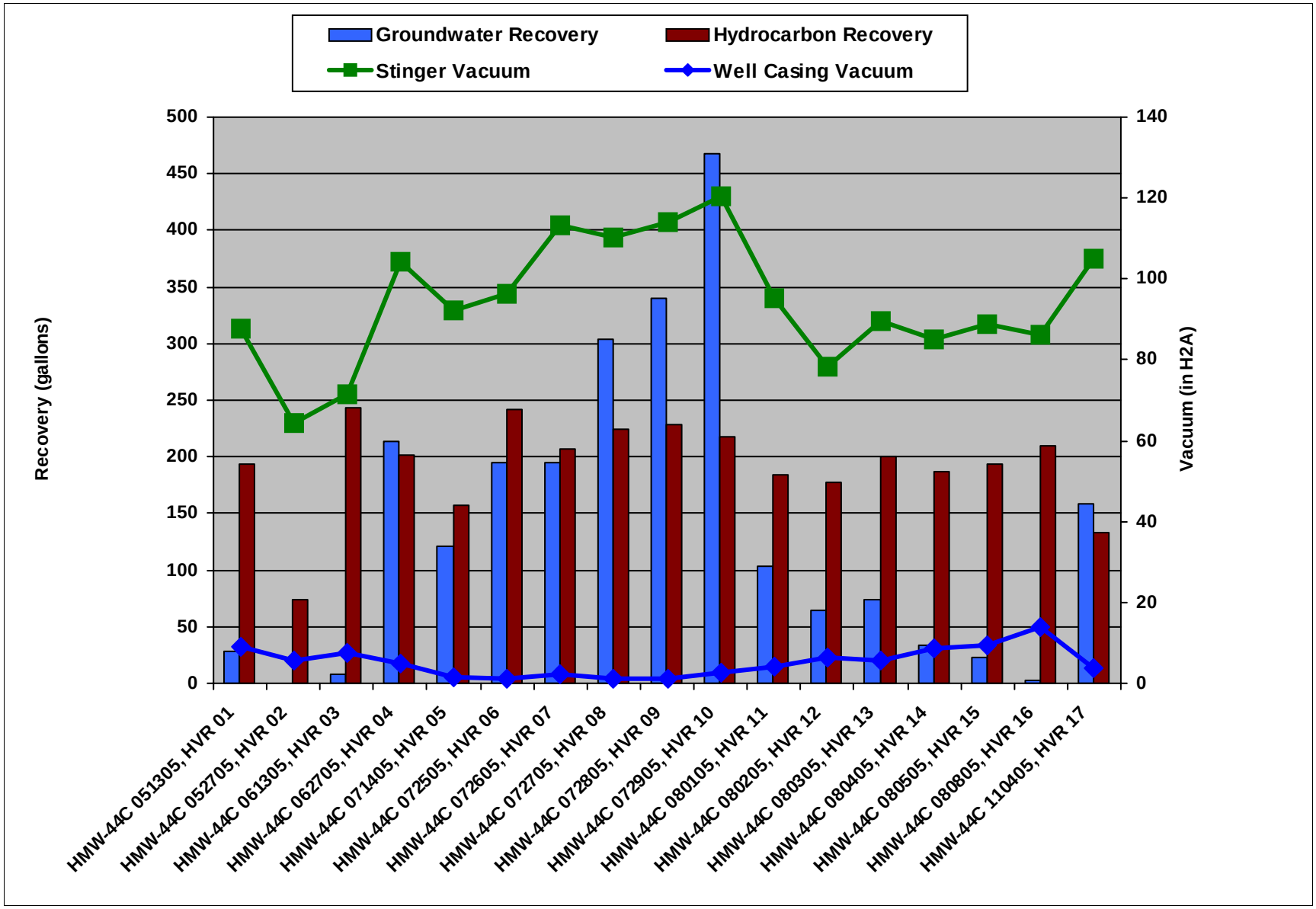

Figure 38: HMW-44C
Hydrocarbon Recovery vs. Groundwater Recovery - with Percentages

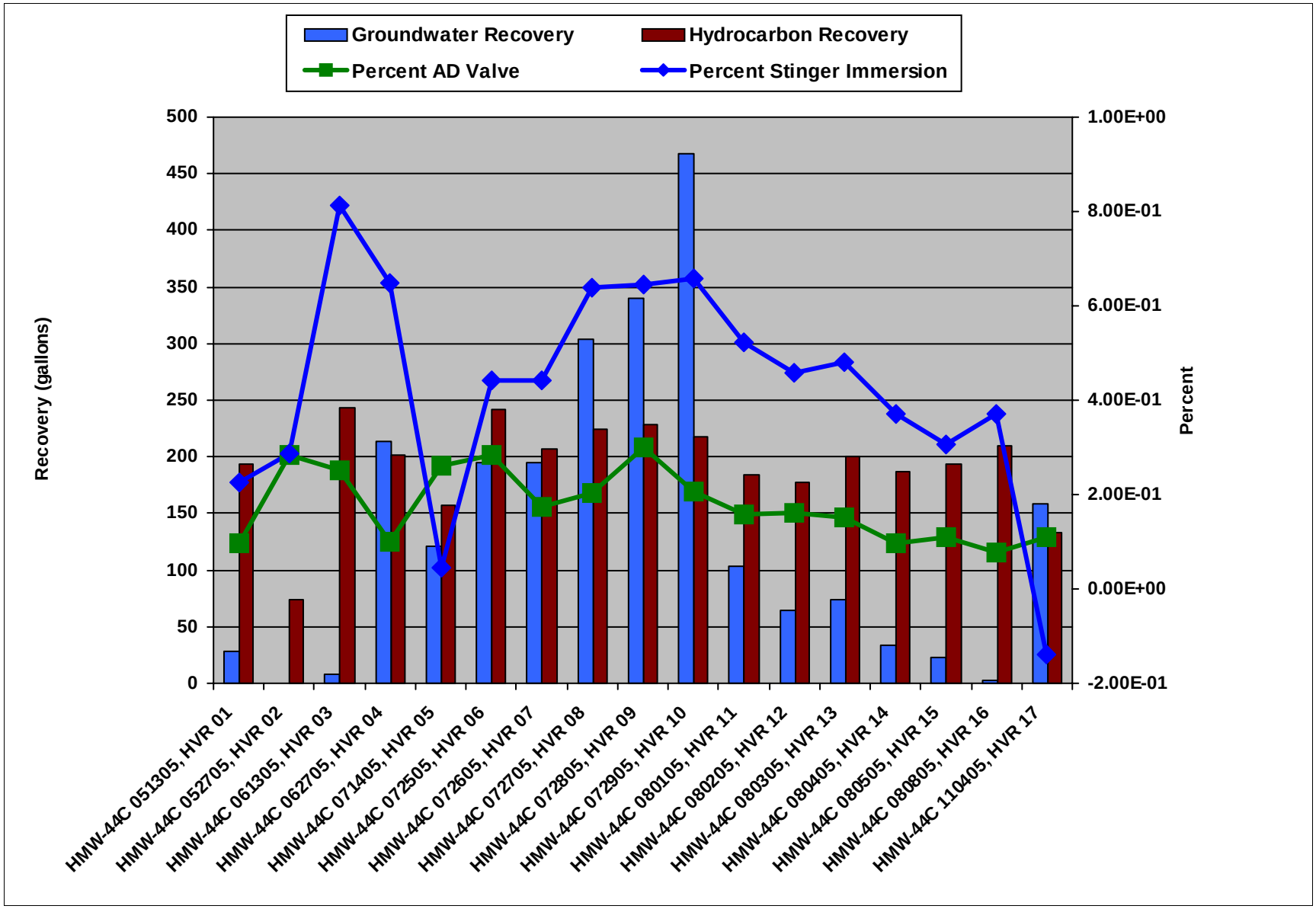

Figure 39: HMW-44C
HiVac Event Recharge as a Percentage of Original Product Thickness

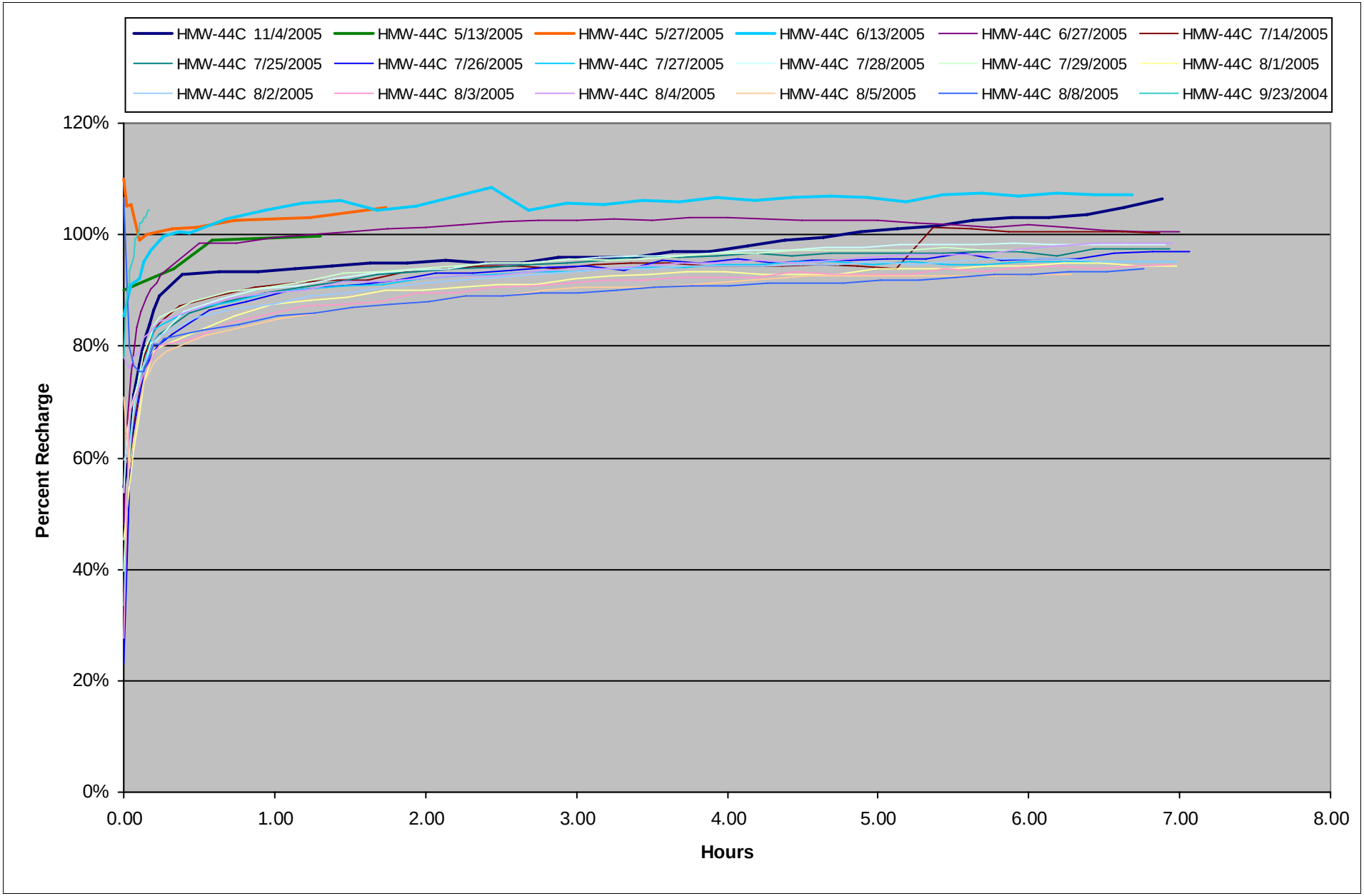

Figure 40: HMW-44C
HiVac Event Recharge as Product Thickness in Feet

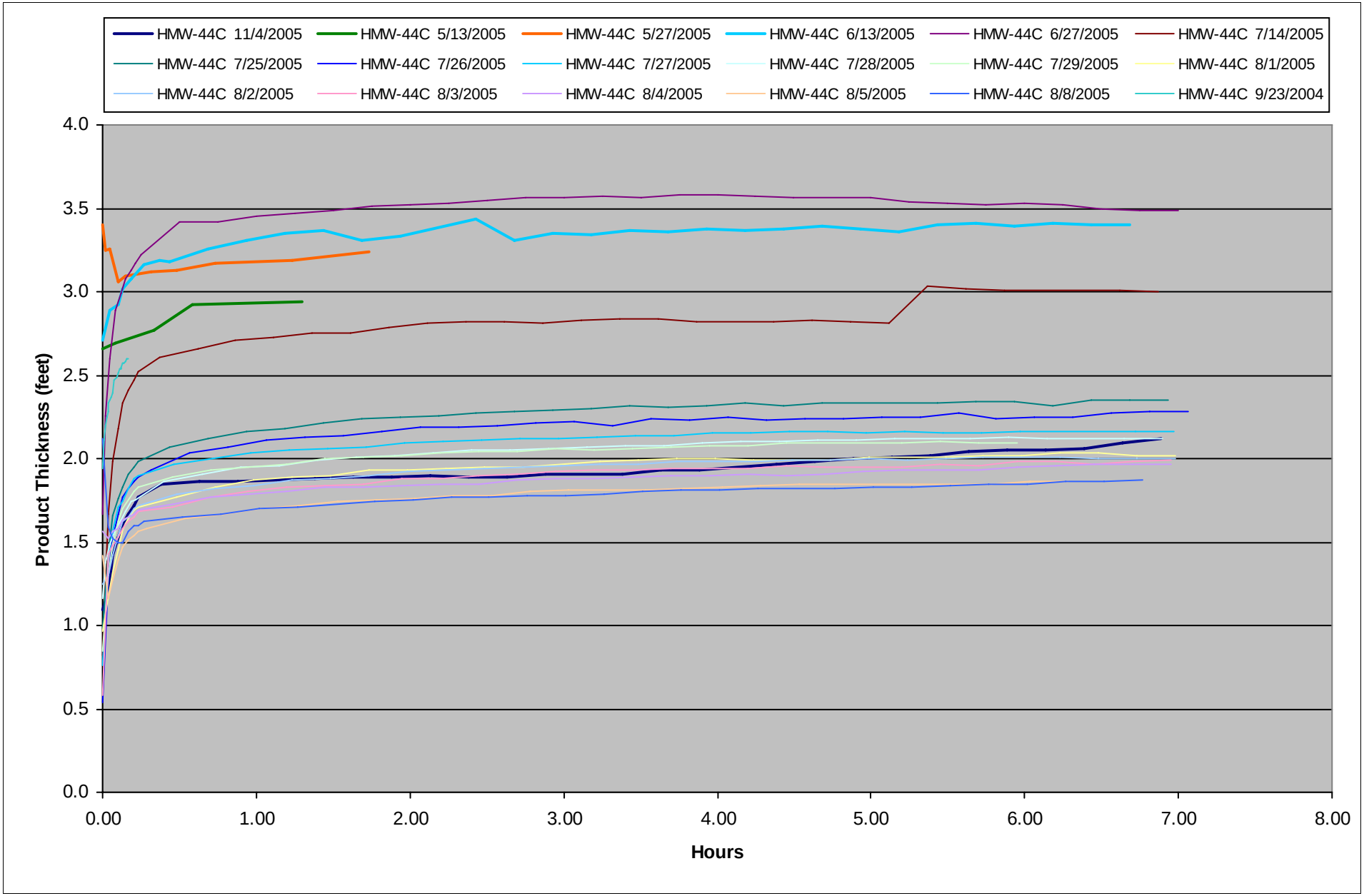

Figure 41: Production Hydrostratigraph

HMW-44C

Time Scale

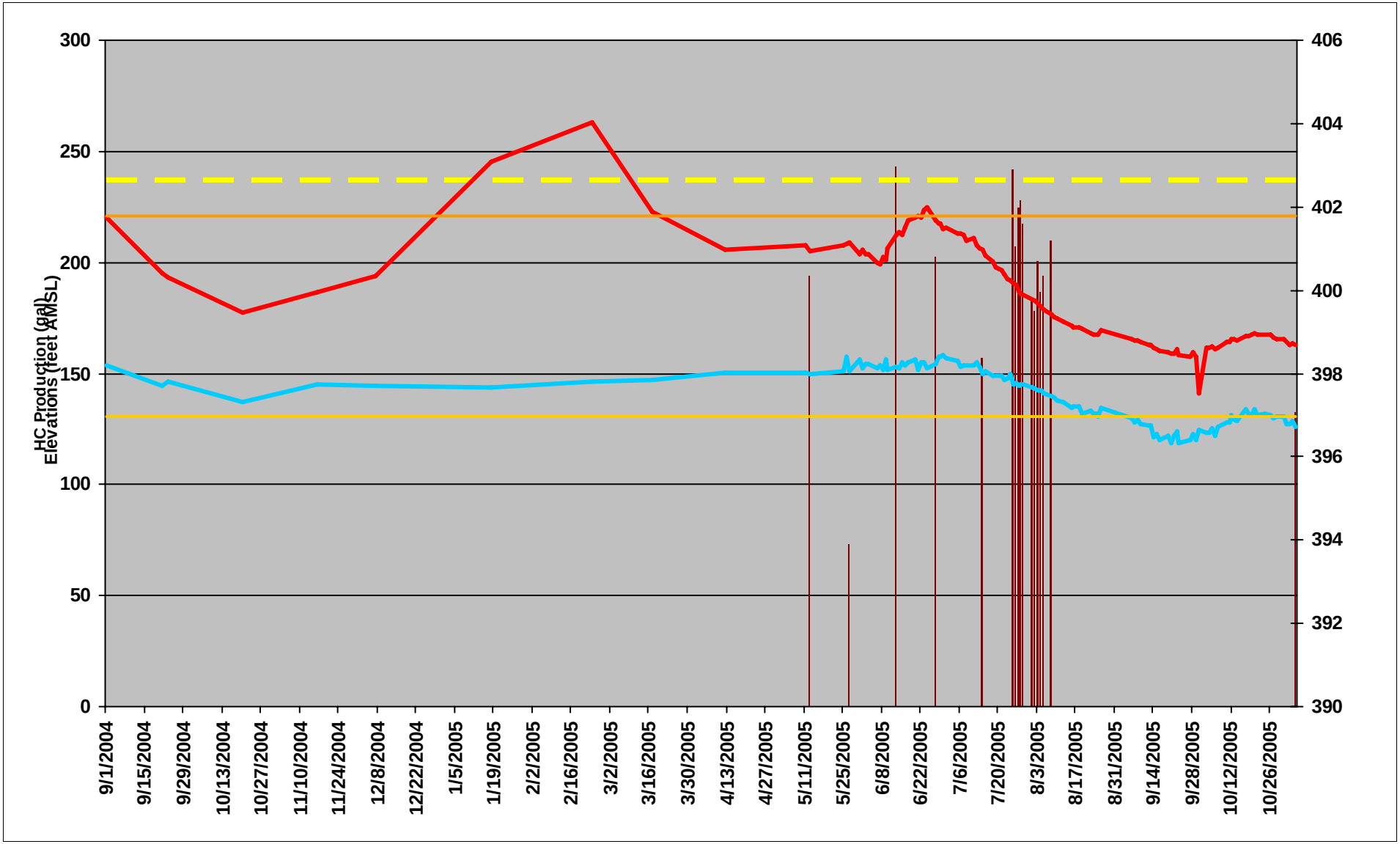

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Figure 42: HMW-44C
Depth to Top of LNAPL vs. LNAPL Thickness 2004-2005

The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
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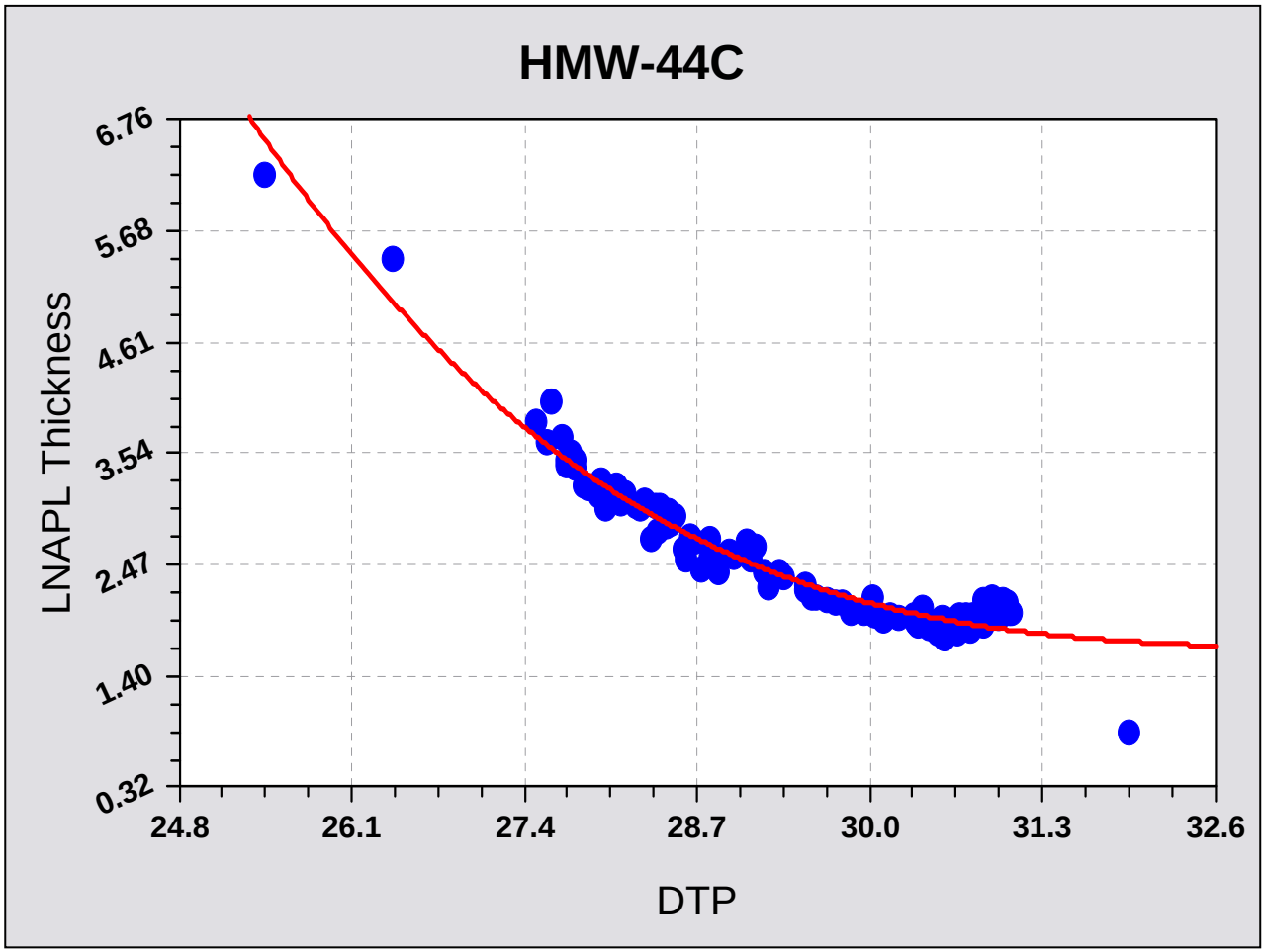


Figure 43: HMW-48C
Multi-Site Cumulative Product Recovery (Gallons)

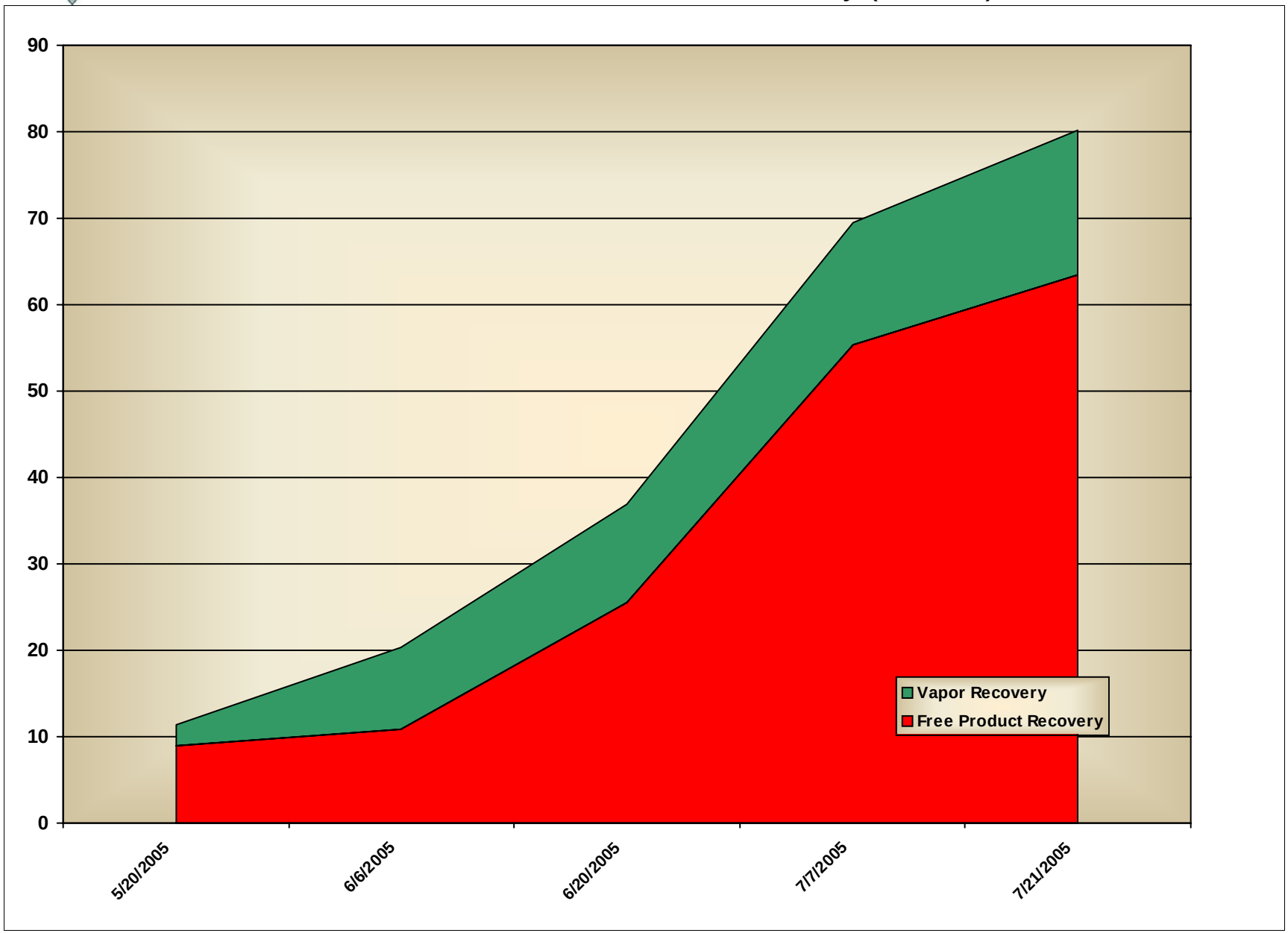


Figure 44: HMW-48C
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

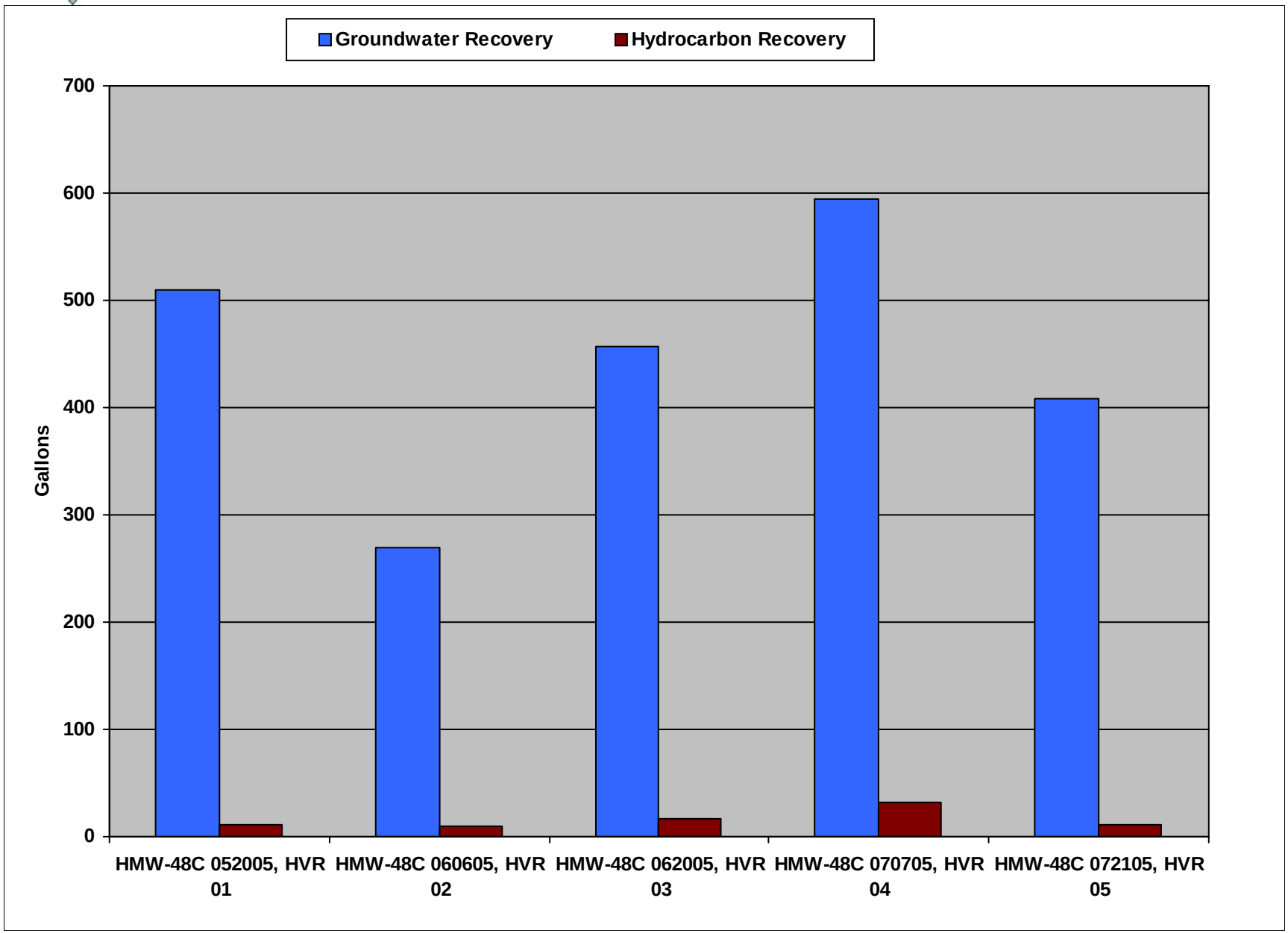


Figure 45: HMW-48C
Multi-Site Hydrocarbon Recovery Rate (Gal/Hr) - Grouped by Site

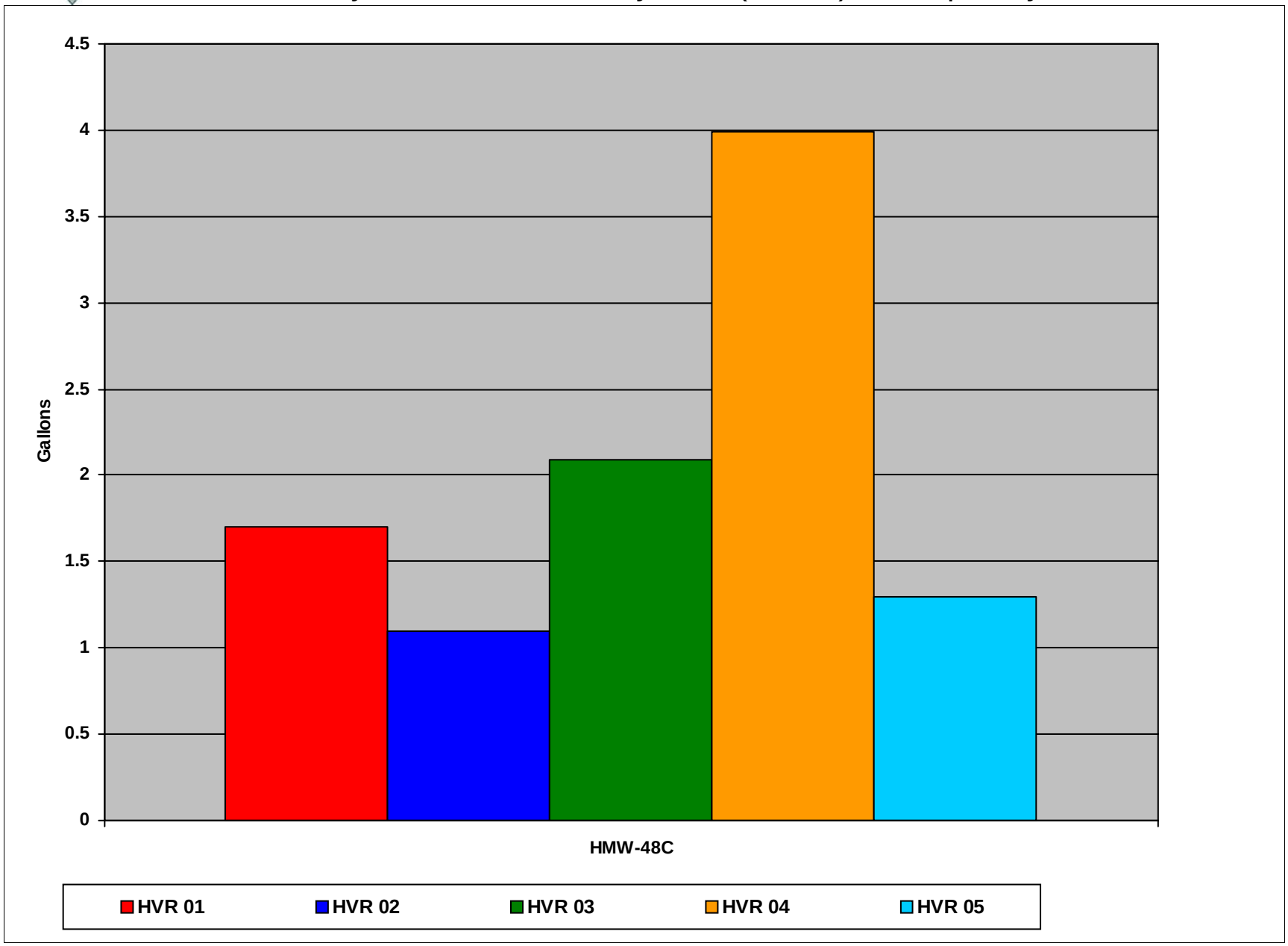


Figure 46: HMW-48C
Multi-Site LB per Hour - ICE Calculated vs. Lab Sample

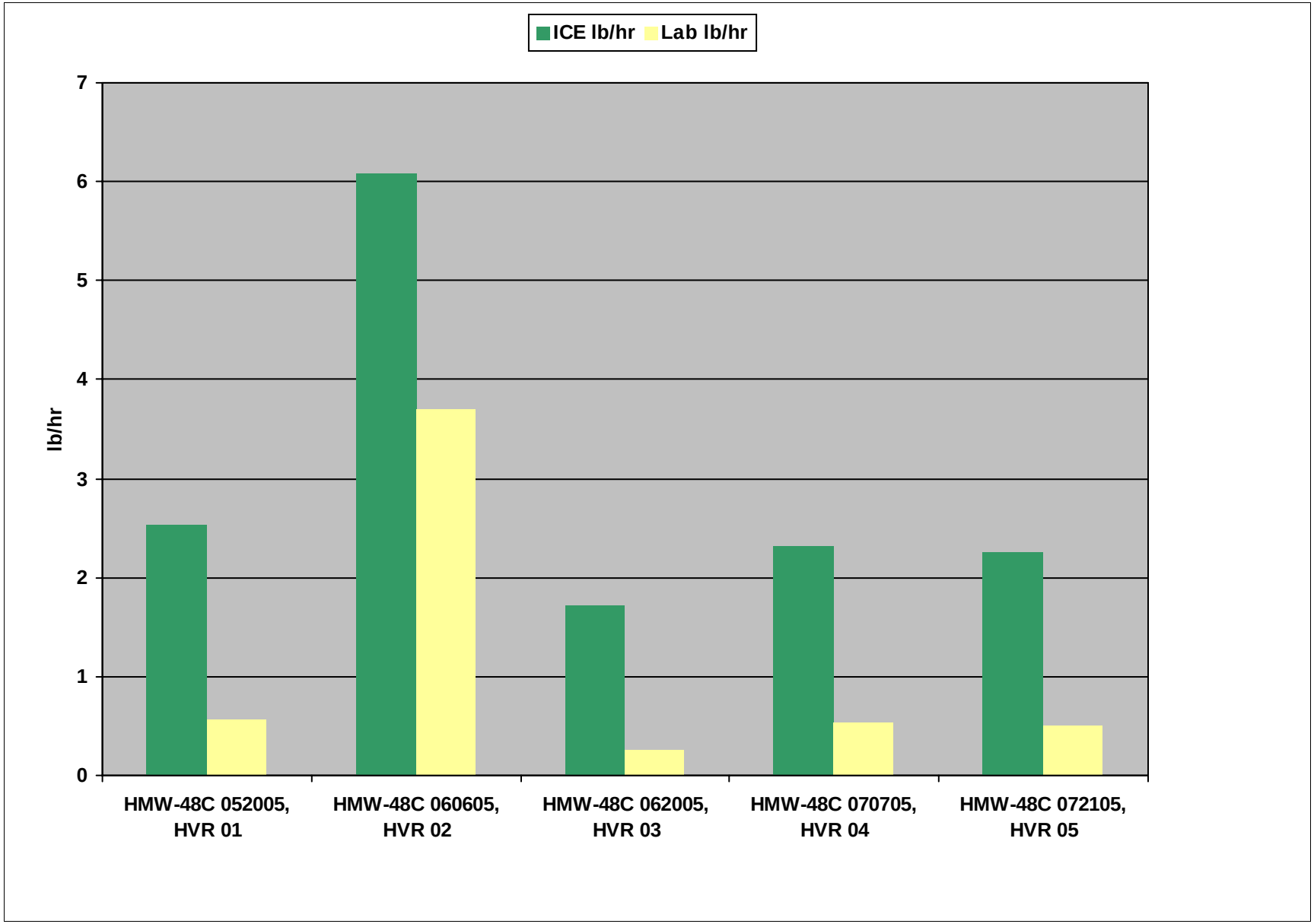


Figure 47: HMW-48C
BTU per Hour

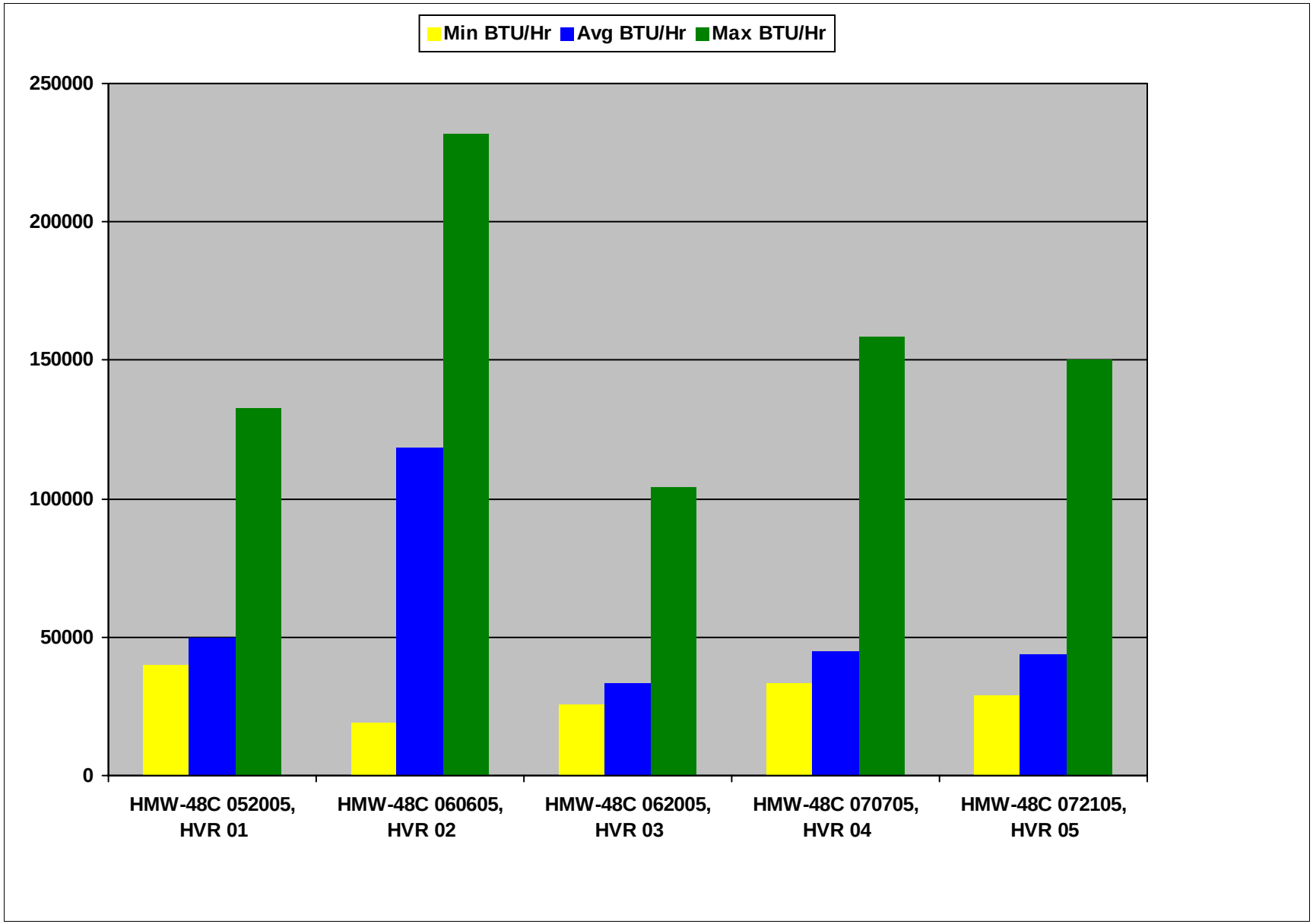


Figure 48: HMW-48C
Multi-Site Vacuums

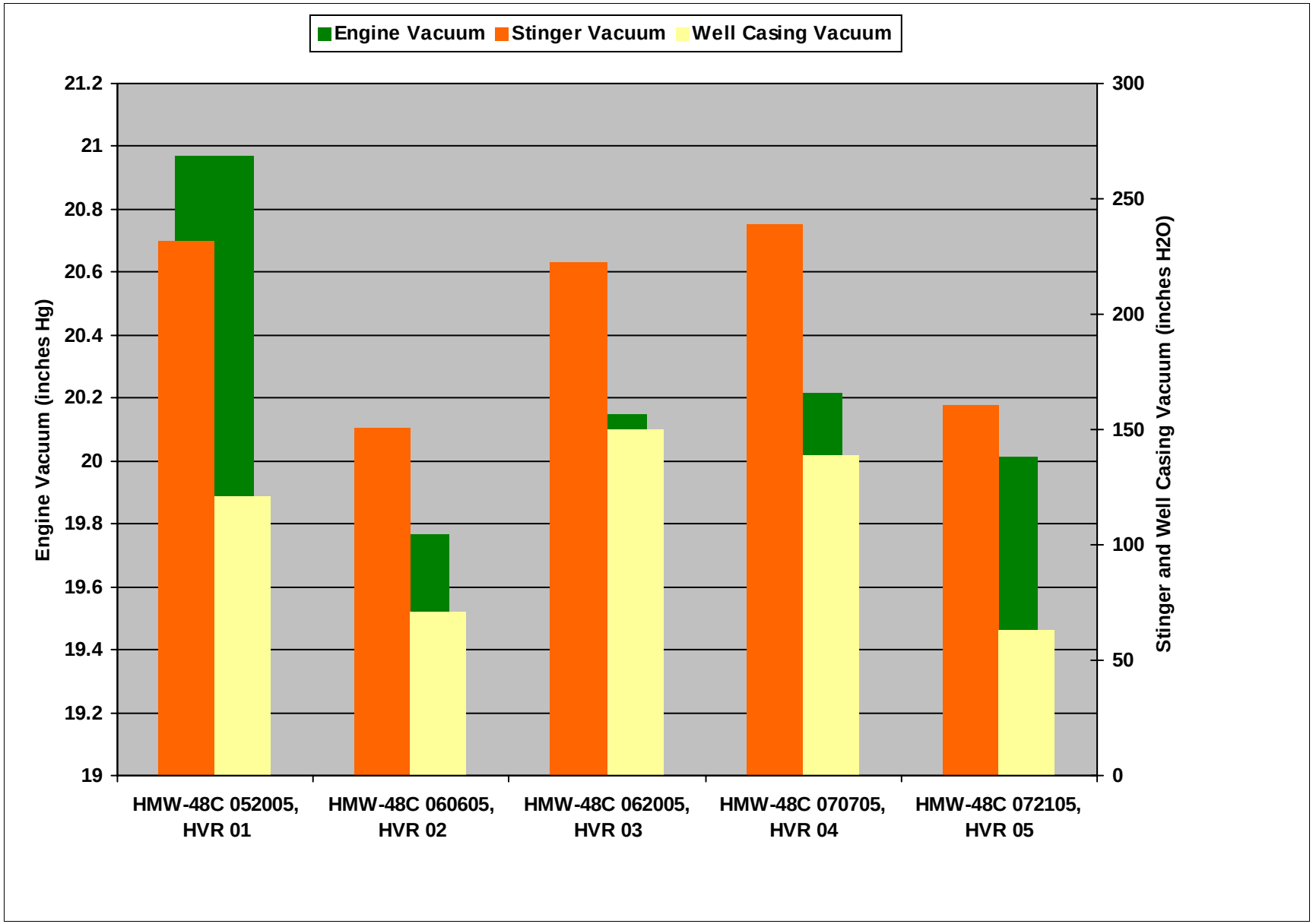


Figure 49: HMW-48C
Multi-Site Air, Well and Fuel Flows

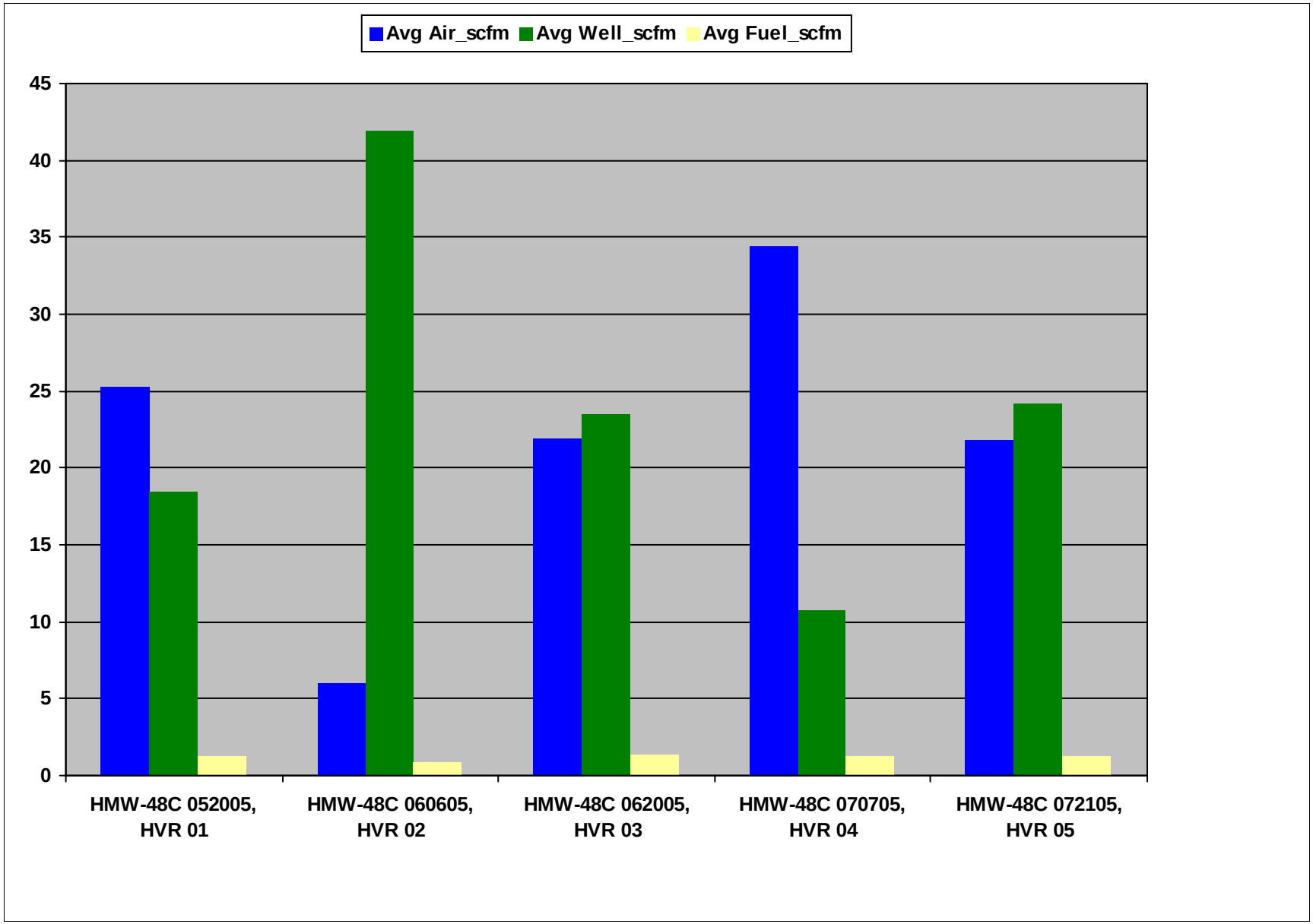


Figure 50: HMW-48C Gauging, Stinger and Production Data
Hydrocarbon Recovery vs. Groundwater Recovery - with Elevations

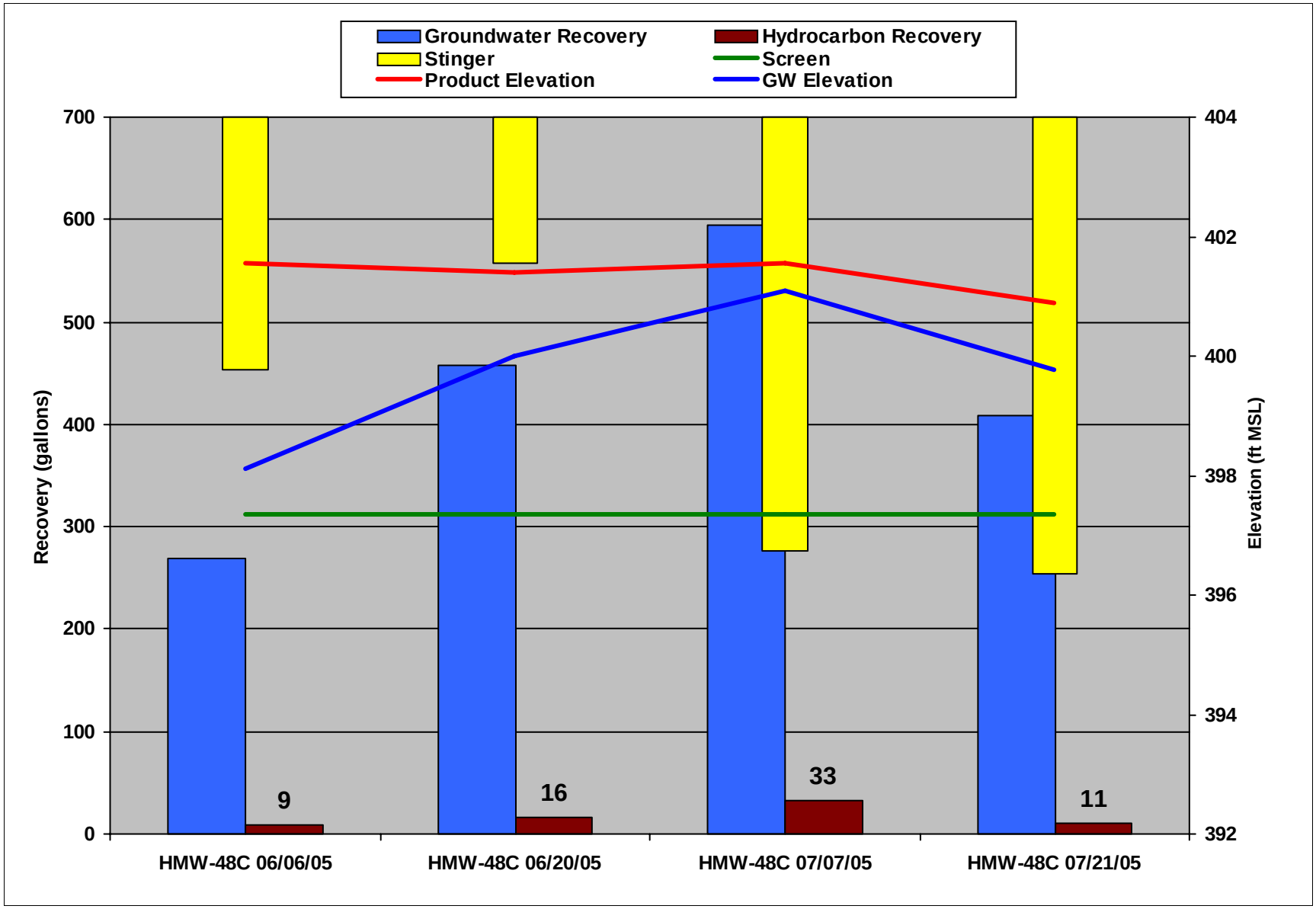


Figure 51: HMW-48C
Hydrocarbon Recovery vs. Groundwater Recovery - with Vacuums

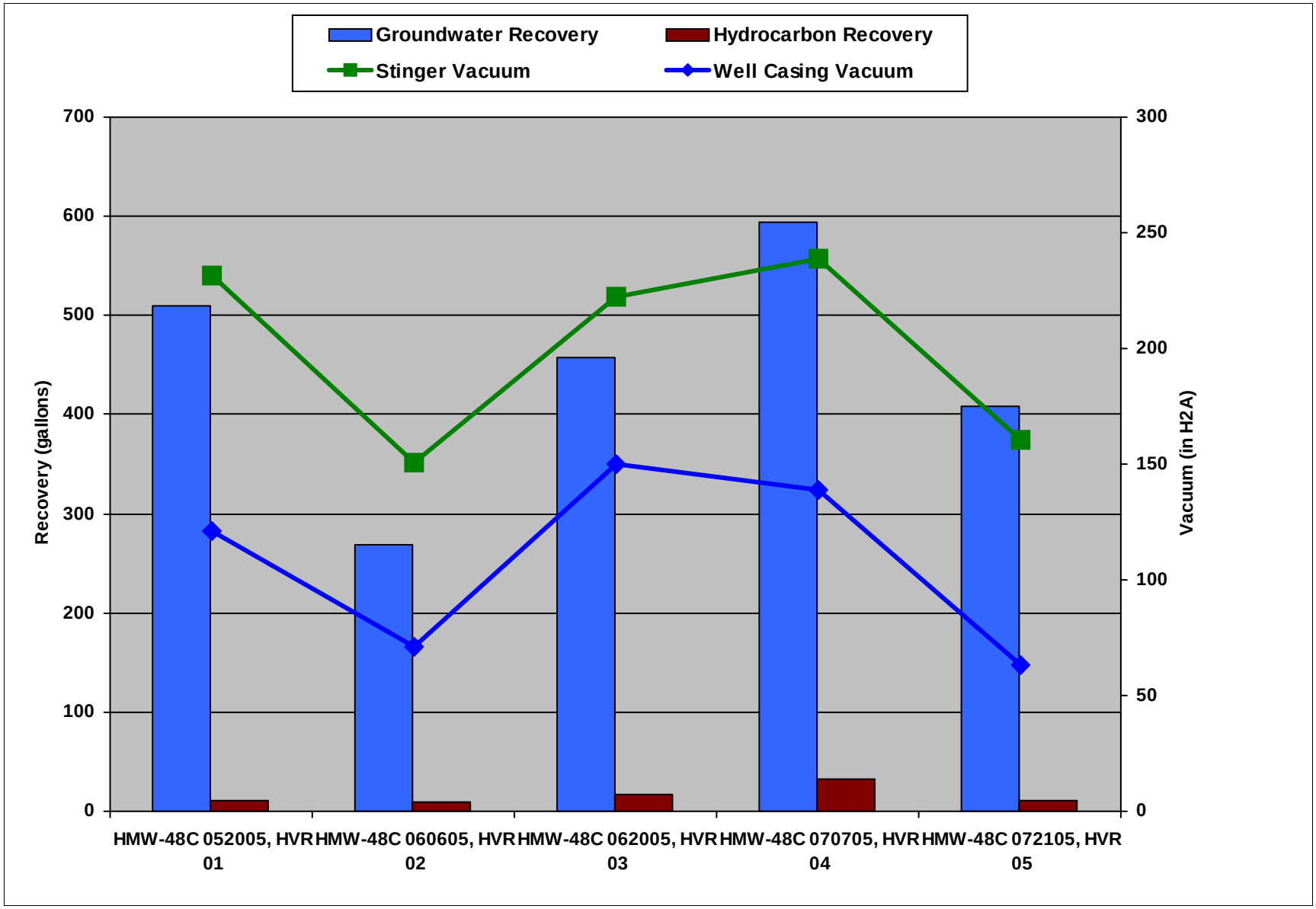


Figure 52: HMW-48C
Hydrocarbon Recovery vs. Groundwater Recovery - with Percentages

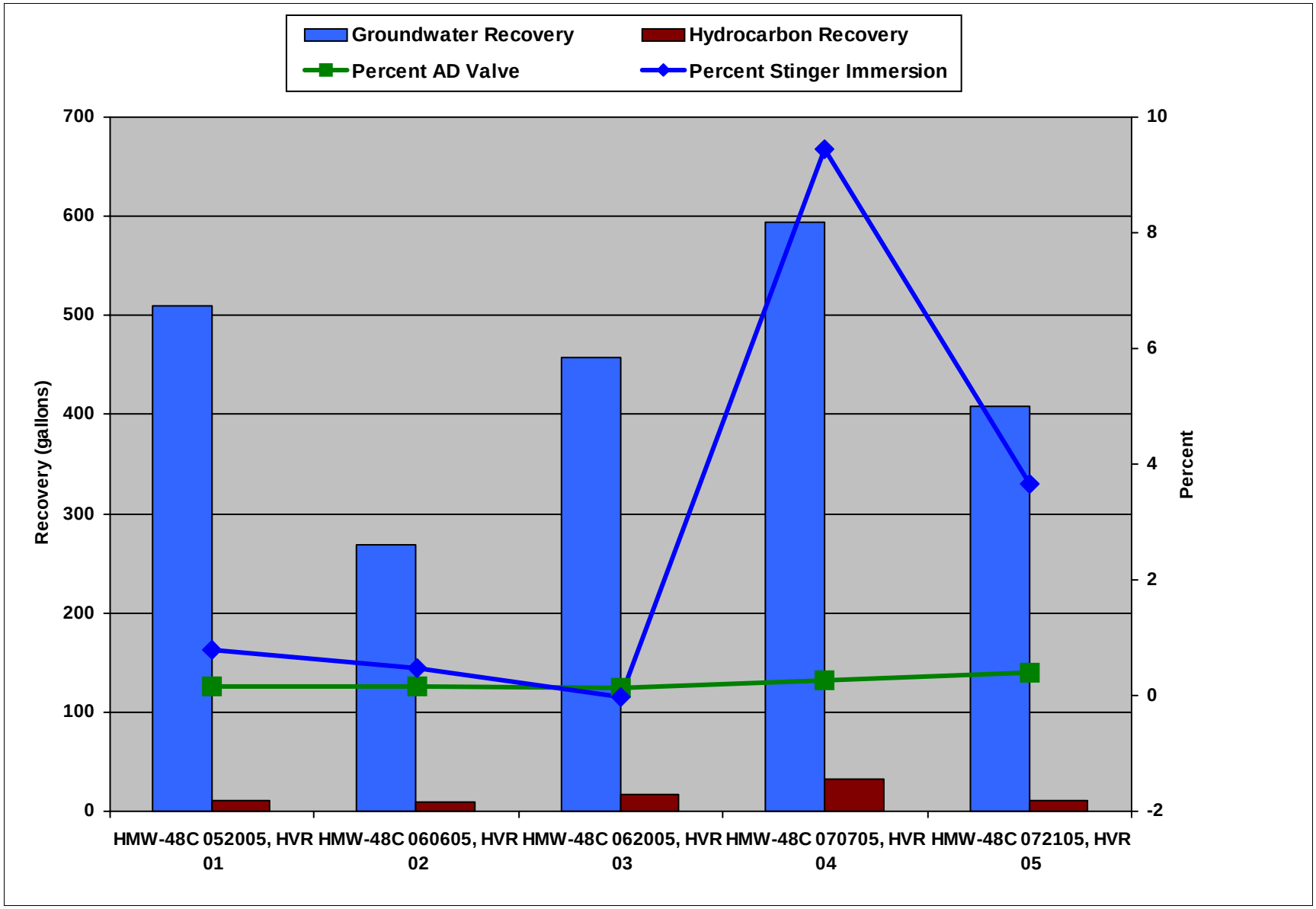


Figure 53: HMW-48C
HiVac Event Recharge as a Percentage of Original Product Thickness

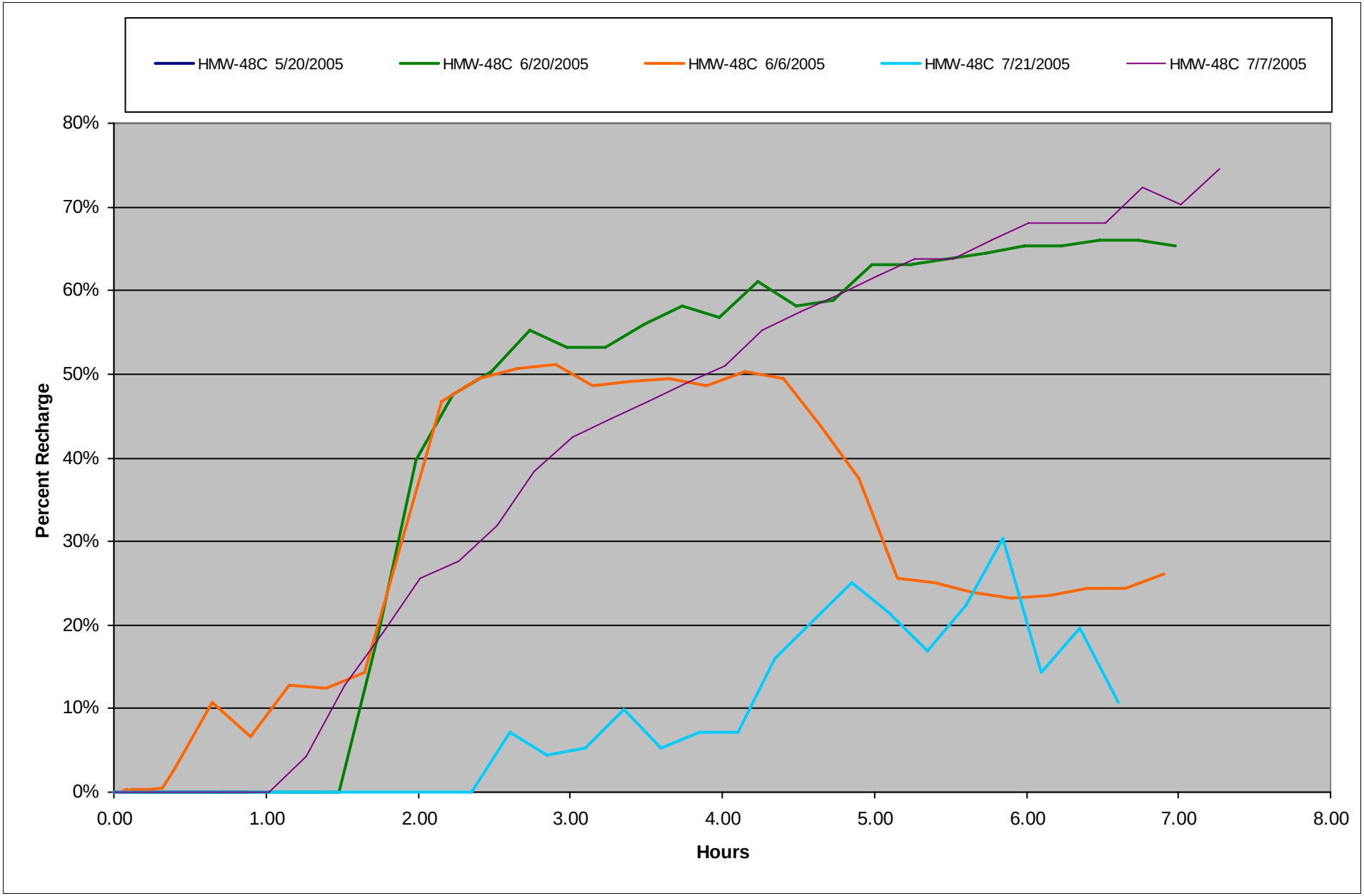


Figure 54: HMW-48C
HiVac Event Recharge as Product Thickness in Feet

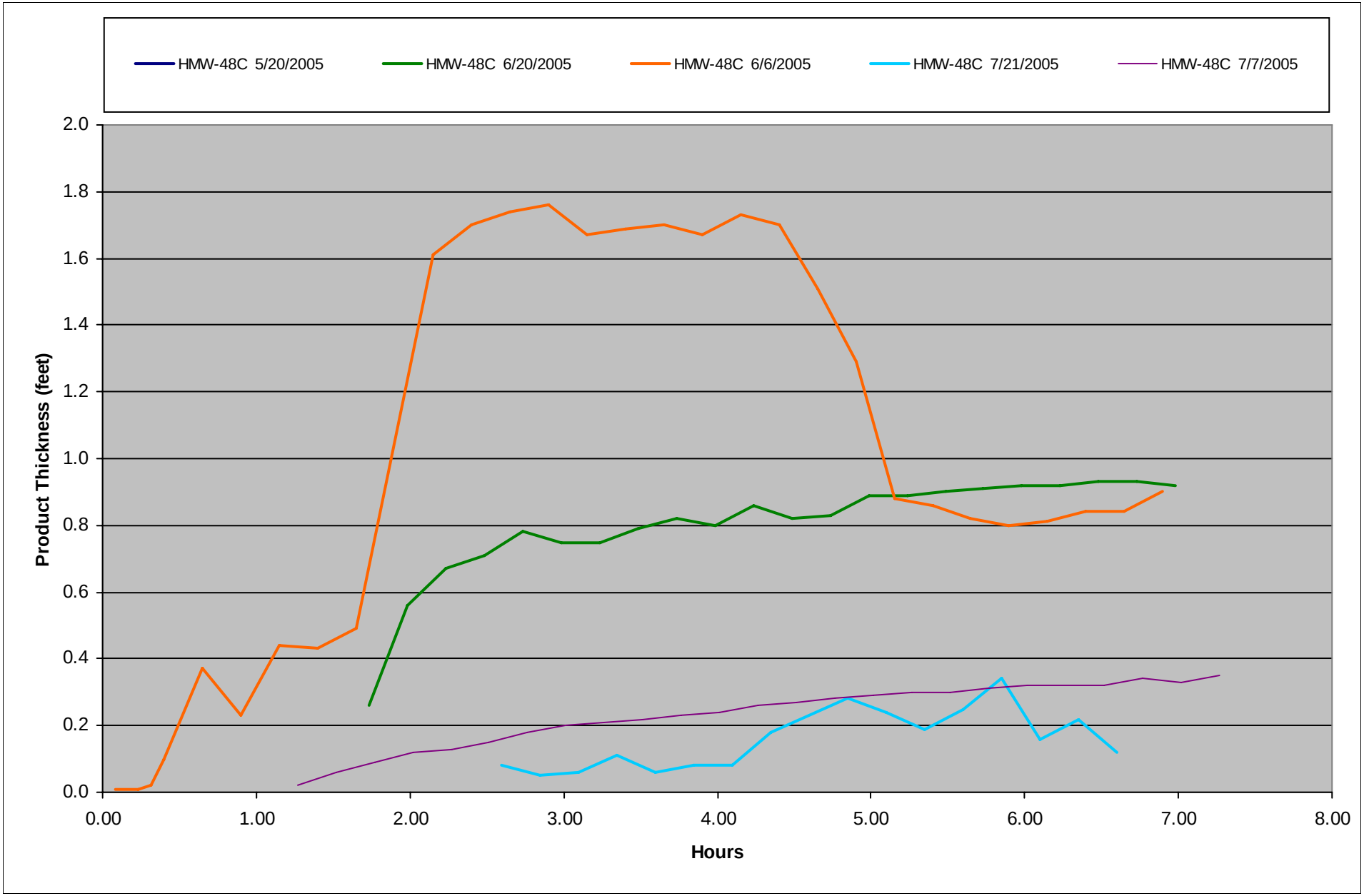
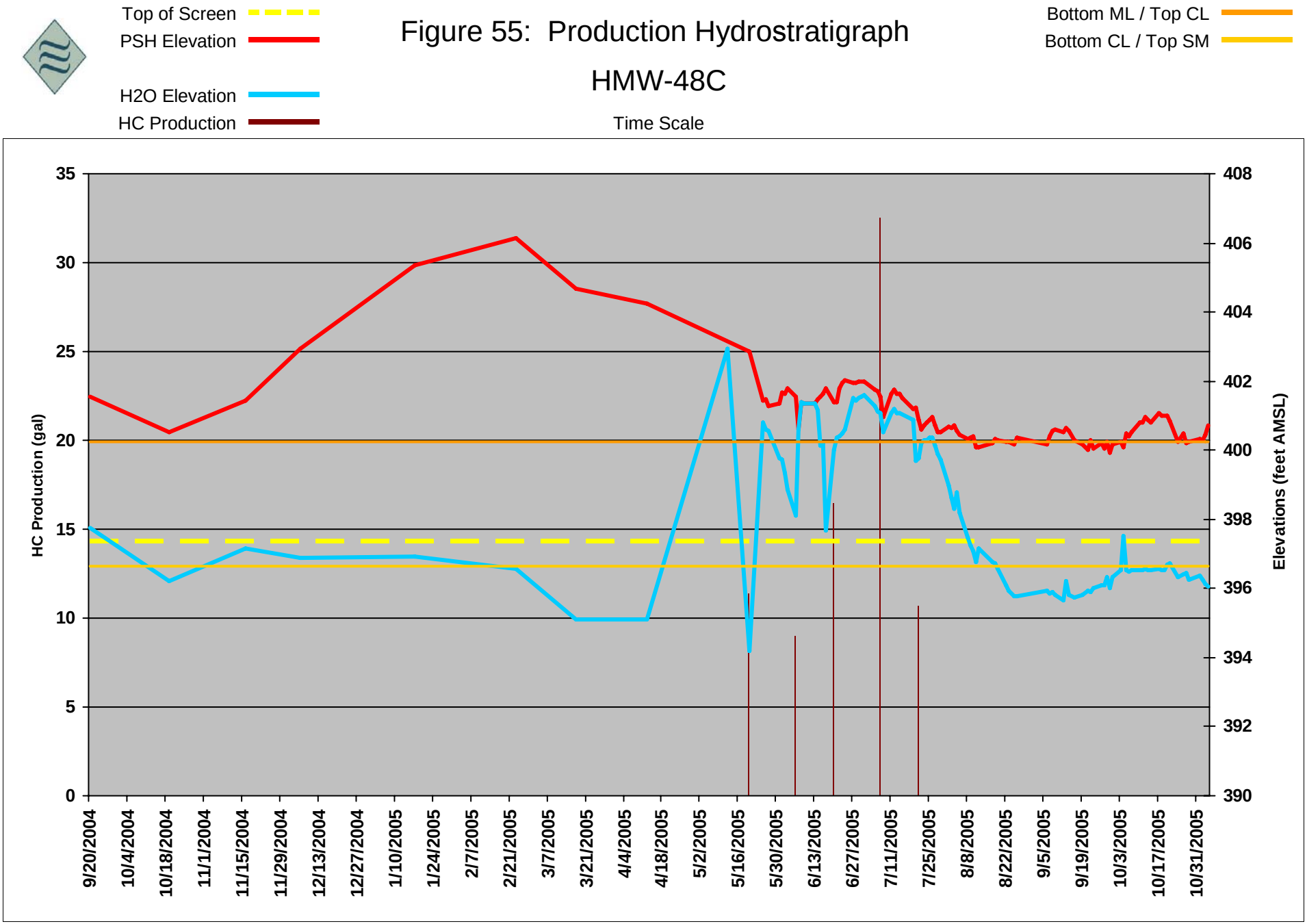


Figure 55: Production Hydrostratigraph

HMW-48C



Hartford, Il.

Figure 56: HMW-48C
Depth to Top of LNAPL vs. LNAPL Thickness 2004-2005

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The Hartford Working Group
H_2A Environmental, Ltd.

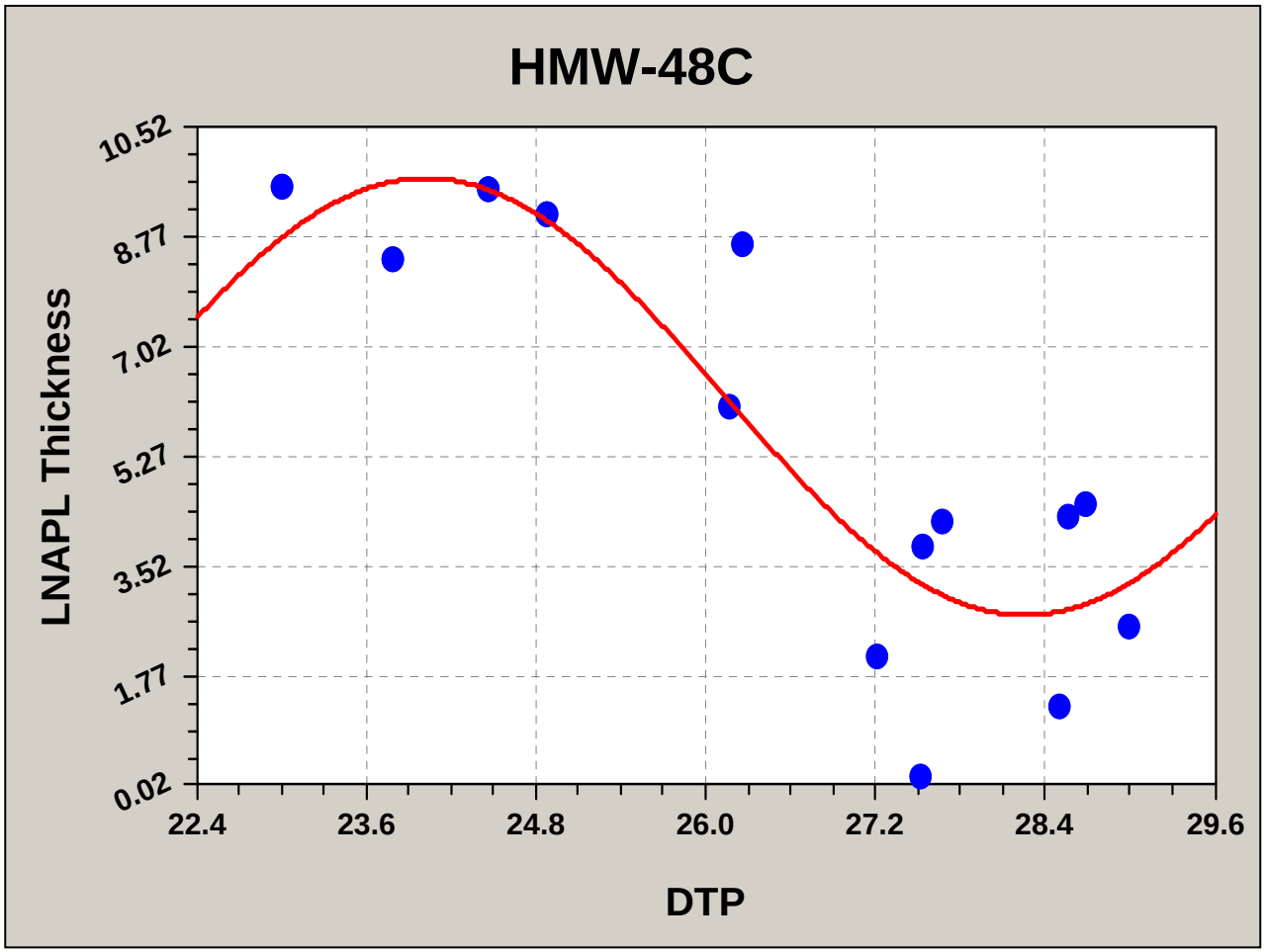


Figure 57: MP-29D
Multi-Site Cumulative Product Recovery (Gallons)

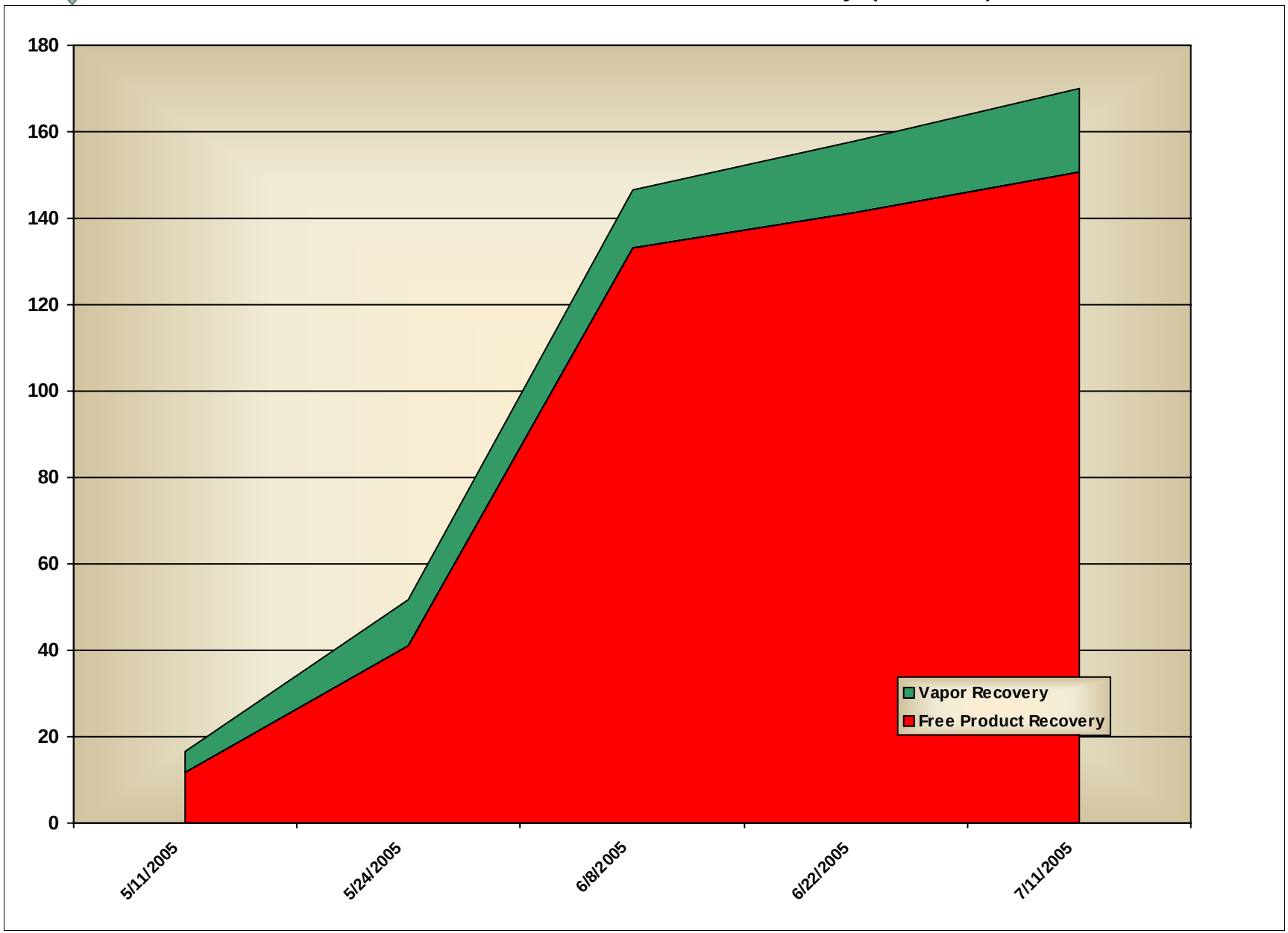


Figure 58: MP-29D
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

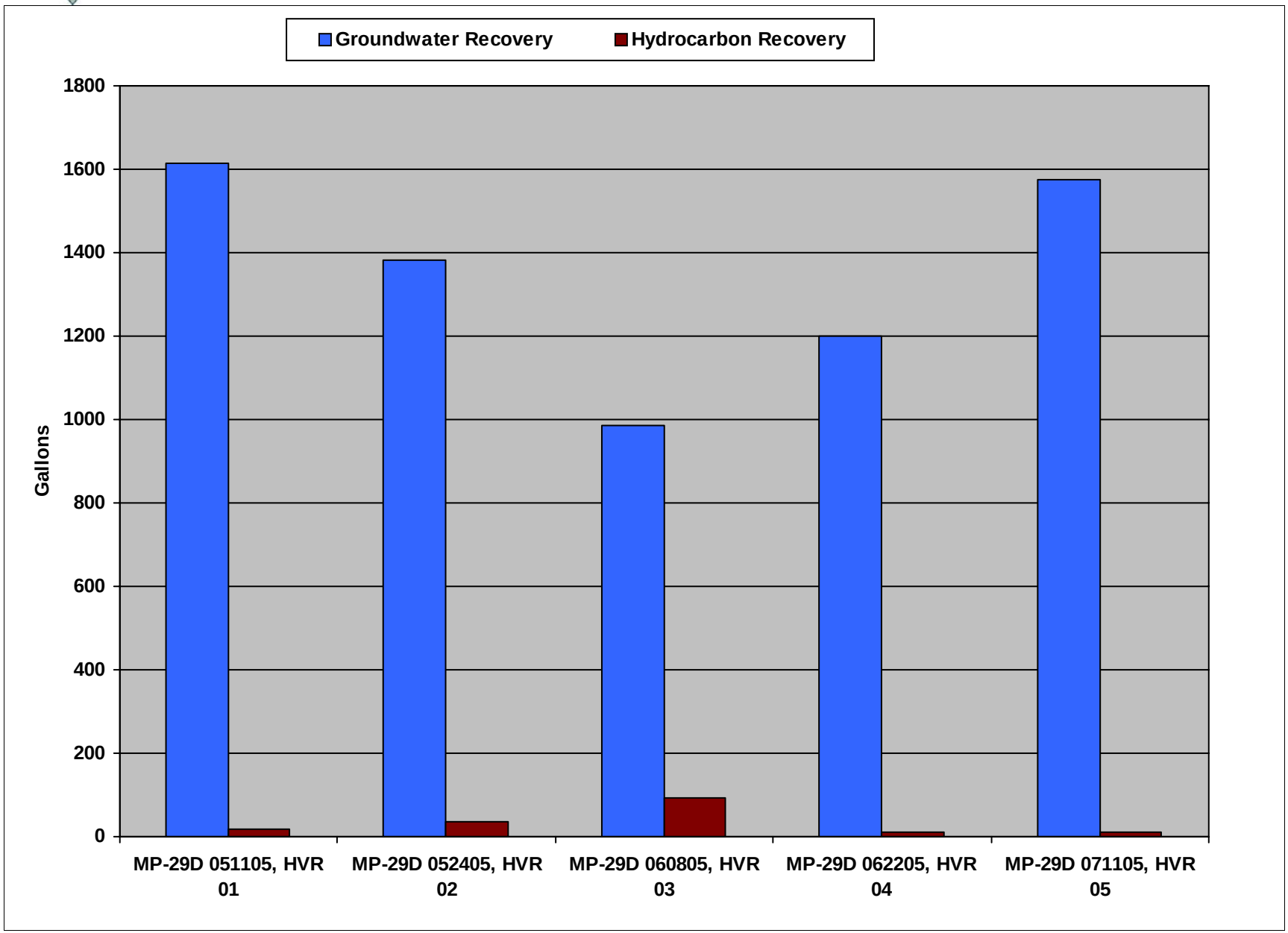


Figure 59: MP-29D
Multi-Site Hydrocarbon Recovery Rate (Gal/Hr) - Grouped by Site

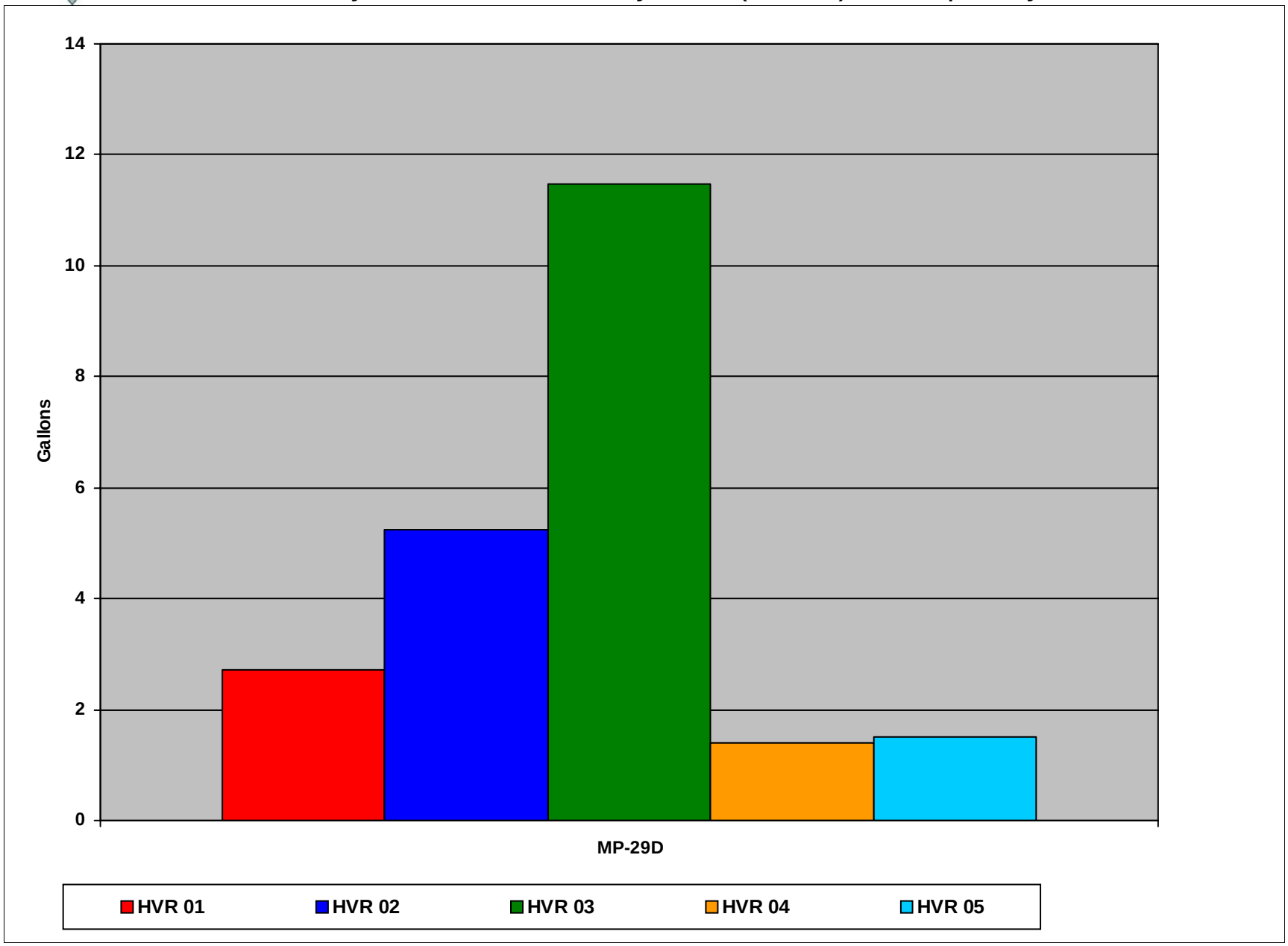


Figure 60: MP-29D
Multi-Site LB per Hour - ICE Calculated vs. Lab Sample

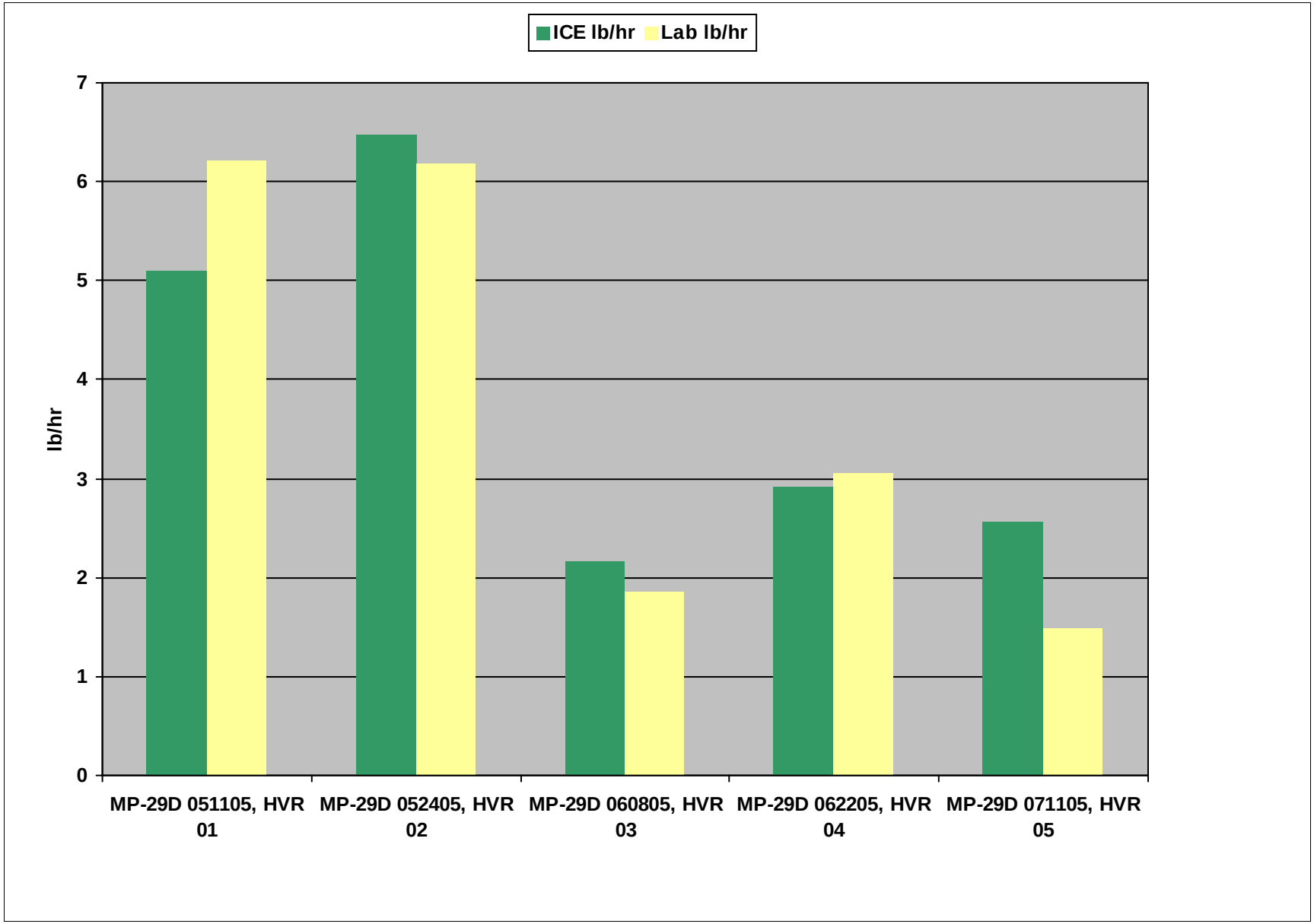


Figure 61: MP-29D
BTU per Hour

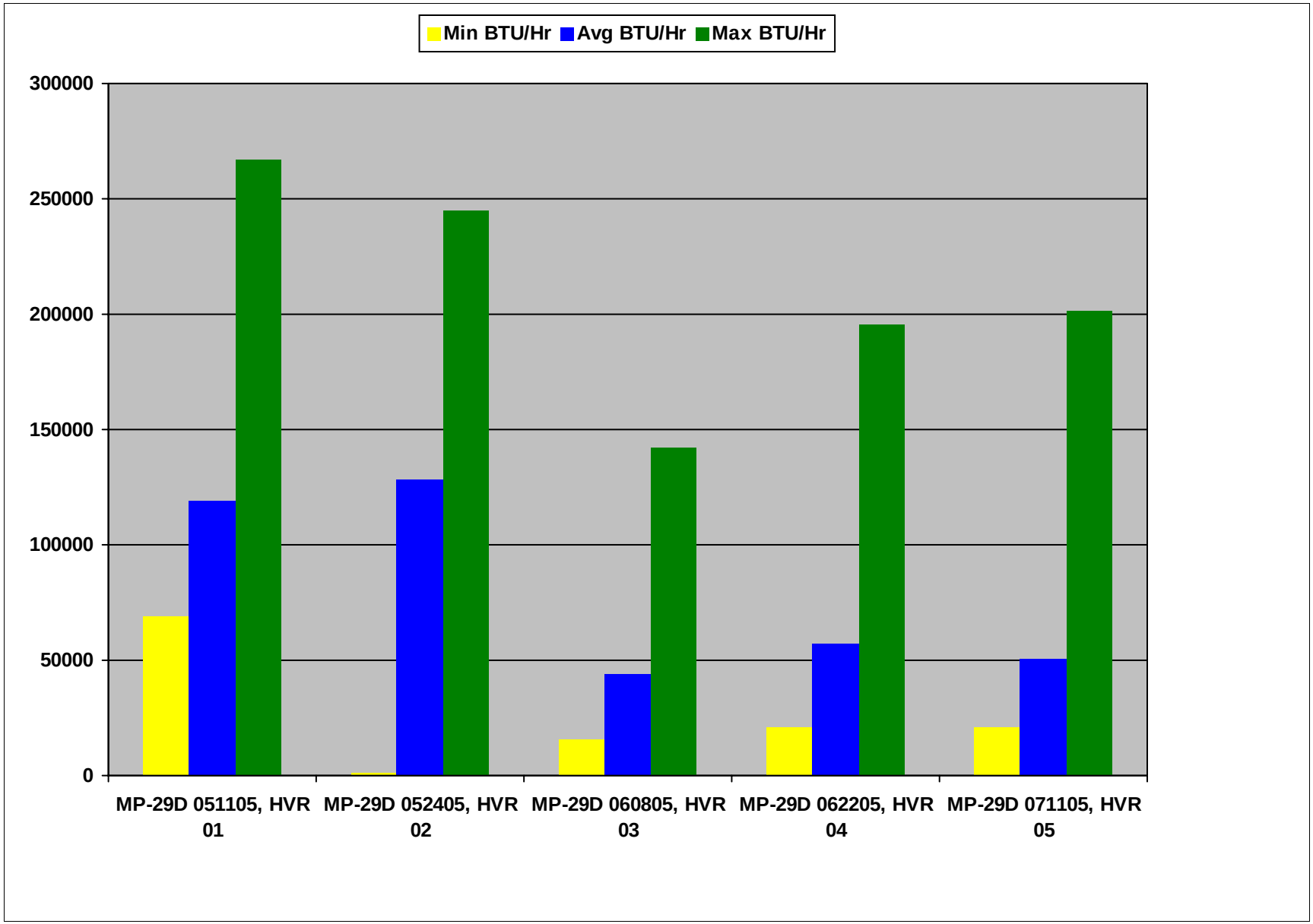


Figure 62: MP-29D
Multi-Site Vacuums

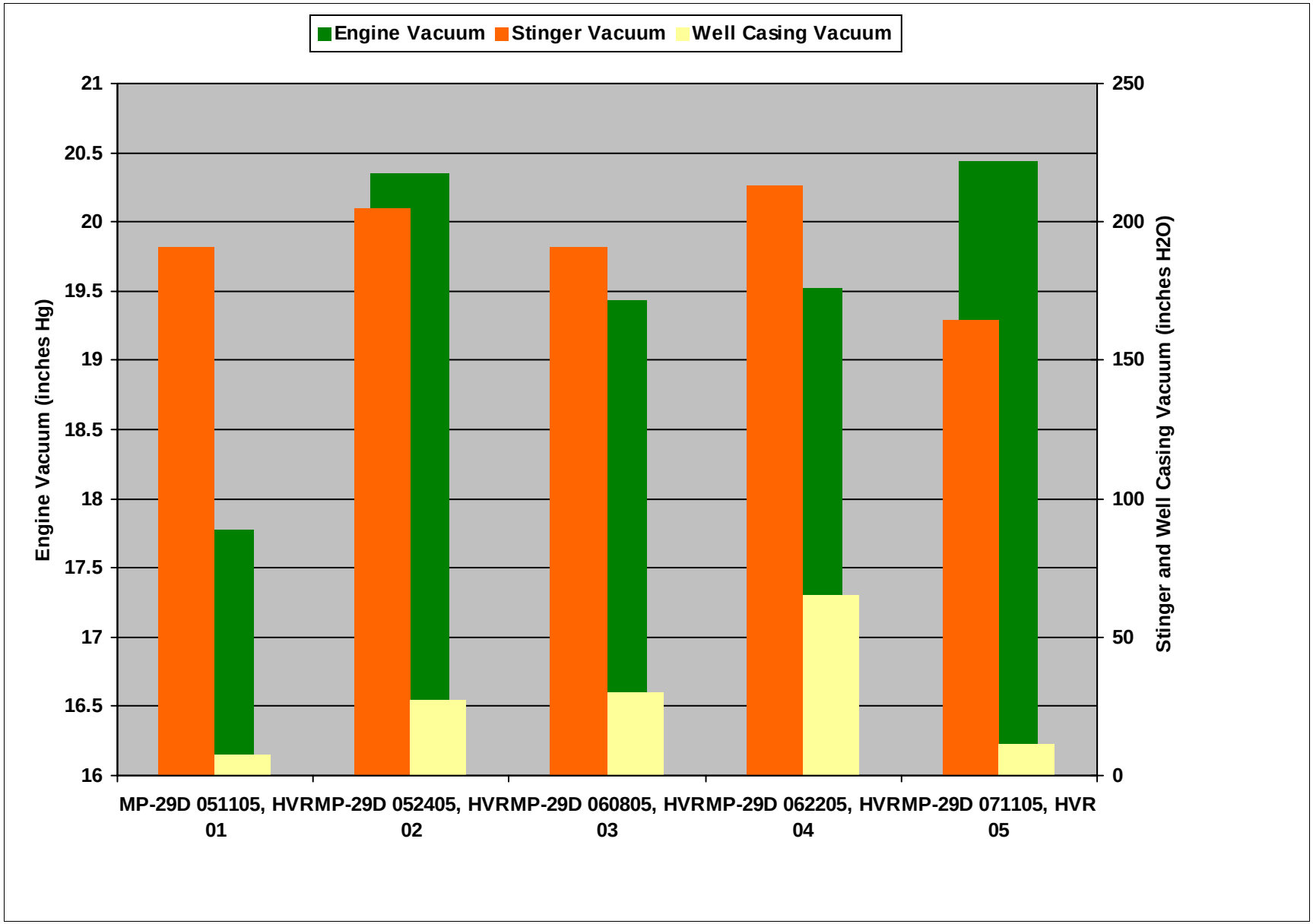


Figure 63: MP-29D
Multi-Site Air, Well and Fuel Flows

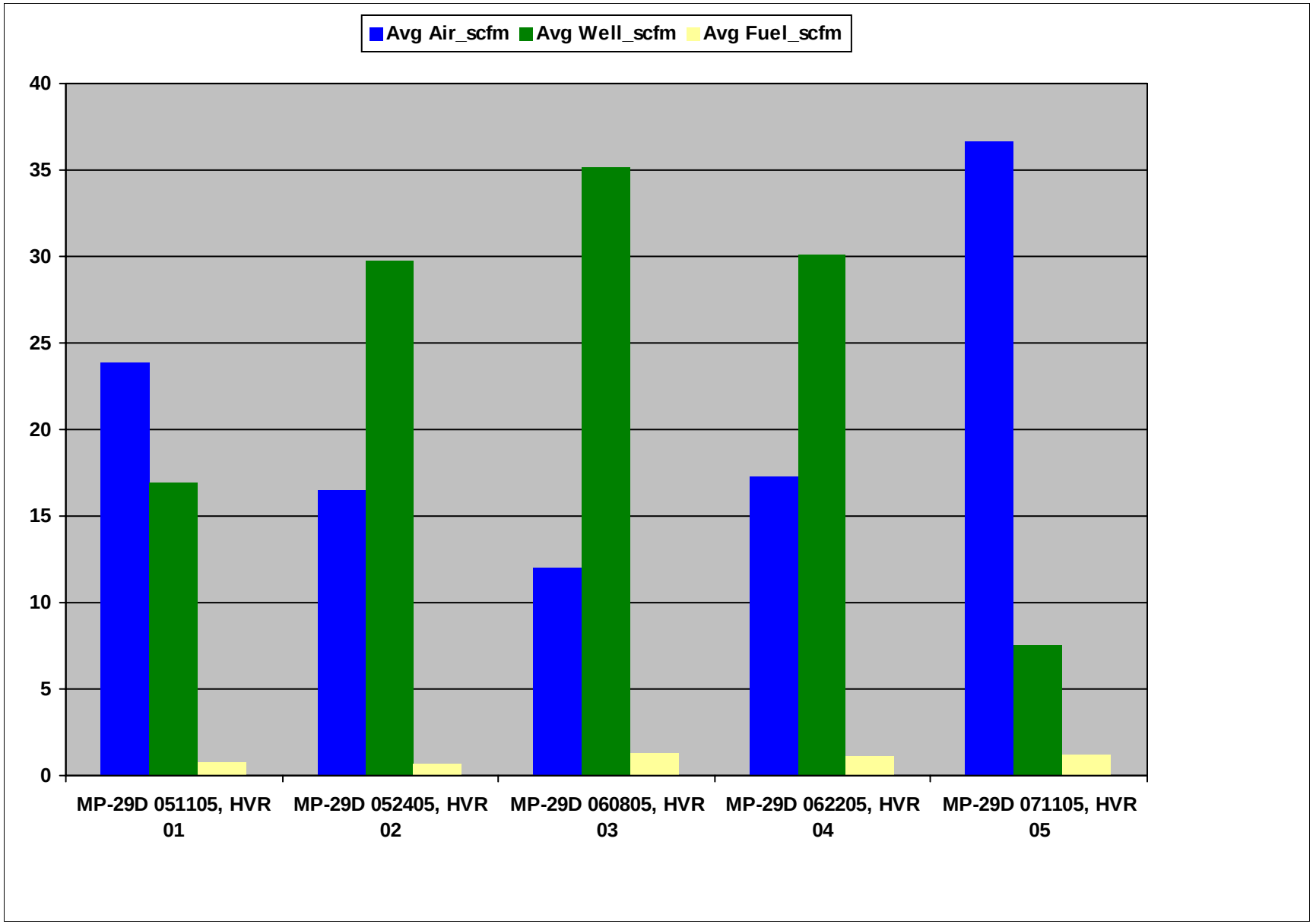


Figure 64: MP-29D Gauging, Stinger and Production Data
Hydrocarbon Recovery vs. Groundwater Recovery - with Elevations

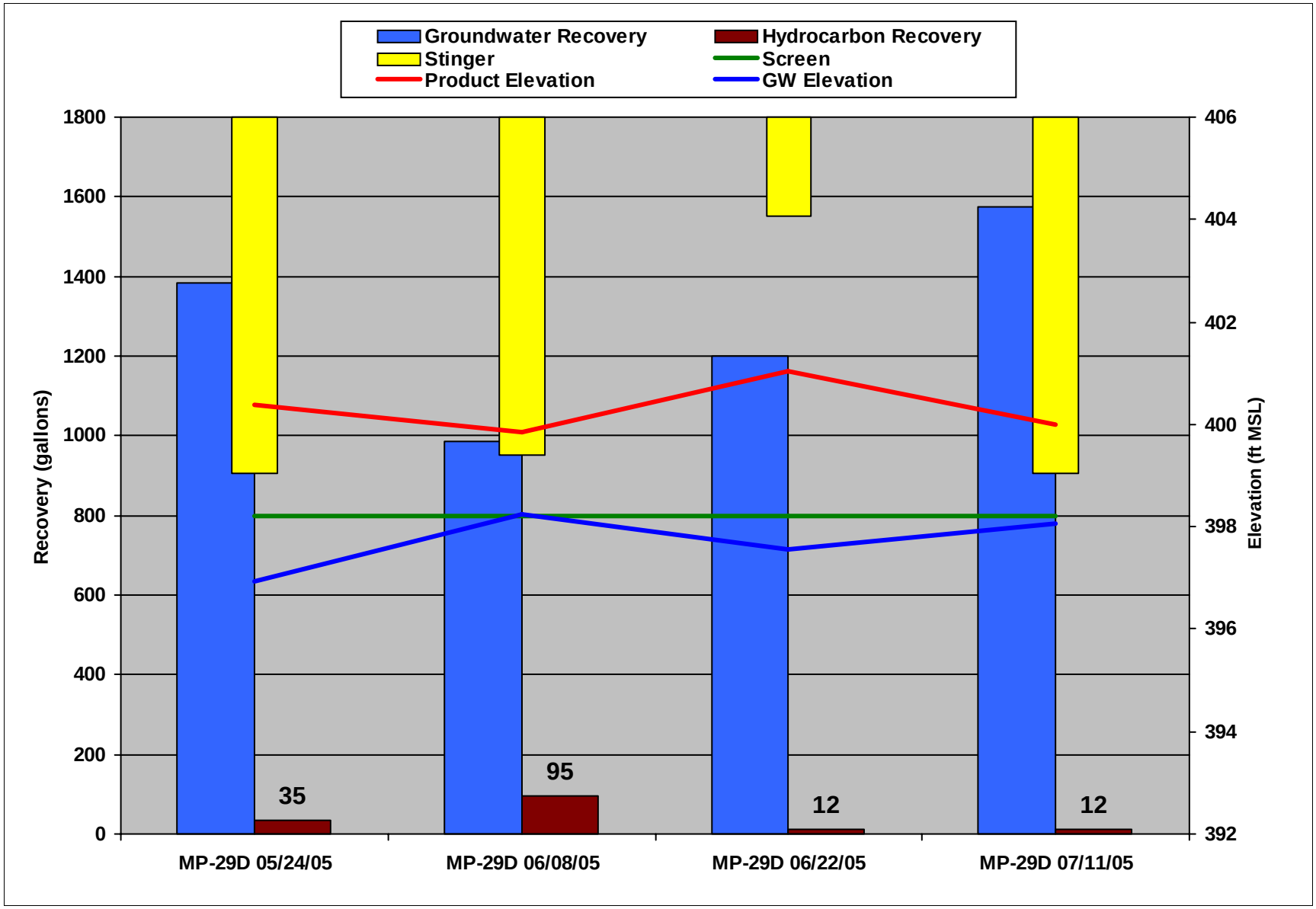


Figure 65: MP-29D
Hydrocarbon Recovery vs. Groundwater Recovery - with Vacuums

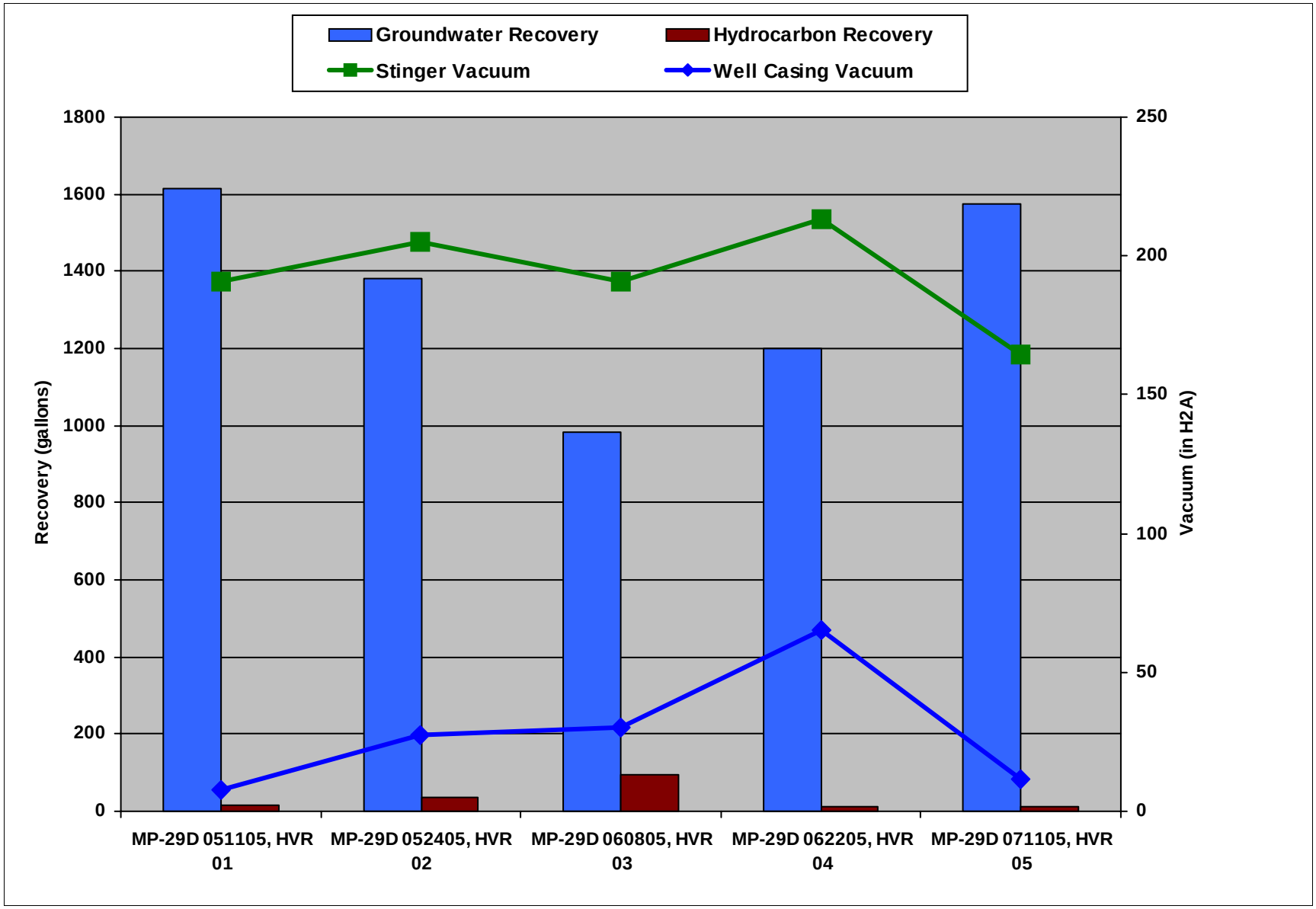


Figure 66: MP-29D
Hydrocarbon Recovery vs. Groundwater Recovery - with Percentages

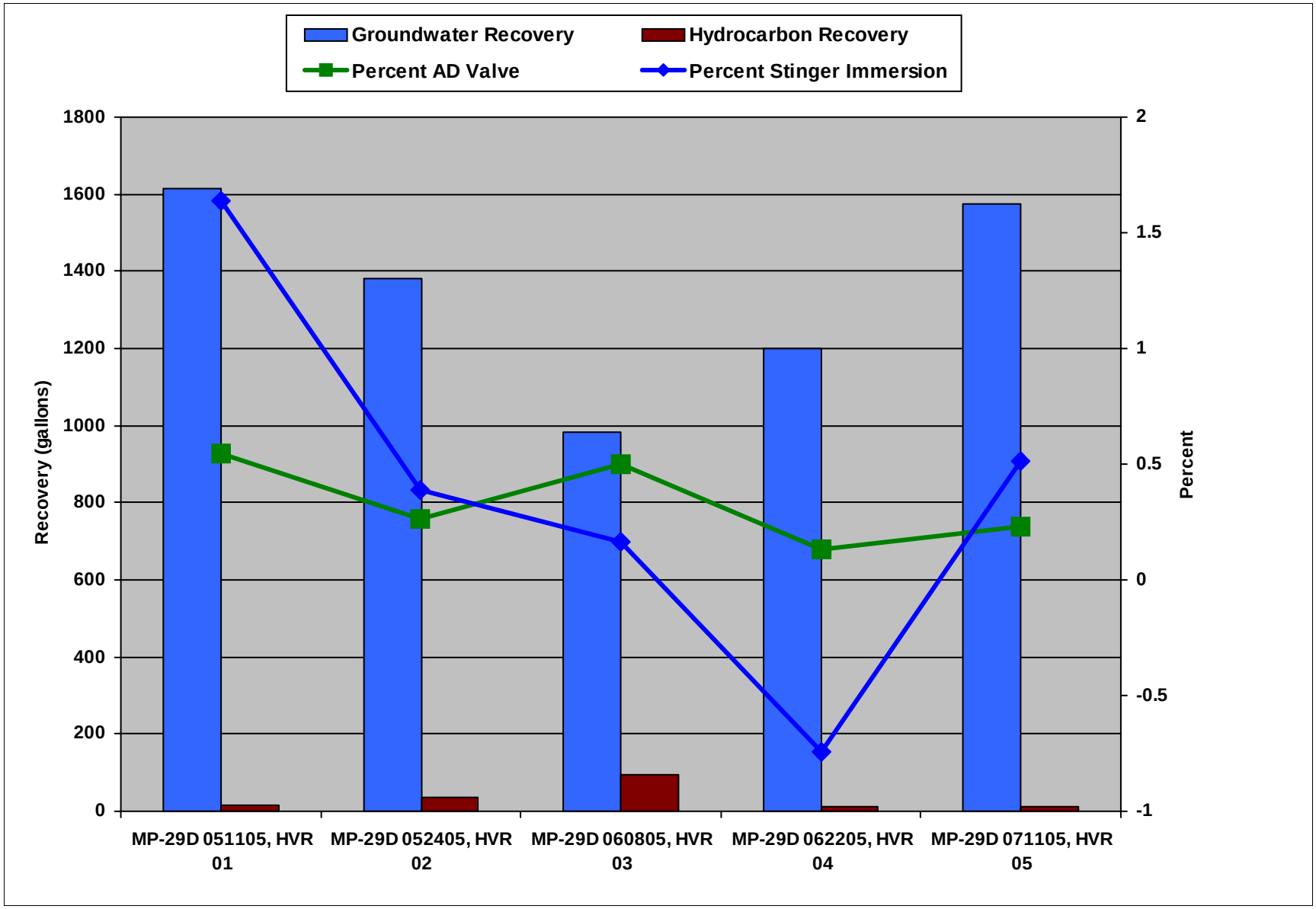


Figure 67: MP-29D
HiVac Event Recharge as a Percentage of Original Product Thickness

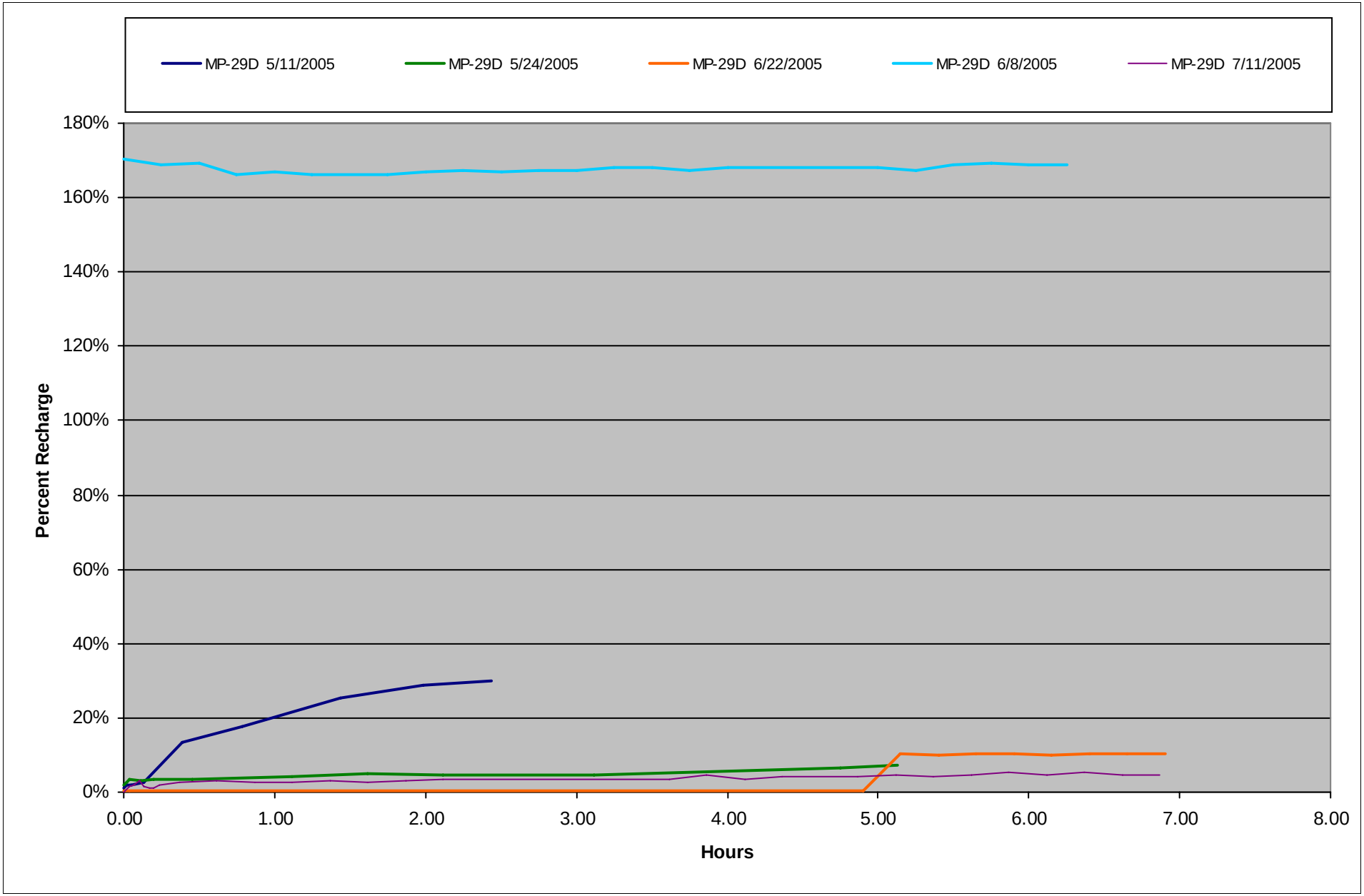


Figure 68: MP-29D
HiVac Event Recharge as Product Thickness in Feet

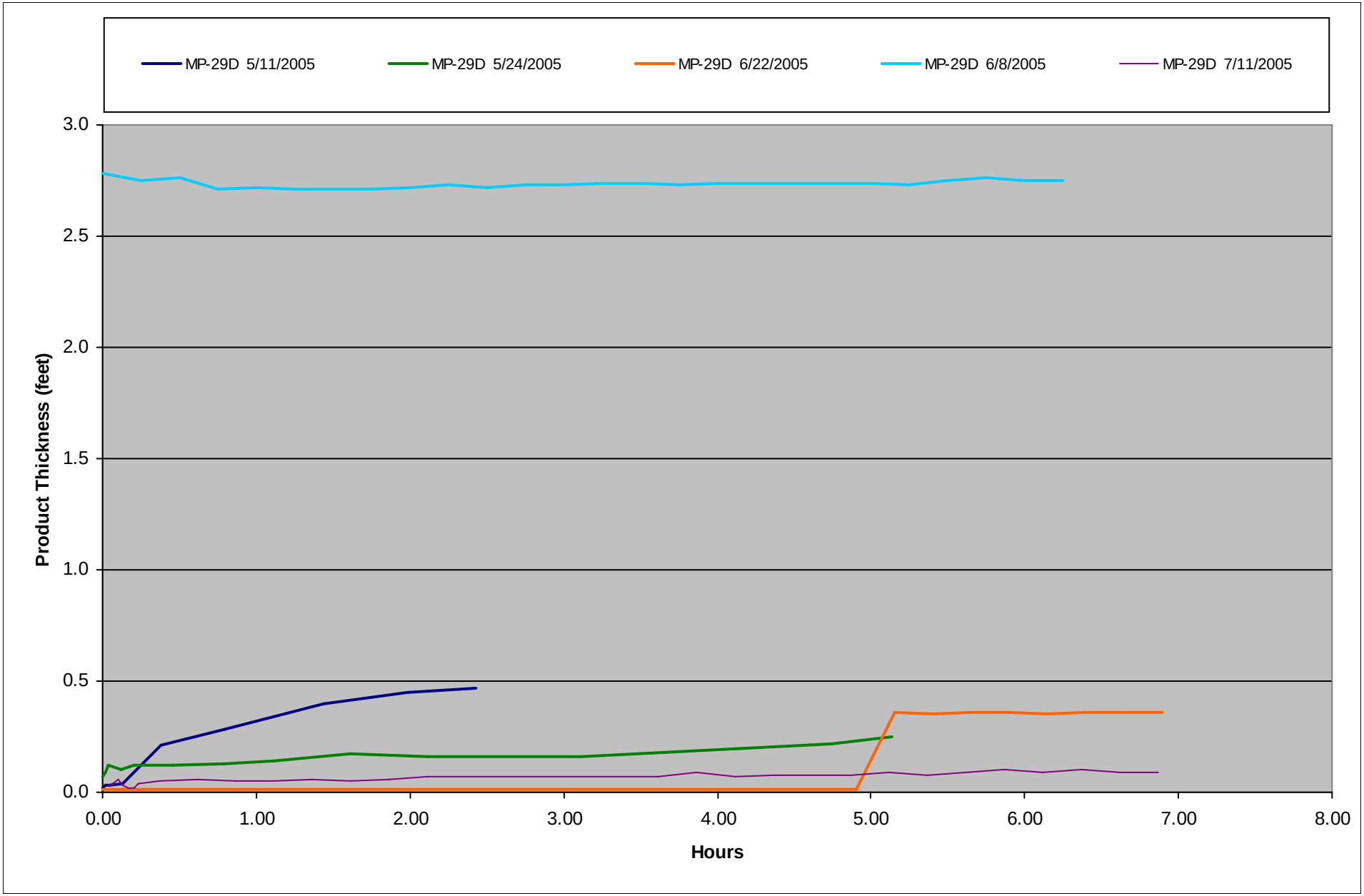
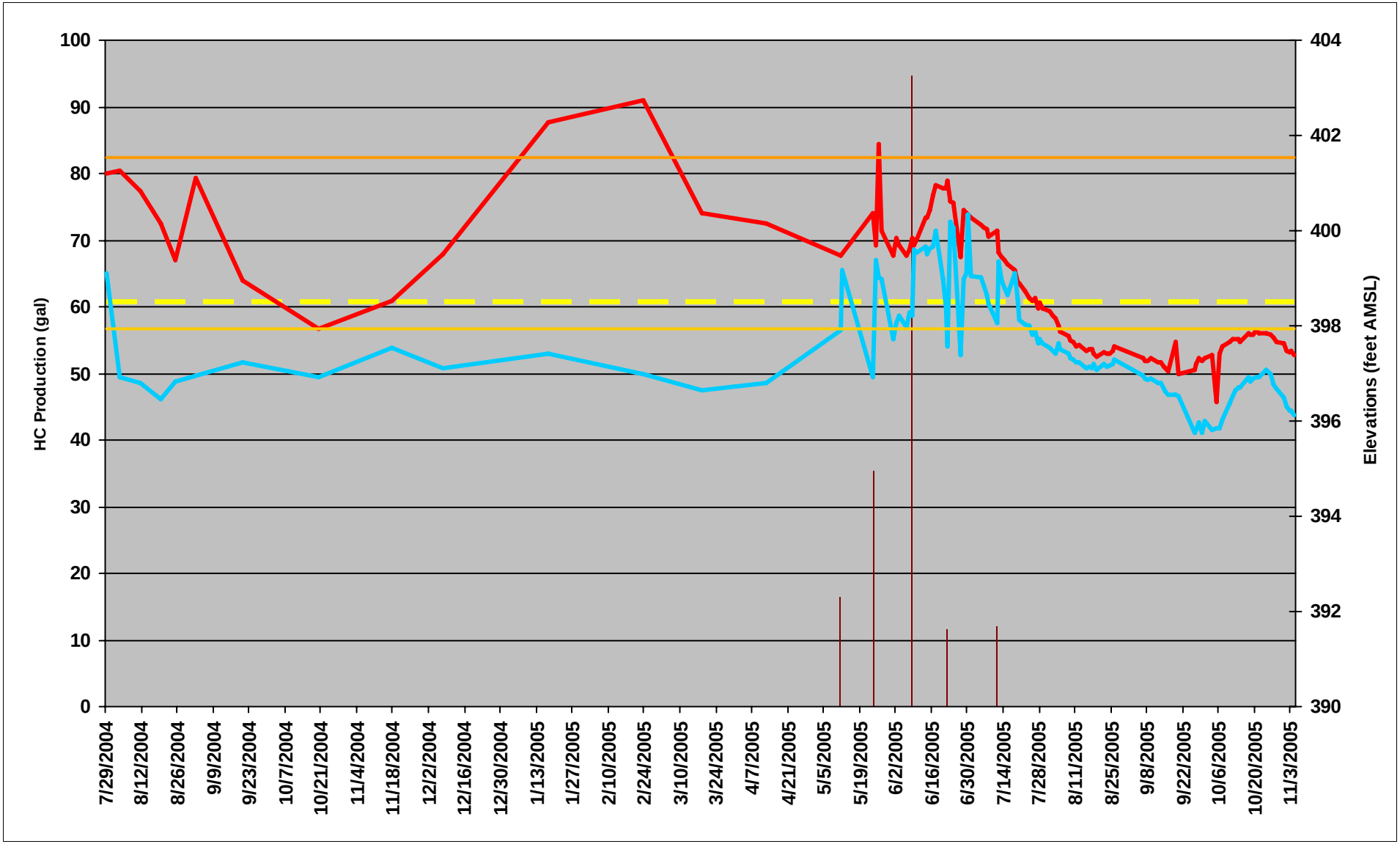


Figure 69: Production Hydrostratigraph

MP-29D

Time Scale



Hartford, Il.

Figure 70: MP-29D
Depth to Top of LNAPL vs. LNAPL Thickness 2004-2005

The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
H_2A Environmental, Ltd.

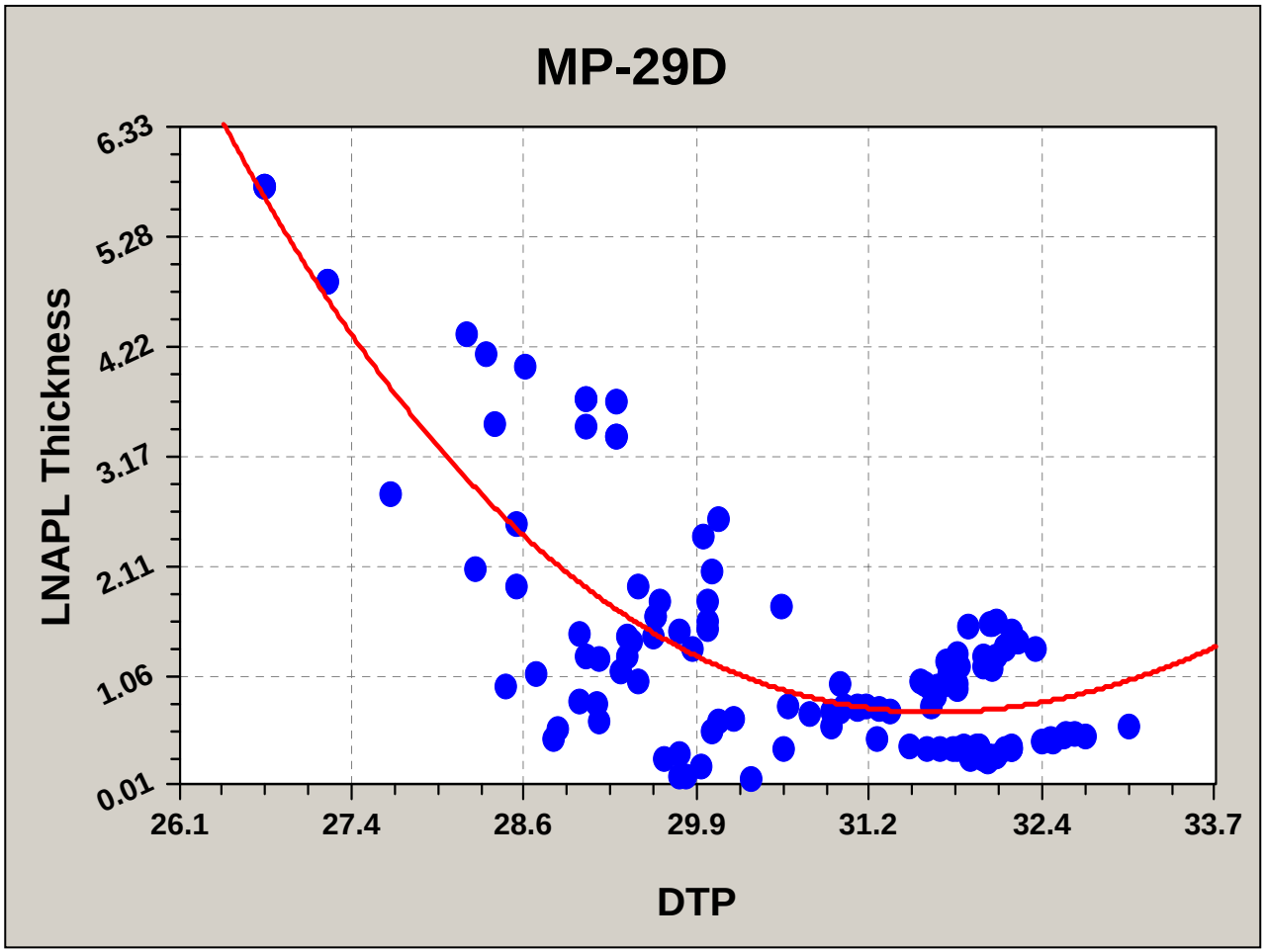


Figure 71: MP-39C
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

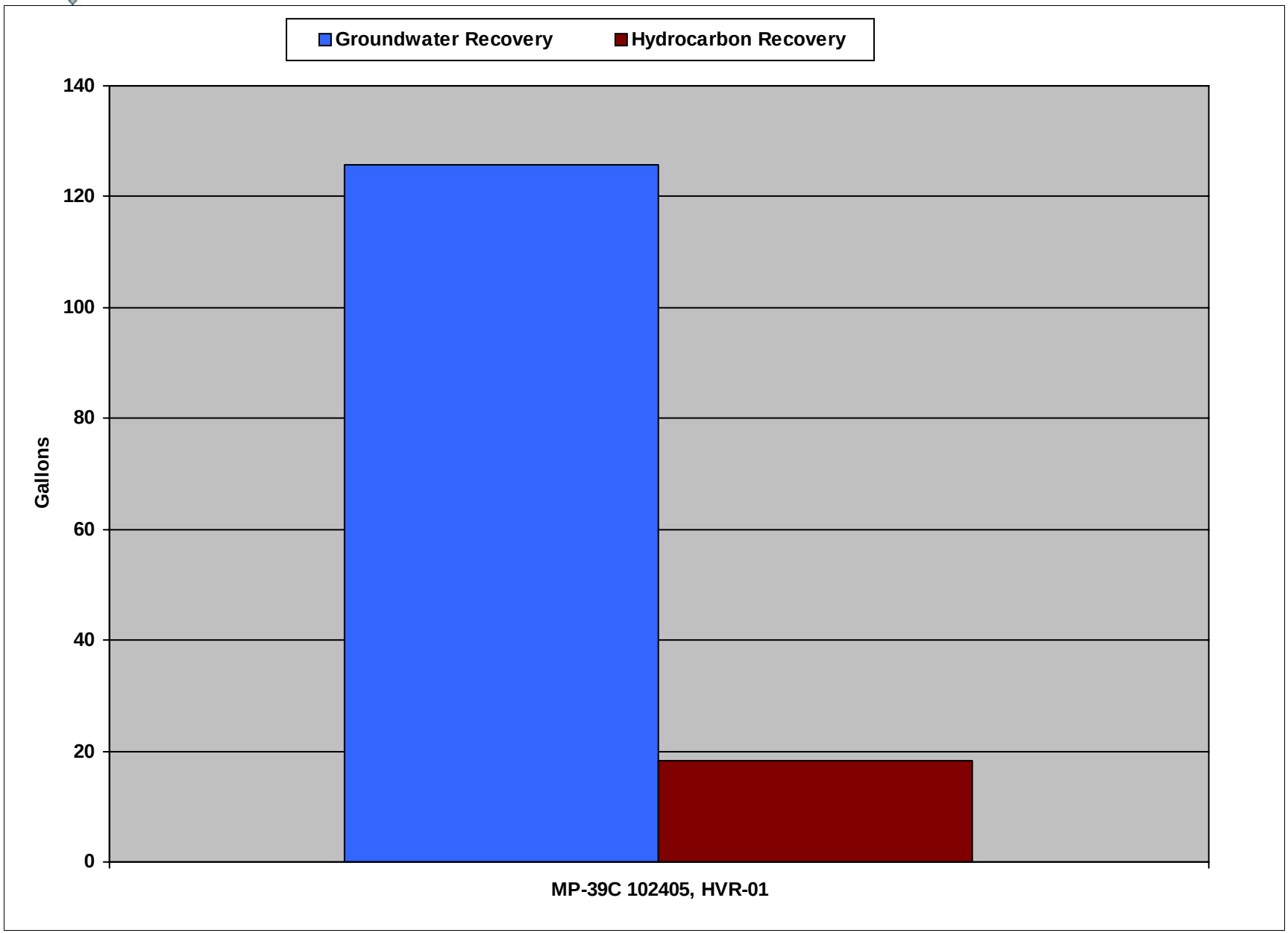


Figure 72: MP-39C
Multi-Site Hydrocarbon Recovery Rate (Gal/Hr) - Grouped by Site

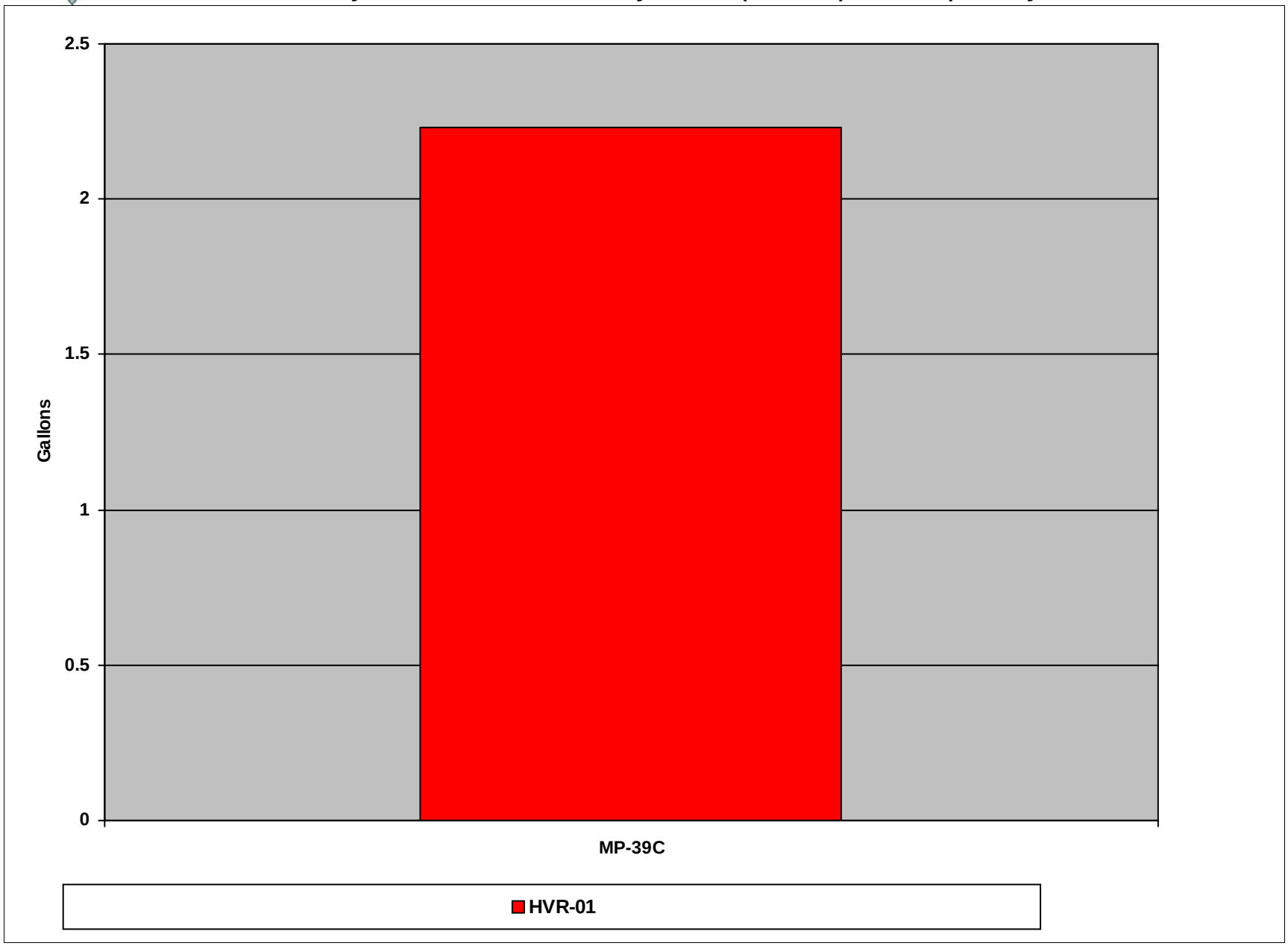


Figure 73: MP-39C
Multi-Site LB per Hour - ICE Calculated vs. Lab Sample

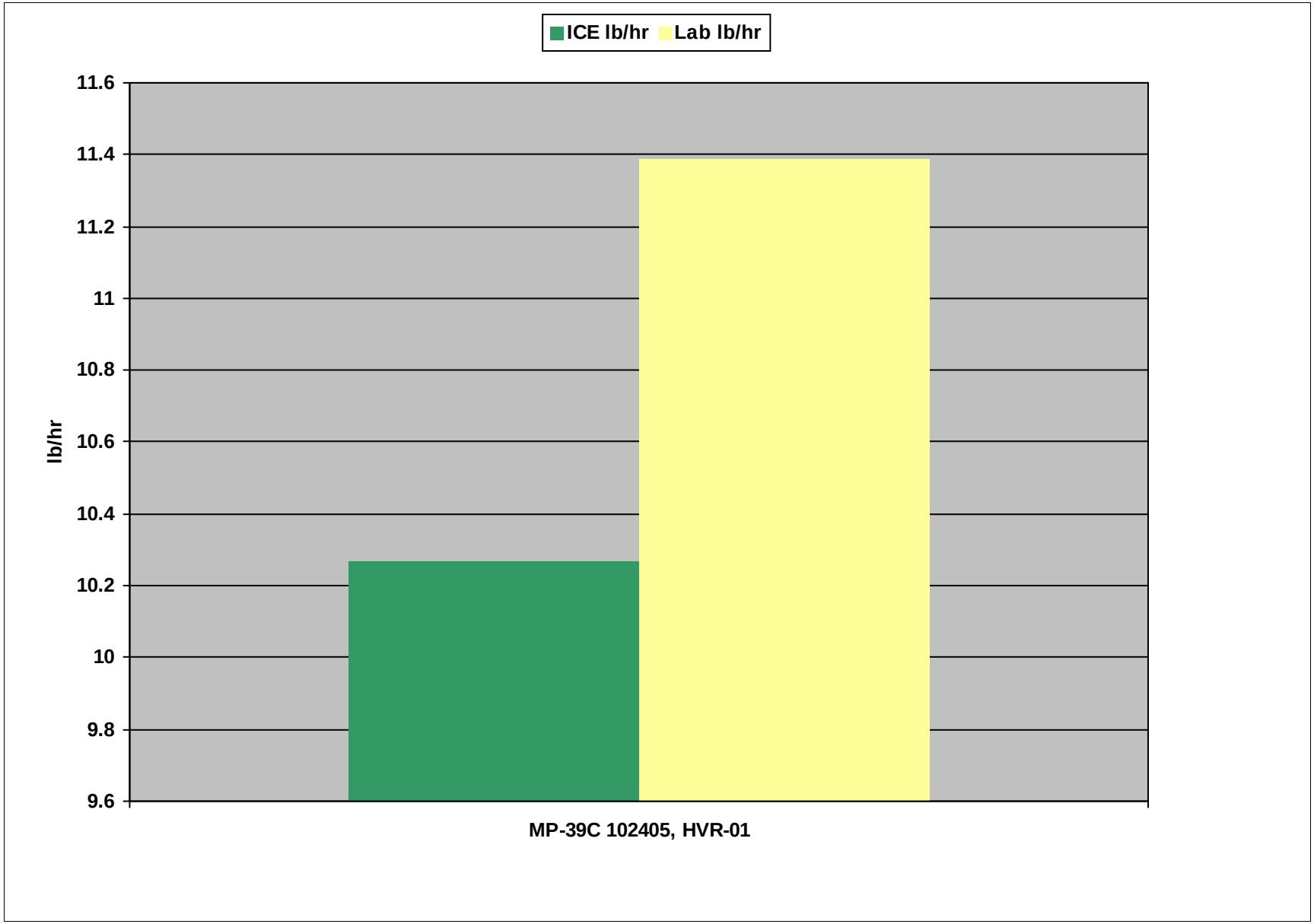


Figure 74: MP-39C
Hydrocarbon Recovery vs. Groundwater Recovery - with Vacuums

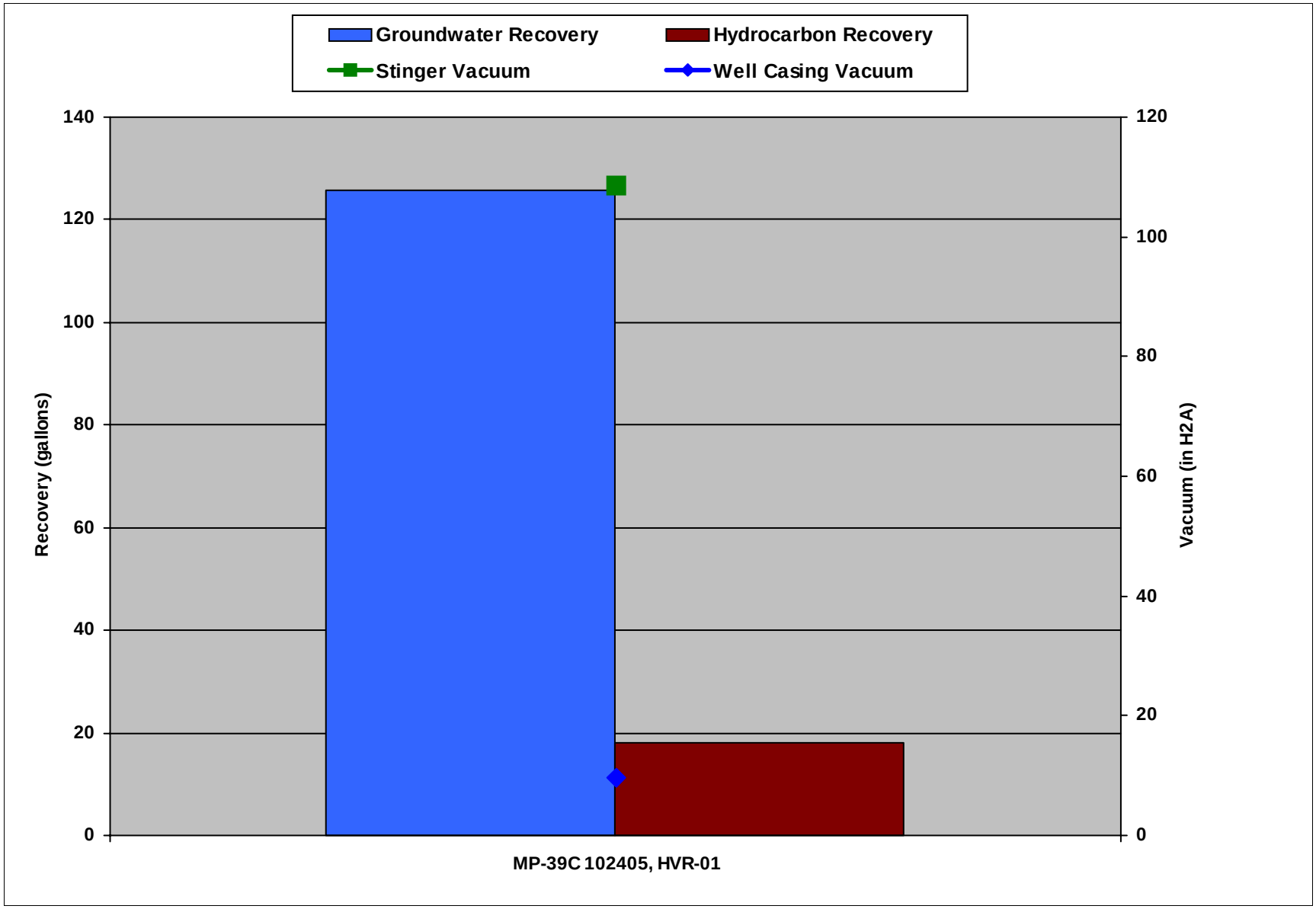


Figure 75: MP-39C
Hydrocarbon Recovery vs. Groundwater Recovery - with Percentages

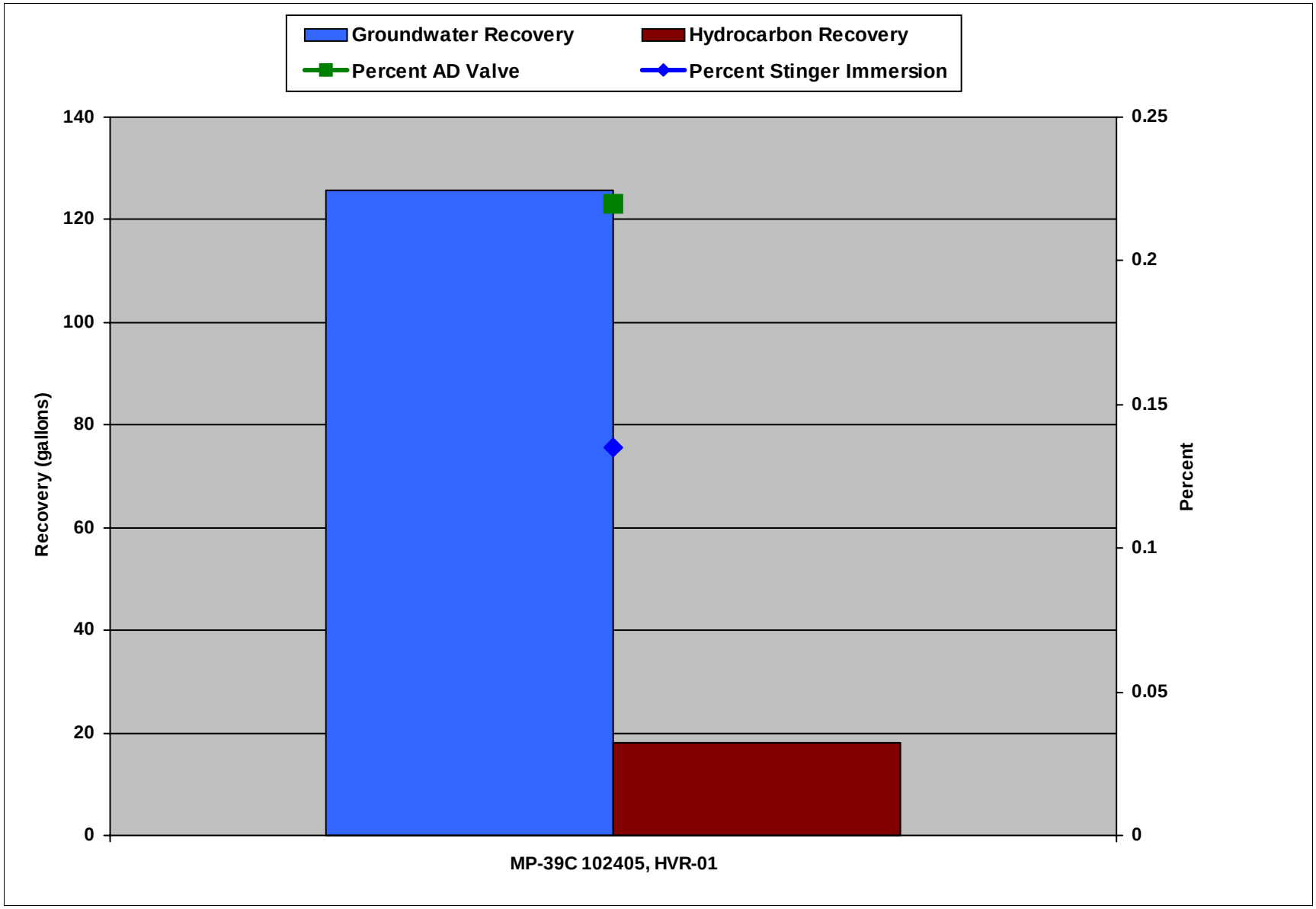


Figure 76: MP-39C
HiVac Event Recharge as a Percentage of Original Product Thickness

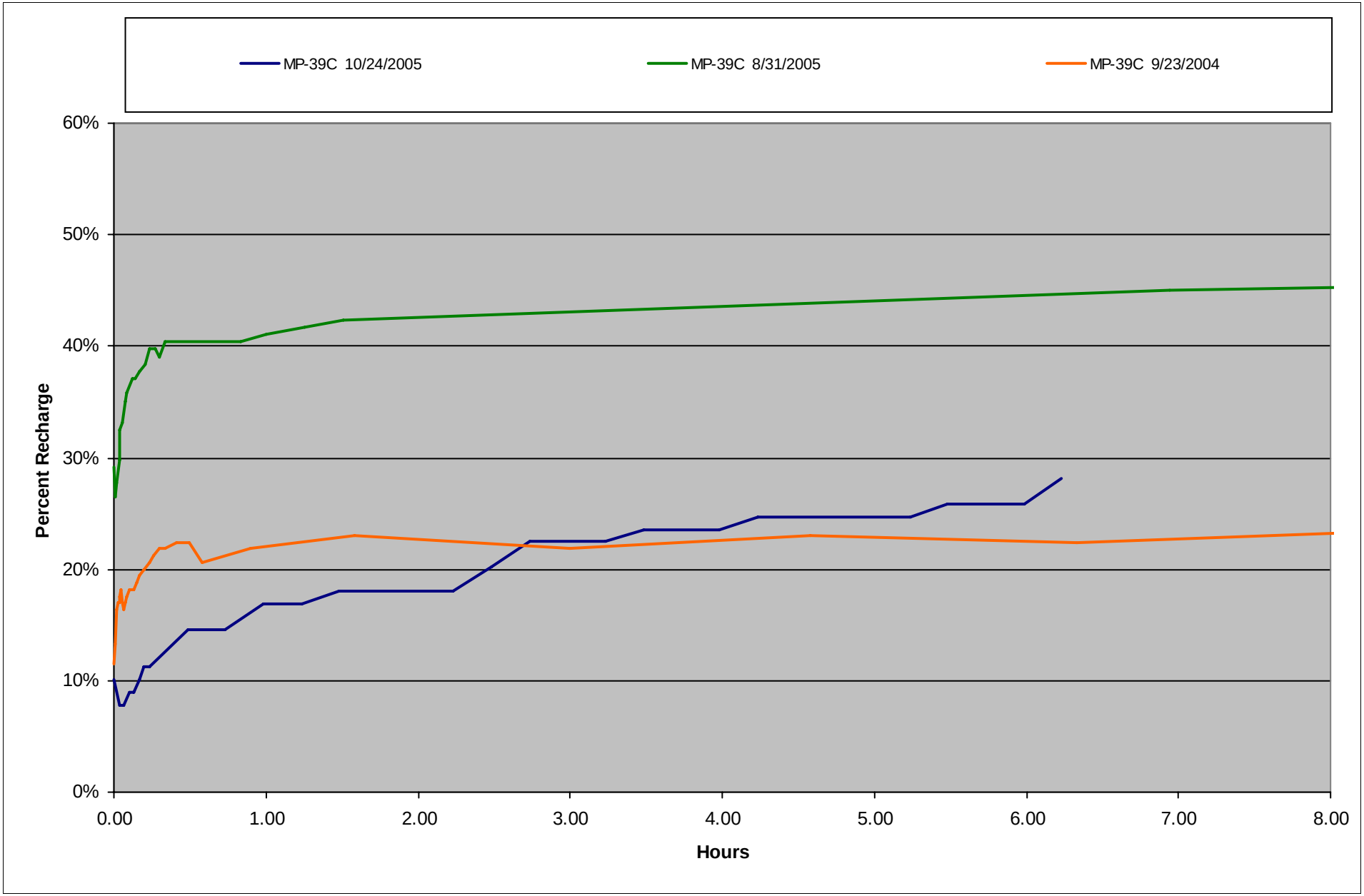


Figure 77: MP-39C
HiVac Event Recharge as Product Thickness in Feet

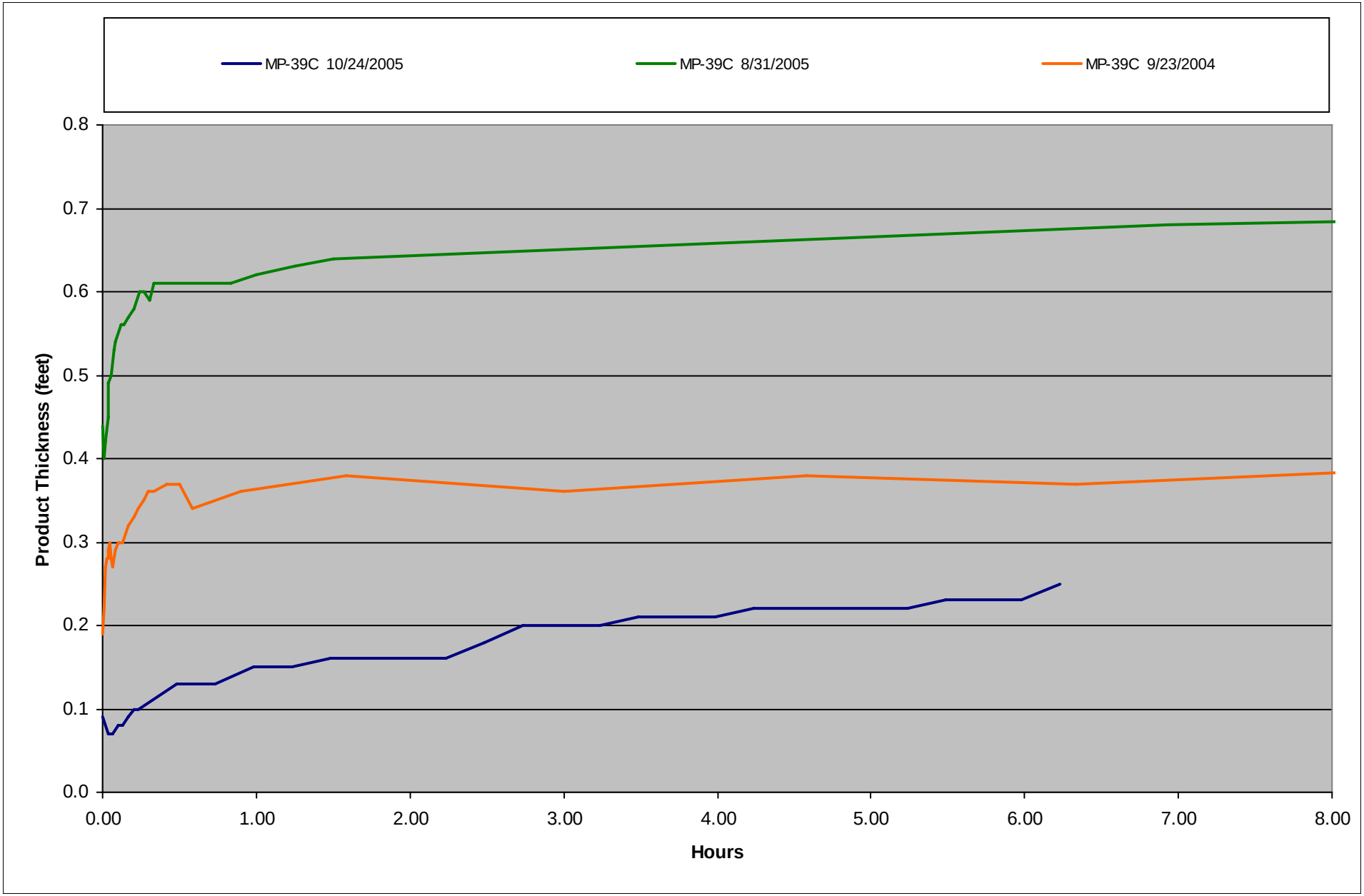
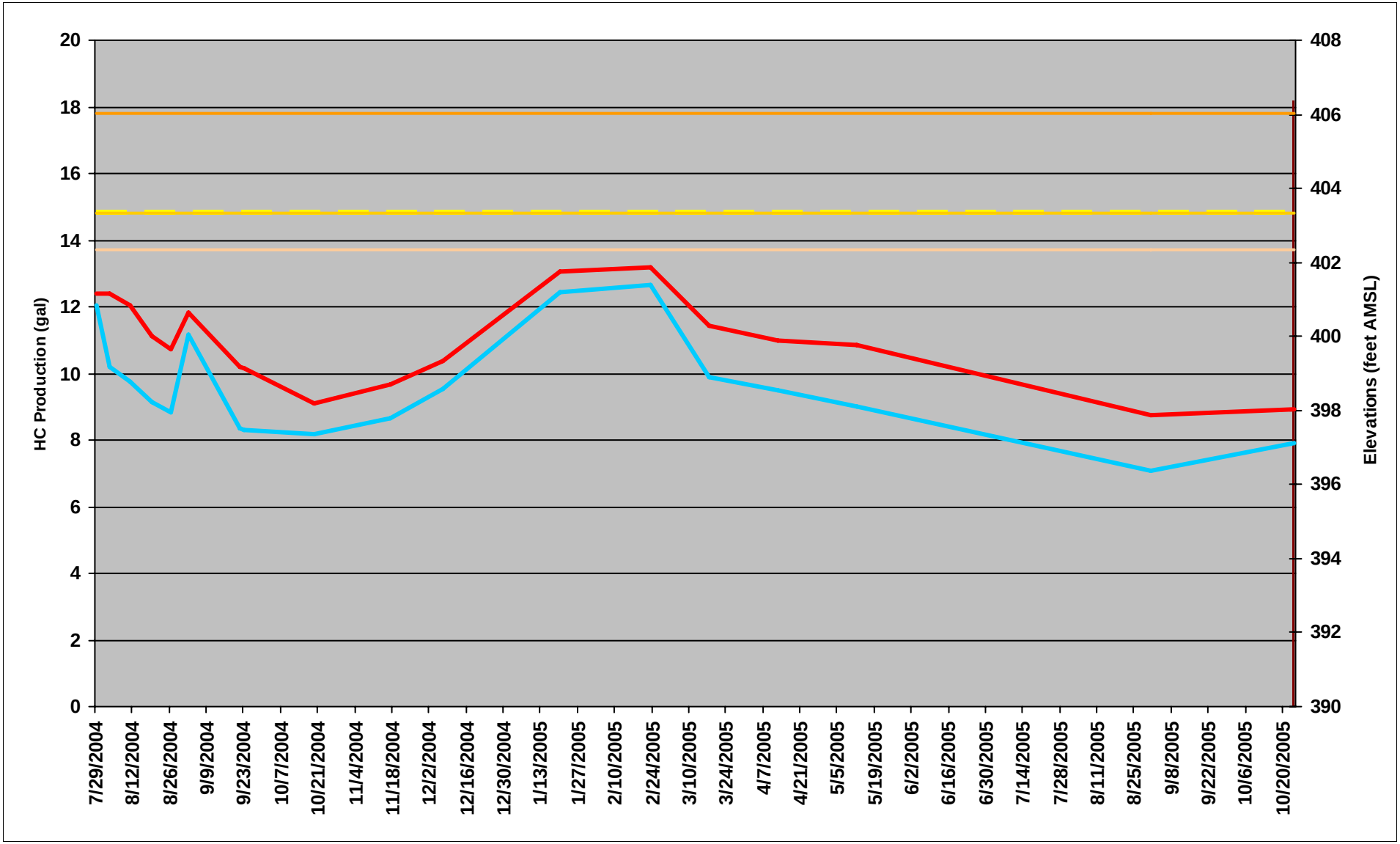


Figure 78: Production Hydrostratigraph

MP-39C

Time Scale



Hartford, Il.

Figure 79: MP-39C
Depth to Top of LNAPL vs. LNAPL Thickness 2004-2005

The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
H_2A Environmental, Ltd.

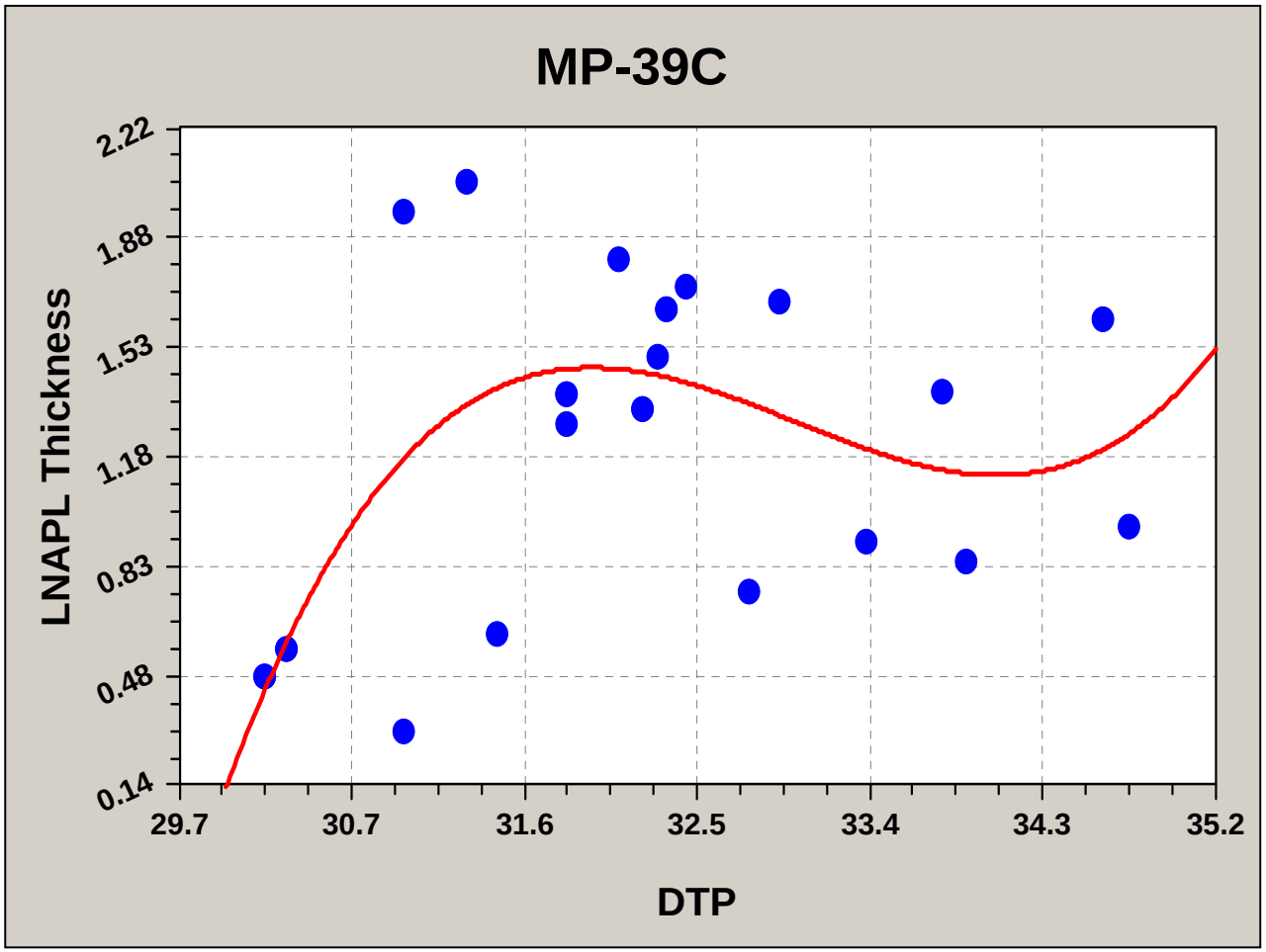


Figure 80: MP47C
Multi-Site Cumulative Product Recovery (Gallons)

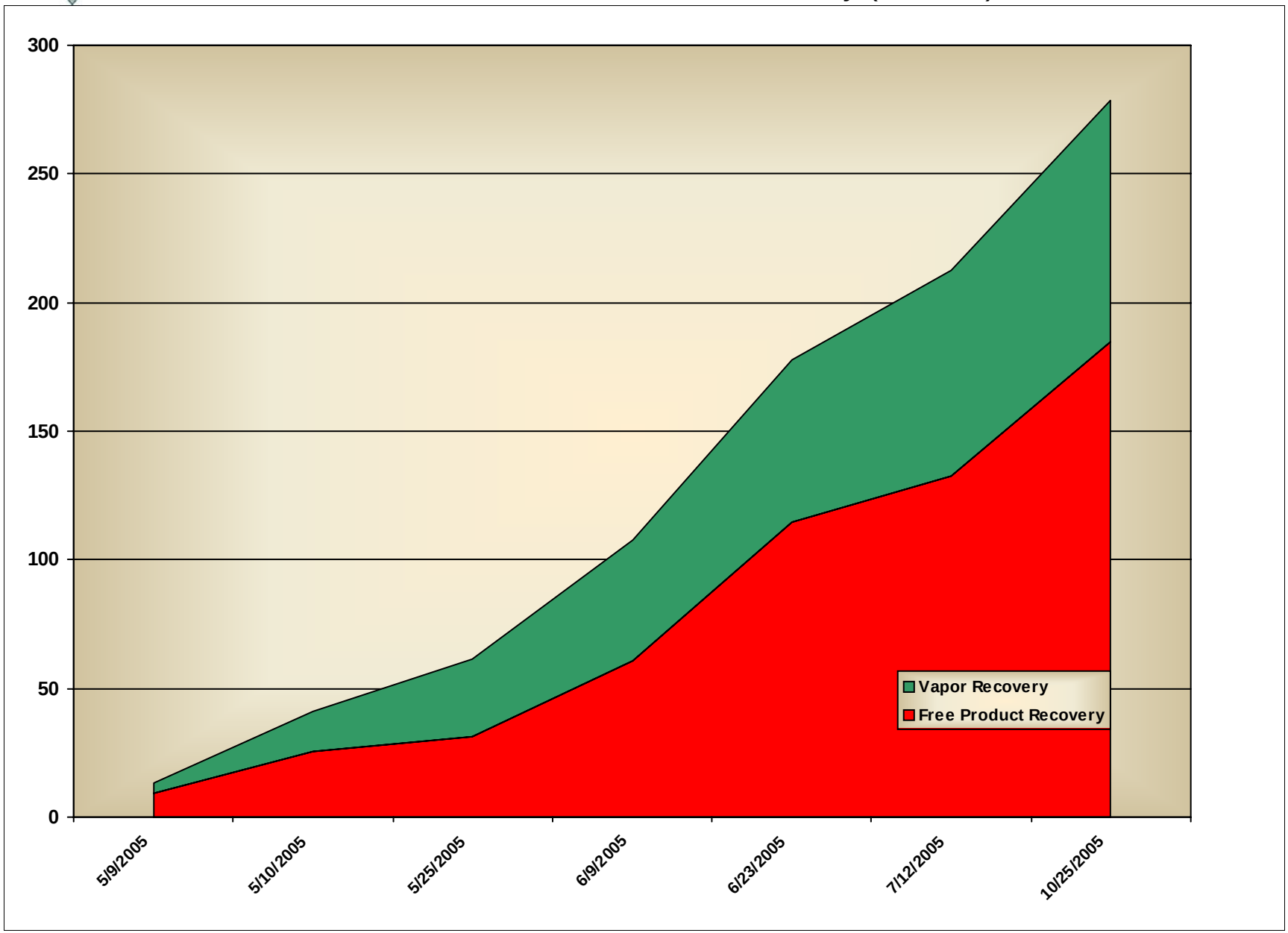


Figure 81: MP47C
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

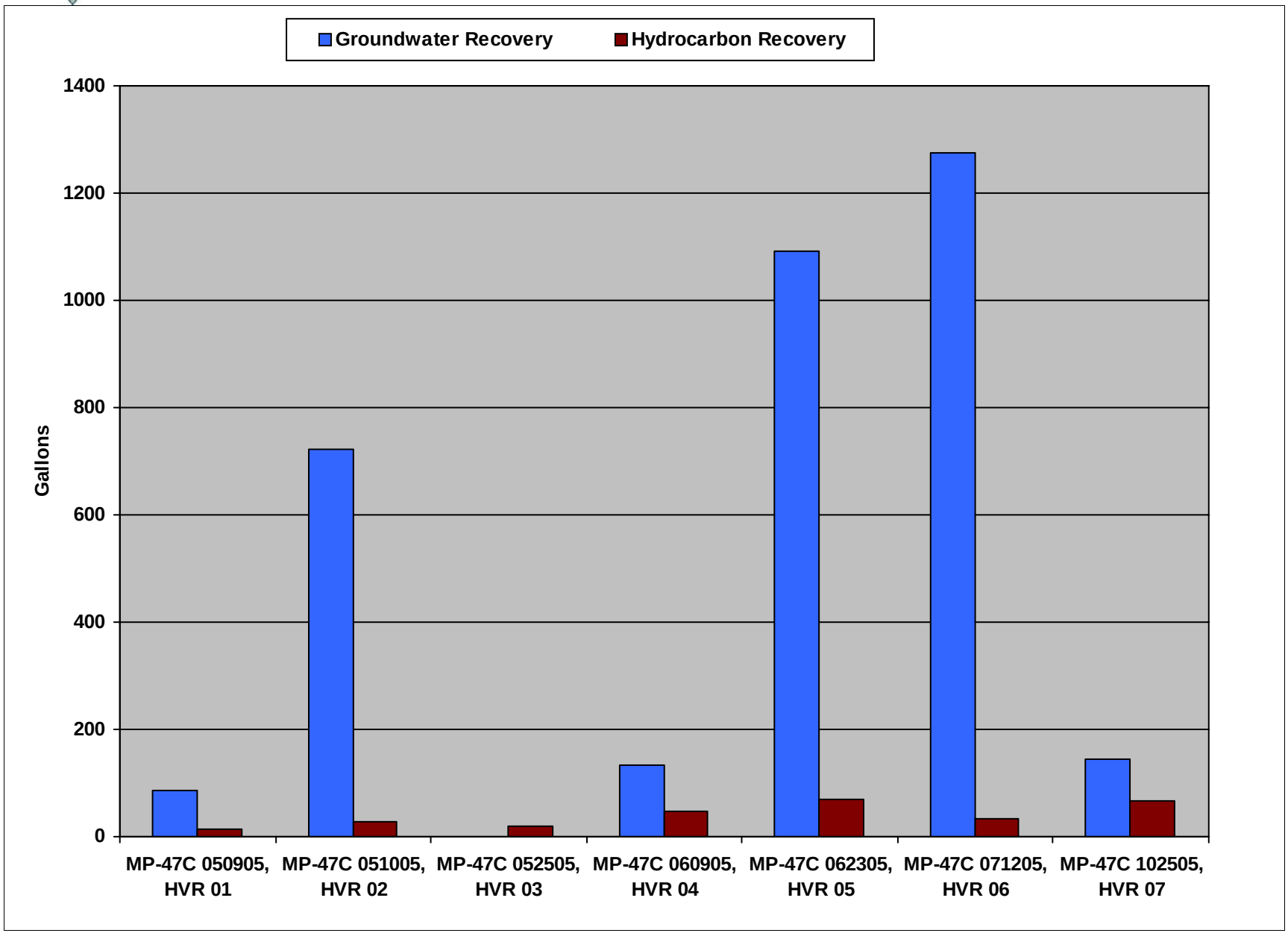


Figure 82: MP47C
Multi-Site Hydrocarbon Recovery Rate (Gal/Hr) - Grouped by Site

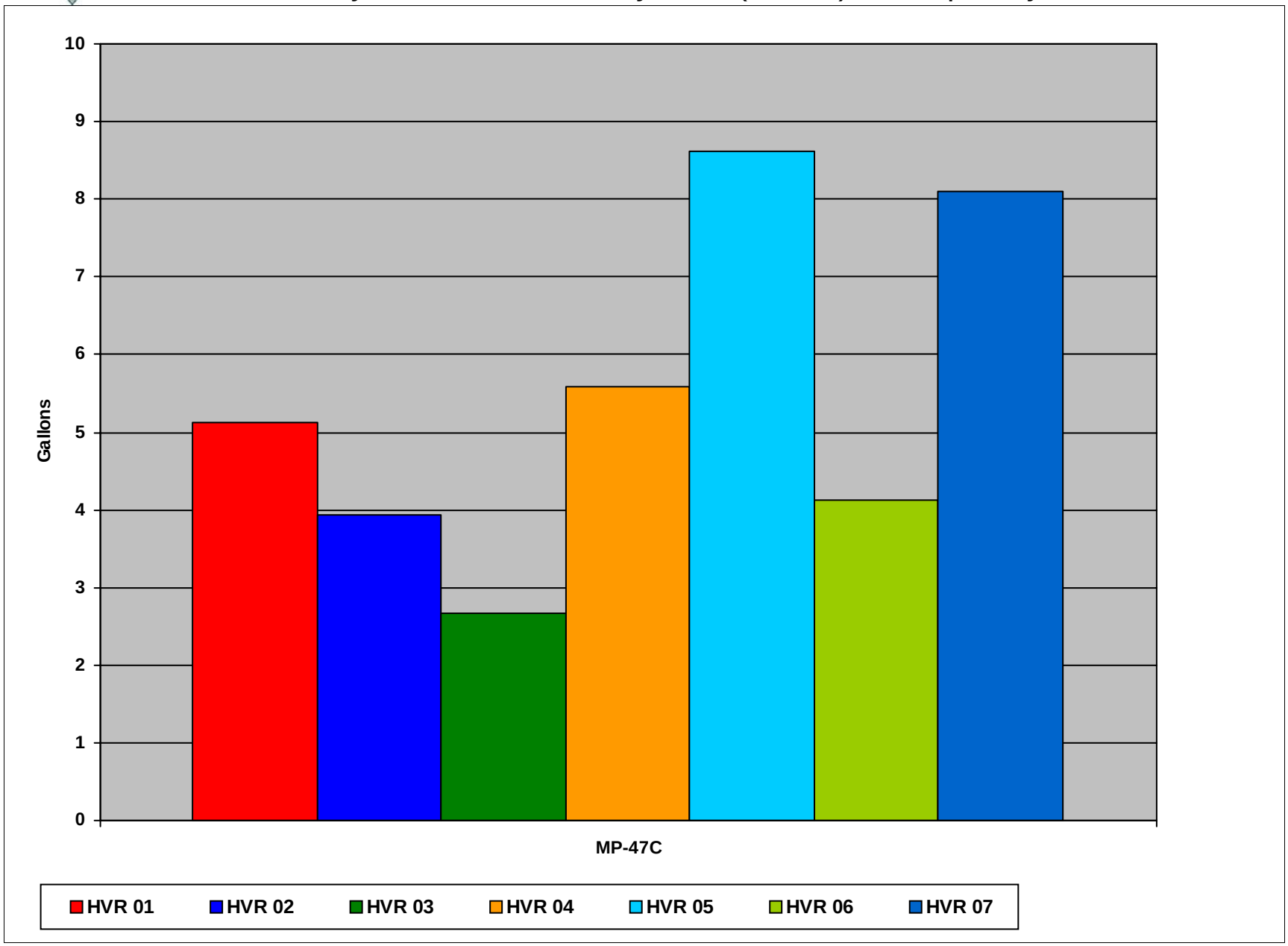


Figure 83: MP47C
Multi-Site LB per Hour - ICE Calculated vs. Lab Sample

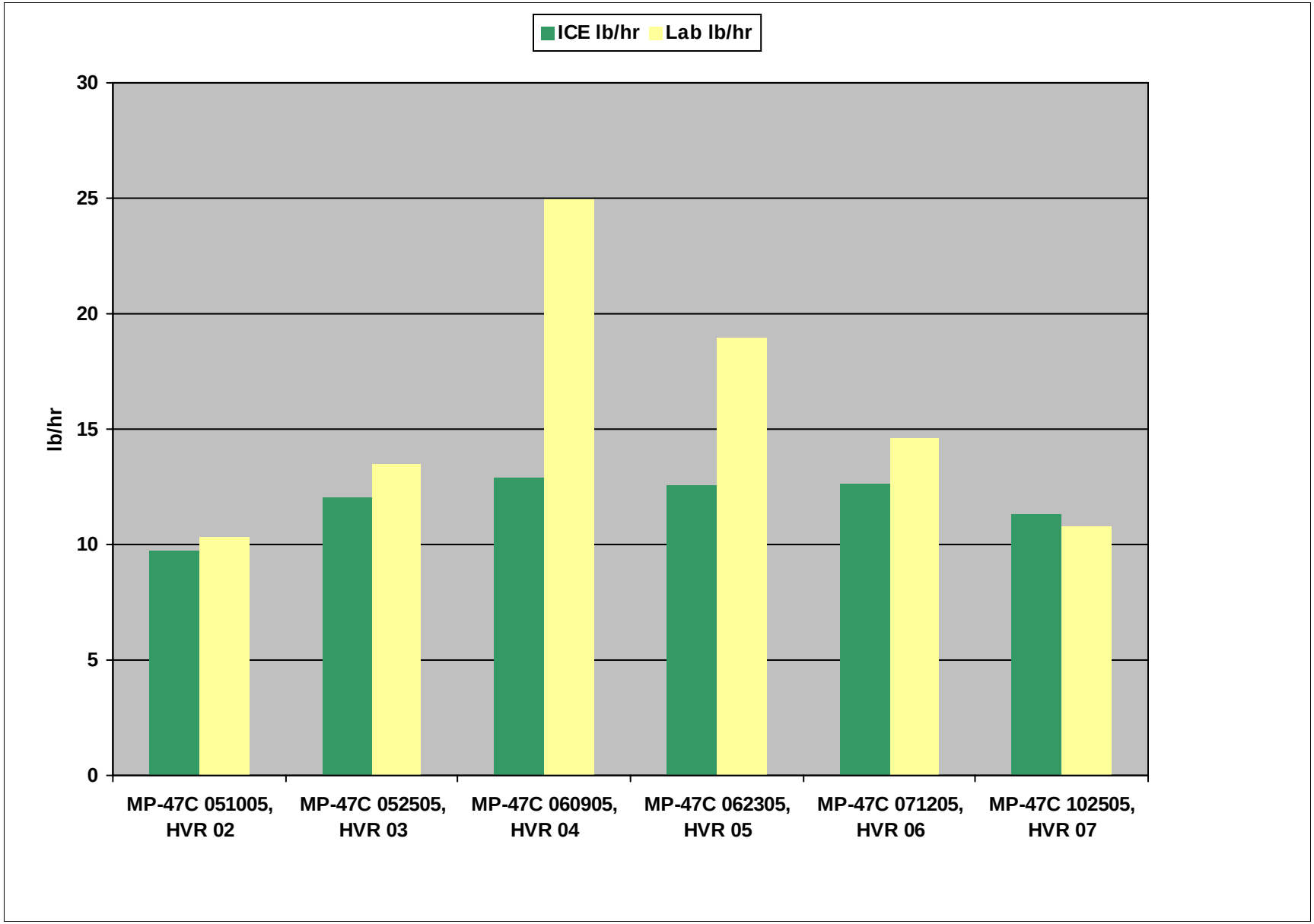


Figure 83: MP47C
Multi-Site LB per Hour - ICE Calculated vs. Lab Sample

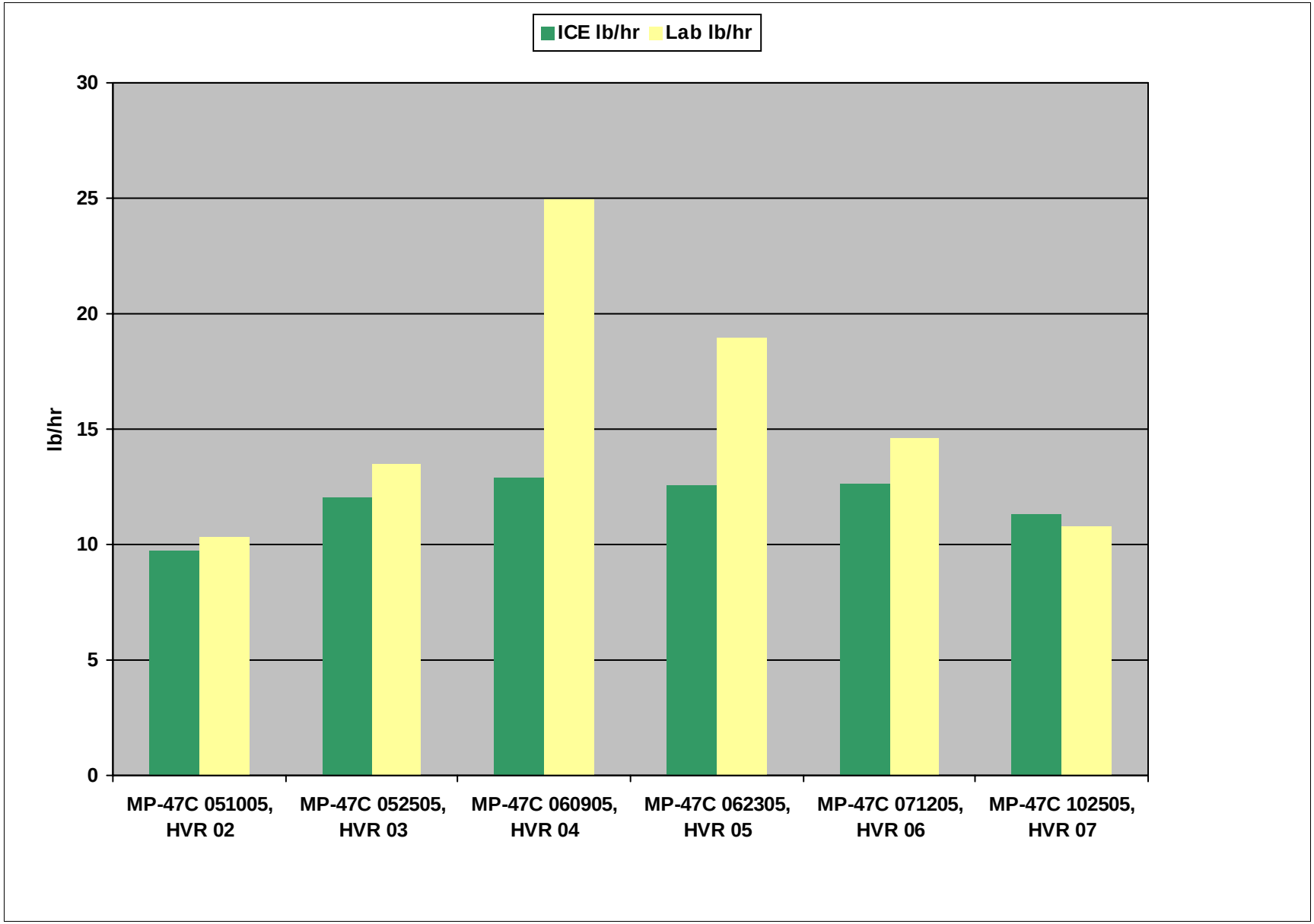


Figure 84: MP47C
BTU per Hour

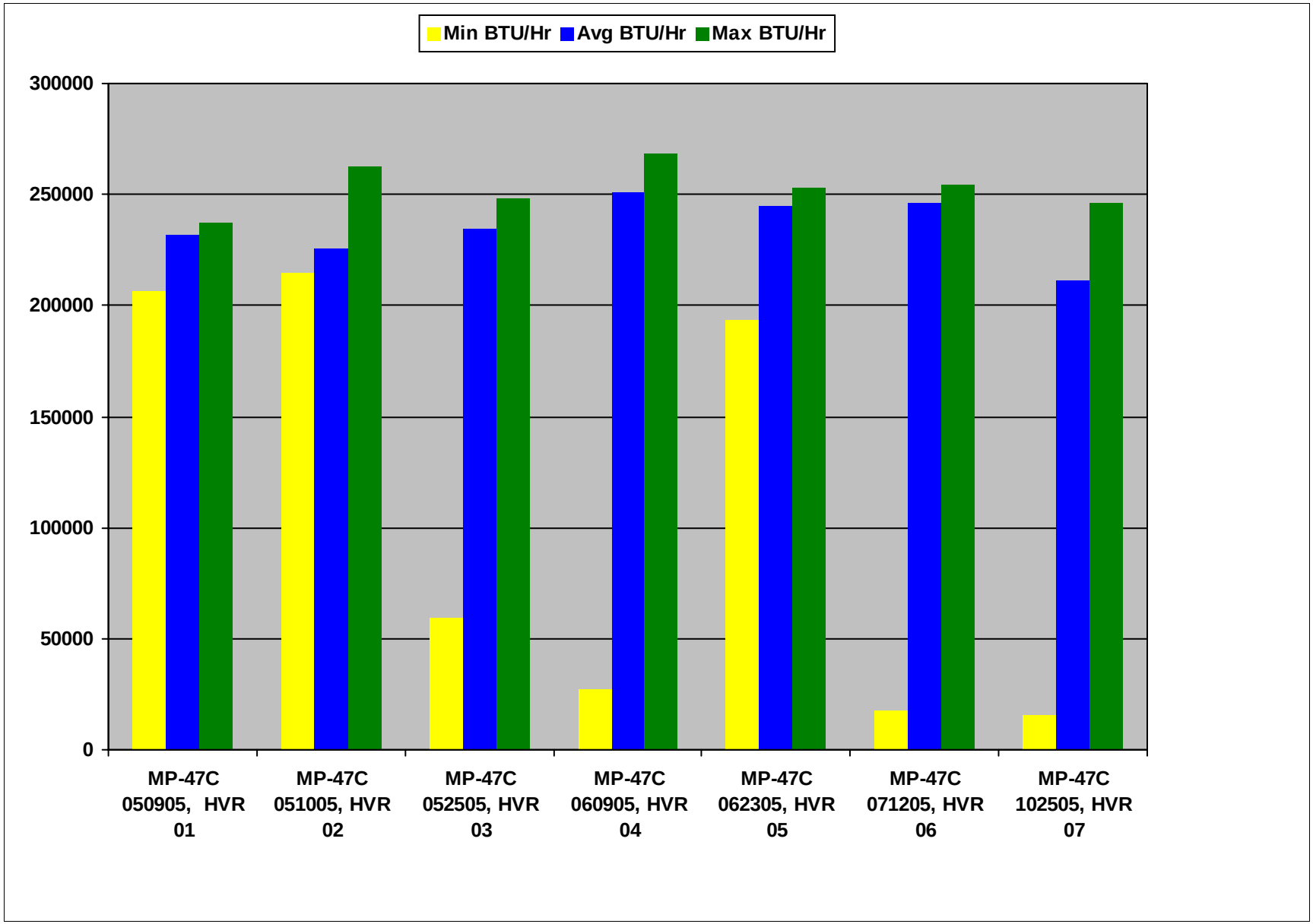


Figure 85: MP47C
Multi-Site Vacuums

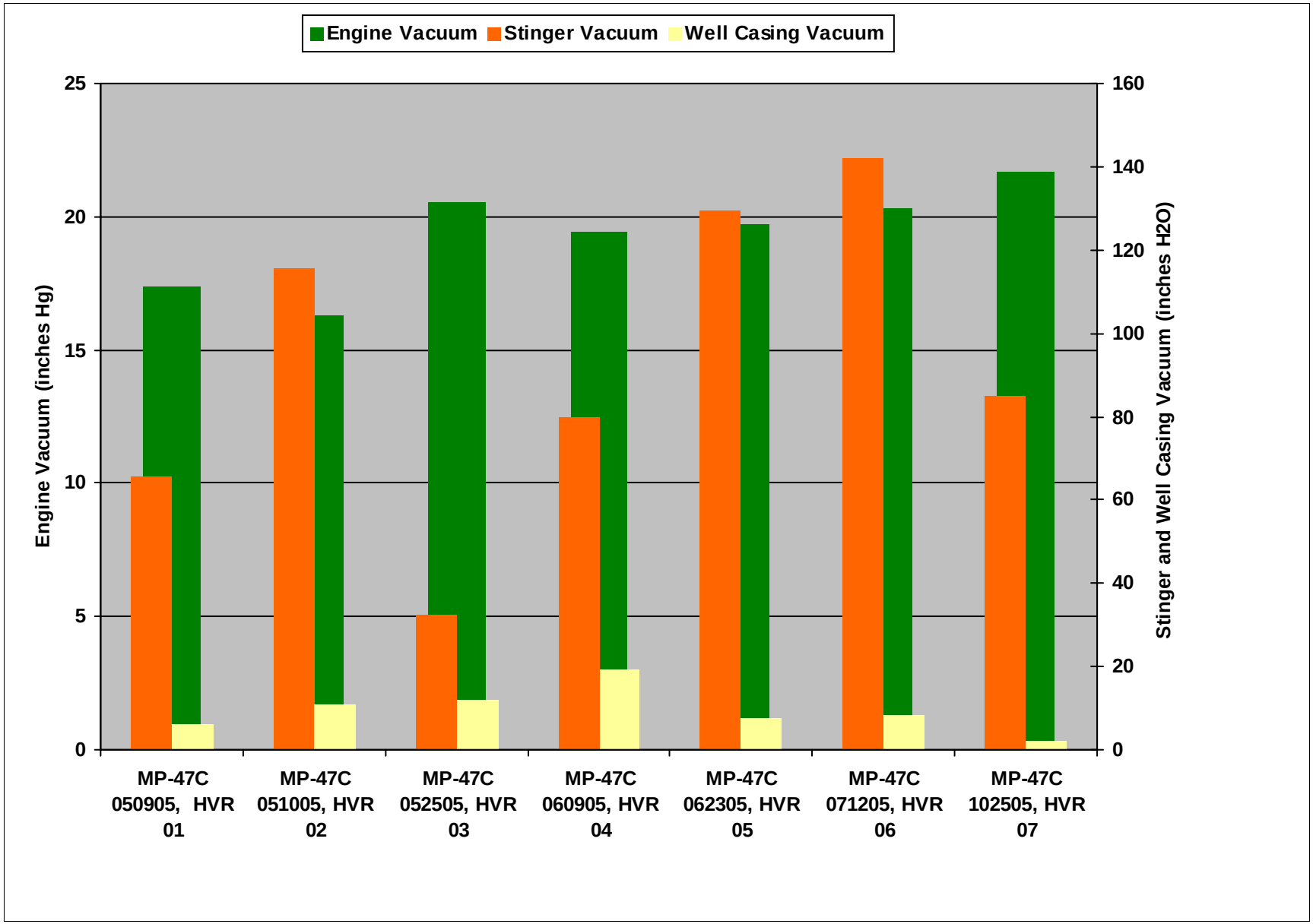


Figure 86: MP47C
Multi-Site Air, Well and Fuel Flows

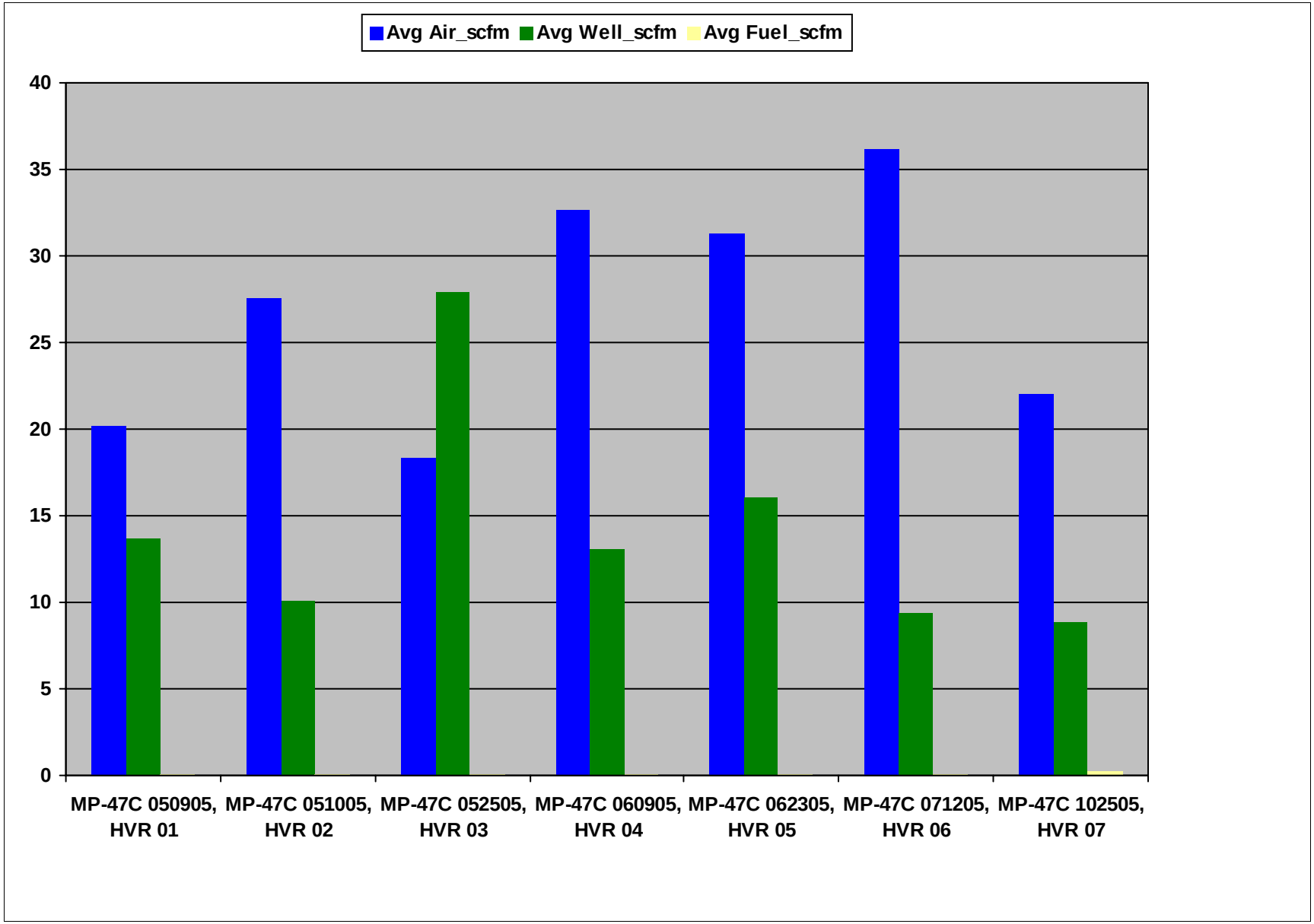


Figure 87: MP-47C Gauging, Stinger and Production Data
Hydrocarbon Recovery vs. Groundwater Recovery - with Elevations

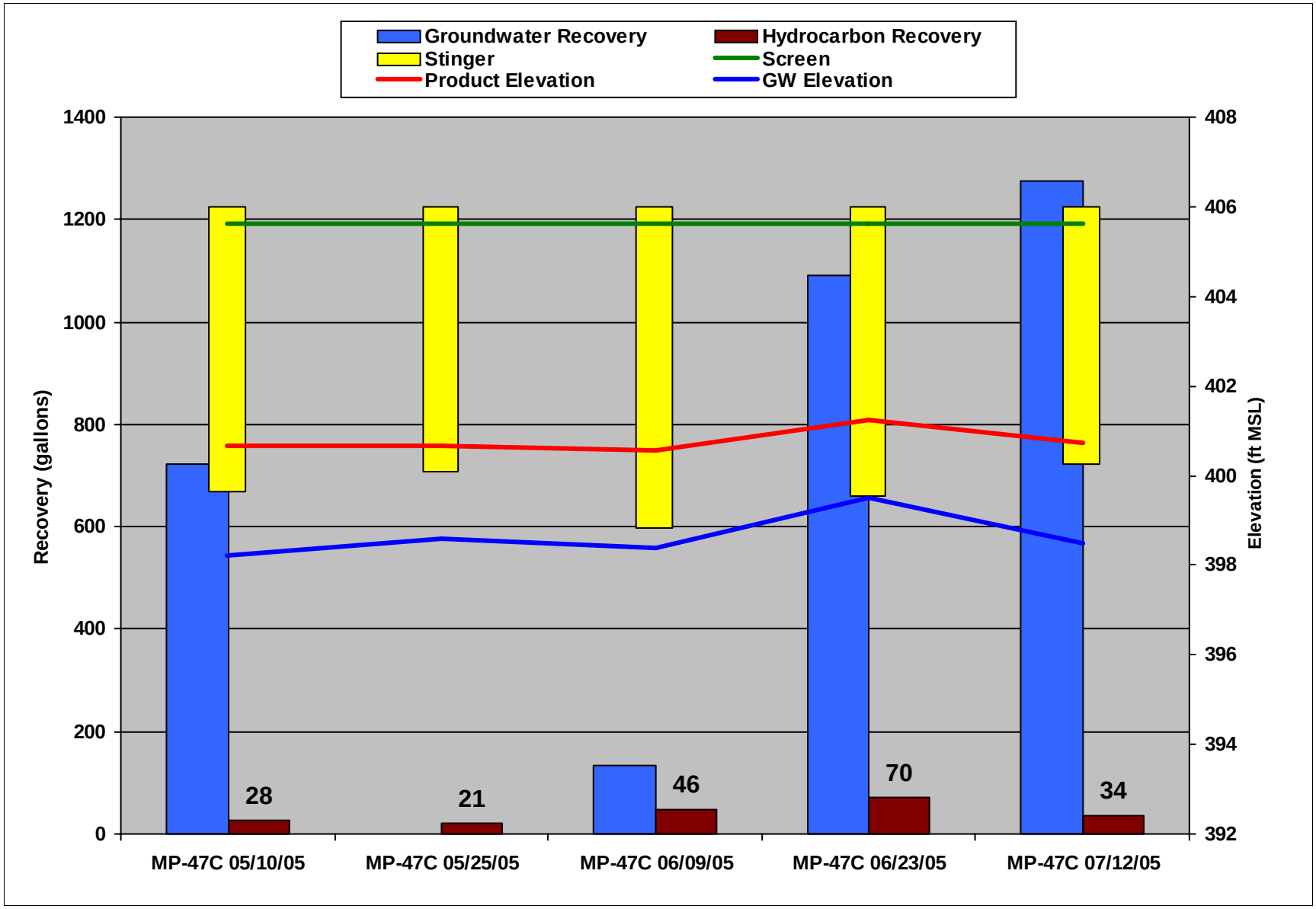


Figure 88: MP47C
Hydrocarbon Recovery vs. Groundwater Recovery - with Vacuums

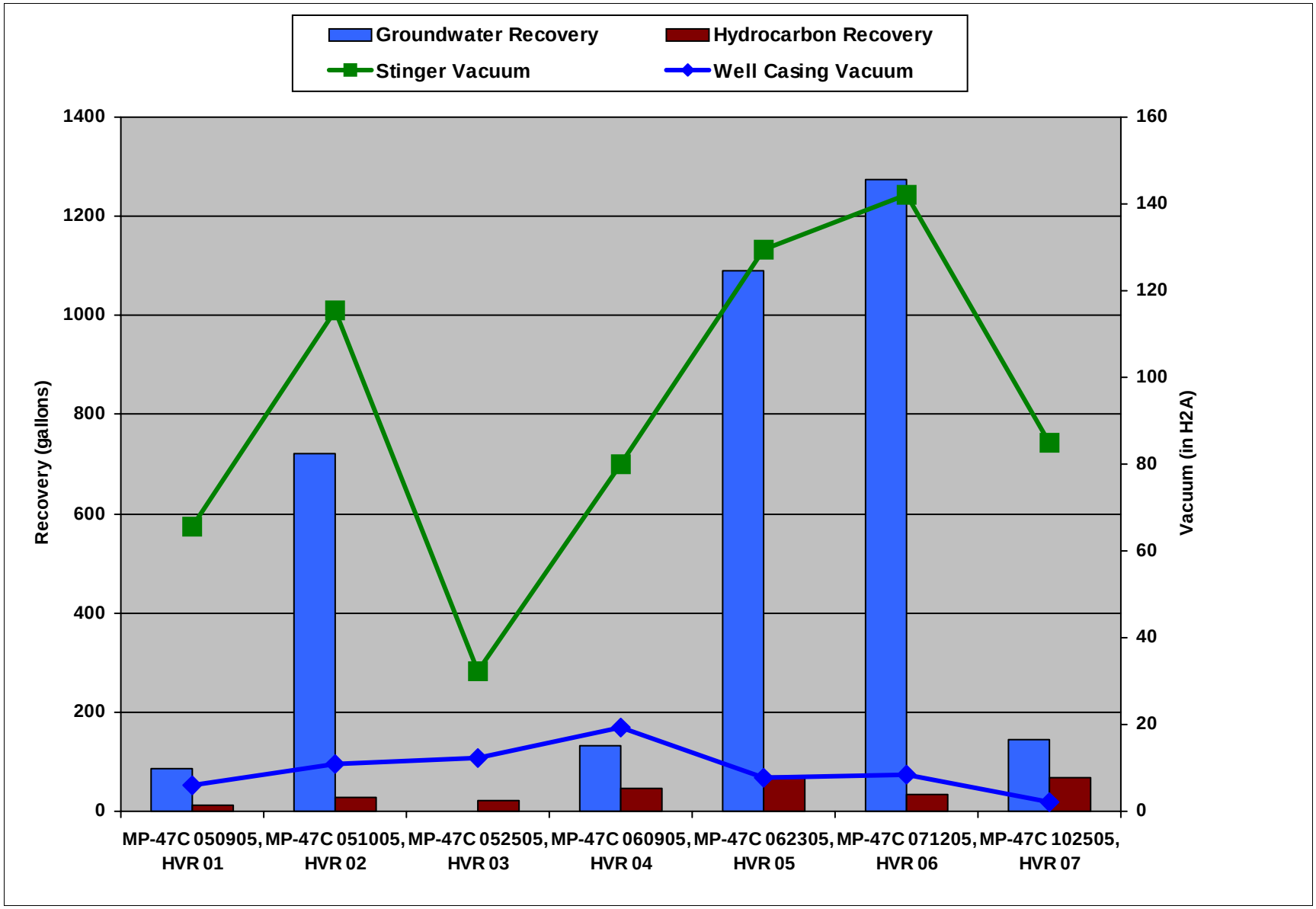


Figure 89: MP47C
Hydrocarbon Recovery vs. Groundwater Recovery - with Percentages

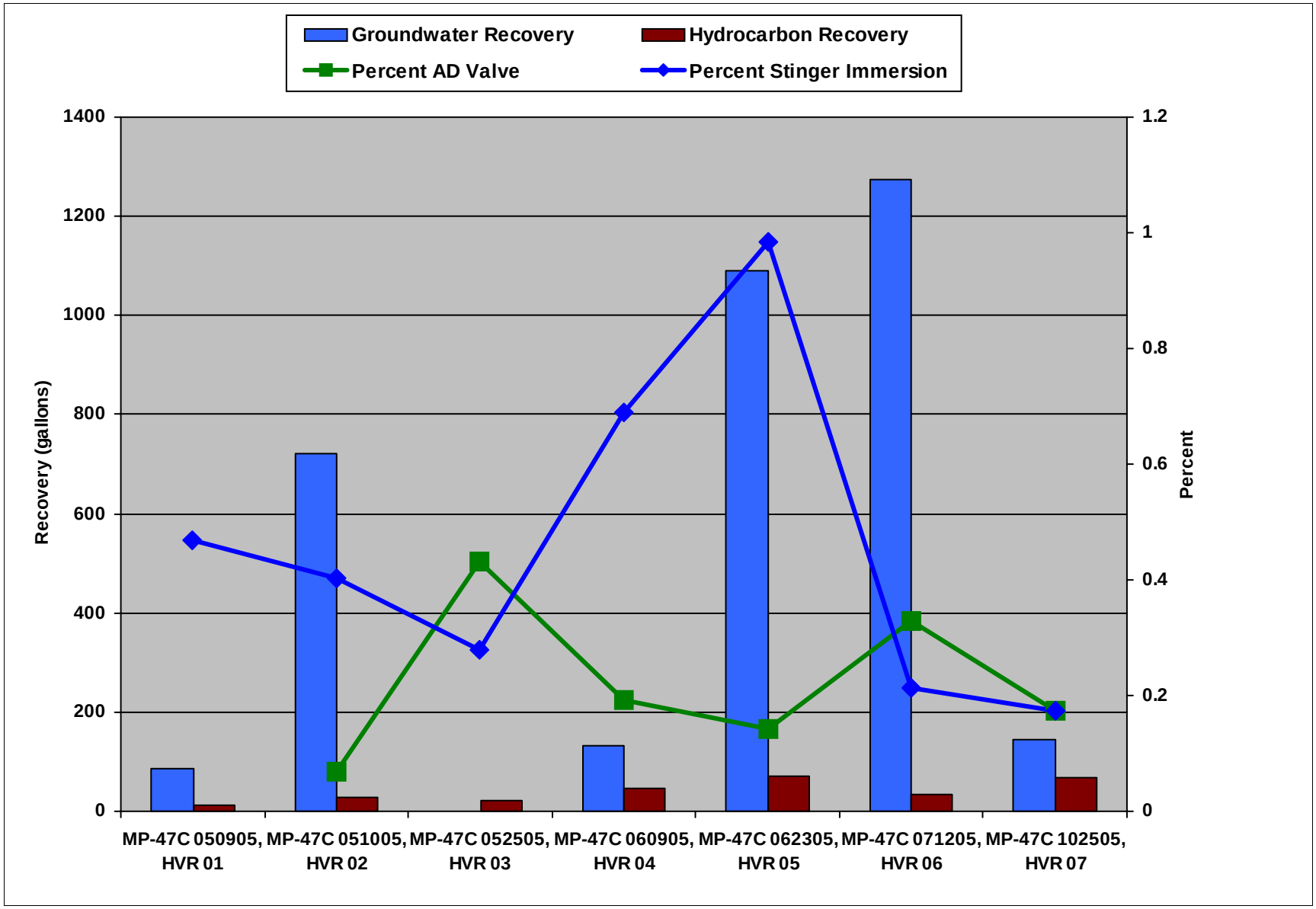


Figure 90: MP-47C
HiVac Event Recharge as a Percentage of Original Product Thickness

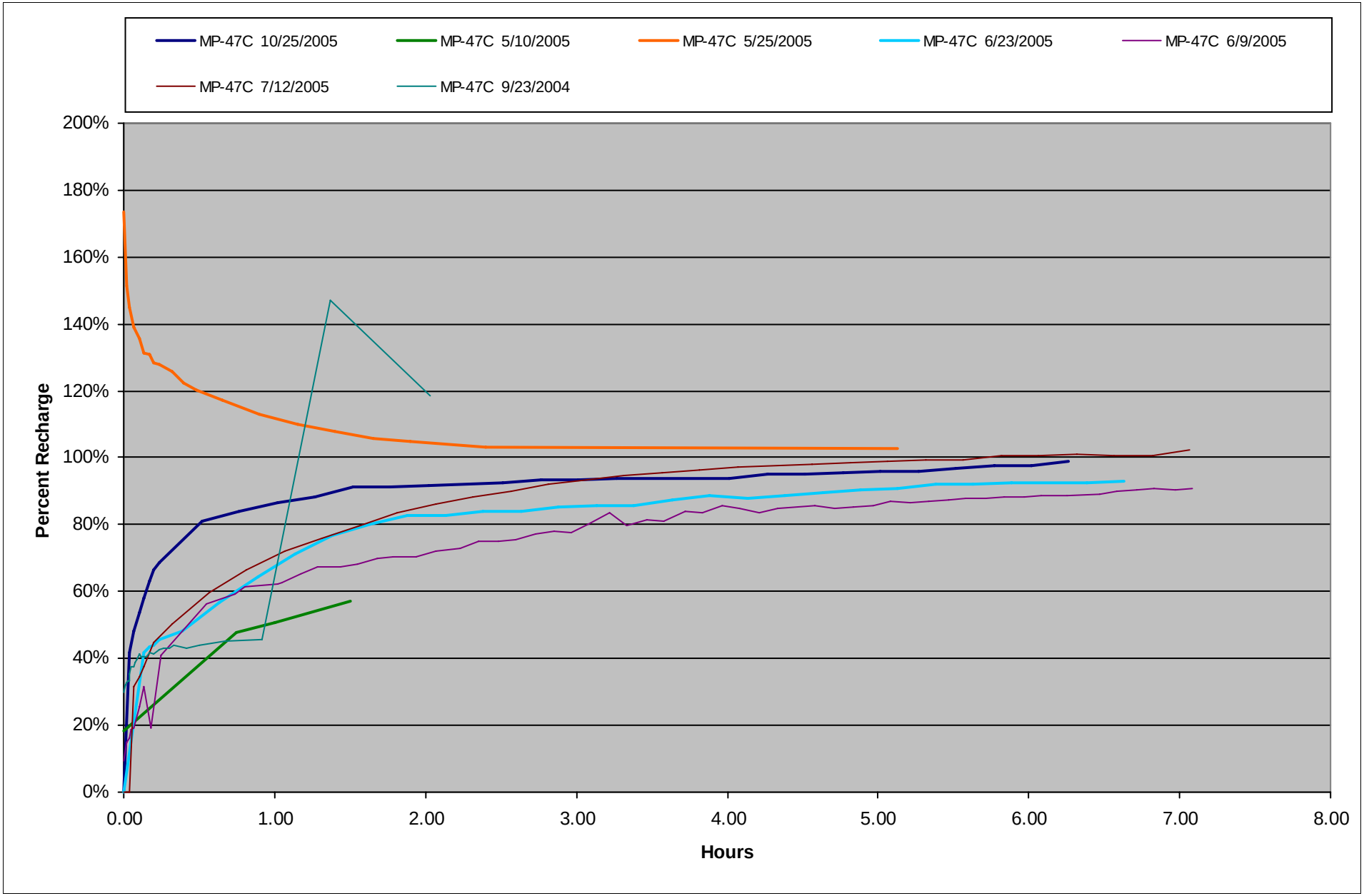


Figure 91: MP-47C
HiVac Event Recharge as Product Thickness in Feet

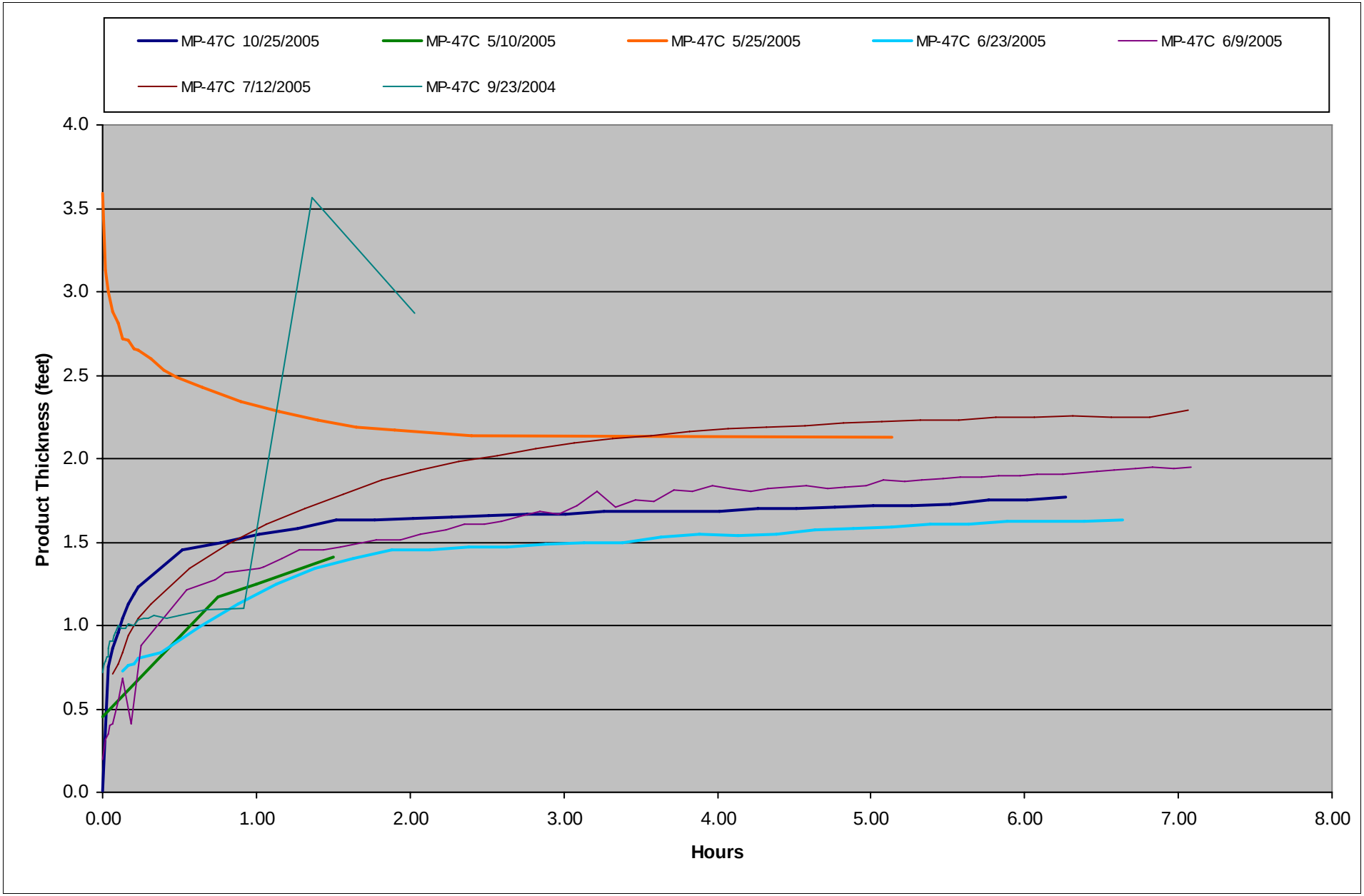
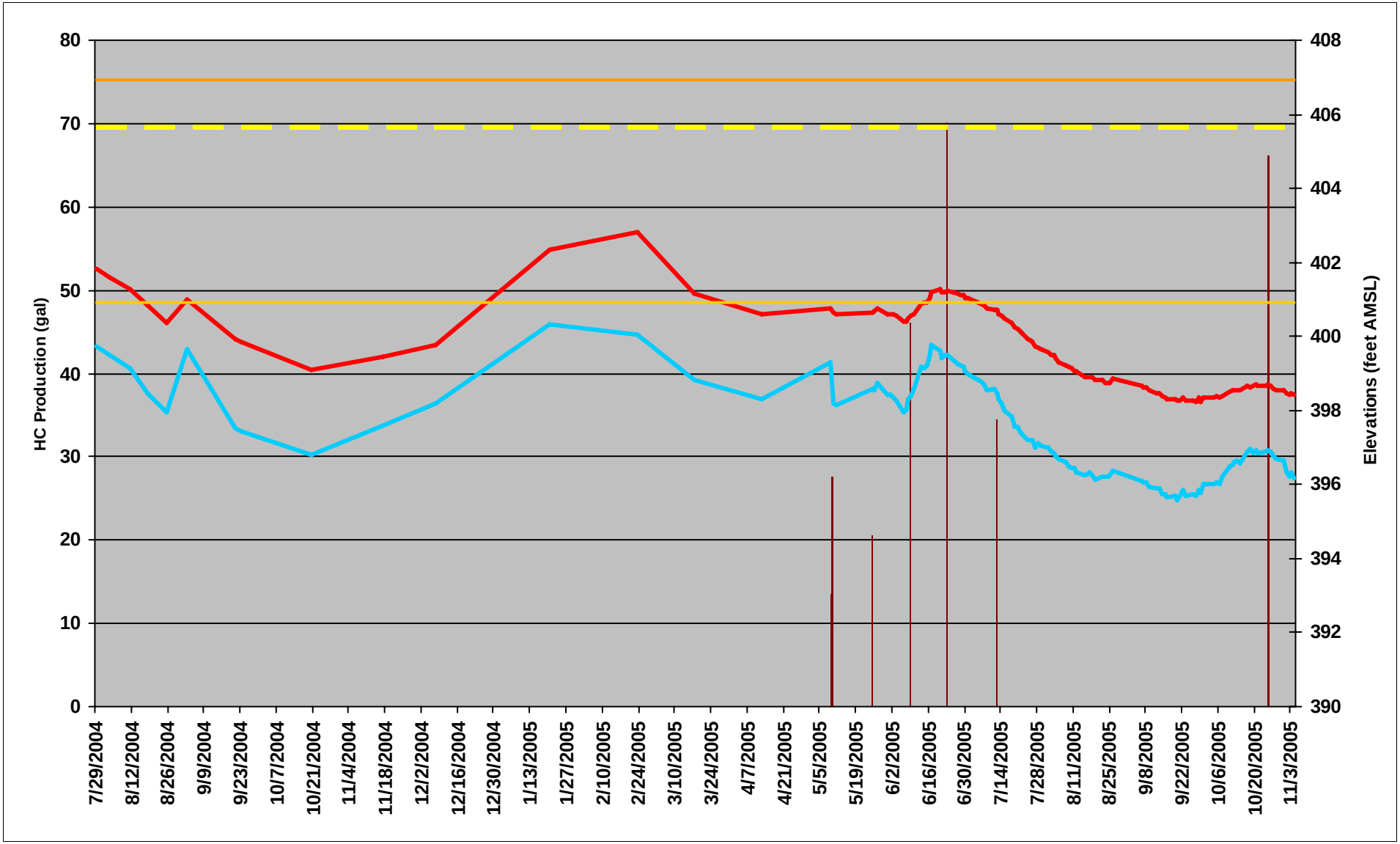


Figure 92: Production Hydrostratigraph

MP-47C

Time Scale



Hartford, Il.

Figure 93: MP-47C
Depth to Top of LNAPL vs. LNAPL Thickness 2004-2005

The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
H_2A Environmental, Ltd.

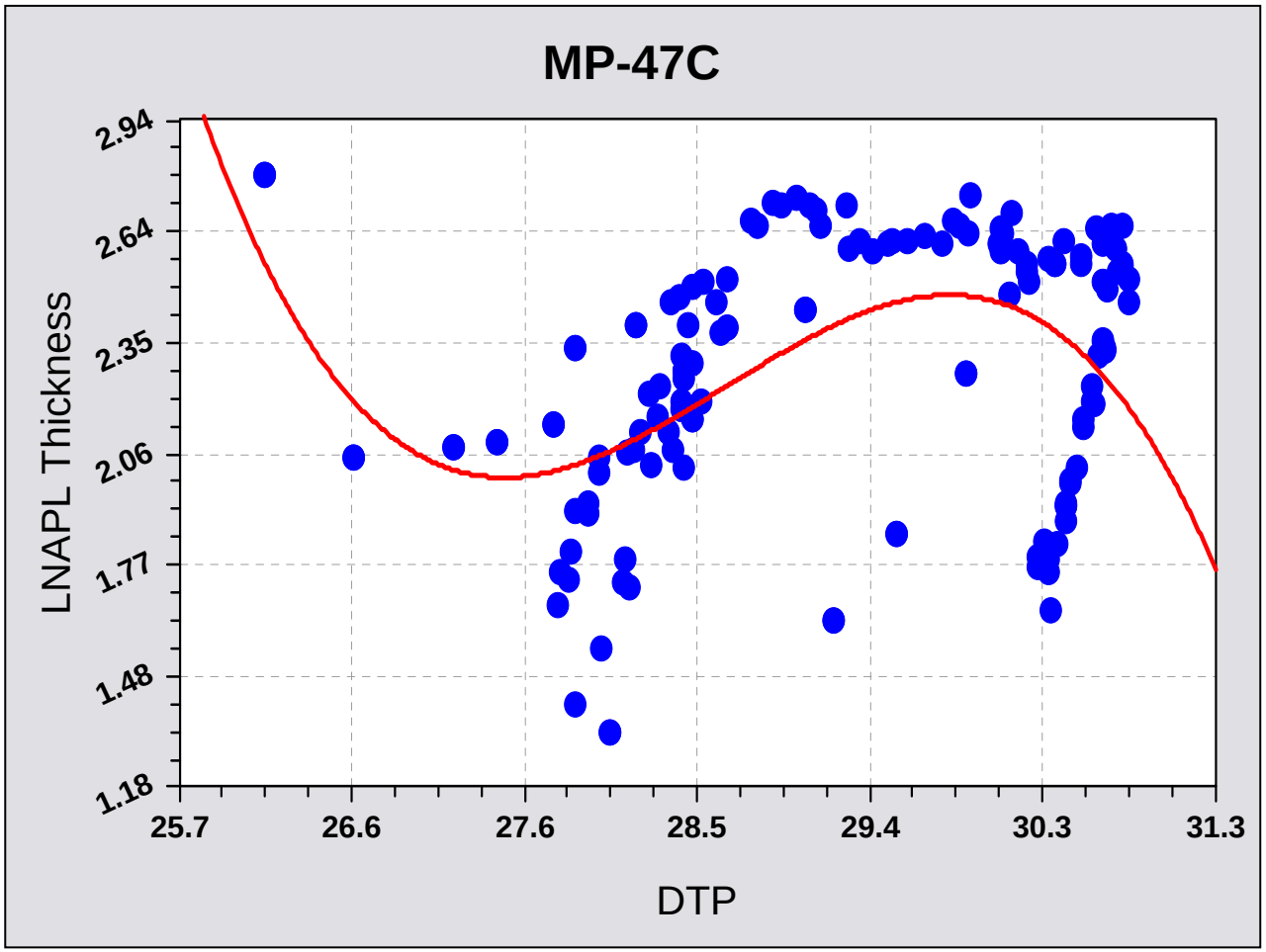


Figure 94: MP-49C
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

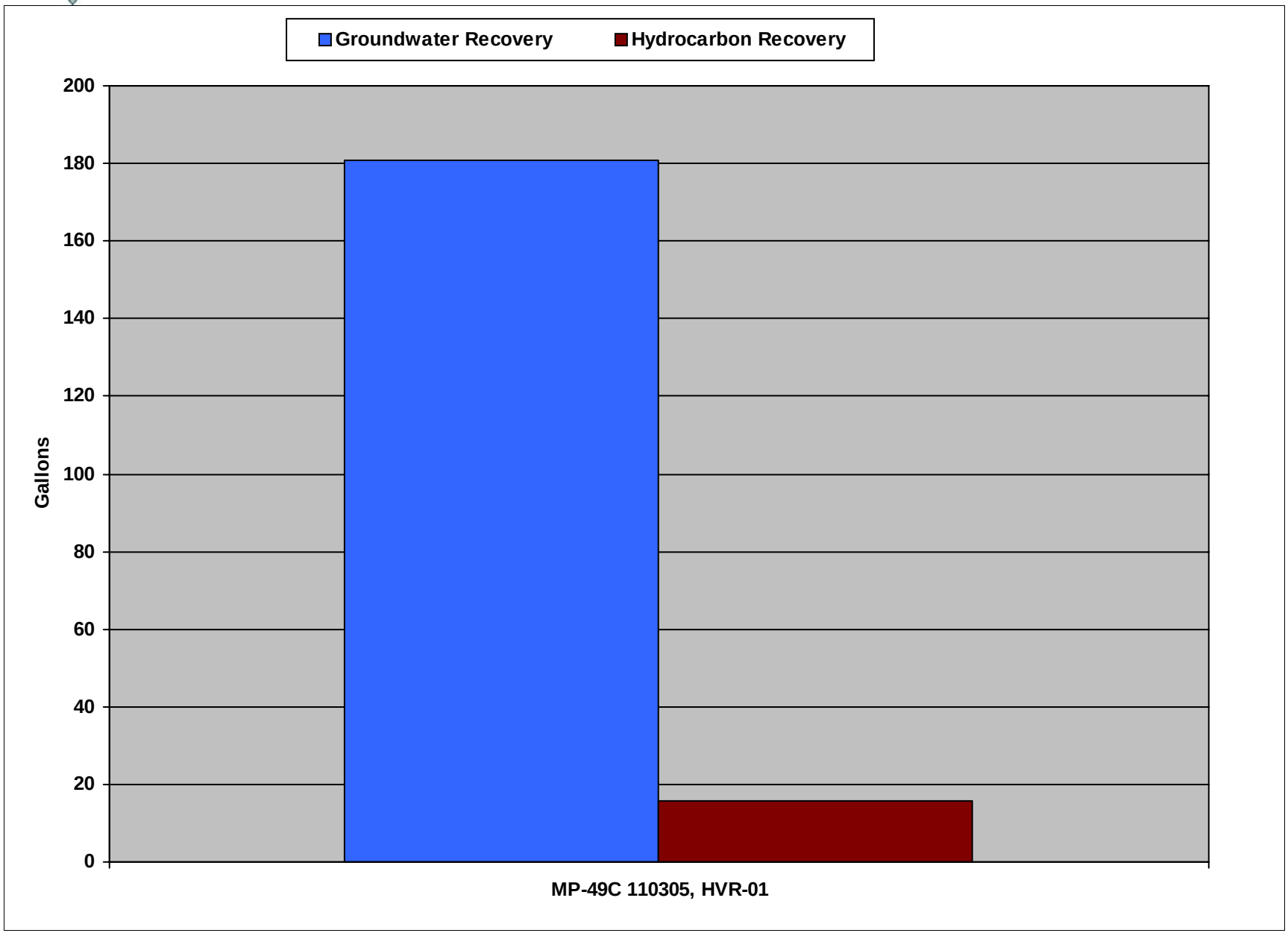


Figure 95: MP-49C
Multi-Site Hydrocarbon Recovery Rate (Gal/Hr) - Grouped by Site

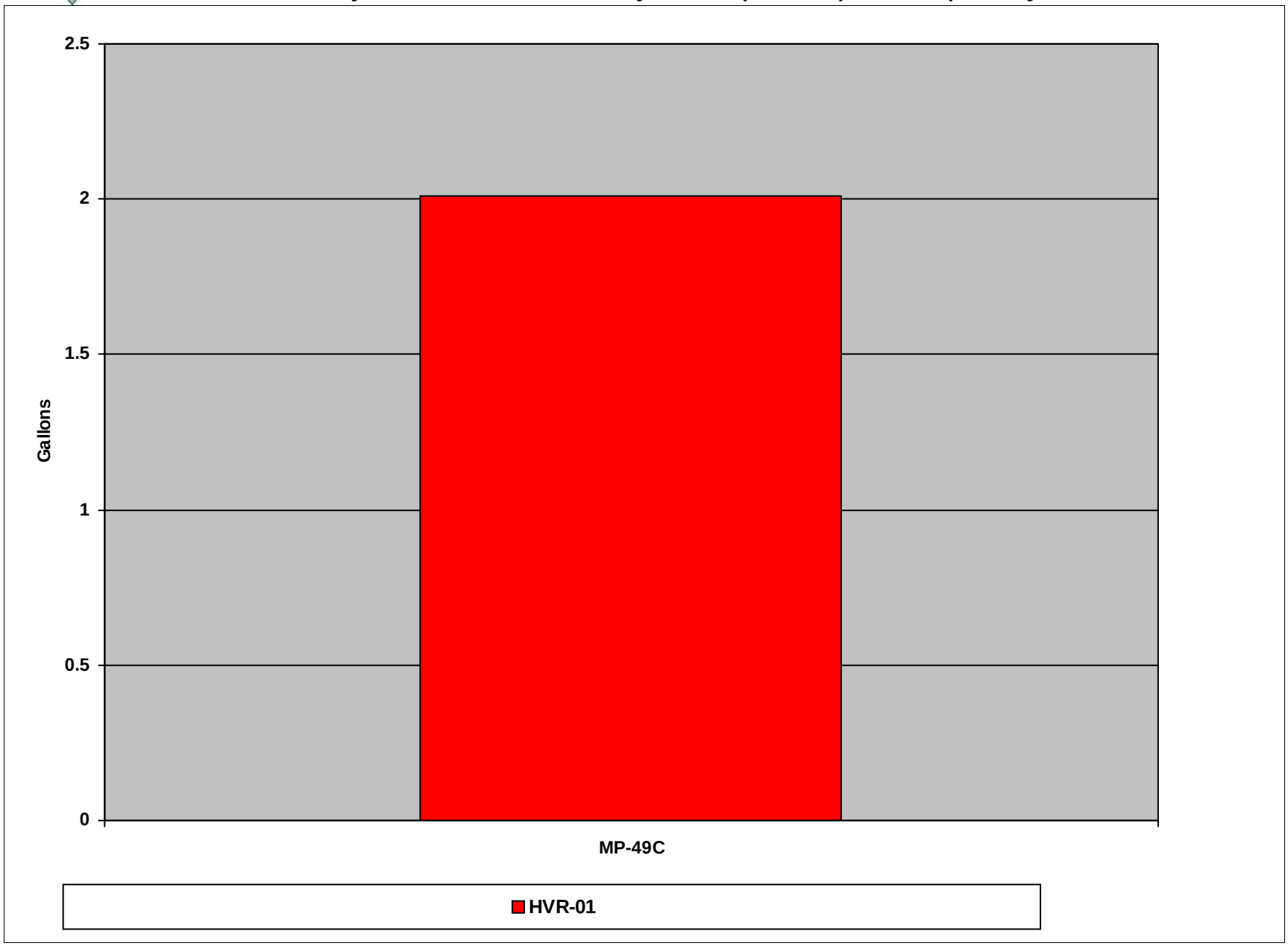


Figure 96: MP-49C
Hydrocarbon Recovery vs. Groundwater Recovery - with Vacuums

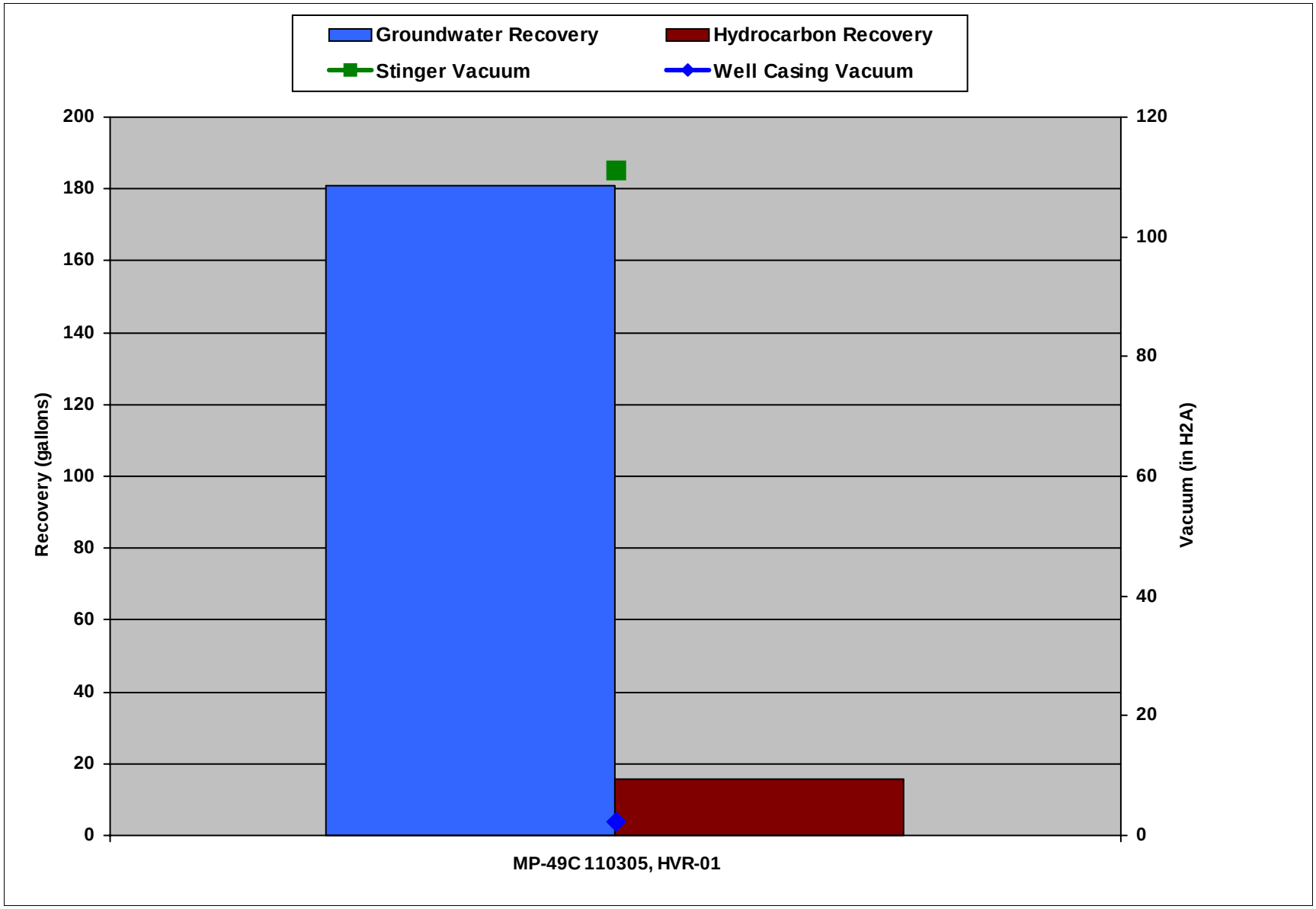


Figure 97: MP-49C
Hydrocarbon Recovery vs. Groundwater Recovery - with Percentages

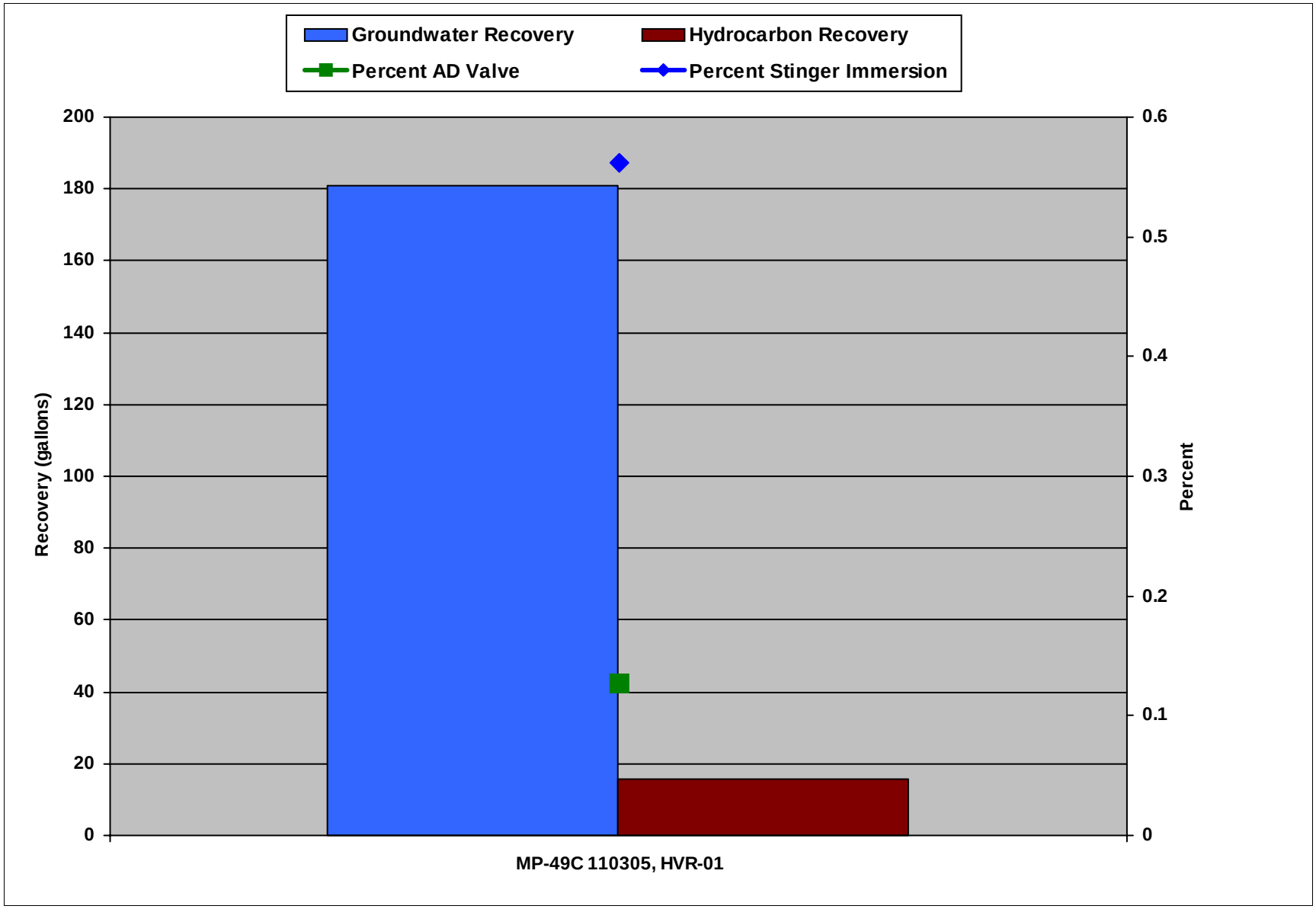


Figure 98: MP - 49C
HiVac Event Recharge as a Percentage of Original Product Thickness

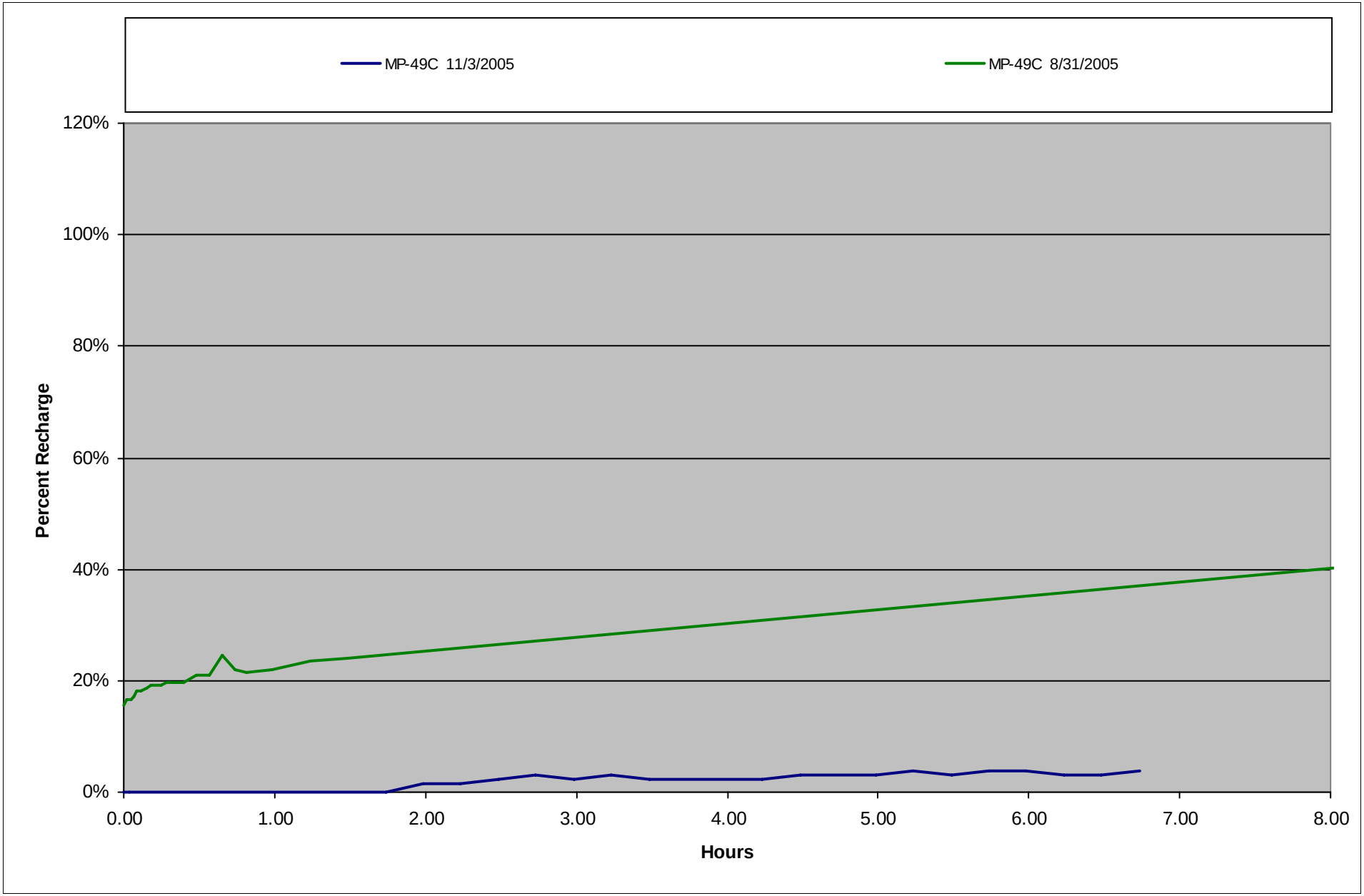


Figure 99: MP - 49C
HiVac Event Recharge as Product Thickness in Feet

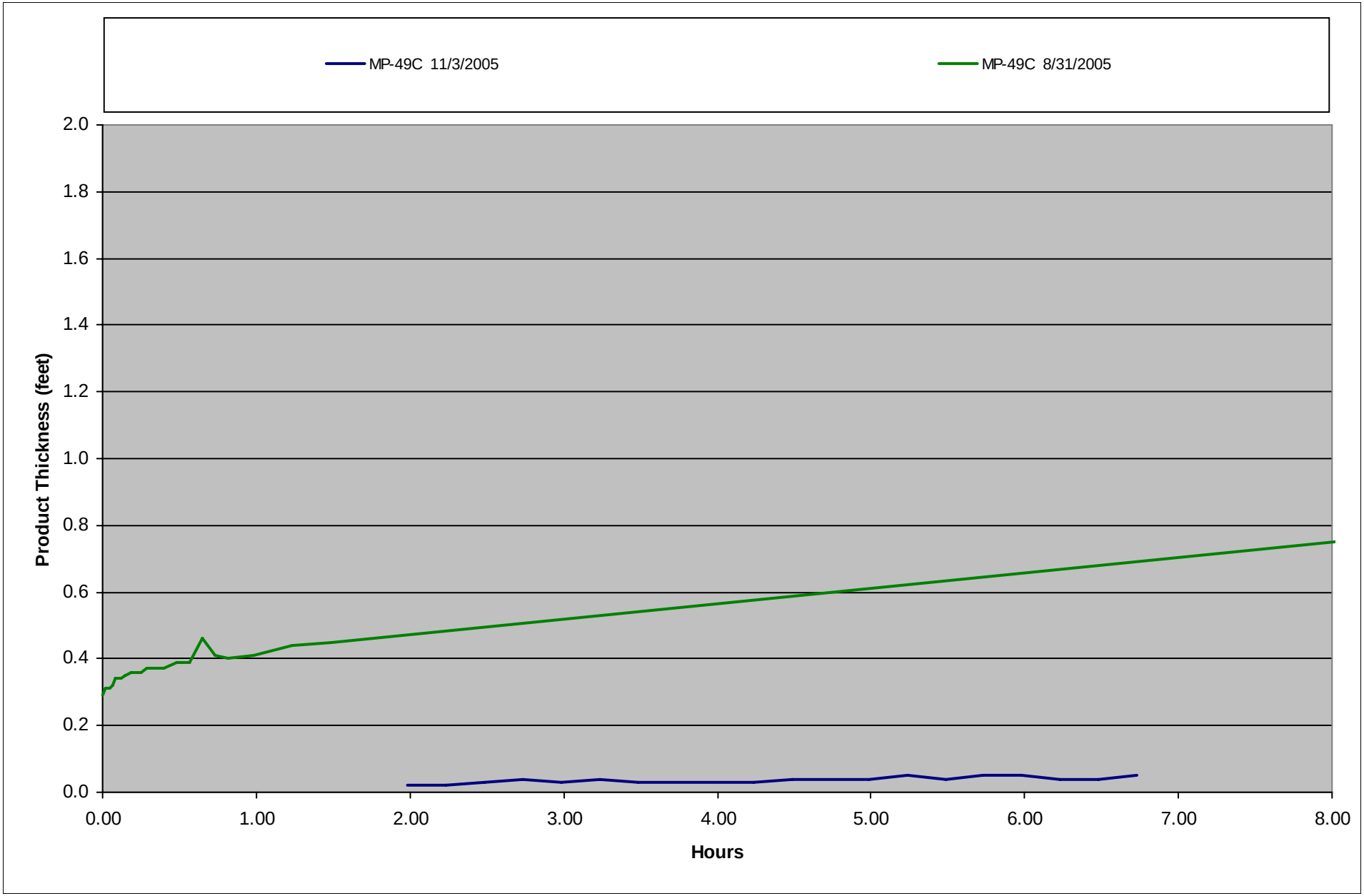


Figure 100: MP-49C
Depth to Top of LNAPL vs. LNAPL Thickness 2004-2005

The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
H_2A Environmental, Ltd.

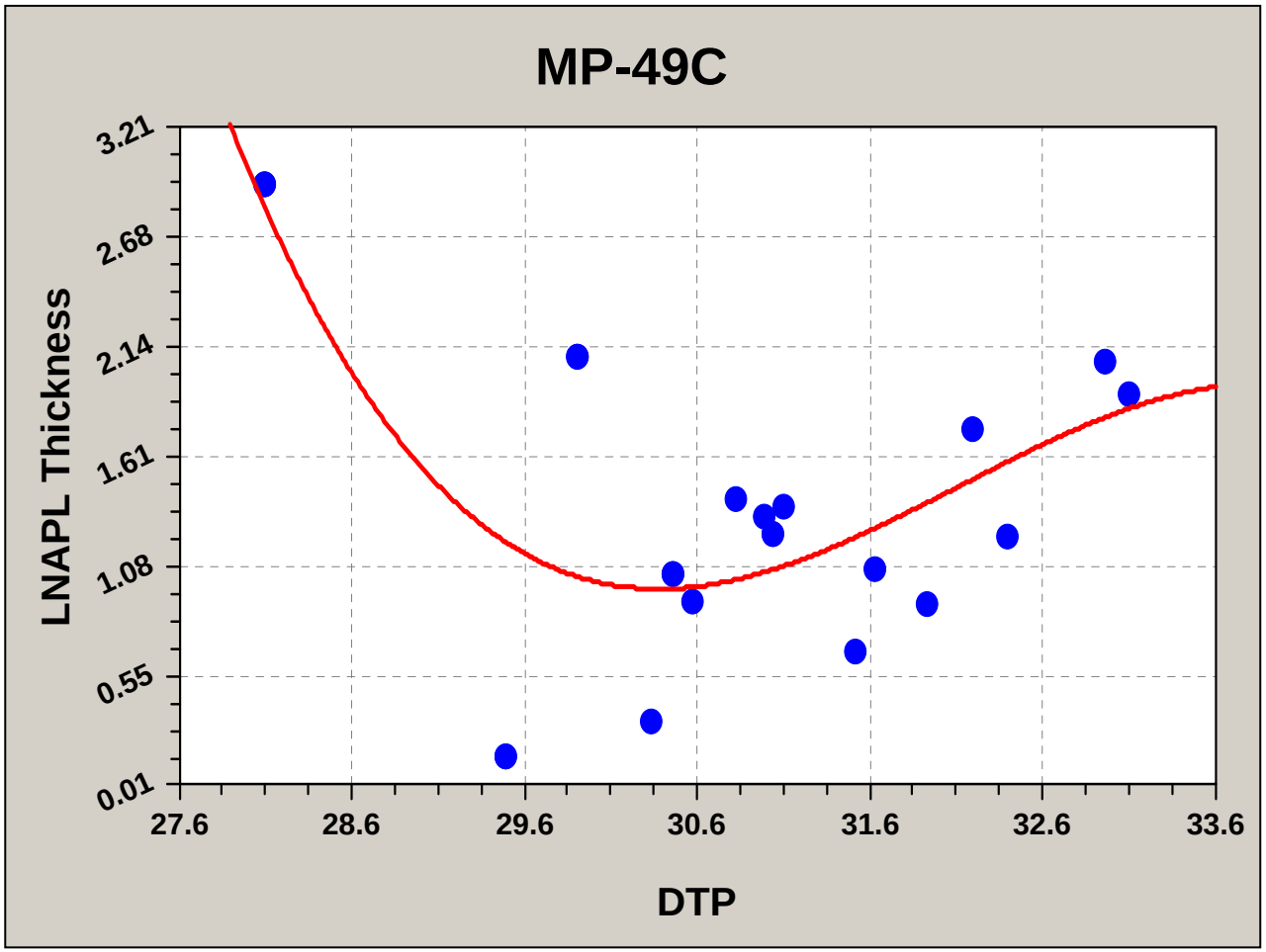


Figure 101: MP-50C
Multi-Site Cumulative Product Recovery (Gallons)

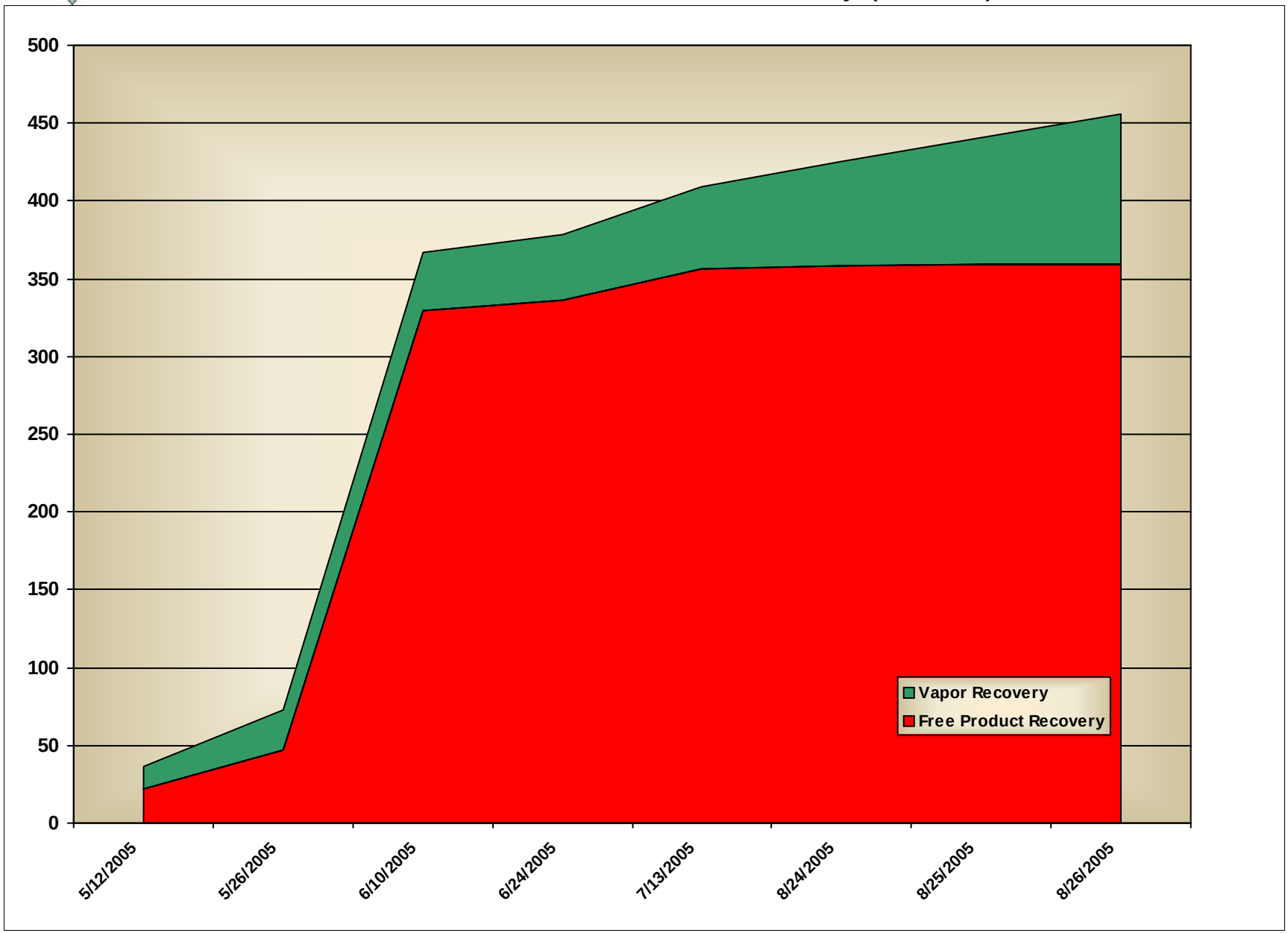


Figure 102: MP-50C
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

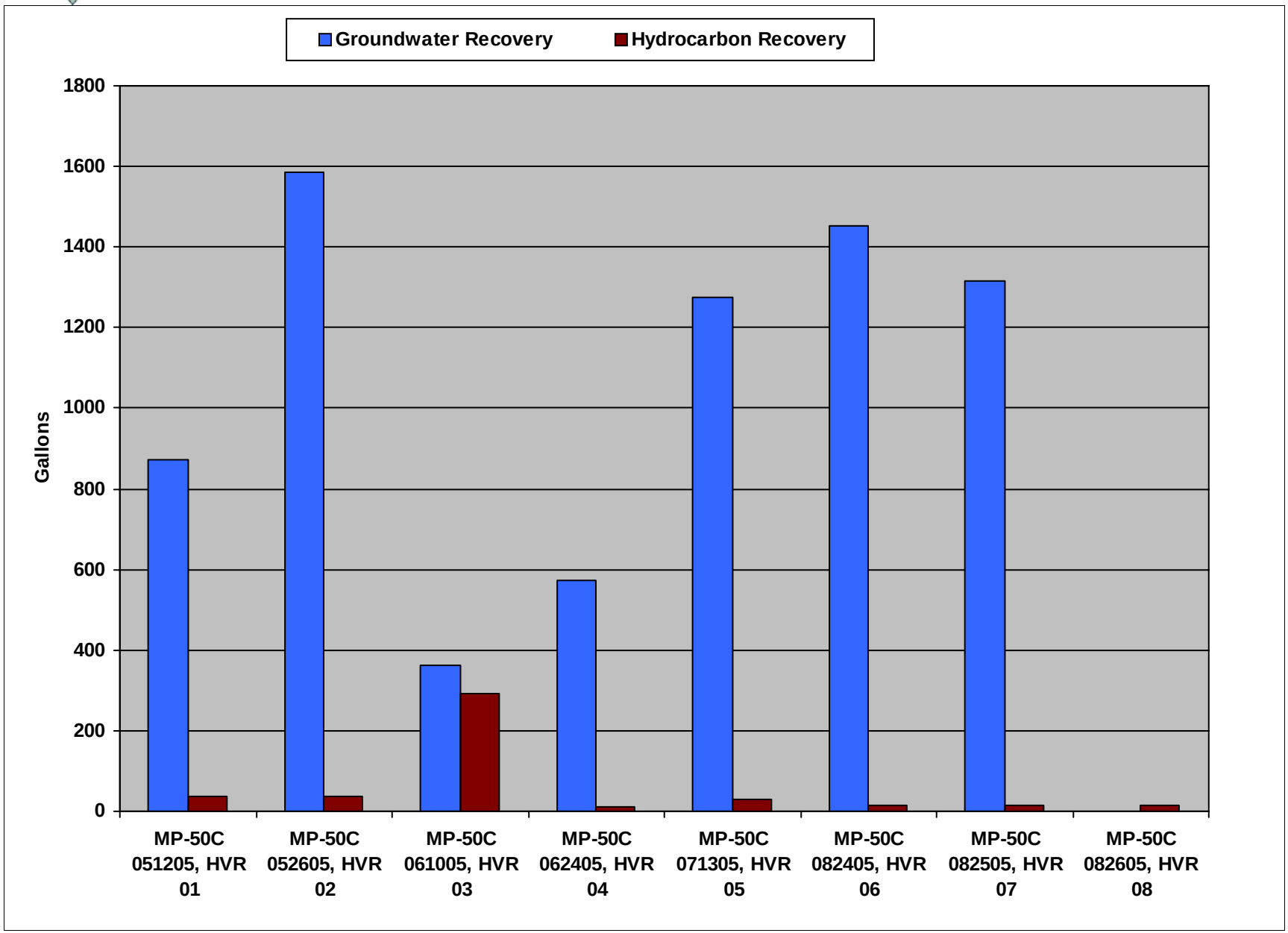


Figure 103: MP-50C
Multi-Site Hydrocarbon Recovery Rate (Gal/Hr) - Grouped by Site

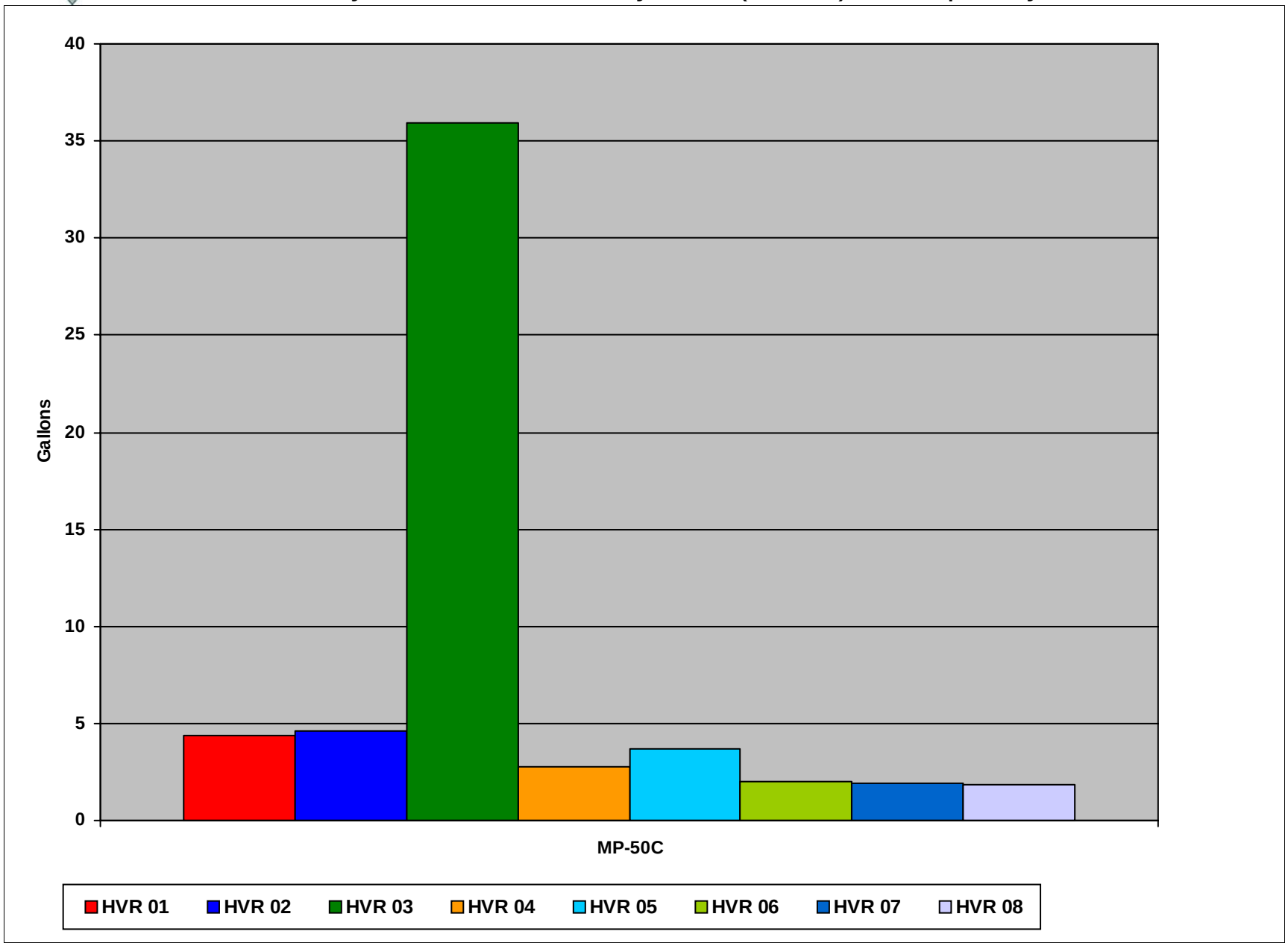


Figure 104: MP-50C
Multi-Site LB per Hour - ICE Calculated vs. Lab Sample

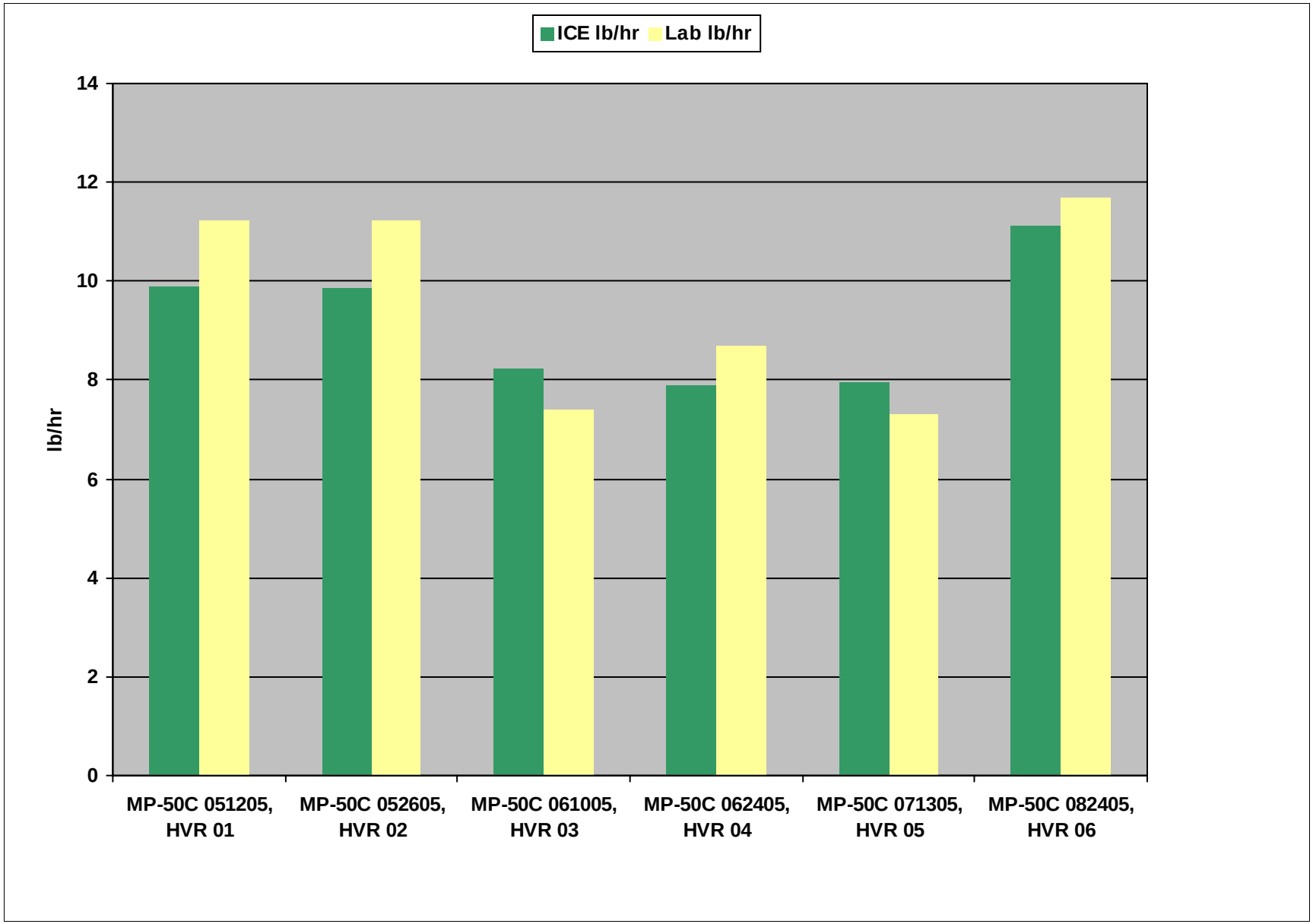


Figure 105: MP-50C
BTU per Hour

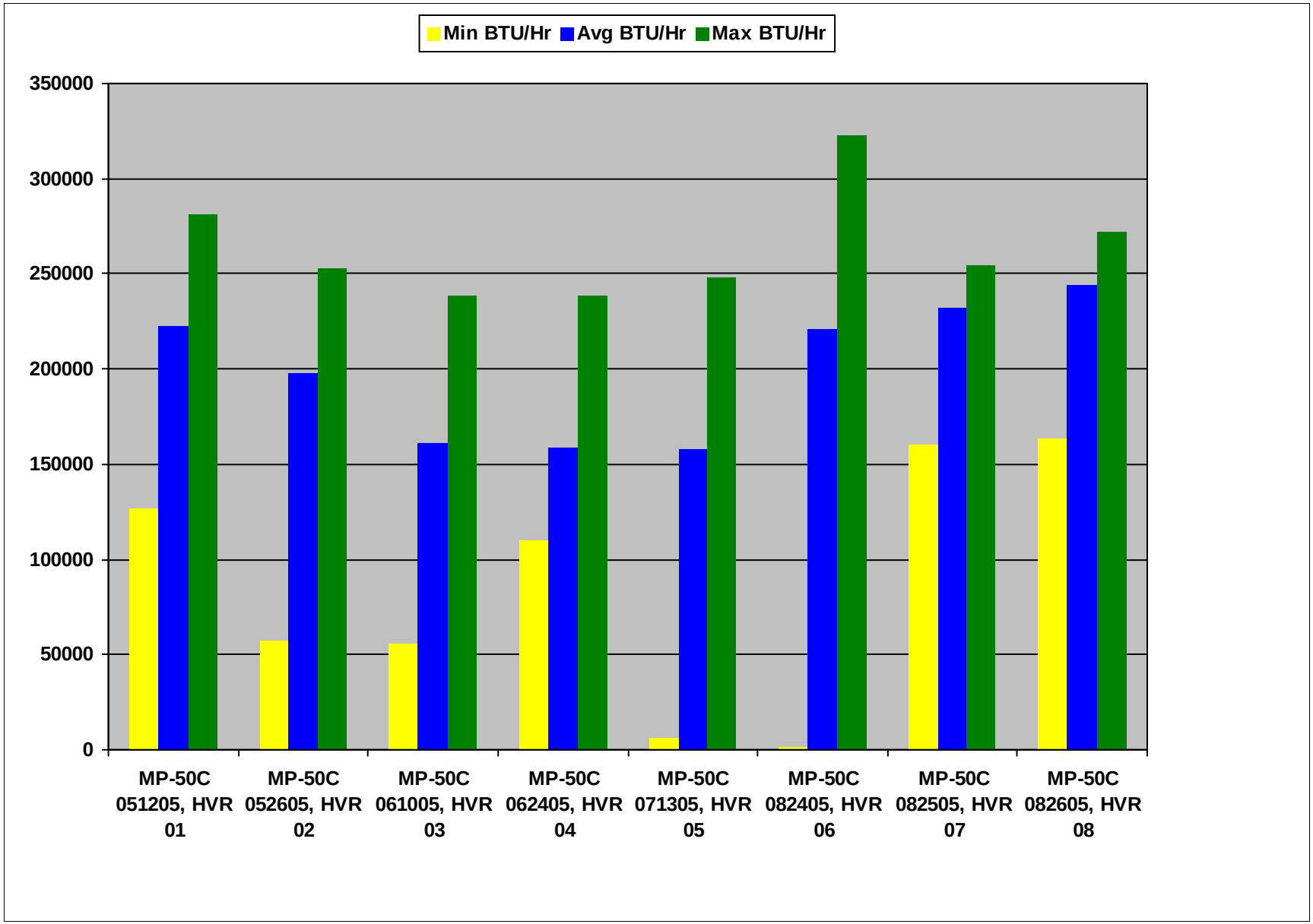


Figure 106: MP-50C
Multi-Site Vacuums

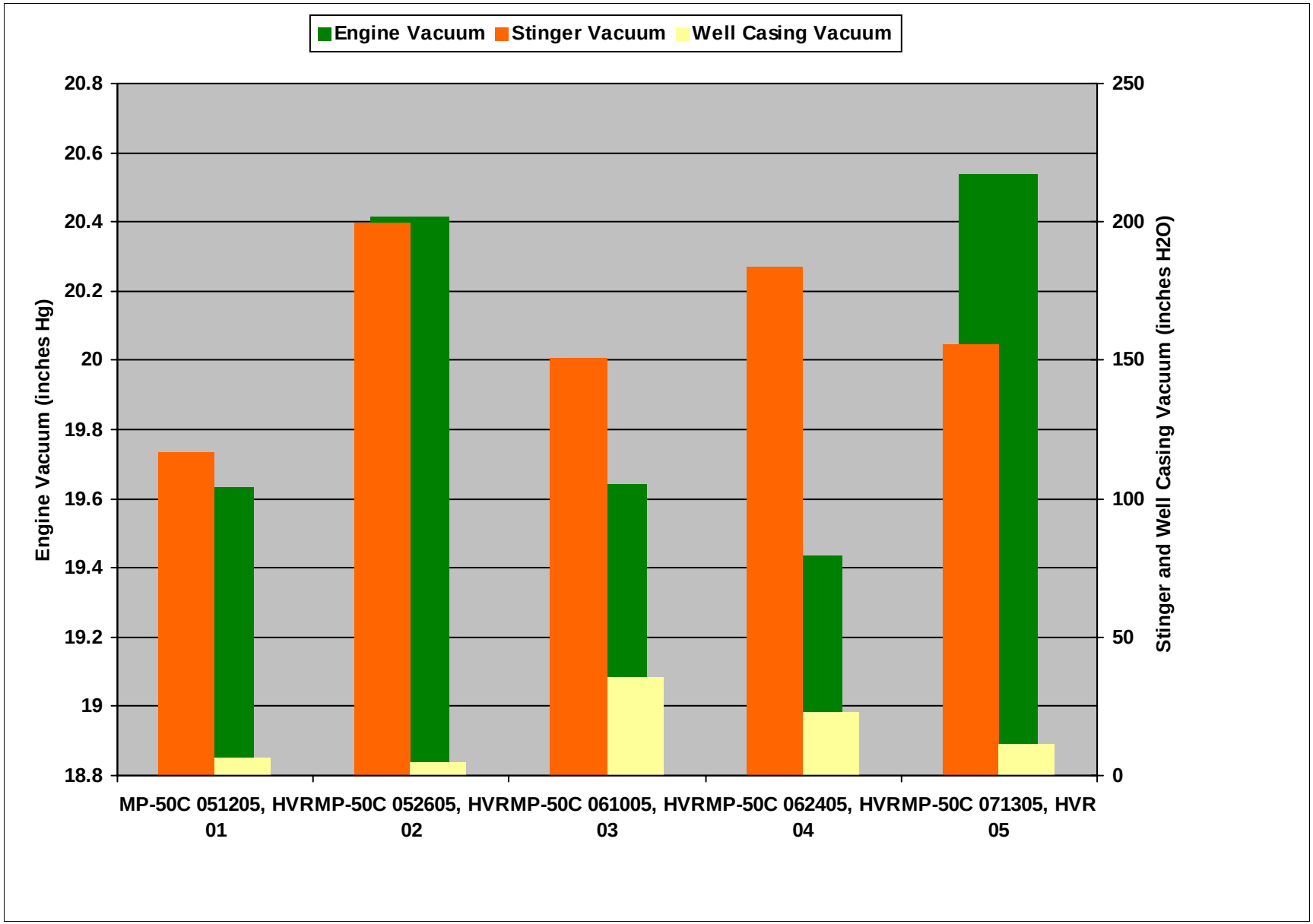


Figure 107: MP-50C
Multi-Site Air, Well and Fuel Flows

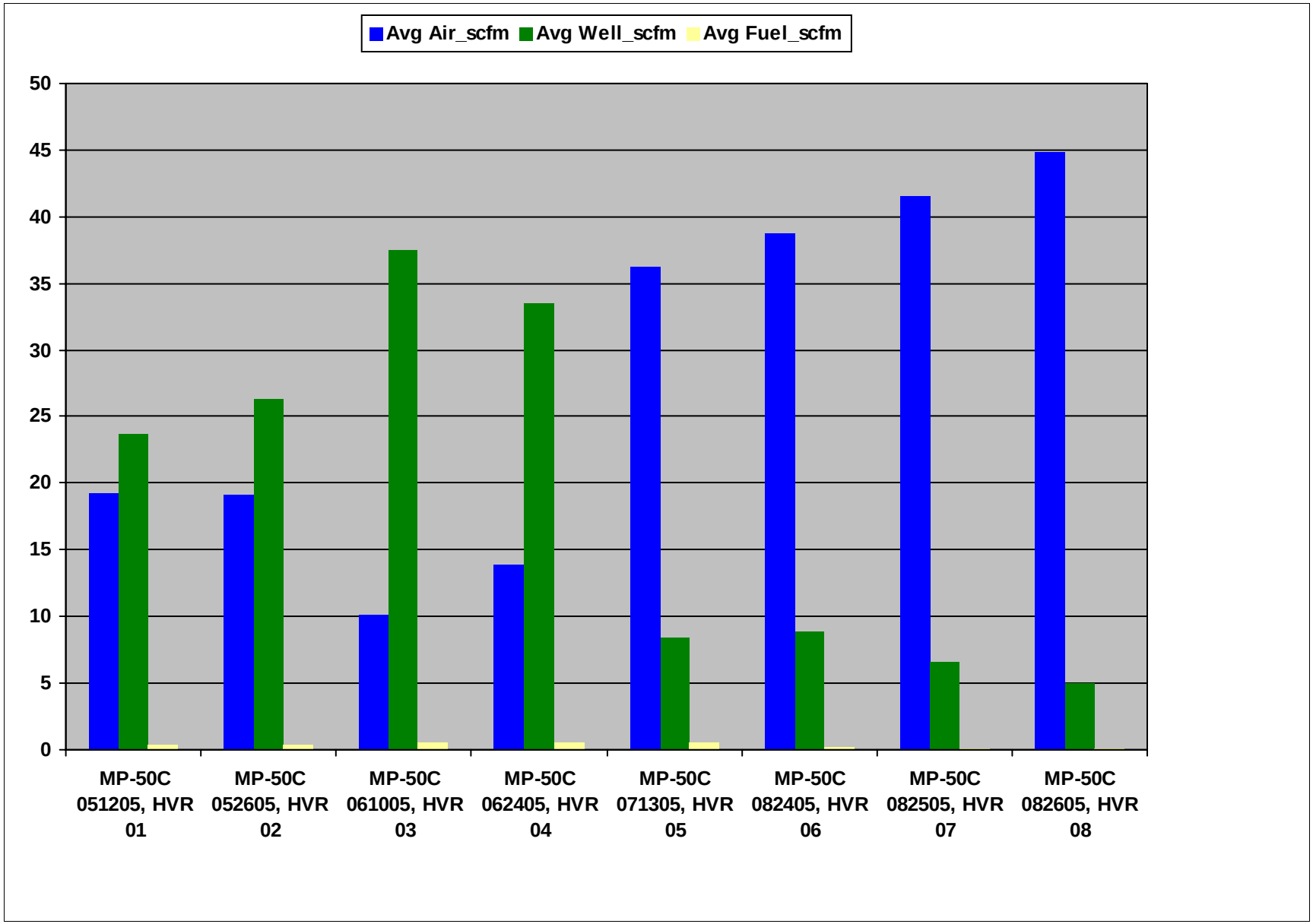


Figure 108: MP-50C Gauging, Stinger and Production Data
Hydrocarbon Recovery vs. Groundwater Recovery - with Elevations

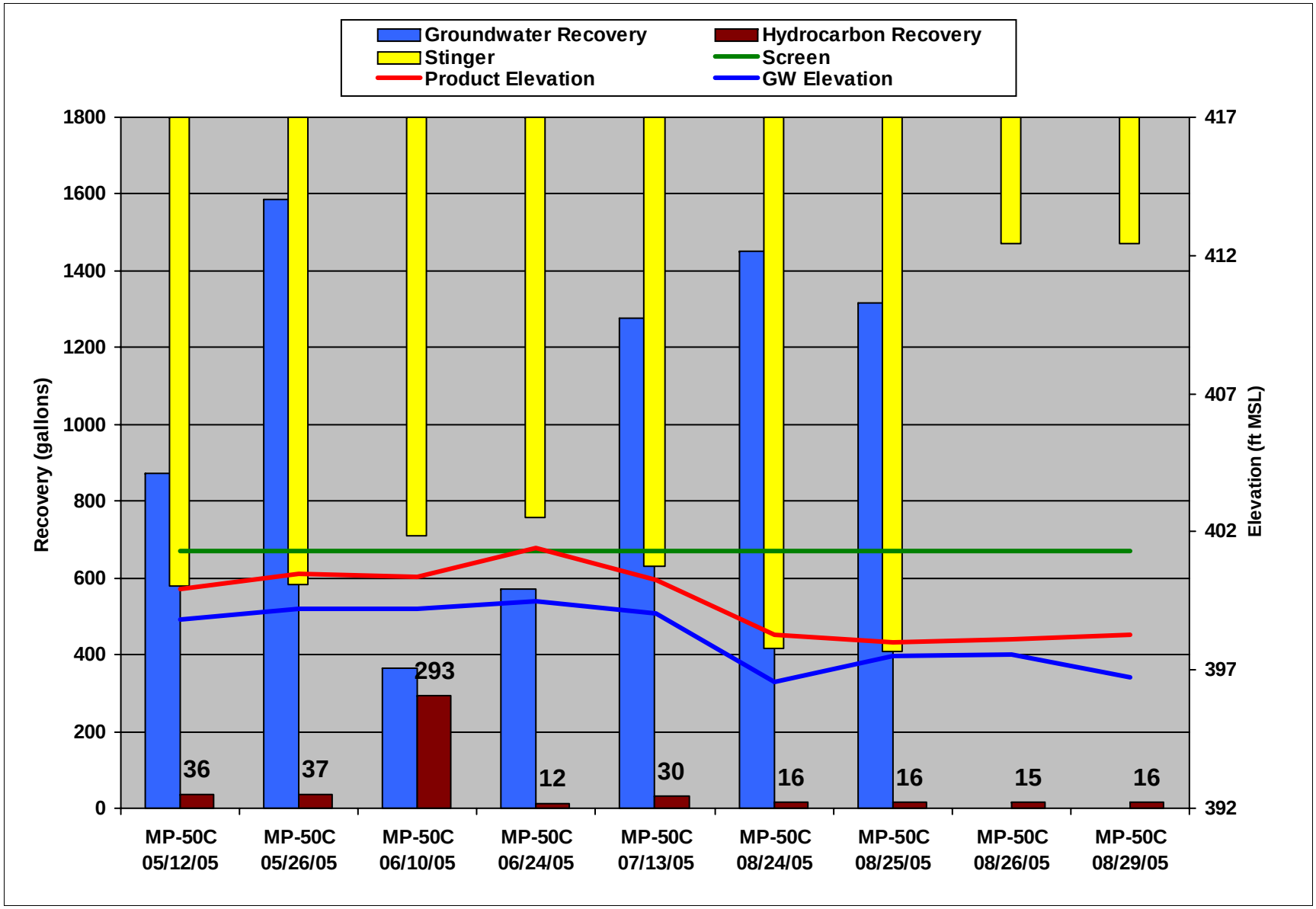


Figure 109: MP-50C
Hydrocarbon Recovery vs. Groundwater Recovery - with Vacuums

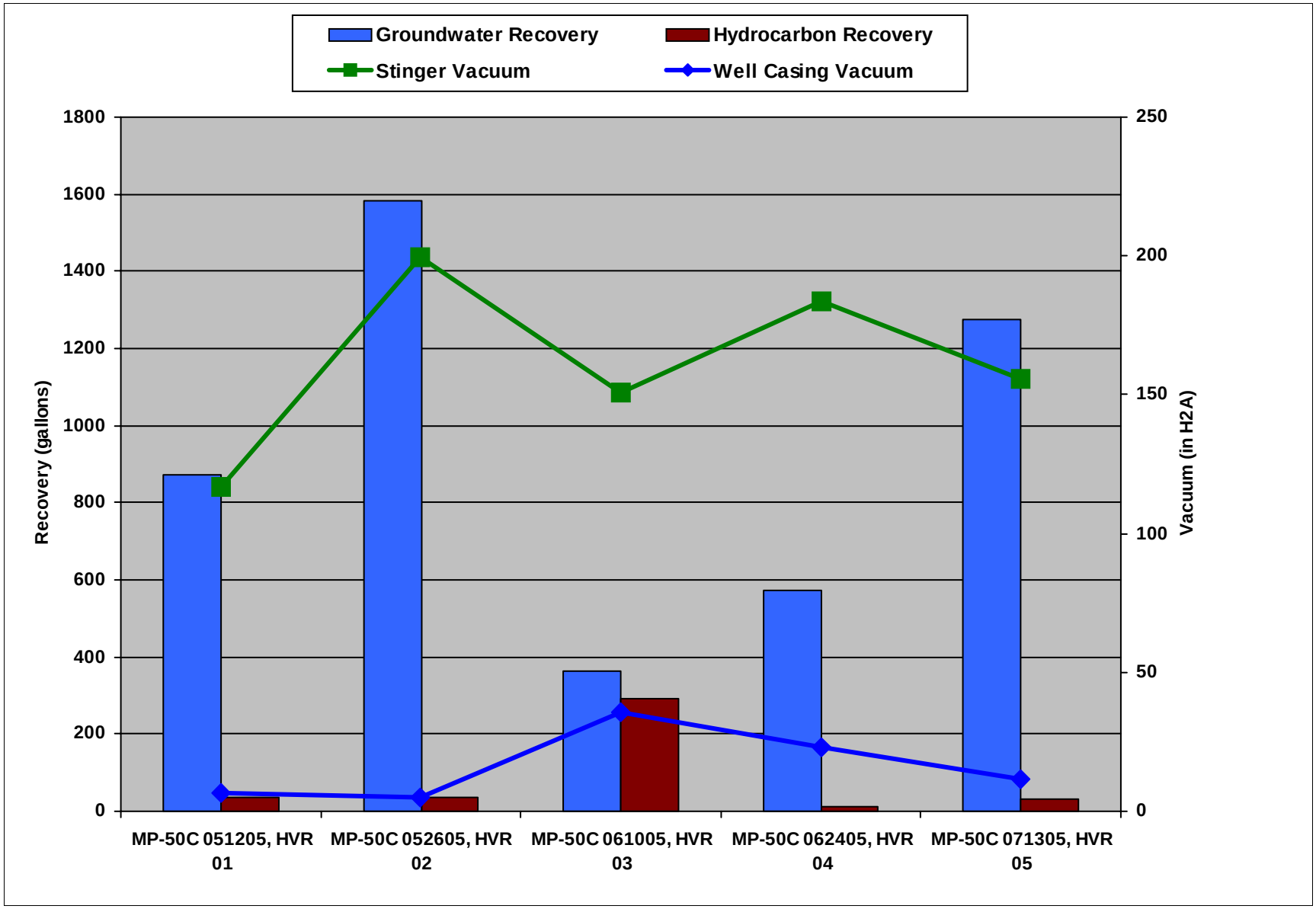


Figure 110: MP-50C
Hydrocarbon Recovery vs. Groundwater Recovery - with Percentages

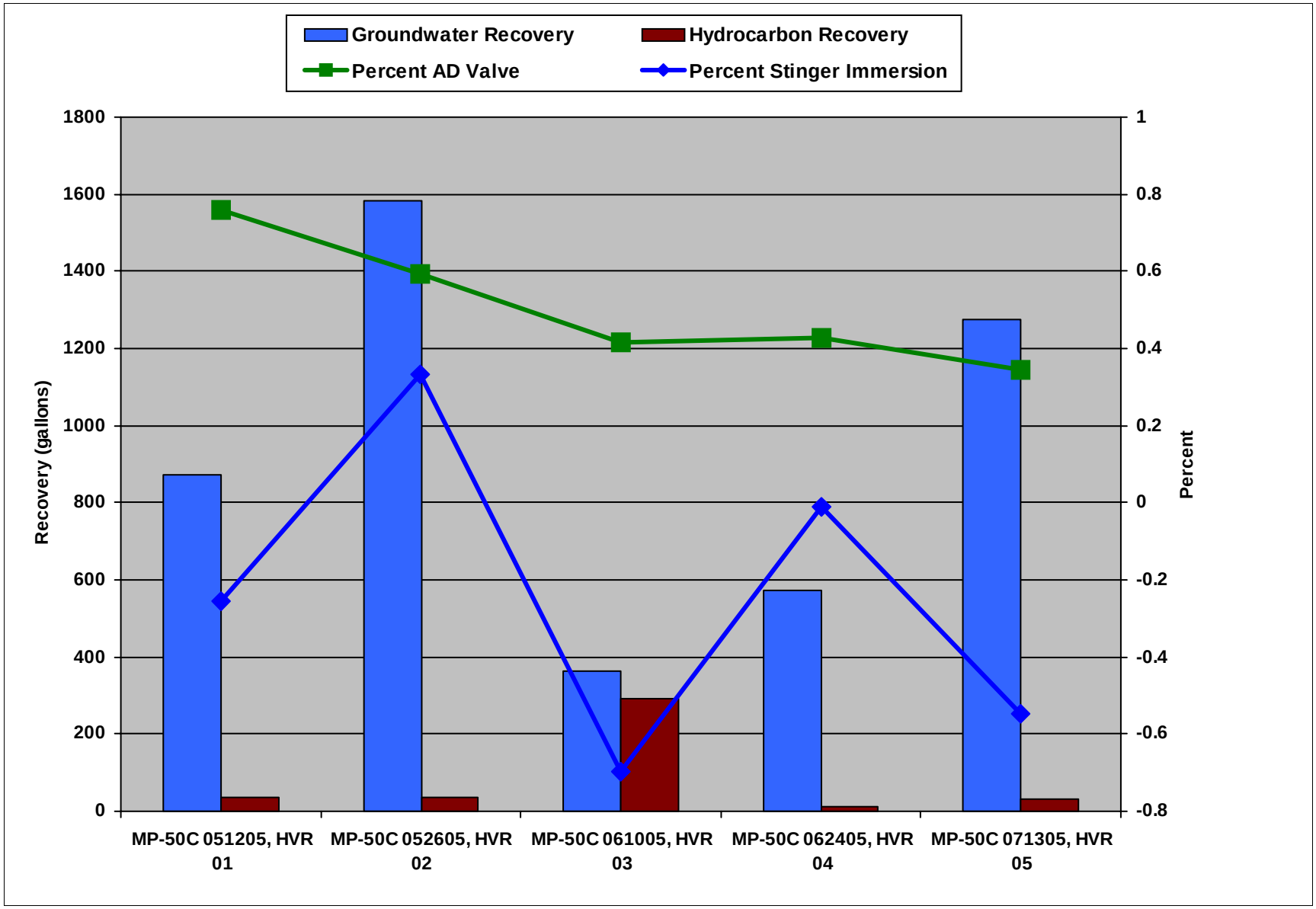


Figure 111: MP -50C
HiVac Event Recharge as a Percentage of Original Product Thickness

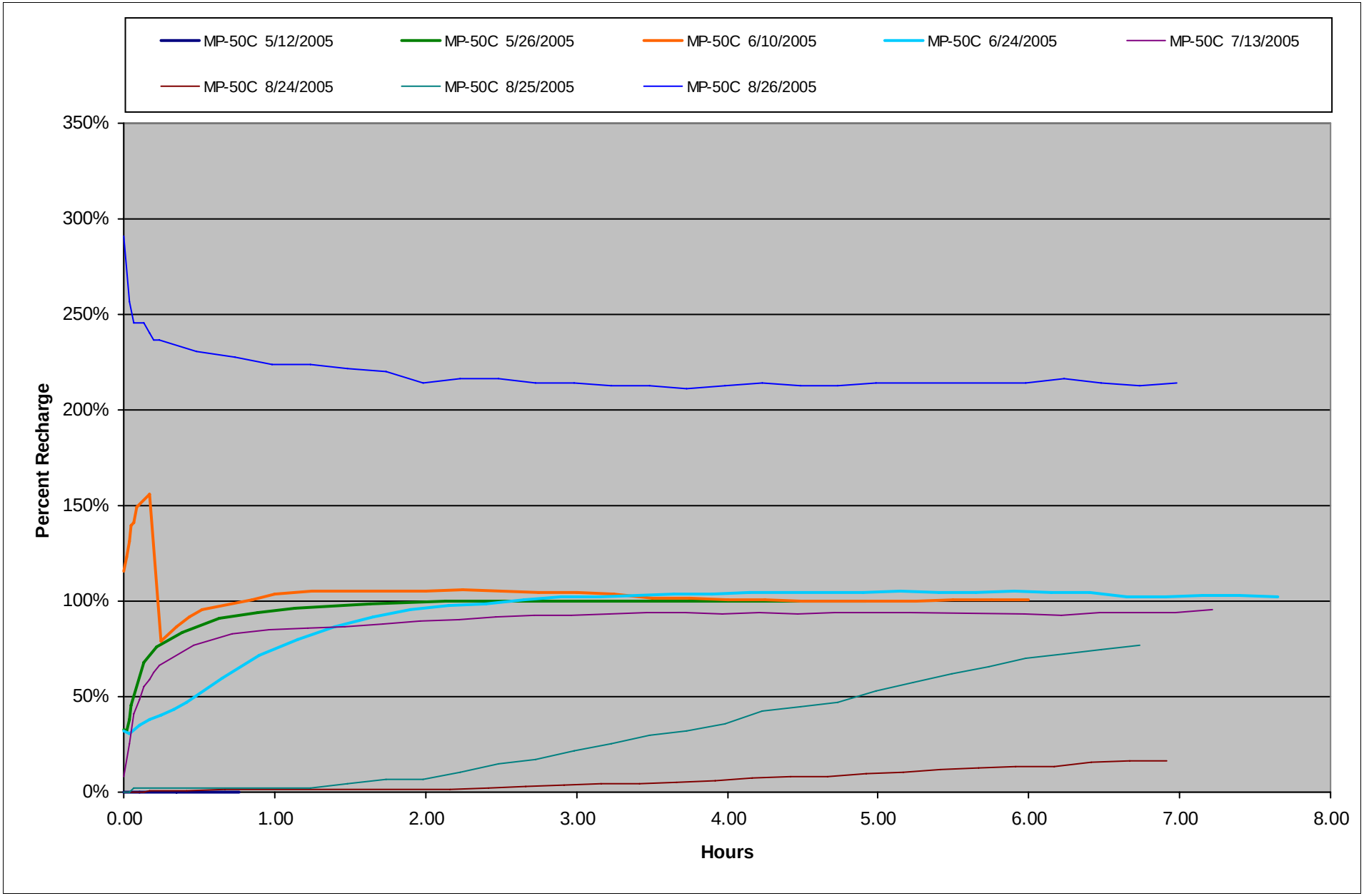


Figure 112: MP -50C
HiVac Event Recharge as Product Thickness in Feet

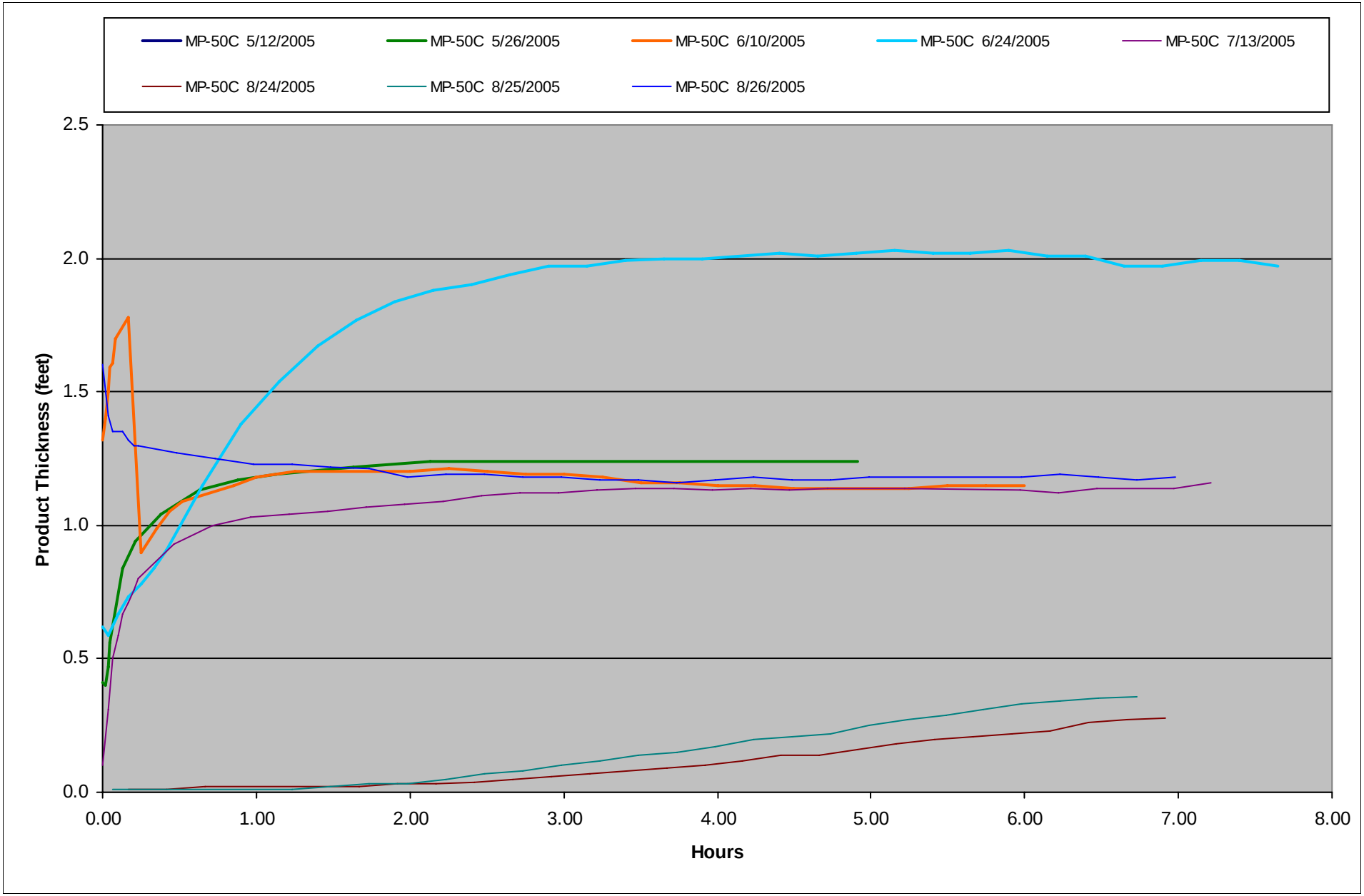
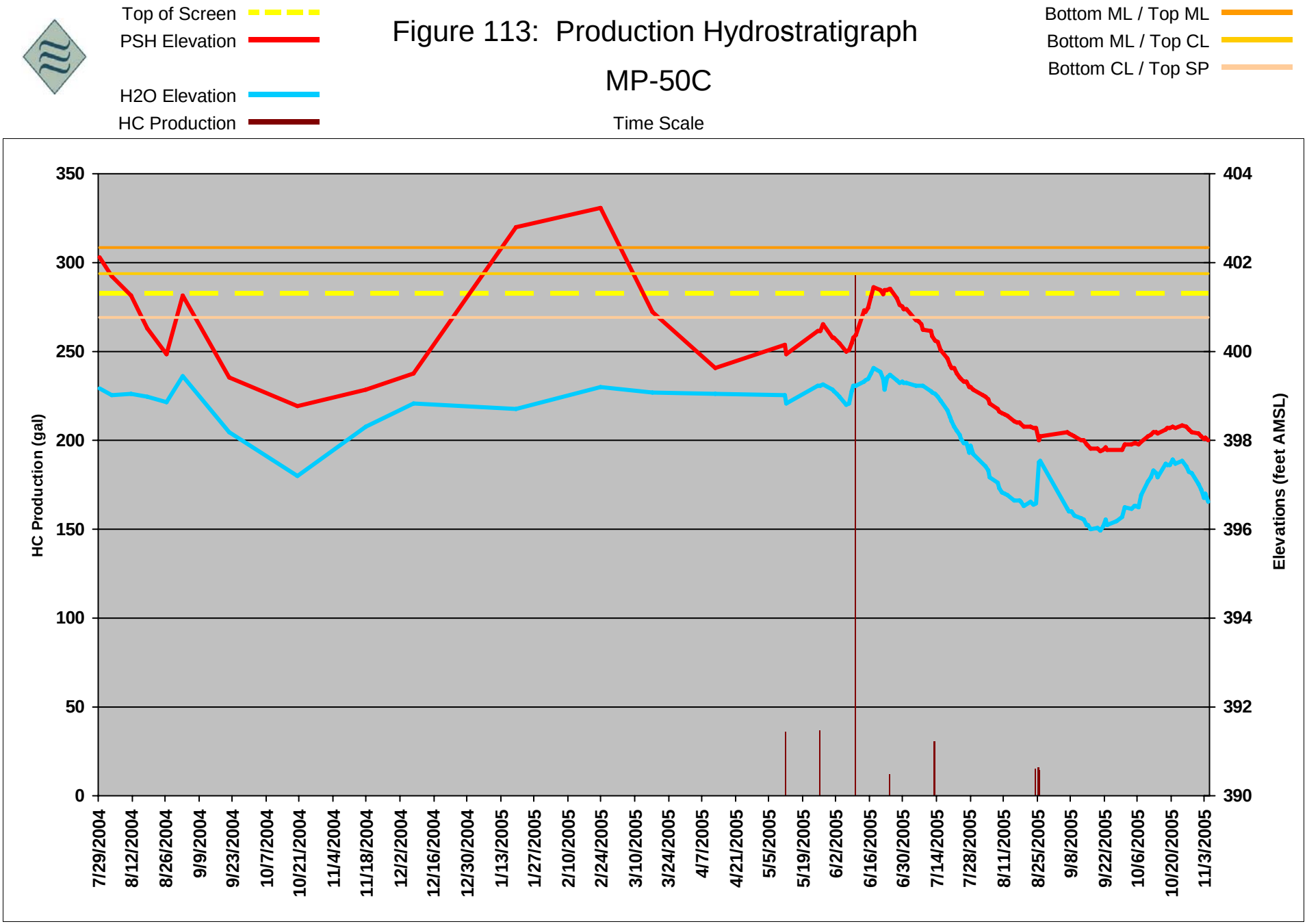


Figure 113: Production Hydrostratigraph

MP-50C



Hartford, Il.

Figure 114: MP-50C
Depth to Top of LNAPL vs. LNAPL Thickness 2004-2005

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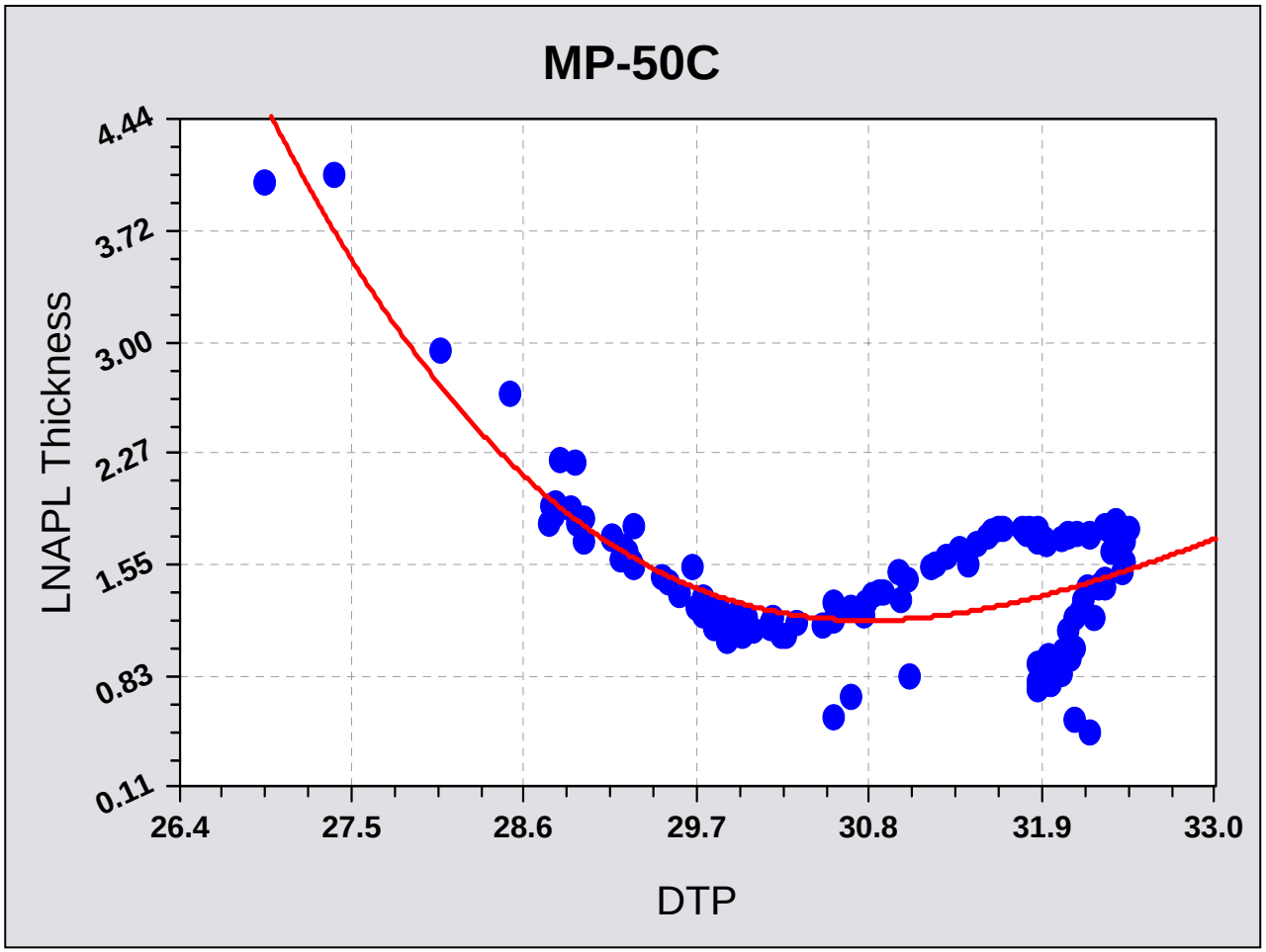

Figure 115: MP-51D
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

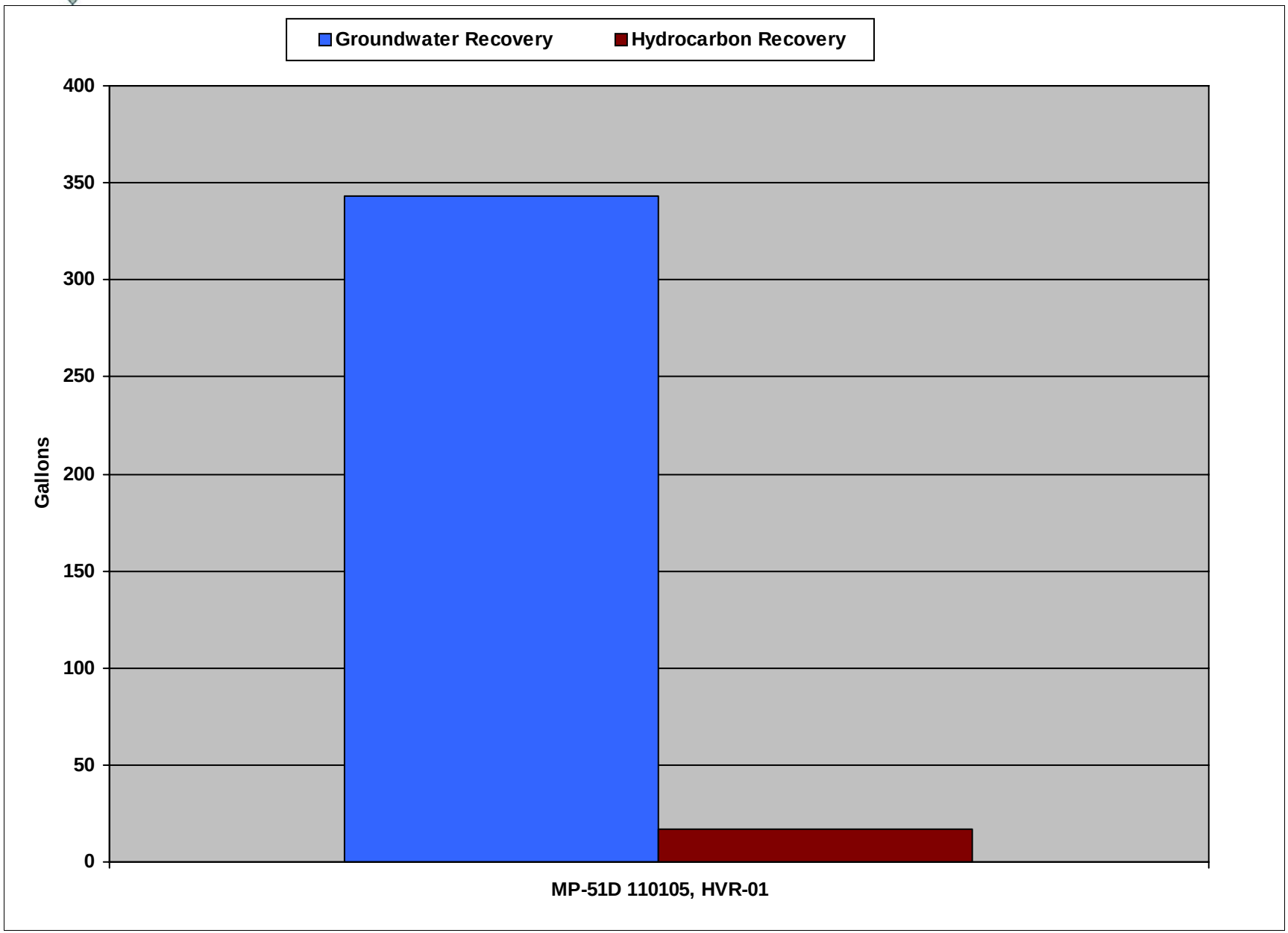

Figure 116: MP-51D
Multi-Site Hydrocarbon Recovery Rate (Gal/Hr) - Grouped by Site

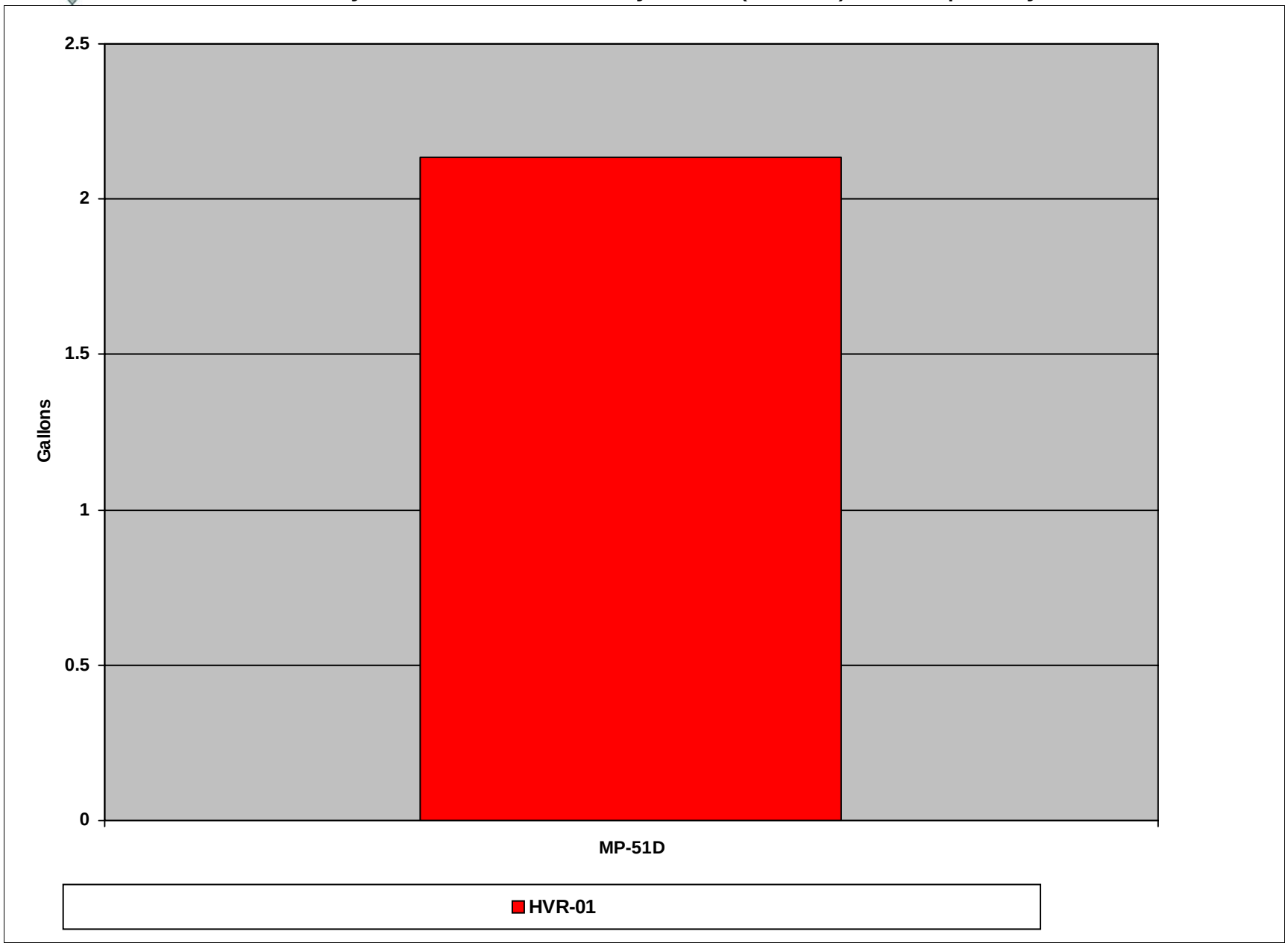

Figure 117: MP-51D
Hydrocarbon Recovery vs. Groundwater Recovery - with Vacuums

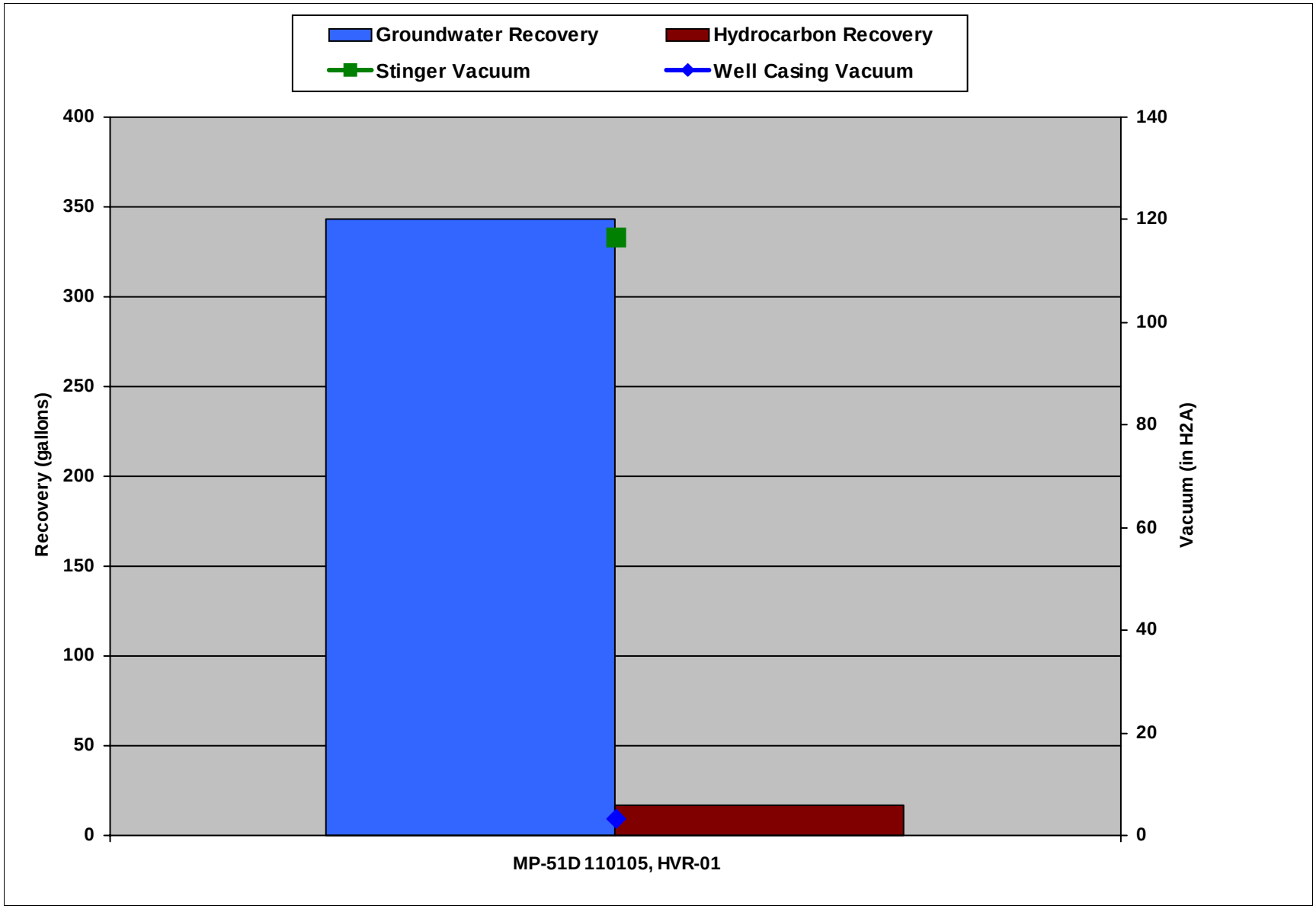

Figure 118: MP-51D
Hydrocarbon Recovery vs. Groundwater Recovery - with Percentages

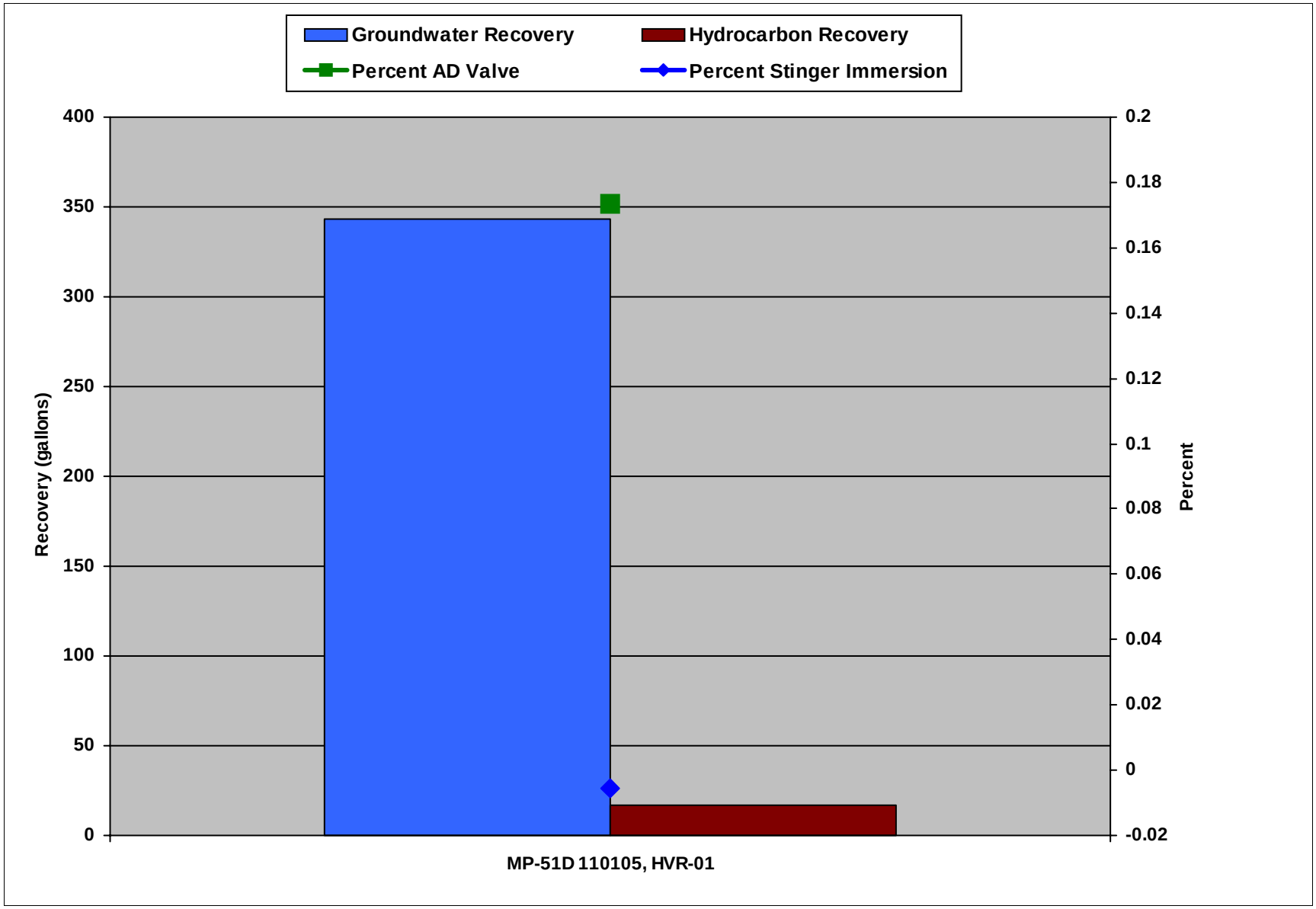

Figure 119: MP-51D
HiVac Event Recharge as a Percentage of Original Product Thickness

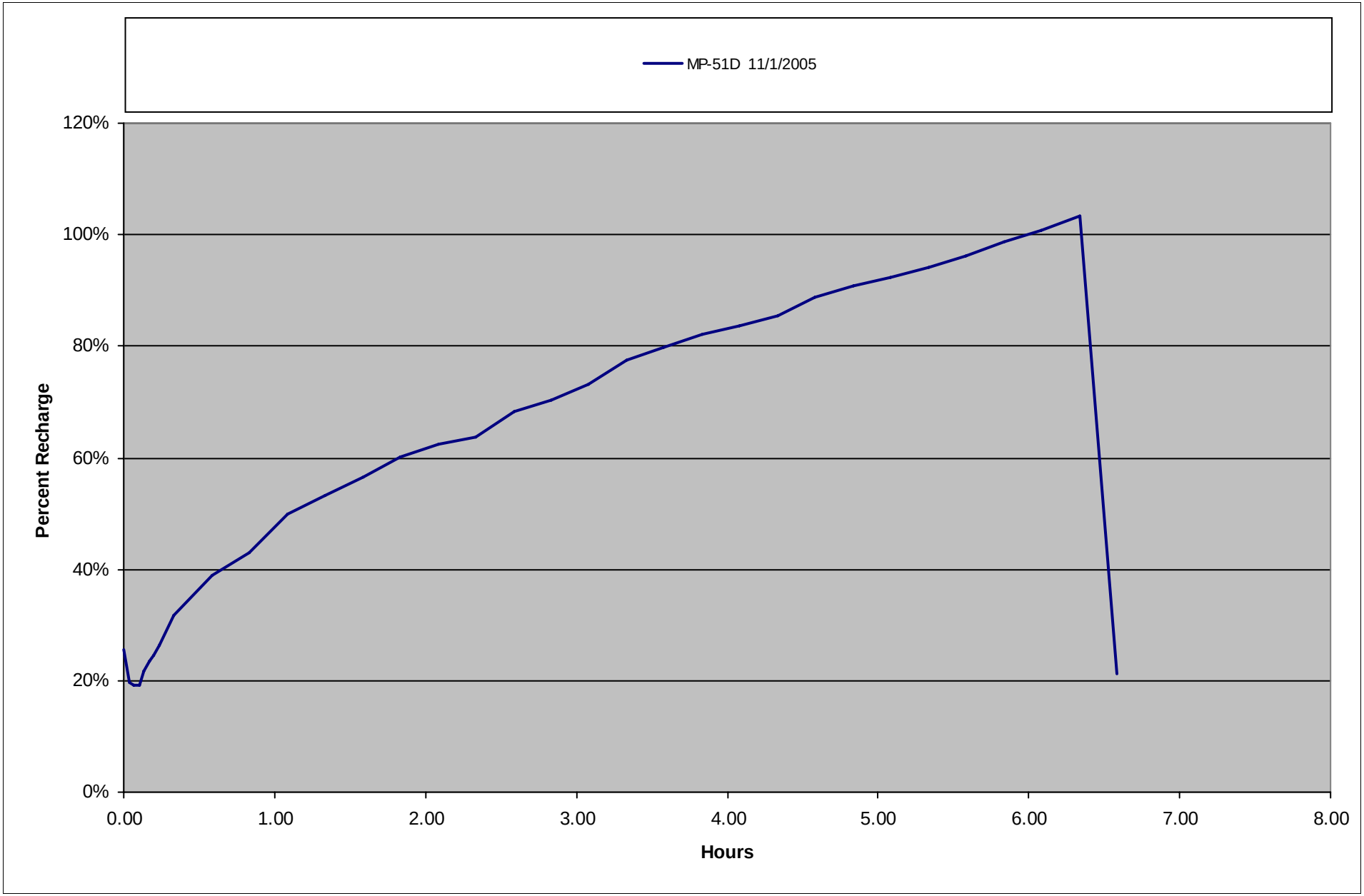

Figure 120: MP-51D
HiVac Event Recharge as Product Thickness in Feet

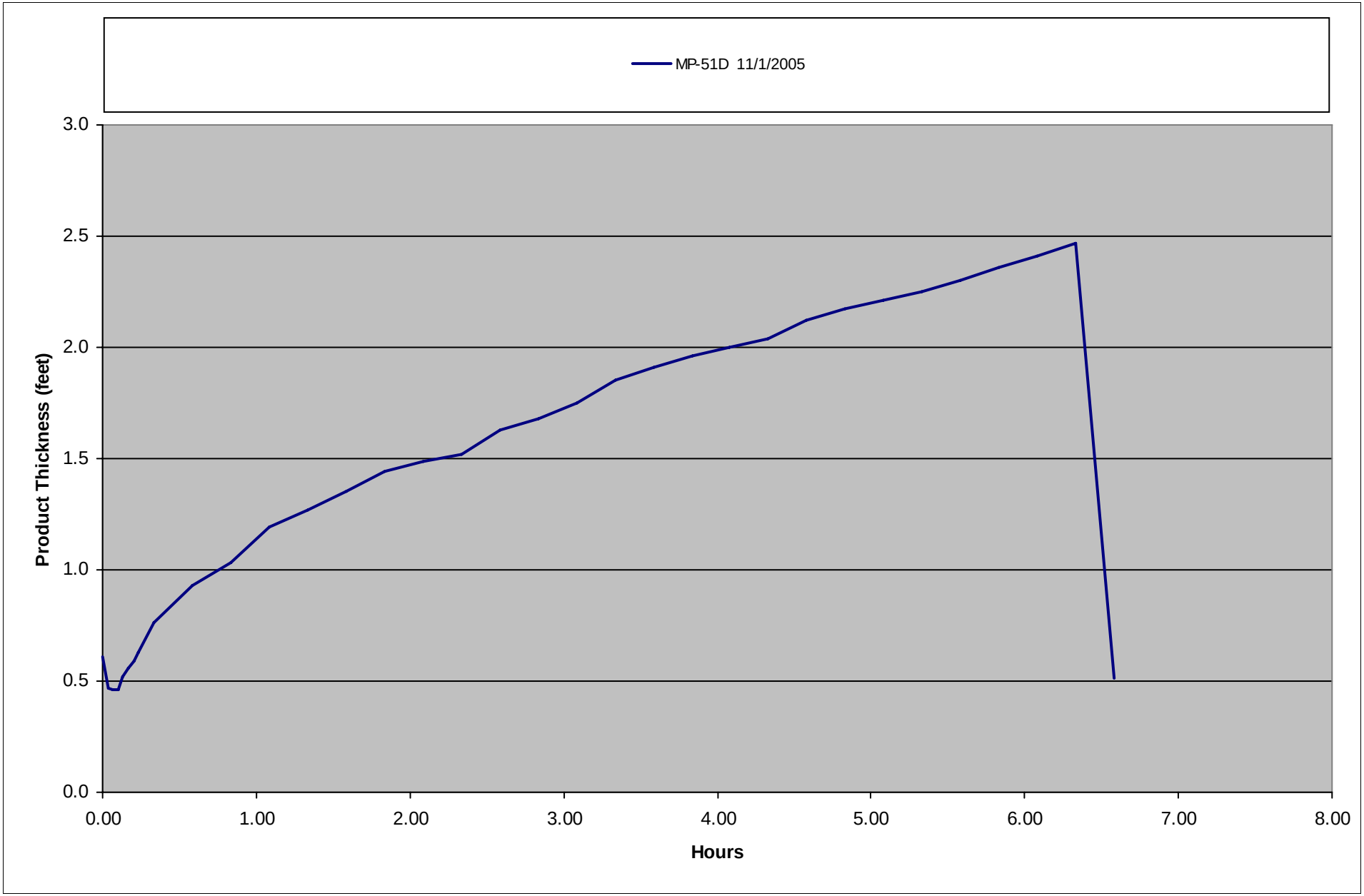

Figure 121: MP-51D
Depth to Top of LNAPL vs. LNAPL Thickness 2004-2005

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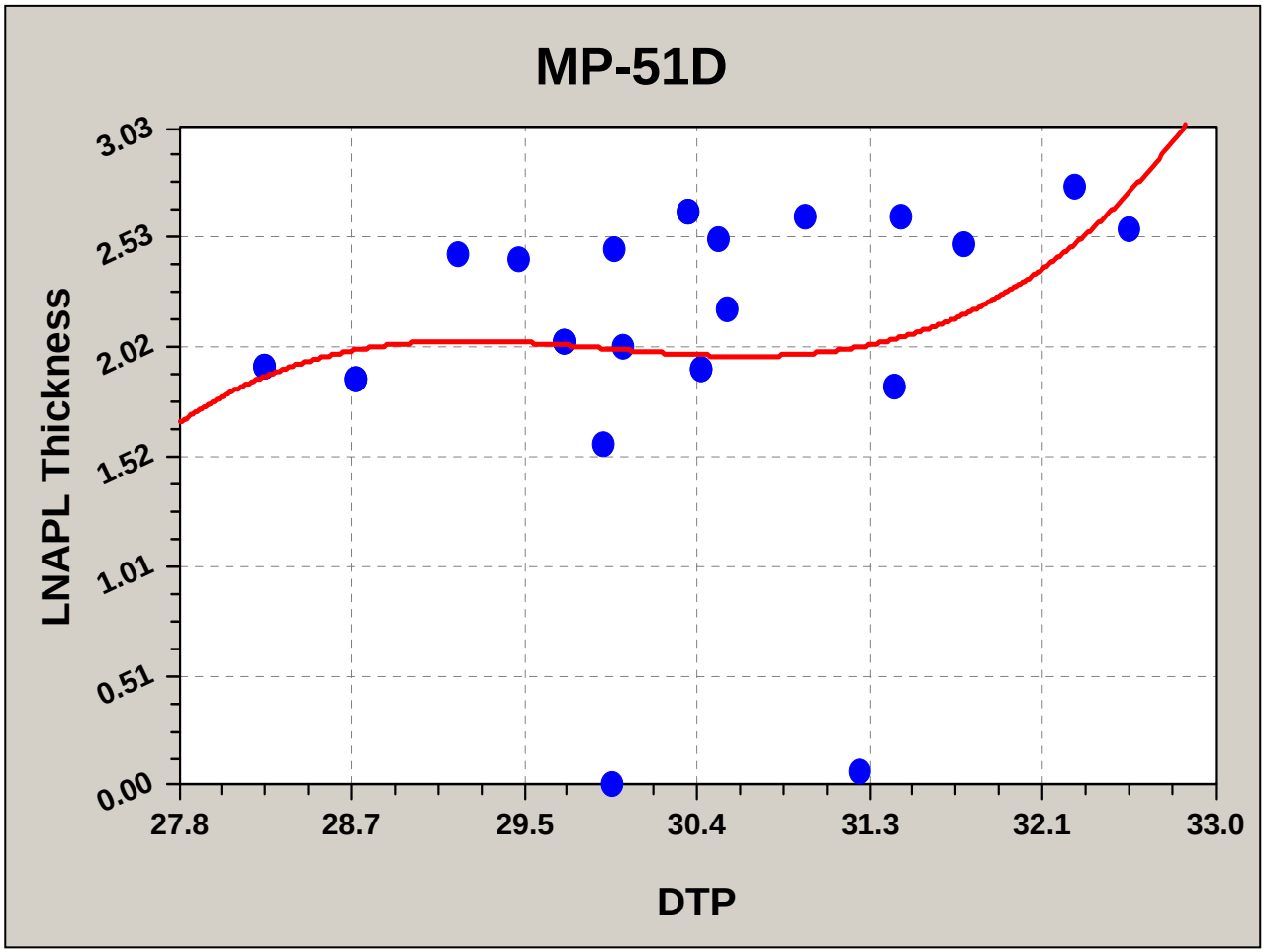

Figure 122: MP-52C
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

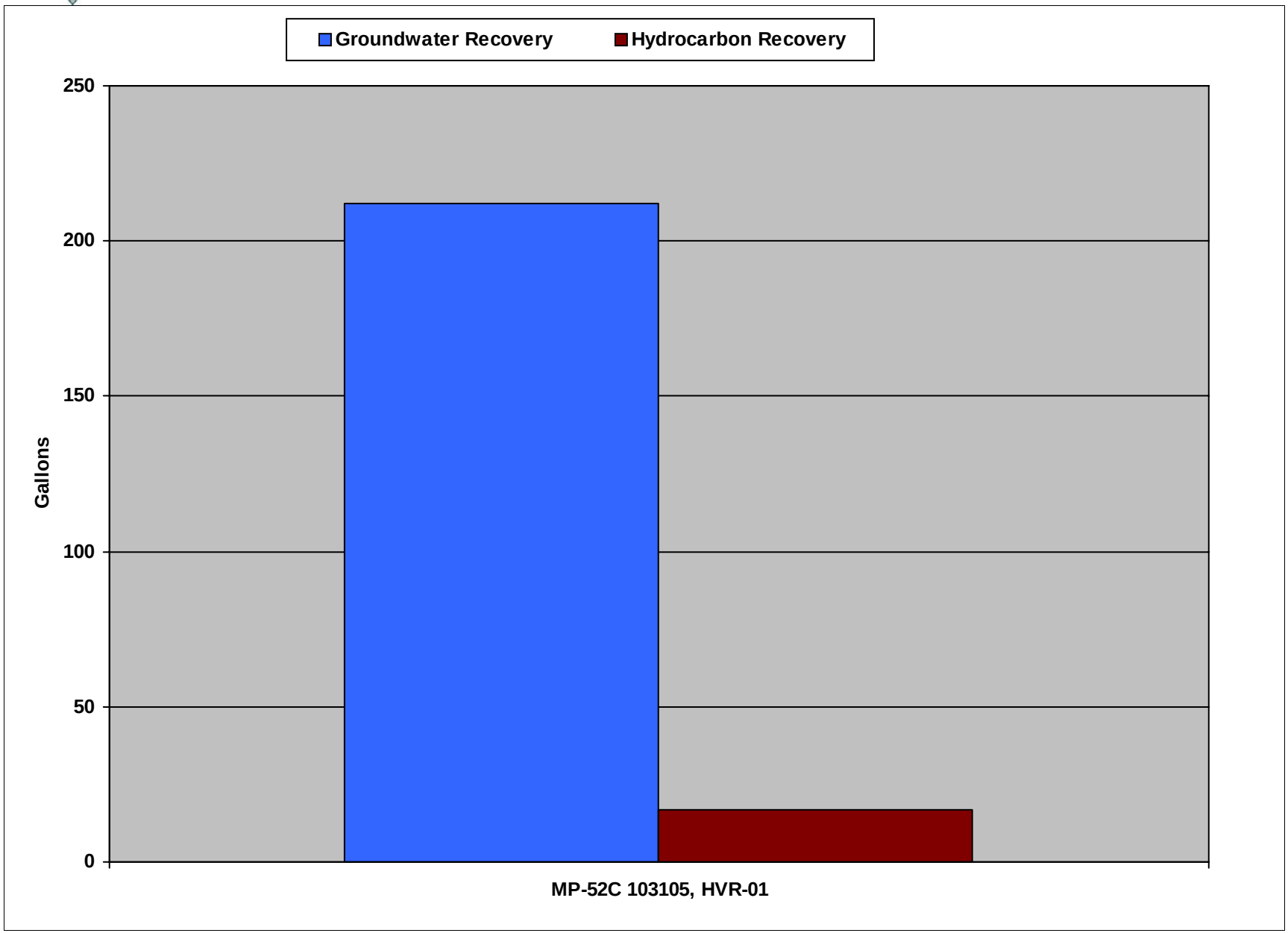

Figure 123: MP-52C
Multi-Site Hydrocarbon Recovery Rate (Gal/Hr) - Grouped by Site

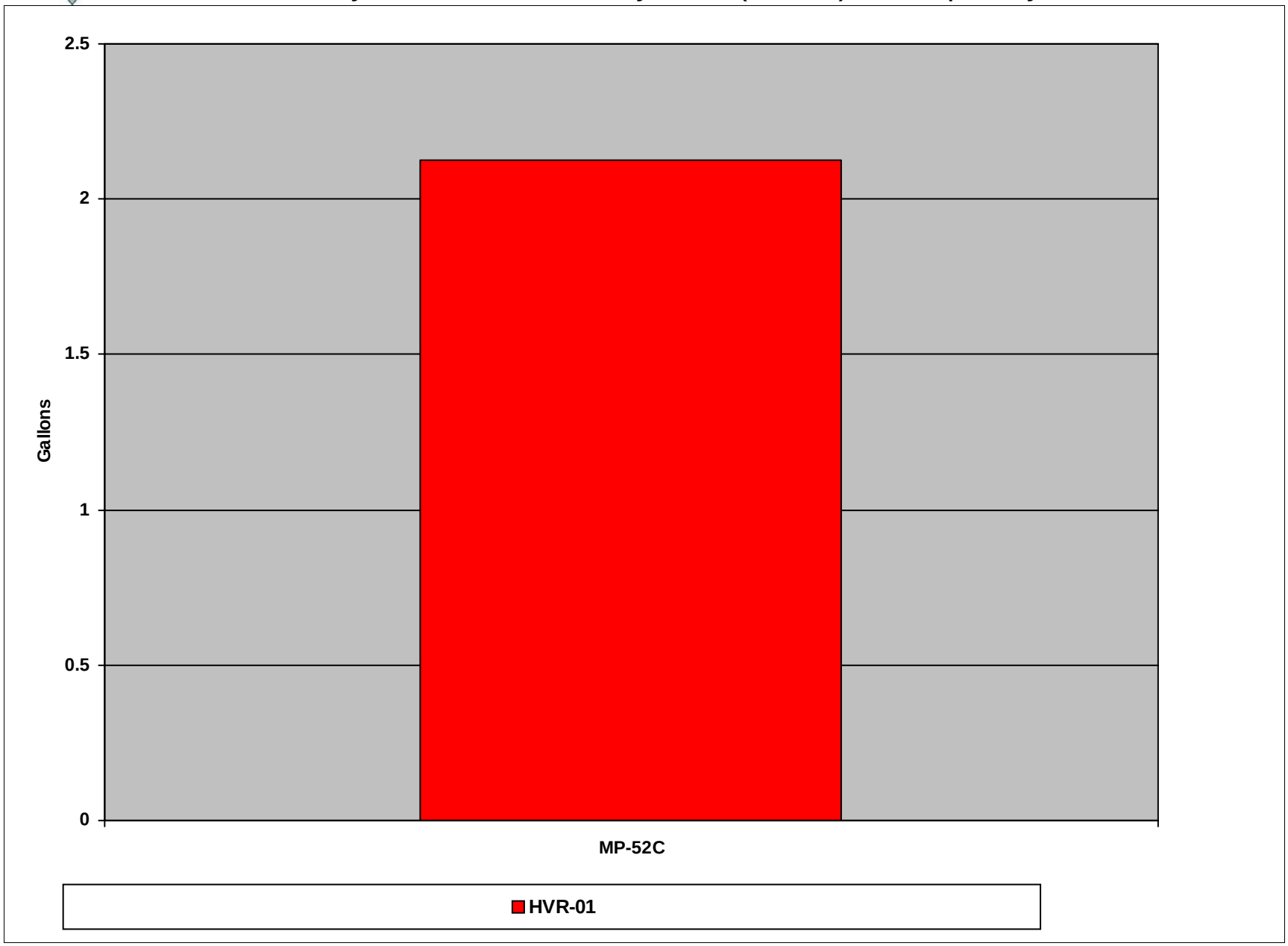

Figure 124: MP-52C
Hydrocarbon Recovery vs. Groundwater Recovery - with Vacuums

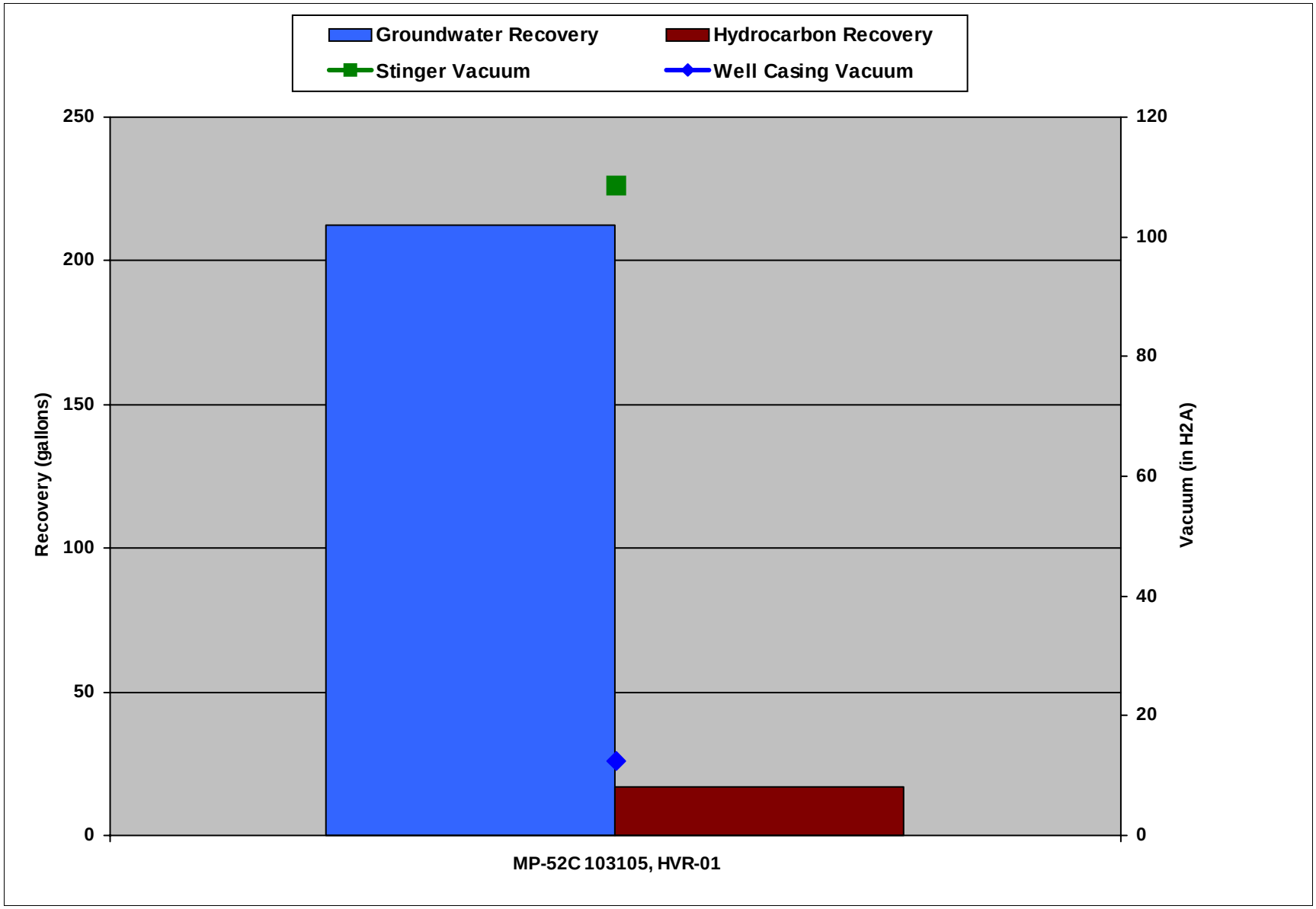

Figure 125: MP-52C
Hydrocarbon Recovery vs. Groundwater Recovery - with Percentages

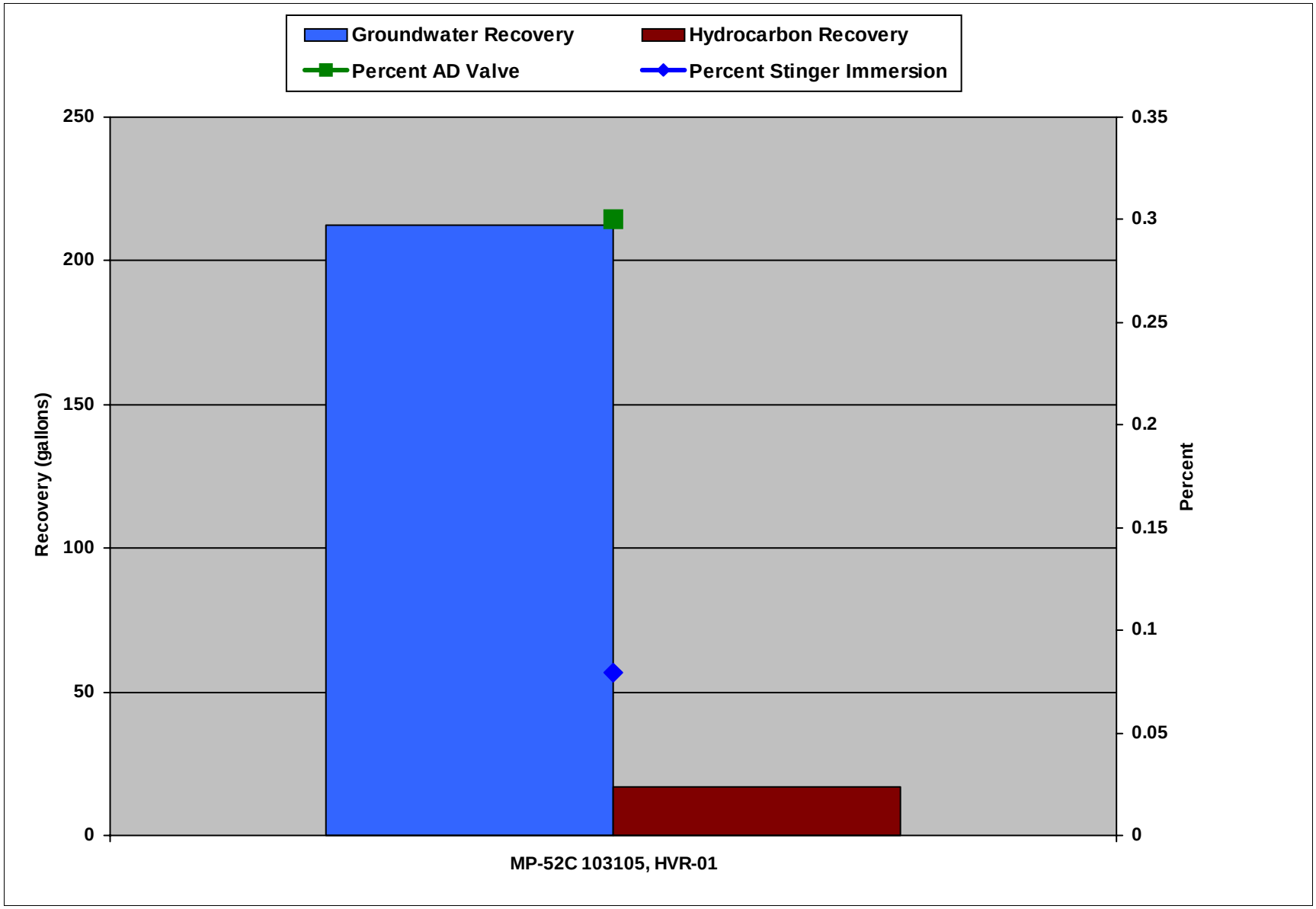

Figure 126: MP-52C
HiVac Event Recharge as a Percentage of Original Product Thickness

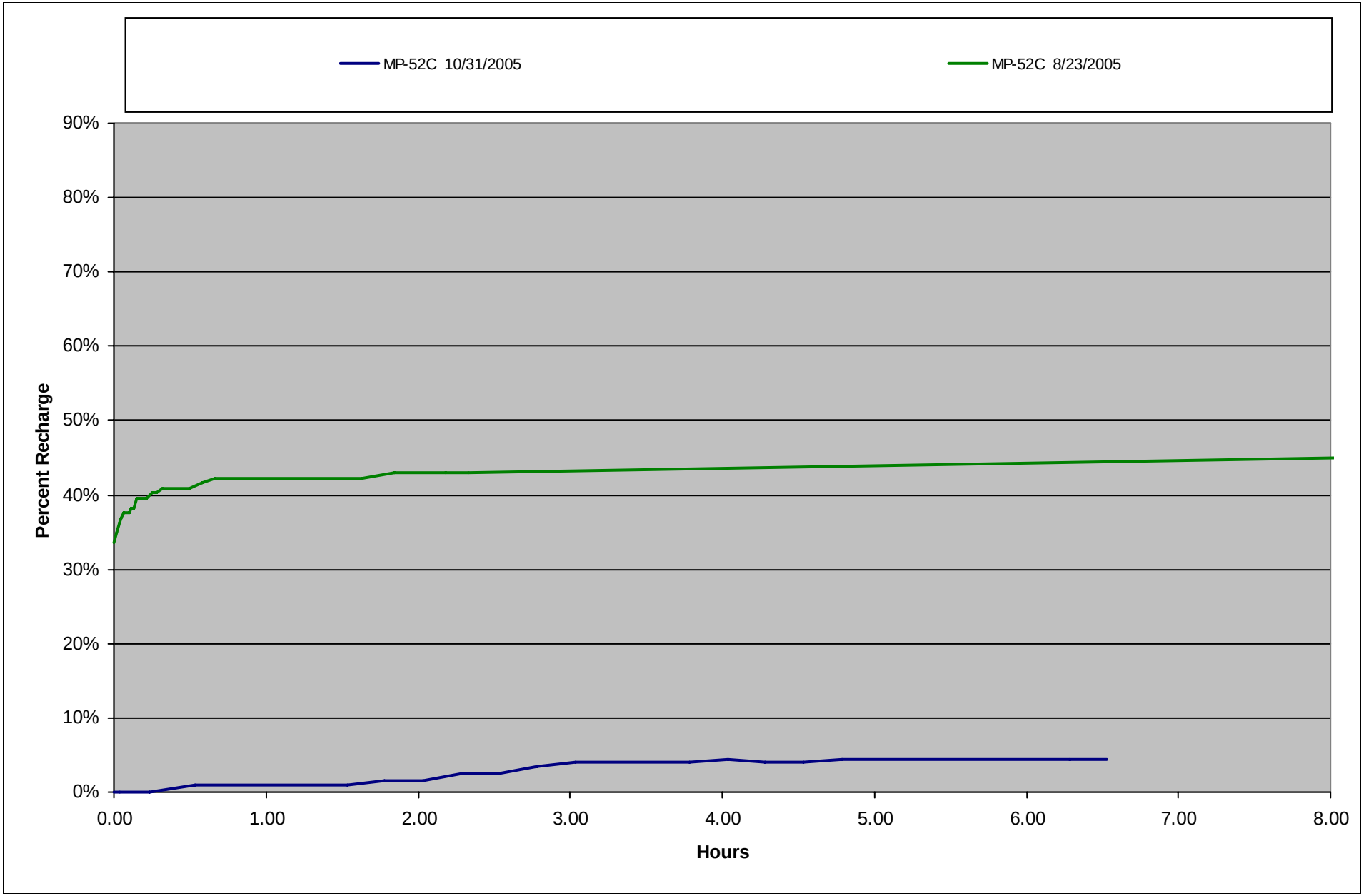

Figure 127: MP-52C
HiVac Event Recharge as Product Thickness in Feet

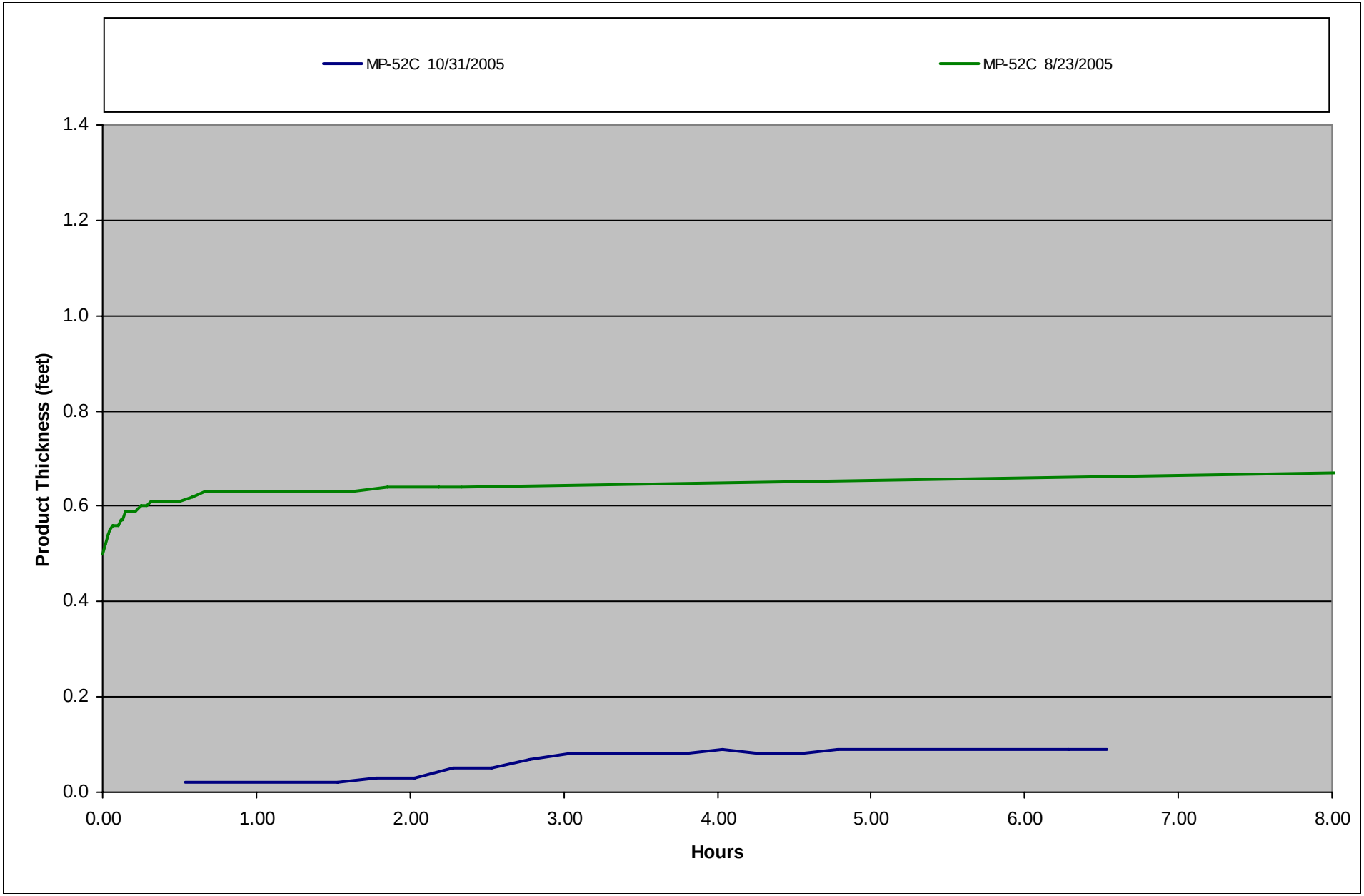

Figure 128: MP-52C
Depth to Top of LNAPL vs. LNAPL Thickness 2005

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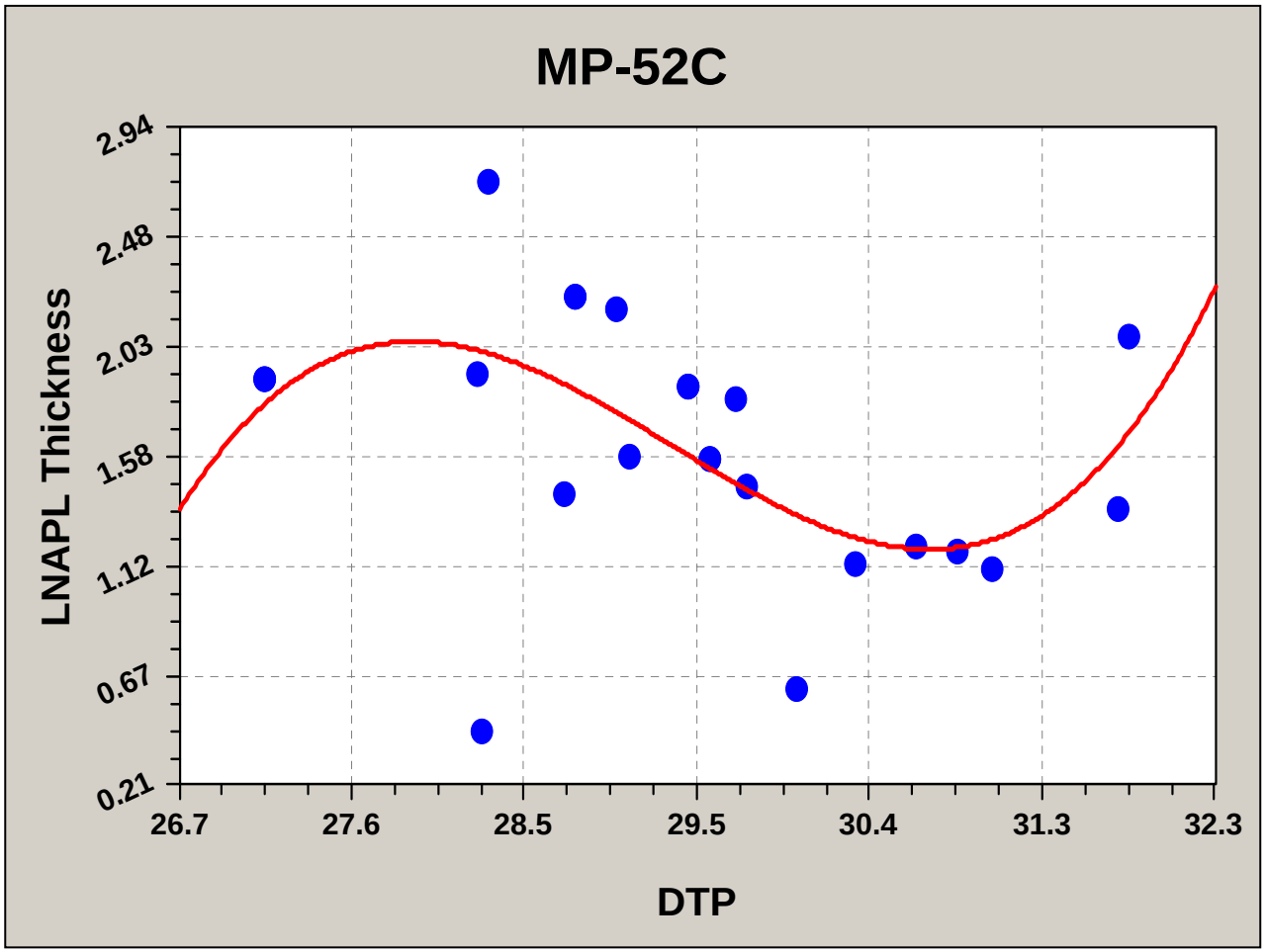

Figure 129: MP-53C
Multi-Site Cumulative Product Recovery (Gallons)

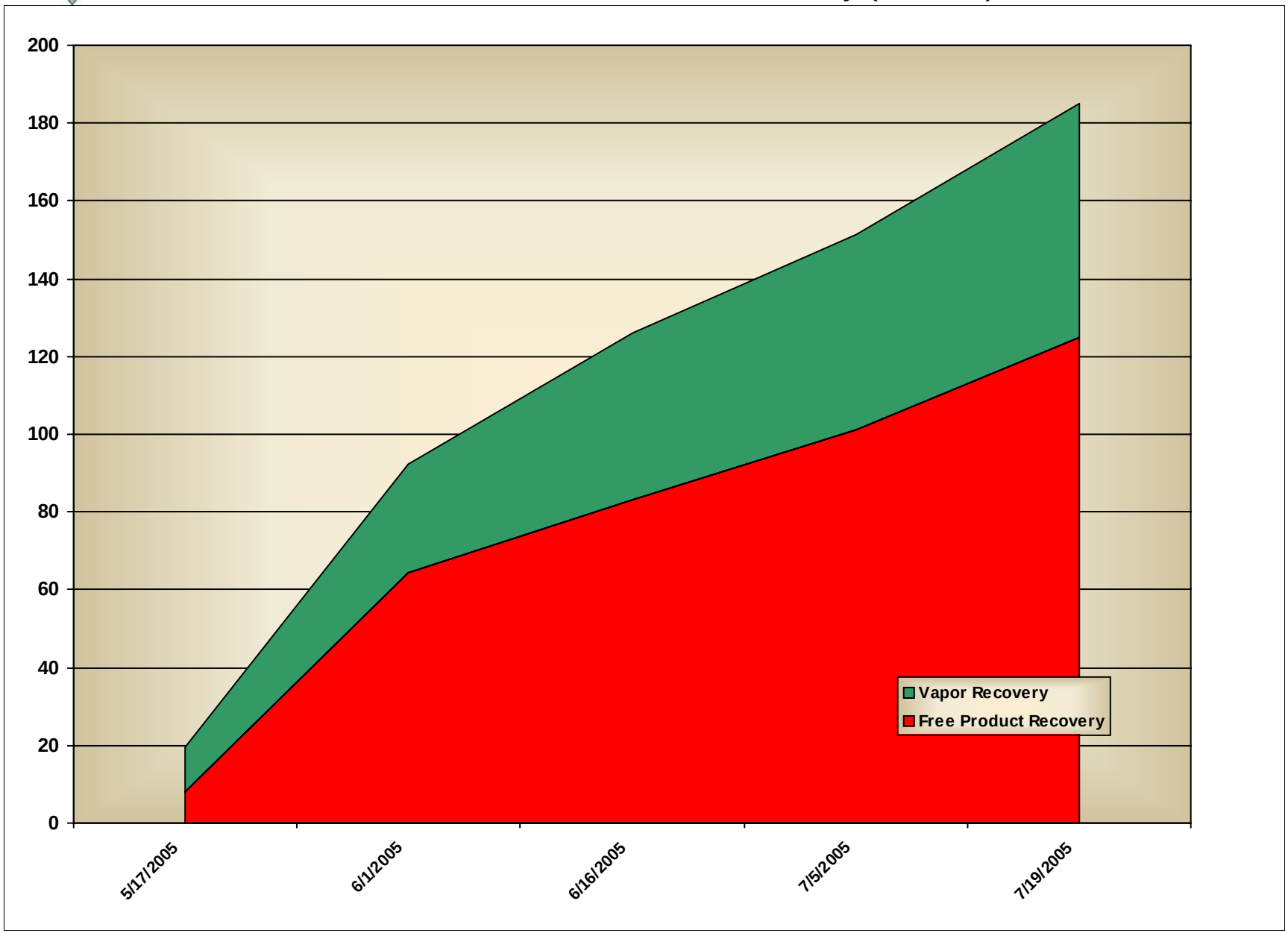

Figure 130: MP-53C
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

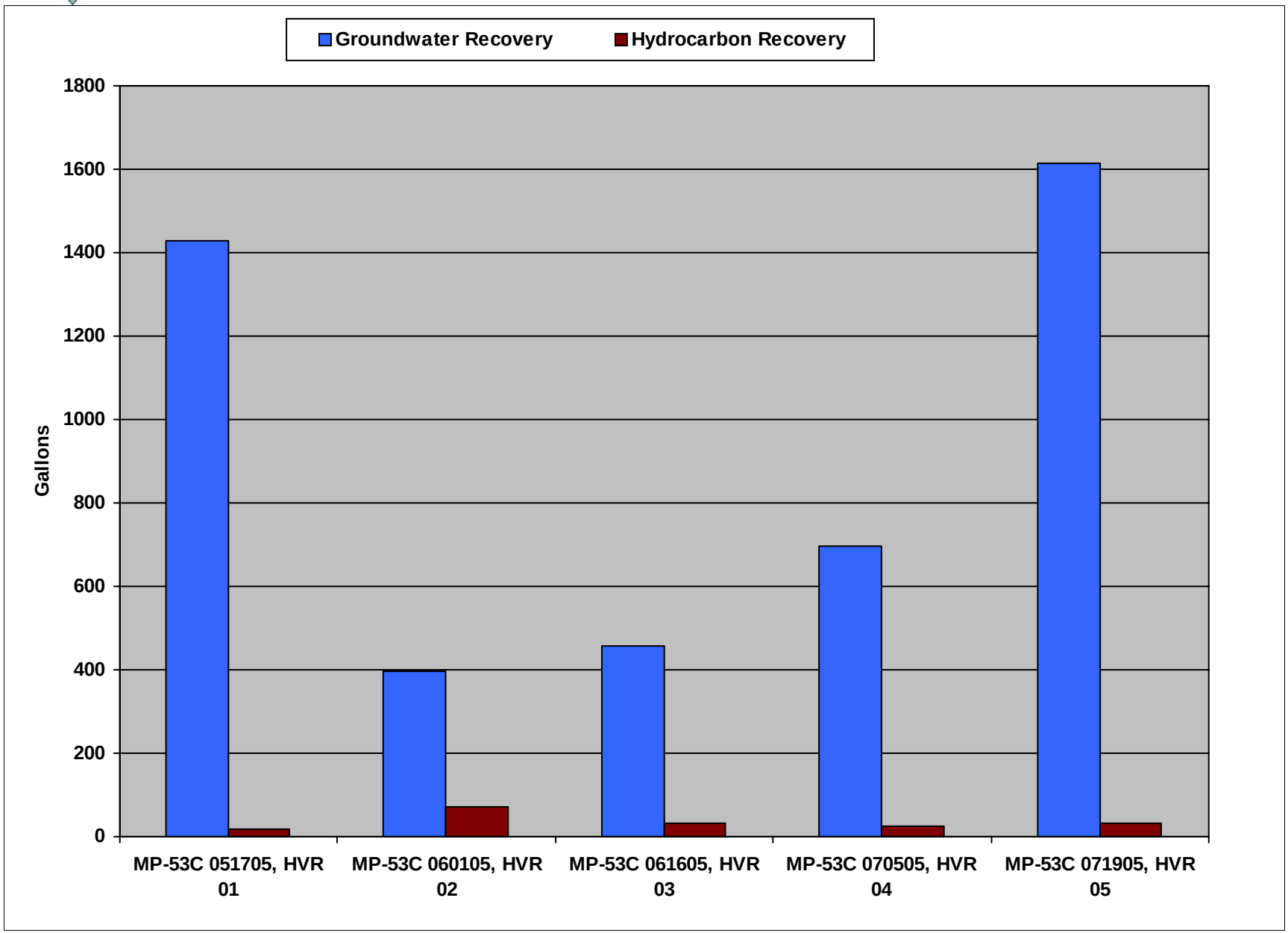

Figure 131: MP-53C
Multi-Site Hydrocarbon Recovery Rate (Gal/Hr) - Grouped by Site

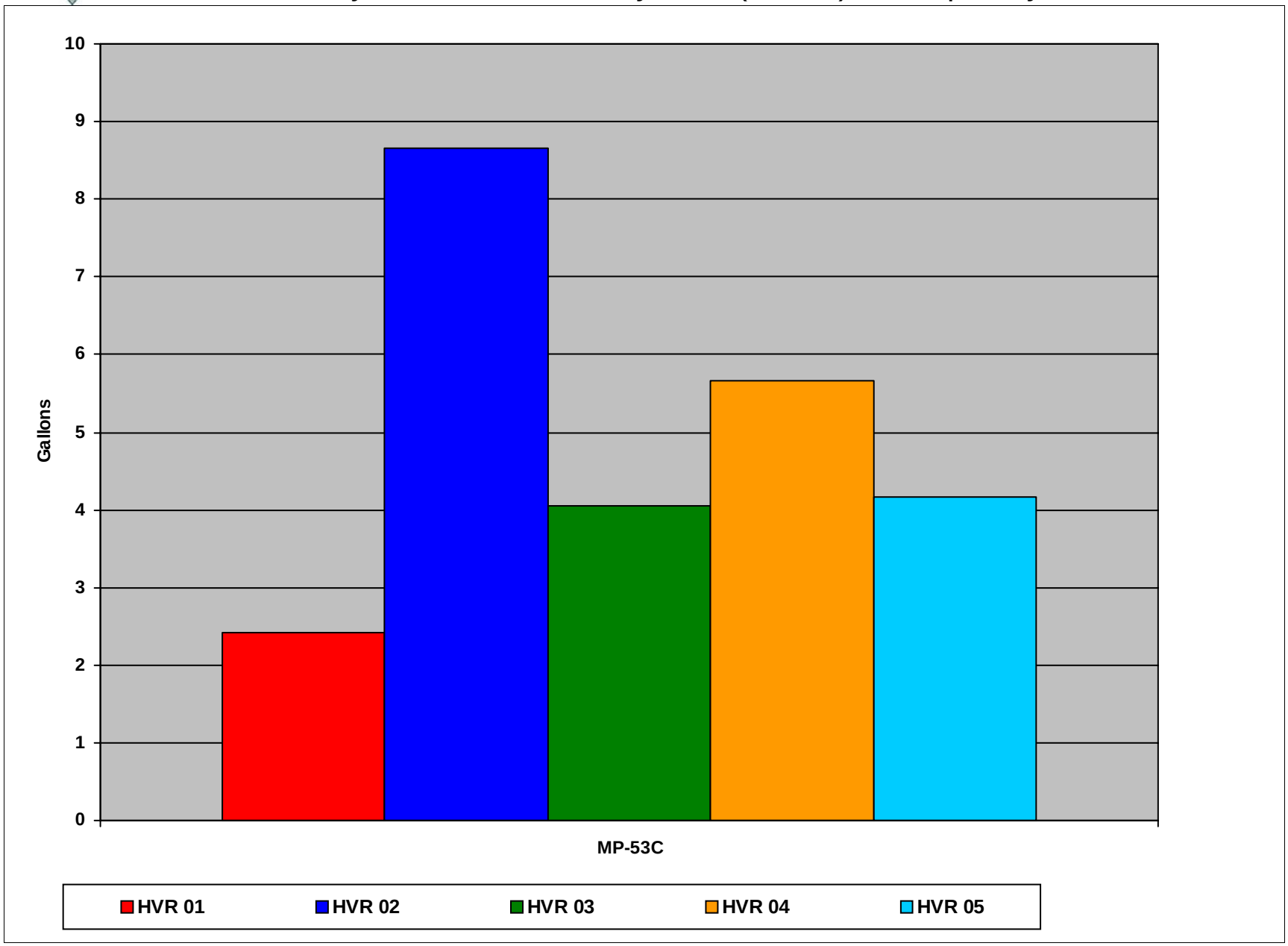

Figure 132: MP-53C
Multi-Site LB per Hour - ICE Calculated vs. Lab Sample

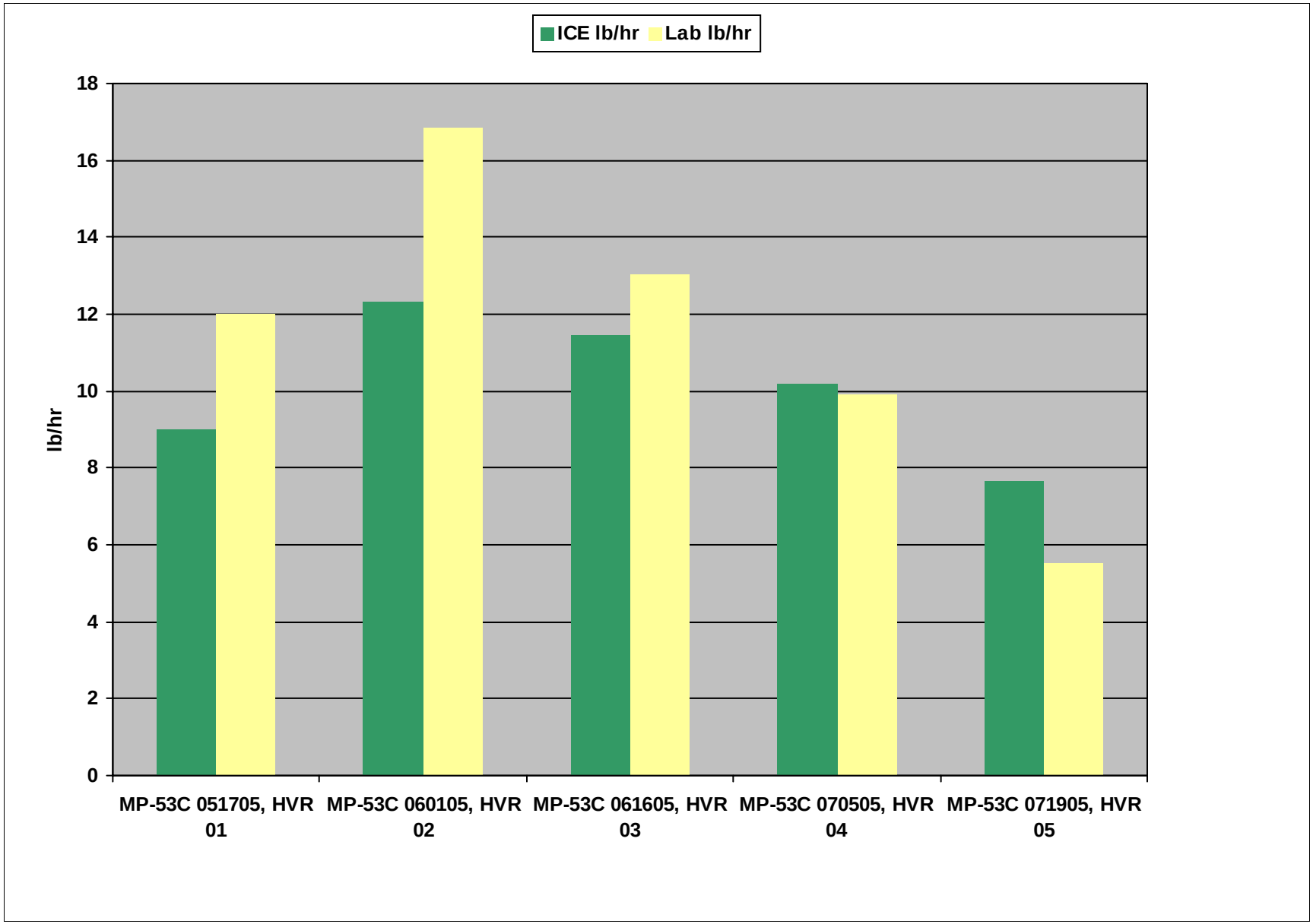

Figure 133: MP-53C
BTU per Hour

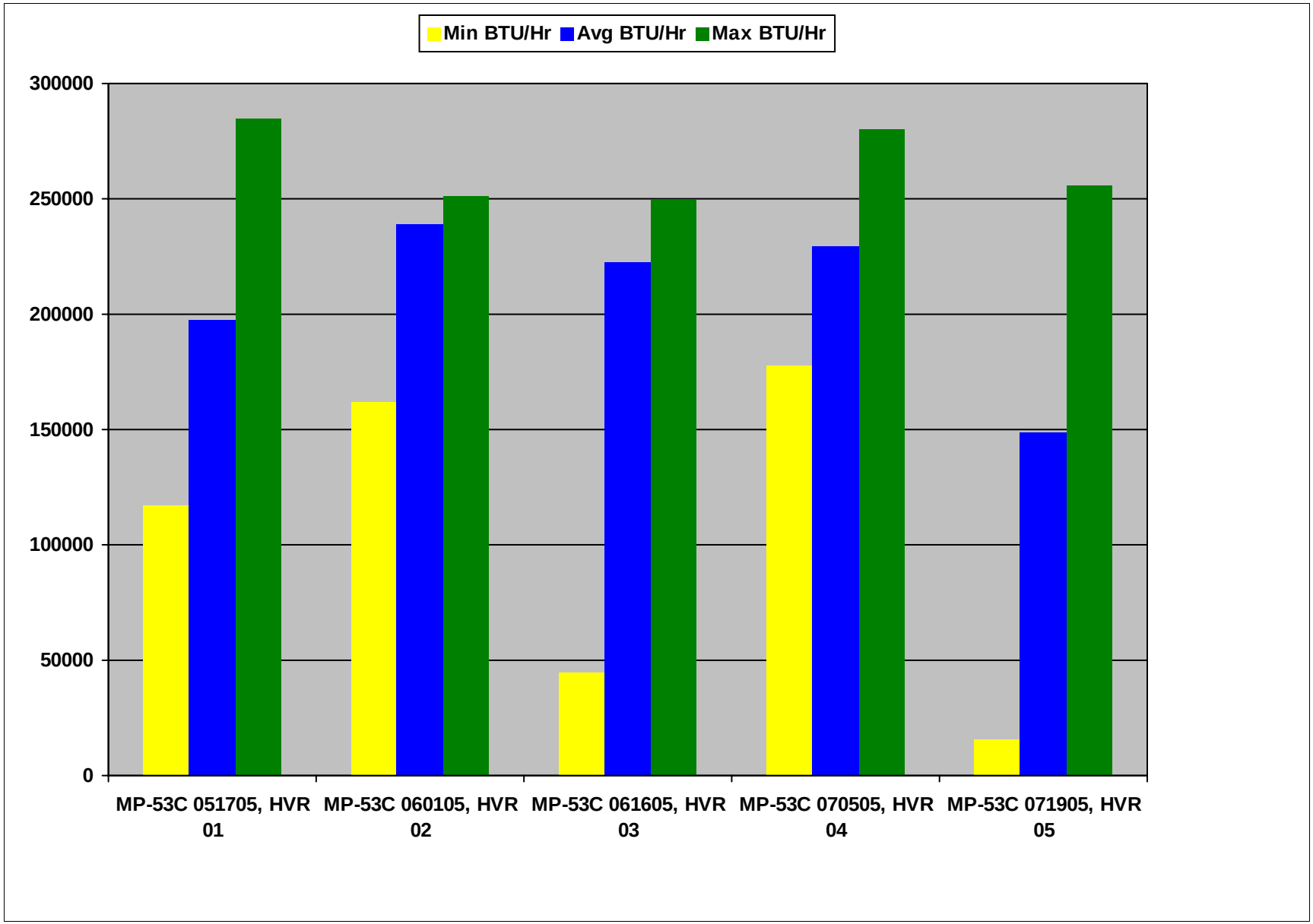

Figure 134: MP-53C
Multi-Site Vacuums

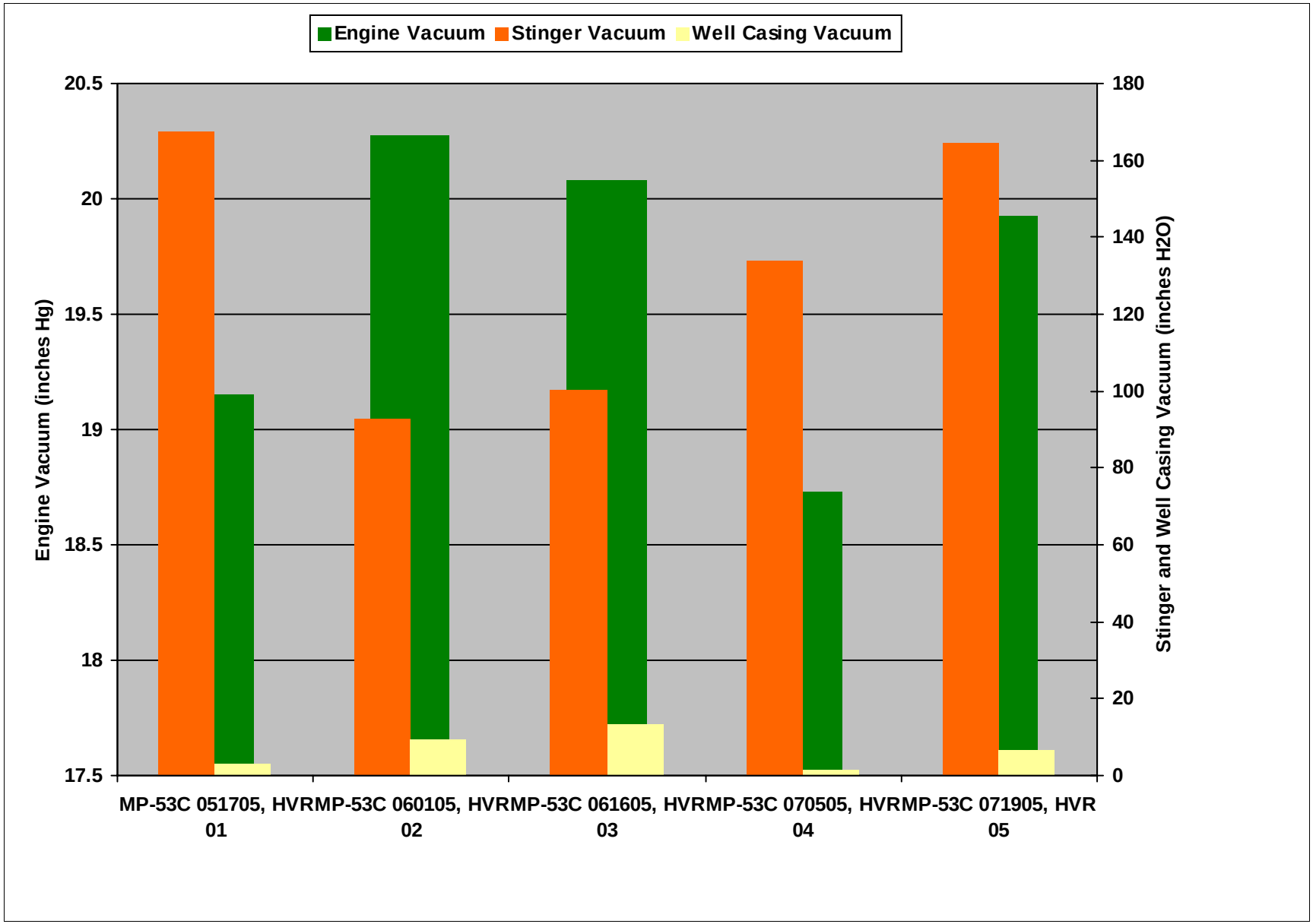

Figure 135: MP-53C
Multi-Site Air, Well and Fuel Flows

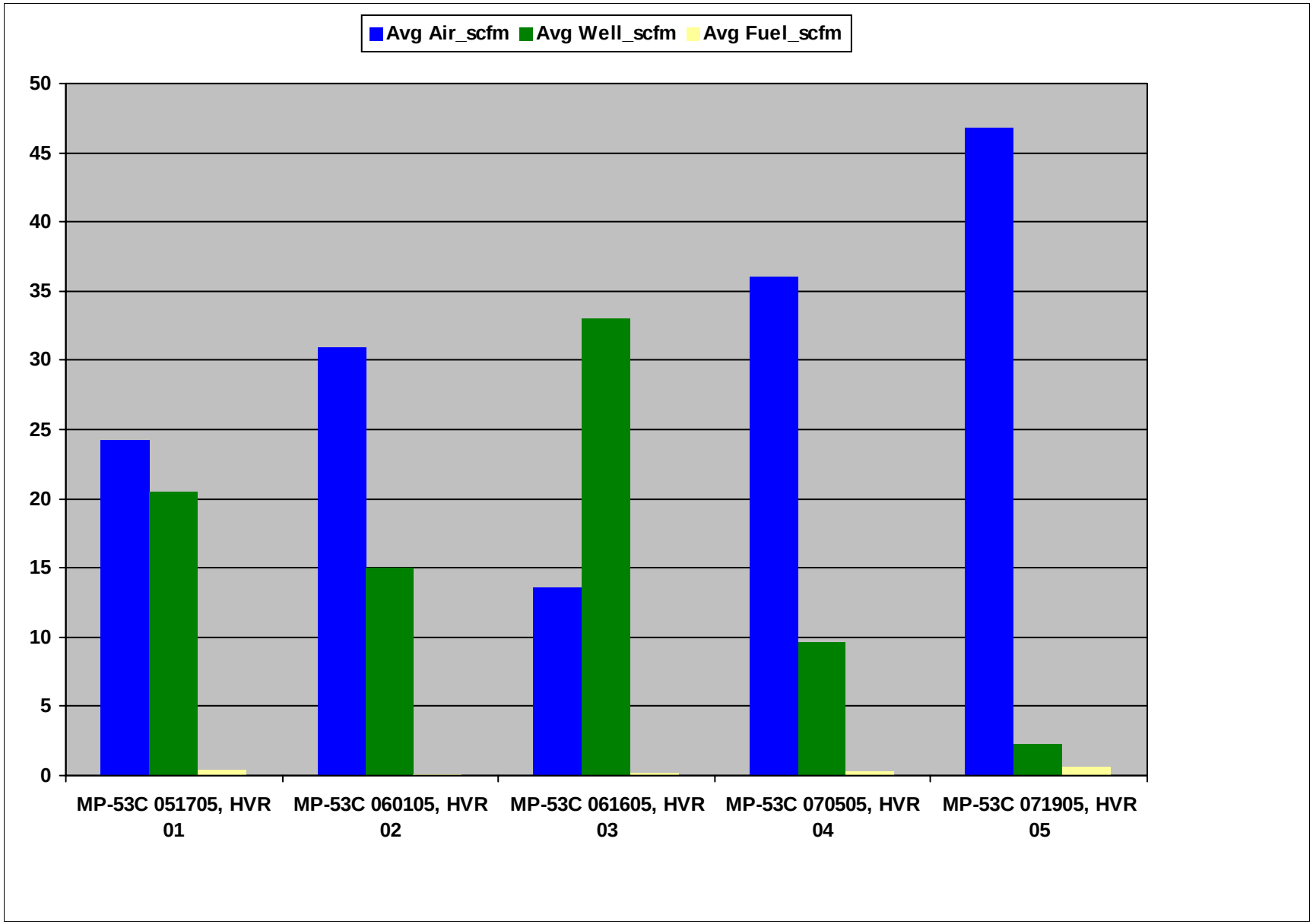

Figure 136: MP-53C Gauging, Stinger and Production Data
Hydrocarbon Recovery vs. Groundwater Recovery - with Elevations

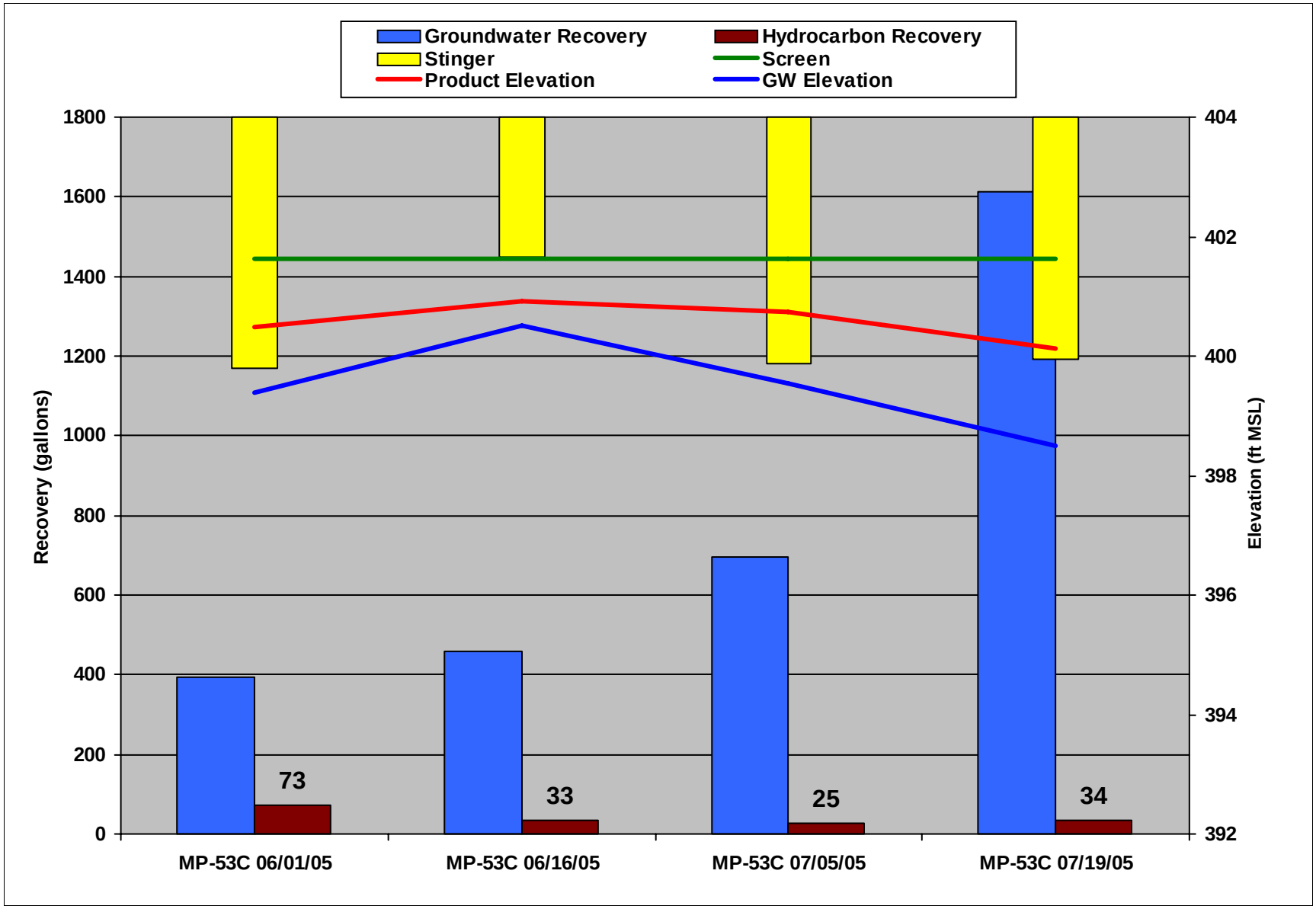

Figure 137: MP-53C
Hydrocarbon Recovery vs. Groundwater Recovery - with Vacuums

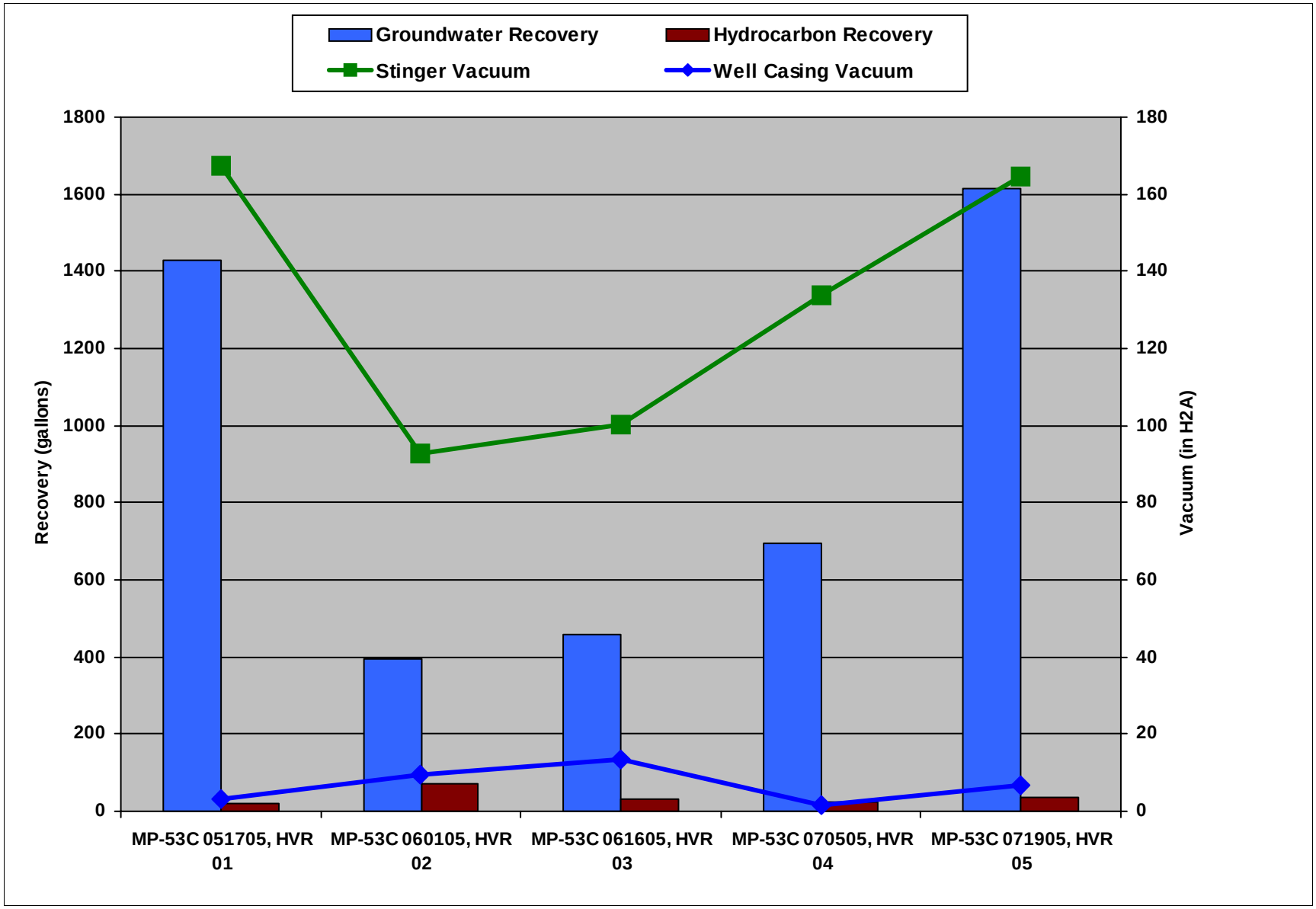

Figure 138: MP-53C
Hydrocarbon Recovery vs. Groundwater Recovery - with Percentages

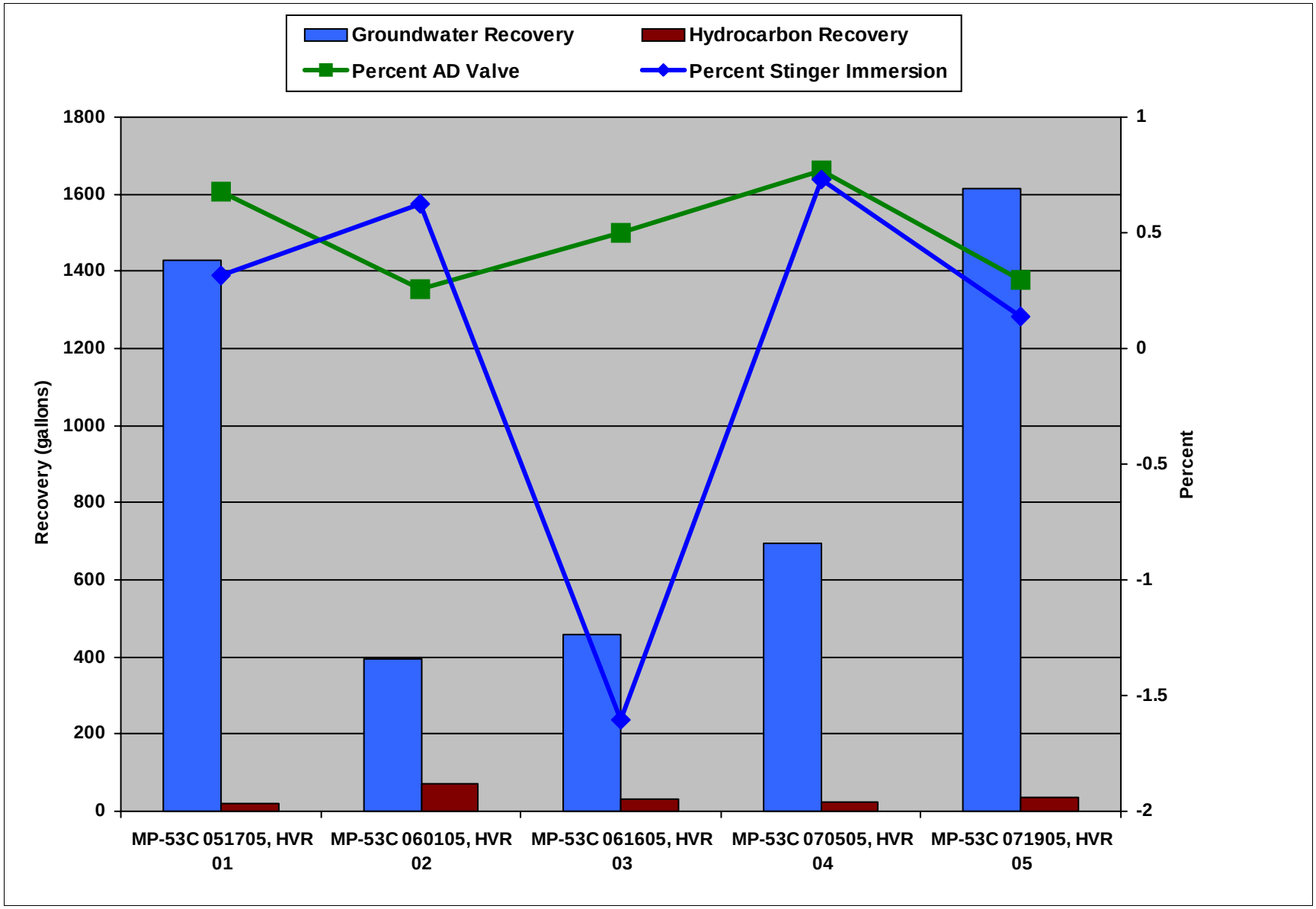

Figure 139: MP-53C
HiVac Event Recharge as a Percentage of Original Product Thickness

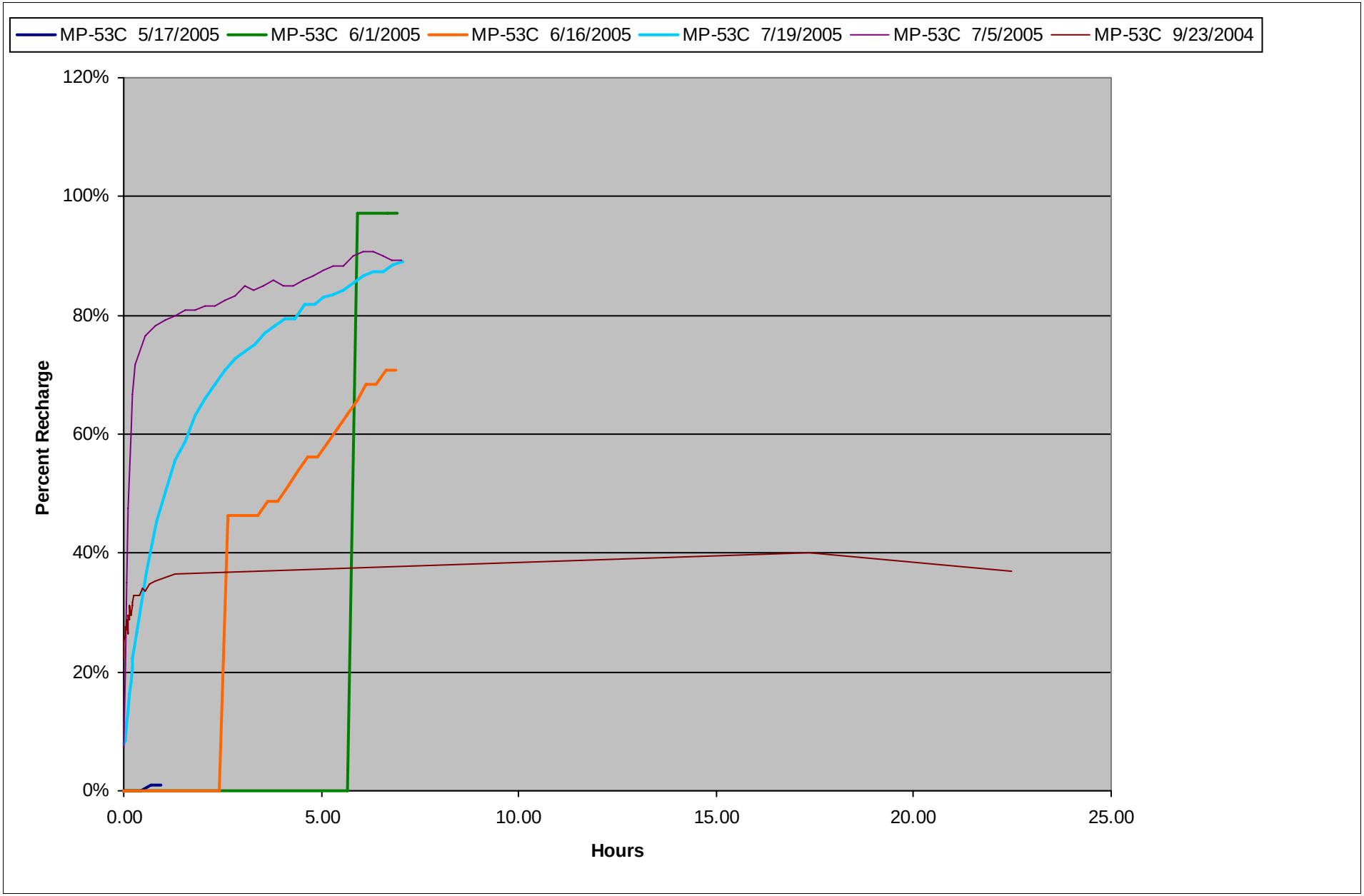

Figure 140: MP-53C
HiVac Event Recharge as Product Thickness in Feet

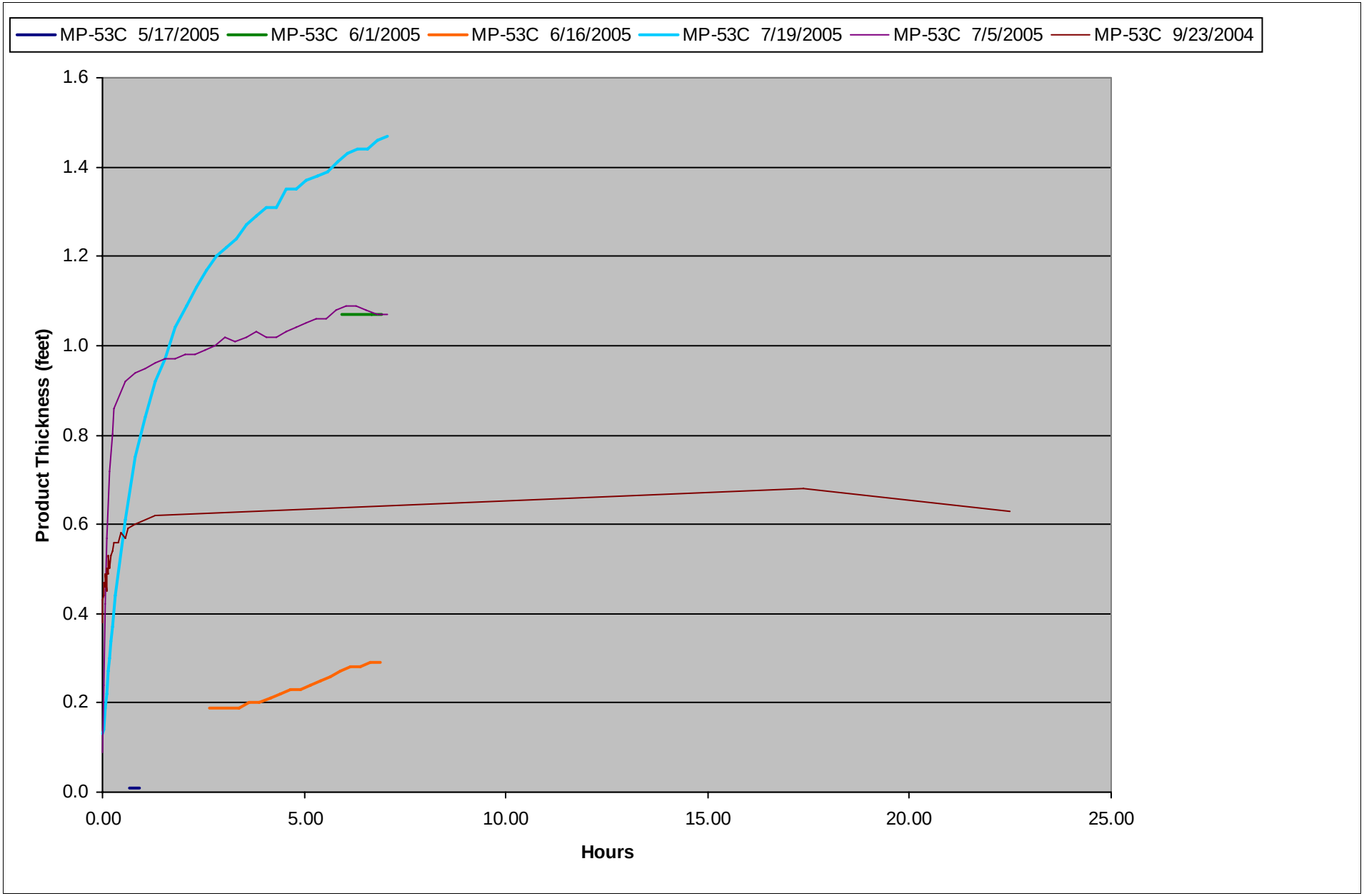

Figure 141: Production Hydrostratigraph

MP-53C

Time Scale

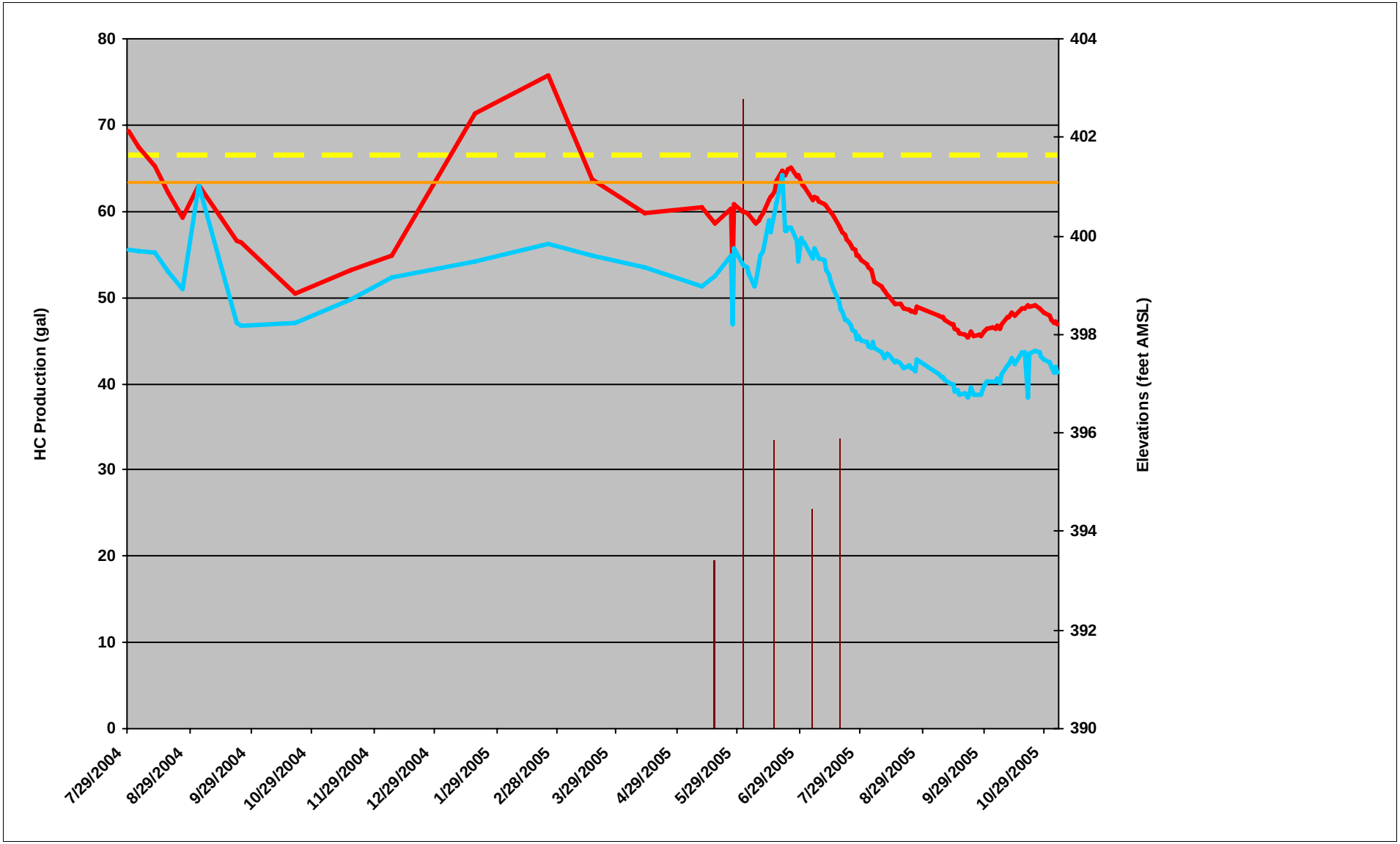

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Figure 142: MP-53C
Depth to Top of LNAPL vs. LNAPL Thickness 2005

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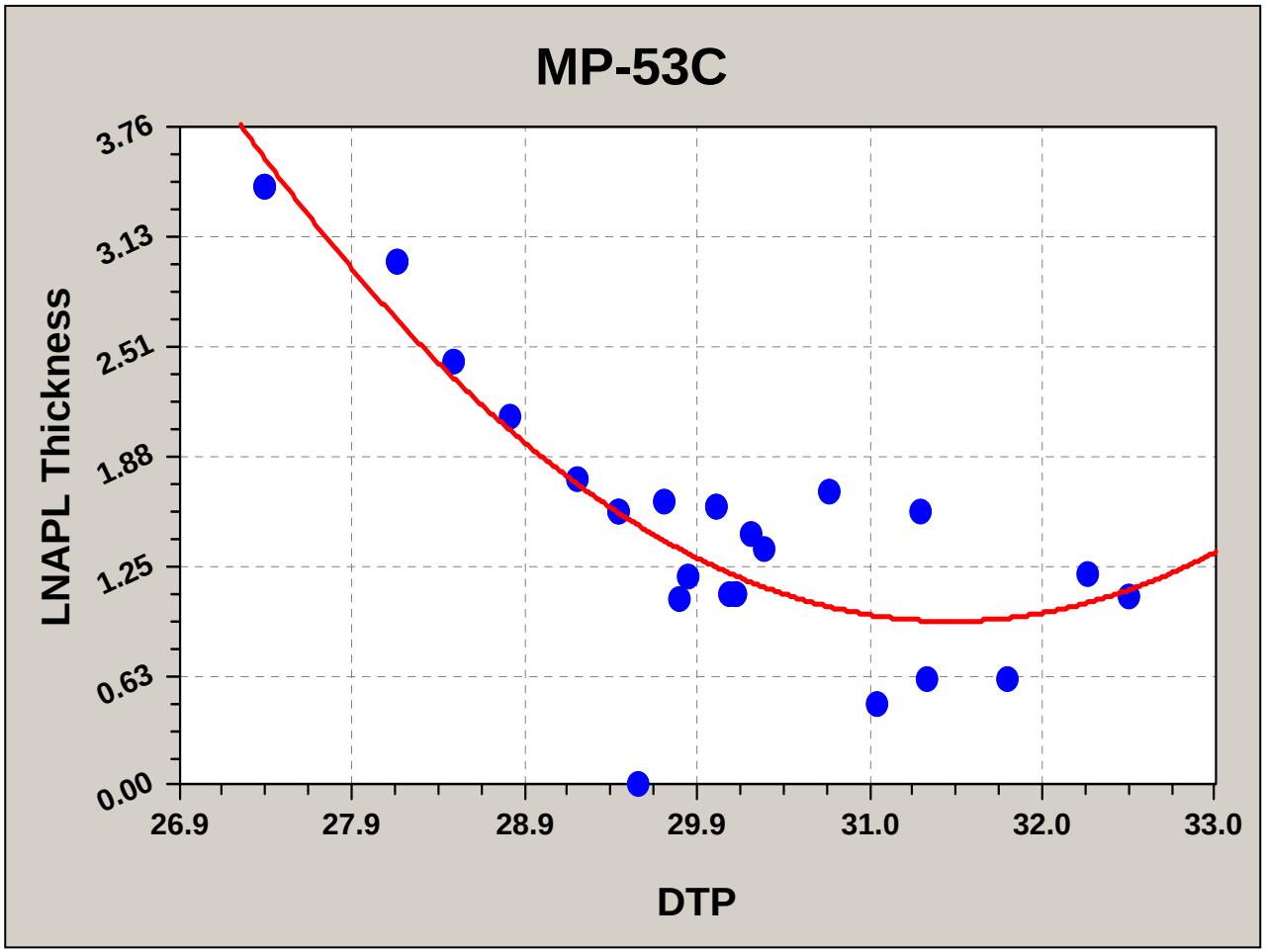

Figure 143: MP-54C
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

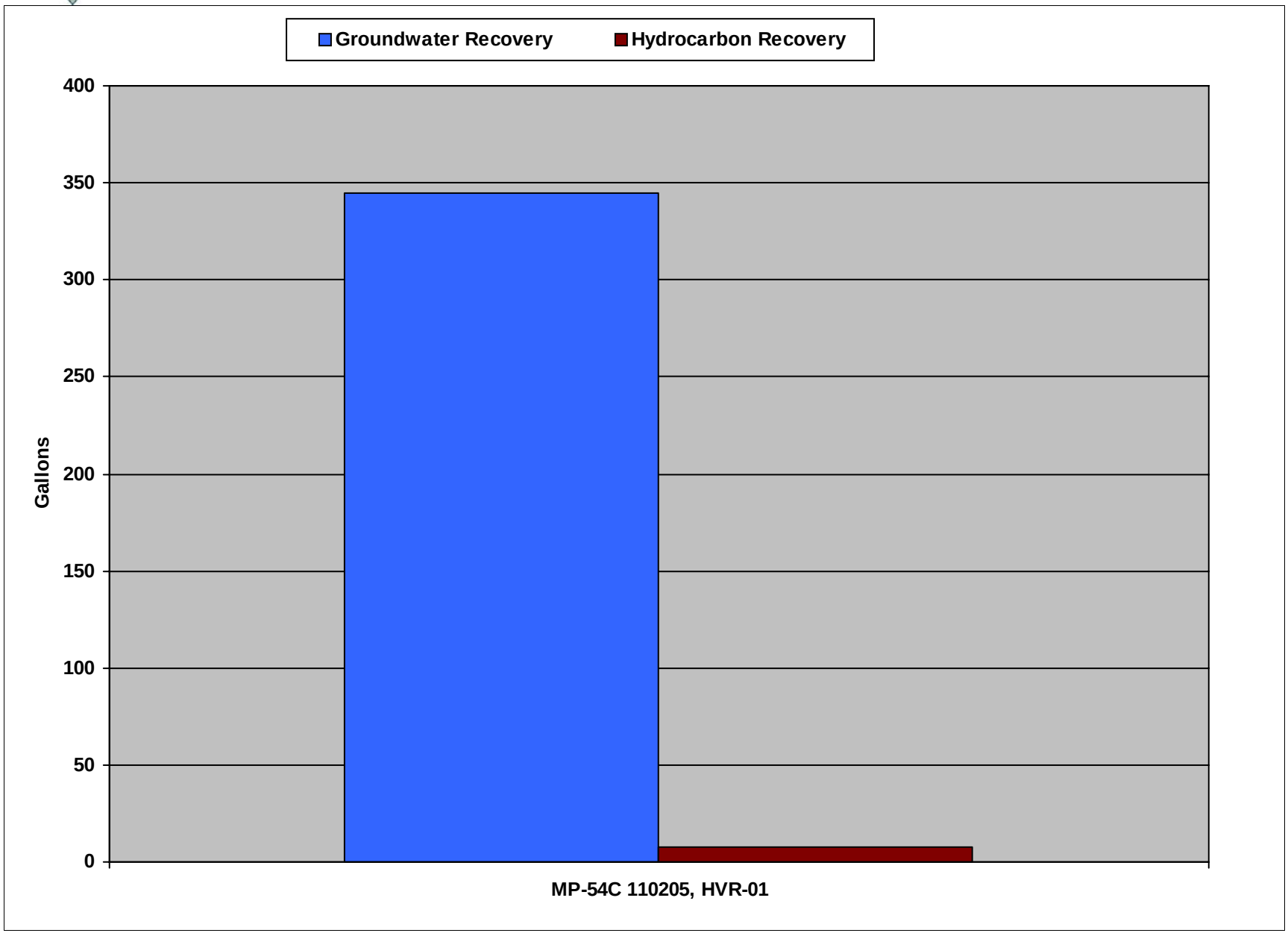

Figure 144: MP-54C
Multi-Site Hydrocarbon Recovery Rate (Gal/Hr) - Grouped by Site

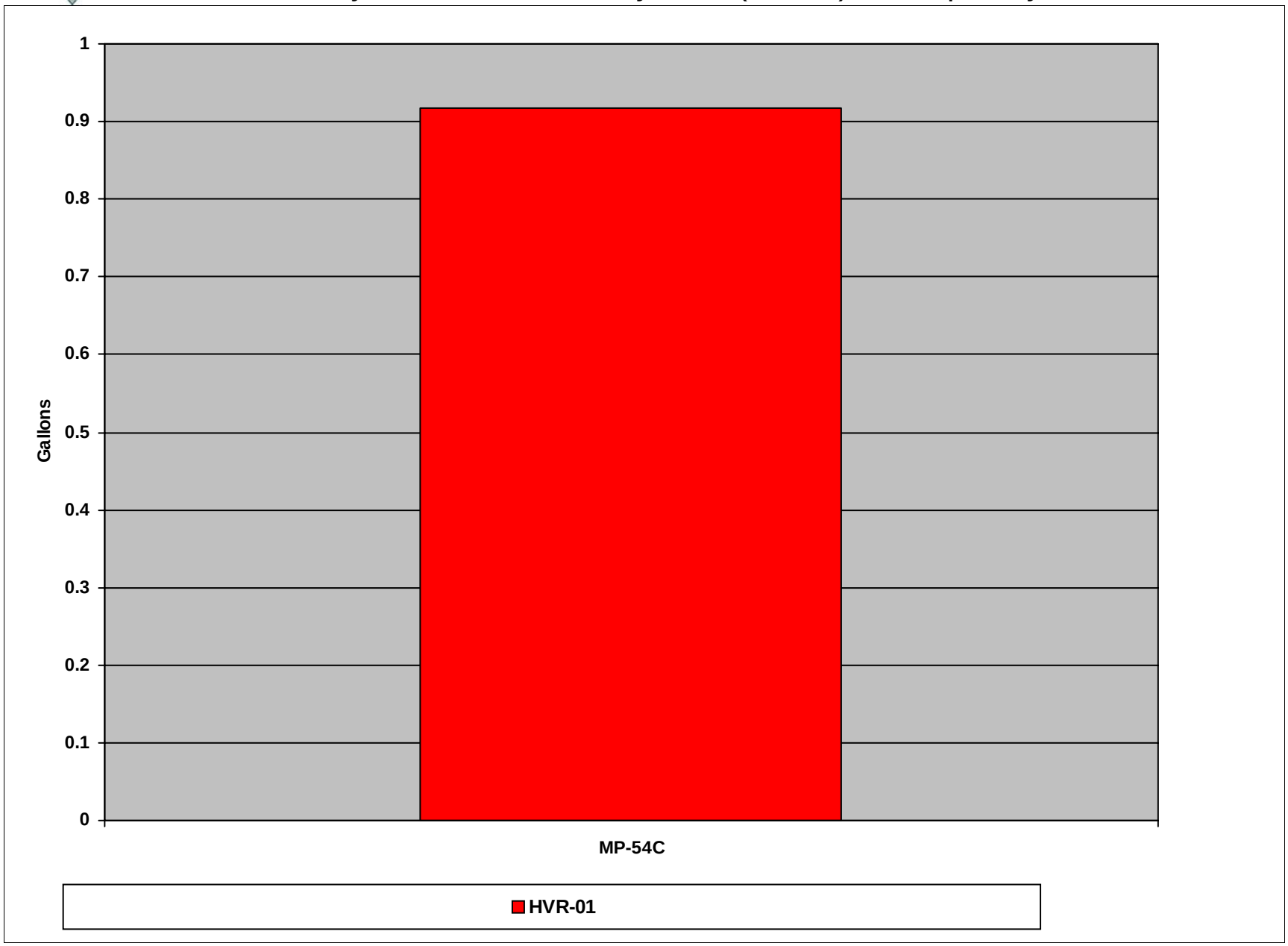

Figure 145: MP-54C
Hydrocarbon Recovery vs. Groundwater Recovery - with Vacuums

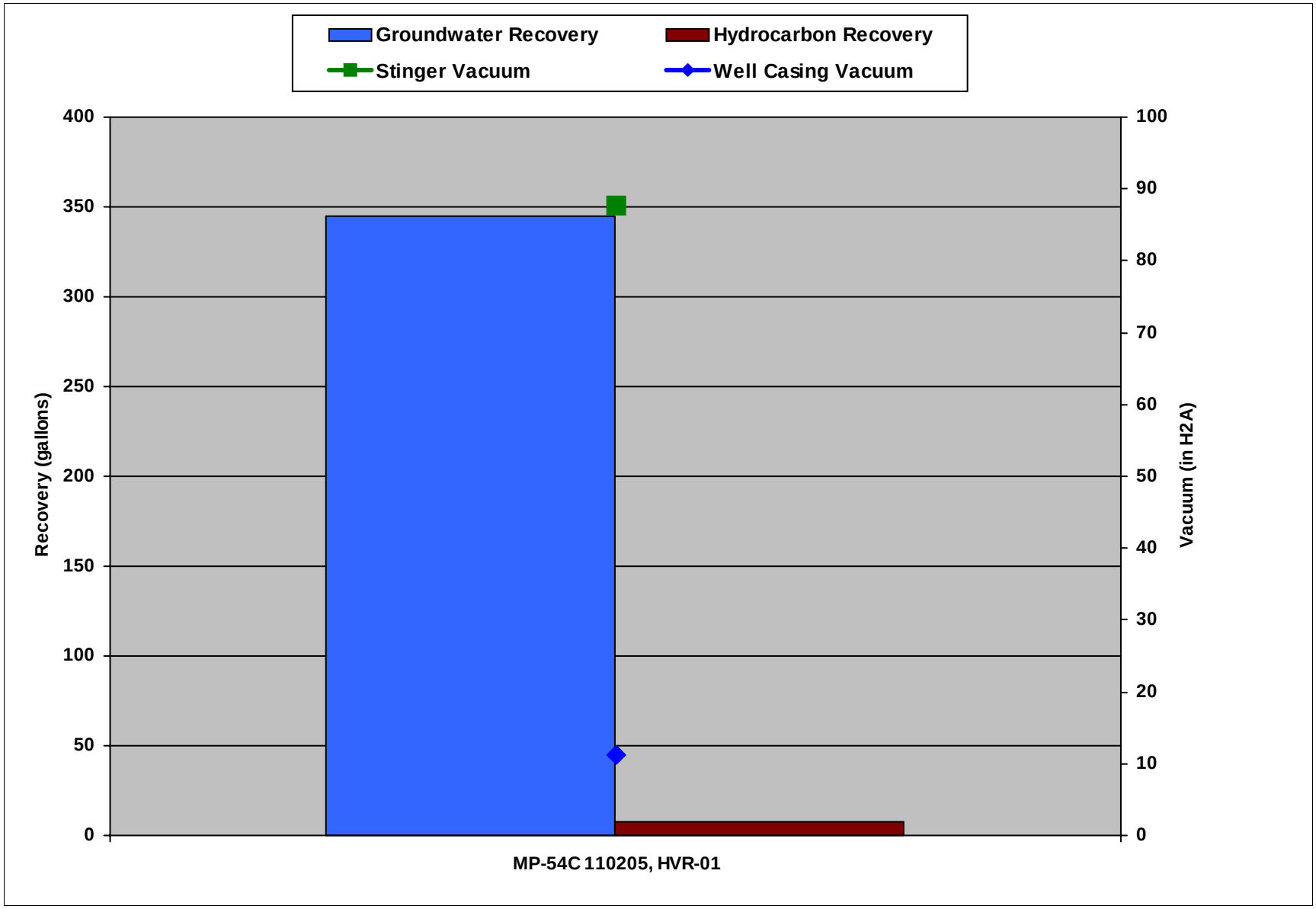

Figure 146: MP-54C
Hydrocarbon Recovery vs. Groundwater Recovery - with Percentages

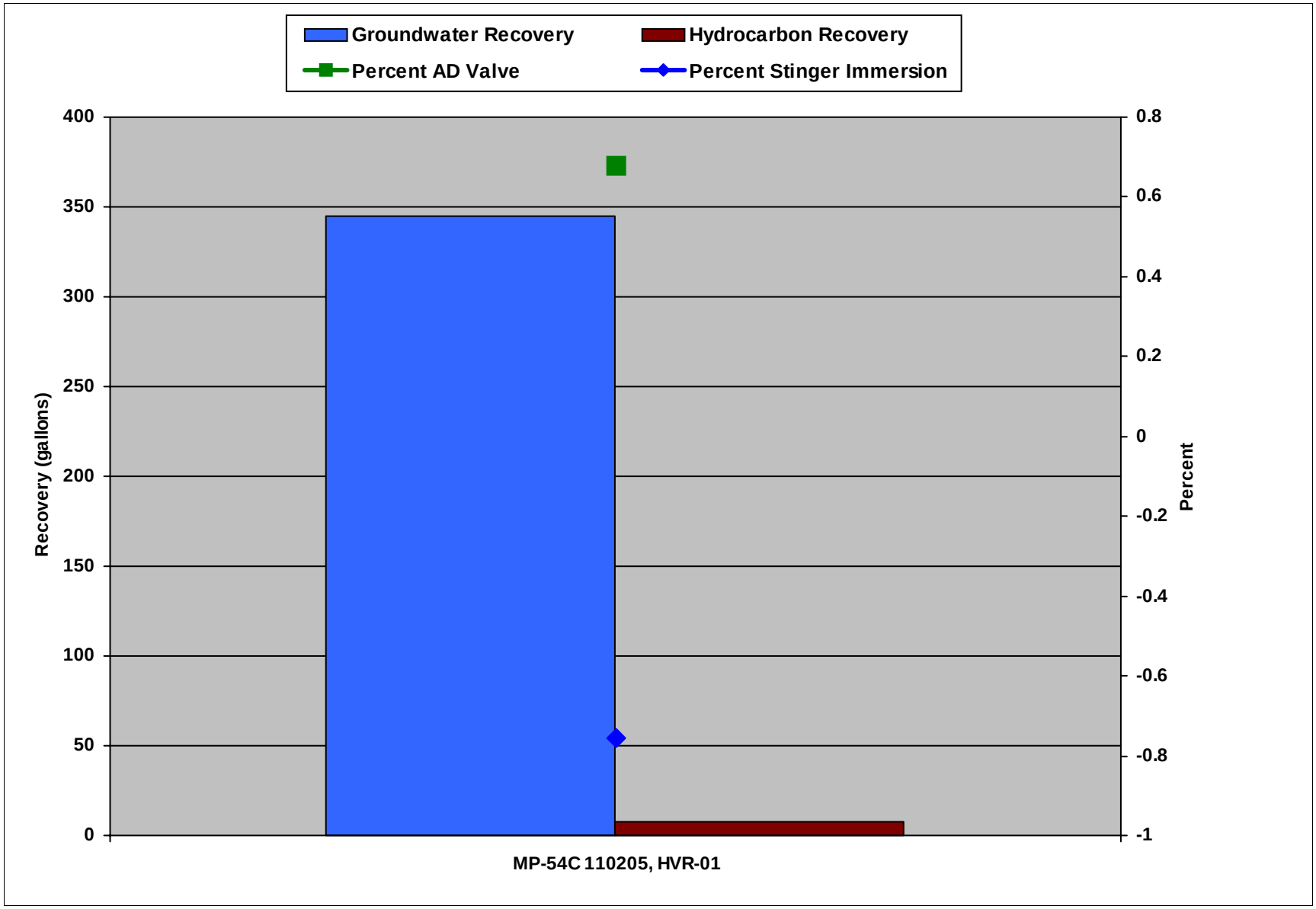

Figure 147: MP-54C
HiVac Event Recharge as a Percentage of Original Product Thickness

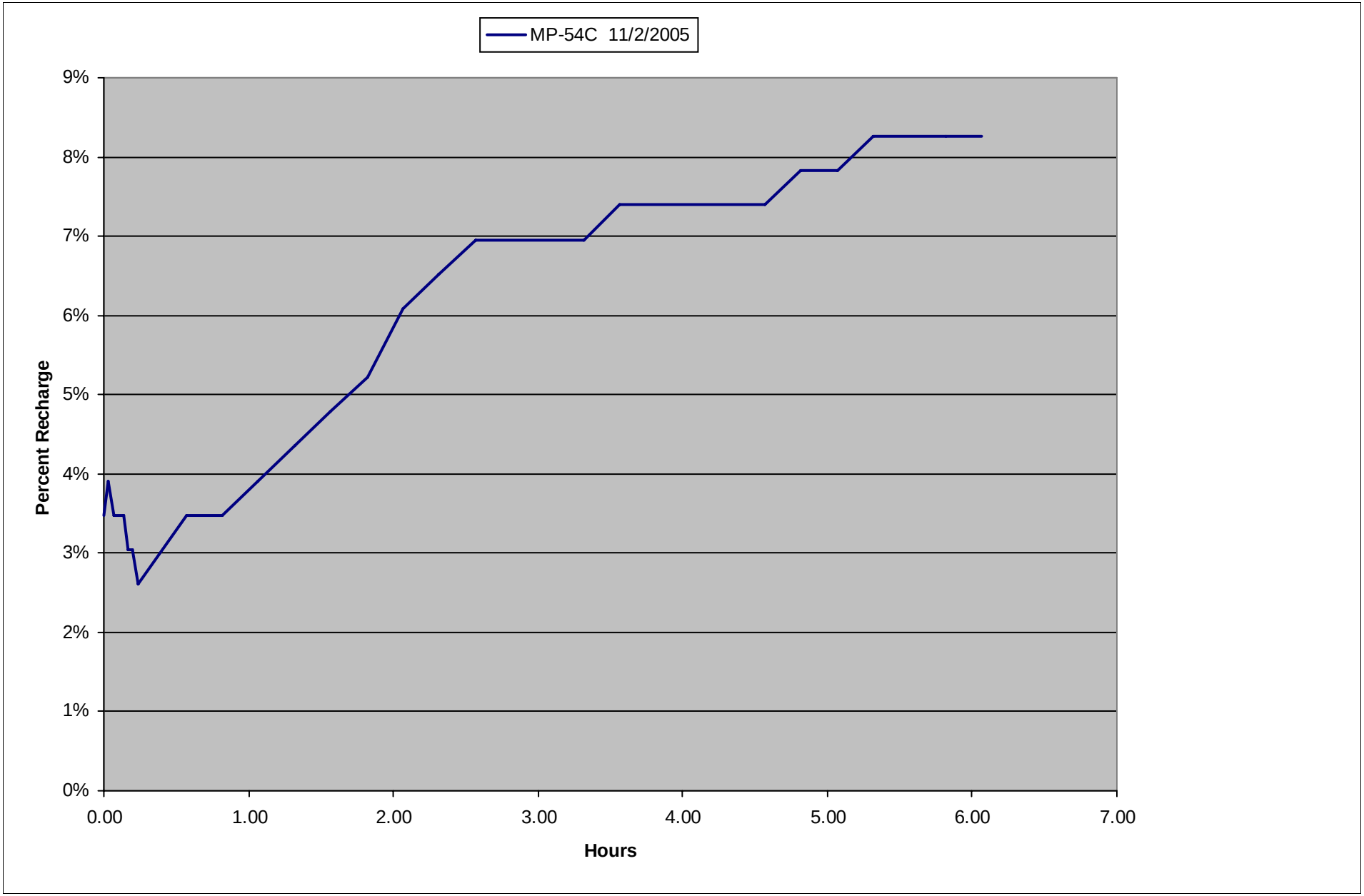

Figure 148: MP-54C
HiVac Event Recharge as Product Thickness in Feet

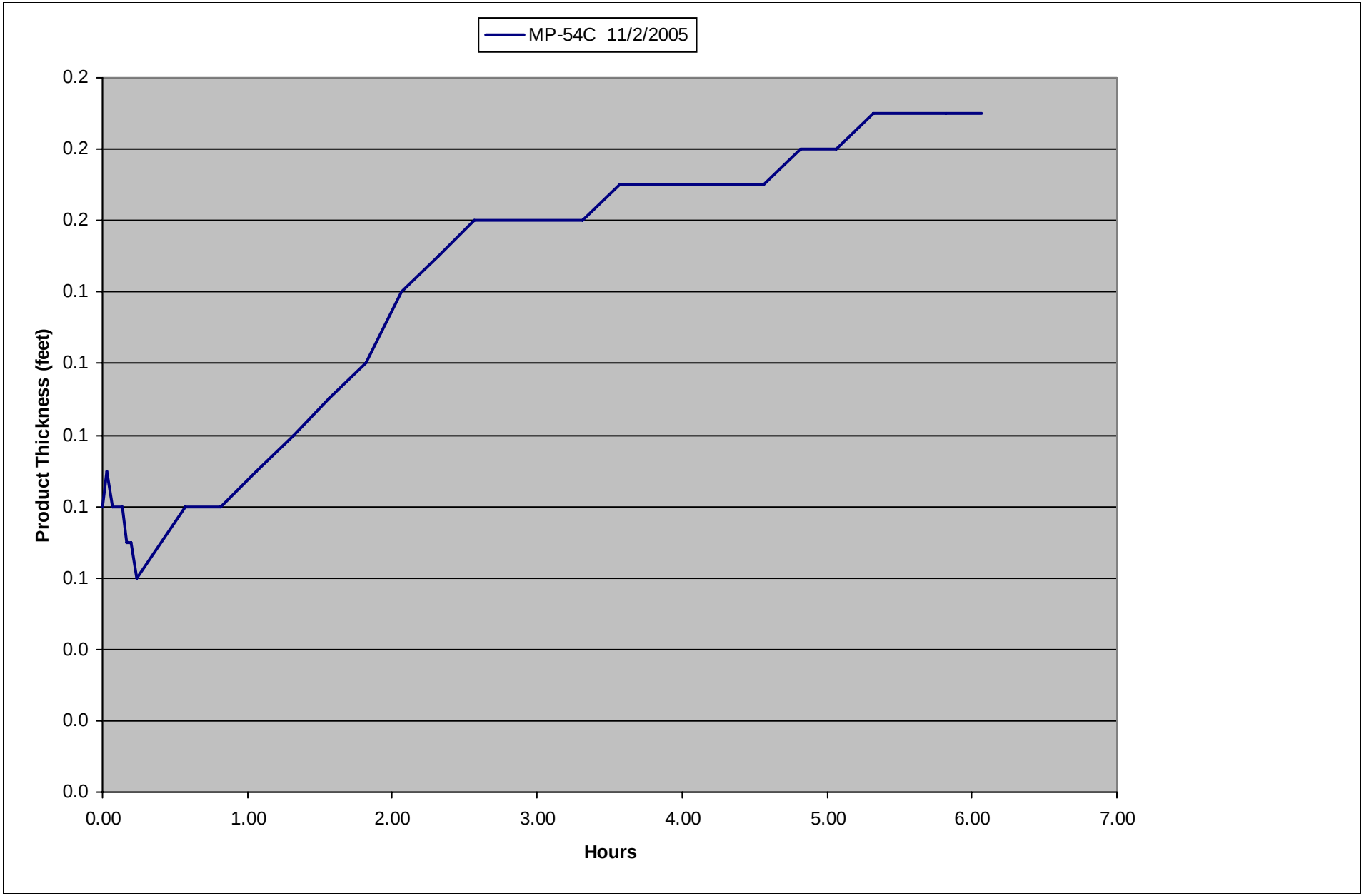

Figure 149: MP-54C
Depth to Top of LNAPL vs. LNAPL Thickness 2005

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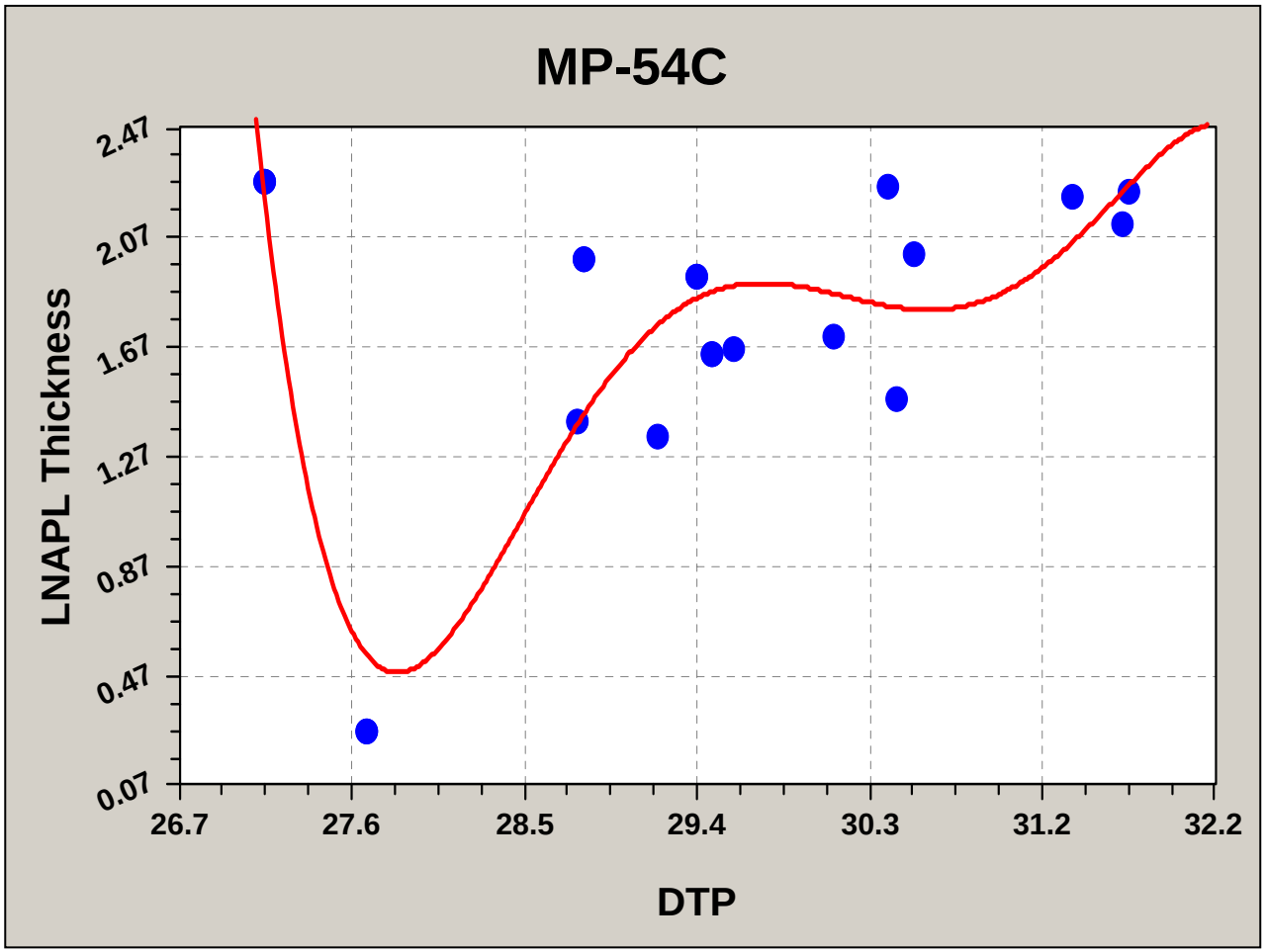

Figure 150: MP-55C
Multi-Site Cumulative Product Recovery (Gallons)

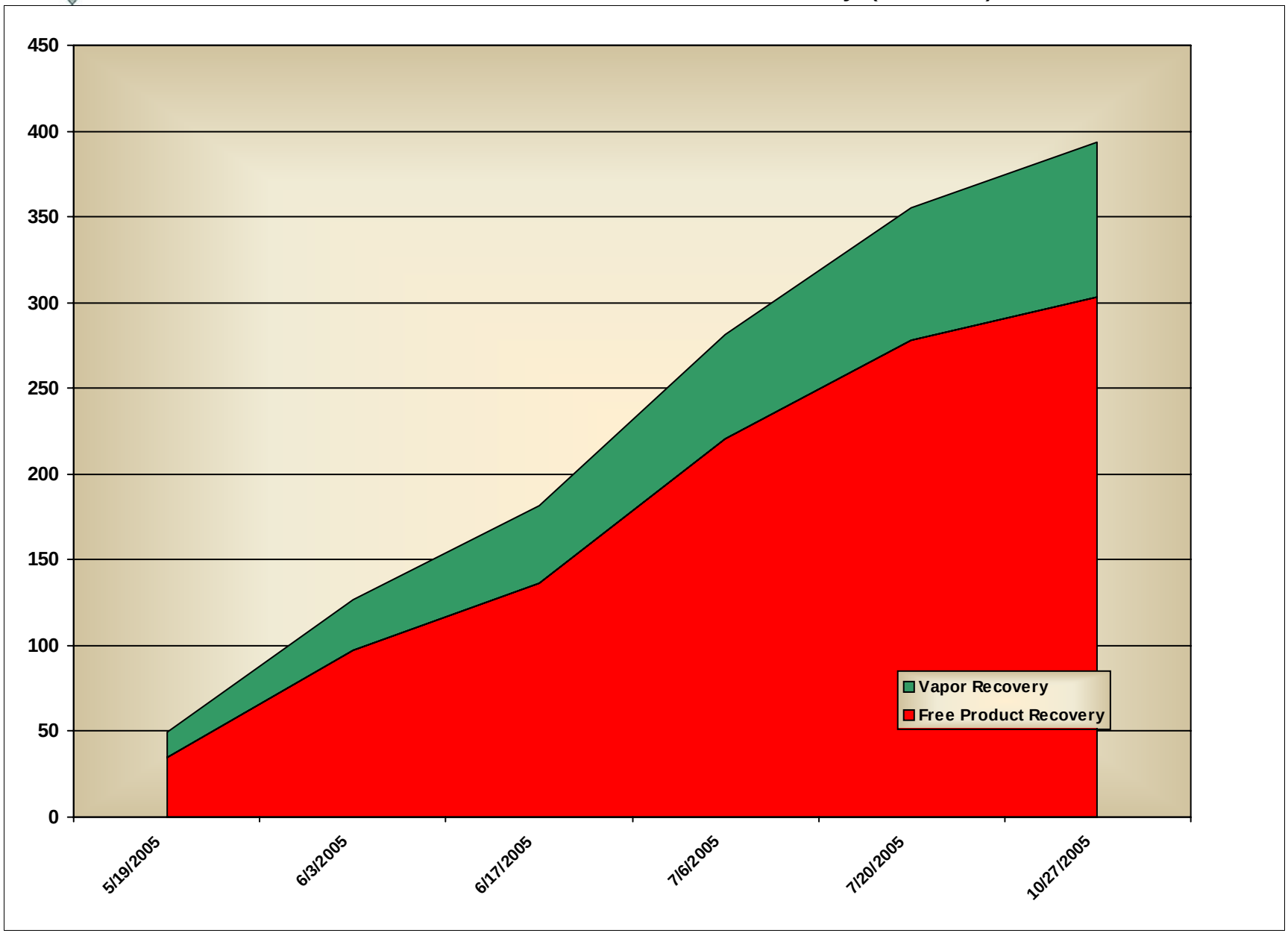

Figure 151: MP-55C
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

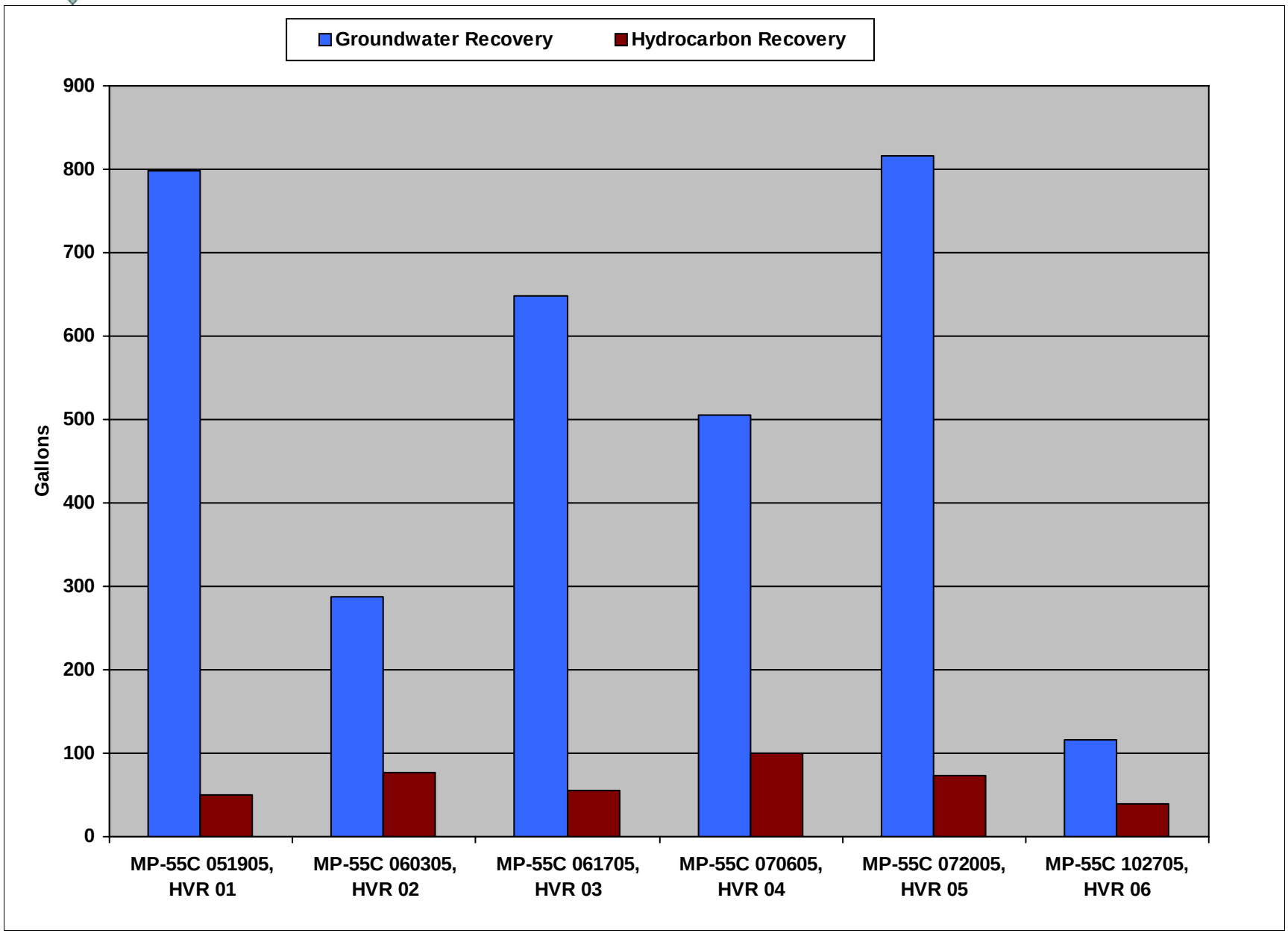

Figure 152: MP-55C
Multi-Site Hydrocarbon Recovery Rate (Gal/Hr) - Grouped by Site

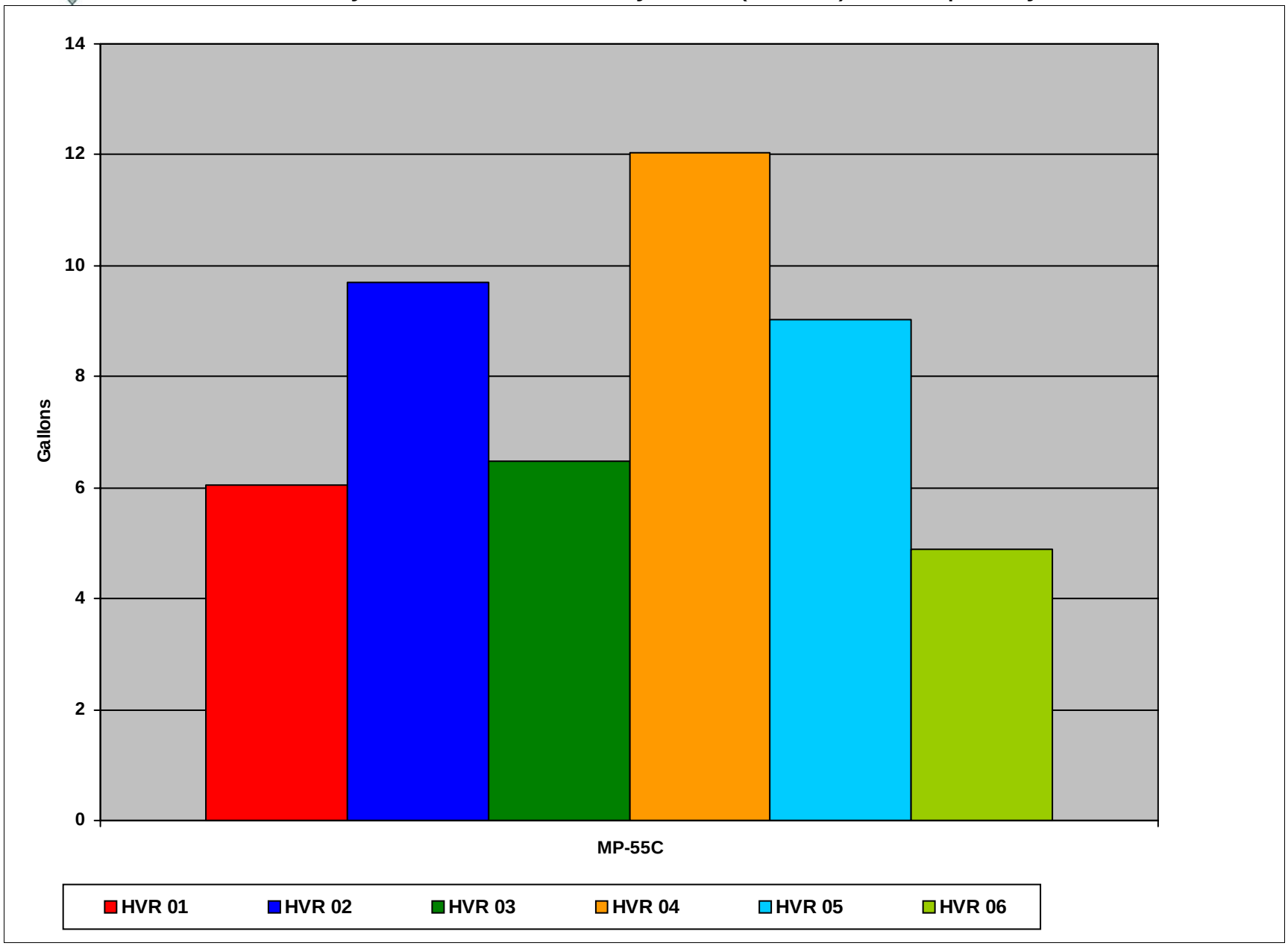

Figure 153: MP-55C
Multi-Site LB per Hour - ICE Calculated vs. Lab Sample

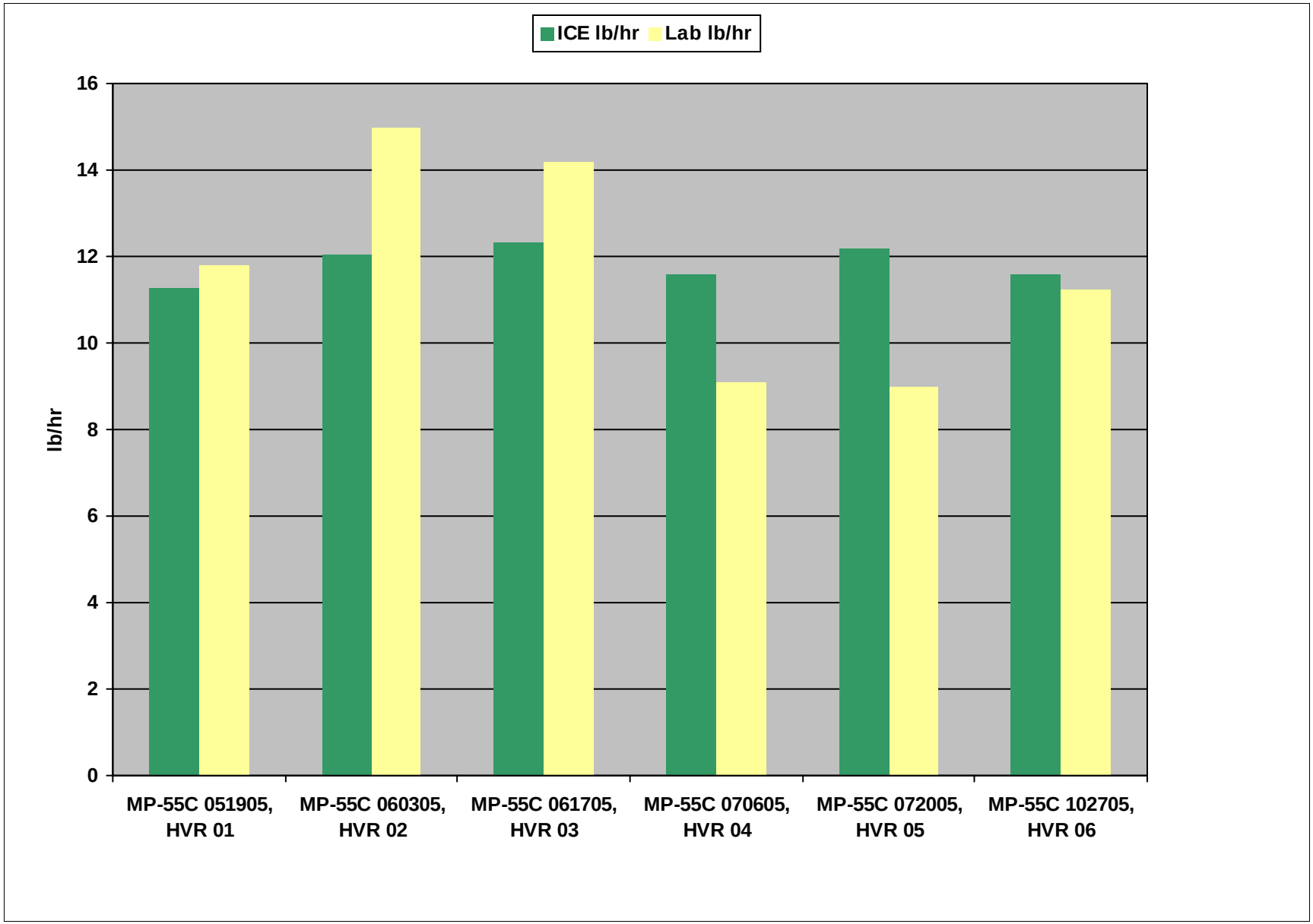

Figure 154: MP-55C
BTU per Hour

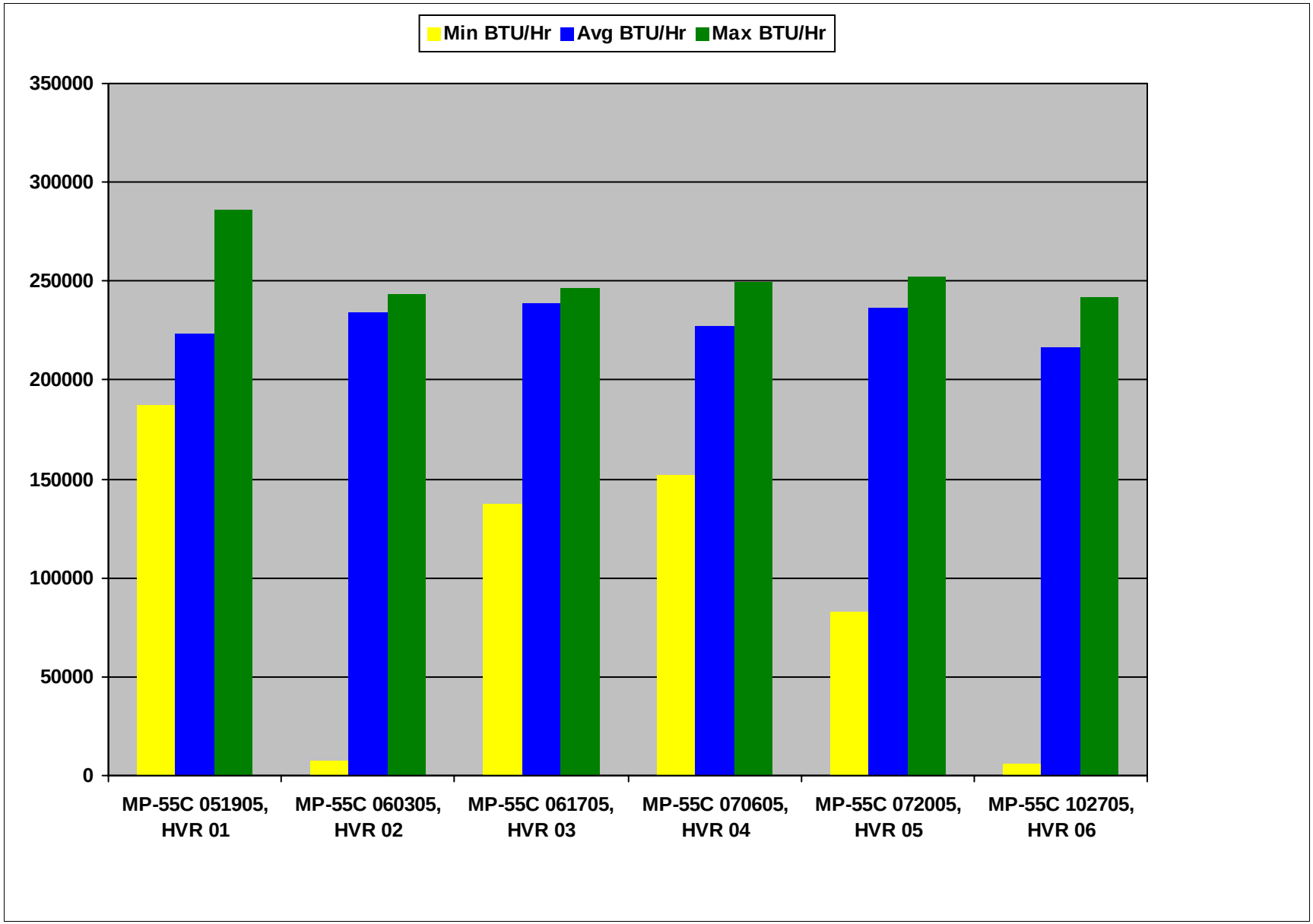

Figure 155: MP-55C
Multi-Site Vacuums

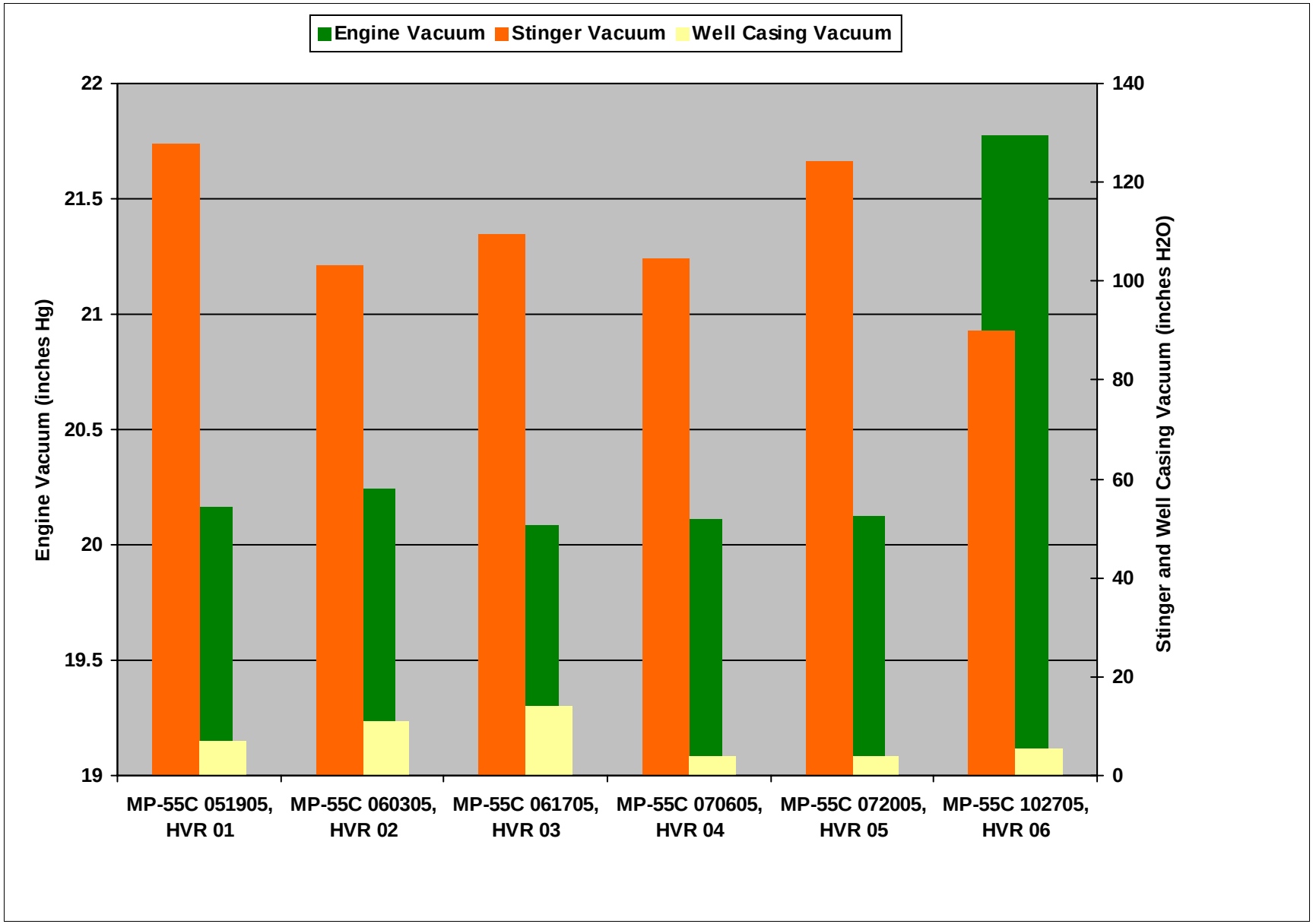

Figure 156: MP-55C
Multi-Site Air, Well and Fuel Flows

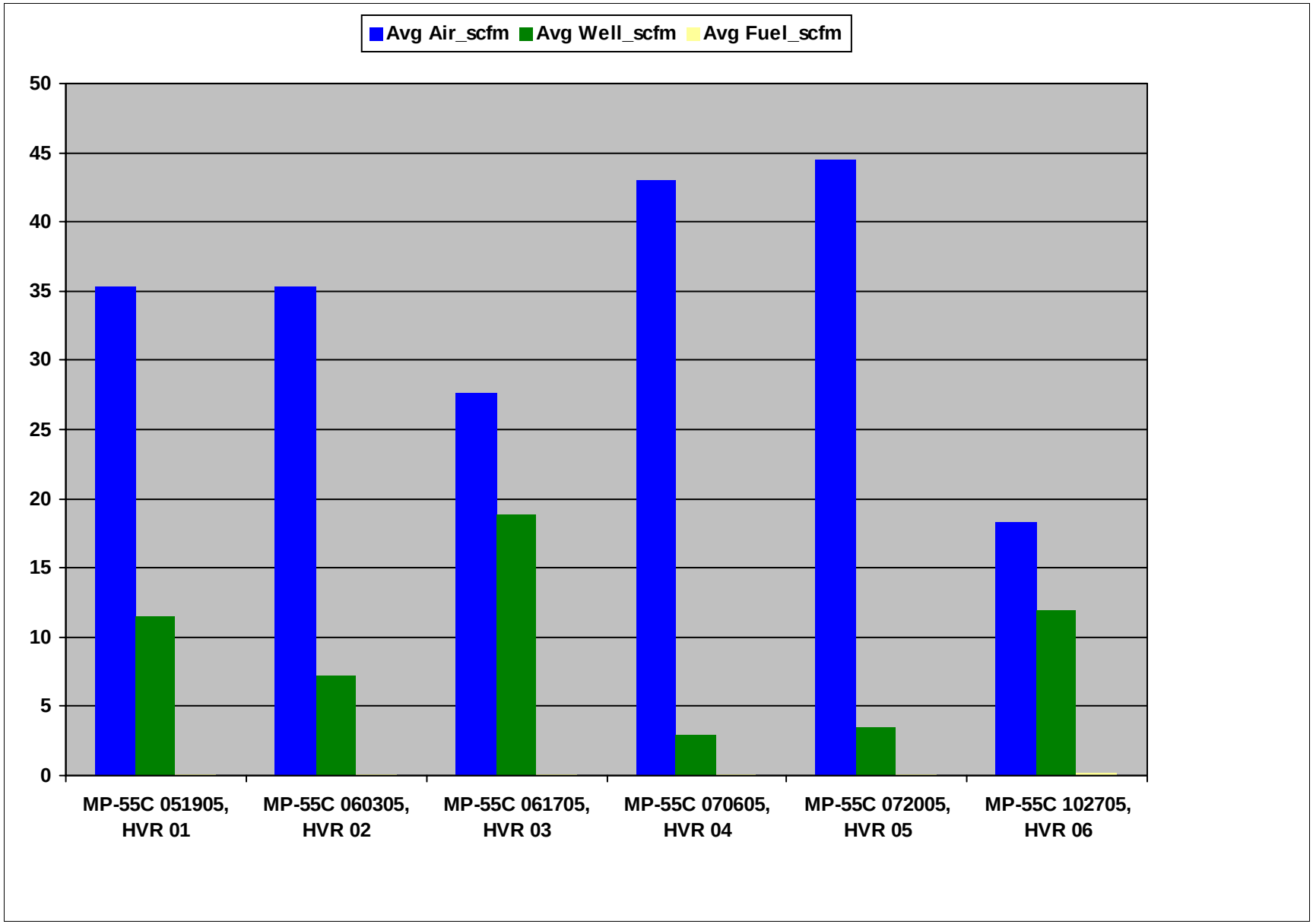

Figure 157: MP-55C Gauging, Stinger and Production Data
Hydrocarbon Recovery vs. Groundwater Recovery - with Elevations

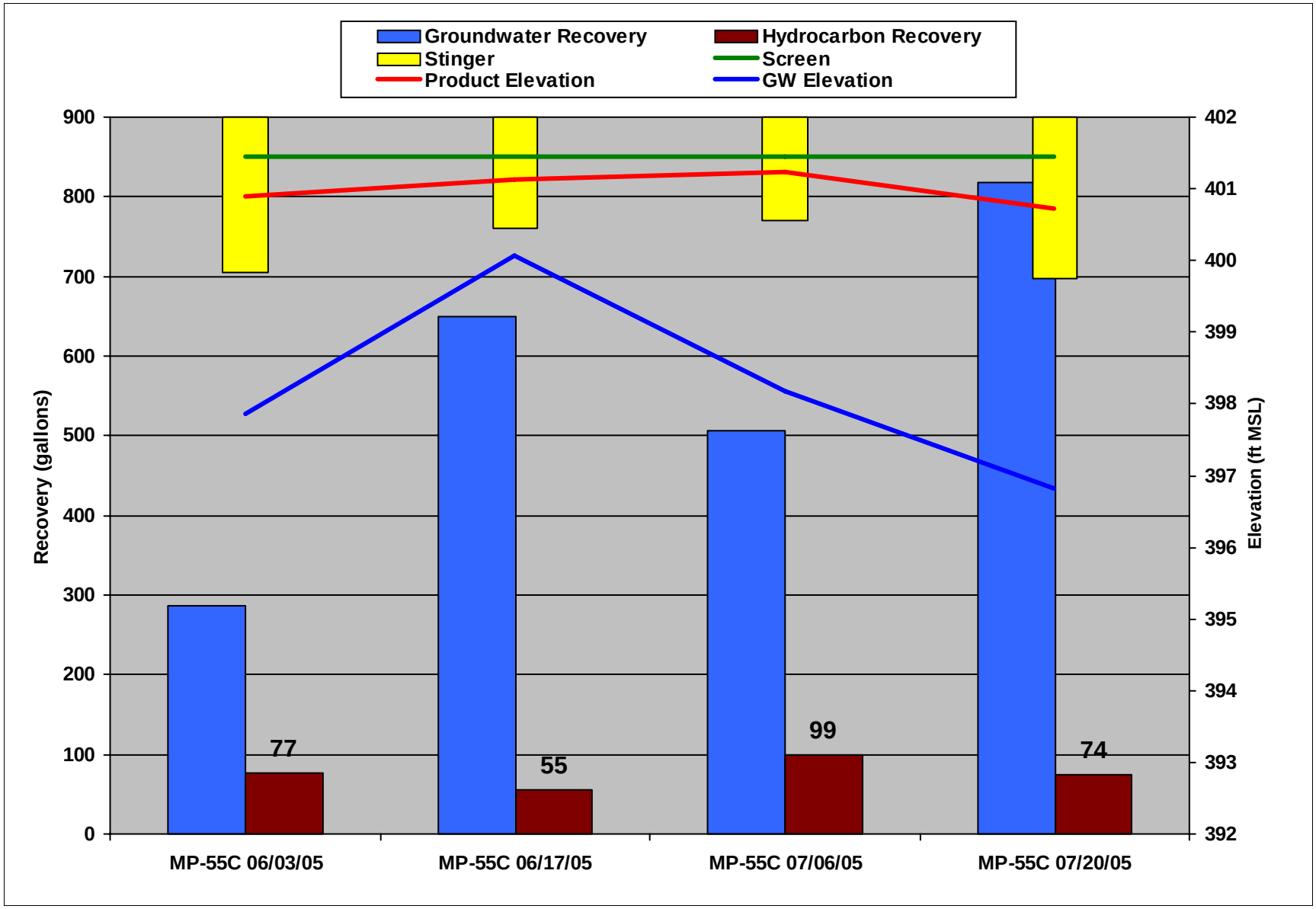

Figure 158: MP-55C
Hydrocarbon Recovery vs. Groundwater Recovery - with Vacuums

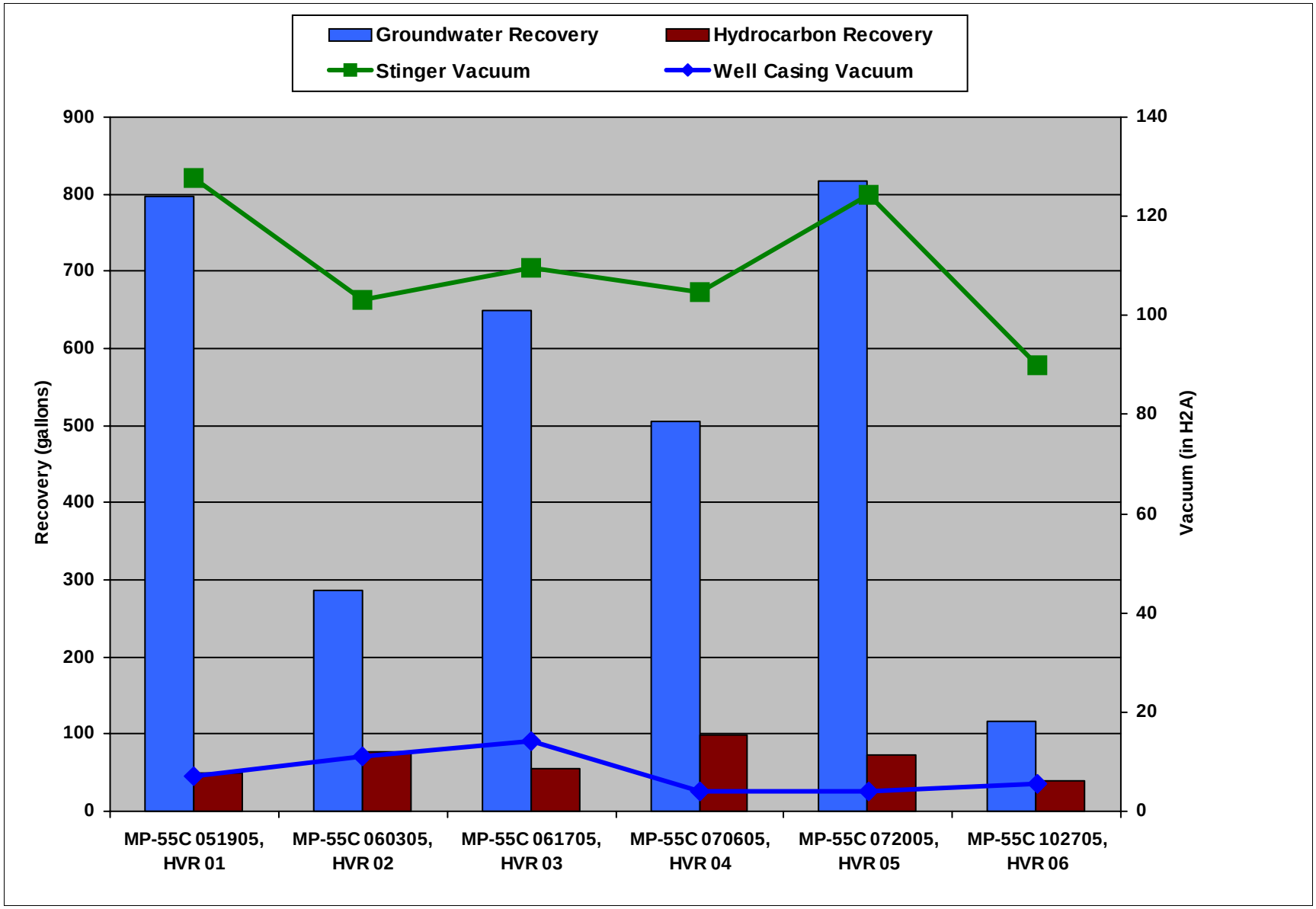

Figure 159: MP-55C
Hydrocarbon Recovery vs. Groundwater Recovery - with Percentages

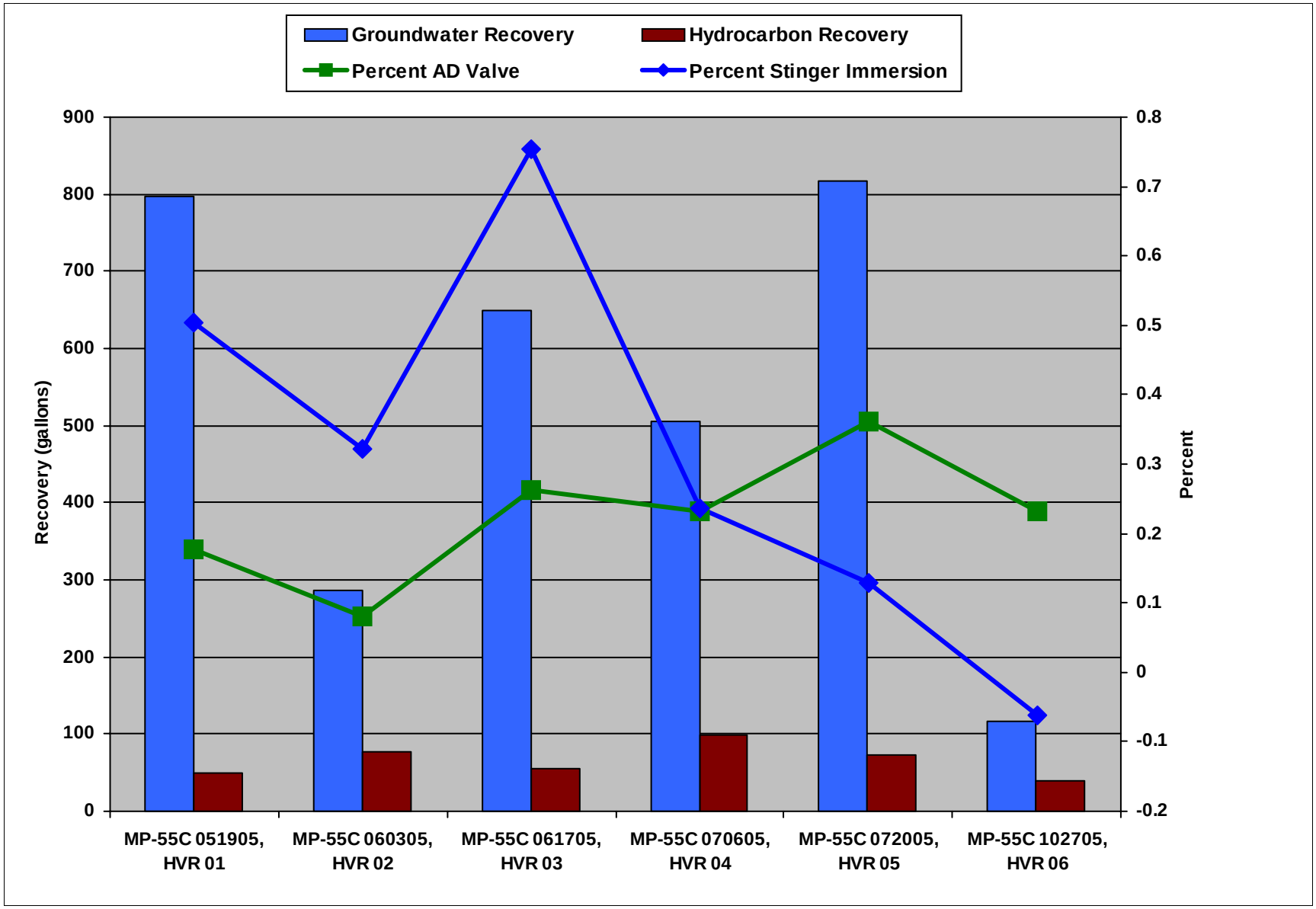

Figure 160: MP-55C
HiVac Event Recharge as a Percentage of Original Product Thickness

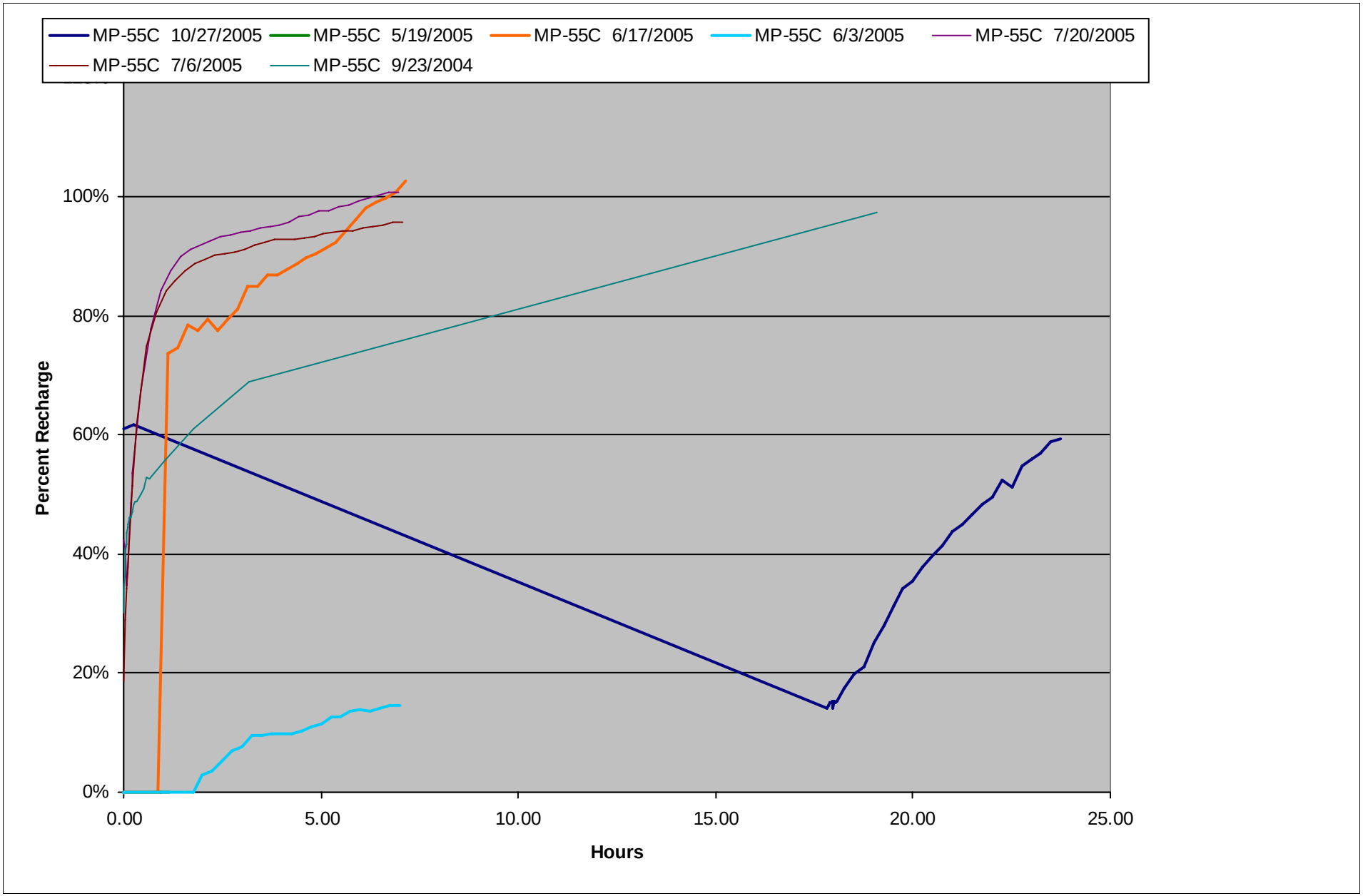

Figure 161: MP-55C
HiVac Event Recharge as Product Thickness in Feet

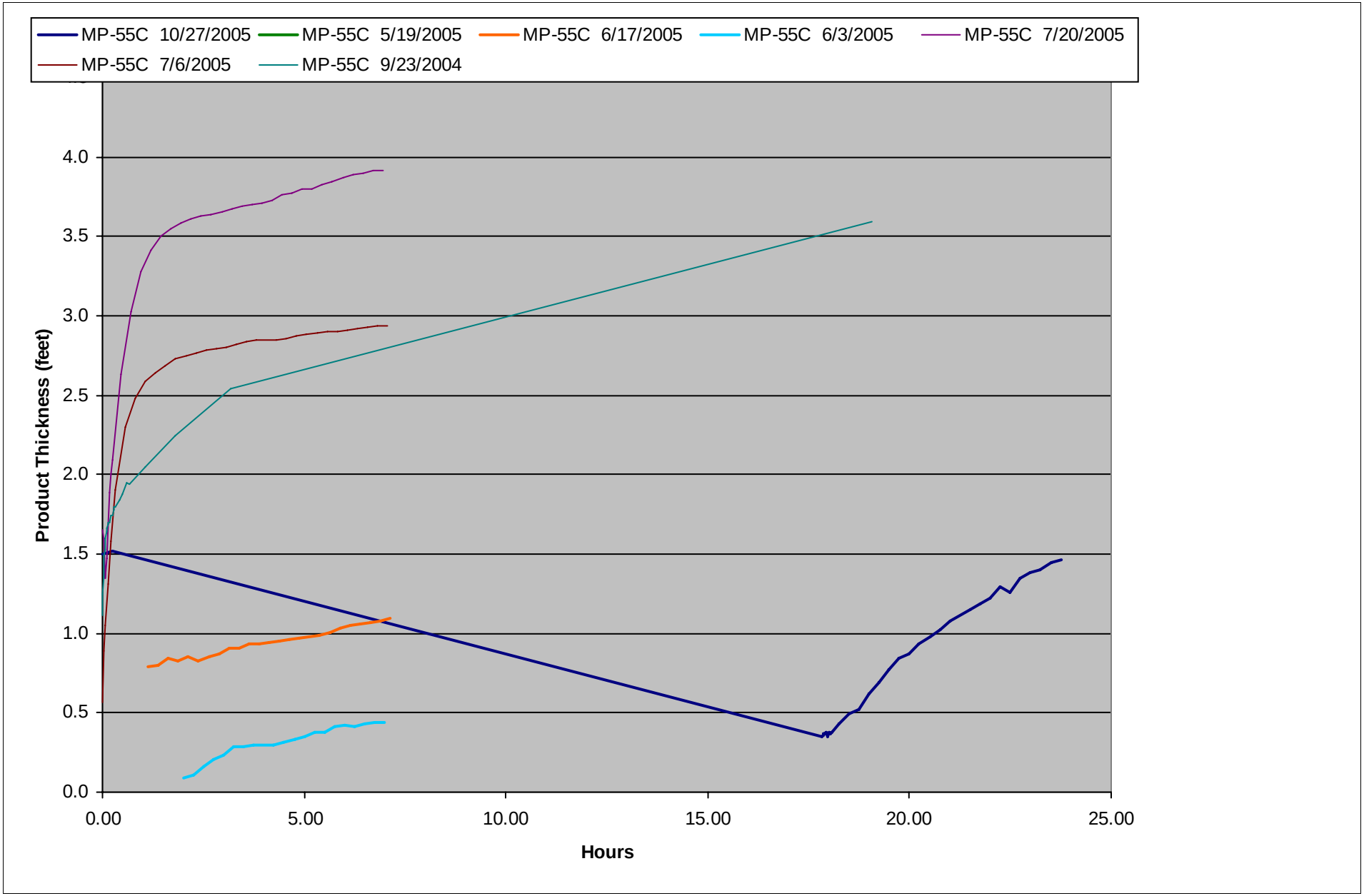

Figure 162: Production Hydrostratigraph

MP-55C

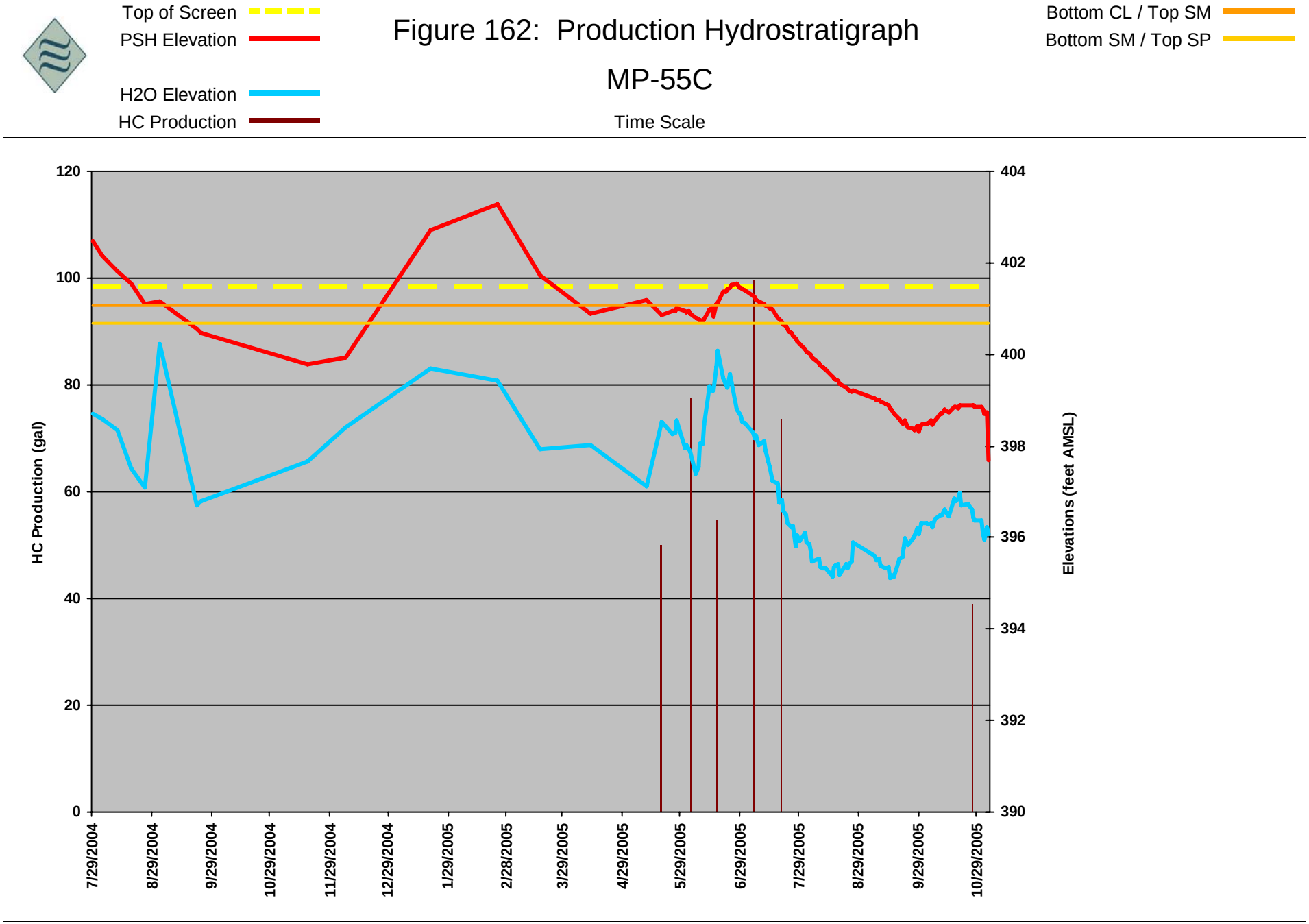

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Figure 163: MP-55C
Depth to Top of LNAPL vs. LNAPL Thickness 2004-2005

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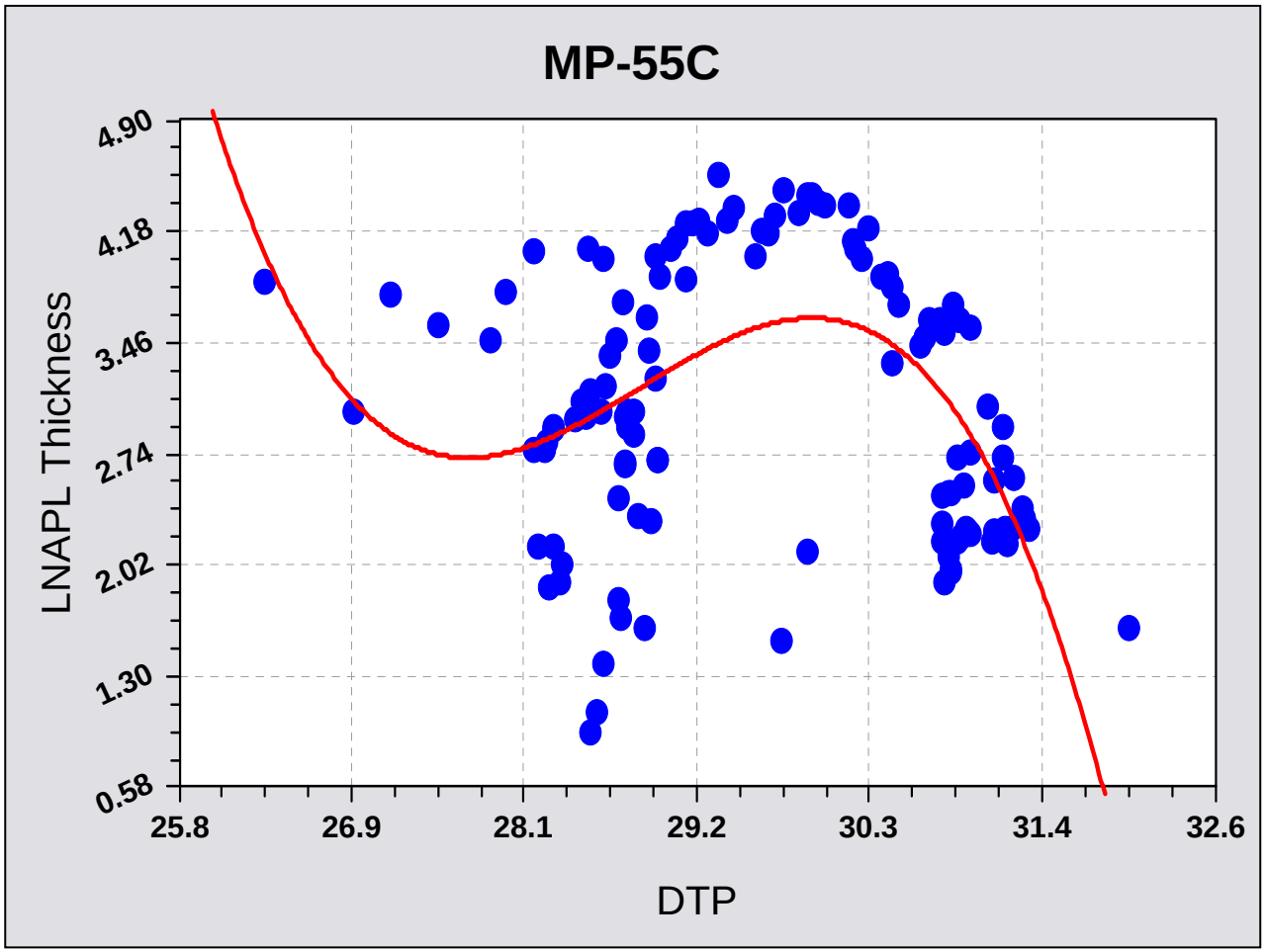


Figure 164: MP-56C
Multi-Site Cumulative Product Recovery (Gallons)

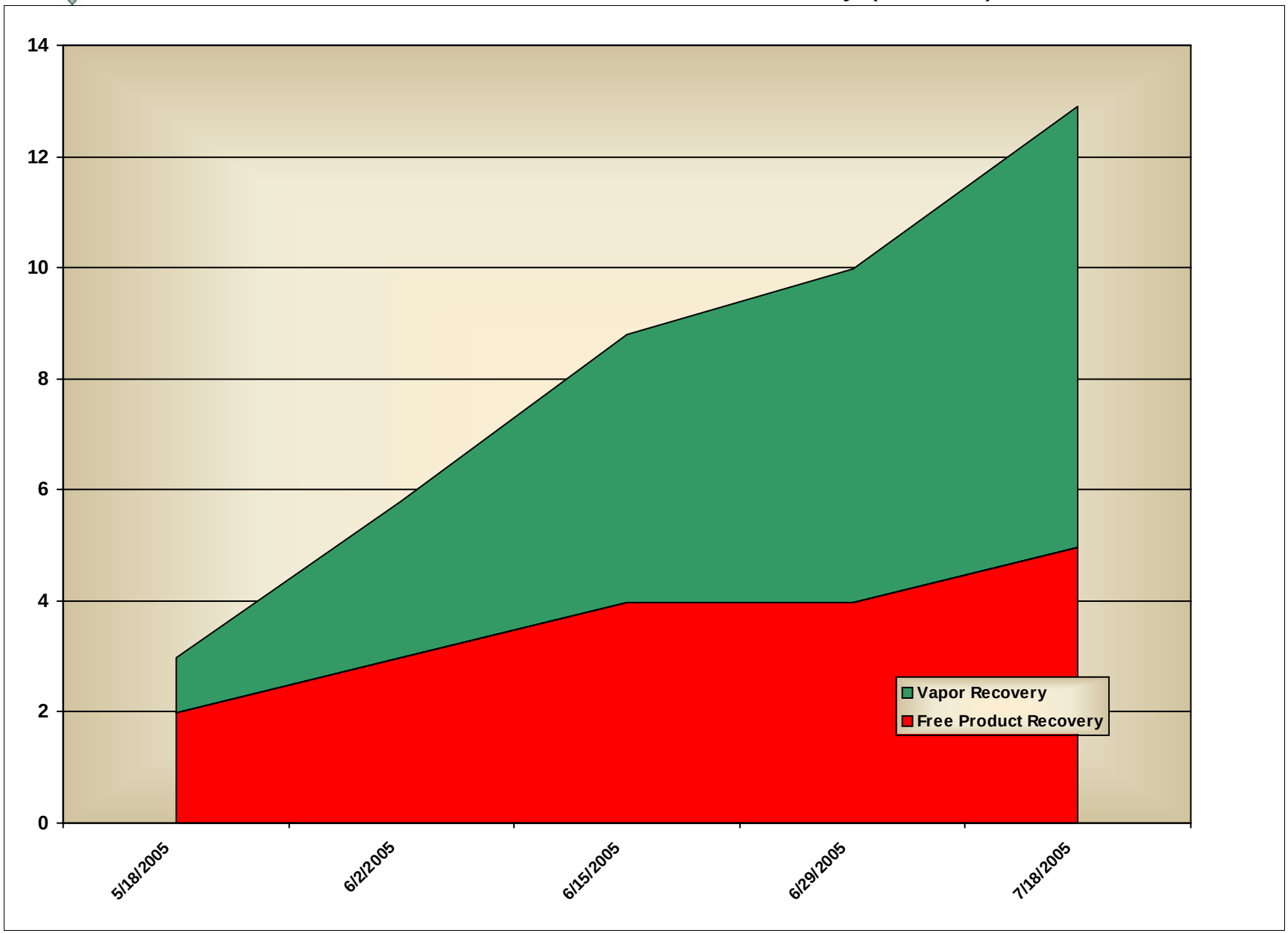


Figure 165: MP-56C
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

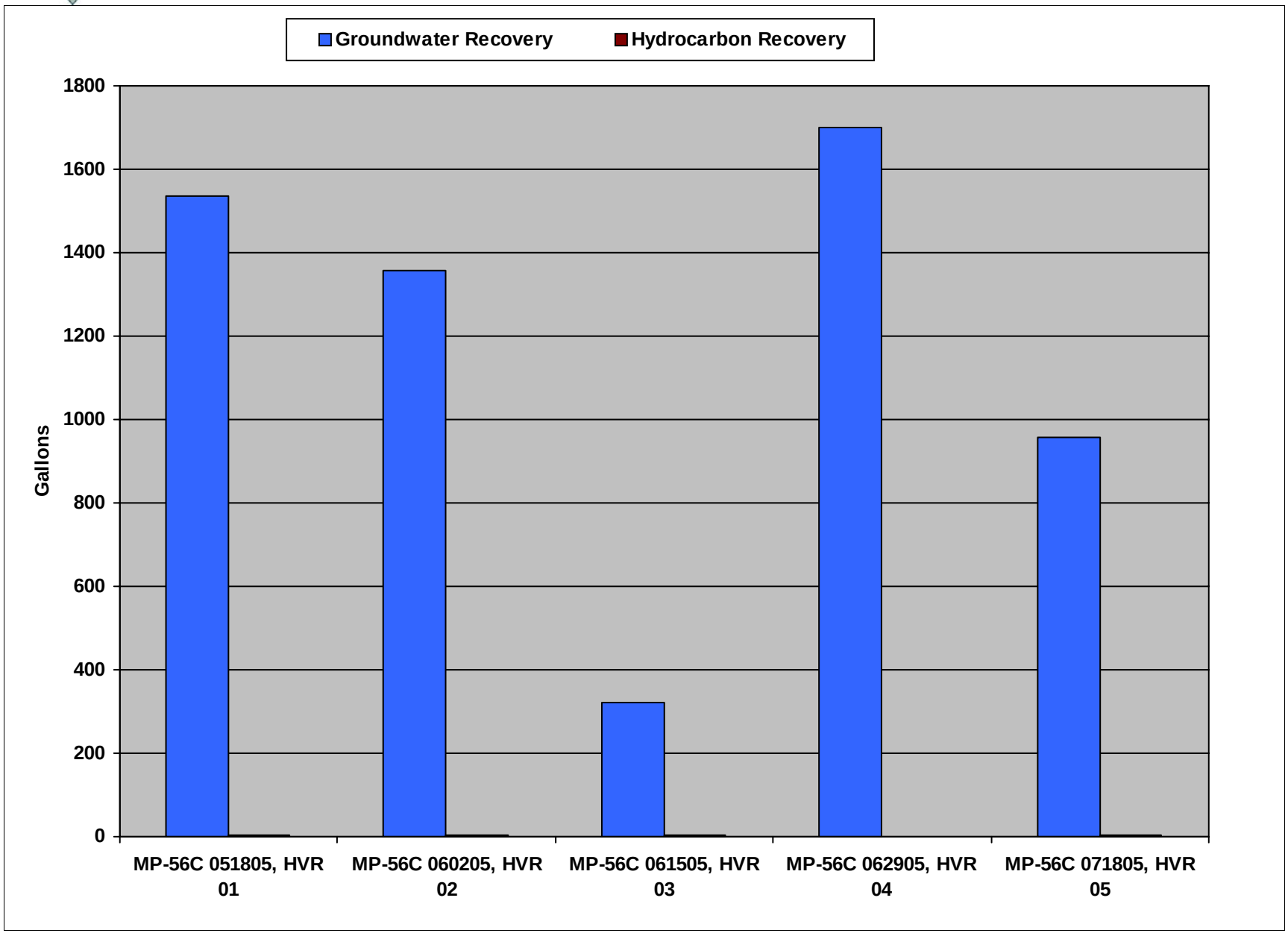


Figure 166: MP-56C
Multi-Site Hydrocarbon Recovery Rate (Gal/Hr) - Grouped by Site

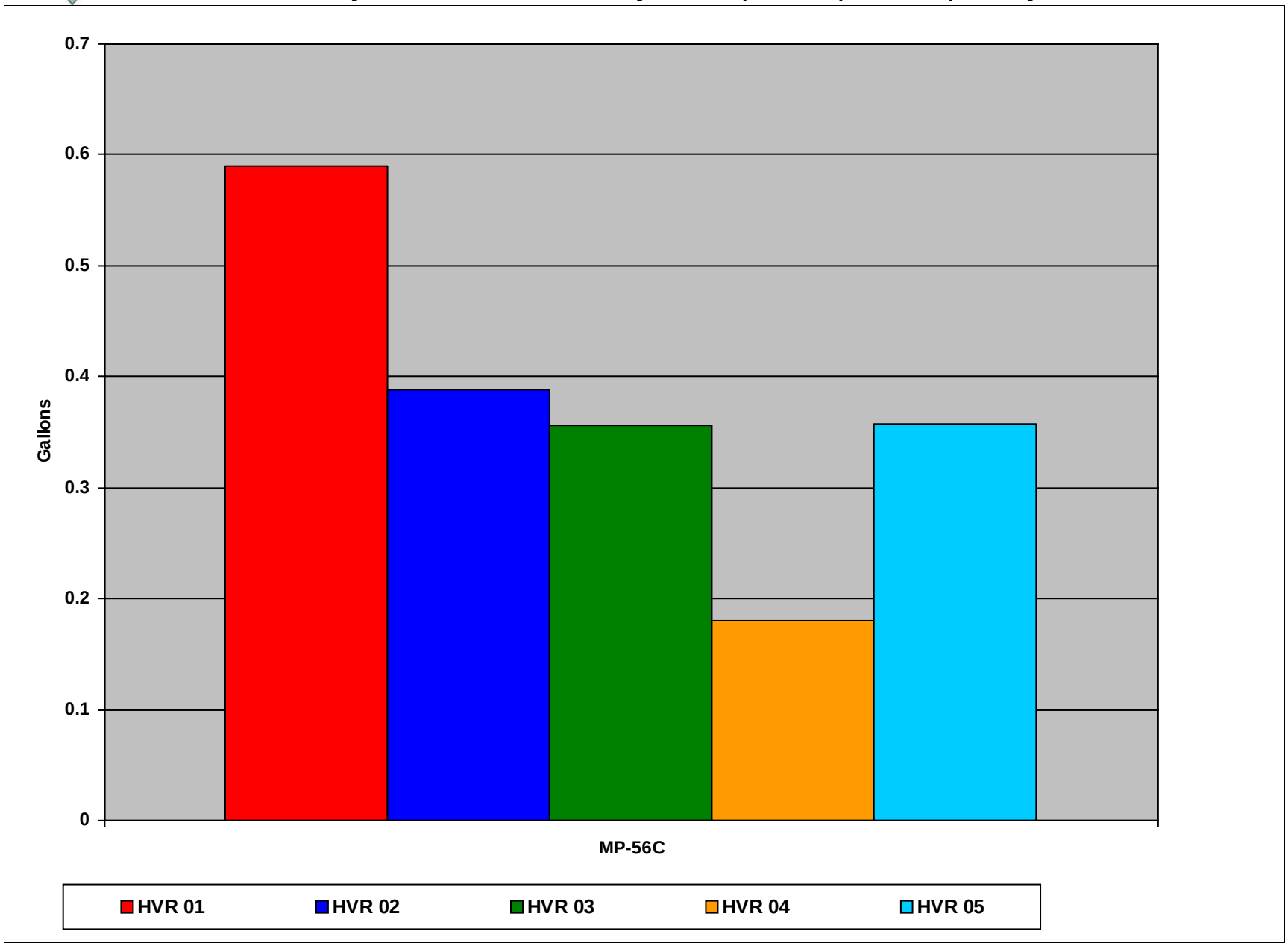


Figure 167: MP-56C
Multi-Site LB per Hour - ICE Calculated vs. Lab Sample

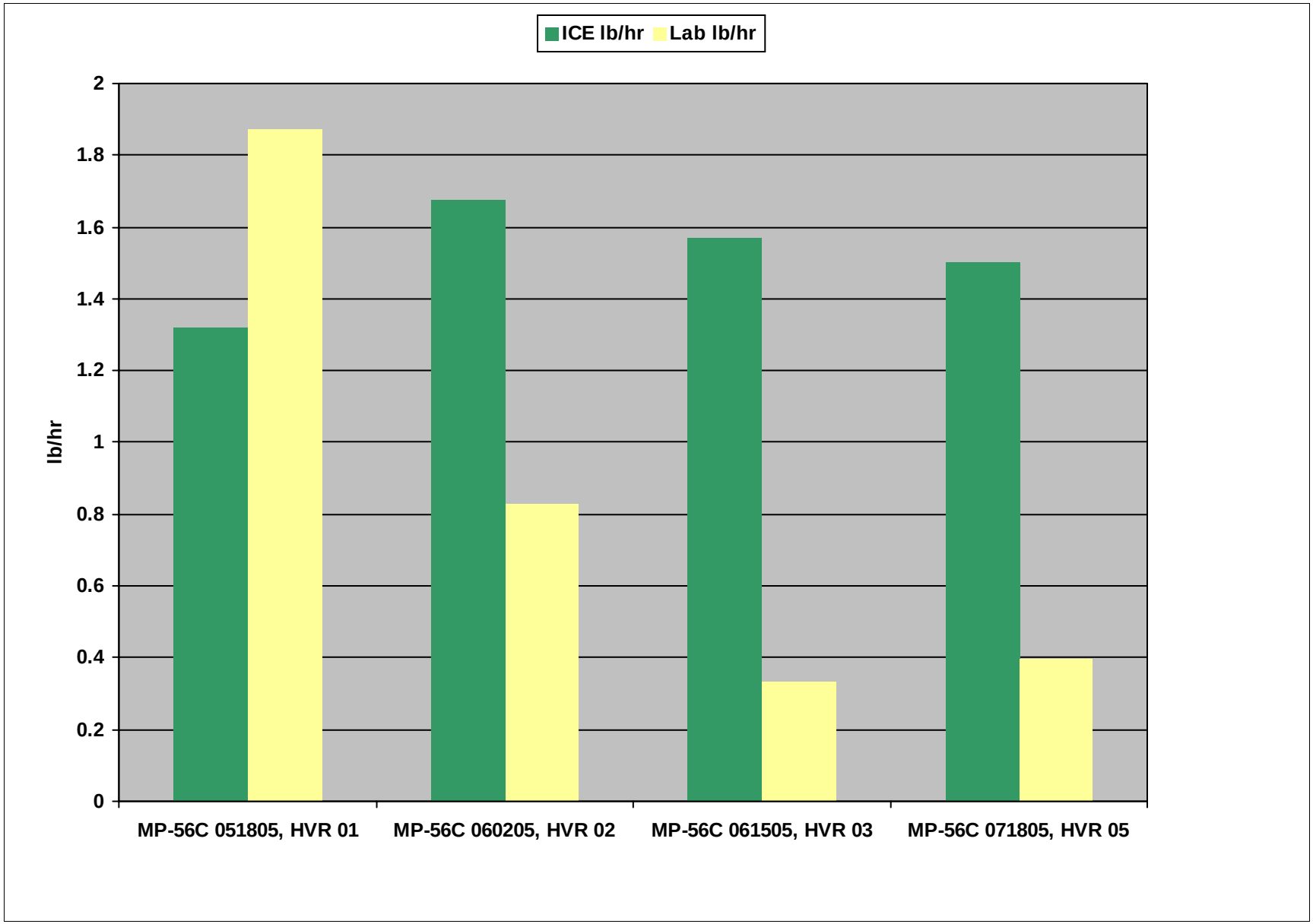


Figure 168: MP-56C
BTU per Hour

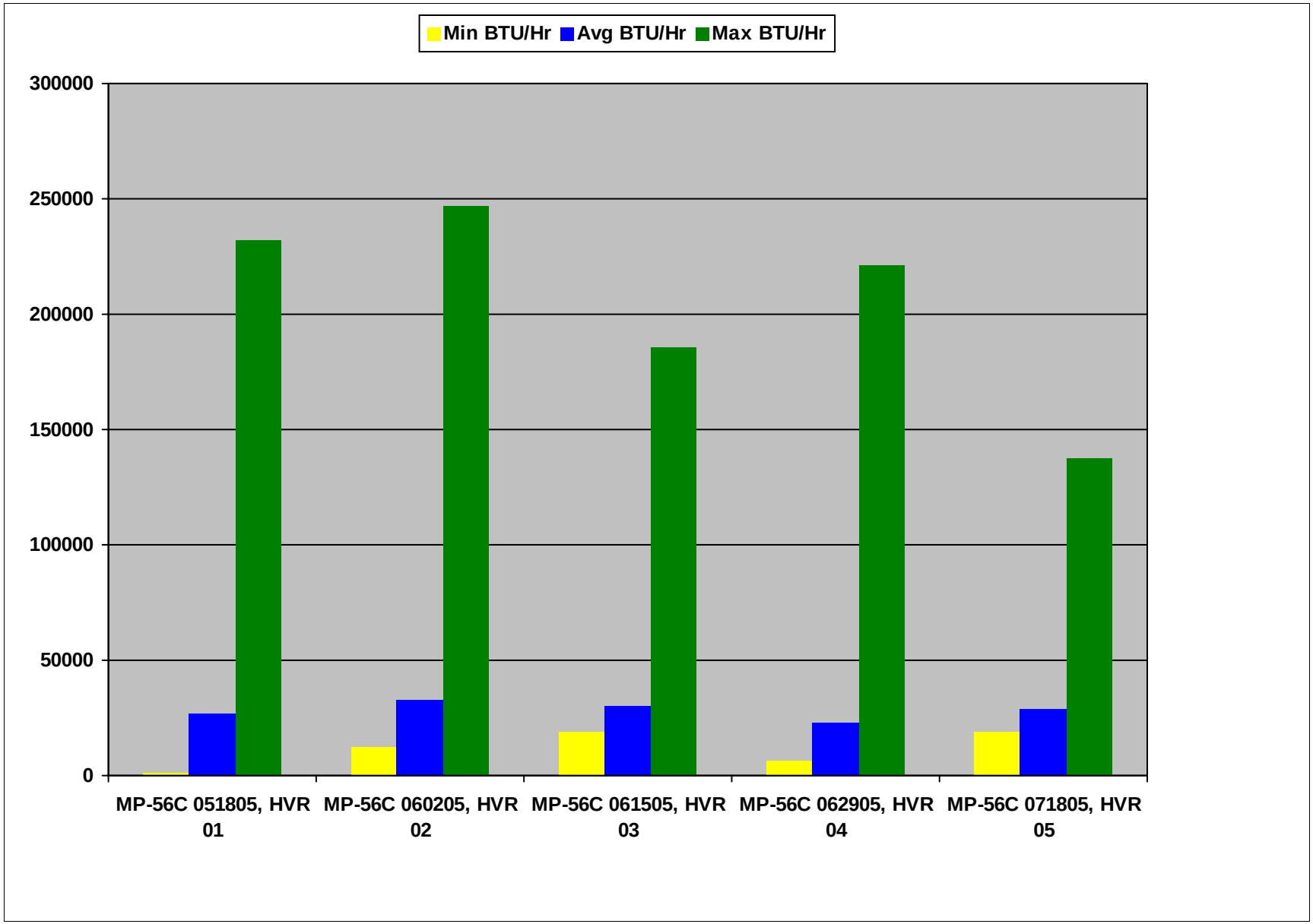


Figure 169: MP-56C
Multi-Site Vacuums

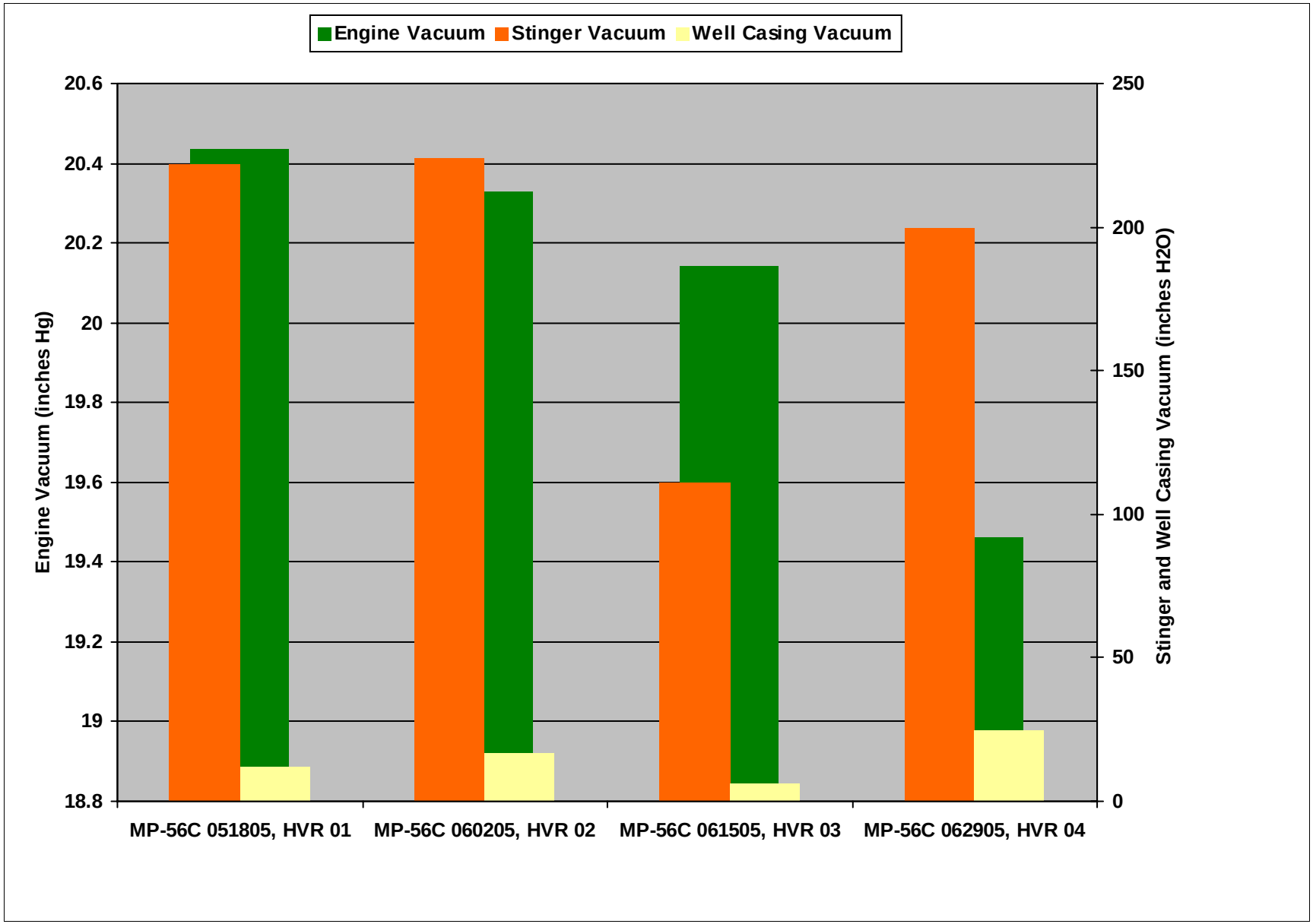


Figure 170: MP-56C
Multi-Site Air, Well and Fuel Flows

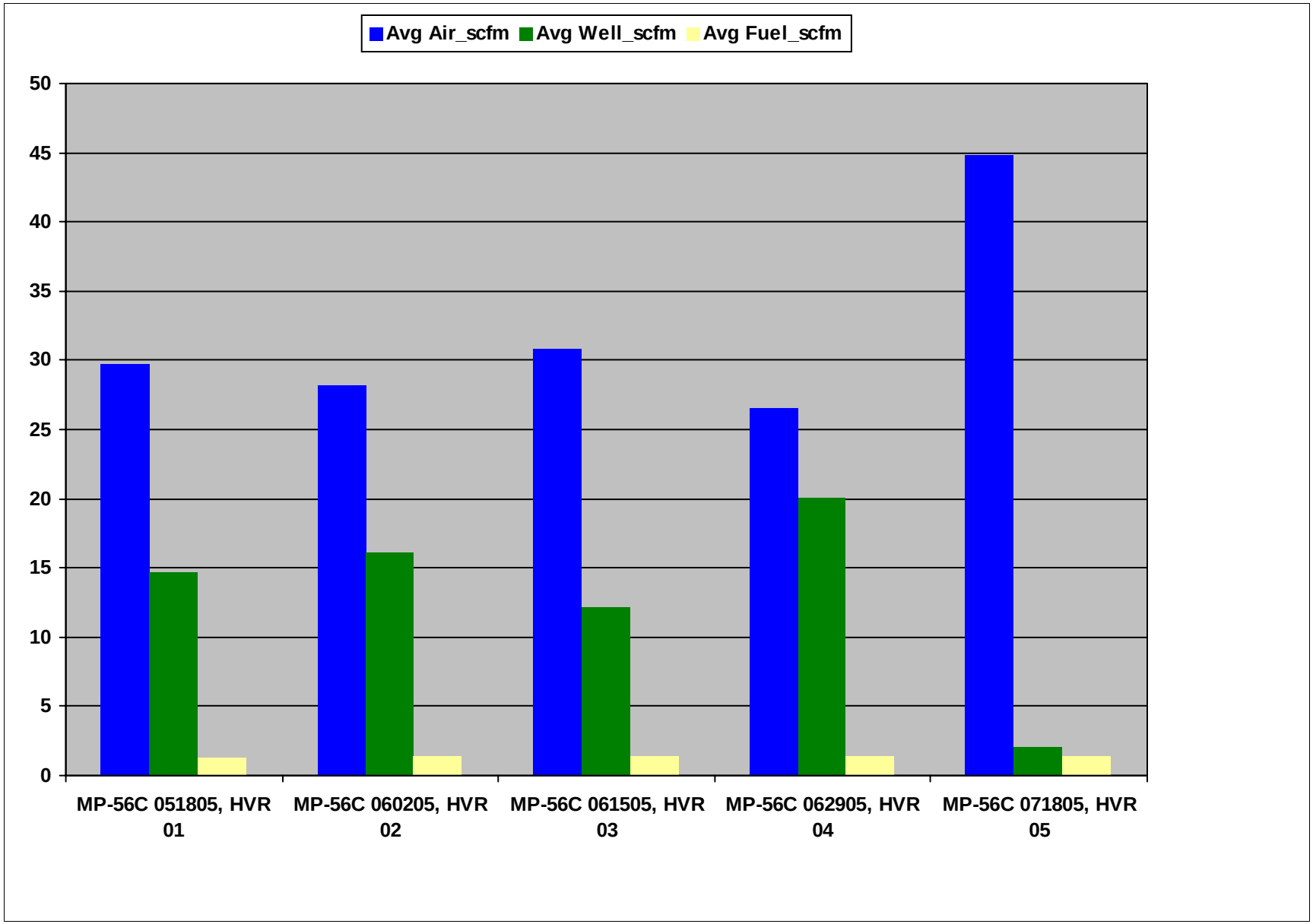


Figure 171: MP-56C Gauging, Stinger and Production Data
Hydrocarbon Recovery vs. Groundwater Recovery - with Elevations

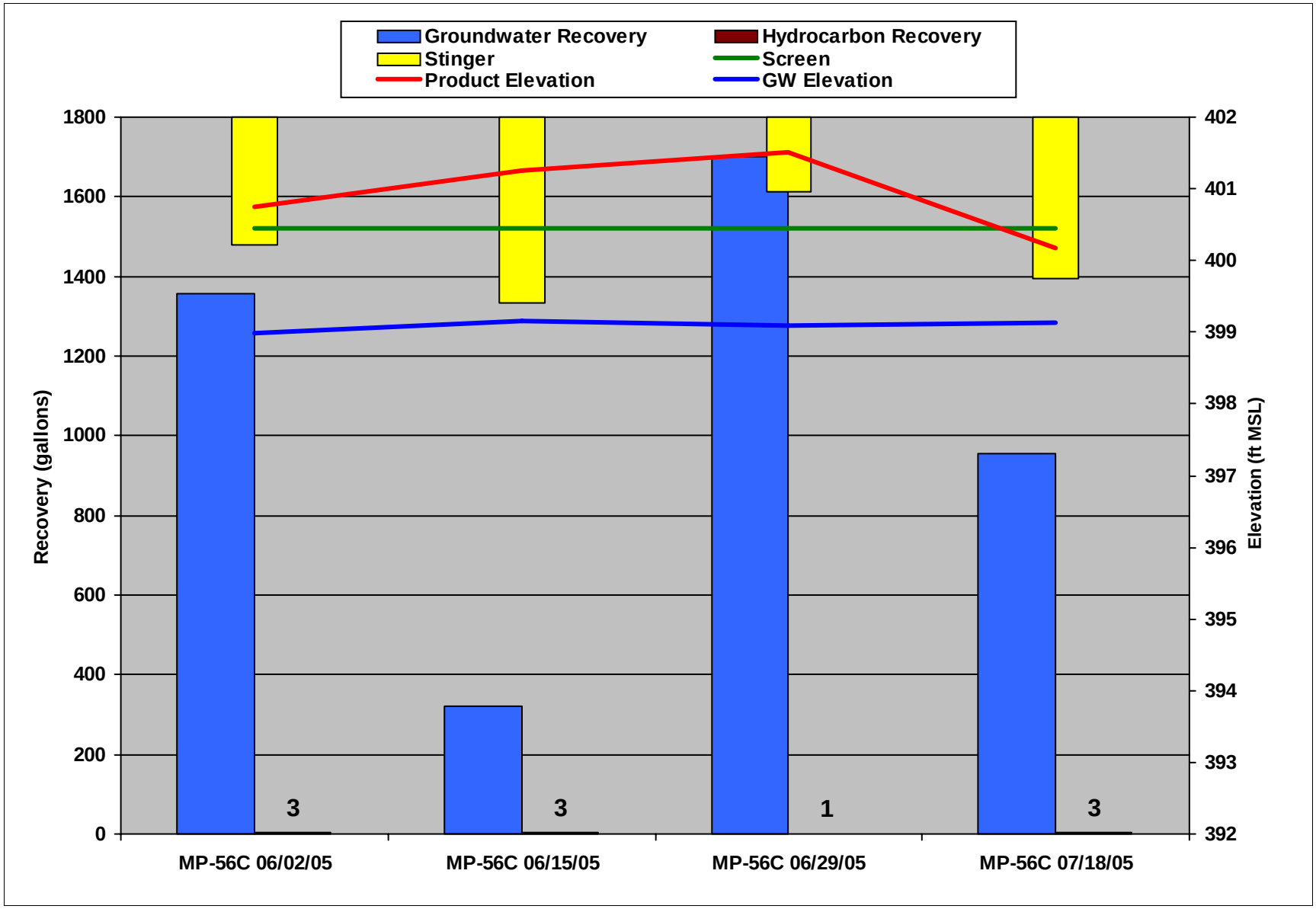


Figure 172: MP-56C
Hydrocarbon Recovery vs. Groundwater Recovery - with Vacuums

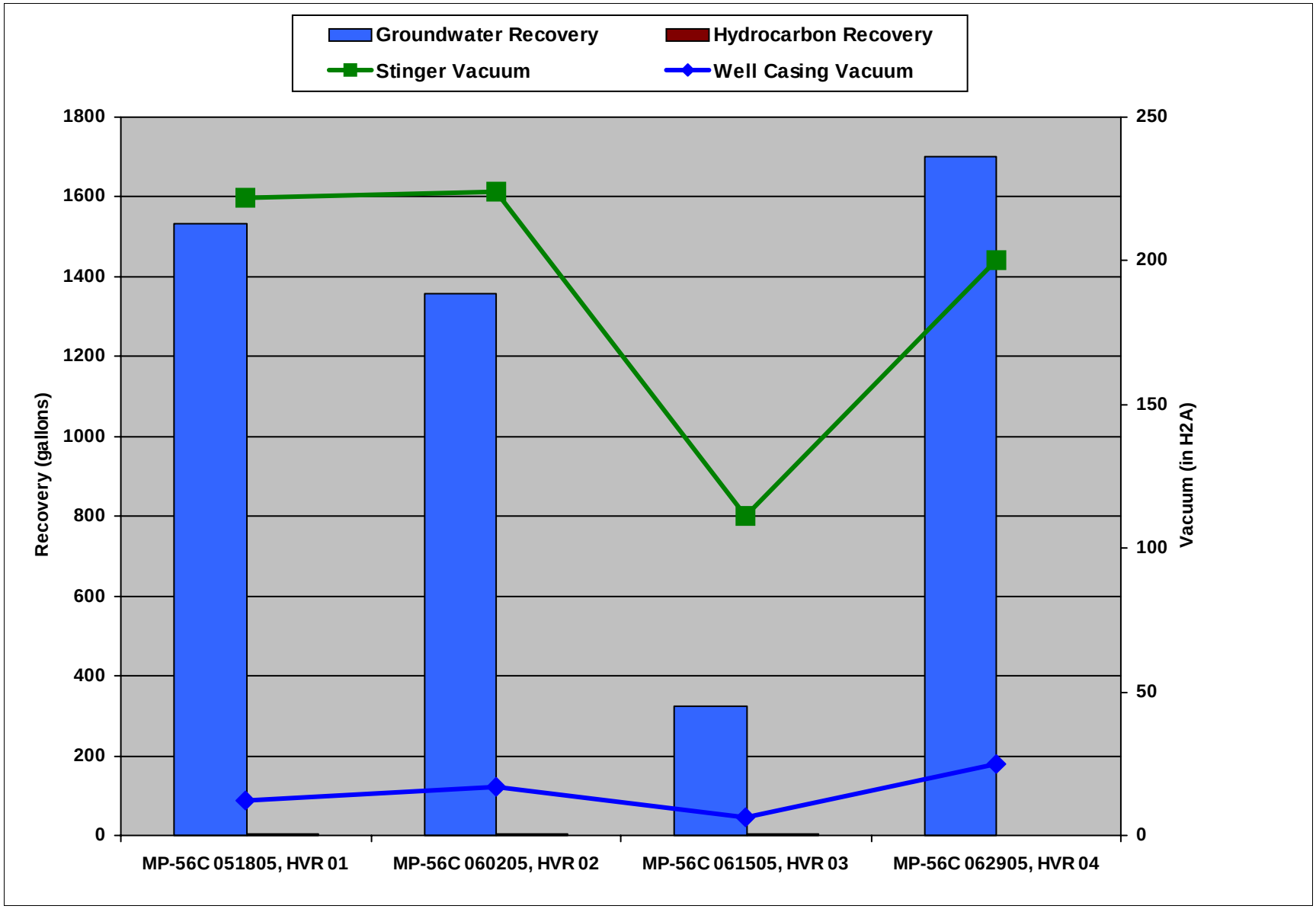


Figure 173: MP-56C
Hydrocarbon Recovery vs. Groundwater Recovery - with Percentages

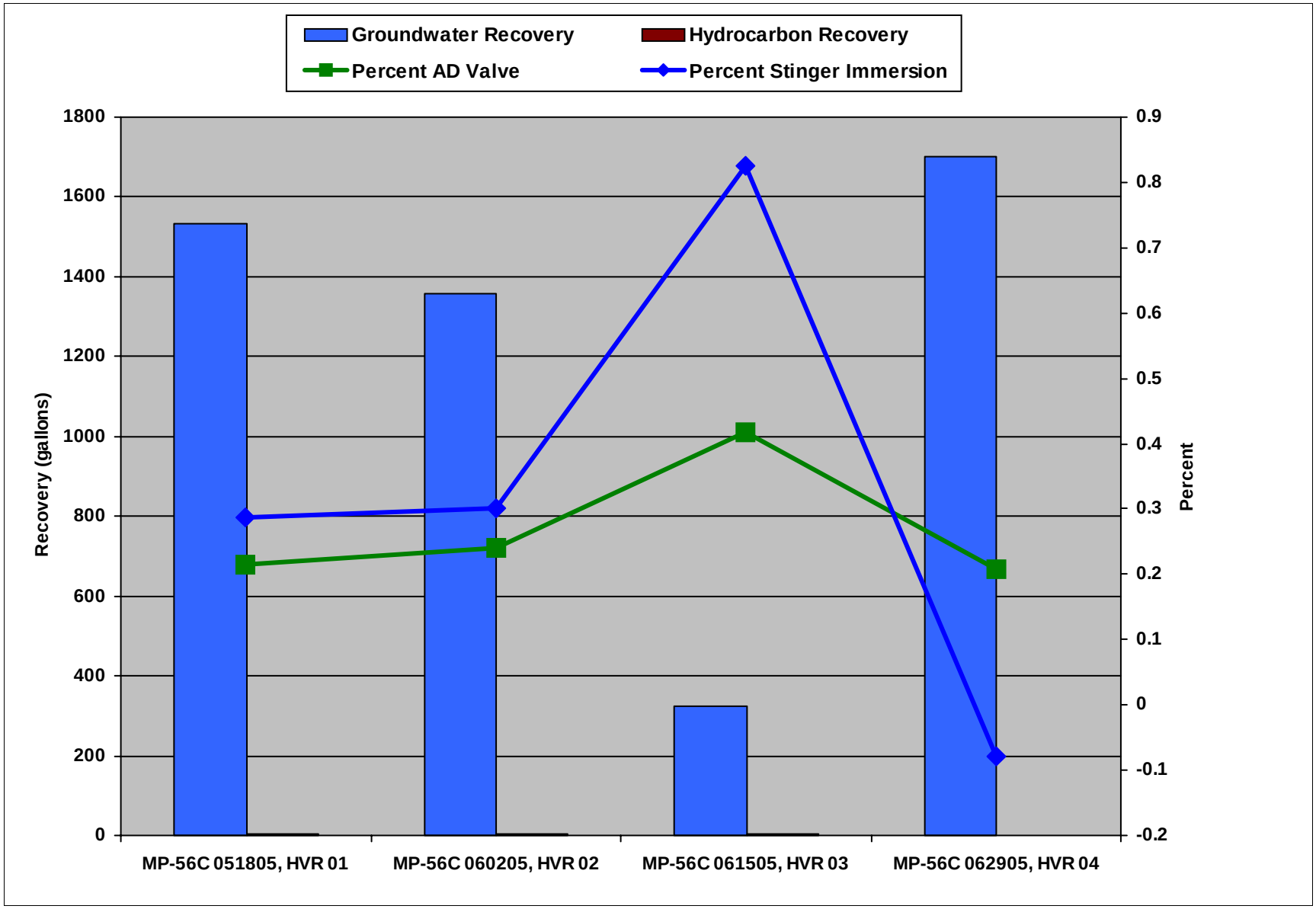


Figure 174: MP-56C
HiVac Event Recharge as a Percentage of Original Product Thickness

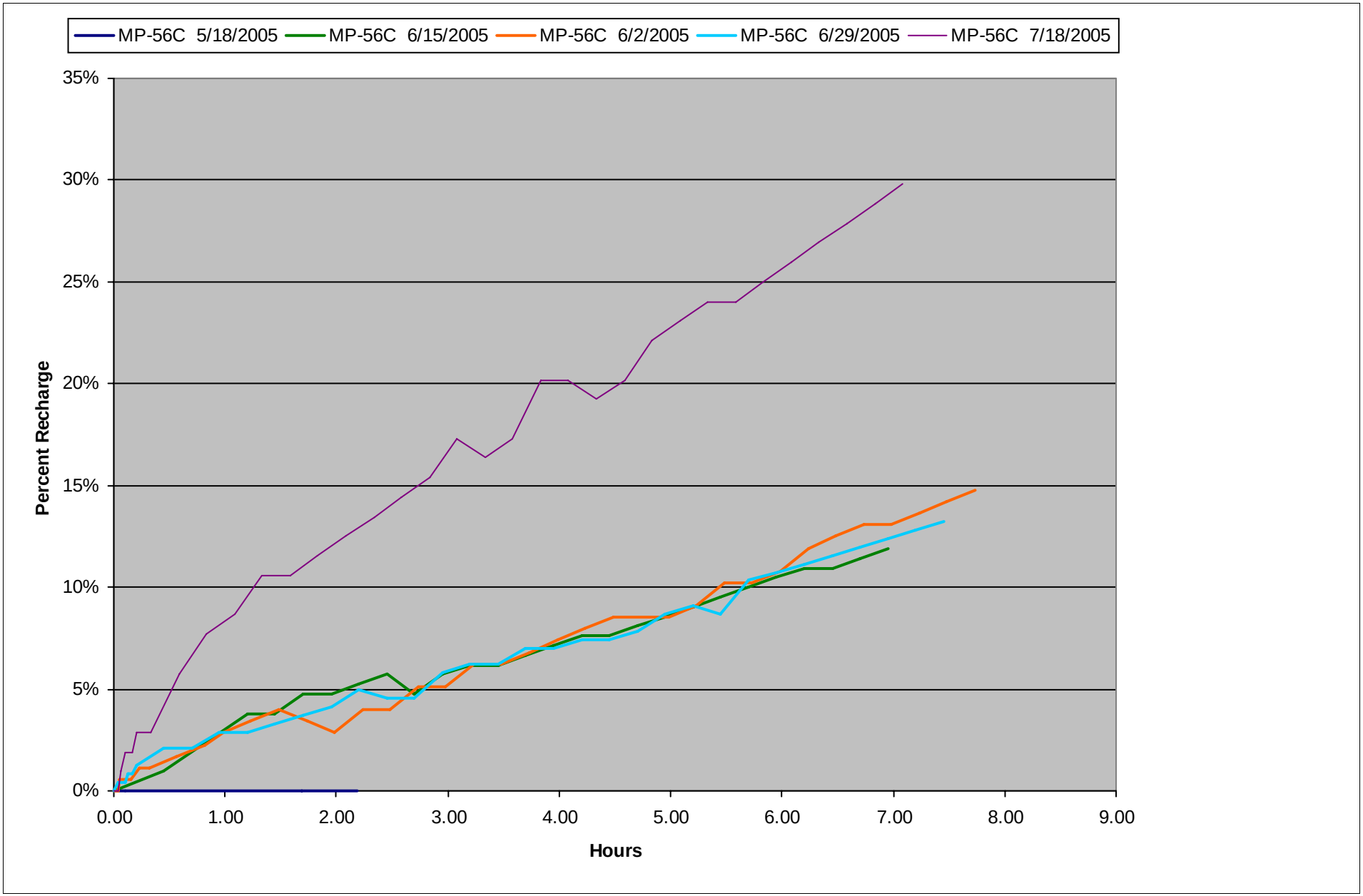


Figure 175: MP-56C
HiVac Event Recharge as Product Thickness in Feet

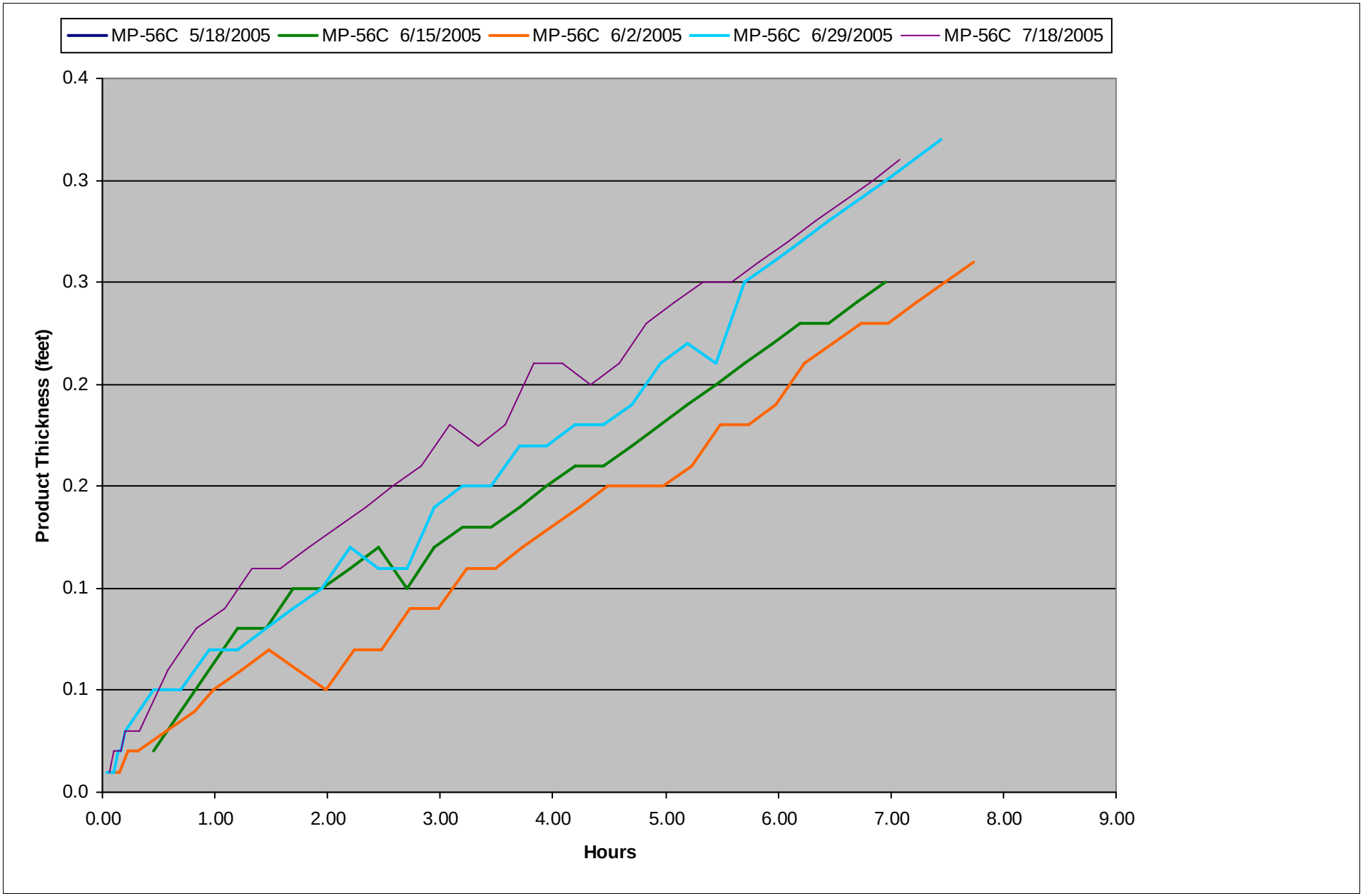
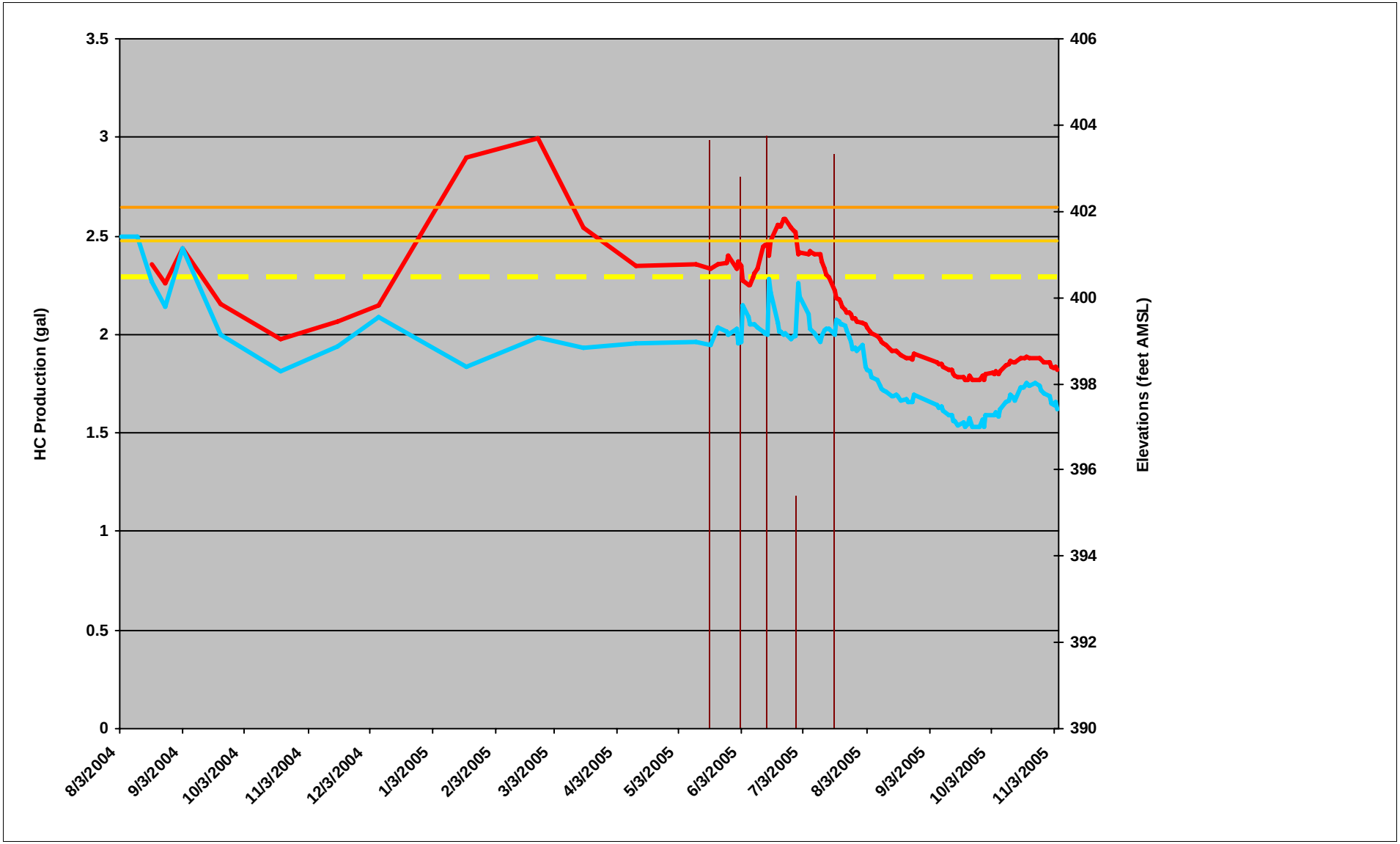


Figure 176: Production Hydrostratigraph

MP-56C

Time Scale



Hartford, Il.

Figure 177: MP-56C
Depth to Top of LNAPL vs. LNAPL Thickness 2004-2005

The Hartford Area Hydrocarbon Plume Site
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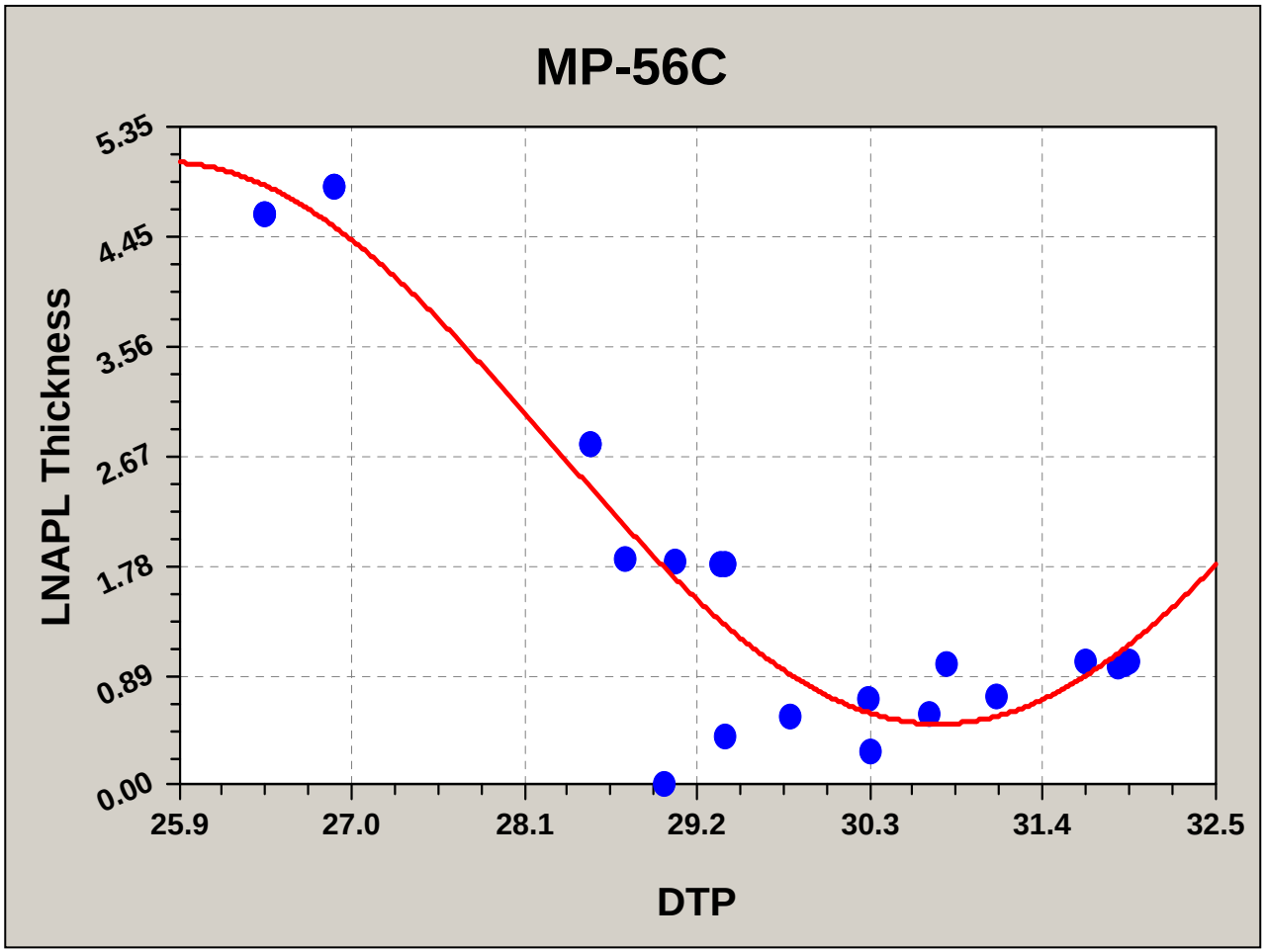

Figure 178: MP-57C
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

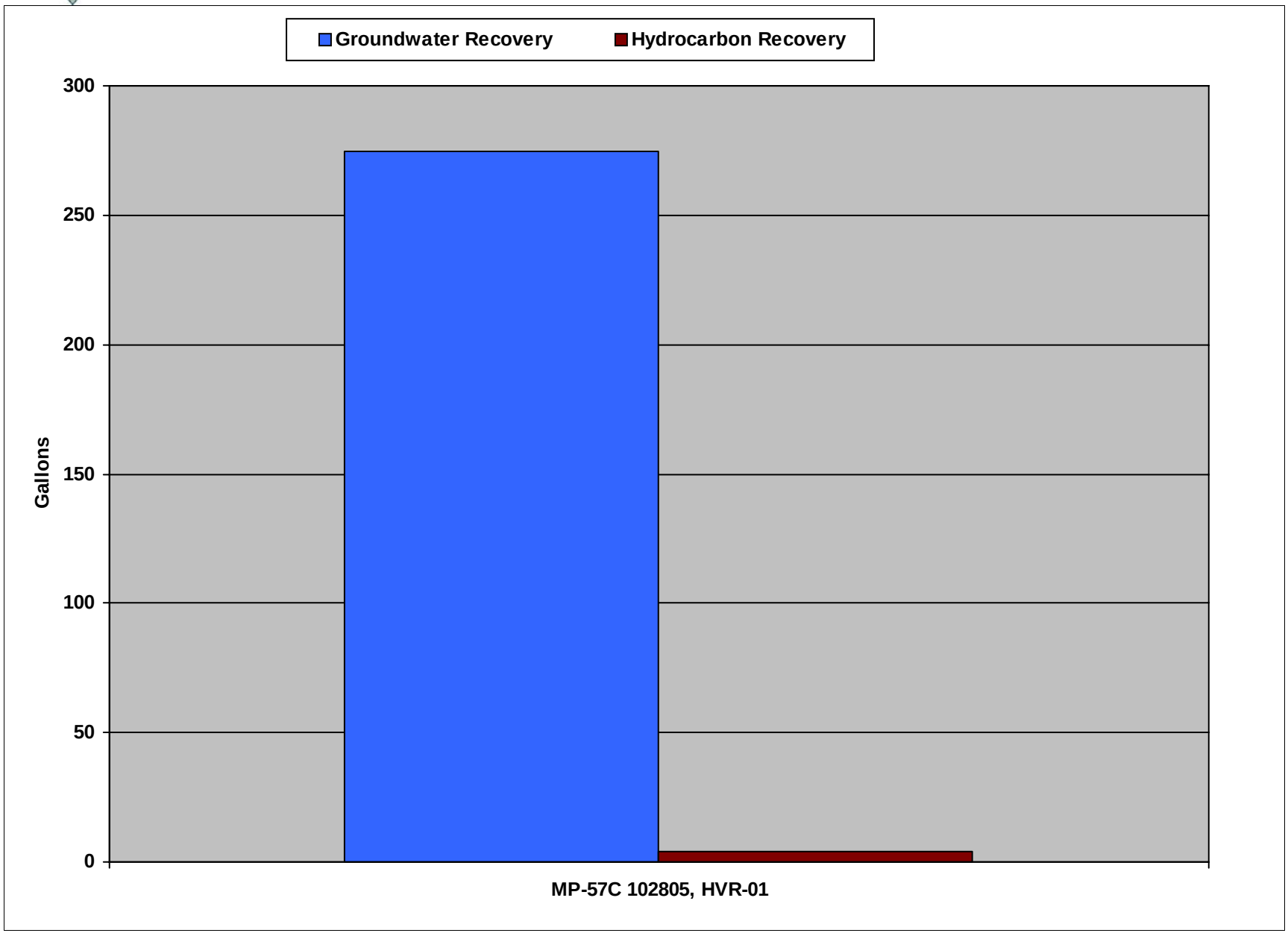

Figure 179: MP-57C
Multi-Site Hydrocarbon Recovery Rate (Gal/Hr) - Grouped by Site

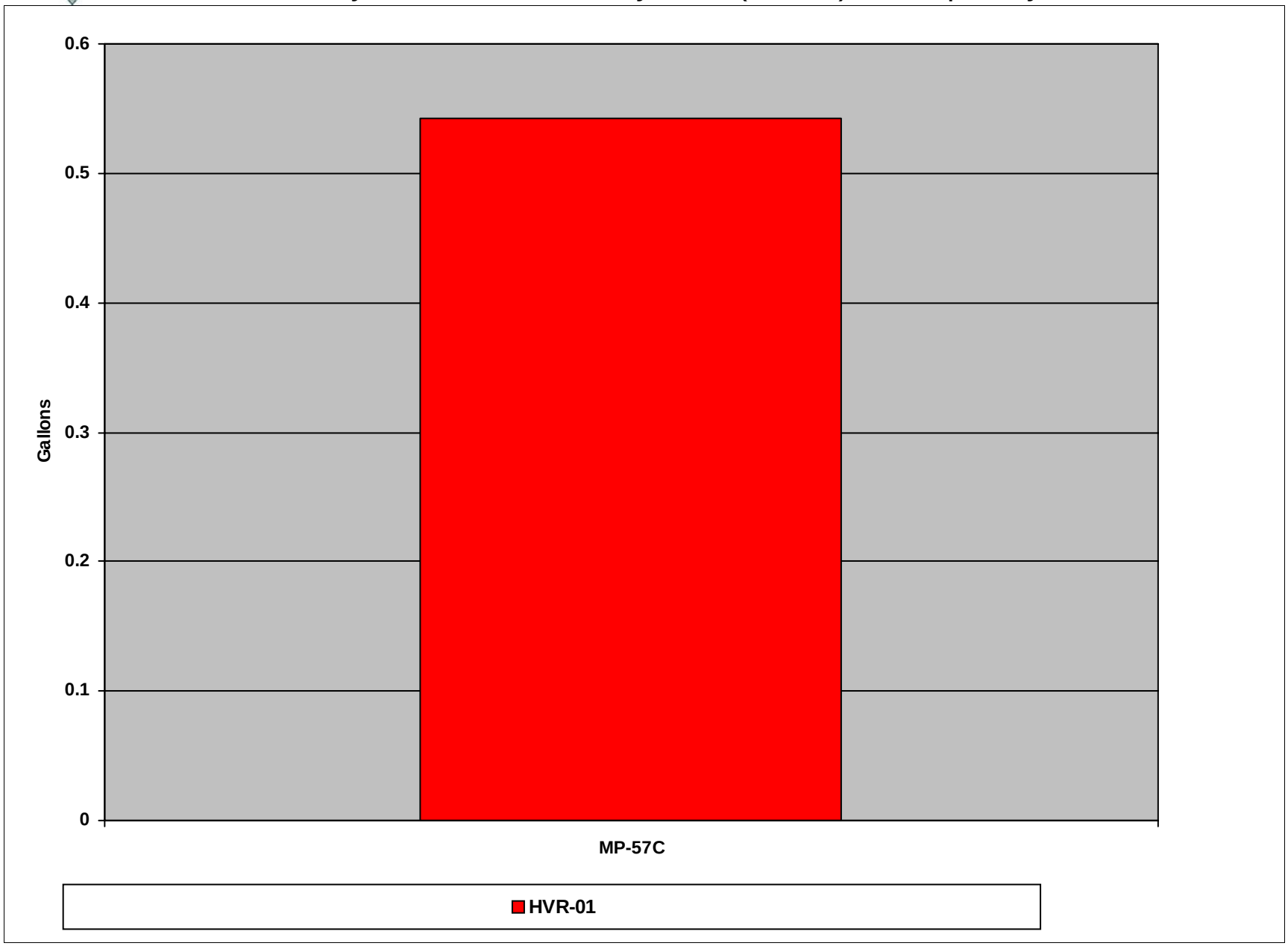

Figure 180: MP-57C
Hydrocarbon Recovery vs. Groundwater Recovery - with Vacuums

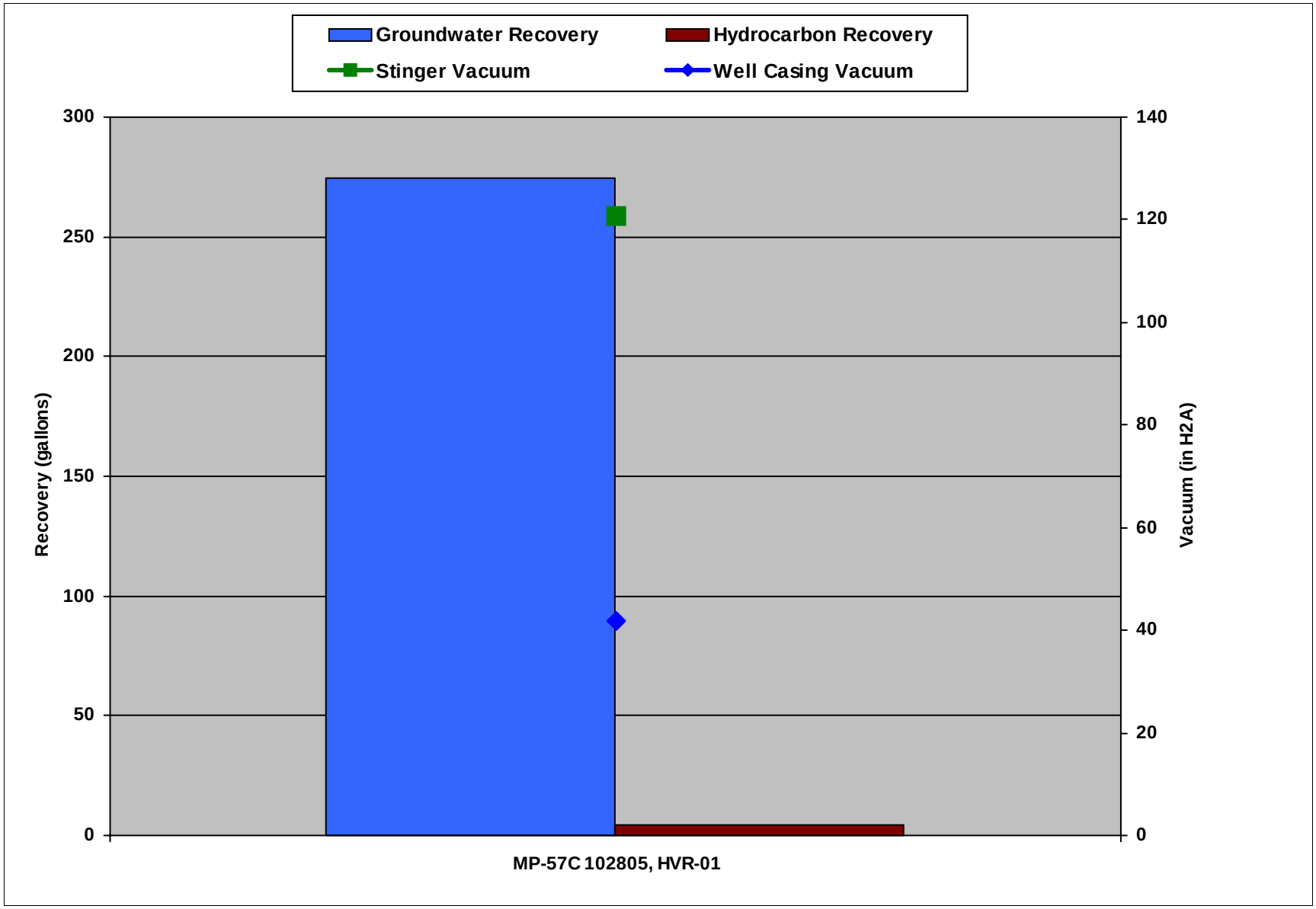

Figure 181: MP-57C
Hydrocarbon Recovery vs. Groundwater Recovery - with Percentages

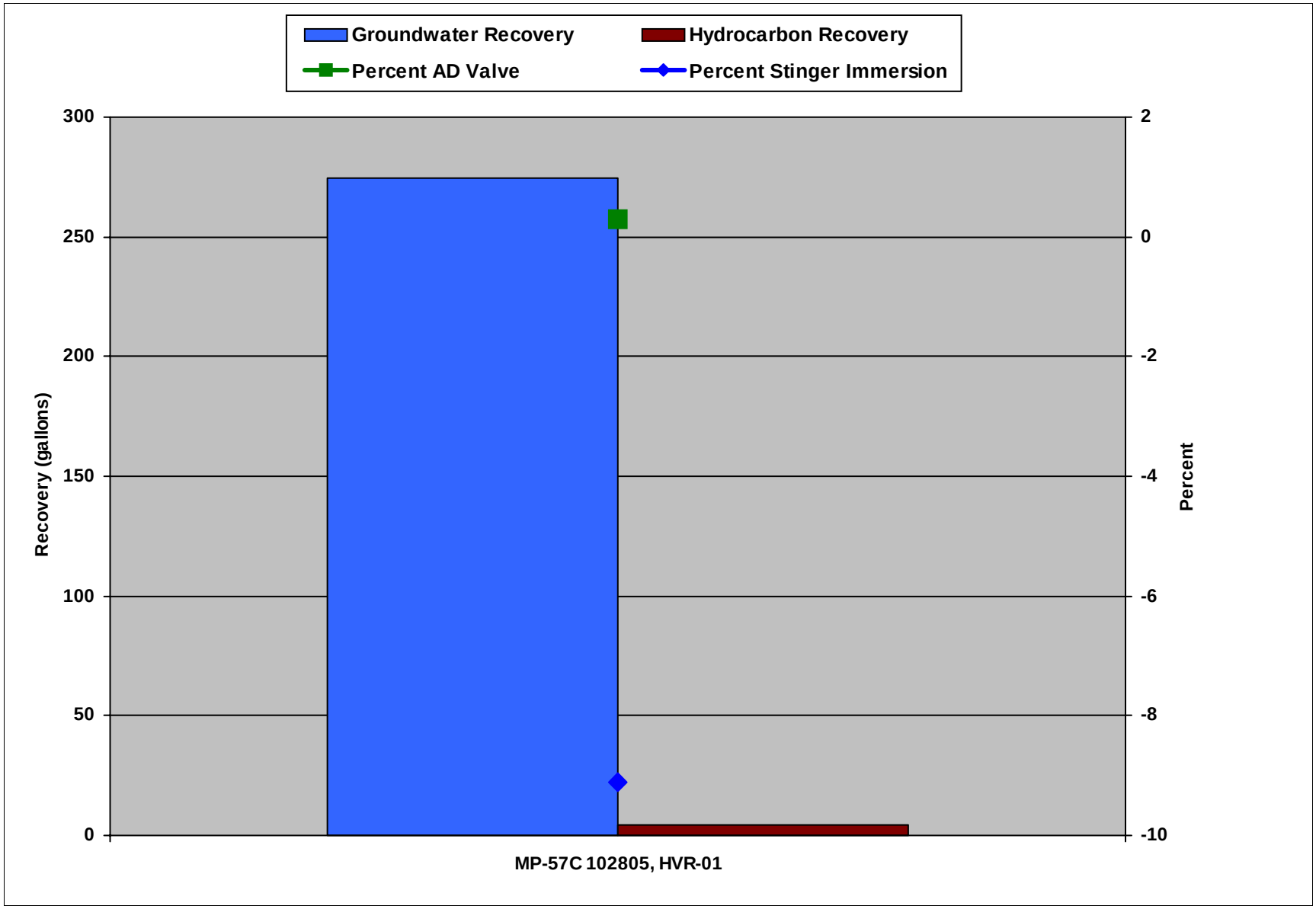

Figure 182: MP-57C
HiVac Event Recharge as a Percentage of Original Product Thickness

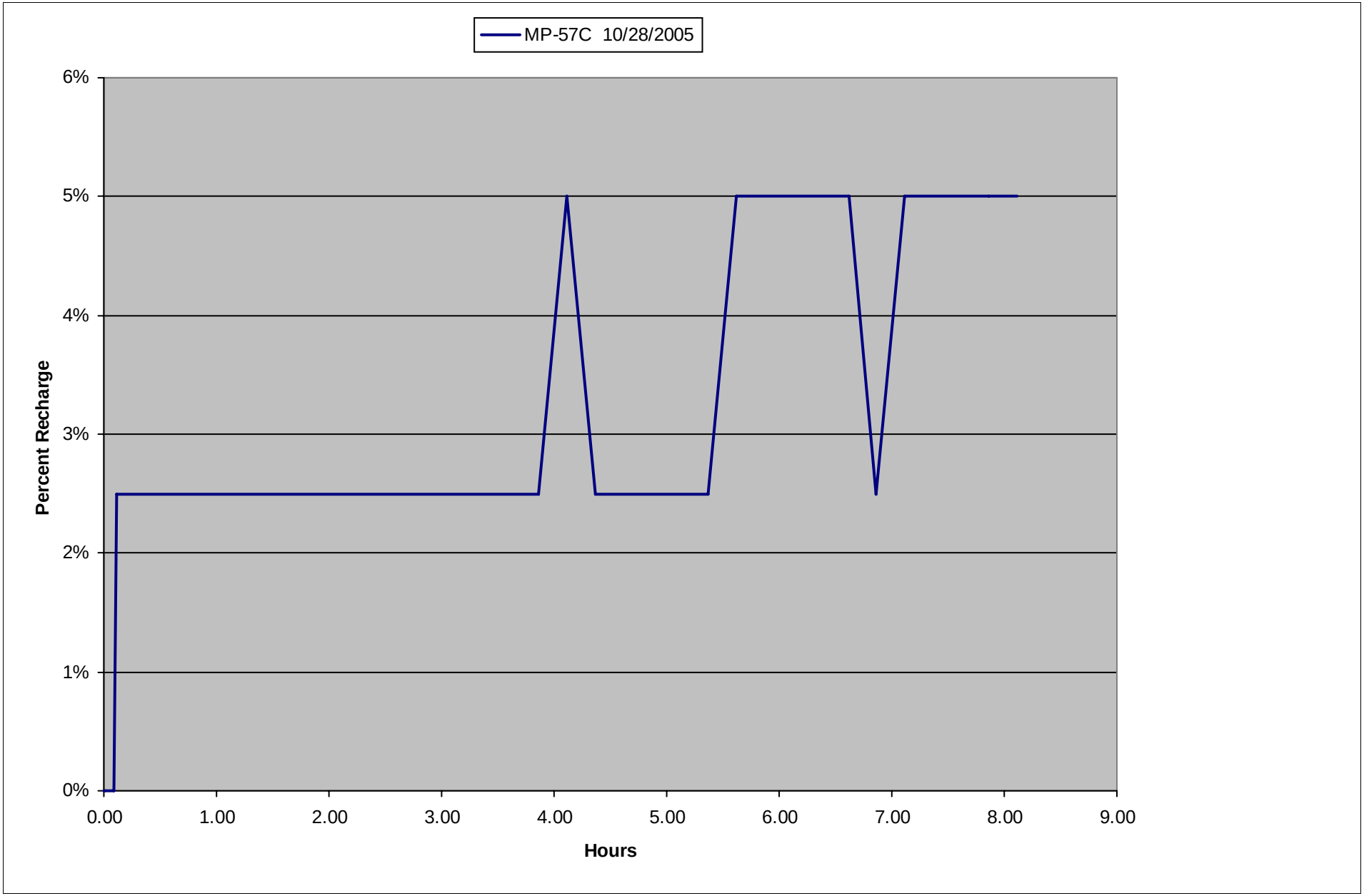

Figure 183: MP-57C
HiVac Event Recharge as Product Thickness in Feet

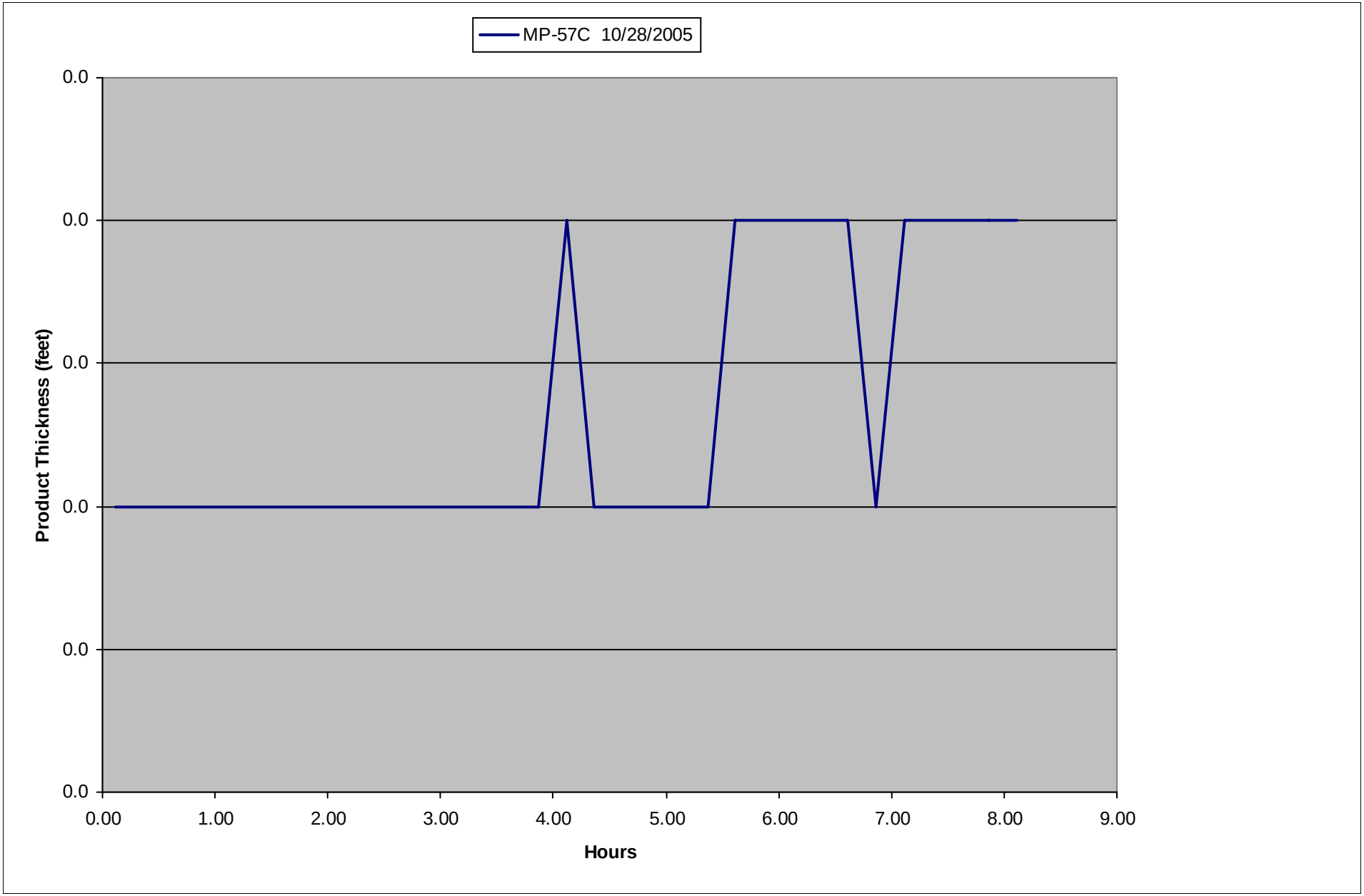

Figure 184: MP-57C
Depth to Top of LNAPL vs. LNAPL Thickness 2004-2005

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H_2A Environmental, Ltd.

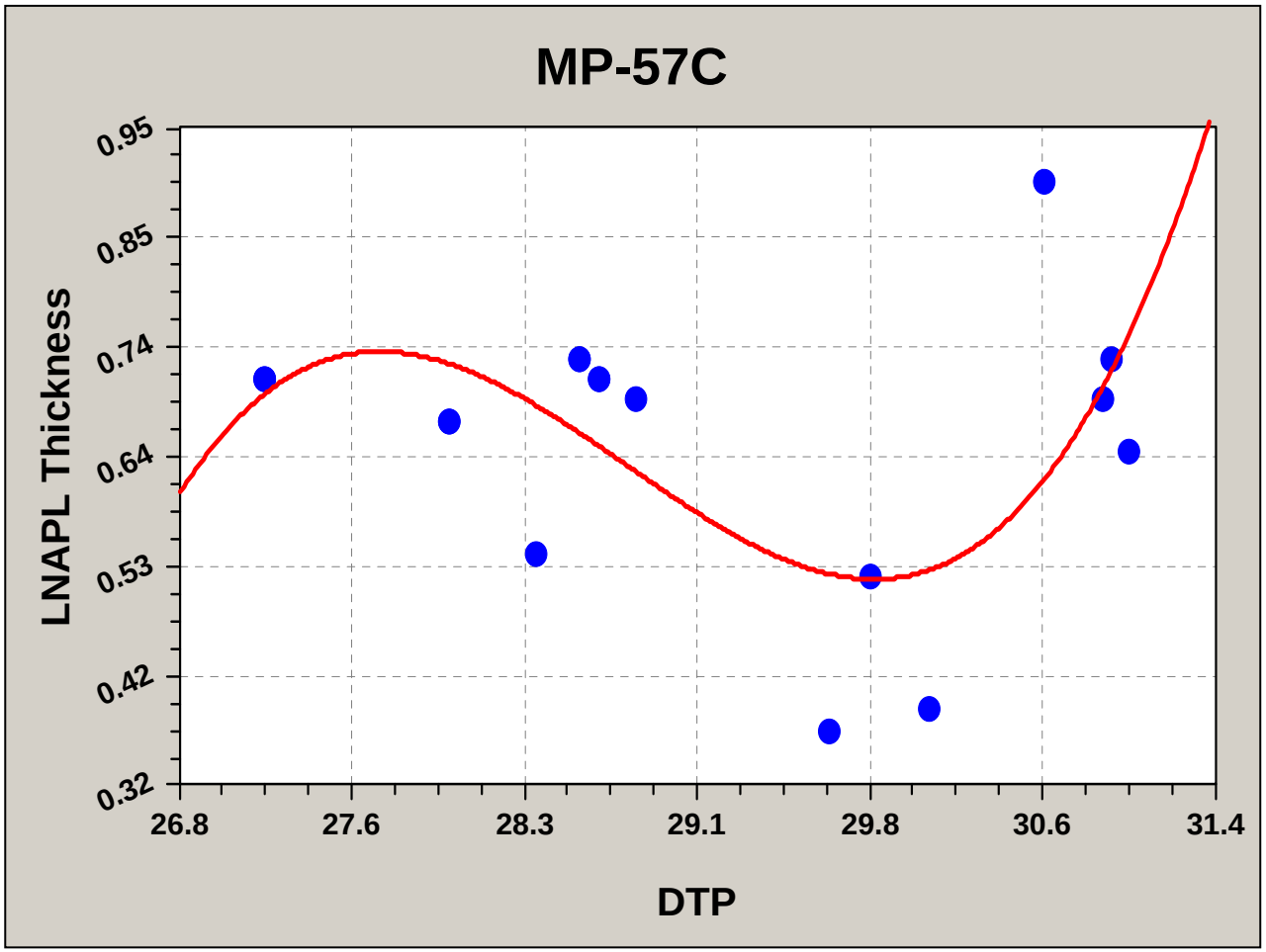


Figure 185: MP-79C
Multi-Site Cumulative Product Recovery (Gallons)

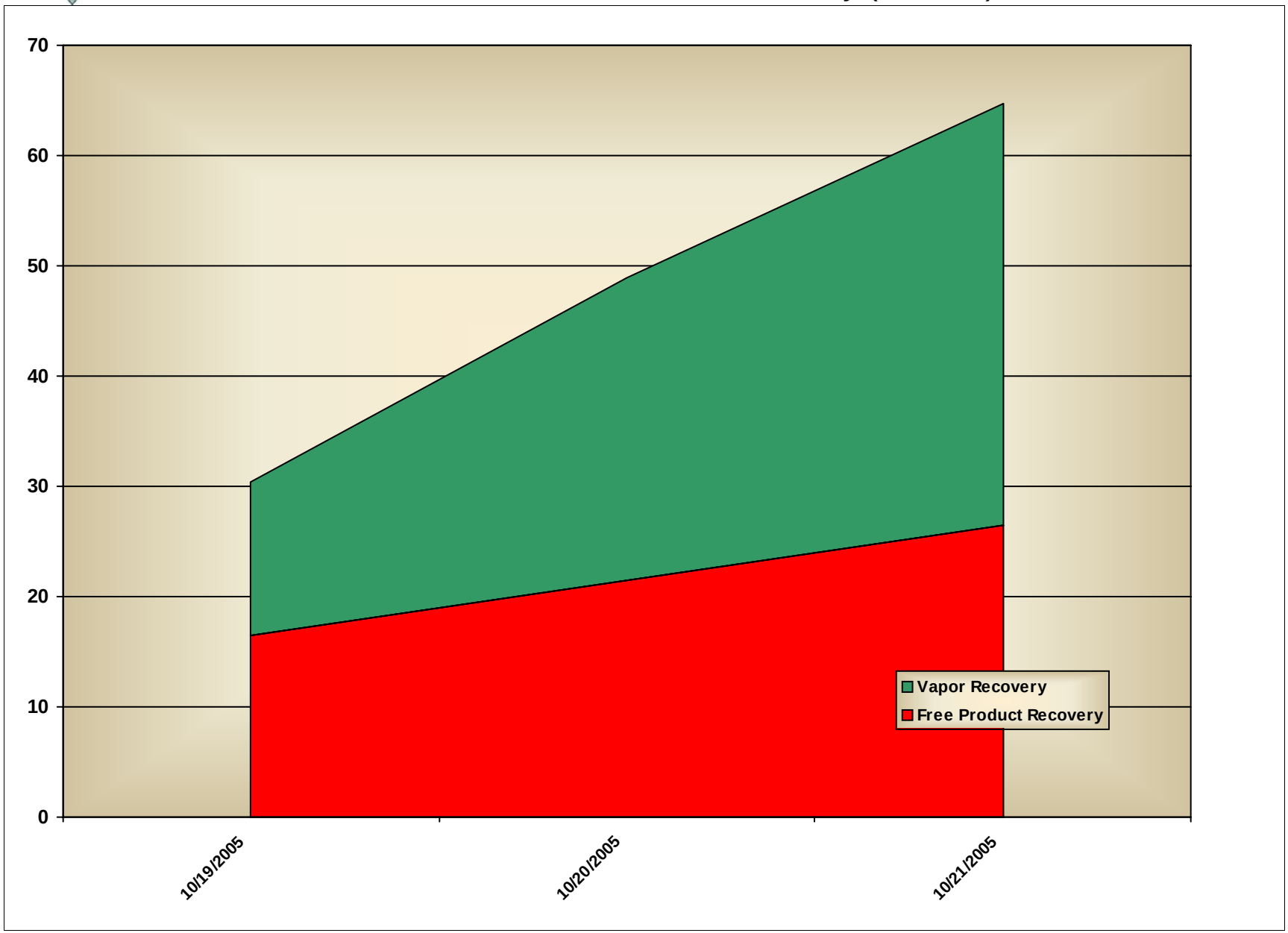


Figure 186: MP-79C
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

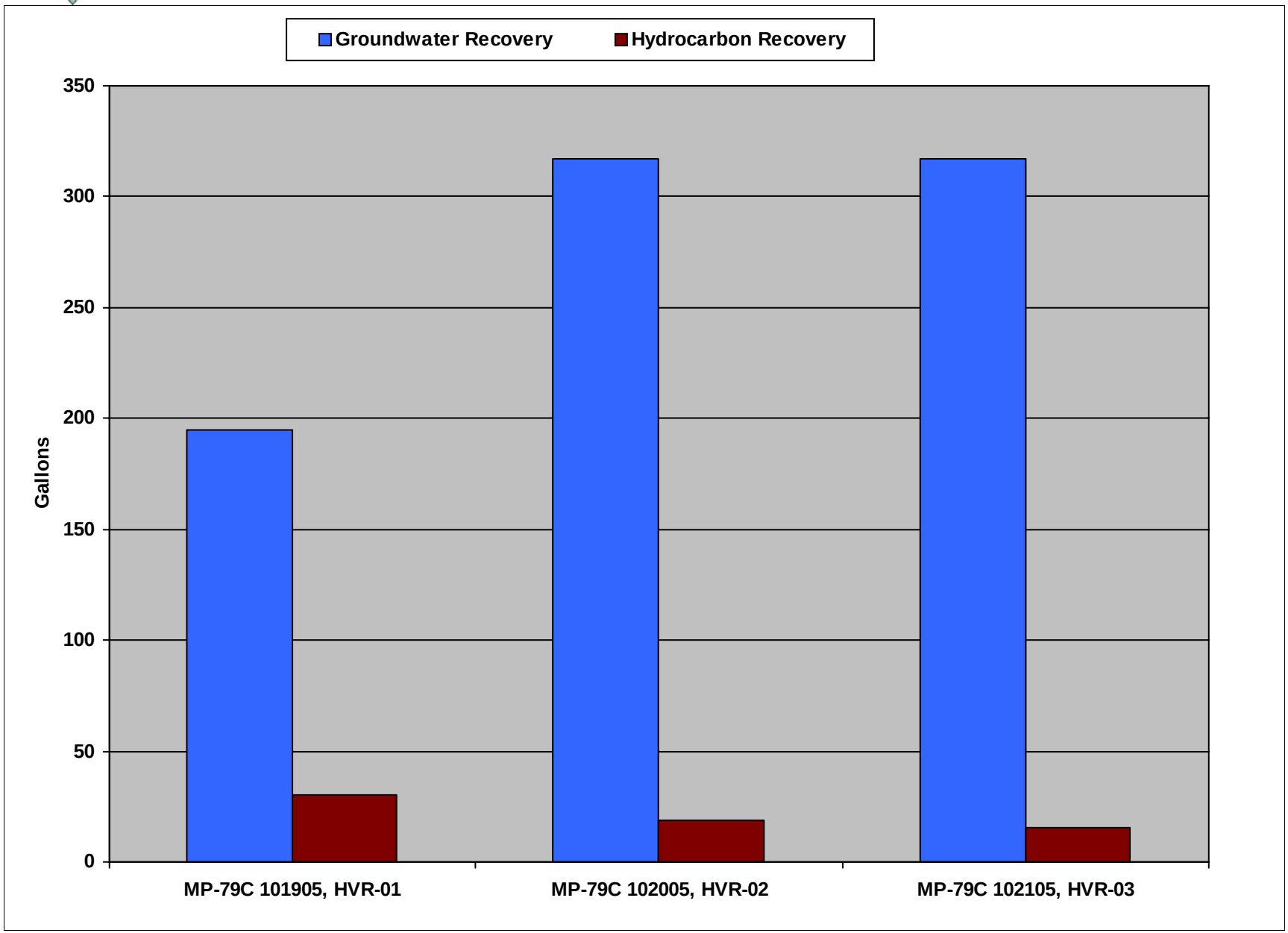


Figure 187: MP-79C
Multi-Site Hydrocarbon Recovery Rate (Gal/Hr) - Grouped by Site

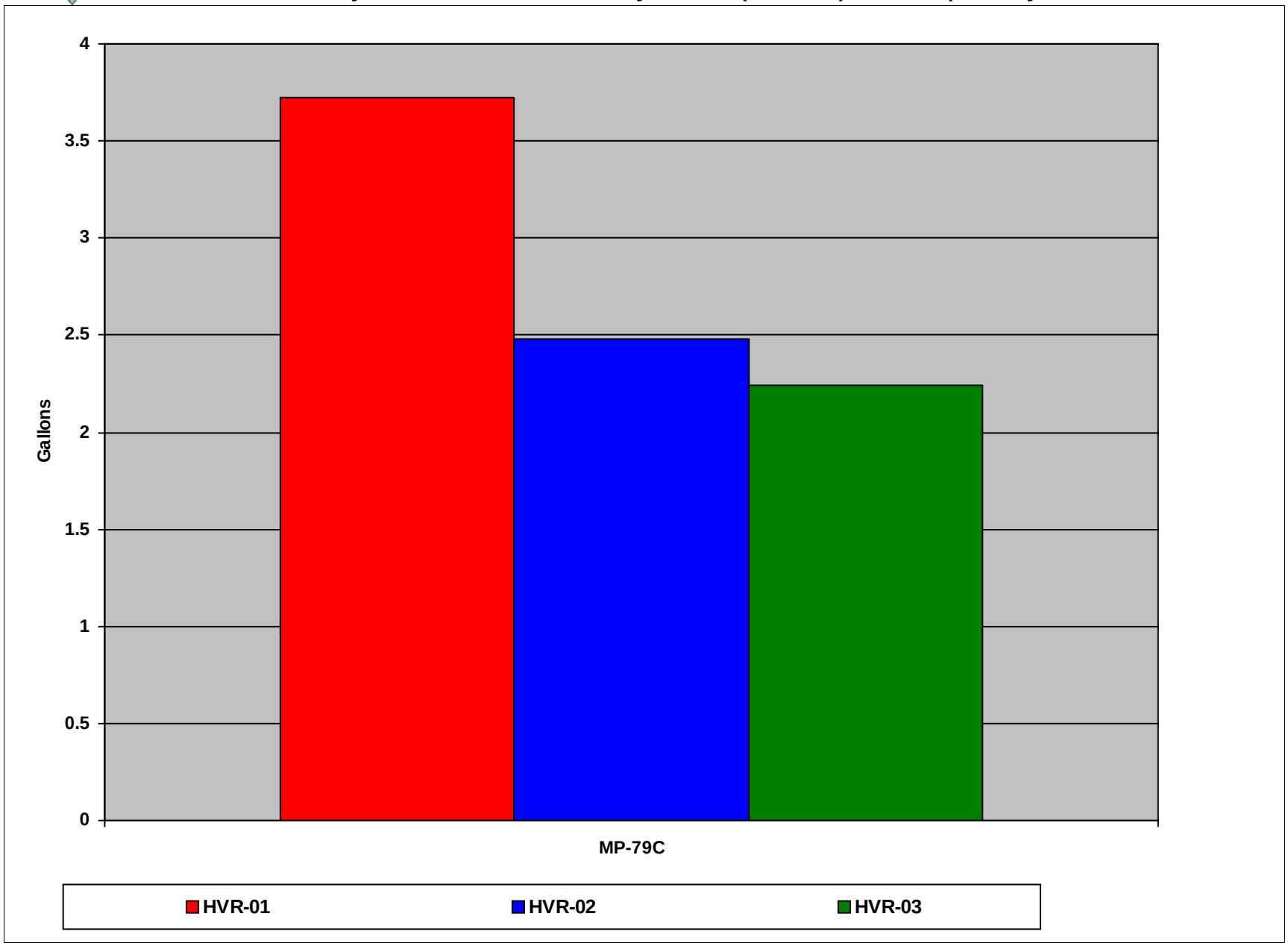


Figure 188: MP-79C
BTU per Hour

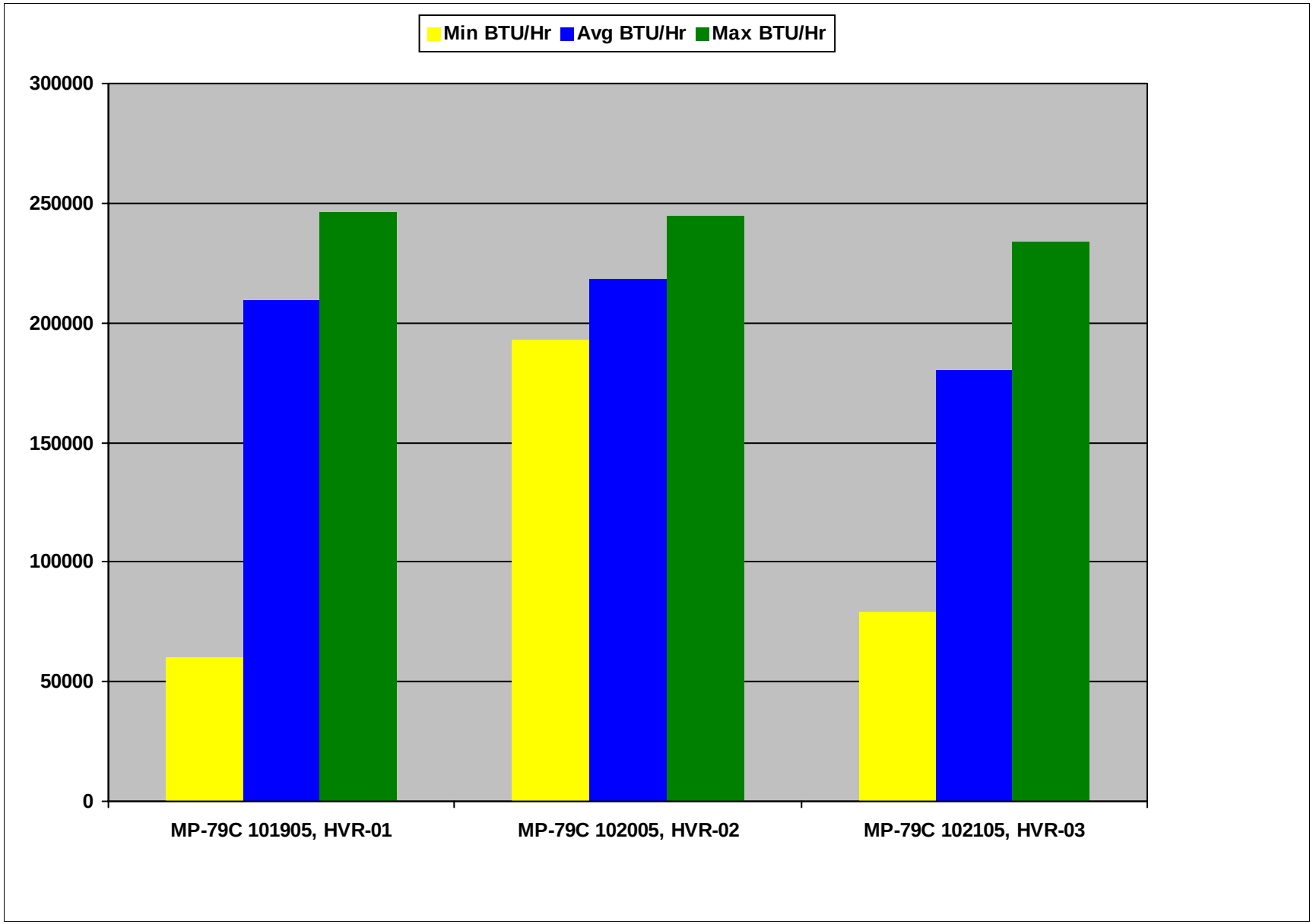


Figure 189: MP-79C
Multi-Site Vacuums

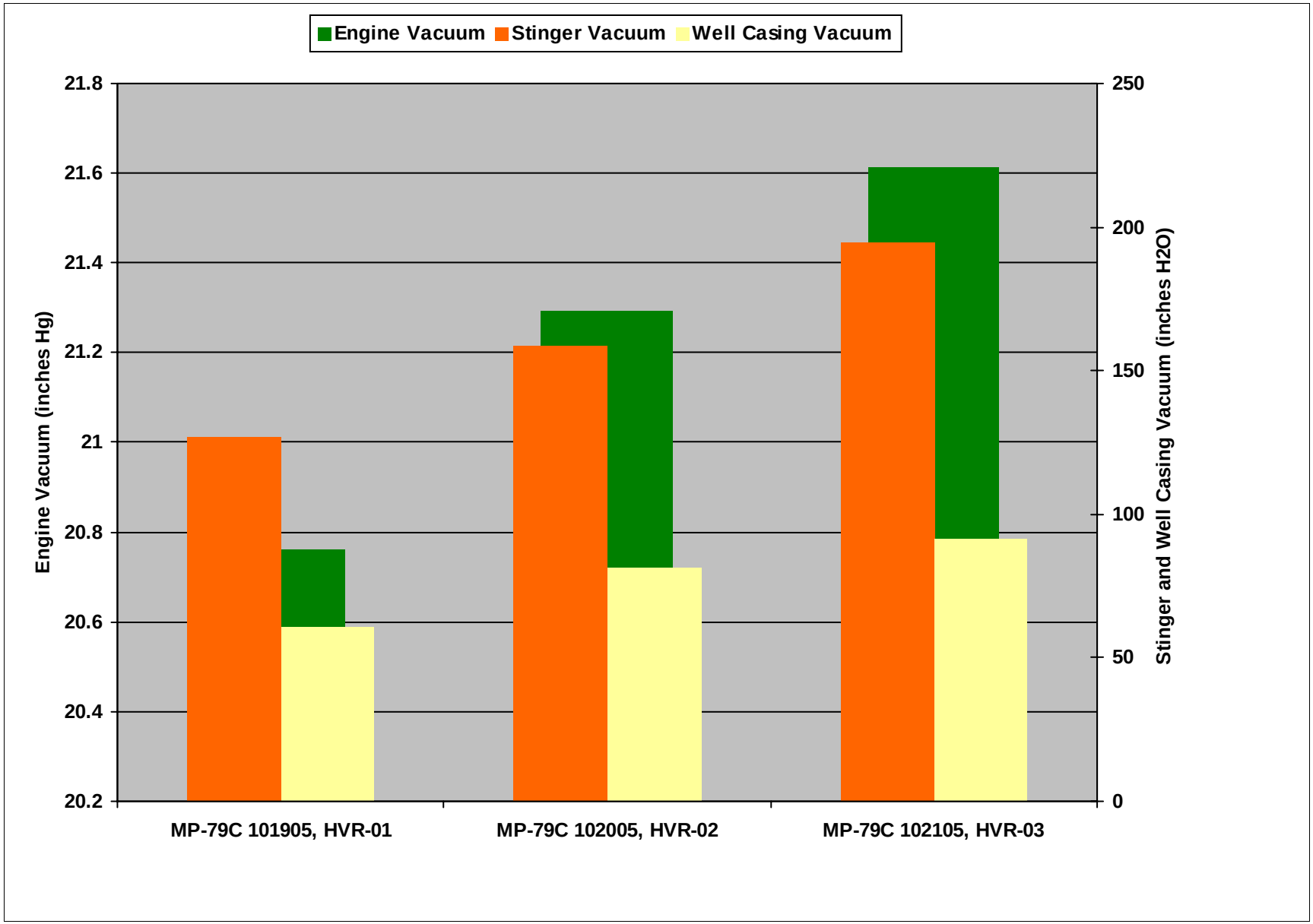


Figure 190: MP-79C
Multi-Site Air, Well and Fuel Flows

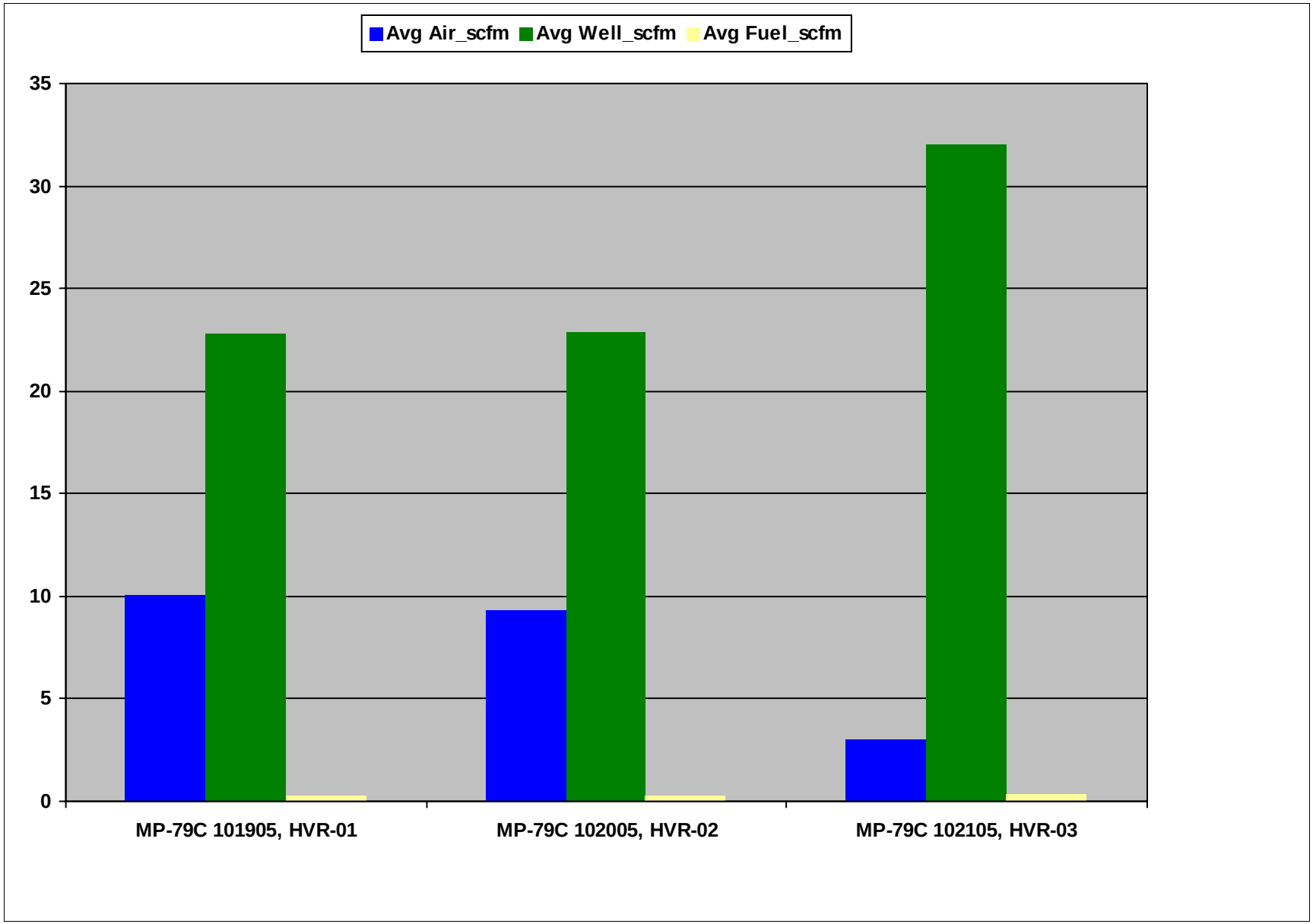


Figure 191: MP-79C Gauging, Stinger and Production Data
Hydrocarbon Recovery vs. Groundwater Recovery - with Elevations

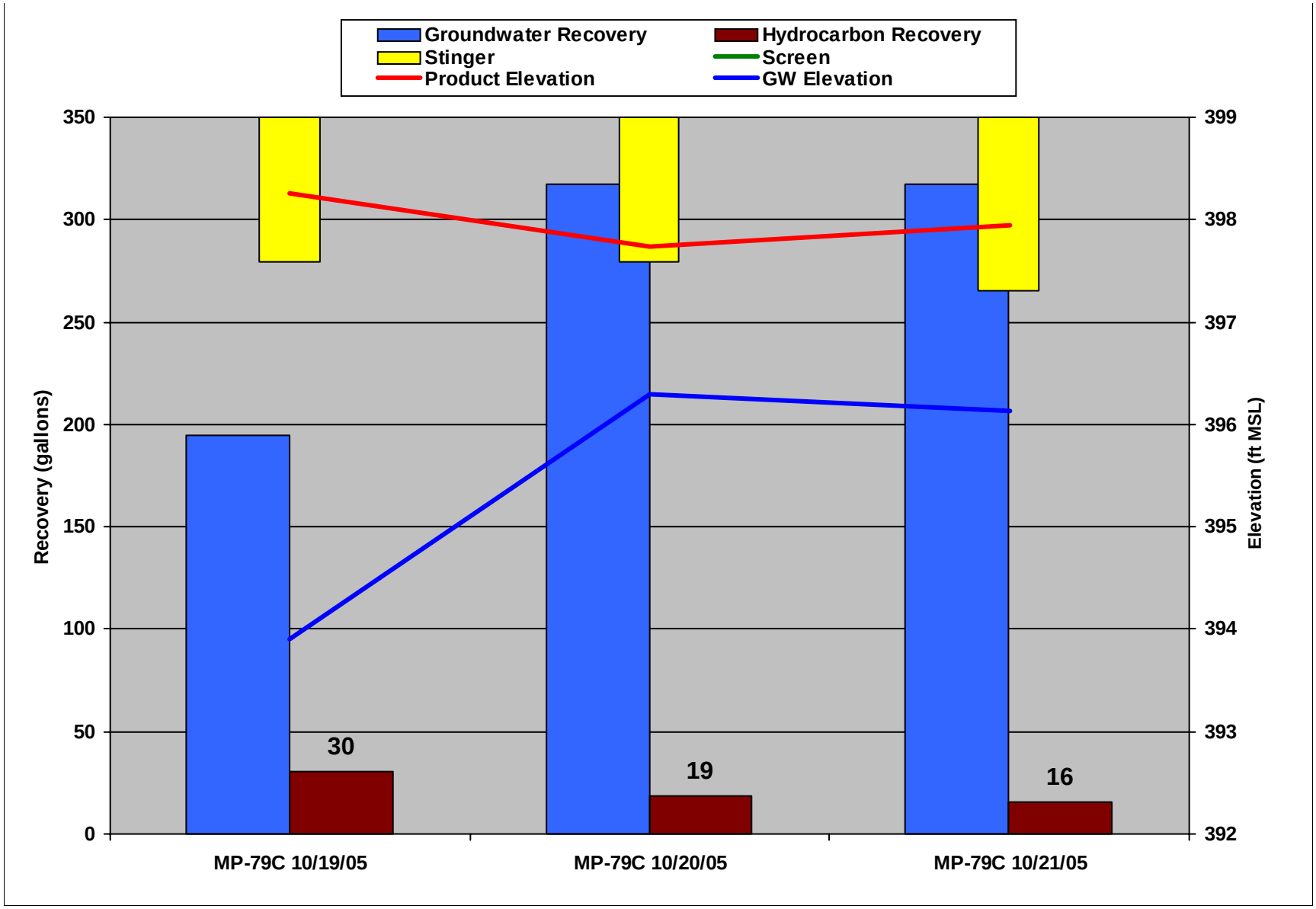


Figure 192: MP-79C
Hydrocarbon Recovery vs. Groundwater Recovery - with Vacuums

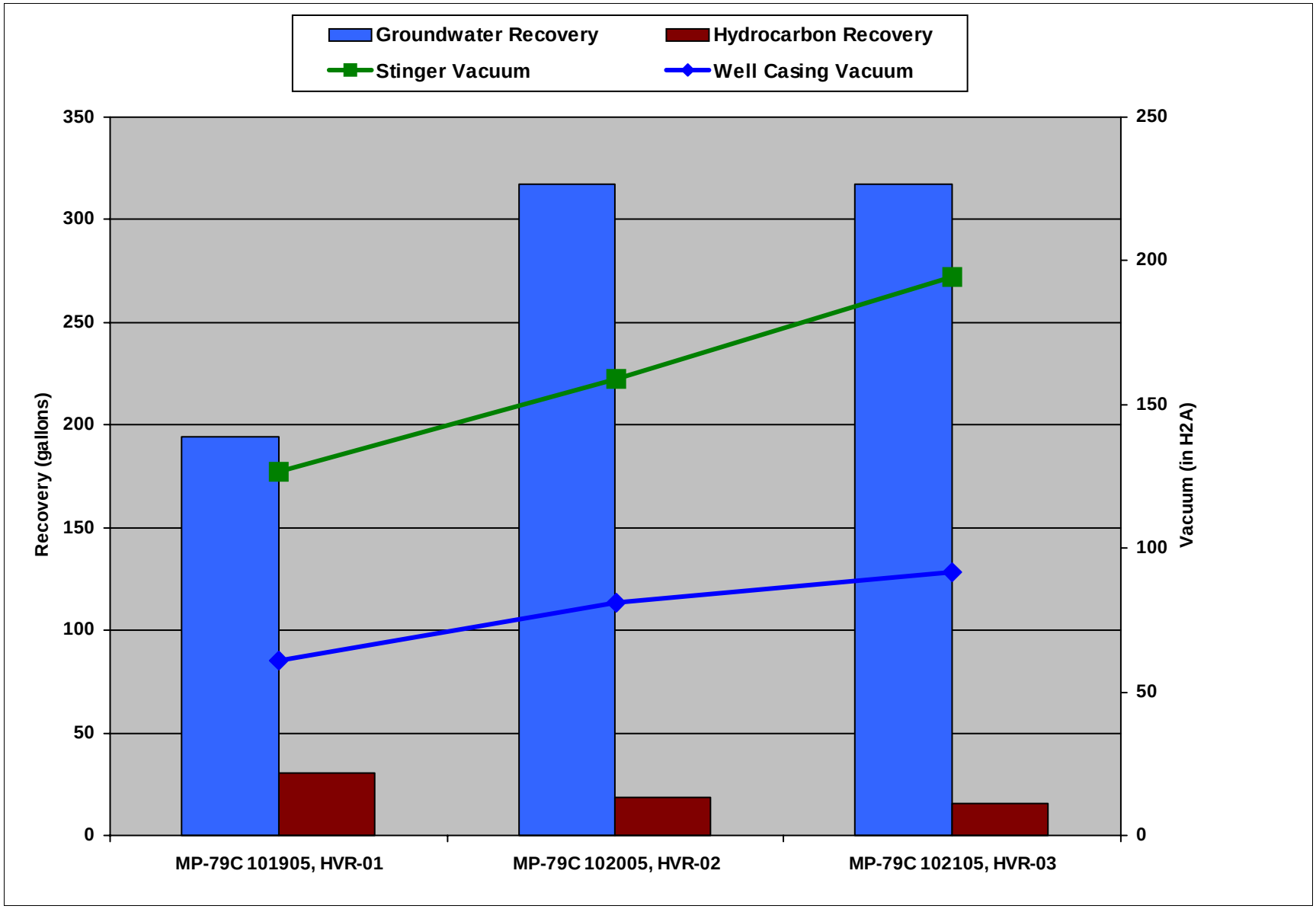


Figure 193: MP-79C
Hydrocarbon Recovery vs. Groundwater Recovery - with Percentages

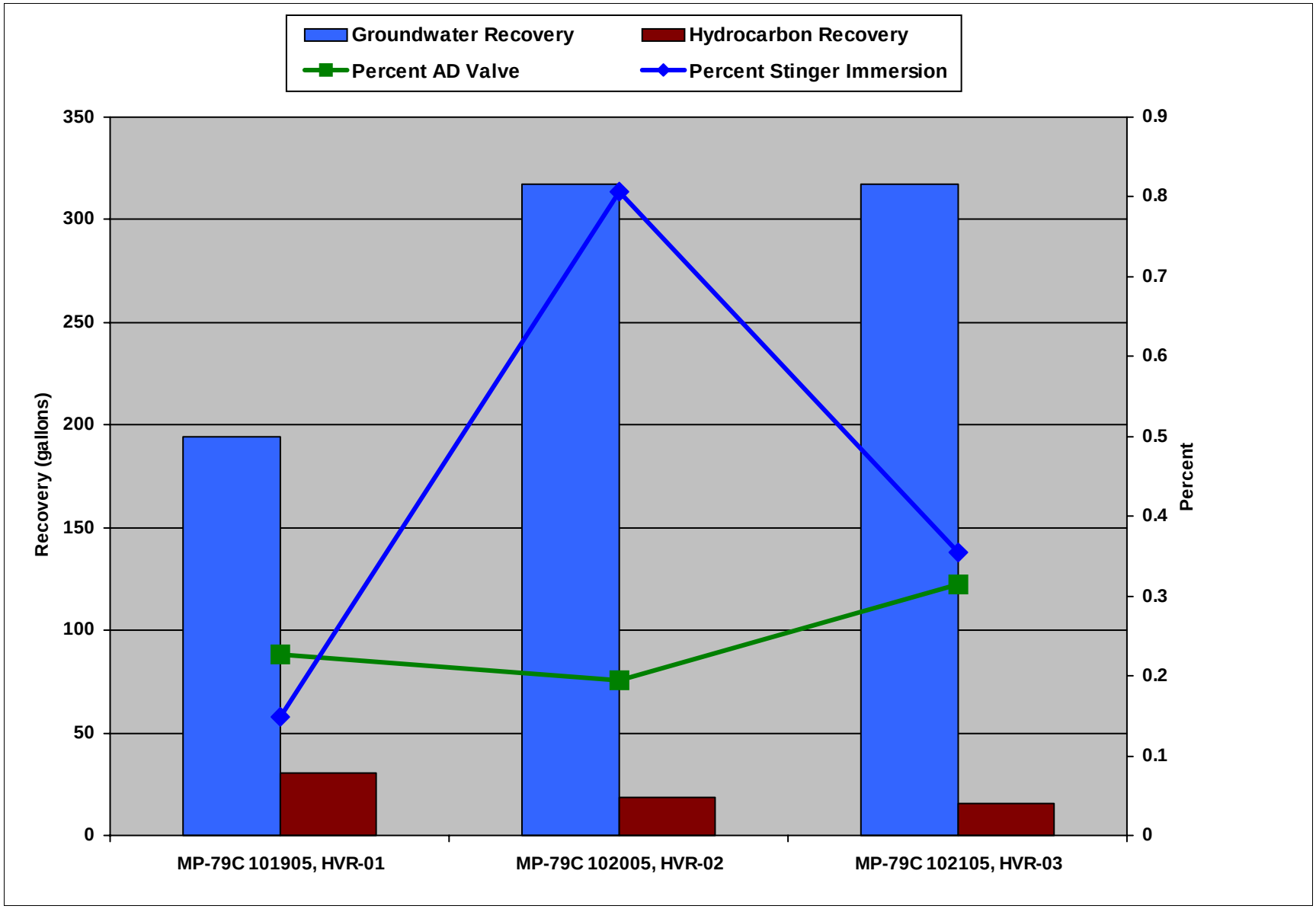


Figure 194: MP-79C
HiVac Event Recharge as a Percentage of Original Product Thickness

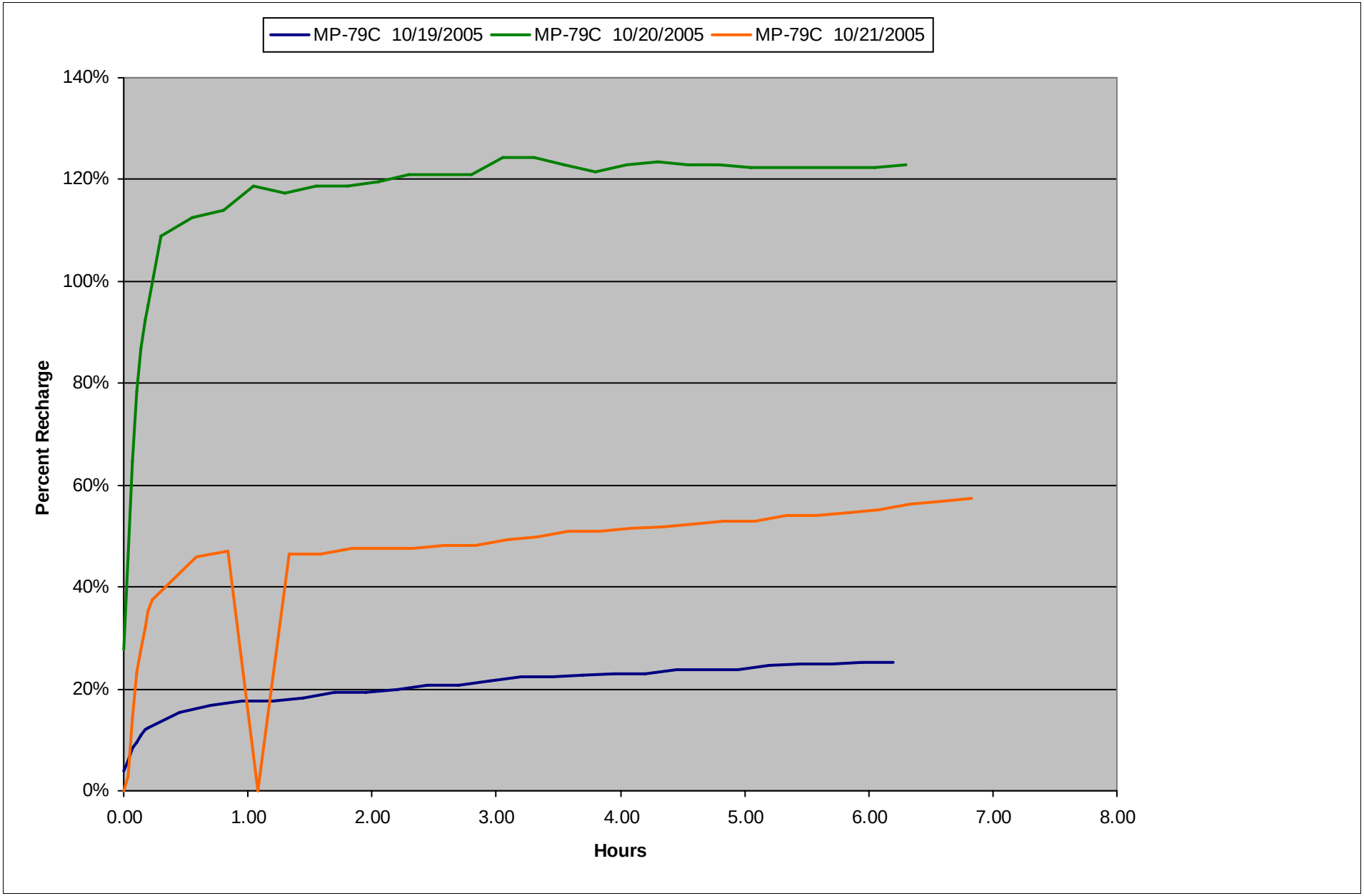


Figure 195: MP-79C
HiVac Event Recharge as Product Thickness in Feet

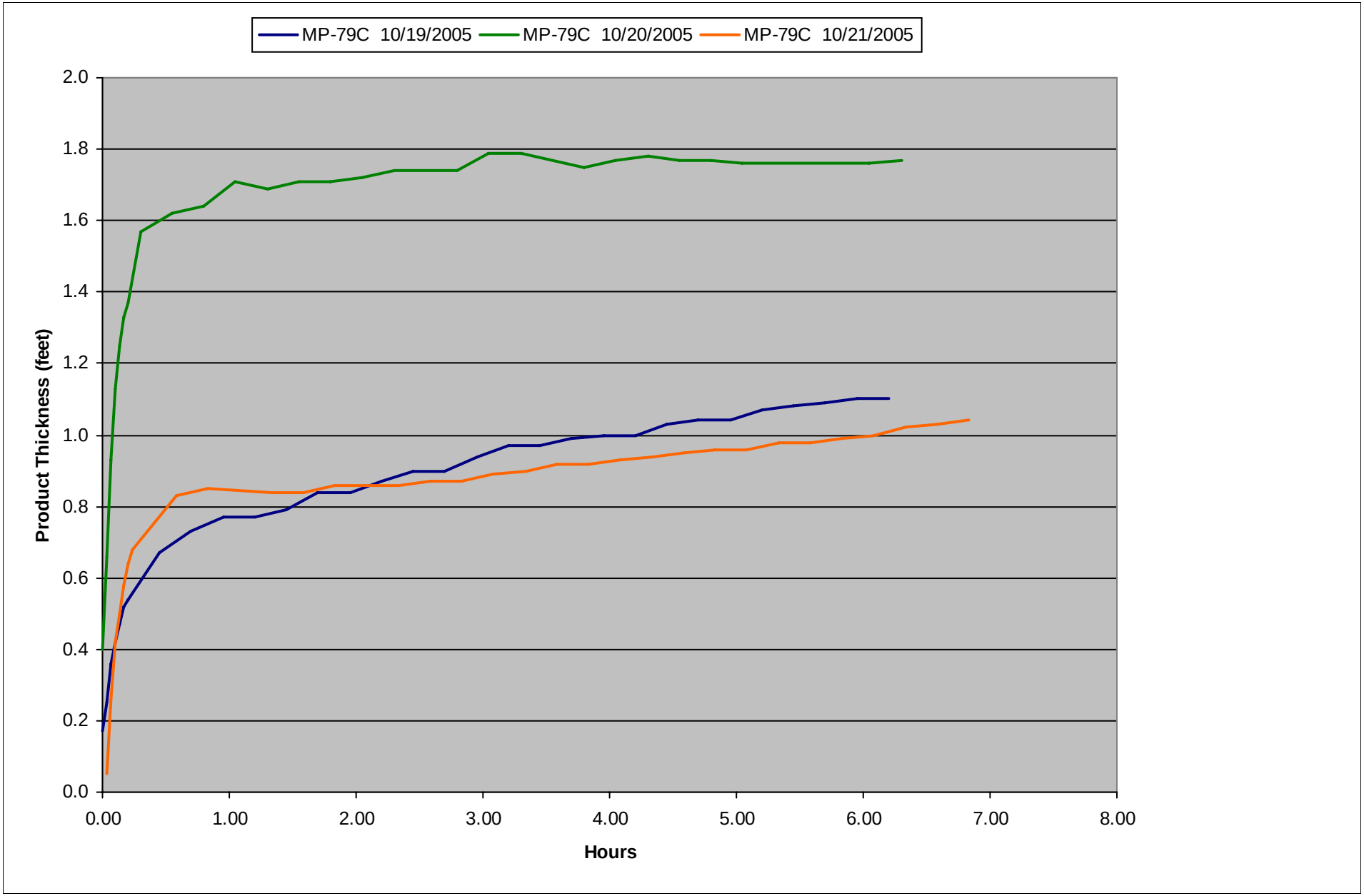
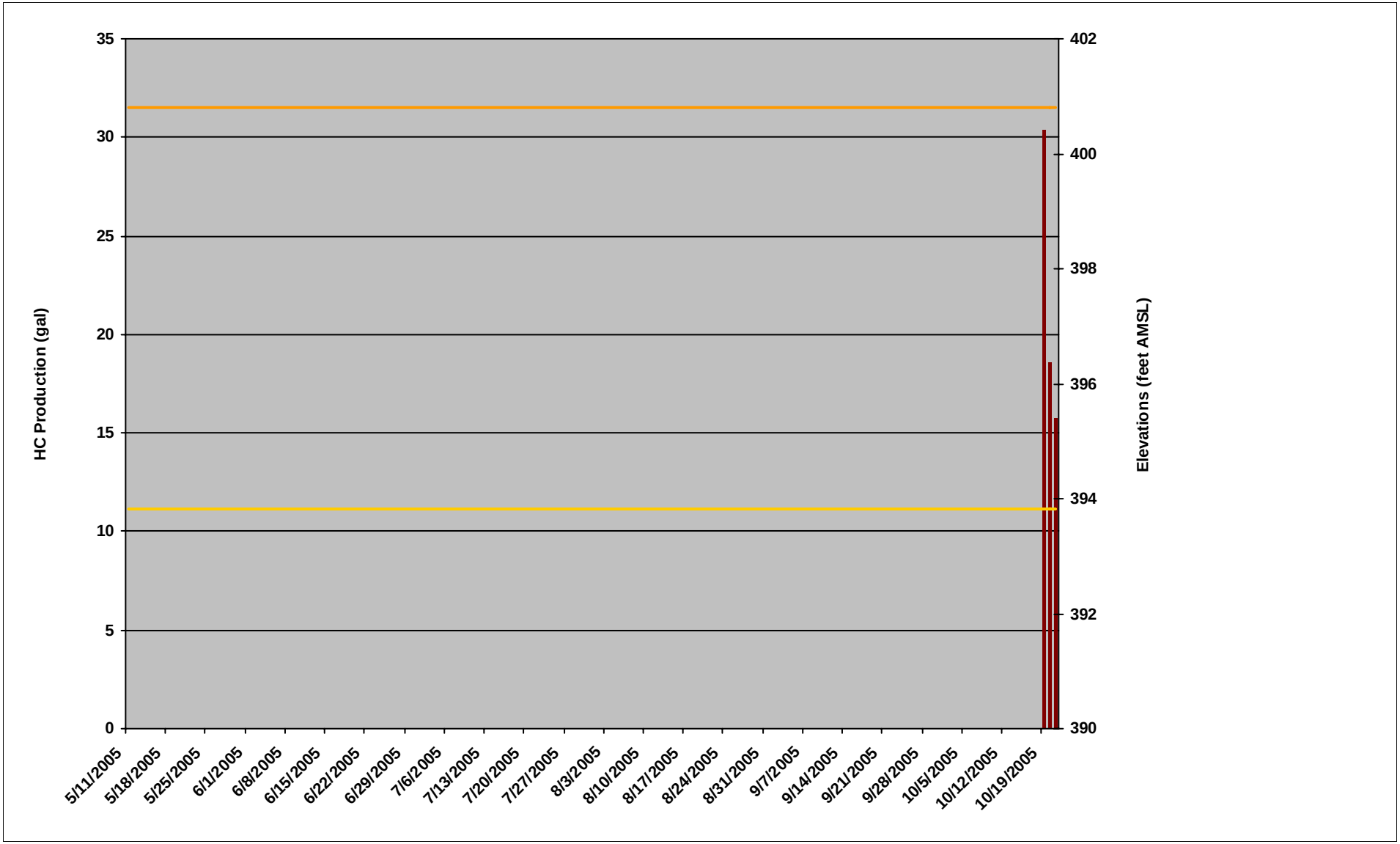


Figure 196: Production Hydrostratigraph

MP-79C

Time Scale



Hartford, Il.

Figure 197: MP-79C
Depth to Top of LNAPL vs. LNAPL Thickness 2004-2005

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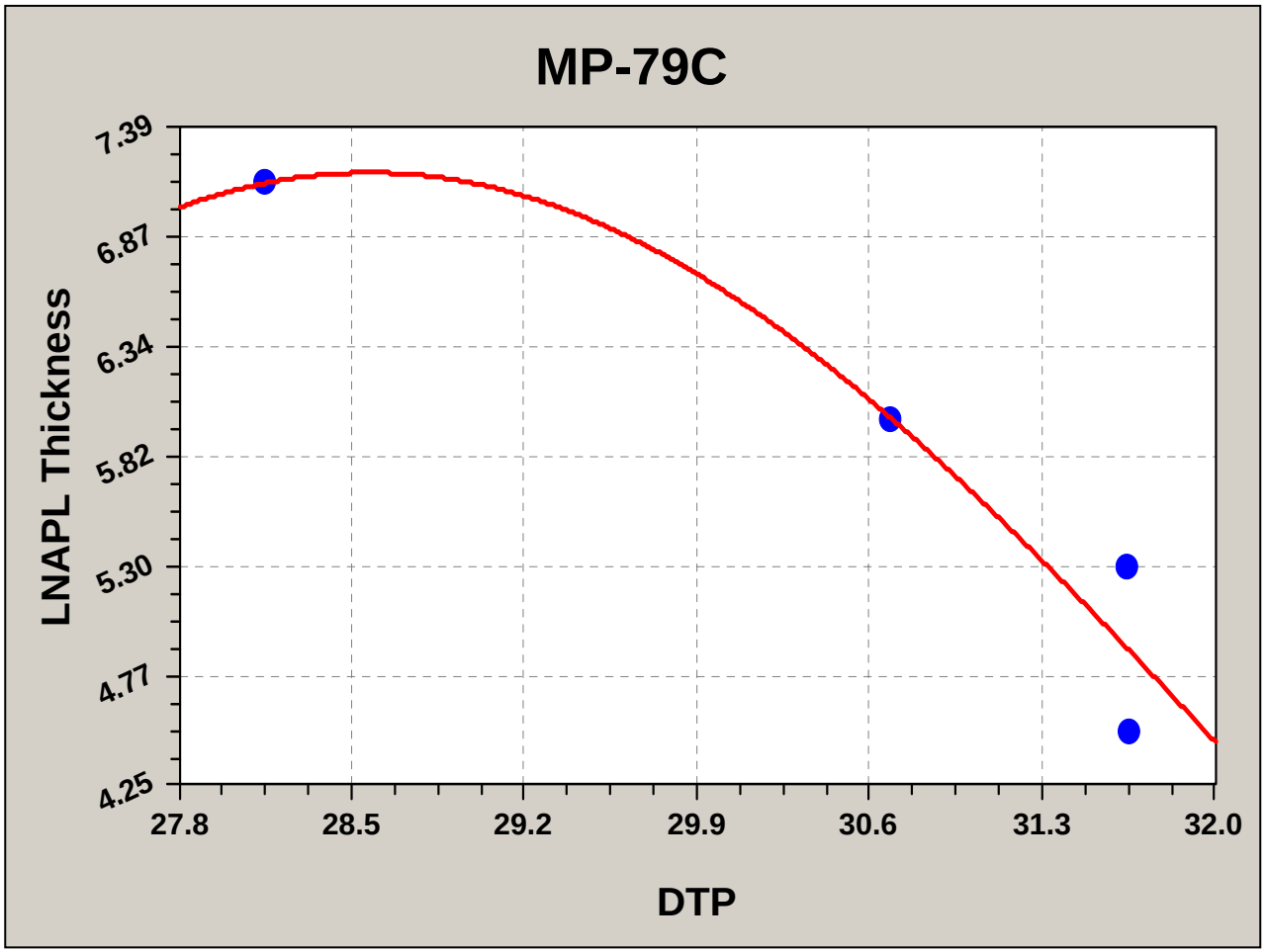

Figure 198: RW-4A
Multi-Site Cumulative Product Recovery (Gallons)

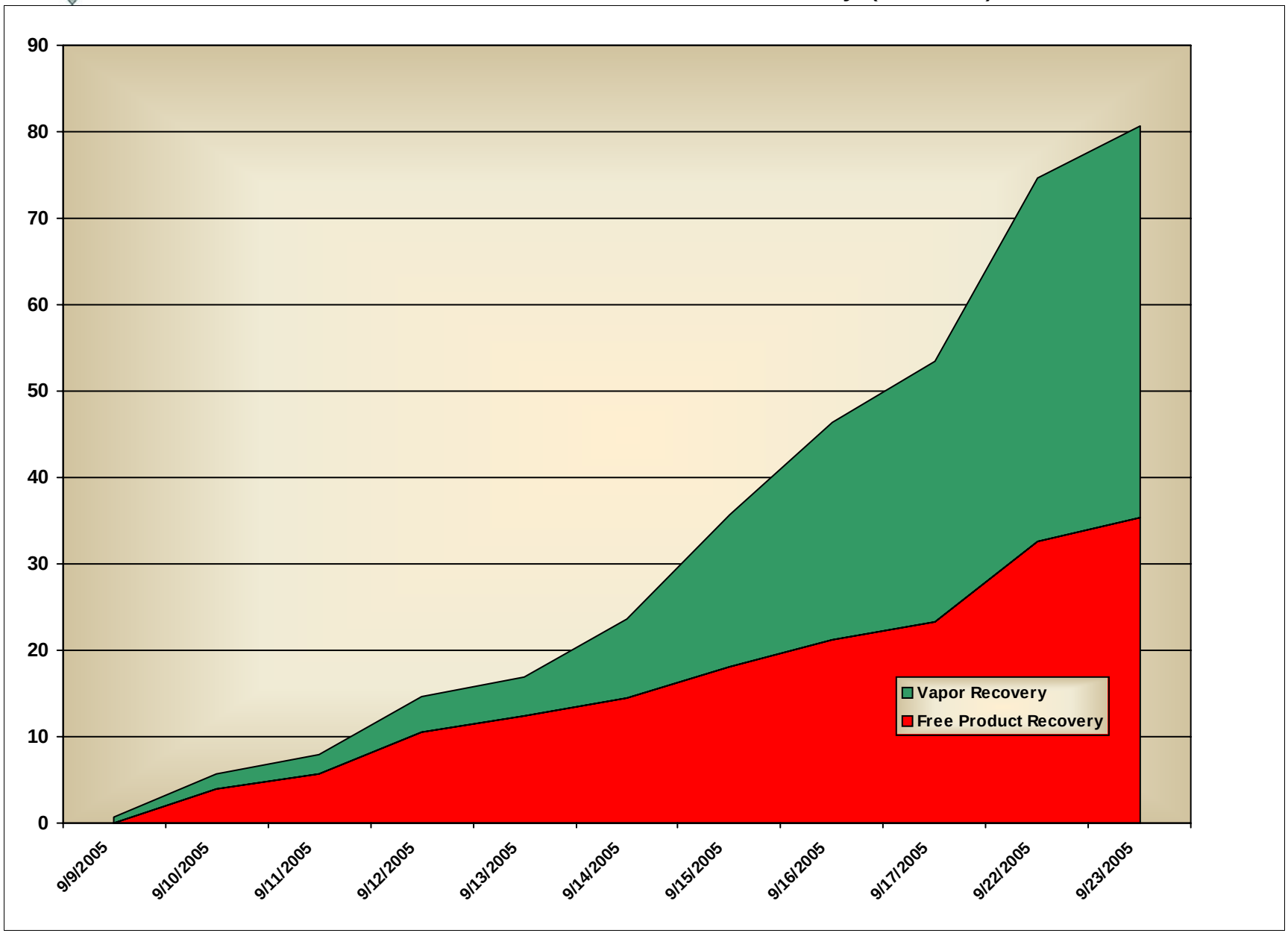

Figure 199: RW-4A
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

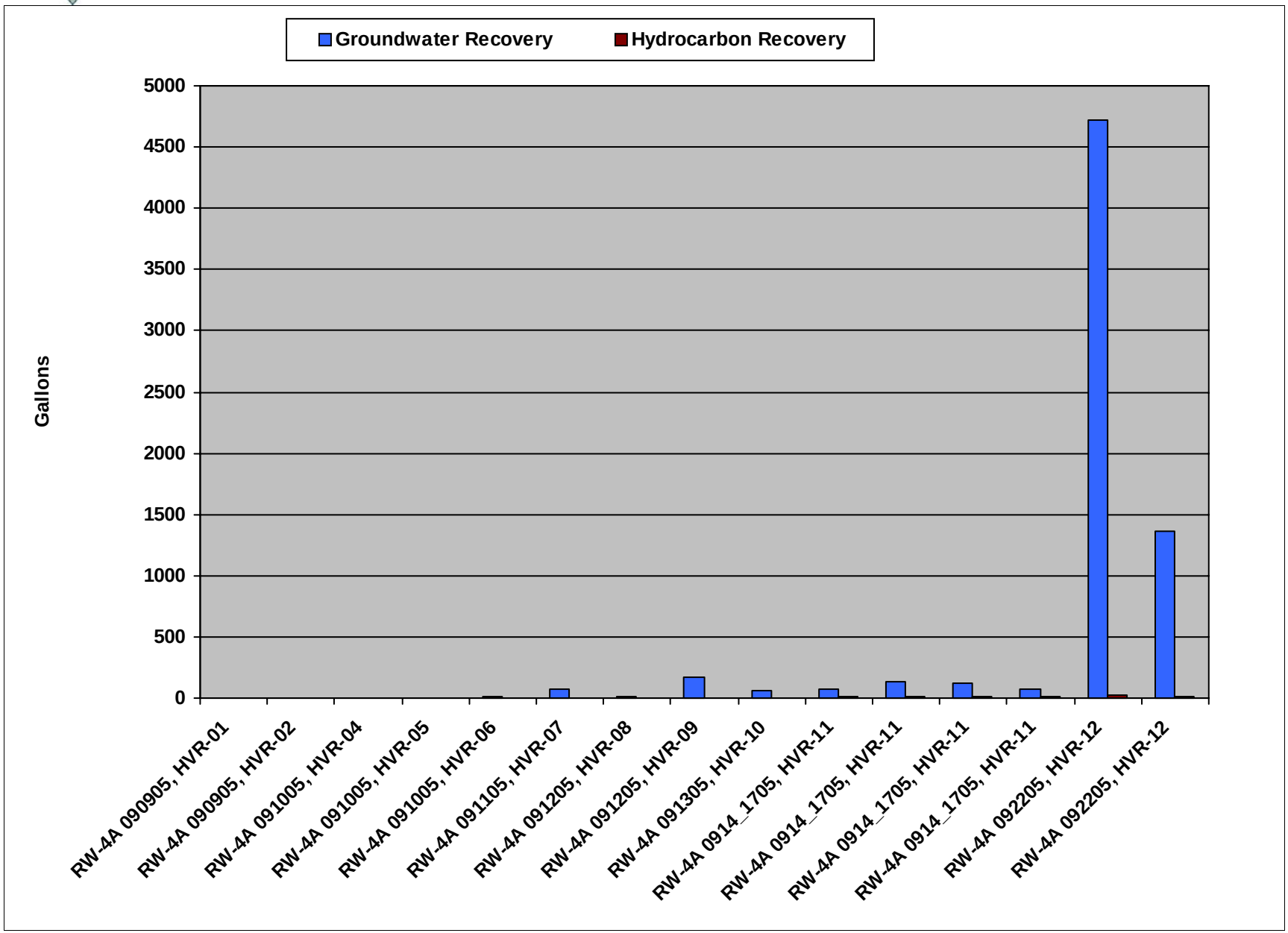

Figure 200: RW-4A
Multi-Site Hydrocarbon Recovery Rate (Gal/Hr) - Grouped by Site

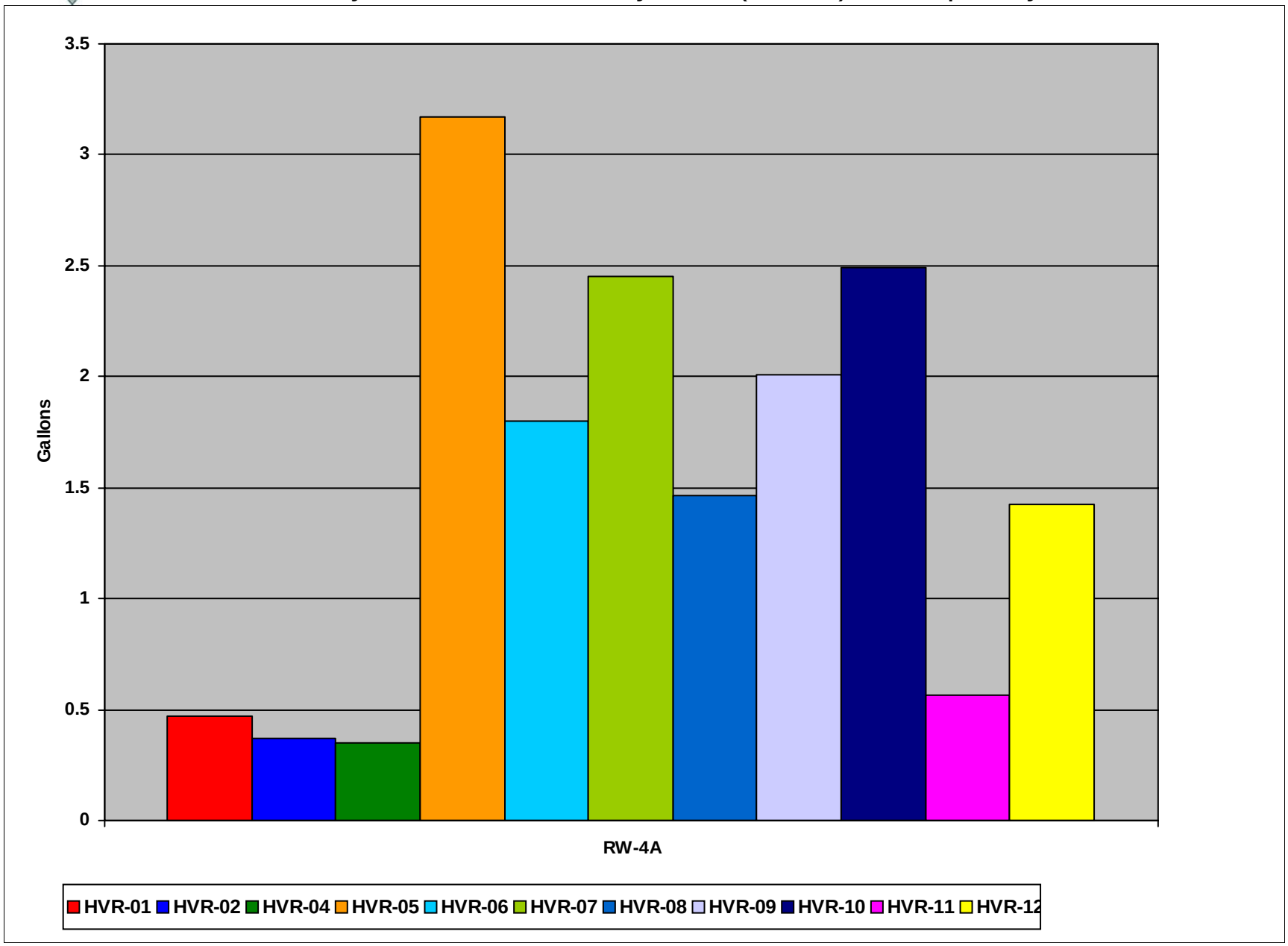

Figure 201: RW-4A
BTU per Hour

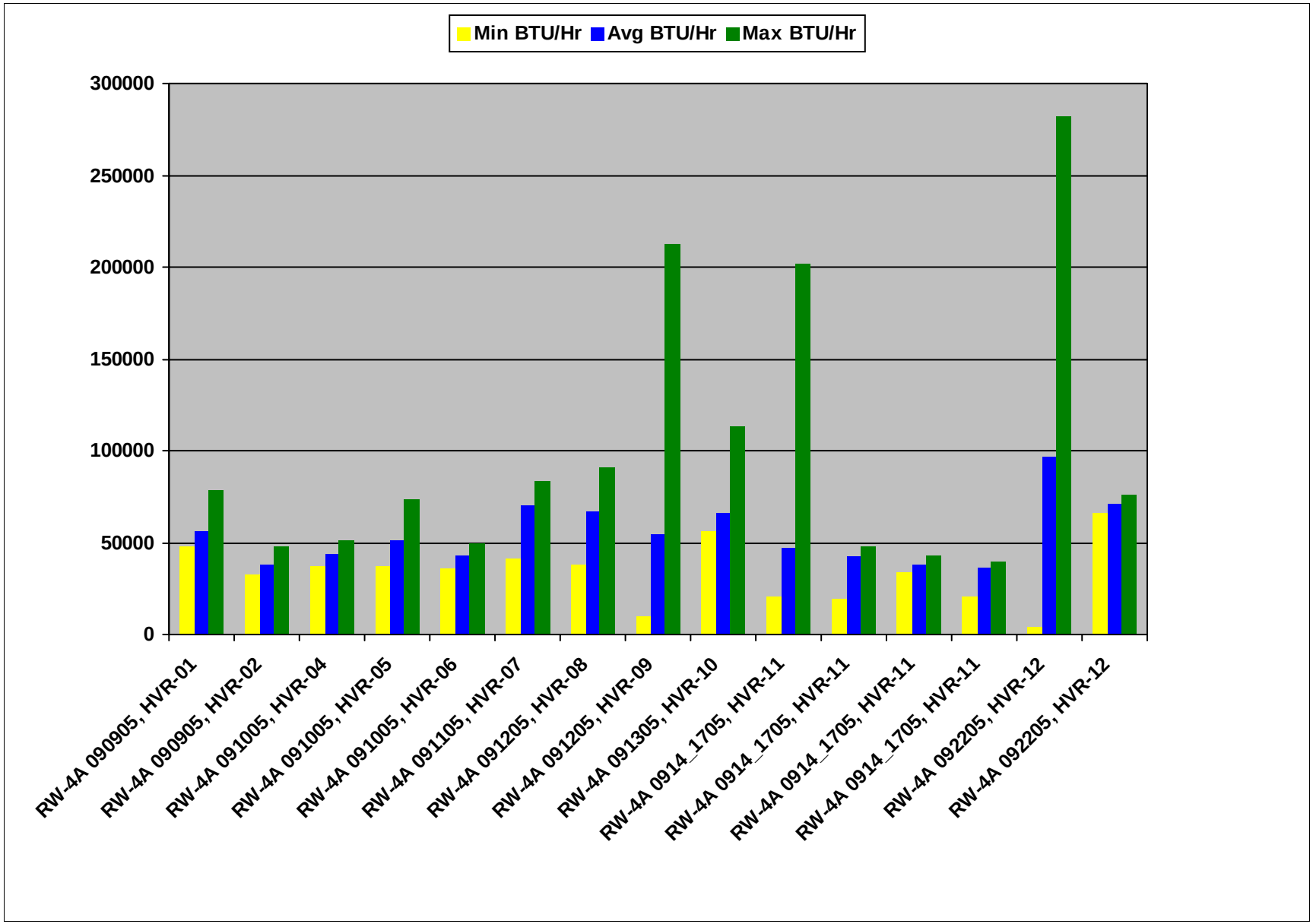

Figure 202: RW-4A
Multi-Site Vacuums

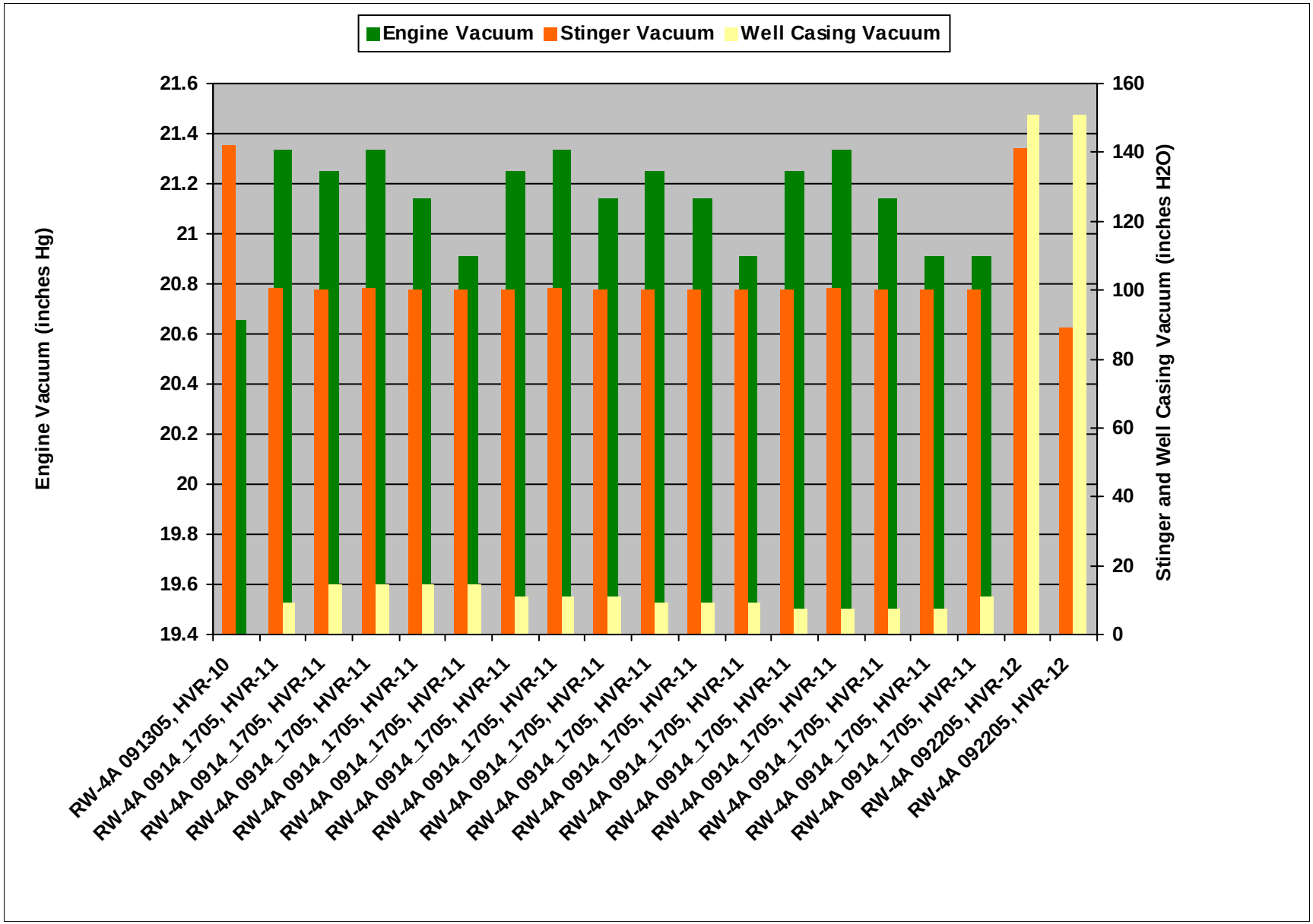

Figure 203: RW-4A
Multi-Site Air, Well and Fuel Flows

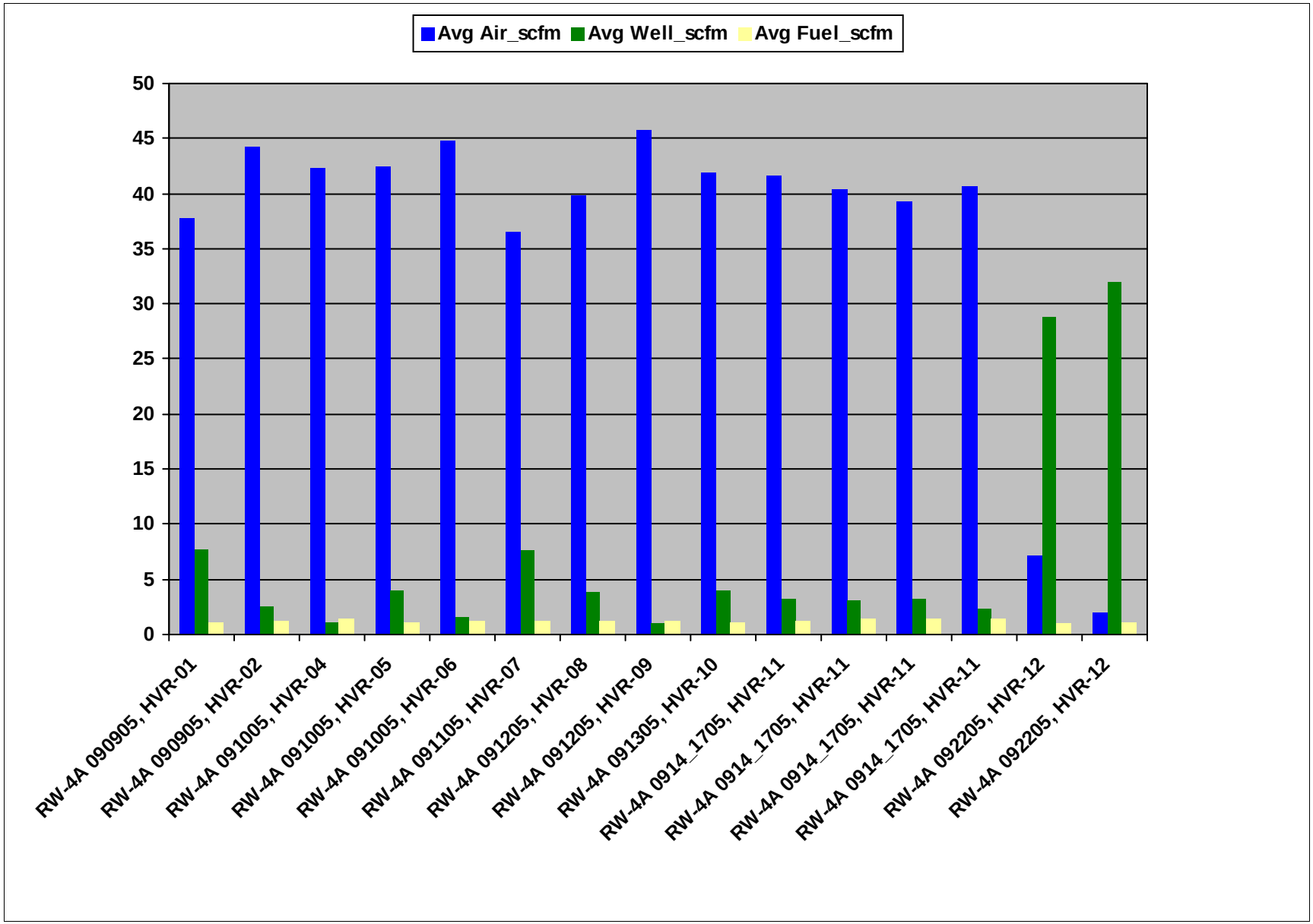

Figure 204: RW-4A Gauging, Stinger Depth and Production Data
Hydrocarbon Recovery vs. Groundwater Recovery - with Elevations

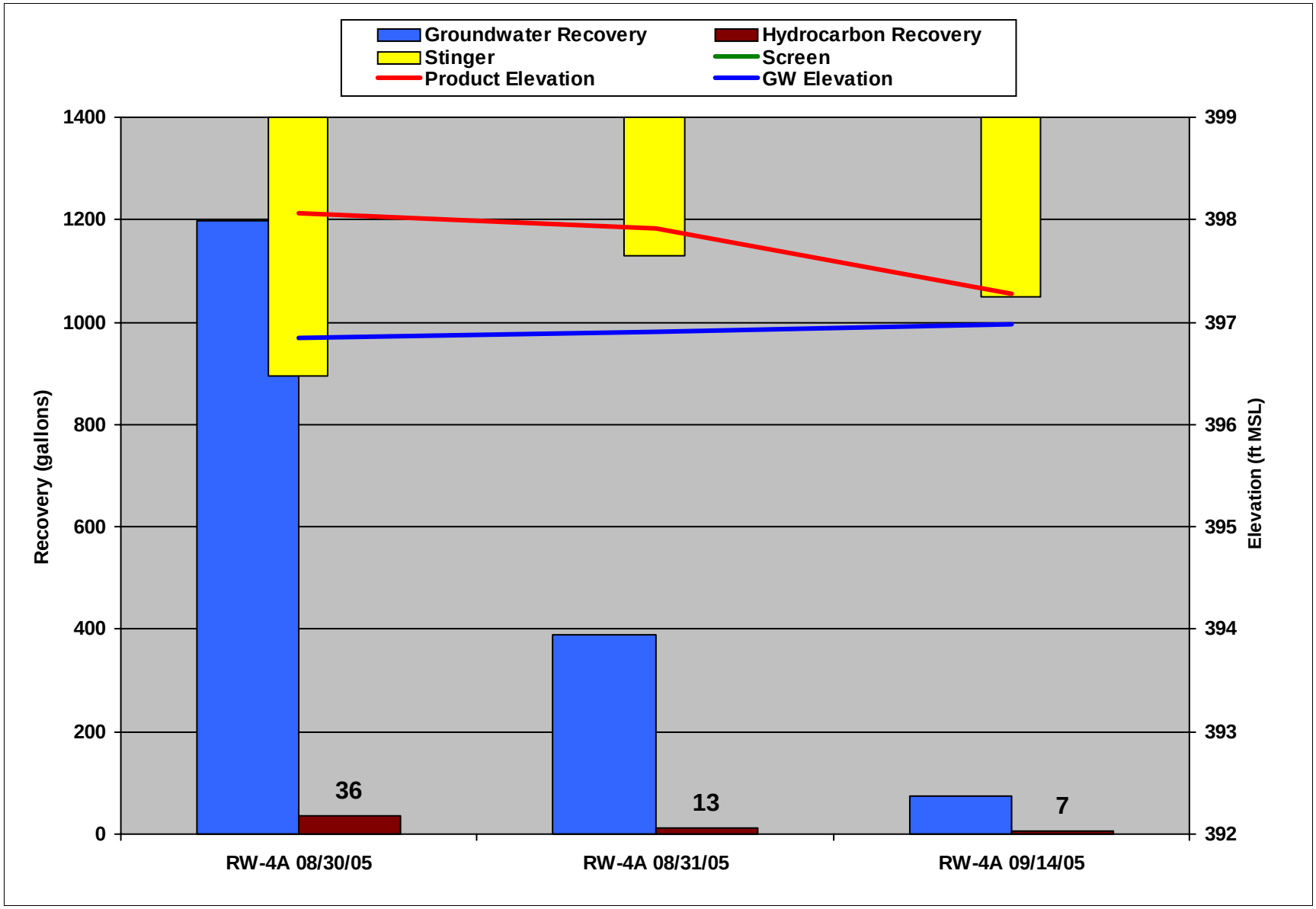

Figure 205: RW-4A
Hydrocarbon Recovery vs. Groundwater Recovery - with Vacuums

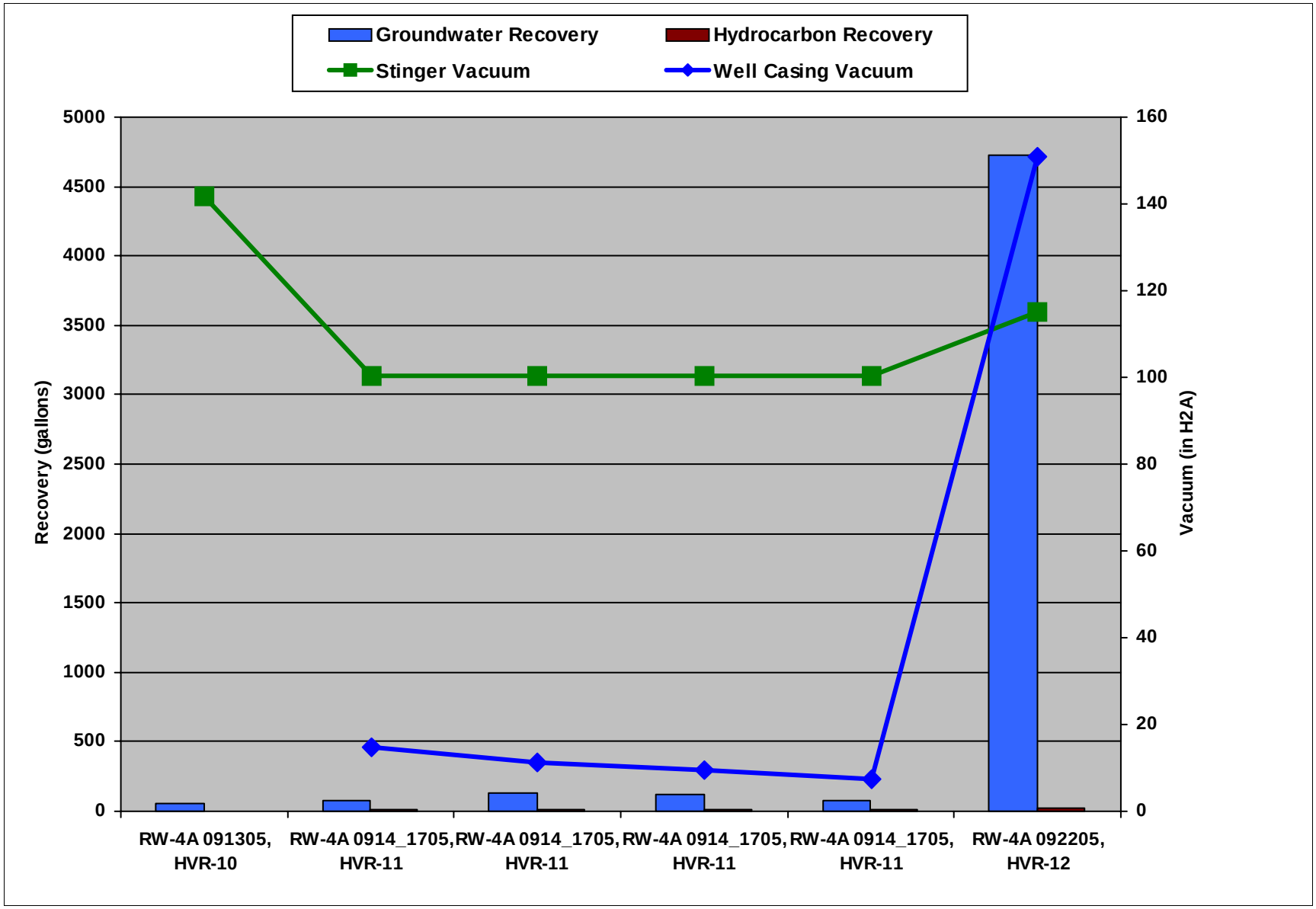

Figure 206: RW-4A
Hydrocarbon Recovery vs. Groundwater Recovery - with Percentages

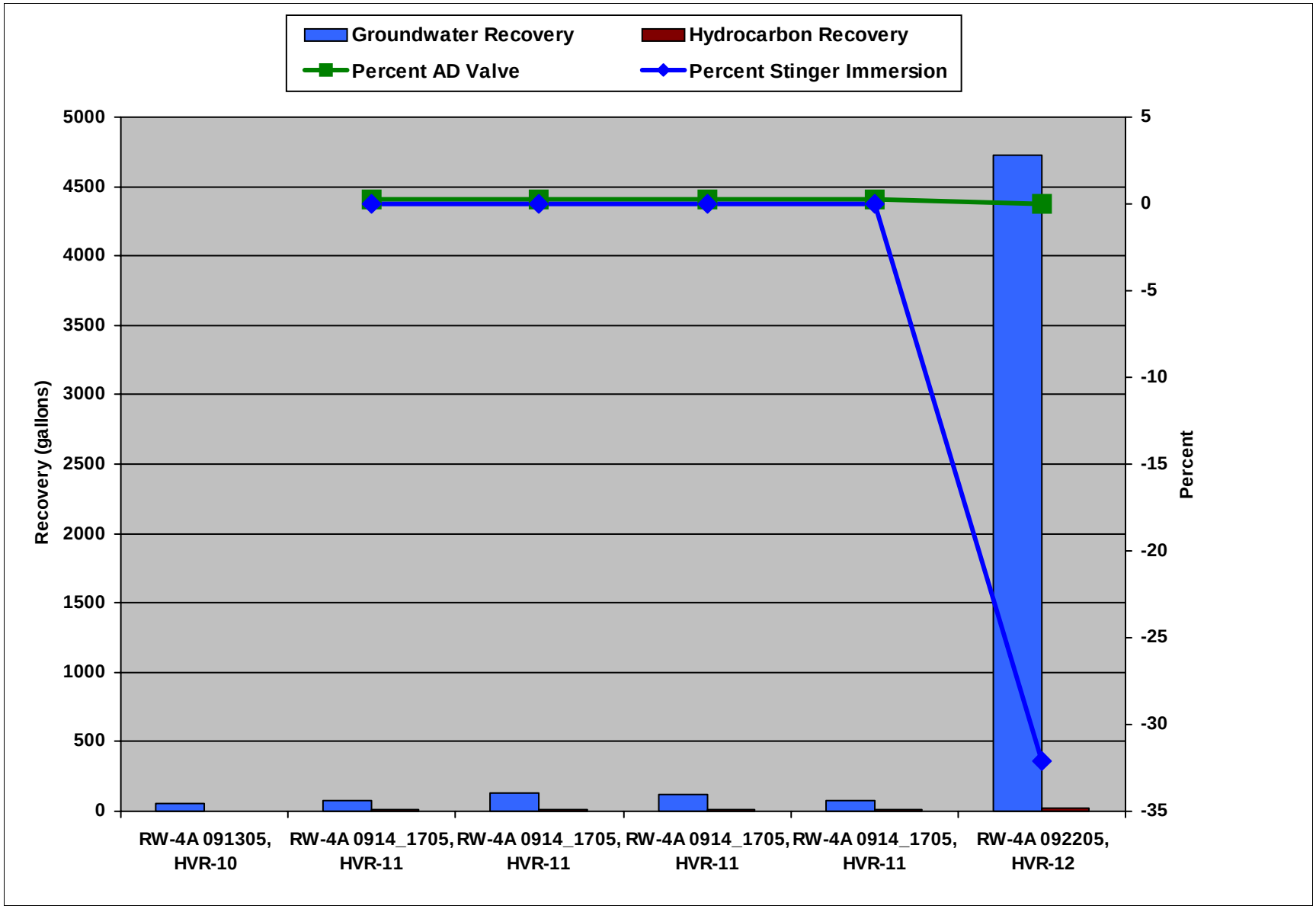

Figure 207: RW-4A
Depth to Top of LNAPL vs. LNAPL Thickness 2004-2005

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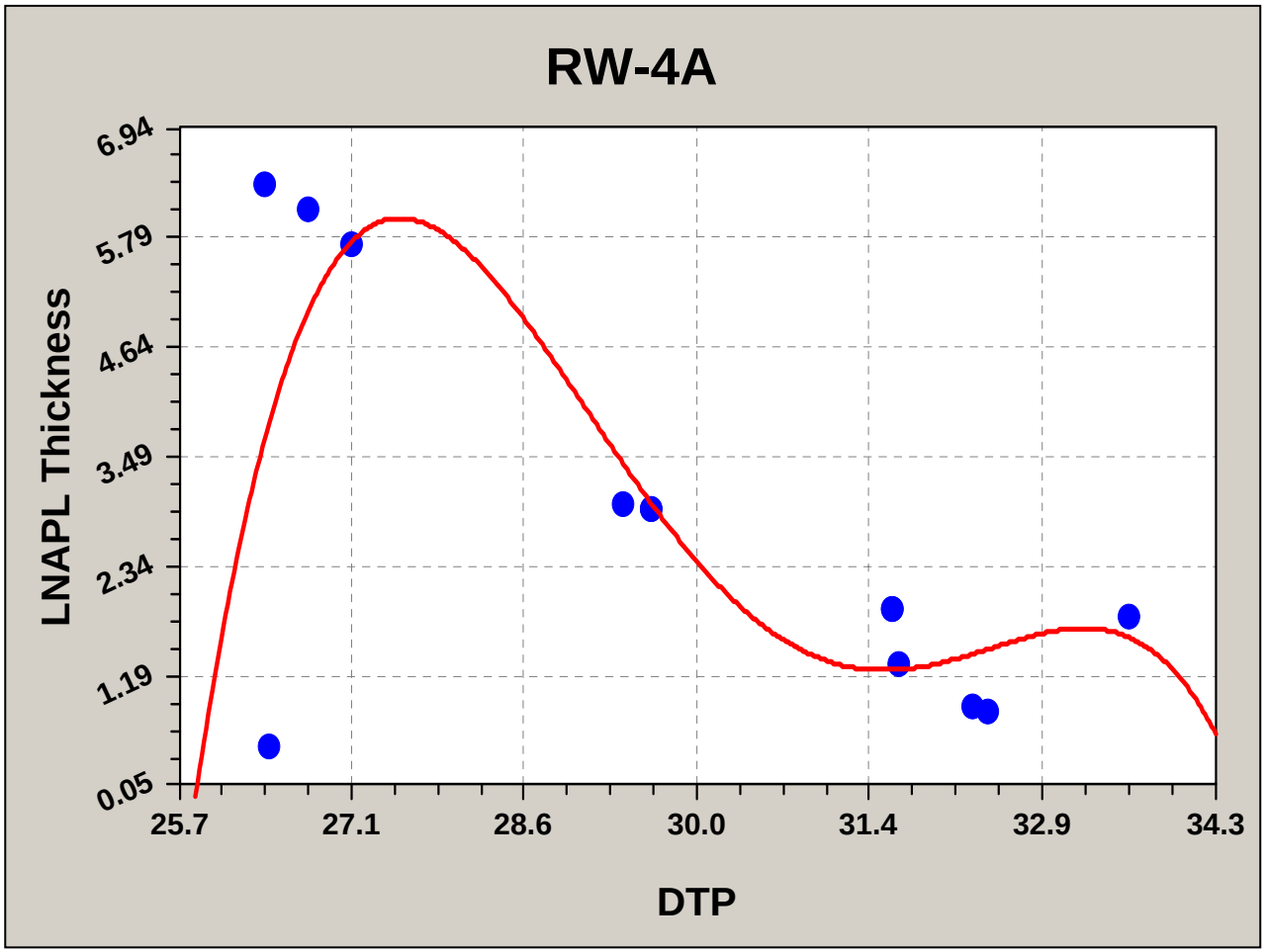

Figure 208: RW-5
Multi-Site Cumulative Product Recovery (Gallons)

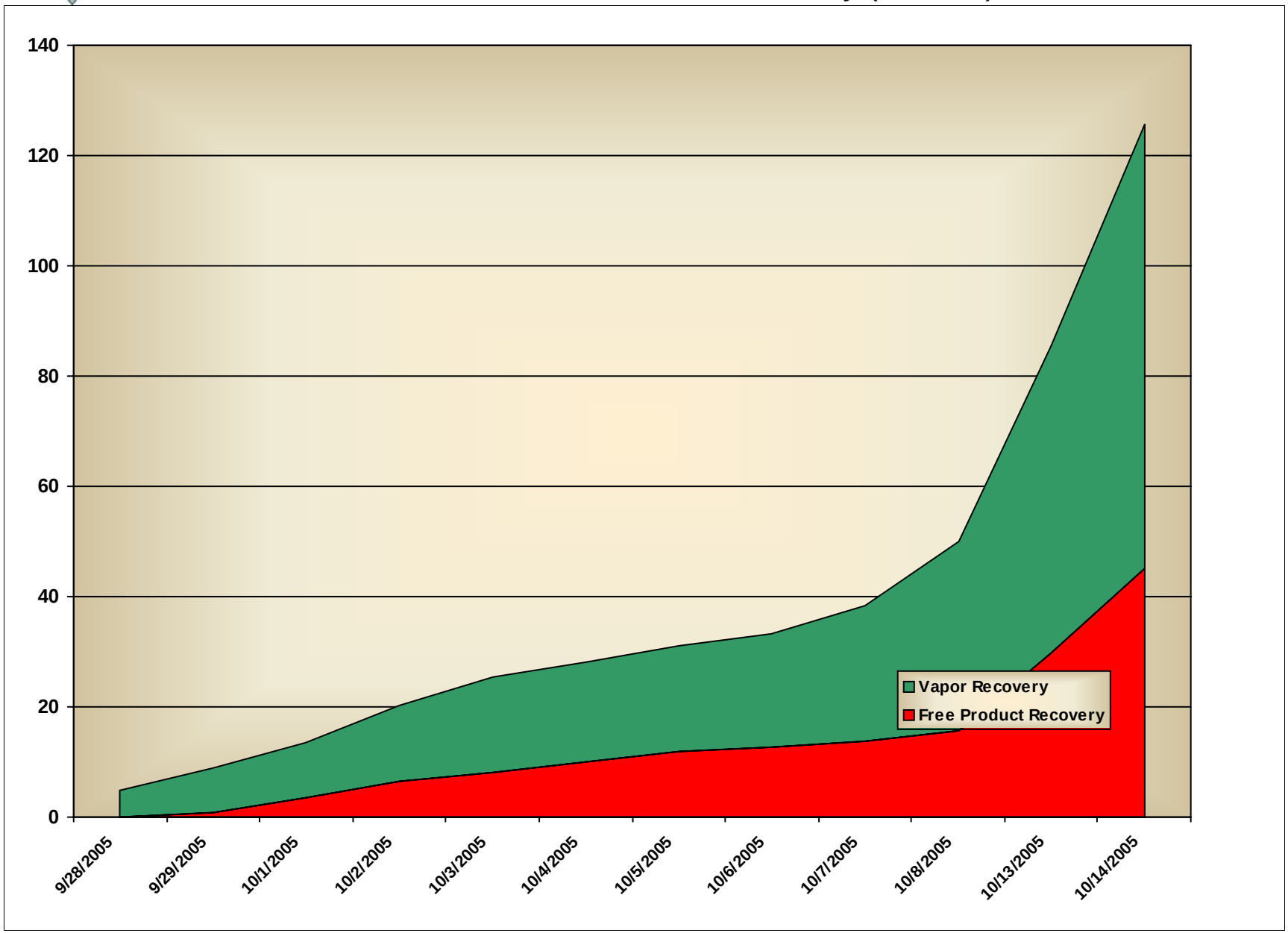

Figure 209: RW-5
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

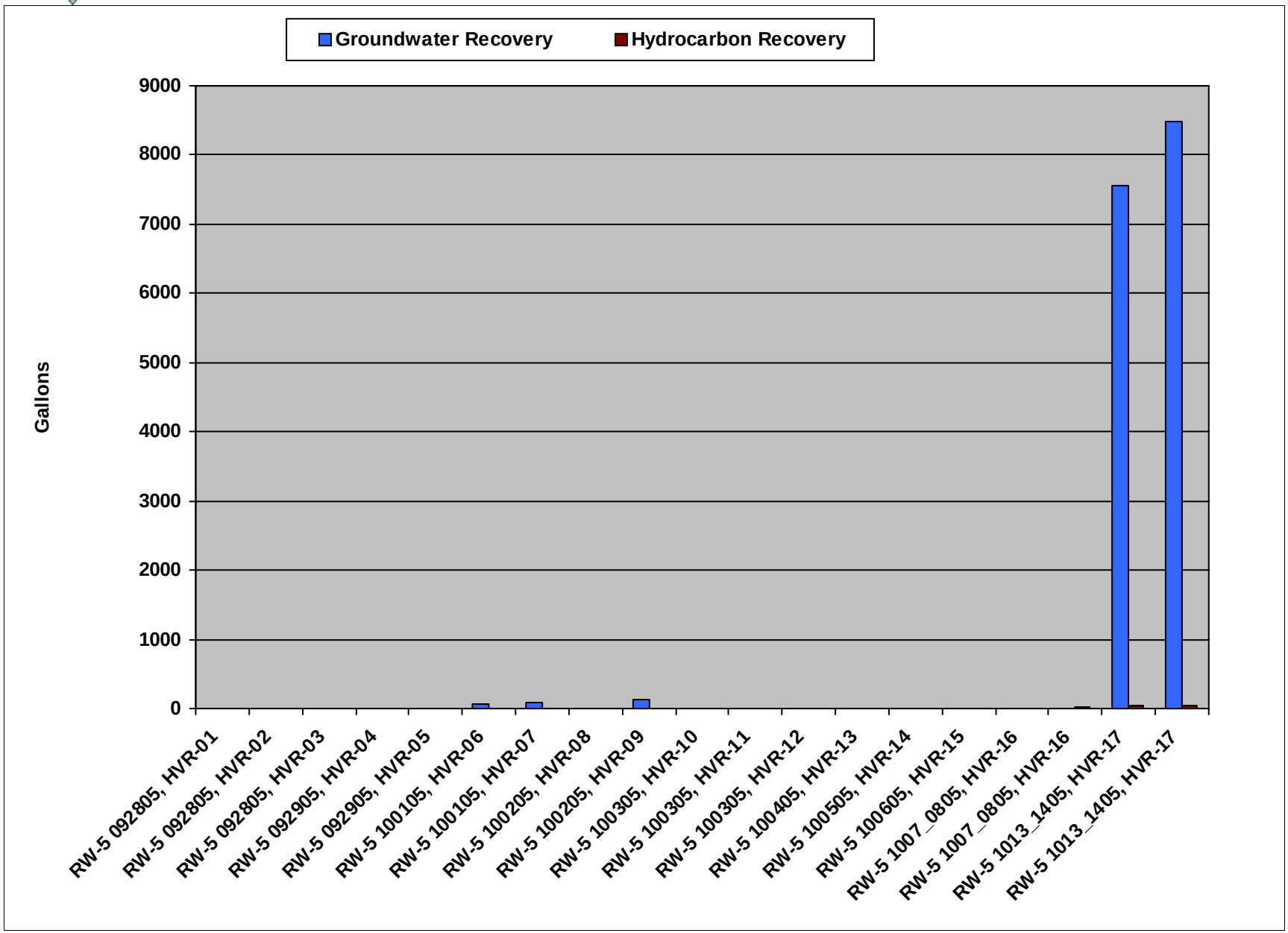

Figure 210: RW-5
Multi-Site Hydrocarbon Recovery Rate (Gal/Hr) - Grouped by Site

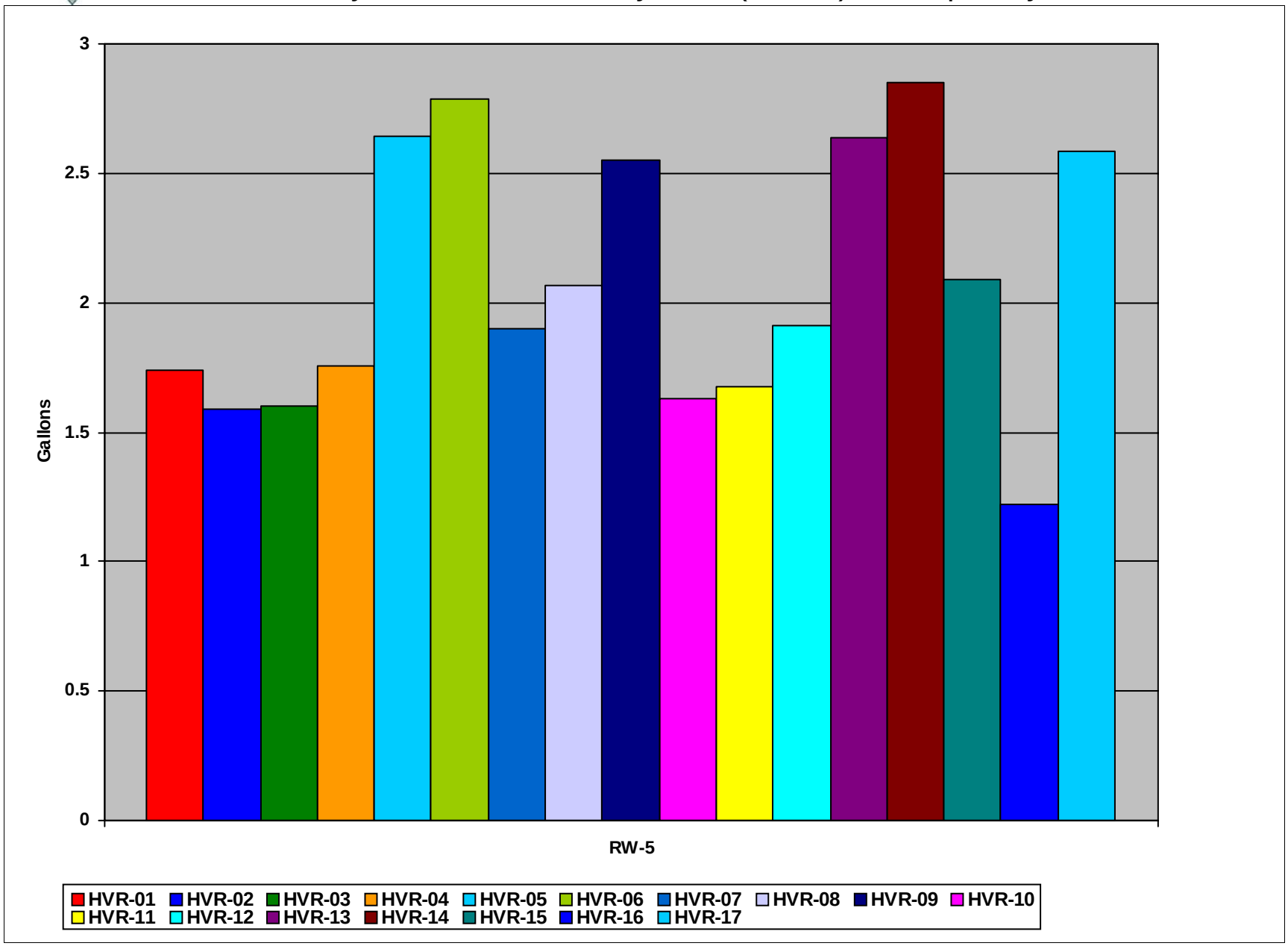

Figure 211: RW-5
Multi-Site LB per Hour - ICE Calculated vs. Lab Sample

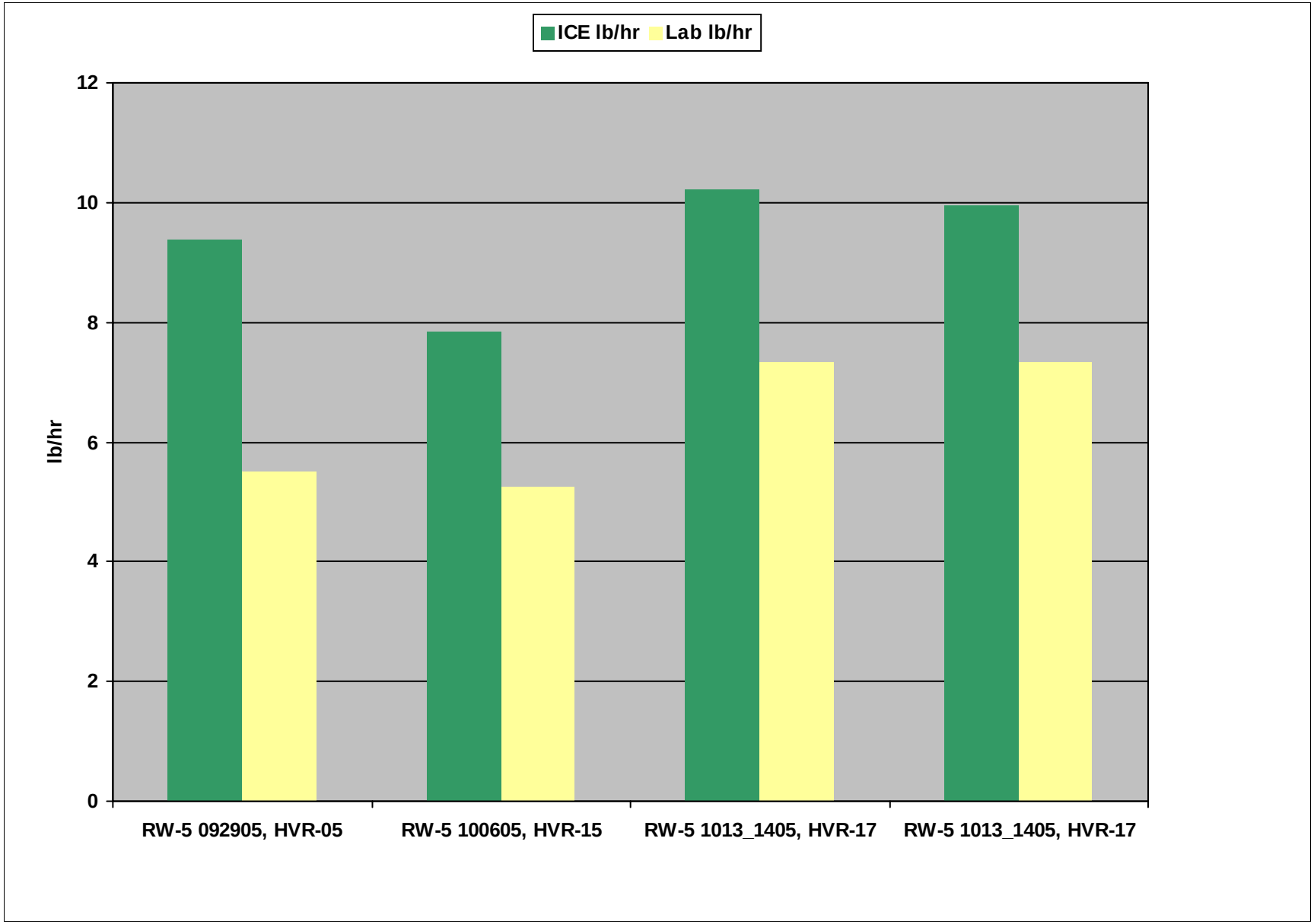

Figure 212: RW-5
BTU per Hour

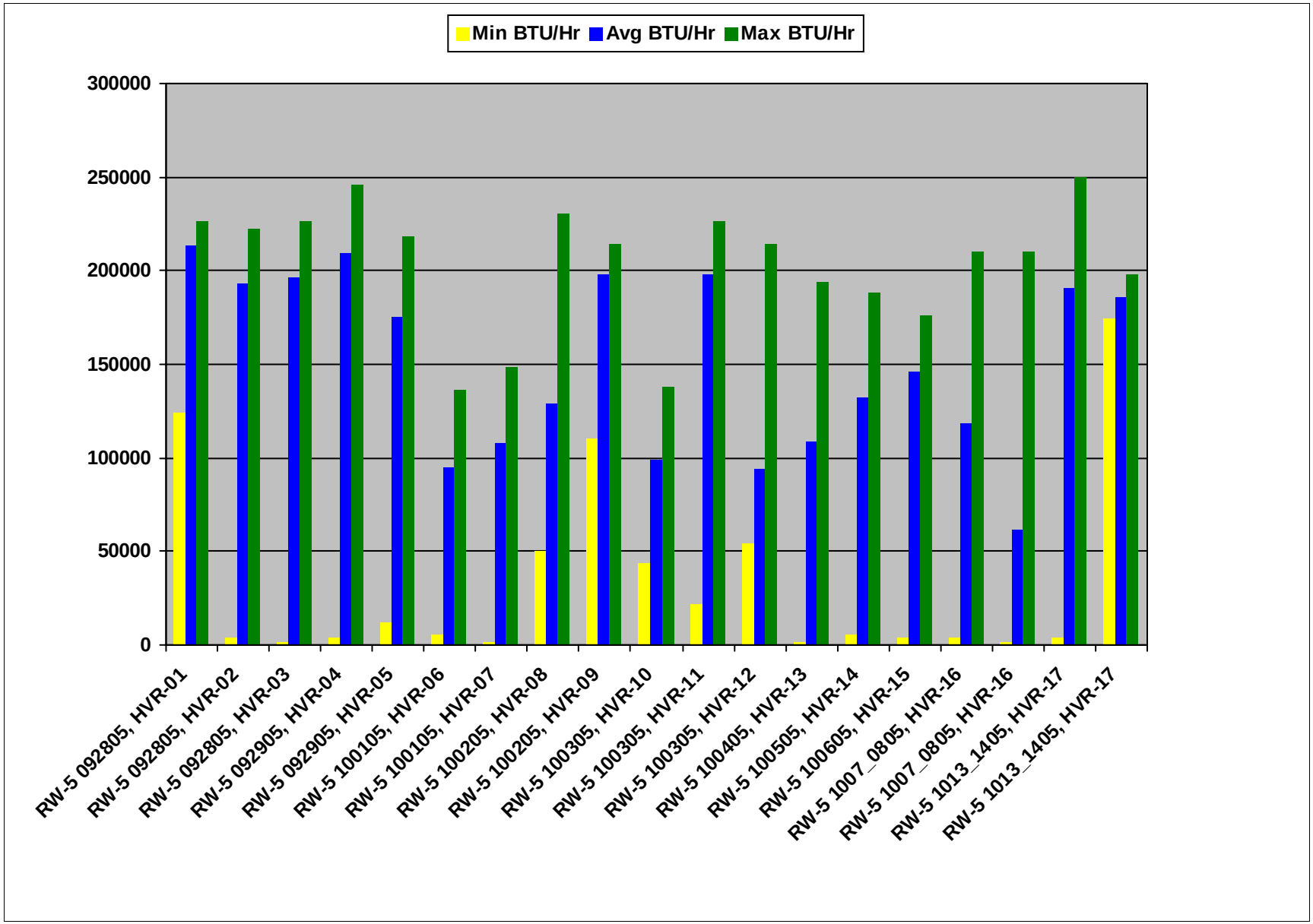

Figure 213: RW-5
Multi-Site Vacuums

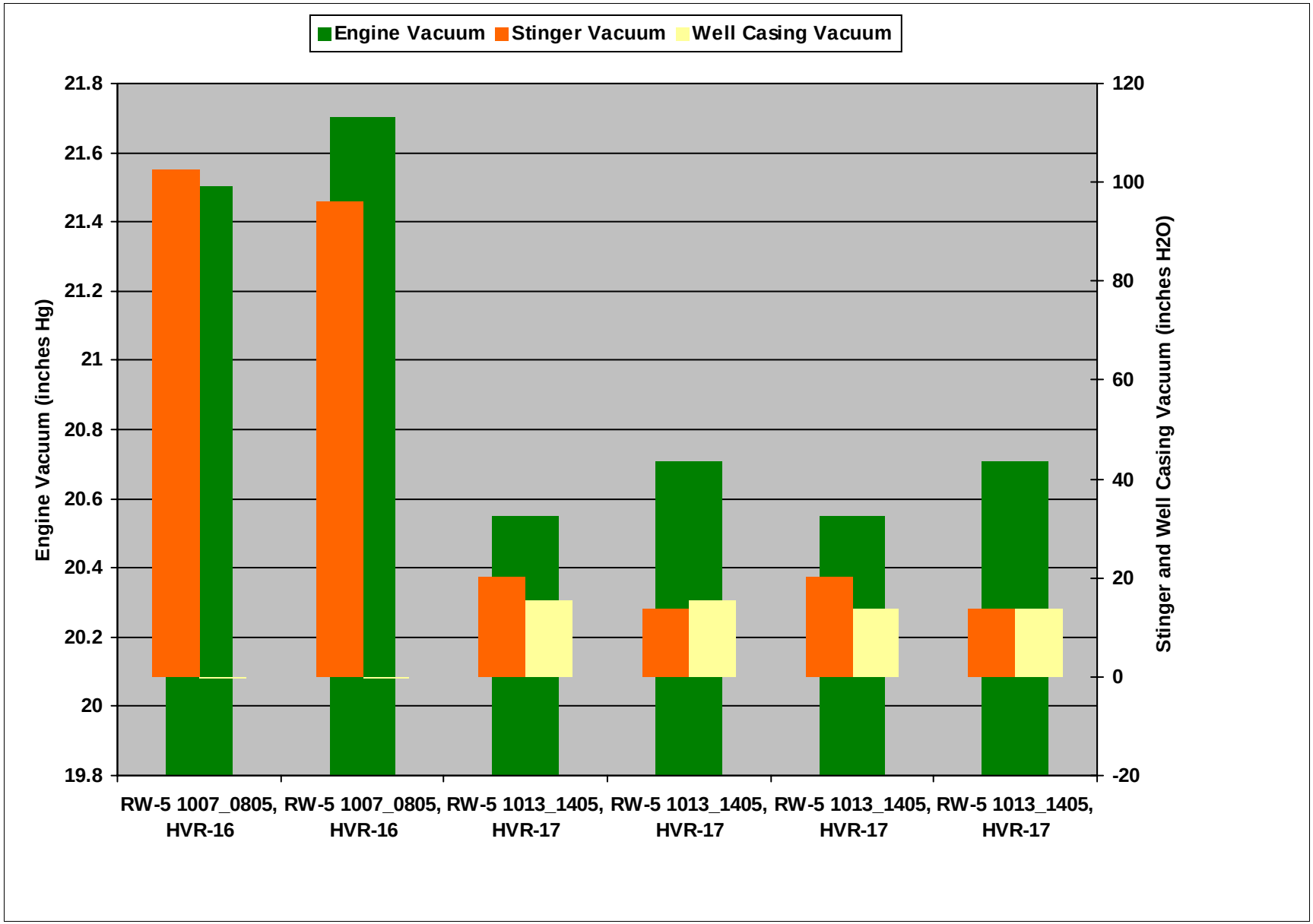

Figure 214: RW-5
Multi-Site Air, Well and Fuel Flows

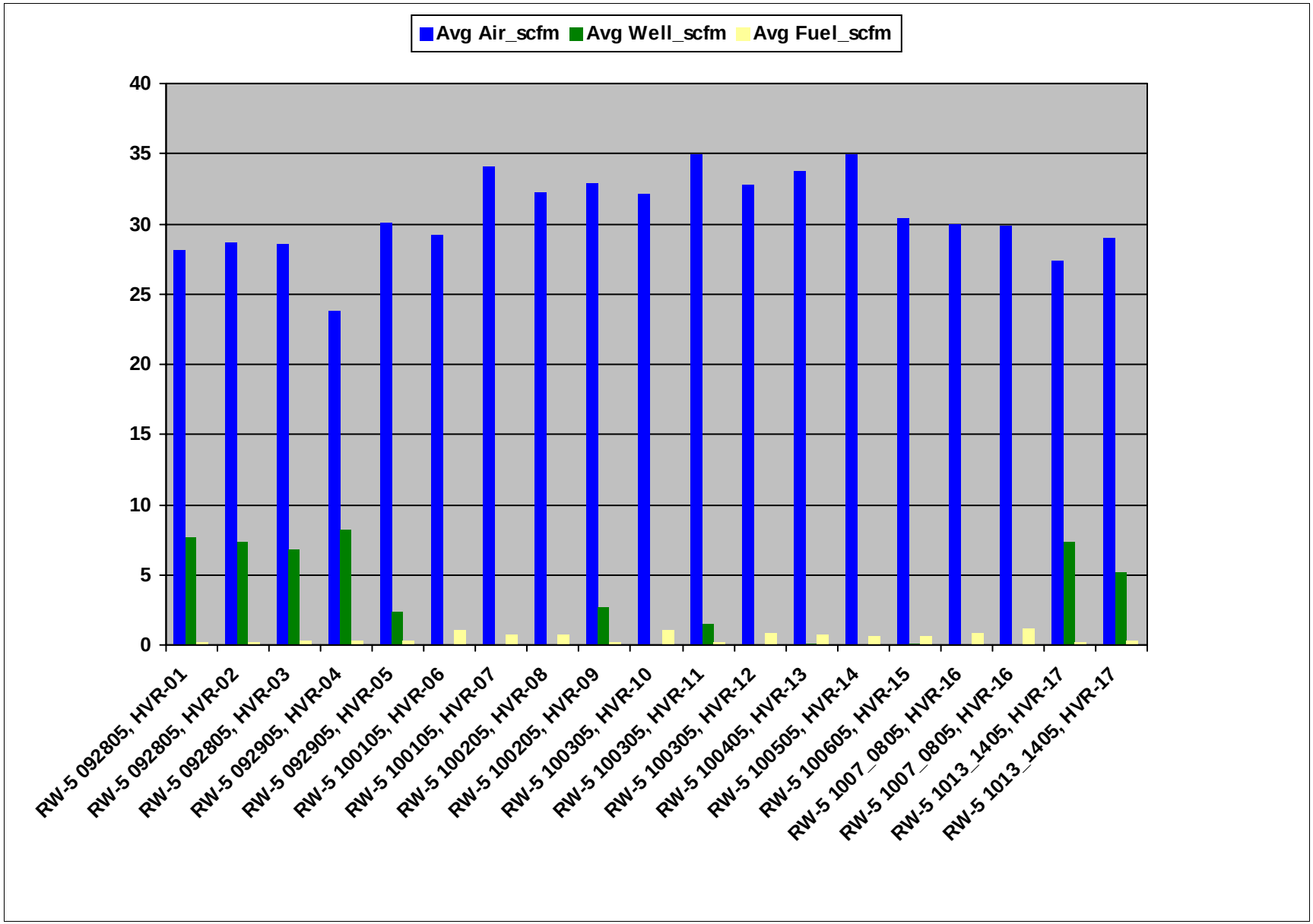

Figure 215: RW-5 Gauging, Stinger Depth and Production Data
Hydrocarbon Recovery vs. Groundwater Recovery - with Elevations

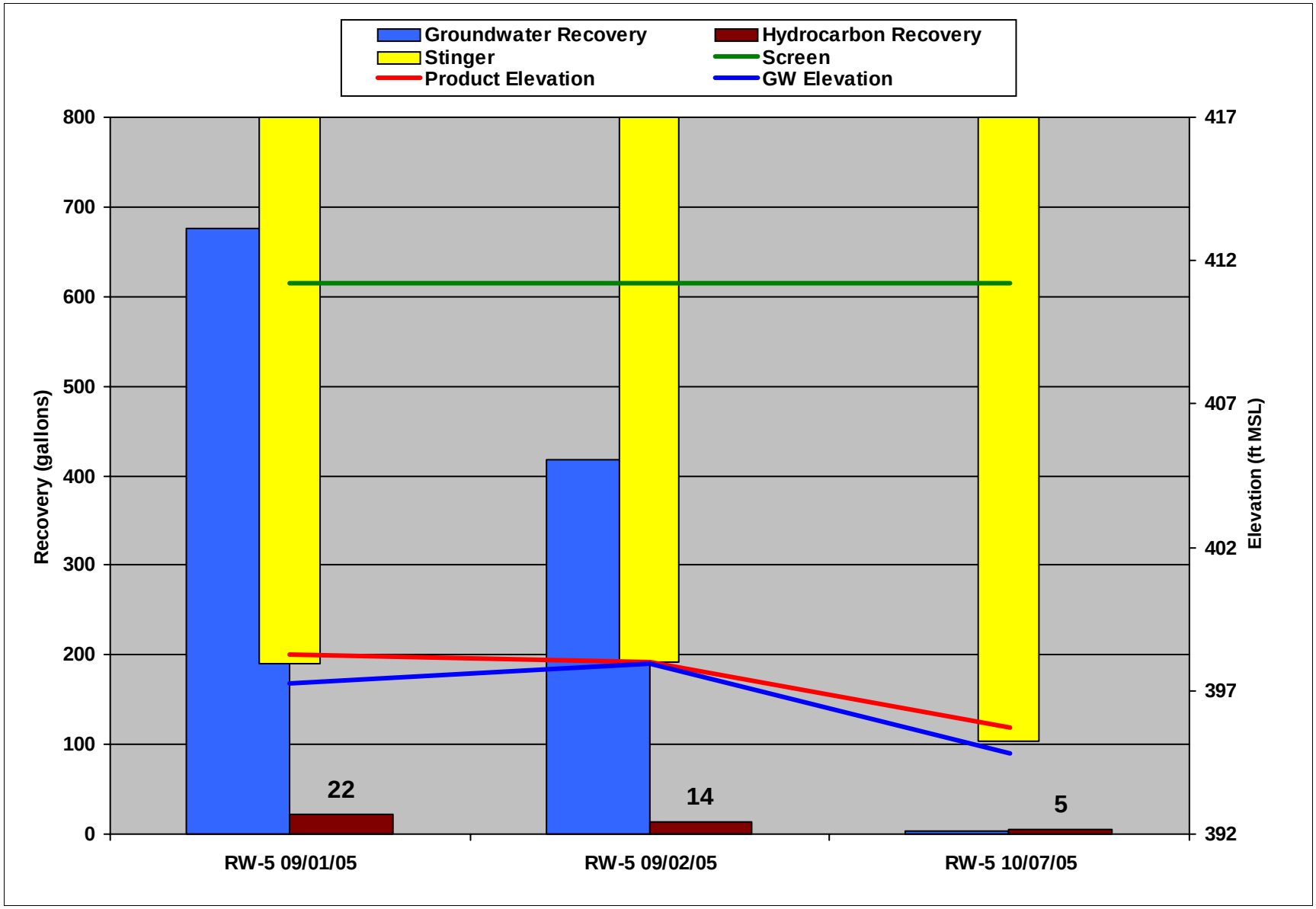

Figure 216: RW-5
Hydrocarbon Recovery vs. Groundwater Recovery - with Vacuums

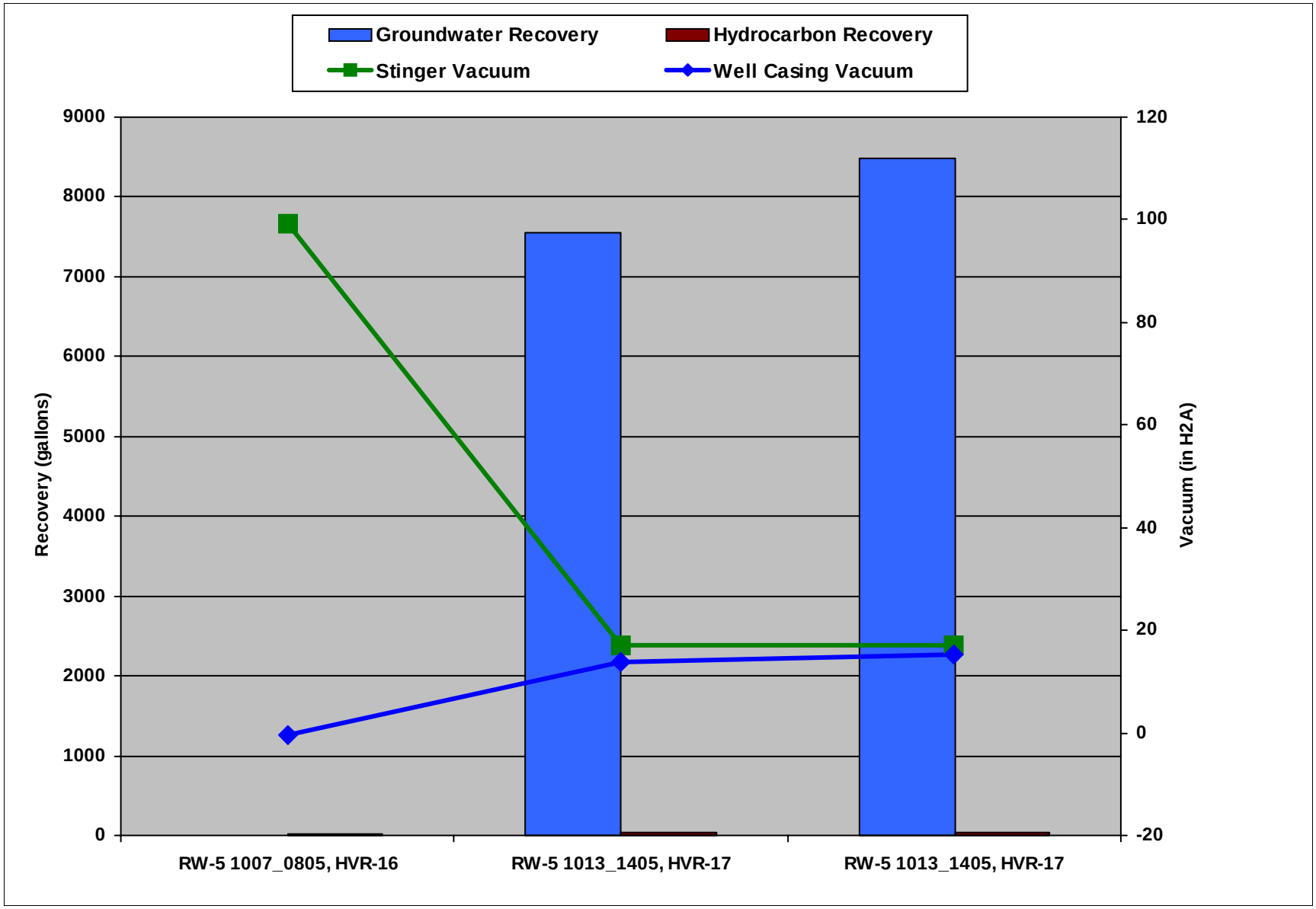

Figure 217: RW-5
Hydrocarbon Recovery vs. Groundwater Recovery - with Percentages

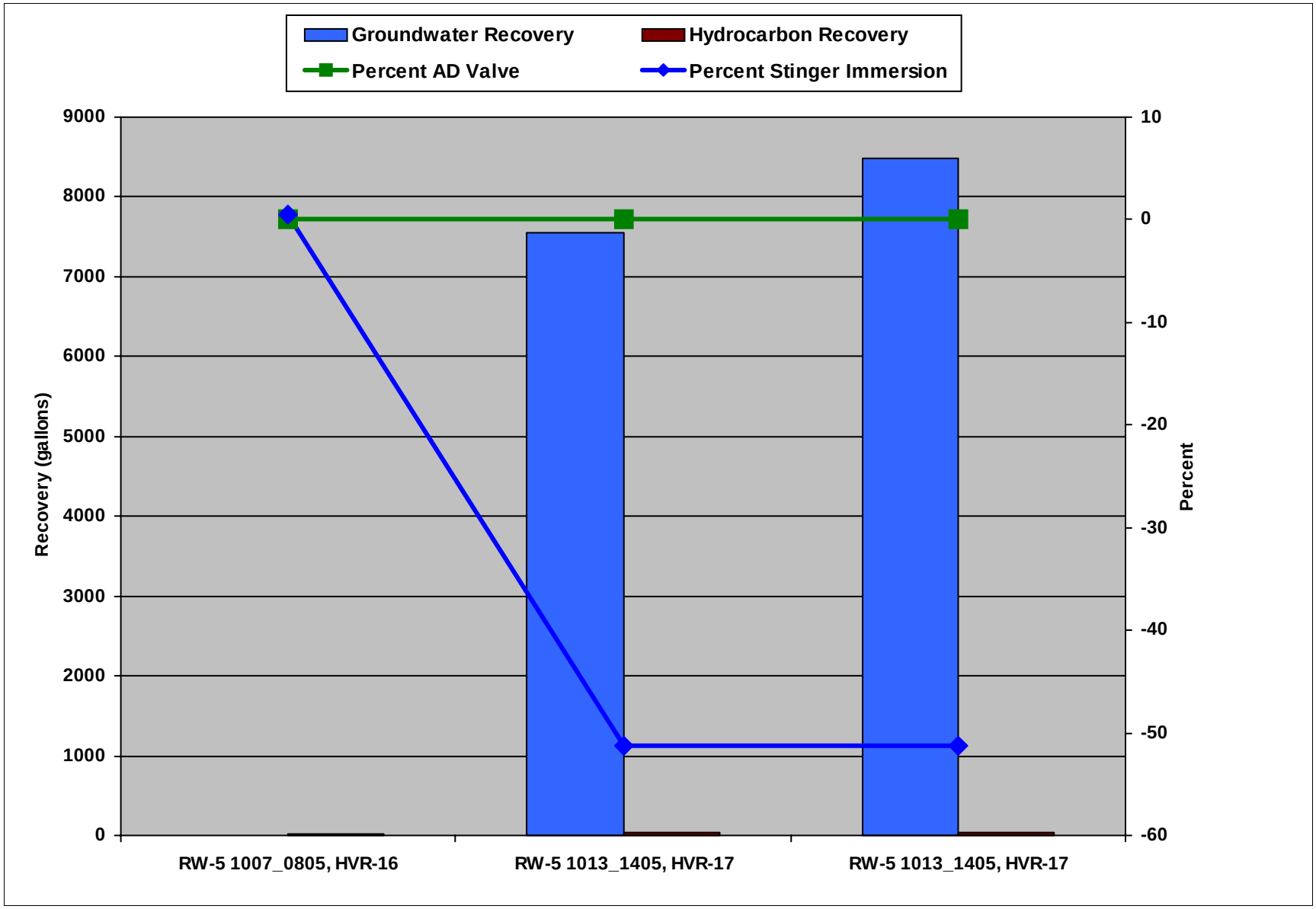

Figure 218: RW-5
Depth to Top of LNAPL vs. LNAPL Thickness 2004-2005

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The Hartford Working Group
H_2A Environmental, Ltd.

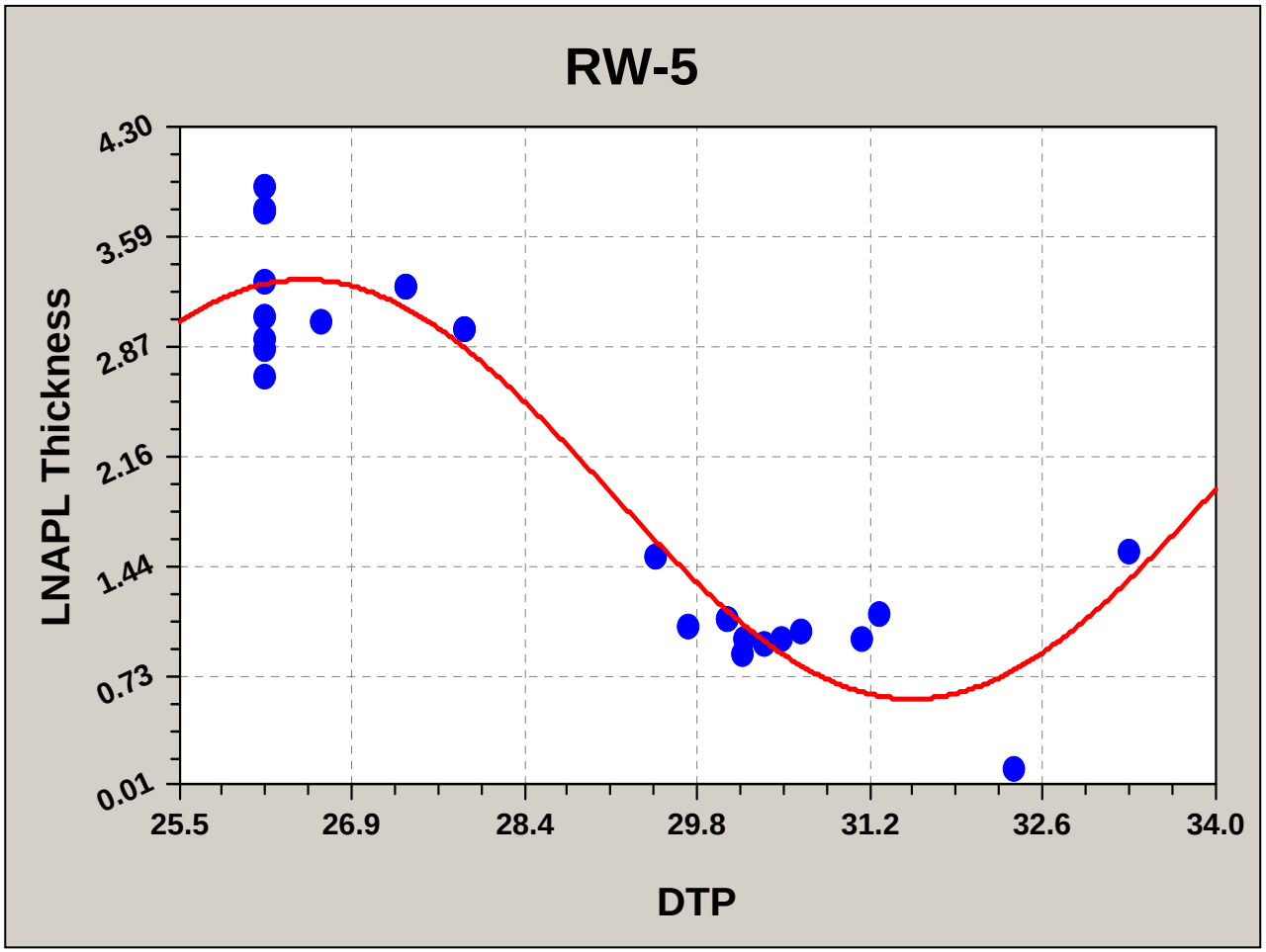


Figure 219: All HVR Wells
Multi-Site Cumulative Product Recovery (Gallons)

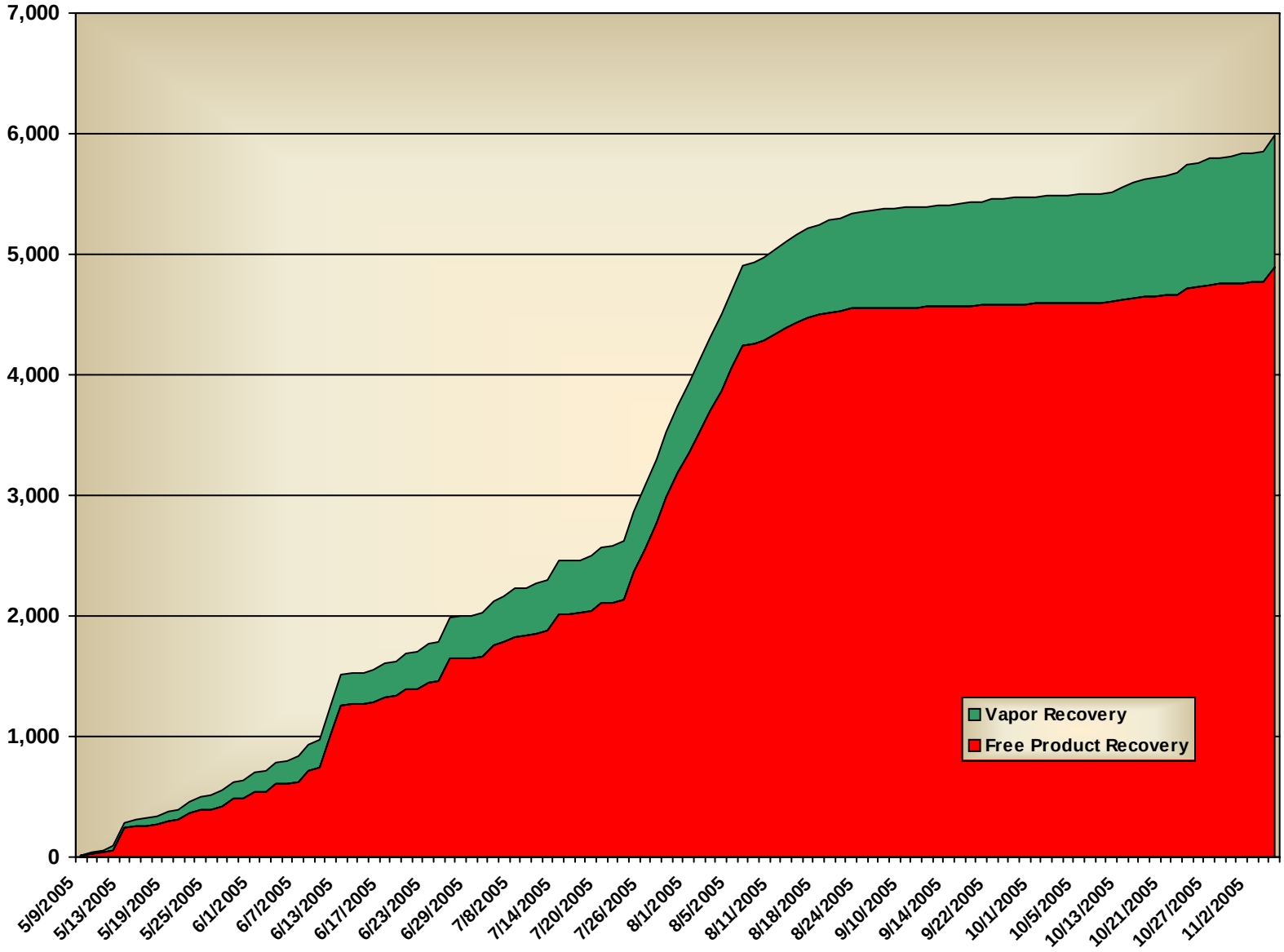


Figure 220: All HVR Wells
Multi-Site Daily Product Recovery (Gallons)

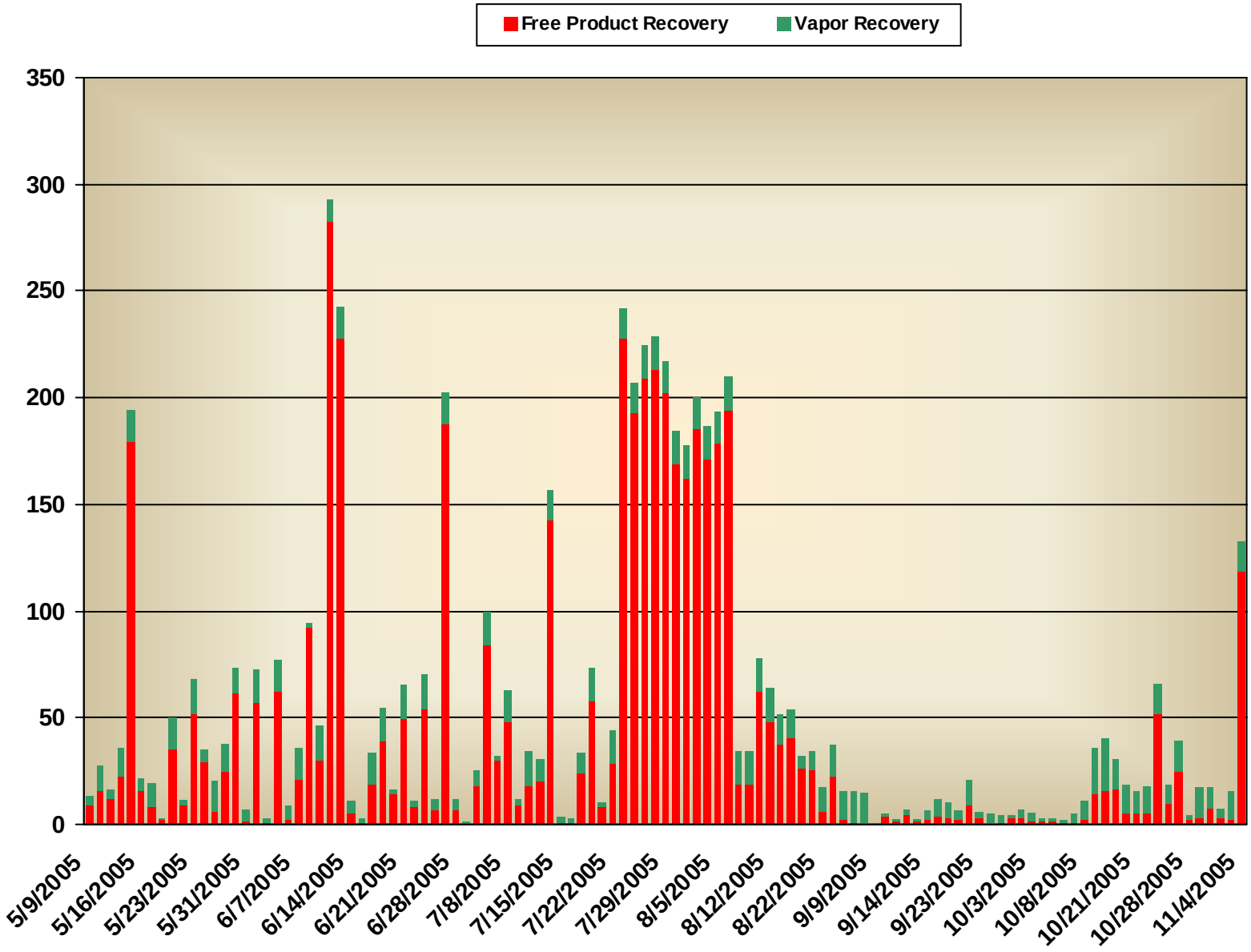


Figure 221: All Non-RW HVR Wells
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

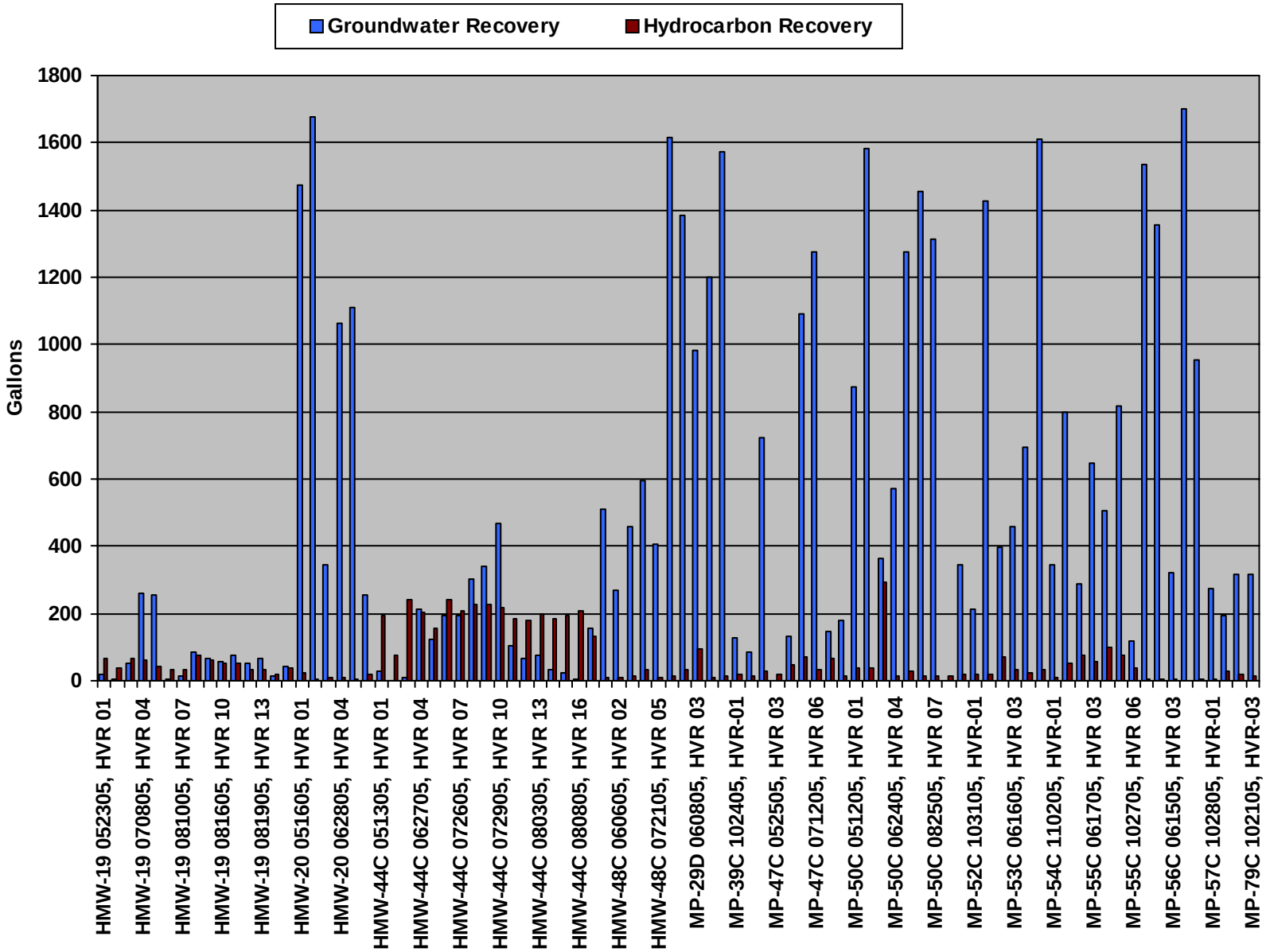


Figure 222: All HVR Wells - HVR Production Summary
The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
H_2A Environmental, Ltd.

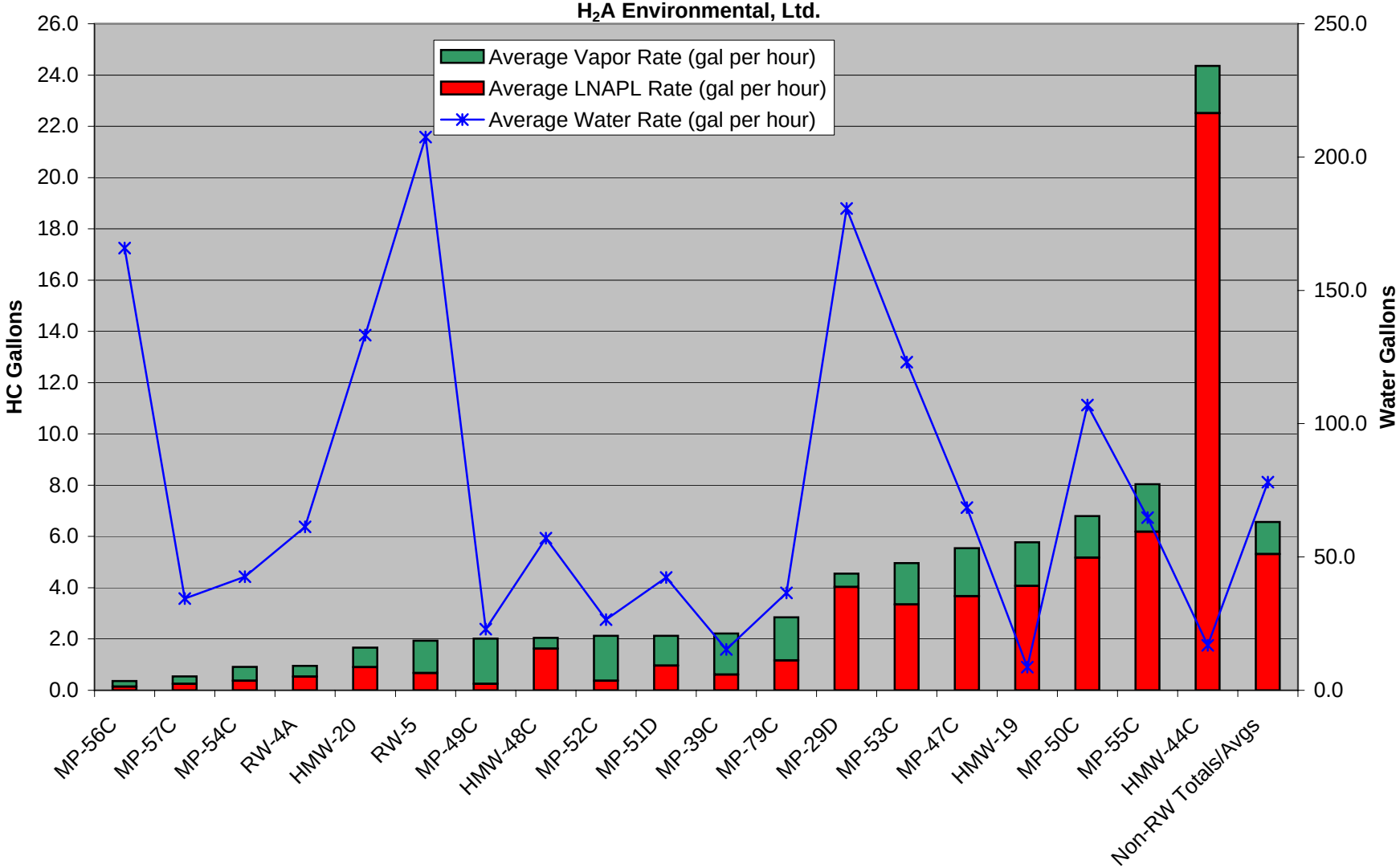
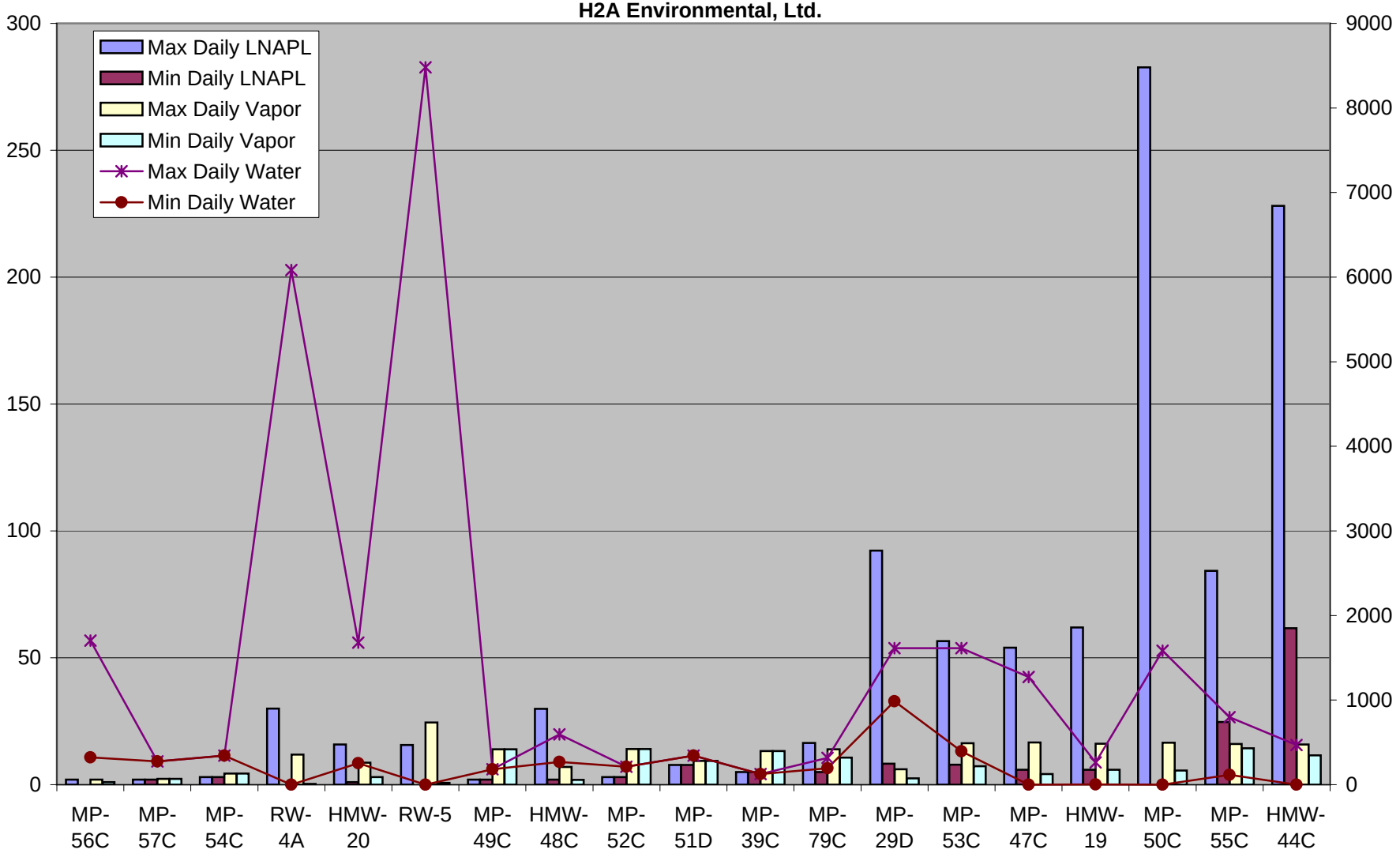
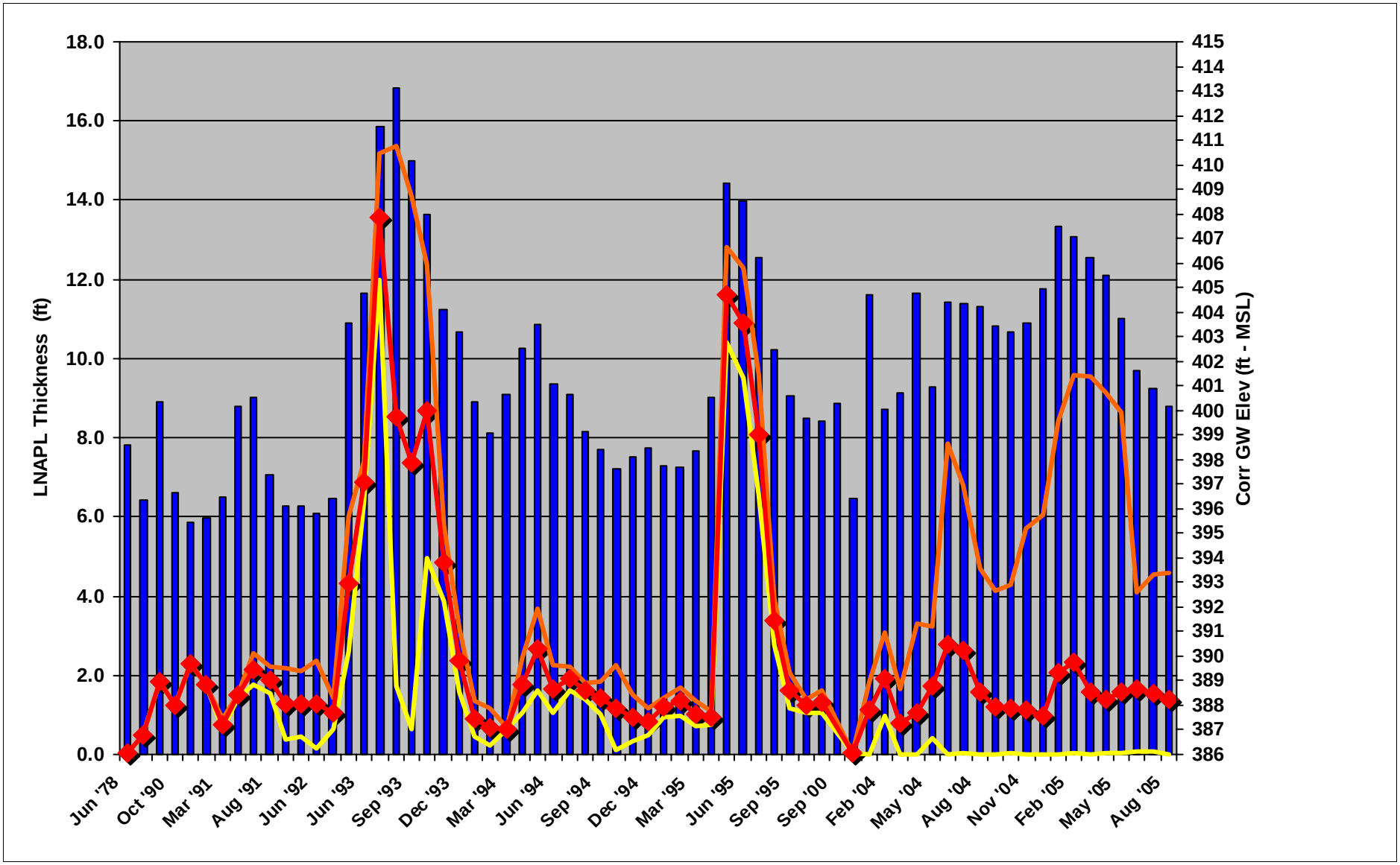


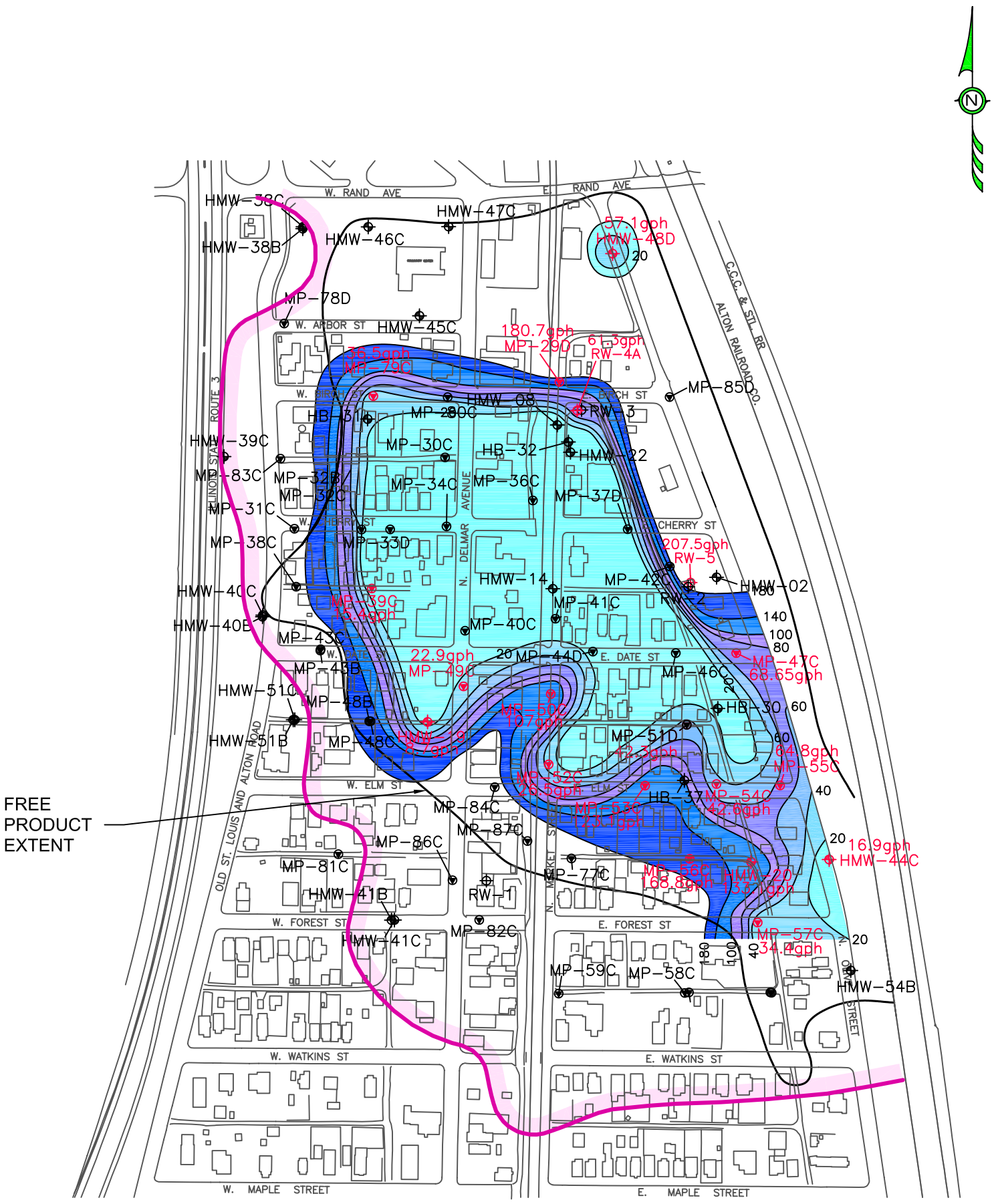
Figure 223: All HVR Wells - HVR Maximum / Minimum Production Comparisons
The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
H2A Environmental, Ltd.



ILR000128249
Hartford Working Group
Hartford Area Hydrocarbon Plume Site
201 E. Hawthorne Street
Hartford, IL

Figure 224: All HVR Wells Corrected GW Elevation (Avg) vs. LNAPL Thickness





LEGEND

RMW-7C, RB-44	MONITORING WELL
RW-1	RECOVERY WELL
MP-29	MONITORING PROBE
P-2	PRODUCTION WELL
	INTERPRETED EXTENT OF ROST RESPONSE
	INTERPRETED EXTENT OF FREE PRODUCT OBSERVED IN MONITORING WELLS

CONTOUR INTERVAL = 20 gph (0–100)
CONTOUR INTERVAL = 40 gph (100–180)

- LESS THAN 20
- 20 – 40
- 40 – 60
- 60 – 80
- 80 –100
- 100– 140
- 140 – 180

NOTES:

1. TOP OF CASING (TOC) ELEVATIONS USED IN THIS MAP FOR VILLAGE WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2003 AND 2004. TOC ELEVATIONS FOR ALL PREMCOR FACILITY WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2004 AND 2005. TOC ELEVATIONS FOR ALL OTHER WELLS WERE OBTAINED FROM HISTORICAL SURVEYS BY CMT, INC.
2. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS, INC.
3. RED WELLS SIGINFY WELLS AT WHICH HVR PILOT TESTING WAS PERFORMED.

SCALE IN FEET
0 100 200 300 600

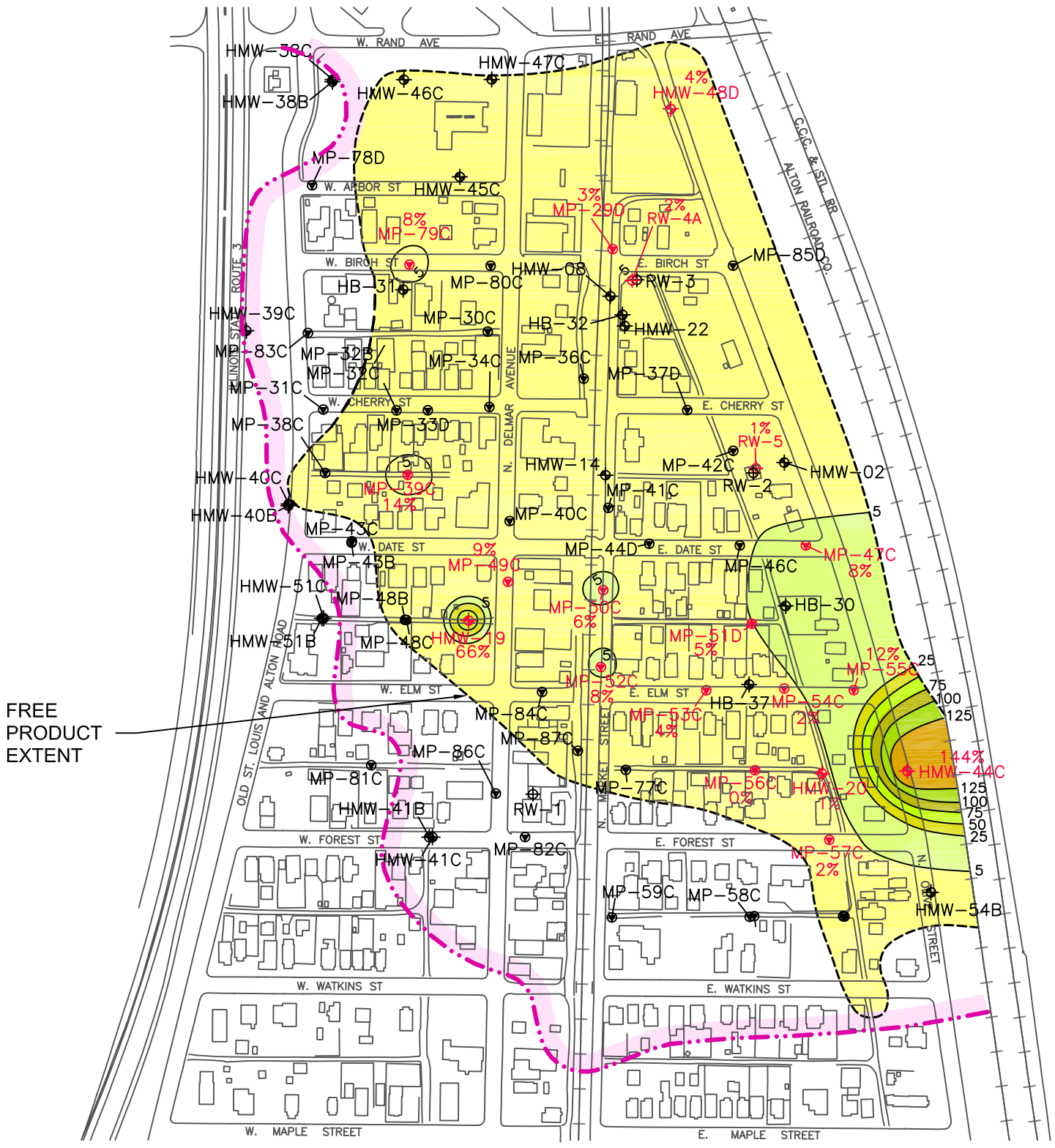
CHECK BY	JMH
DRAWN BY	MLR
DATE	12/15/05
SCALE	AS SHOWN
CAD NO.	154.001.225
PRJ NO.	154.001

AVERAGE WATER PRODUCTION RATE
(gal per hour)

THE HARTFORD AREA HYDROCARBON PLUME SITE
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

H2A ENVIRONMENTAL, LTD.

FIGURE
225



LEGEND

RMW-7C, RB-44	MONITORING WELL
RW-1	RECOVERY WELL
MP-29	MONITORING PROBE
P-2	PRODUCTION WELL
	CONTOUR LIMIT = 1%
	INTERPRETED EXTENT OF ROST RESPONSE
	INTERPRETED EXTENT OF FREE PRODUCT OBSERVED IN MONITORING WELLS

VARIABLE CI:
UP TO 25%, CI=5%
GREATER THAN 25%, CI=25%

- 0–5
- 5–25
- 25–50
- 50–75
- 75–100
- 100–125
- 125+

NOTES:

1. TOP OF CASING (TOC) ELEVATIONS USED IN THIS MAP FOR VILLAGE WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2003 AND 2004. TOC ELEVATIONS FOR ALL PREMCOR FACILITY WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2004 AND 2005. TOC ELEVATIONS FOR ALL OTHER WELLS WERE OBTAINED FROM HISTORICAL SURVEYS BY CMT, INC.
2. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS, INC.
3. RED WELLS SIGINFY WELLS AT WHICH HVR PILOT TESTING WAS PERFORMED.

SCALE IN FEET
0 100 200 300 600

CHECK BY	JMH
DRAWN BY	MLR
DATE	12/20/05
SCALE	AS SHOWN
CAD NO.	154.001.226
PRJ NO.	154.001

AVERAGE TOTAL HYDROCARBON AS % OF WATER

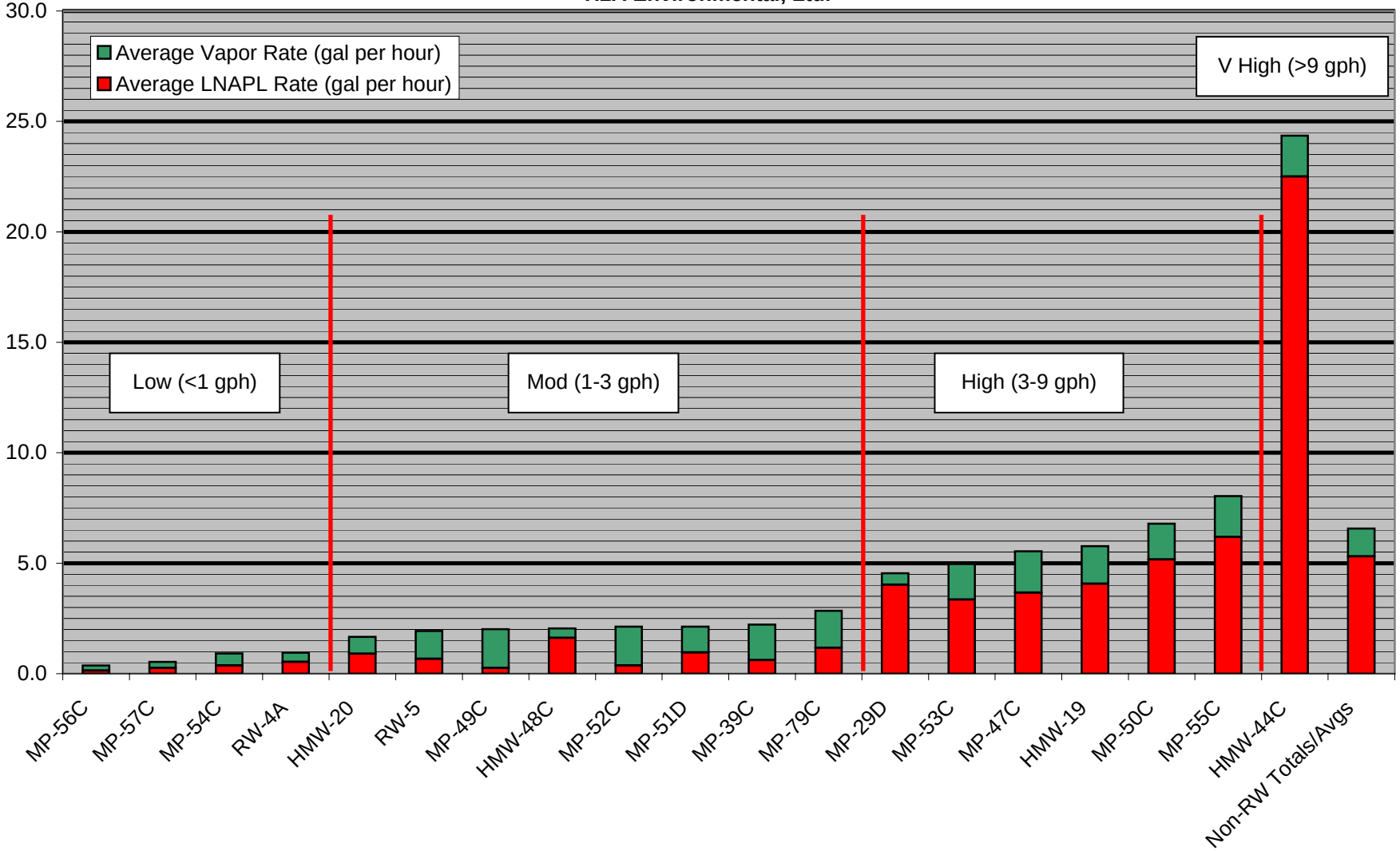
THE HARTFORD AREA HYDROCARBON PLUME SITE
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

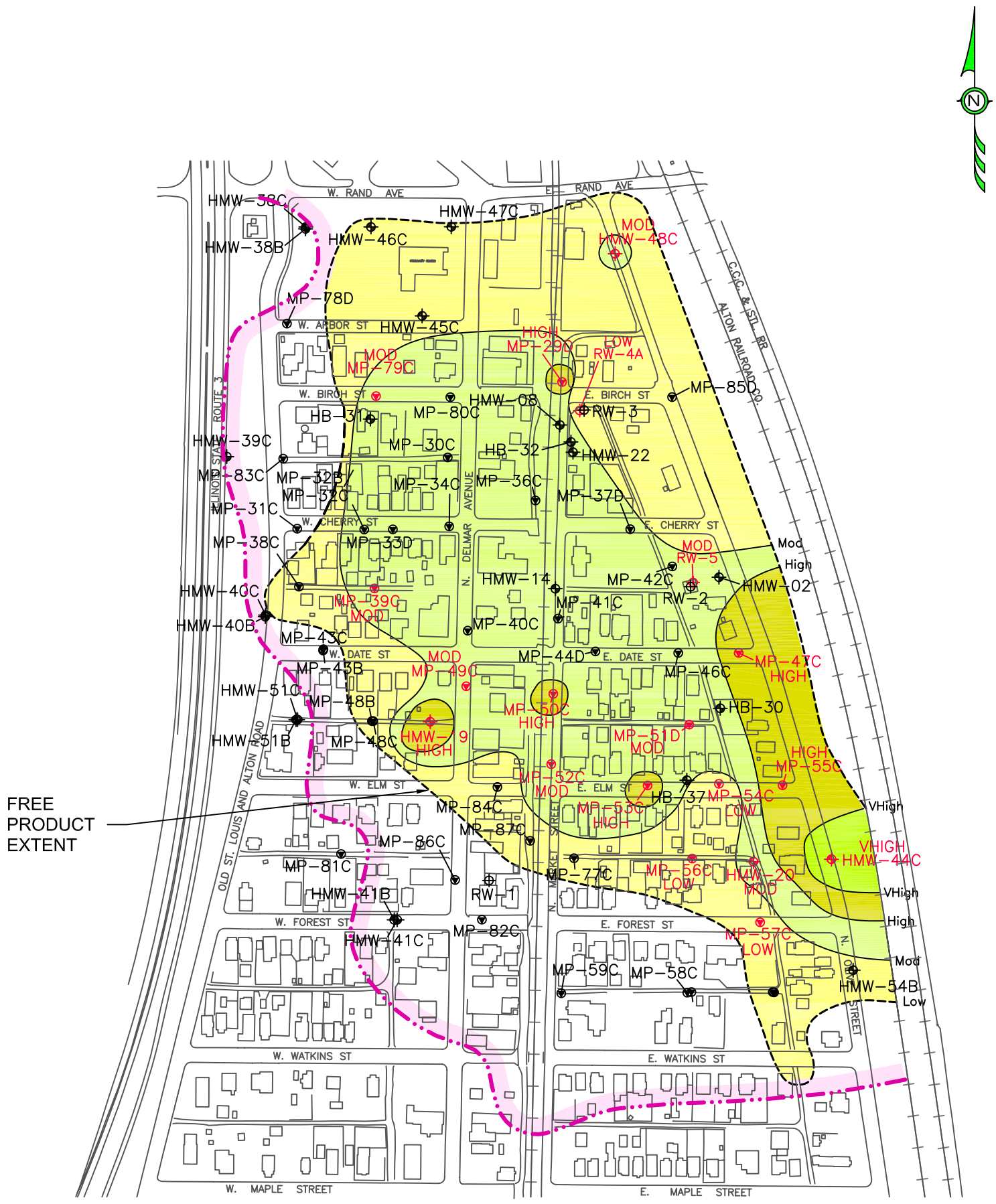
H2A ENVIRONMENTAL, LTD.

FIGURE

226

Figure 227: All HVR Wells - LNAPL as Fluid and as Vapor Hourly Recovery Rates
The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
H2A Environmental, Ltd.





LEGEND

RMW-7C, RB-44	MONITORING WELL
RW-1	RECOVERY WELL
MP-29	MONITORING PROBE
P-2	PRODUCTION WELL
	INTERPRETED EXTENT OF ROST RESPONSE
	INTERPRETED EXTENT OF FREE PRODUCT OBSERVED IN MONITORING WELLS

- Low
- Moderate
- High
- Very High

NOTES:

1. TOP OF CASING (TOC) ELEVATIONS USED IN THIS MAP FOR VILLAGE WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2003 AND 2004. TOC ELEVATIONS FOR ALL PREMCOR FACILITY WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2004 AND 2005. TOC ELEVATIONS FOR ALL OTHER WELLS WERE OBTAINED FROM HISTORICAL SURVEYS BY CMT, INC.
2. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS, INC.
3. RED WELLS SIGINFY WELLS AT WHICH HVR PILOT TESTING WAS PERFORMED.

SCALE IN FEET

0 100 200 300 600

CHECK BY	JMH
DRAWN BY	MLR
DATE	12/15/05
SCALE	AS SHOWN
CAD NO.	154.001.228
PRJ NO.	154.001

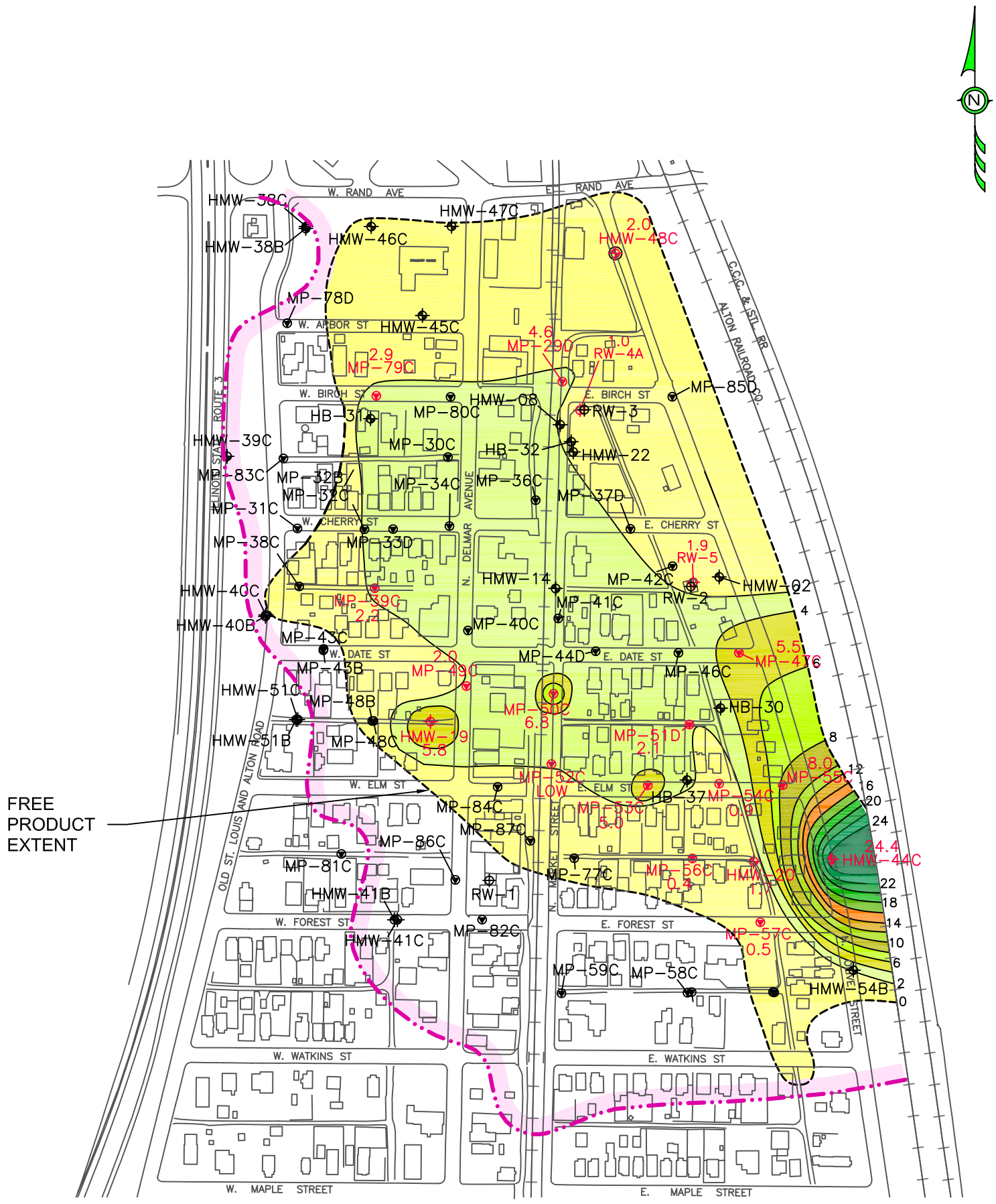
TOTAL HYDROCARBON REMOVAL CATEGORY
(Low, Moderate, High, Very High)

THE HARTFORD AREA HYDROCARBON PLUME SITE
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

H2A ENVIRONMENTAL, LTD.

FIGURE

228



LEGEND

- RMW-7C, RB-44 — MONITORING WELL
- RW-1 — RECOVERY WELL
- MP-29 — MONITORING PROBE
- P-2 — PRODUCTION WELL
- INTERPRETED EXTENT OF ROST RESPONSE
- INTERPRETED EXTENT OF FREE PRODUCT OBSERVED IN MONITORING WELLS

CONTOUR LIMIT = 1 gph

CONTOUR INTERVAL = 2 gph

- 0–2 gph
- 2–4 gph
- 4–6 gph
- 6–8 gph
- 8–10 gph
- 10–12 gph
- 12–14 gph
- 14–16 gph
- 16–18 gph
- 18–20 gph
- 20–22 gph
- 22–24 gph
- 24+ gph

NOTES:

1. TOP OF CASING (TOC) ELEVATIONS USED IN THIS MAP FOR VILLAGE WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2003 AND 2004. TOC ELEVATIONS FOR ALL PREMCOR FACILITY WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2004 AND 2005. TOC ELEVATIONS FOR ALL OTHER WELLS WERE OBTAINED FROM HISTORICAL SURVEYS BY CMT, INC.
2. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS, INC.
3. RED WELLS SIGINFY WELLS AT WHICH HVR PILOT TESTING WAS PERFORMED.

SCALE IN FEET

0 100 200 300 600

CHECK BY	JMH
DRAWN BY	MLR
DATE	12/20/05
SCALE	AS SHOWN
CAD NO.	154.001.229
PRJ NO.	154.001

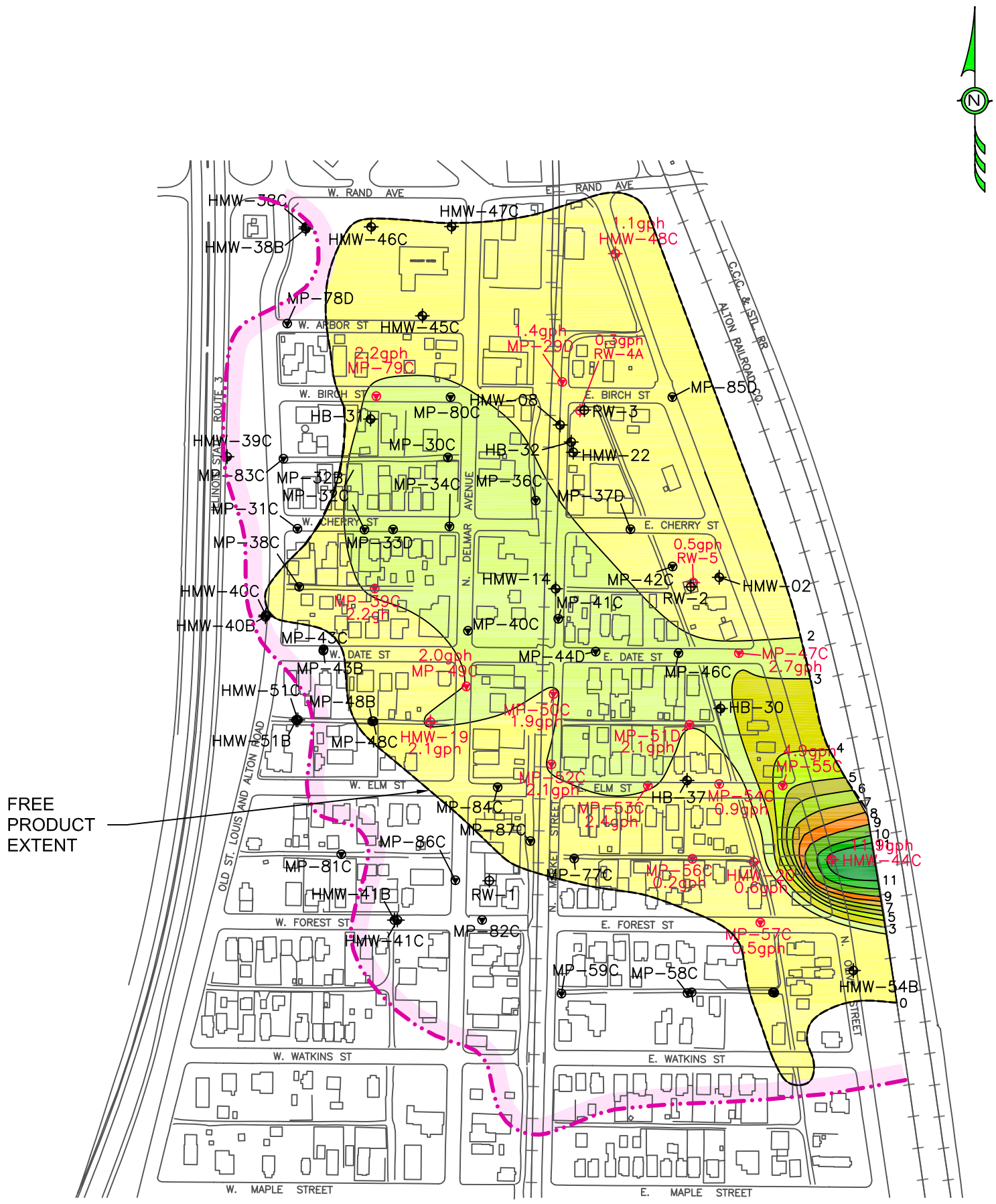
AVERAGE TOTAL HYDROCARBON REMOVAL RATE
(gal per hour)

THE HARTFORD AREA HYDROCARBON PLUME SITE
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

H2A ENVIRONMENTAL, LTD.

FIGURE

229



LEGEND

RMW-7C, RB-44	MONITORING WELL
RW-1	RECOVERY WELL
MP-29	MONITORING PROBE
P-2	PRODUCTION WELL
	INTERPRETED EXTENT OF ROST RESPONSE
	INTERPRETED EXTENT OF FREE PRODUCT OBSERVED IN MONITORING WELLS

CONTOUR LIMIT = 1 gph
CONTOUR INTERVAL = 1 gph

- 0–2
- 2–3
- 3–4
- 4–5
- 5–6
- 6–7
- 7–8
- 8–9
- 9–10
- 10–11
- 11+

NOTES:

1. TOP OF CASING (TOC) ELEVATIONS USED IN THIS MAP FOR VILLAGE WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2003 AND 2004. TOC ELEVATIONS FOR ALL PREMCOR FACILITY WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2004 AND 2005. TOC ELEVATIONS FOR ALL OTHER WELLS WERE OBTAINED FROM HISTORICAL SURVEYS BY CMT, INC.
2. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS, INC.
3. RED WELLS SIGINFY WELLS AT WHICH HVR PILOT TESTING WAS PERFORMED.

SCALE IN FEET
0 100 200 300 600

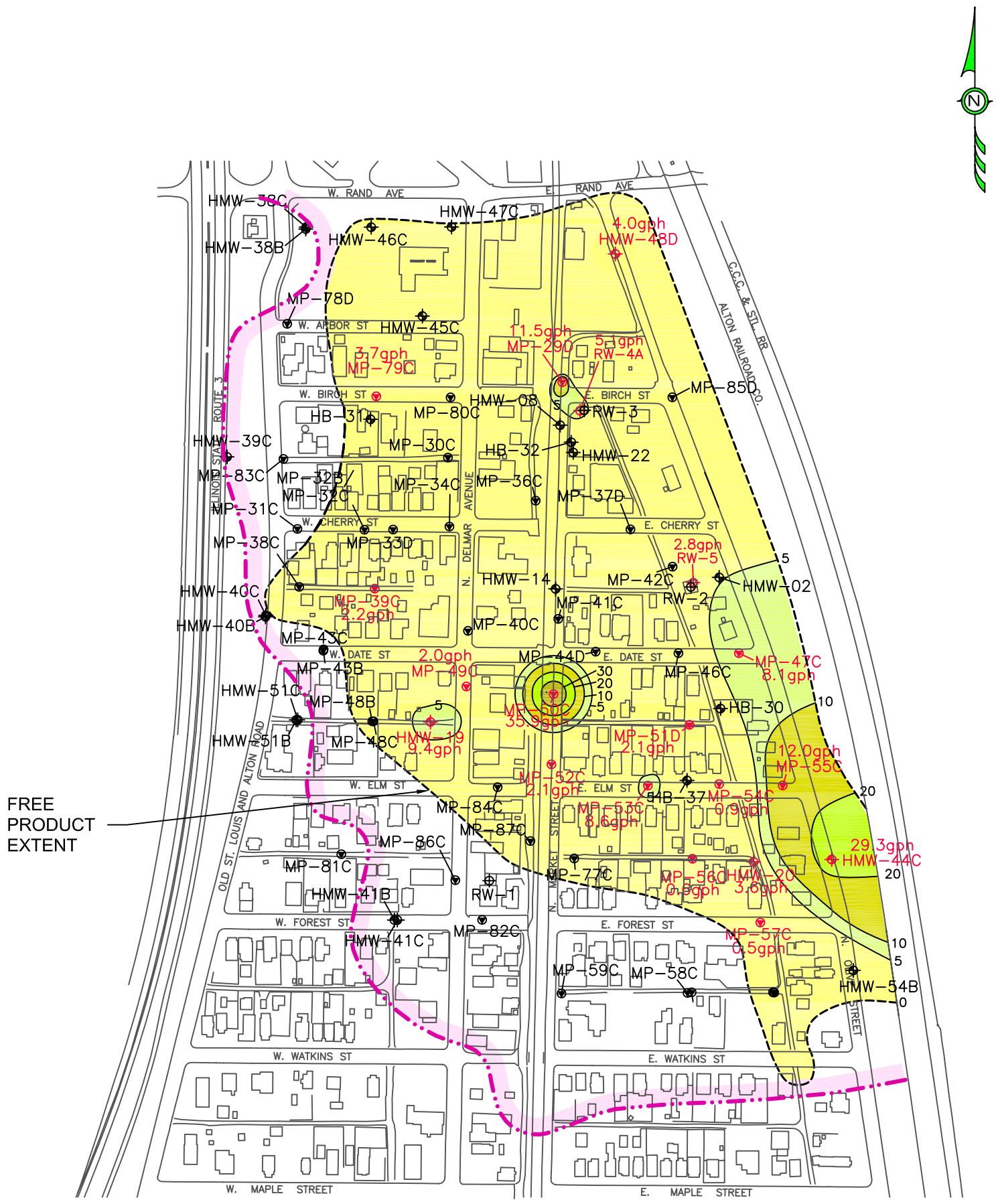
CHECK BY	JMH
DRAWN BY	MLR
DATE	12/20/05
SCALE	AS SHOWN
CAD NO.	154.001.230
PRJ NO.	154.001

MINIMUM TOTAL HYDROCARBON REMOVAL RATE
(gal per hour)

THE HARTFORD AREA HYDROCARBON PLUME SITE
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

H2A ENVIRONMENTAL, LTD.

FIGURE
230



LEGEND

RMW-7C, RB-44	MONITORING WELL
RW-1	RECOVERY WELL
MP-29	MONITORING PROBE
P-2	PRODUCTION WELL
	INTERPRETED EXTENT OF ROST RESPONSE
	INTERPRETED EXTENT OF FREE PRODUCT OBSERVED IN MONITORING WELLS

CONTOUR LIMIT = 1 gph

VARIABLE CI: 1 gph (0–5), 10 gph (5–35)

- 0–5
- 5–10
- 10–20
- 20–30
- 30+

NOTES:

1. TOP OF CASING (TOC) ELEVATIONS USED IN THIS MAP FOR VILLAGE WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2003 AND 2004. TOC ELEVATIONS FOR ALL PREMCOR FACILITY WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2004 AND 2005. TOC ELEVATIONS FOR ALL OTHER WELLS WERE OBTAINED FROM HISTORICAL SURVEYS BY CMT, INC.
2. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS, INC.
3. RED WELLS SIGINFY WELLS AT WHICH HVR PILOT TESTING WAS PERFORMED.

SCALE IN FEET

0 100 200 300 600

CHECK BY	JMH
DRAWN BY	MLR
DATE	12/20/05
SCALE	AS SHOWN
CAD NO.	154.001.231
PRJ NO.	154.001

MAXIMUM TOTAL HYDROCARBON REMOVAL RATE
(gal per hour)

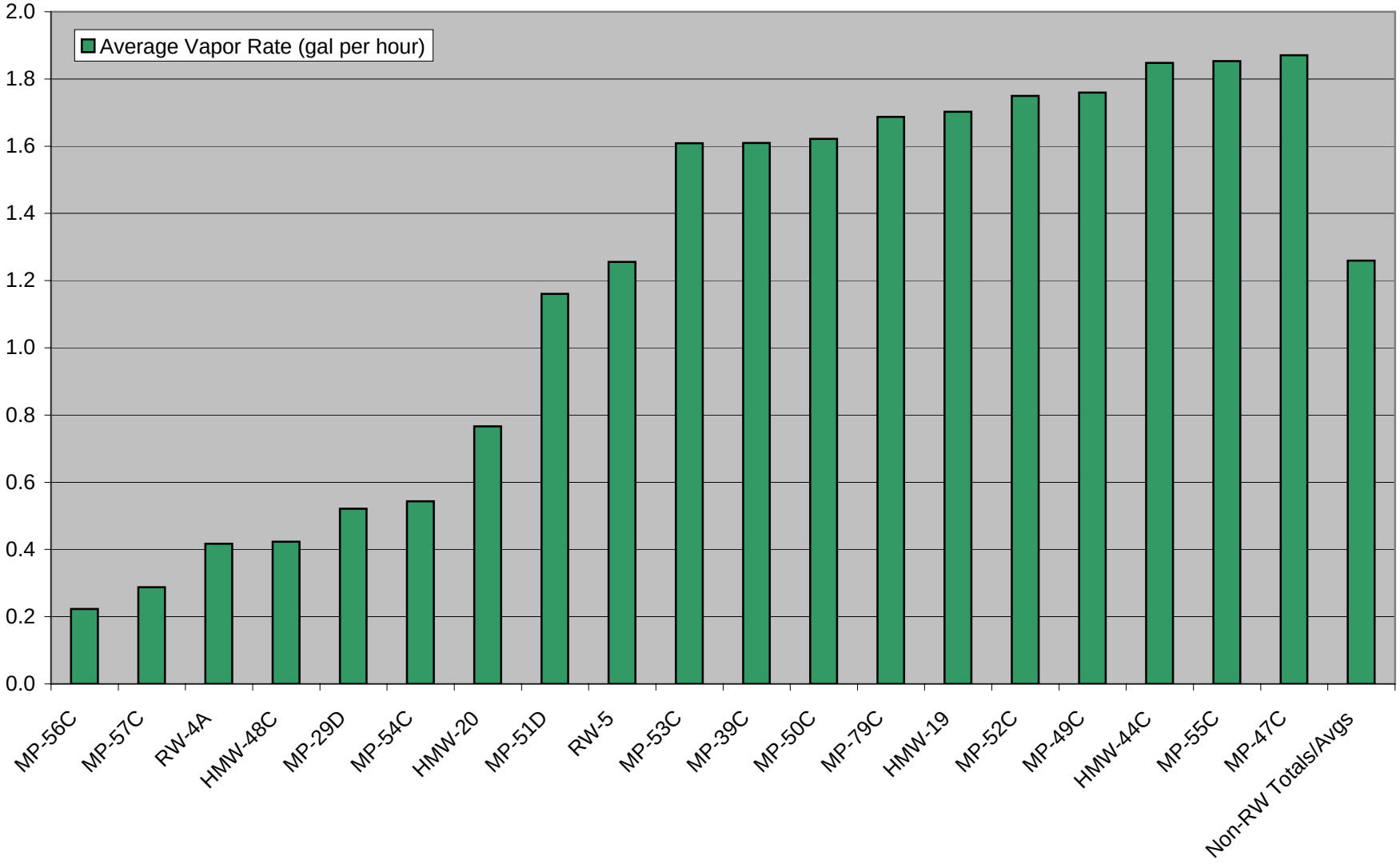
THE HARTFORD AREA HYDROCARBON PLUME SITE
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

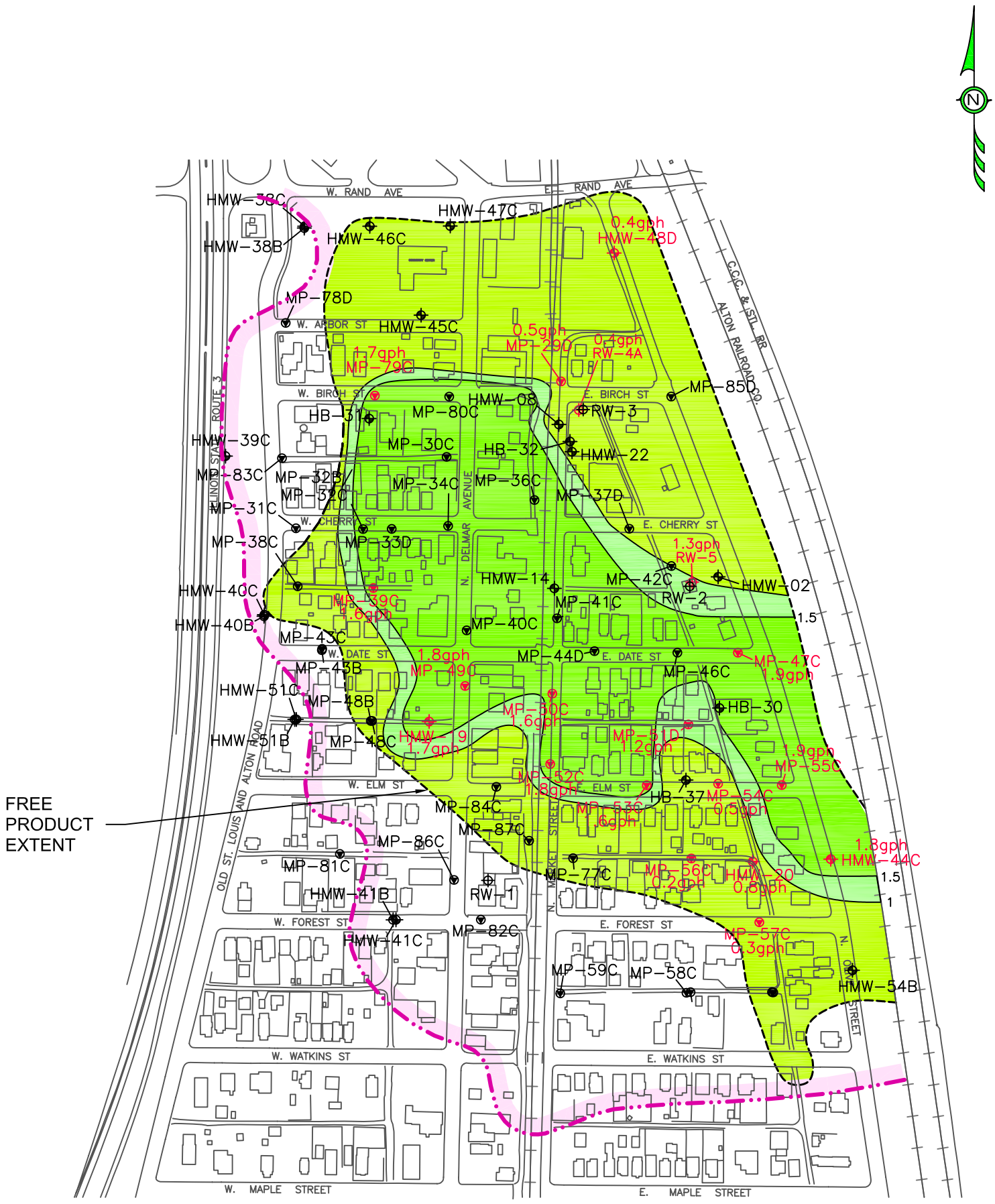
H2A ENVIRONMENTAL, LTD.

FIGURE

231

Figure 232: All HVR Wells - Average Vapor Removal Rates
The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
H2A Environmental, Ltd.





LEGEND

RMW-7C, RB-44	MONITORING WELL
RW-1	RECOVERY WELL
MP-29	MONITORING PROBE
P-2	PRODUCTION WELL
	INTERPRETED EXTENT OF ROST RESPONSE
	INTERPRETED EXTENT OF FREE PRODUCT OBSERVED IN MONITORING WELLS

CONTOUR LIMIT = 0.5 gph

CONTOUR INTERVAL = 0.5 gph

- 0–1
- 1–1.5
- 1.5+

NOTES:

1. TOP OF CASING (TOC) ELEVATIONS USED IN THIS MAP FOR VILLAGE WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2003 AND 2004. TOC ELEVATIONS FOR ALL PREMCOR FACILITY WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2004 AND 2005. TOC ELEVATIONS FOR ALL OTHER WELLS WERE OBTAINED FROM HISTORICAL SURVEYS BY CMT, INC.
2. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS, INC.
3. RED WELLS SIGINFY WELLS AT WHICH HVR PILOT TESTING WAS PERFORMED.

SCALE IN FEET

0 100 200 300 600

CHECK BY	JMH
DRAWN BY	MLR
DATE	12/20/05
SCALE	AS SHOWN
CAD NO.	154.001.233
PRJ NO.	154.001

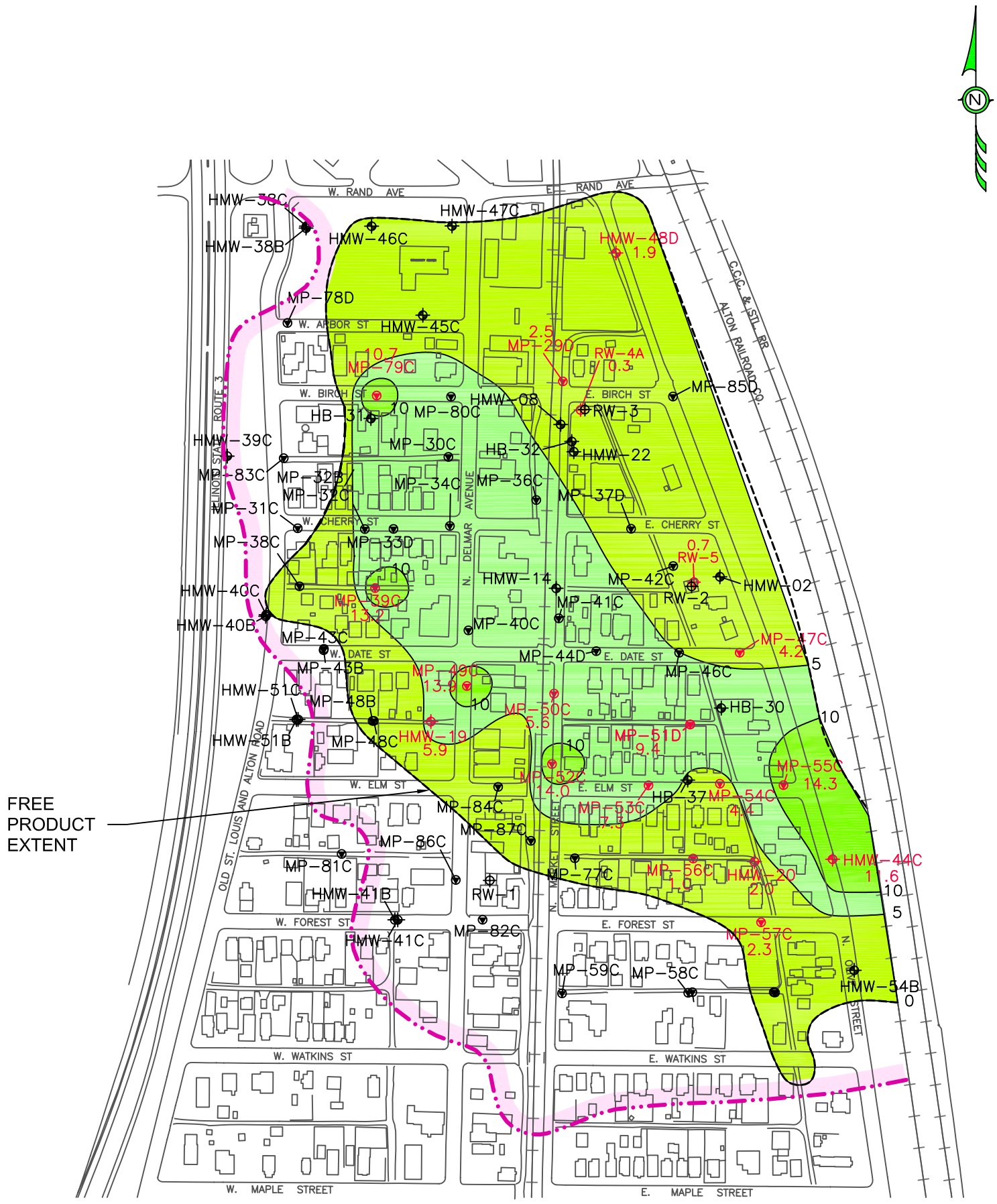
AVERAGE VAPOR REMOVAL RATE
(gal per hour)

THE HARTFORD AREA HYDROCARBON PLUME SITE
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

H2A ENVIRONMENTAL, LTD.

FIGURE

233



LEGEND

RMW-7C, RB-44	MONITORING WELL
RW-1	RECOVERY WELL
MP-29	MONITORING PROBE
P-2	PRODUCTION WELL
	INTERPRETED EXTENT OF ROST RESPONSE
	INTERPRETED EXTENT OF FREE PRODUCT OBSERVED IN MONITORING WELLS

CONTOUR LIMIT = 1 gp8hd

CONTOUR INTERVAL = 5 gp8hd

- 0–5
- 5–10
- 10+

NOTES:

1. TOP OF CASING (TOC) ELEVATIONS USED IN THIS MAP FOR VILLAGE WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2003 AND 2004. TOC ELEVATIONS FOR ALL PREMCOR FACILITY WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2004 AND 2005. TOC ELEVATIONS FOR ALL OTHER WELLS WERE OBTAINED FROM HISTORICAL SURVEYS BY CMT, INC.
2. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS, INC.
3. RED WELLS SIGINFY WELLS AT WHICH HVR PILOT TESTING WAS PERFORMED.

SCALE IN FEET

0 100 200 300 600

CHECK BY	JMH
DRAWN BY	MLR
DATE	12/15/05
SCALE	AS SHOWN
CAD NO.	154.001.234
PRJ NO.	154.001

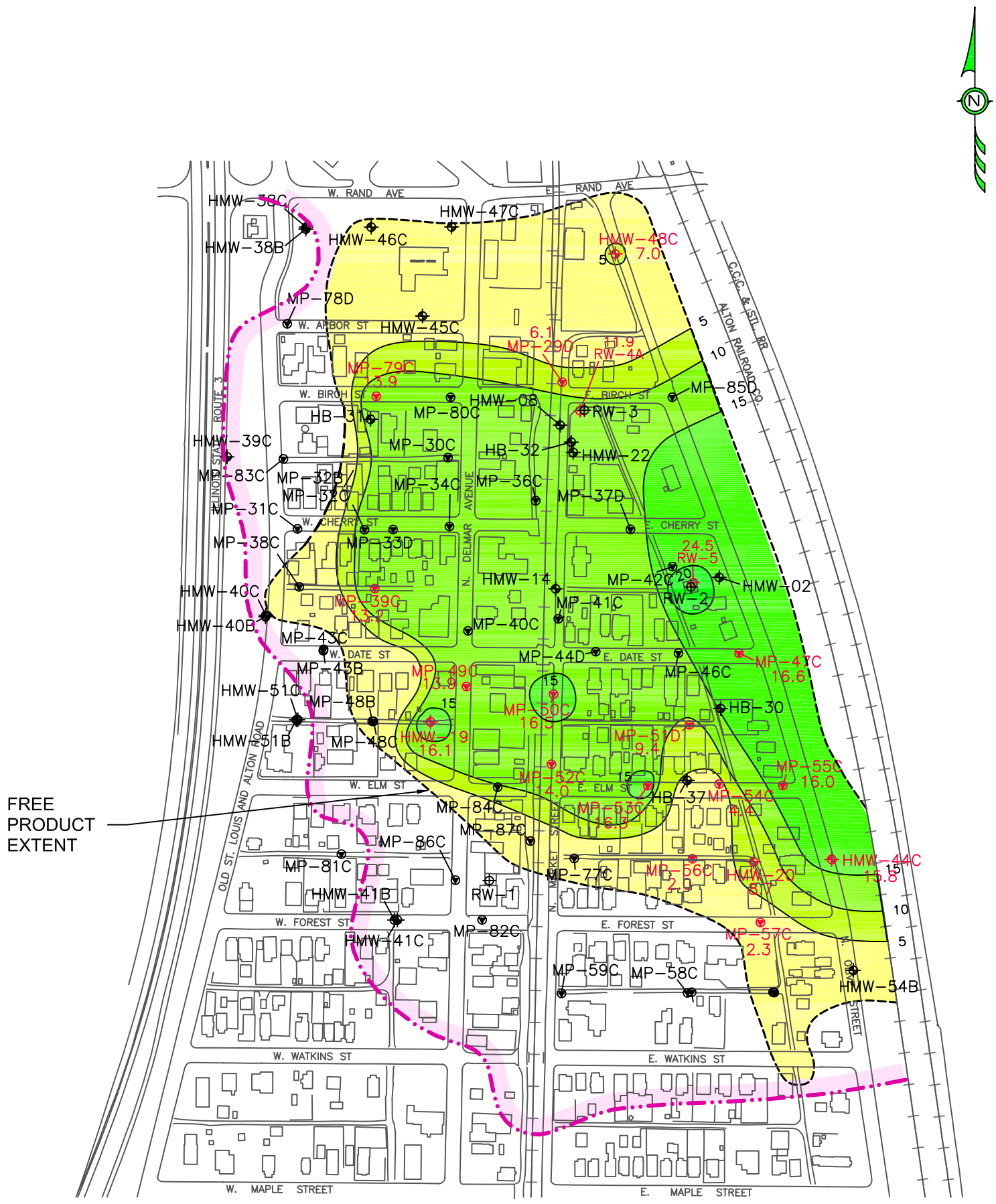
MINIMUM DAILY VAPOR REMOVAL
(gal per 8 hour day)

THE HARTFORD AREA HYDROCARBON PLUME SITE
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

H2A ENVIRONMENTAL, LTD.

FIGURE

234



LEGEND

RMW-7C, RB-44 — MONITORING WELL

RW-1 — RECOVERY WELL

MP-29 — MONITORING PROBE

P-2 — PRODUCTION WELL

INTERPRETED EXTENT OF ROST RESPONSE

INTERPRETED EXTENT OF FREE PRODUCT OBSERVED IN MONITORING WELLS

CONTOUR LIMIT = 5 gp8hd

CONTOUR INTERVAL = 5 gp8hd

- 0–5
- 5–10
- 10–15
- 15–20
- 20+

NOTES:

1. TOP OF CASING (TOC) ELEVATIONS USED IN THIS MAP FOR VILLAGE WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2003 AND 2004. TOC ELEVATIONS FOR ALL PREMCOR FACILITY WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2004 AND 2005. TOC ELEVATIONS FOR ALL OTHER WELLS WERE OBTAINED FROM HISTORICAL SURVEYS BY CMT, INC.
2. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS, INC.
3. RED WELLS SIGINFY WELLS AT WHICH HVR PILOT TESTING WAS PERFORMED.

SCALE IN FEET

0 100 200 300 600

CHECK BY	JMH
DRAWN BY	MLR
DATE	12/20/05
SCALE	AS SHOWN
CAD NO.	154.001.235
PRJ NO.	154.001

MAXIMUM DAILY VAPOR REMOVAL
(gal per 8 hour day)

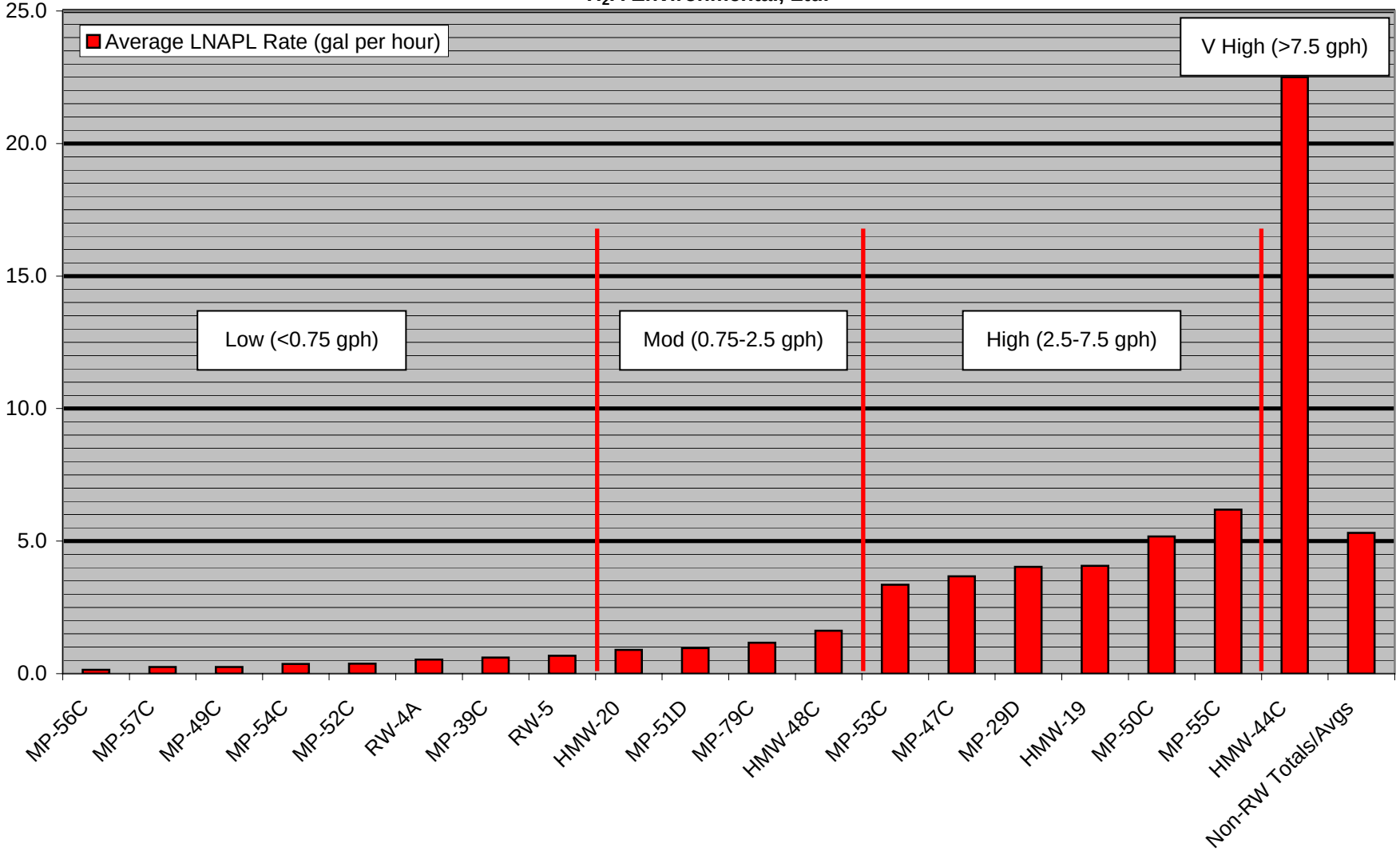
THE HARTFORD AREA HYDROCARBON PLUME SITE
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

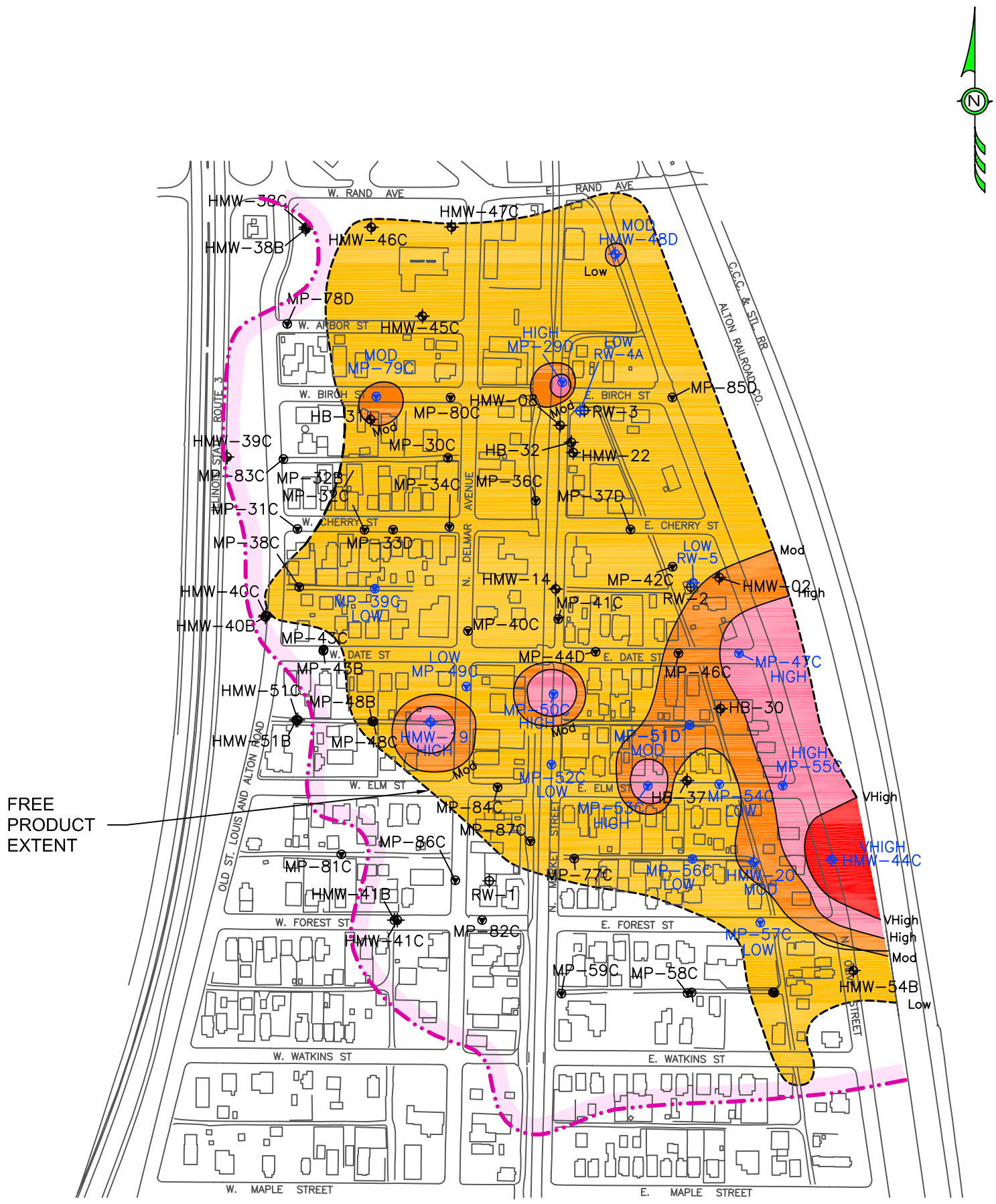
H2A ENVIRONMENTAL, LTD.

FIGURE

235

Figure 236: All HVR Wells - Average LNAPL Removal Rates
The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
H_2A Environmental, Ltd.





LEGEND

- RMW-7C, RB-44 — MONITORING WELL
- RW-1 — RECOVERY WELL
- MP-29 — MONITORING PROBE
- P-2 — PRODUCTION WELL
- INTERPRETED EXTENT OF ROST RESPONSE
- INTERPRETED EXTENT OF FREE PRODUCT OBSERVED IN MONITORING WELLS

- Low
- Moderate
- High
- Very High

NOTES:

1. TOP OF CASING (TOC) ELEVATIONS USED IN THIS MAP FOR VILLAGE WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2003 AND 2004. TOC ELEVATIONS FOR ALL PREMCOR FACILITY WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2004 AND 2005. TOC ELEVATIONS FOR ALL OTHER WELLS WERE OBTAINED FROM HISTORICAL SURVEYS BY CMT, INC.
2. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS, INC.
3. BLUE WELLS SIGINFY WELLS AT WHICH HVR PILOT TESTING WAS PERFORMED.

SCALE IN FEET

0 100 200 300 600

CHECK BY	JMH
DRAWN BY	MLR
DATE	12/15/05
SCALE	AS SHOWN
CAD NO.	154.001.237
PRJ NO.	154.001

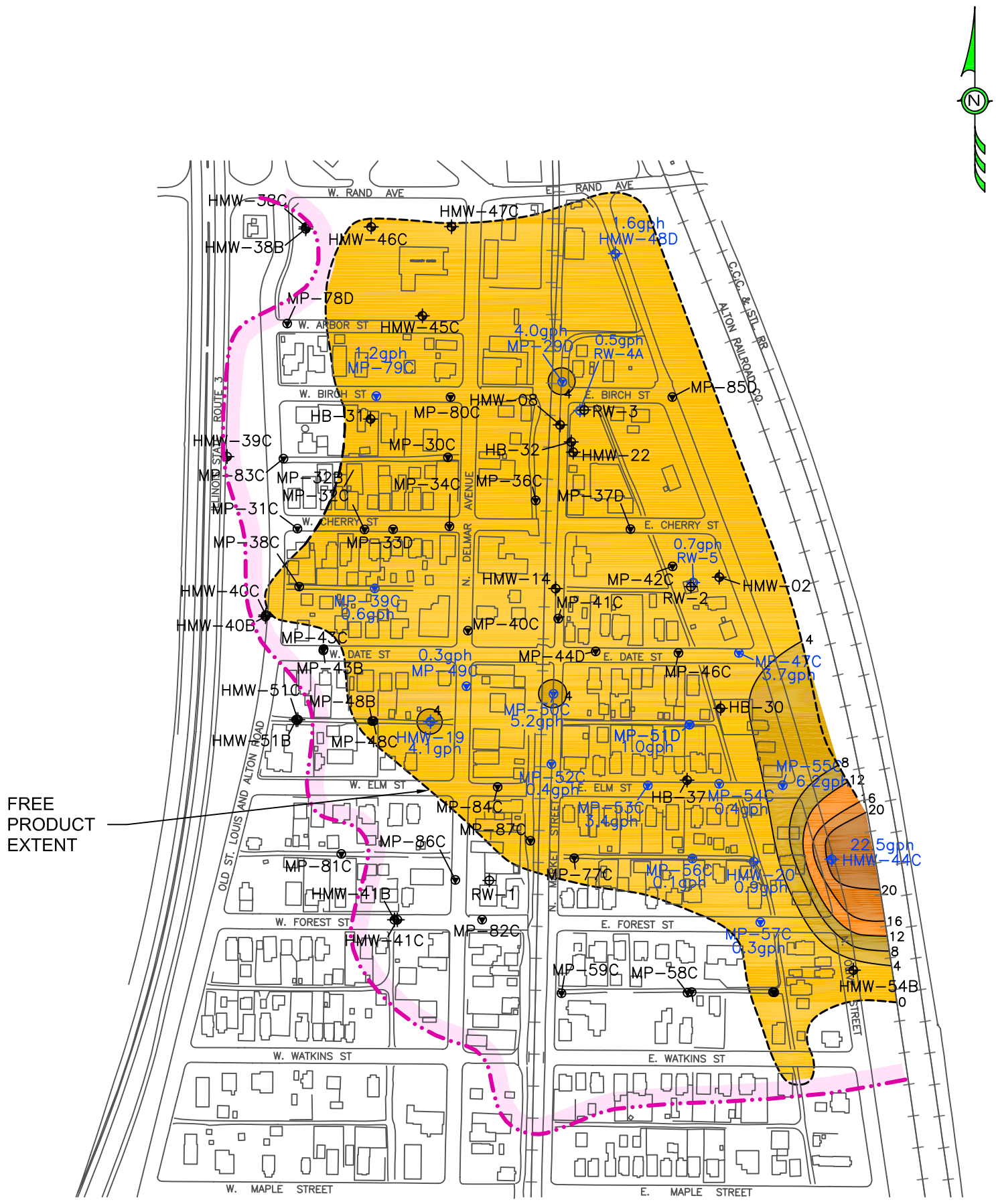
LNAPL REMOVAL CATEGORY
(Low, Moderate, High, Very High)

THE HARTFORD AREA HYDROCARBON PLUME SITE
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

H2A ENVIRONMENTAL, LTD.

FIGURE

237



LEGEND

RMW-7C, RB-44	MONITORING WELL
RW-1	RECOVERY WELL
MP-29	MONITORING PROBE
P-2	PRODUCTION WELL
	INTERPRETED EXTENT OF ROST RESPONSE
	INTERPRETED EXTENT OF FREE PRODUCT OBSERVED IN MONITORING WELLS

- 0–4 gph
- 4–8 gph
- 8–12 gph
- 12–16 gph
- 16–20 gph
- 20+ gph

NOTES:

1. TOP OF CASING (TOC) ELEVATIONS USED IN THIS MAP FOR VILLAGE WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2003 AND 2004. TOC ELEVATIONS FOR ALL PREMCOR FACILITY WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2004 AND 2005. TOC ELEVATIONS FOR ALL OTHER WELLS WERE OBTAINED FROM HISTORICAL SURVEYS BY CMT, INC.
2. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS, INC.
3. BLUE WELLS SIGINFY WELLS AT WHICH HVR PILOT TESTING WAS PERFORMED.

SCALE IN FEET

0 100 200 300 600

CHECK BY	JMH
DRAWN BY	MLR
DATE	12/20/05
SCALE	AS SHOWN
CAD NO.	154.001.238
PRJ NO.	154.001

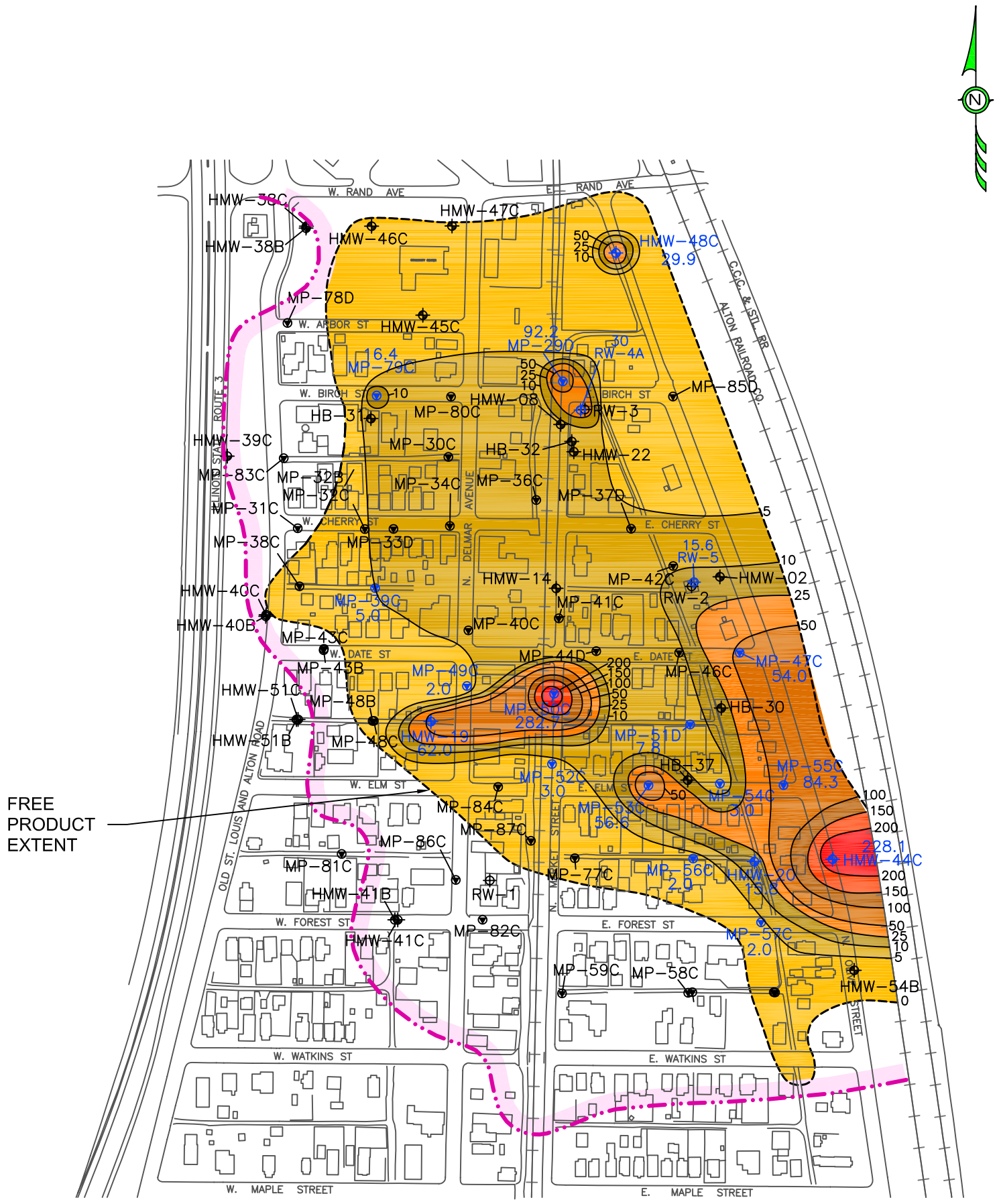
AVERAGE LNAPL REMOVAL RATE
(gal per hour)

THE HARTFORD AREA HYDROCARBON PLUME SITE
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

H2A ENVIRONMENTAL, LTD.

FIGURE

238



LEGEND

- RMW-7C, RB-44 — MONITORING WELL
- RW-1 — RECOVERY WELL
- MP-29 — MONITORING PROBE
- P-2 — PRODUCTION WELL
- INTERPRETED EXTENT OF ROST RESPONSE
- INTERPRETED EXTENT OF FREE PRODUCT OBSERVED IN MONITORING WELLS

CONTOUR LIMIT = 1 gp8hd

CONTOUR INTERVAL = COMPLEX

- 0–5 gp8hd
- 5–10 gp8hd
- 10–25 gp8hd
- 25–50 gp8hd
- 50–100 gp8hd
- 100–150 gp8hd
- 150–200 gp8hd
- 200+ gp8hd

NOTES:

1. TOP OF CASING (TOC) ELEVATIONS USED IN THIS MAP FOR VILLAGE WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2003 AND 2004. TOC ELEVATIONS FOR ALL PREMCOR FACILITY WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2004 AND 2005. TOC ELEVATIONS FOR ALL OTHER WELLS WERE OBTAINED FROM HISTORICAL SURVEYS BY CMT, INC.
2. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS, INC.
3. BLUE WELLS SIGINFY WELLS AT WHICH HVR PILOT TESTING WAS PERFORMED.

SCALE IN FEET

0 100 200 300 600

CHECK BY	JMH
DRAWN BY	MLR
DATE	12/15/05
SCALE	AS SHOWN
CAD NO.	154.001.239
PRJ NO.	154.001

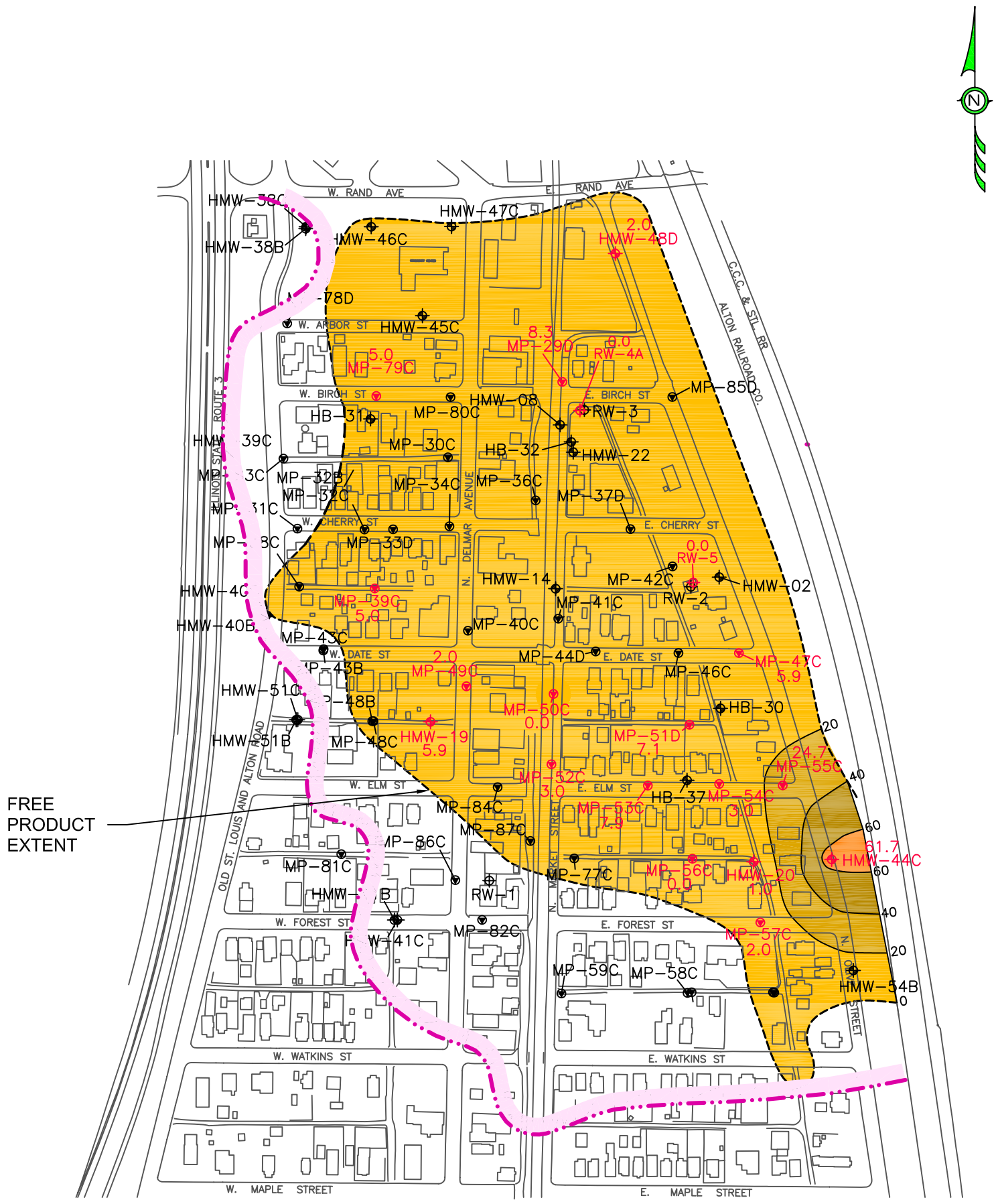
MAXIMUM DAILY LNAPL REMOVAL RATES
(gal per 8 hour day)

THE HARTFORD AREA HYDROCARBON PLUME SITE
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

H2A ENVIRONMENTAL, LTD.

FIGURE

239



LEGEND

RMW-7C, RB-44	MONITORING WELL
RW-1	RECOVERY WELL
MP-29	MONITORING PROBE
P-2	PRODUCTION WELL
	INTERPRETED EXTENT OF ROST RESPONSE
	INTERPRETED EXTENT OF FREE PRODUCT OBSERVED IN MONITORING WELLS

CONTOUR LIMIT = 1 gp8hd

CONTOUR INTERVAL = 20 gp8hd

- (0–20 gp8hd)
- (20–40 gp8hd)
- (40–60 gp8hd)
- (60+ gp8hd)

NOTES:

1. TOP OF CASING (TOC) ELEVATIONS USED IN THIS MAP FOR VILLAGE WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2003 AND 2004. TOC ELEVATIONS FOR ALL PREMCOR FACILITY WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2004 AND 2005. TOC ELEVATIONS FOR ALL OTHER WELLS WERE OBTAINED FROM HISTORICAL SURVEYS BY CMT, INC.
2. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS, INC.
3. RED WELLS SIGINFY WELLS AT WHICH HVR PILOT TESTING WAS PERFORMED.

SCALE IN FEET

0 100 200 300 600

CHECK BY	JMH
DRAWN BY	MLR
DATE	12/15/05
SCALE	AS SHOWN
CAD NO.	154.001.240
PRJ NO.	154.001

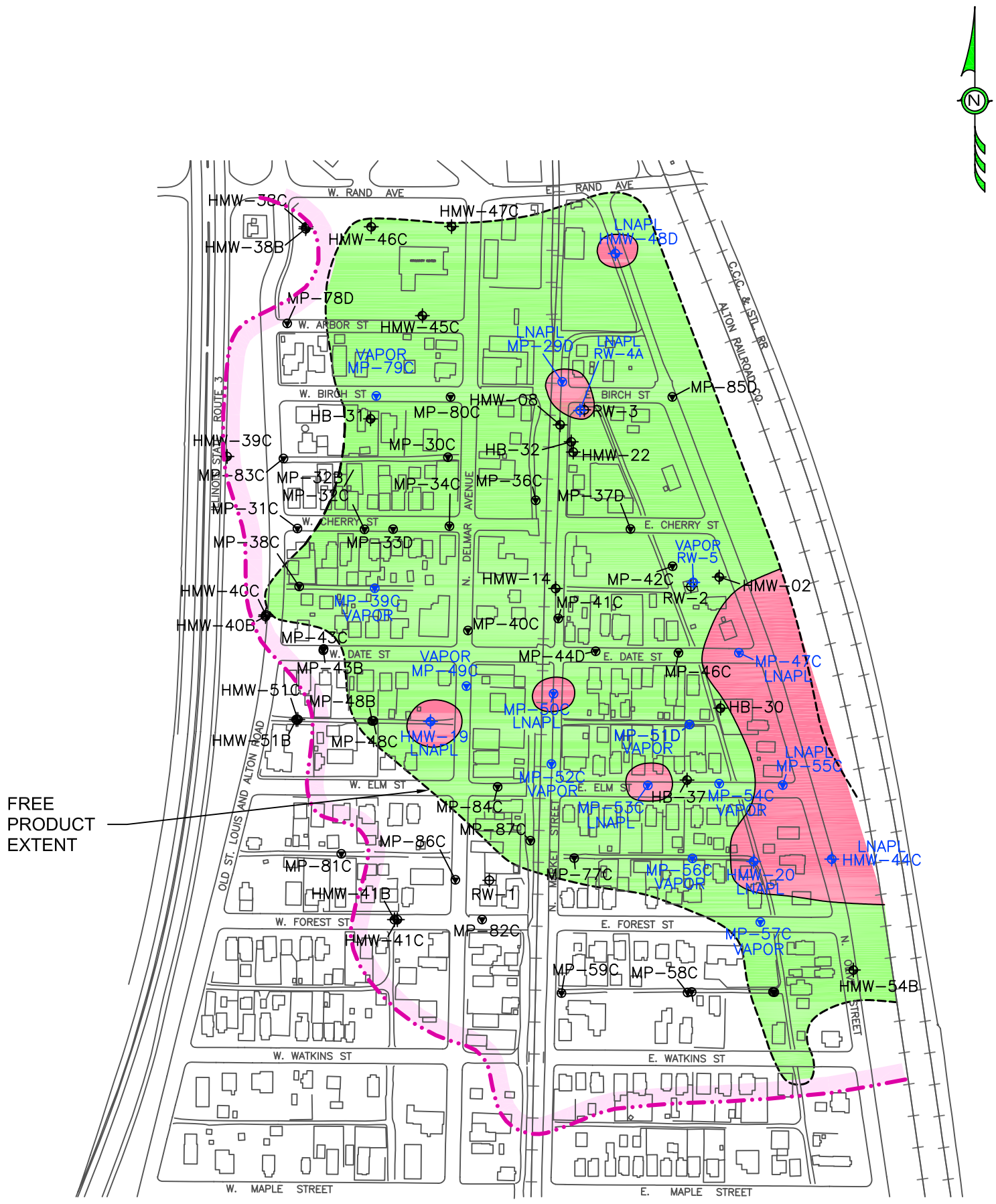
MINIMUM DAILY LNAPL REMOVAL CONTOURS
(gal per 8 hour day)

THE HARTFORD AREA HYDROCARBON PLUME SITE
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

H2A ENVIRONMENTAL, LTD.

FIGURE

240



LEGEND

RMW-7C, RB-44	MONITORING WELL
RW-1	RECOVERY WELL
MP-29	MONITORING PROBE
P-2	PRODUCTION WELL
	INTERPRETED EXTENT OF ROST RESPONSE
	INTERPRETED EXTENT OF FREE PRODUCT OBSERVED IN MONITORING WELLS

VAPOR
LNAPL

NOTES:

1. TOP OF CASING (TOC) ELEVATIONS USED IN THIS MAP FOR VILLAGE WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2003 AND 2004. TOC ELEVATIONS FOR ALL PREMCOR FACILITY WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2004 AND 2005. TOC ELEVATIONS FOR ALL OTHER WELLS WERE OBTAINED FROM HISTORICAL SURVEYS BY CMT, INC.
2. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS, INC.
3. BLUE WELLS SIGINFY WELLS AT WHICH HVR PILOT TESTING WAS PERFORMED.

SCALE IN FEET
0 100 200 300 600

CHECK BY	JMH
DRAWN BY	MLR
DATE	12/20/05
SCALE	AS SHOWN
CAD NO.	154.001.241
PRJ NO.	154.001

PRIMARY REMOVAL PHASE DURING HVR

THE HARTFORD AREA HYDROCARBON PLUME SITE
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

H2A ENVIRONMENTAL, LTD.

FIGURE

241

Figure 242: All HVR Wells - Comparison of Average LNAPL vs. Vapor Phase Recovery
The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
H_2A Environmental, Ltd.

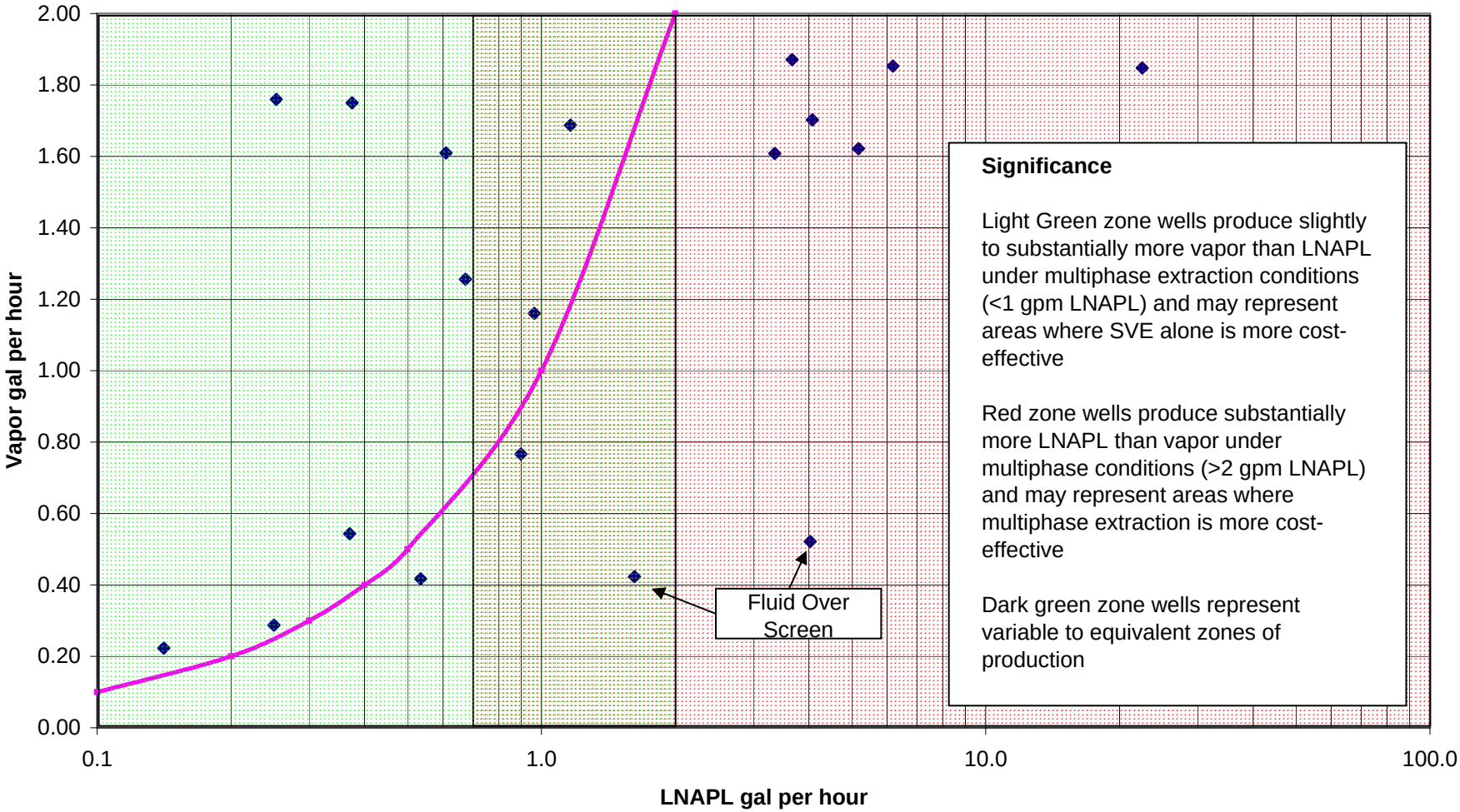


Figure 243: RW-4A Continuous HVR (9/14-17/05)
Multi-Site Cumulative Product Recovery (Gallons)

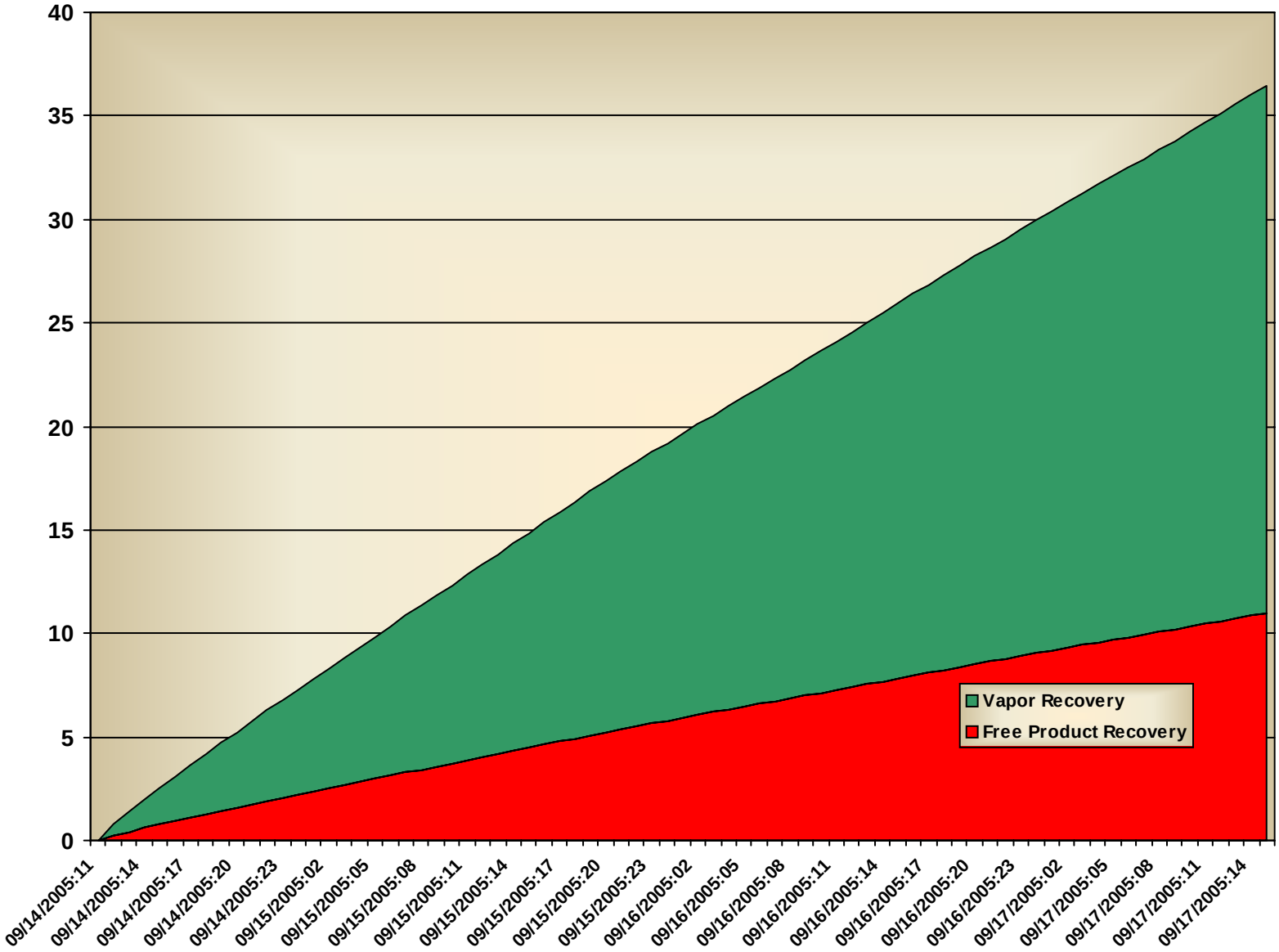


Figure 244: RW-4A Continuous HVR (9/14-17/05)
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

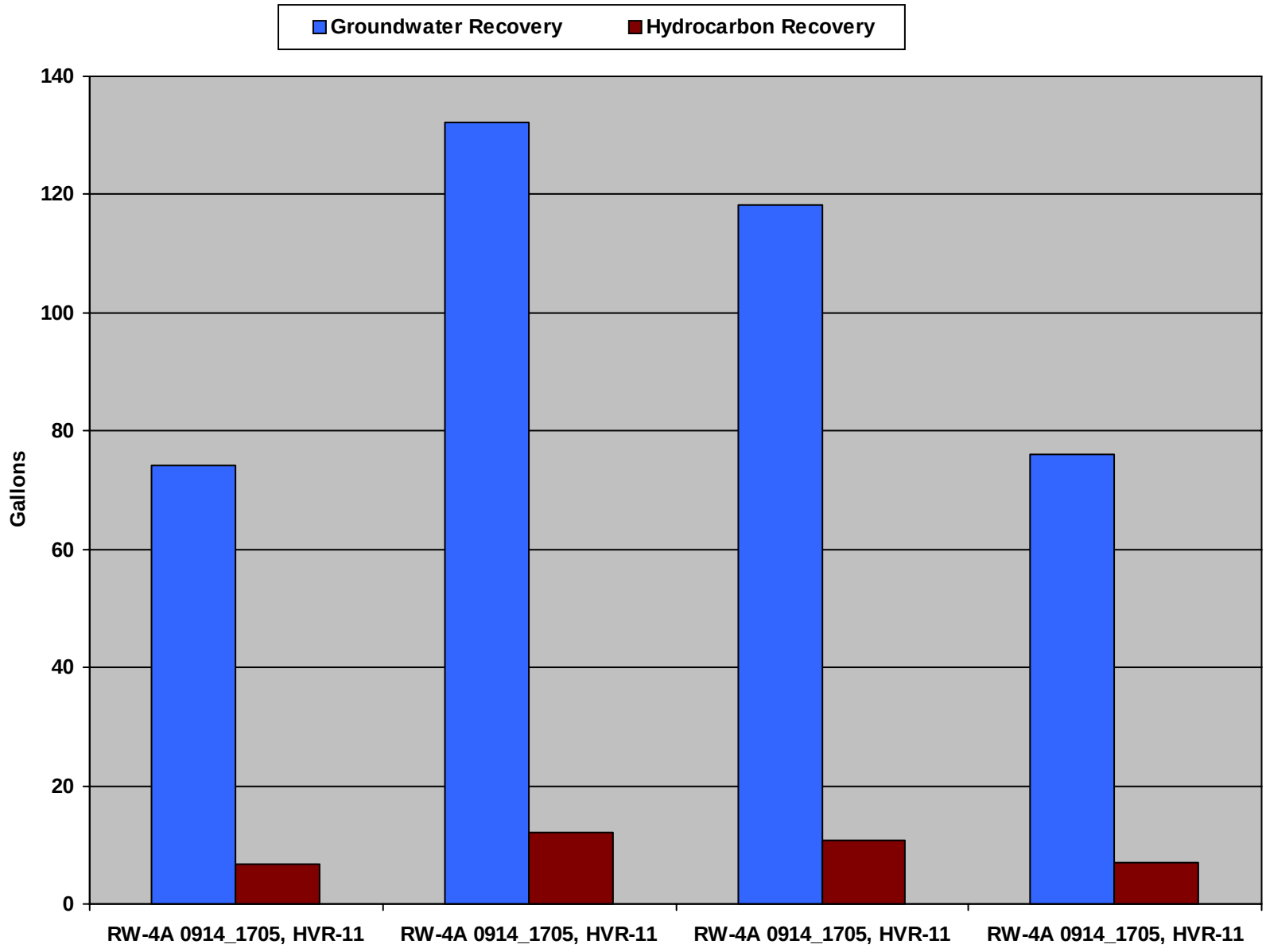


Figure 245: RW-4A Continuous HVR Drawdown
The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
H2A Environmental, Ltd.

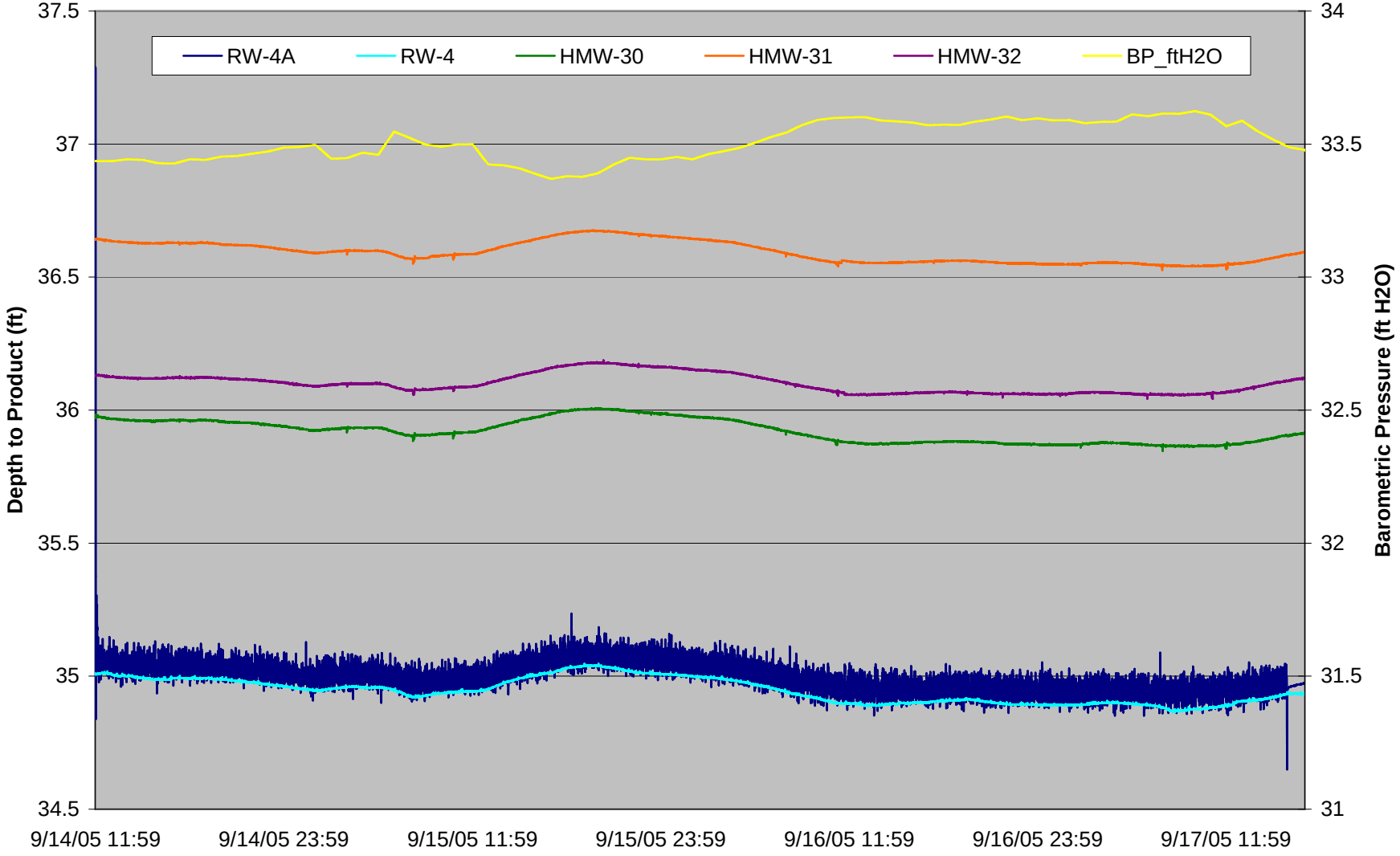
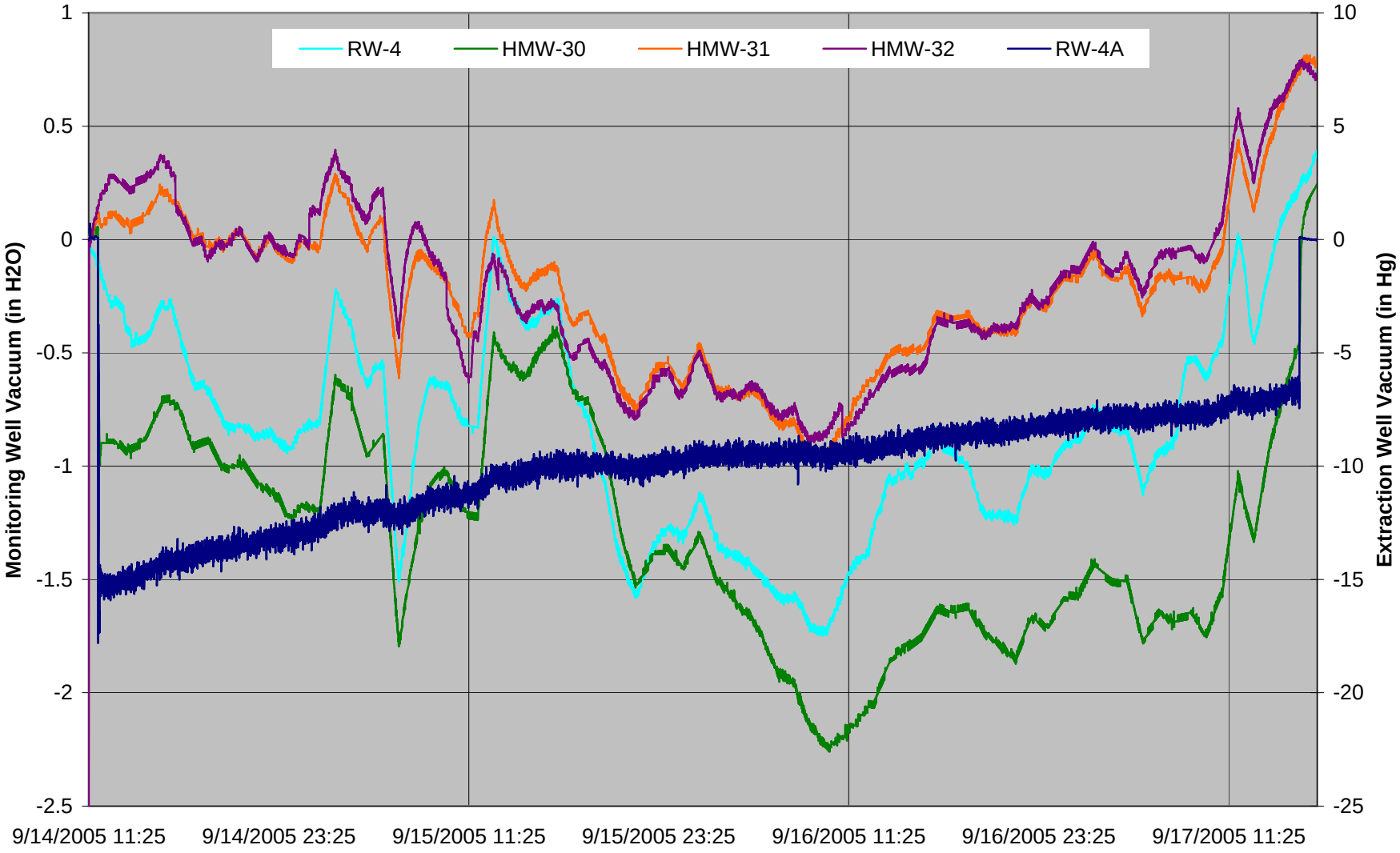
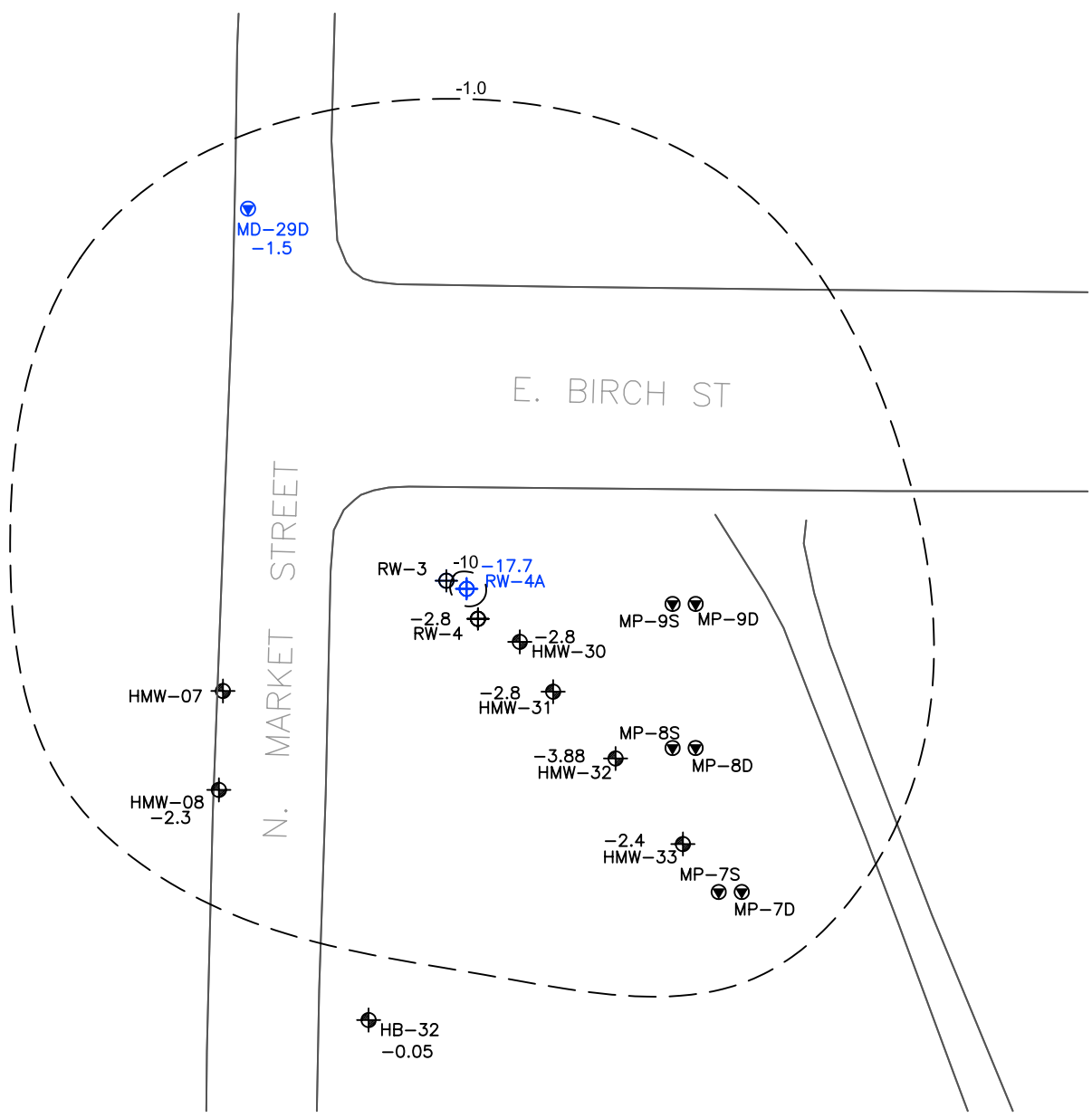


Figure 246: RW-4A Continuous HVR Vacuum ROI Data
The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
H_2A Environmental, Ltd.





LEGEND

RMW-7C, RB-44	MONITORING WELL
RW-1	RECOVERY WELL
MP-29	MONITORING PROBE
P-2	PRODUCTION WELL
-10	LOGARITHMIC CI (1.0, 10)

NOTES:

1. TOP OF CASING (TOC) ELEVATIONS USED IN THIS MAP FOR VILLAGE WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2003 AND 2004. TOC ELEVATIONS FOR ALL PREMCOR FACILITY WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2004 AND 2005. TOC ELEVATIONS FOR ALL OTHER WELLS WERE OBTAINED FROM HISTORICAL SURVEYS BY CMT, INC.
2. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS, INC.
3. BLUE WELLS SIGNIFY WELLS AT WHICH HVR PILOT TESTING WAS PERFORMED.

SCALE IN FEET

0 10 20 30 60

CHECK BY	JMH
DRAWN BY	MLR
DATE	12/20/05
SCALE	AS SHOWN
CAD NO.	154.001.247
PRJ NO.	154.001

RW-4A CONTINUOUS HVR PILOT TEST
MAXIMUM VACUUM ROI (in H2O)

THE HARTFORD AREA HYDROCARBON PLUME SITE
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

H2A ENVIRONMENTAL, LTD.

FIGURE

247

Figure 248: RW-4A Continuous DPE Well Diagram and Equipment Setup

The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
H_2A Environmental, Ltd.

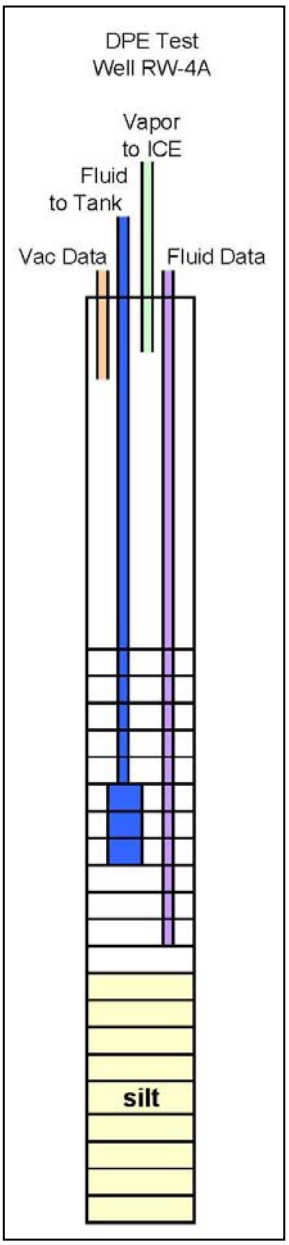


Figure 249: RW-4A Continuous DPE (9/22-23/05)
Multi-Site Cumulative Product Recovery (Gallons)

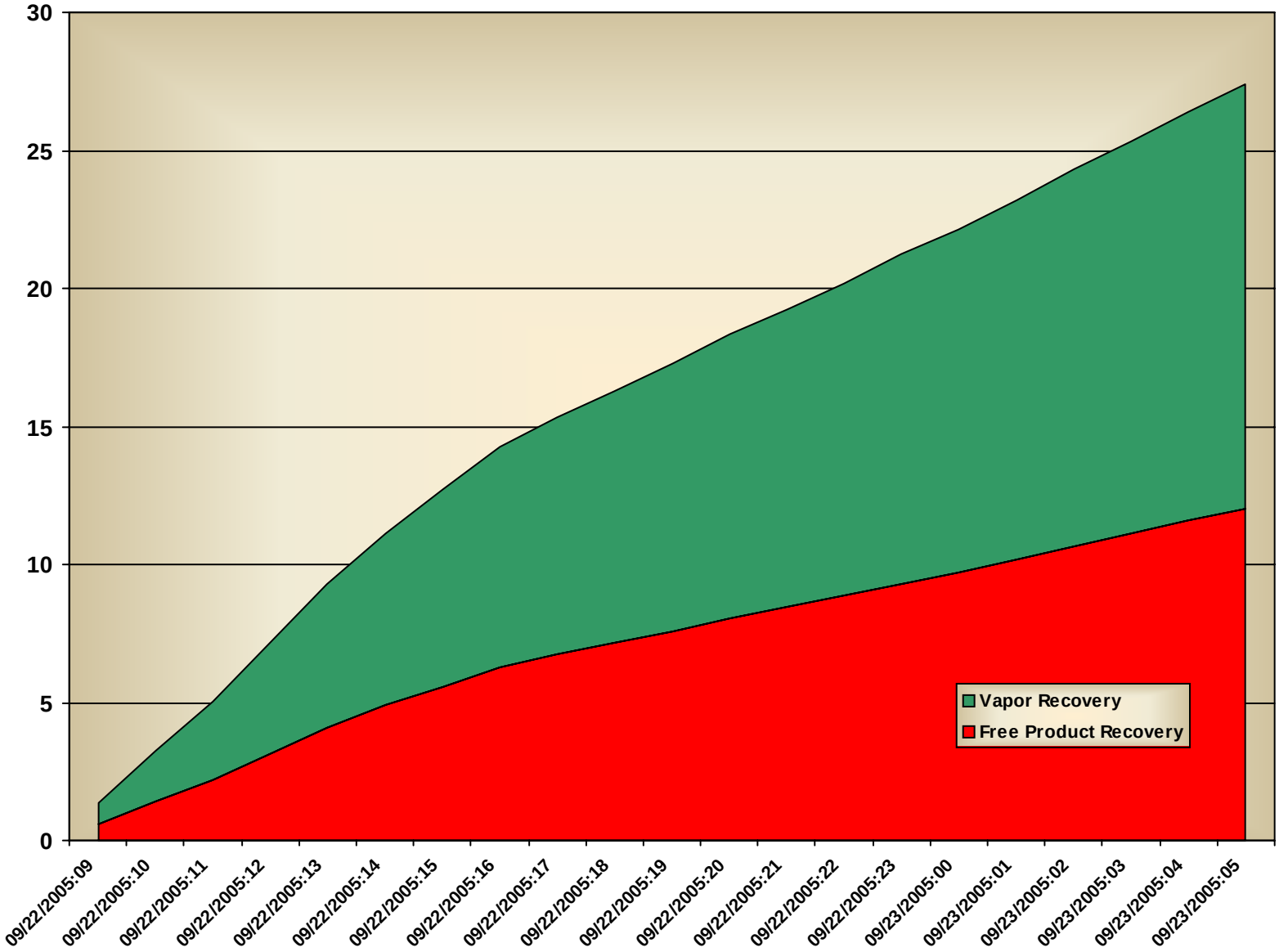


Figure 250: RW-4A Continuous DPE (9/22-23/05)
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

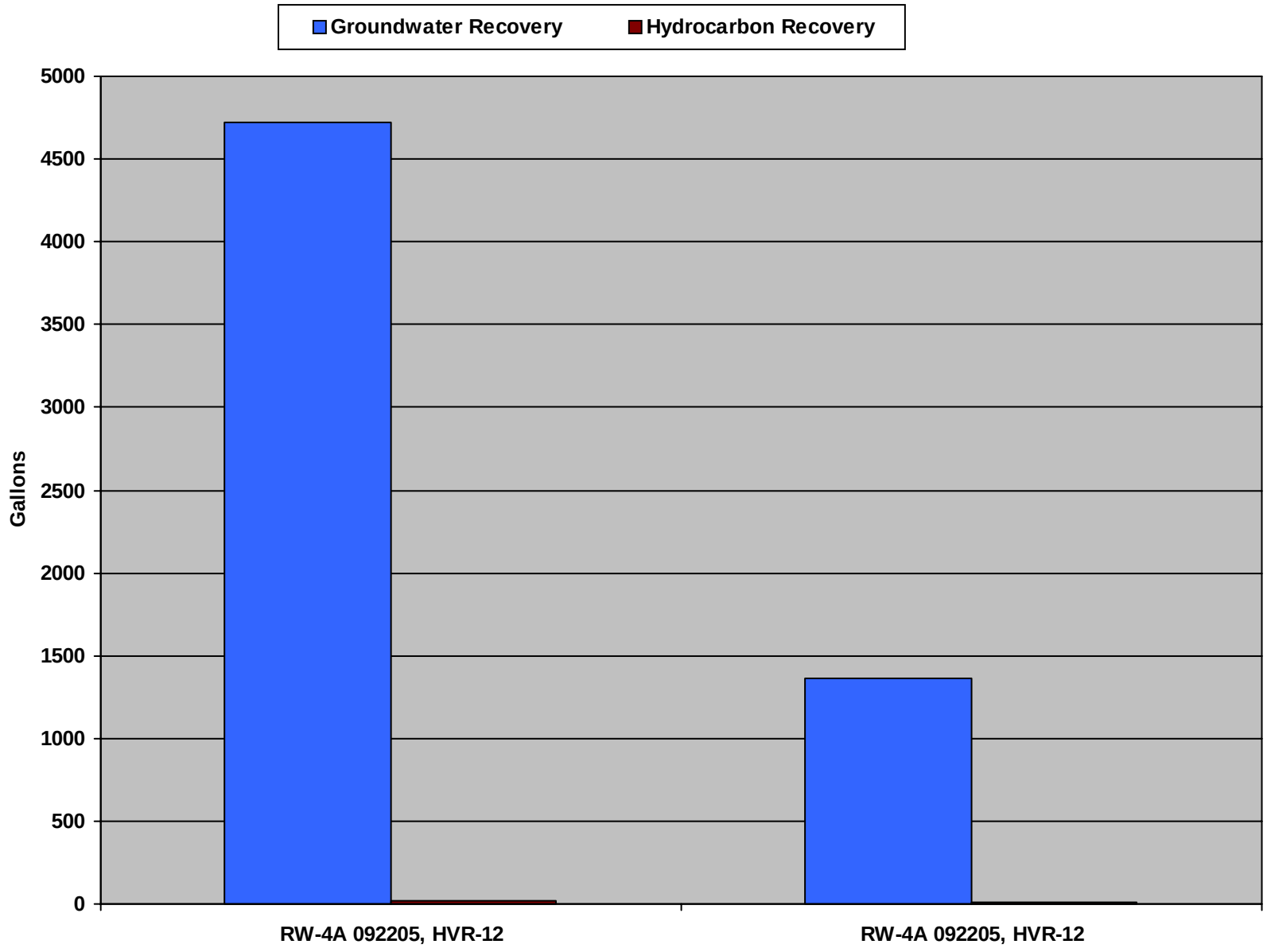
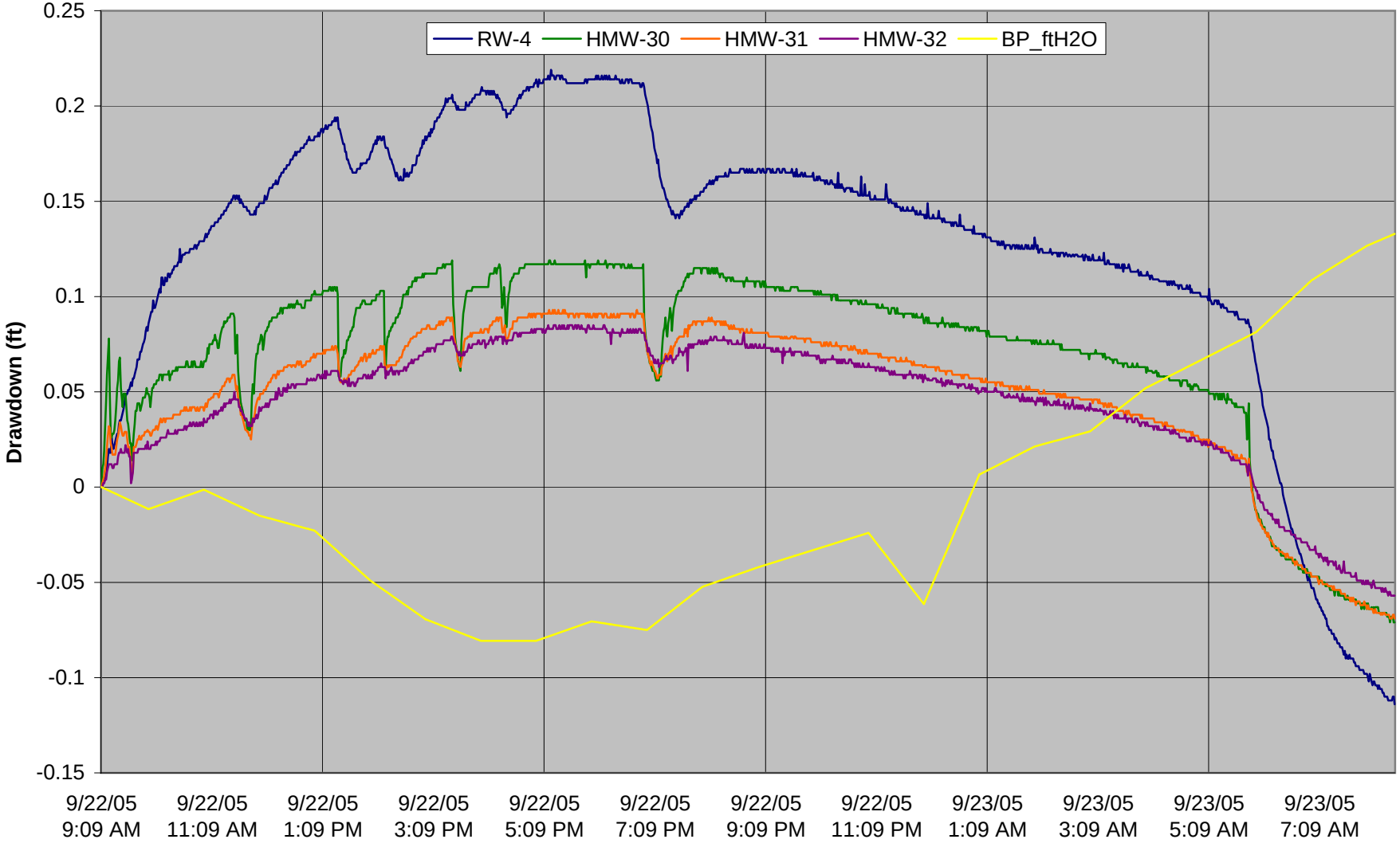
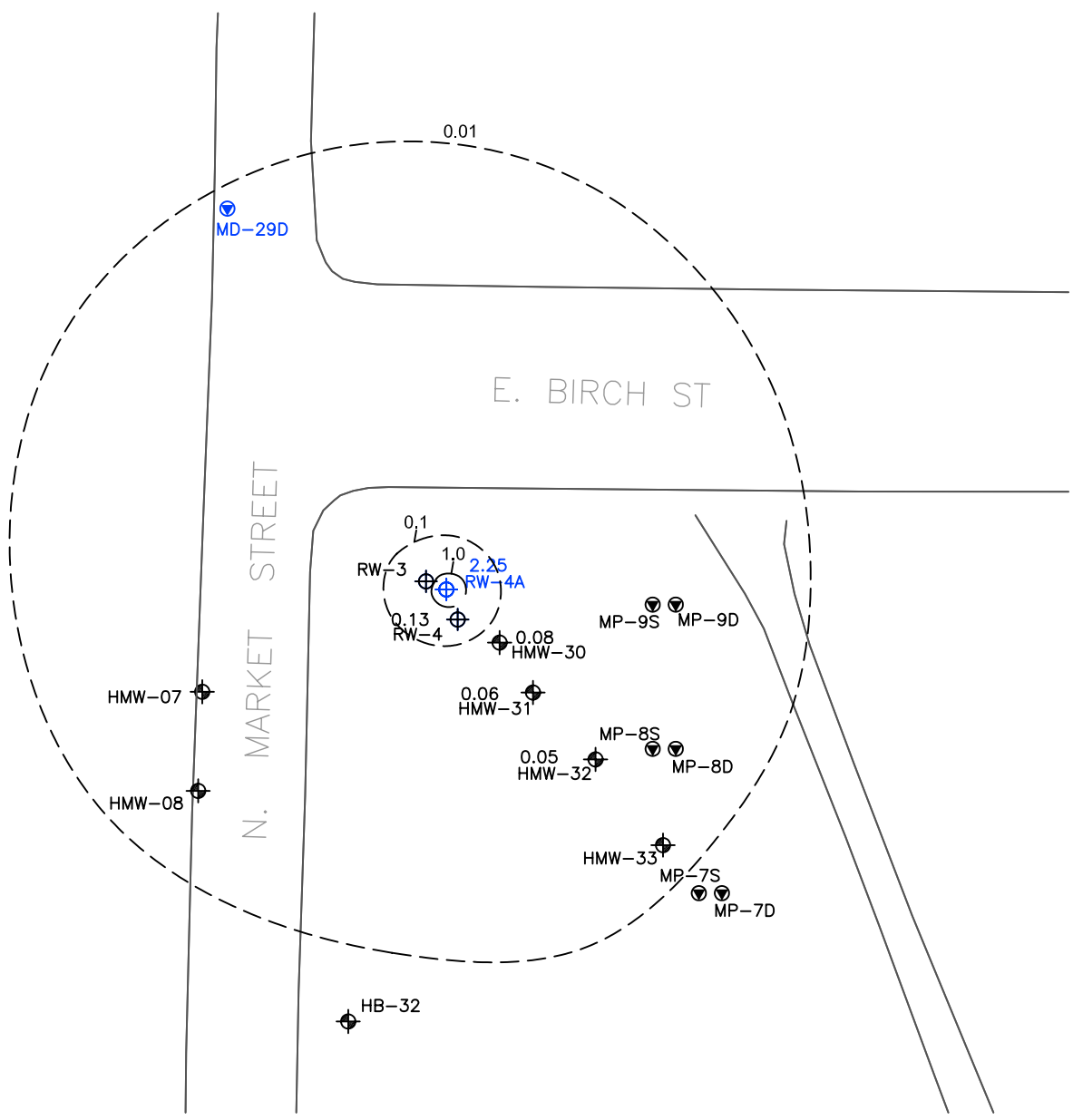


Figure 251: RW-4A Continuous DPE Drawdown
The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
H_2A Environmental, Ltd.





LEGEND

RMW-7C, RB-44 — MONITORING WELL

RW-1 — RECOVERY WELL

MP-29 — MONITORING PROBE

P-2 — PRODUCTION WELL

0.1 — LOGARITHMIC CI (1.0; 0.1; 0.01)

NOTES:

1. TOP OF CASING (TOC) ELEVATIONS USED IN THIS MAP FOR VILLAGE WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2003 AND 2004. TOC ELEVATIONS FOR ALL PREMCOR FACILITY WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2004 AND 2005. TOC ELEVATIONS FOR ALL OTHER WELLS WERE OBTAINED FROM HISTORICAL SURVEYS BY CMT, INC.
2. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS, INC.
3. BLUE WELLS SIGNIFY WELLS AT WHICH HVR PILOT TESTING WAS PERFORMED.

SCALE IN FEET

0 10 20 30 60

CHECK BY	JMH
DRAWN BY	MLR
DATE	12/20/05
SCALE	AS SHOWN
CAD NO.	154.001.252
PRJ NO.	154.001

RW-4A CONTINUOUS DPE PILOT TEST
DRAWDOWN ROI (feet)

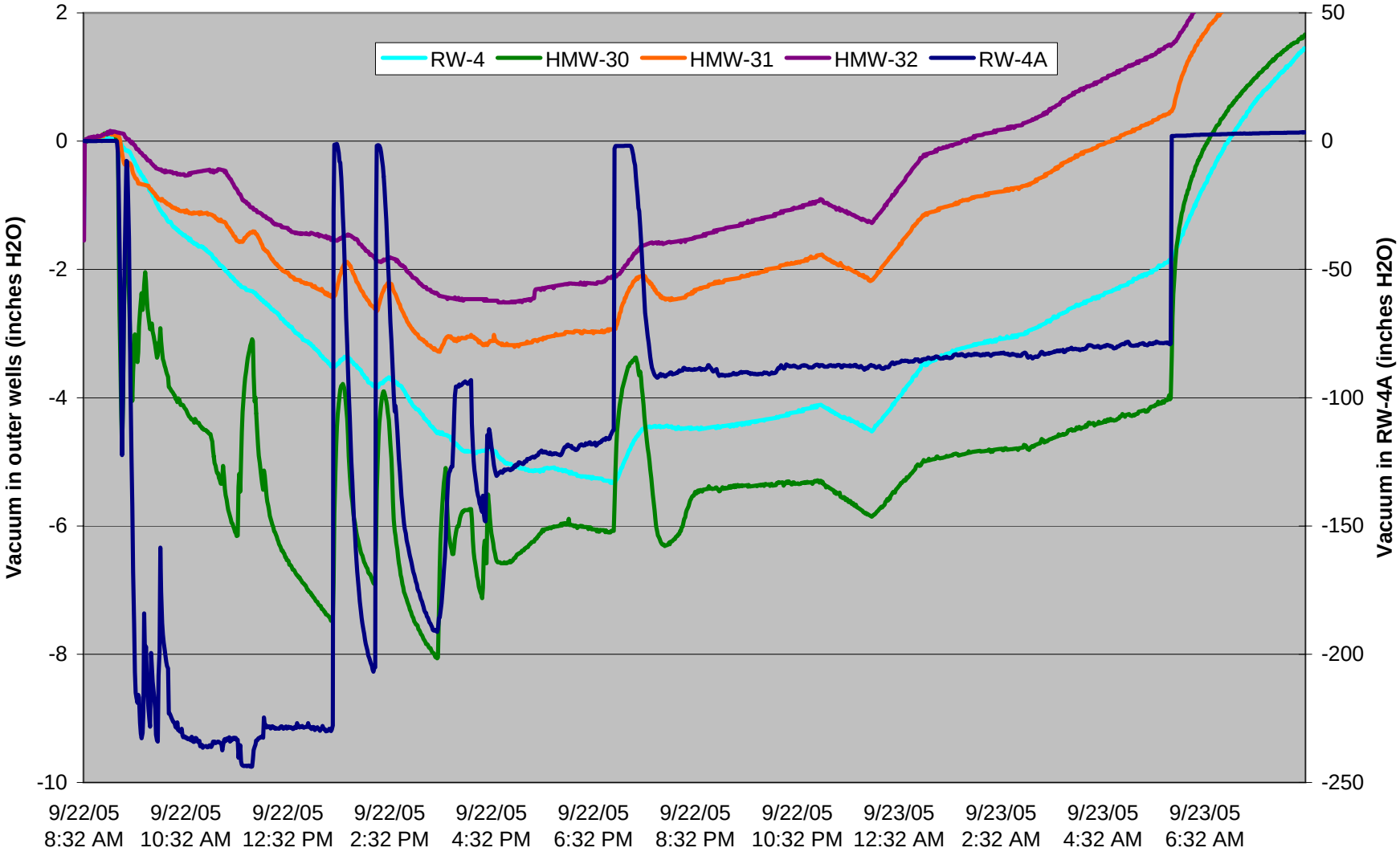
THE HARTFORD AREA HYDROCARBON PLUME SITE
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

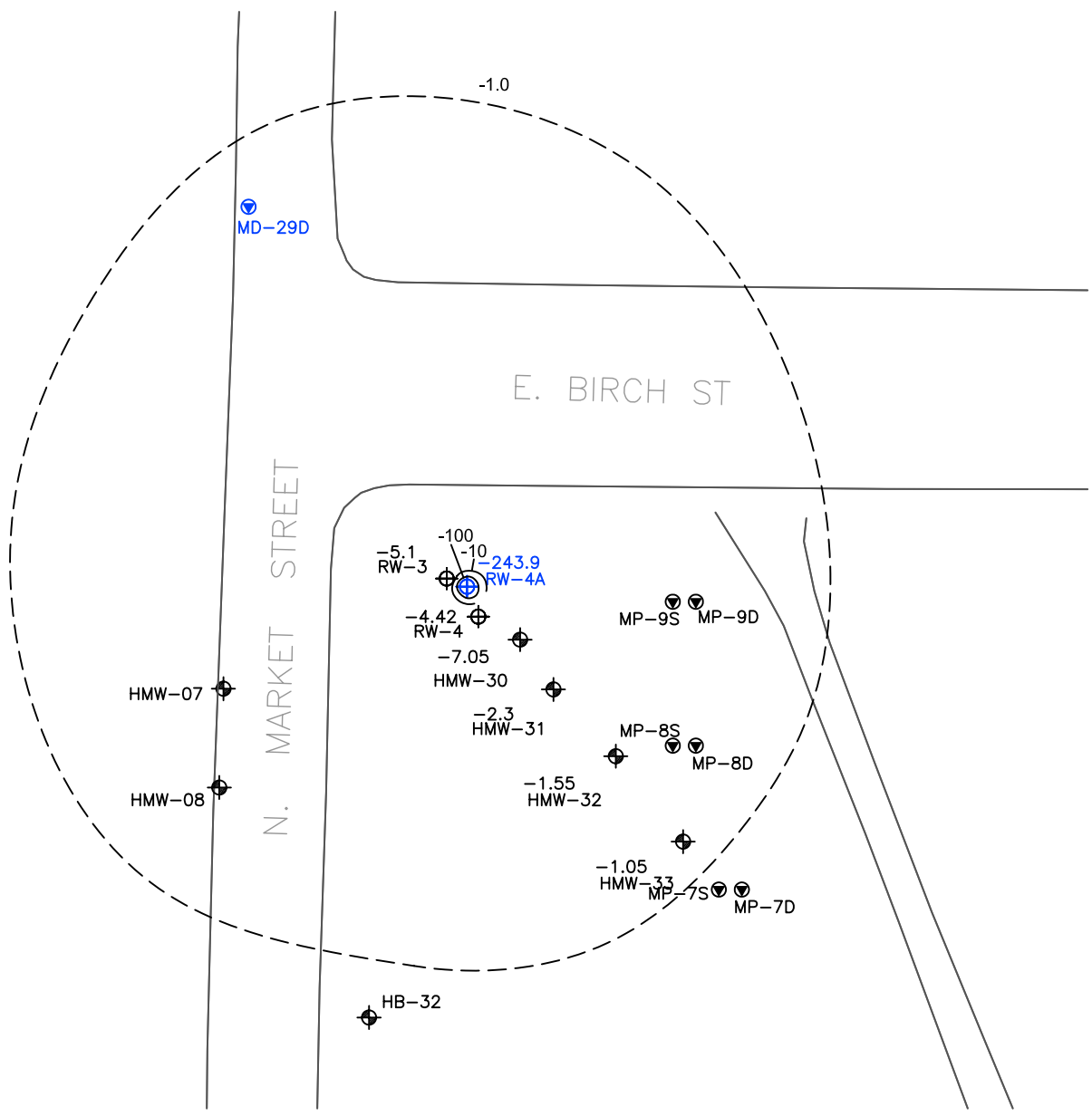
H2A ENVIRONMENTAL, LTD.

FIGURE

252

Figure 253: RW-4A Continuous DPE Vacuum ROI Data
The Hartford Area Hydrocarbon Plume
The Hartford Working Group
H_2A Environmental, Ltd.





LEGEND

RMW-7C, RB-44	MONITORING WELL
RW-1	RECOVERY WELL
MP-29	MONITORING PROBE
P-2	PRODUCTION WELL
-1.0	LOGARITHMIC CI (100, 10, 1)

NOTES:

1. TOP OF CASING (TOC) ELEVATIONS USED IN THIS MAP FOR VILLAGE WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2003 AND 2004. TOC ELEVATIONS FOR ALL PREMCOR FACILITY WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2004 AND 2005. TOC ELEVATIONS FOR ALL OTHER WELLS WERE OBTAINED FROM HISTORICAL SURVEYS BY CMT, INC.
2. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS, INC.
3. BLUE WELLS SIGNIFY WELLS AT WHICH HVR PILOT TESTING WAS PERFORMED.

SCALE IN FEET

0 10 20 30 60

CHECK BY	JMH
DRAWN BY	MLR
DATE	12/20/05
SCALE	AS SHOWN
CAD NO.	154.001.254
PRJ NO.	154.001

RW-4A CONTINUOUS DPE PILOT TEST
MAXIMUM VACUUM ROI (in H2O)

THE HARTFORD AREA HYDROCARBON PLUME SITE
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

H2A ENVIRONMENTAL, LTD.

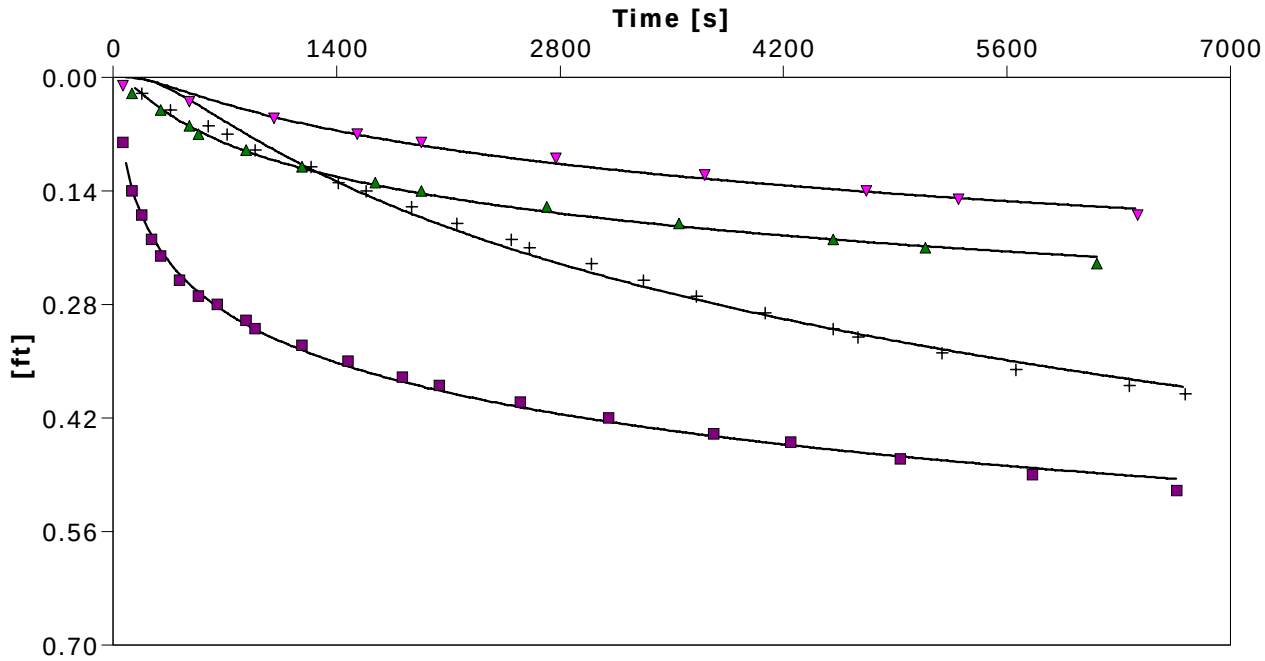
FIGURE

254

Figure 255: RW-4A Pumping Test Analysis

H2A Environmental, Ltd. **430 N. Carroll Ave., Suite 120** **Southlake, TX 76092**	**Pumping Test Analysis Report**
	Project: Hartford Area Hydrocarbon Plume
	Number: 154.001.301
	Client: HWG

Location: Hartford, IL	Pumping Test: RW-4A DPE Test	Pumping well: RW-4A
Test conducted by: H2A		Test date: 9/22/2005
Analysis performed by: JMH	Recharge Data Analysis - Obs Wells	Date: 9/28/2005
Aquifer Thickness: 50.00 ft	Discharge: variable, average rate 4.5 [U.S. gal/min]	



Calculation after AGARWAL + Theis with Jacob Correction

Observation well	Transmissivity [ft²/d]	K [ft/d]	Storage coefficient	Radial distance to PW [ft]	
HMW-30	7.51×10^{2}	1.50×10^{1}	2.63×10^{-3}	15.2	
HMW-31	9.82×10^{2}	1.96×10^{1}	1.12×10^{-2}	24.95	
HMW-32	9.34×10^{2}	1.87×10^{1}	1.15×10^{-2}	40.15	
RW-4	3.45×10^{2}	6.91×10^{0}	3.16×10^{-1}	5.57	
Average	7.53×10^{2}	1.51×10^{1}	8.54×10^{-2}		

Figure 256: RW-4A
Comparison of Continuous HVR and DPE Production

The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
H_2A Environmental, Ltd.

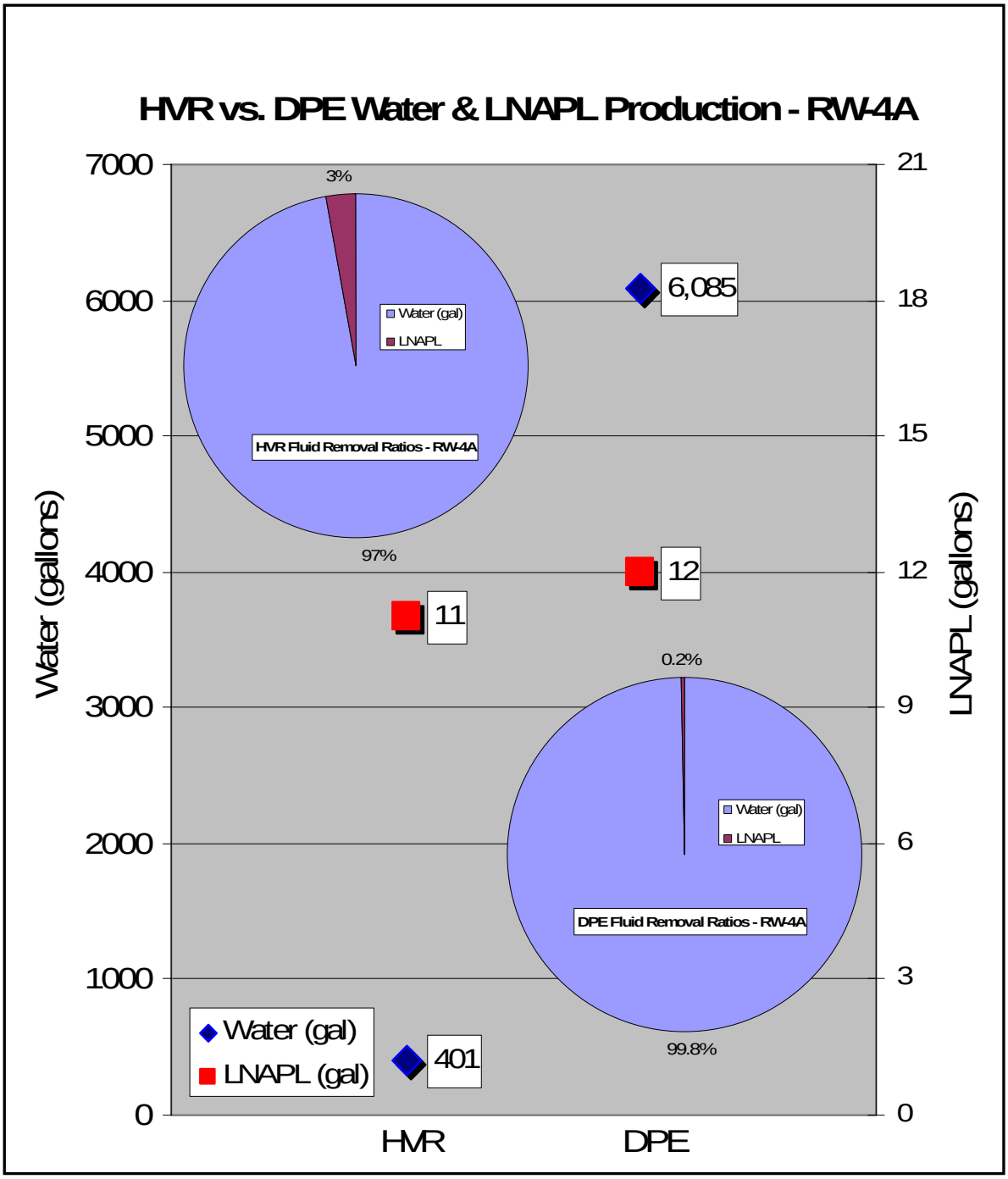


Figure 257: RW-5 Continuous HVR (10/7-8/05)
Multi-Site Cumulative Product Recovery (Gallons)

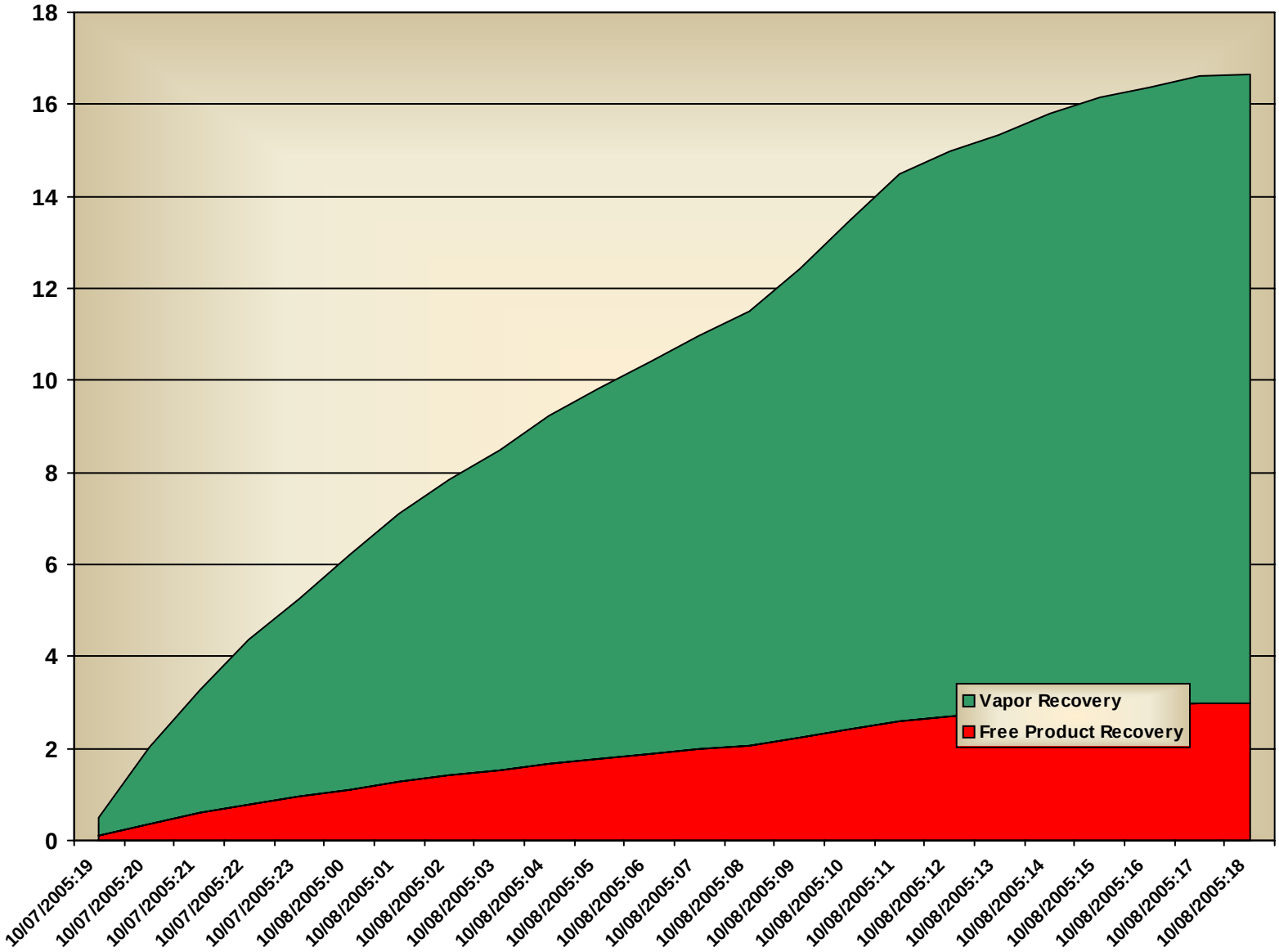


Figure 258: RW-5 Continuous HVR (10/7-8/05)
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

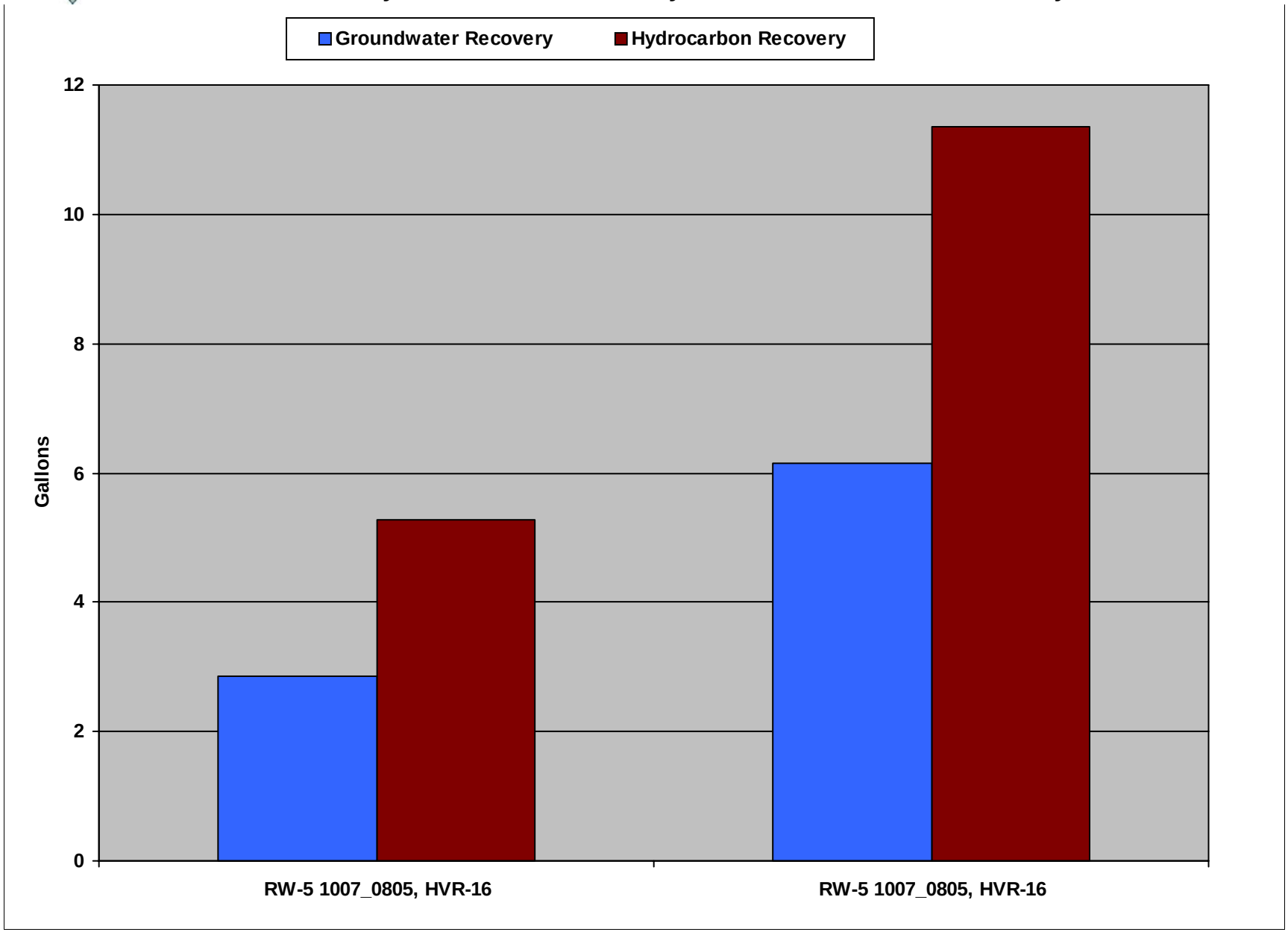


Figure 259: RW-5 Continuous HVR Depth to Product (drawdown)
The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
H_2A Environmental, Ltd.

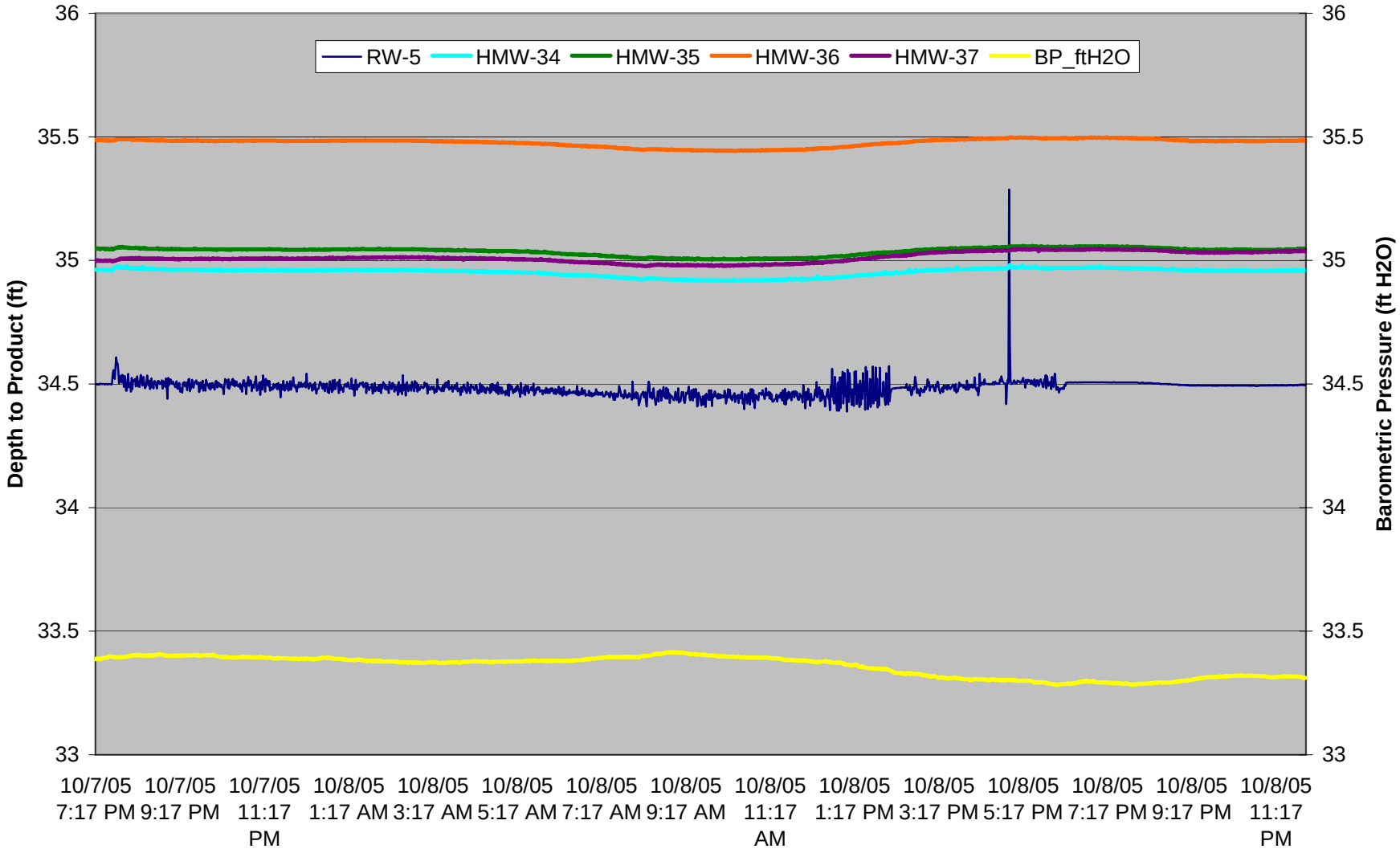
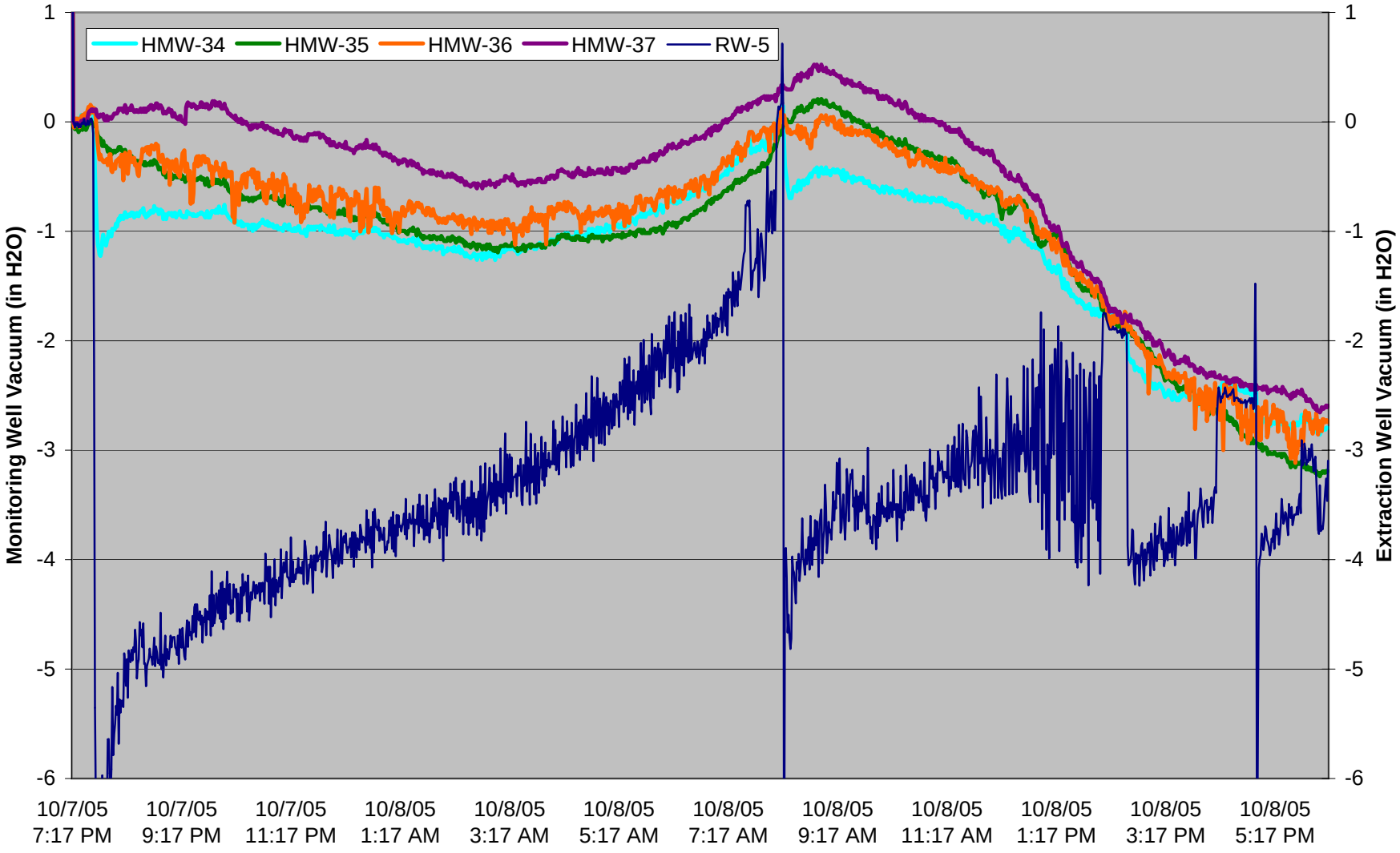
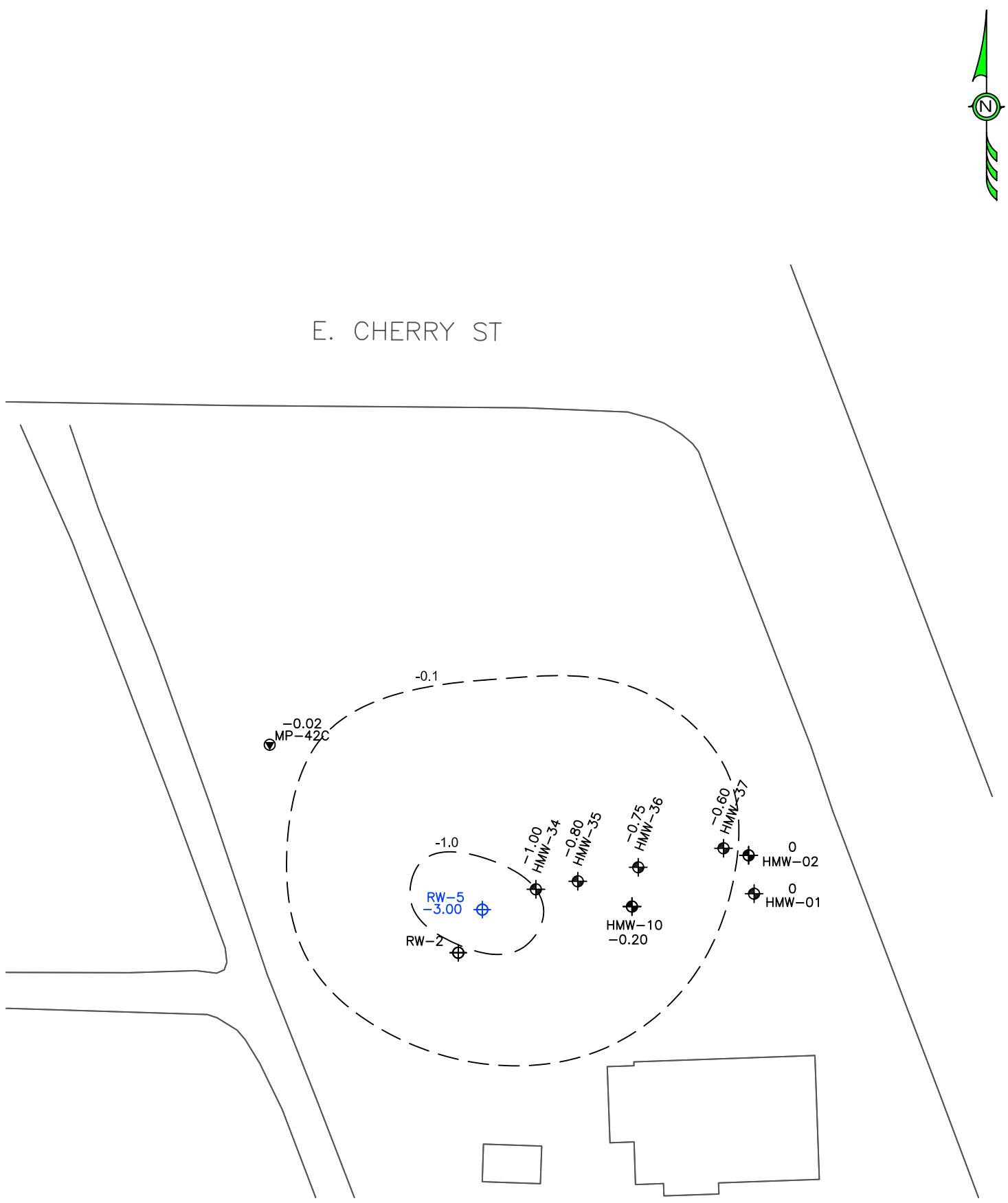


Figure 260: RW-5 Continuous HVR Vacuum ROI Data
The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
H_2A Environmental, Ltd.





LEGEND

RMW-7C, RB-44	MONITORING WELL
RW-1	RECOVERY WELL
MP-29	MONITORING PROBE
P-2	PRODUCTION WELL
-0.1	LOGARITHMIC CI (1.0, 0.1)

NOTES:

1. TOP OF CASING (TOC) ELEVATIONS USED IN THIS MAP FOR VILLAGE WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2003 AND 2004. TOC ELEVATIONS FOR ALL PREMCOR FACILITY WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2004 AND 2005. TOC ELEVATIONS FOR ALL OTHER WELLS WERE OBTAINED FROM HISTORICAL SURVEYS BY CMT, INC.
2. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS, INC.
3. BLUE WELLS SIGNIFY WELLS AT WHICH HVR PILOT TESTING WAS PERFORMED.

SCALE IN FEET

0 10 20 30 60

CHECK BY	JMH
DRAWN BY	MLR
DATE	12/20/05
SCALE	AS SHOWN
CAD NO.	154.001.261
PRJ NO.	154.001

RW-5 CONTINUOUS HVR PILOT TEST
MAXIMUM VACUUM ROI (in H2O)

THE HARTFORD AREA HYDROCARBON PLUME SITE
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

H2A ENVIRONMENTAL, LTD.

FIGURE

261

Figure 262: RW-5 Continuous DPE Well Diagram and Equipment Setup

The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
H_2A Environmental, Ltd.

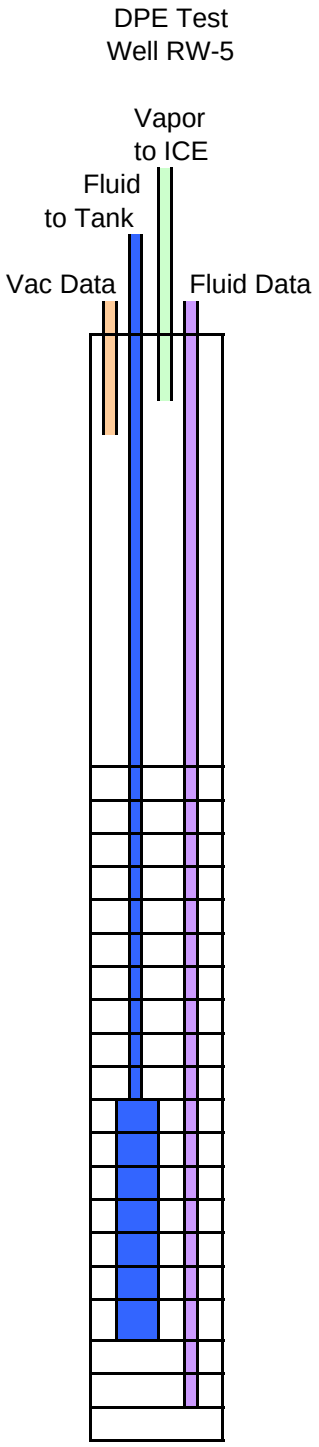


Figure 263: RW-5 Continuous DPE (10/13-14/05)
Multi-Site Cumulative Product Recovery (Gallons)

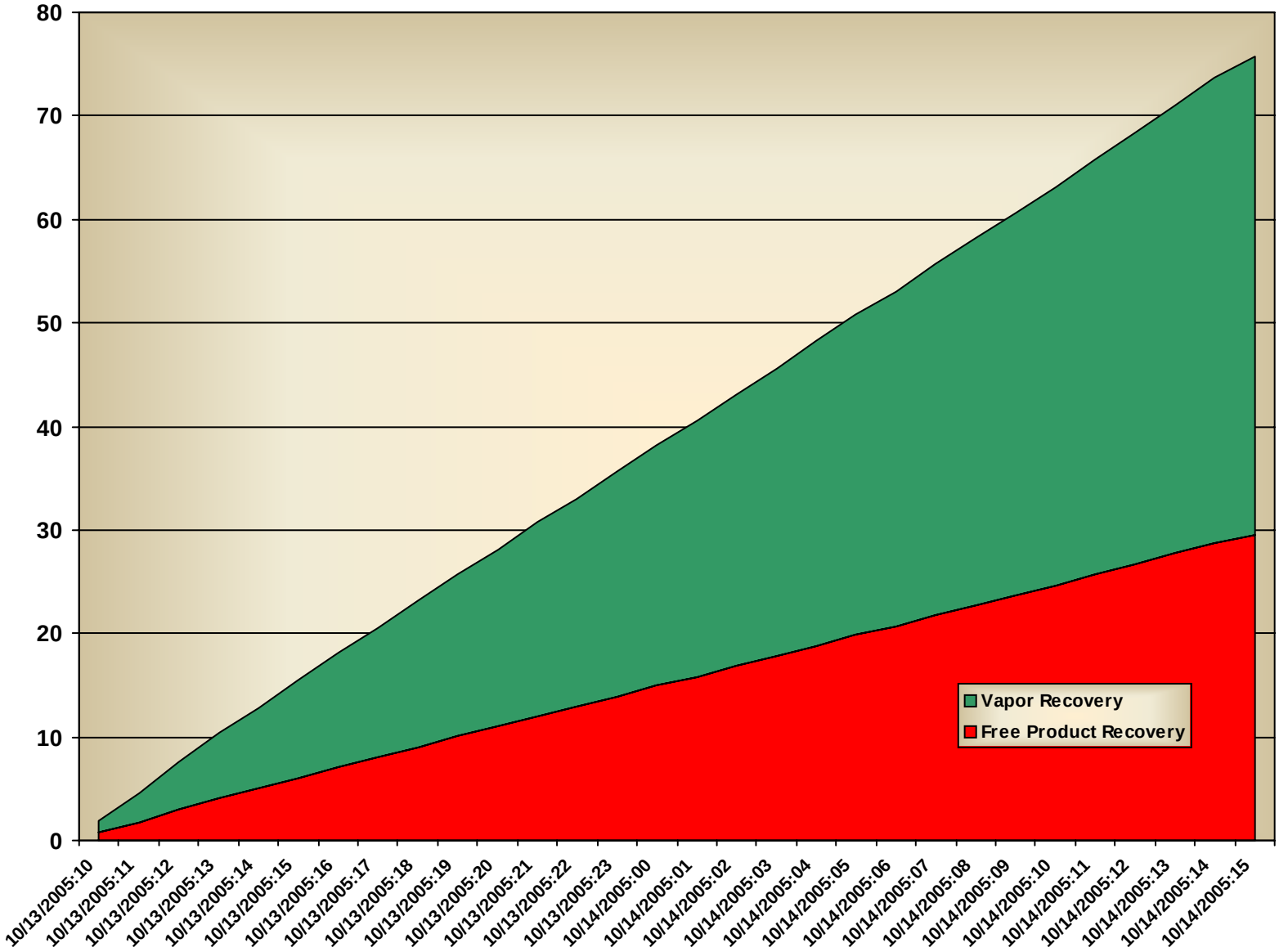


Figure 264: RW-5 Continuous DPE (10/13-14/05)
Multi-Site Hydrocarbon Recovery vs. Groundwater Recovery

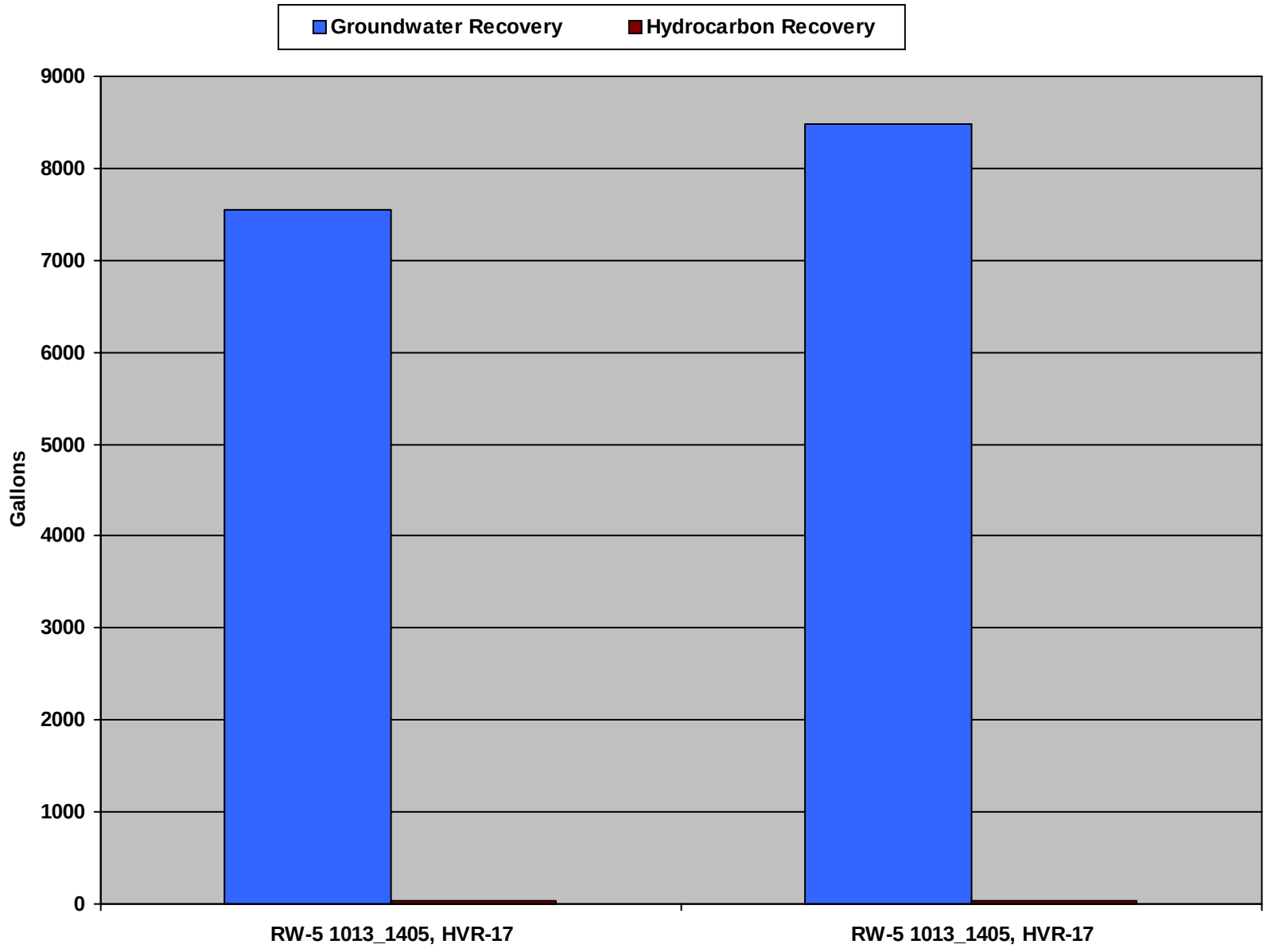
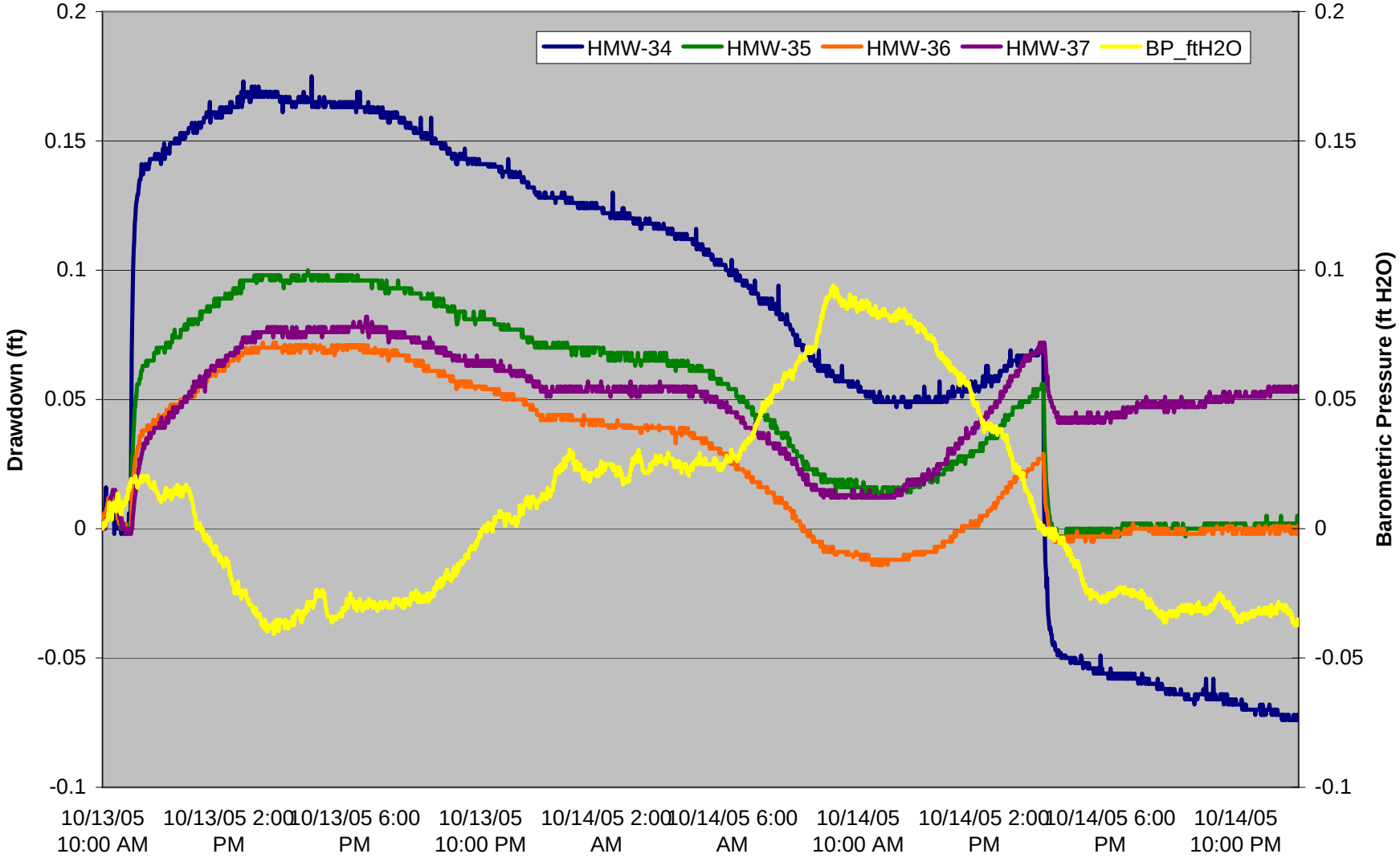
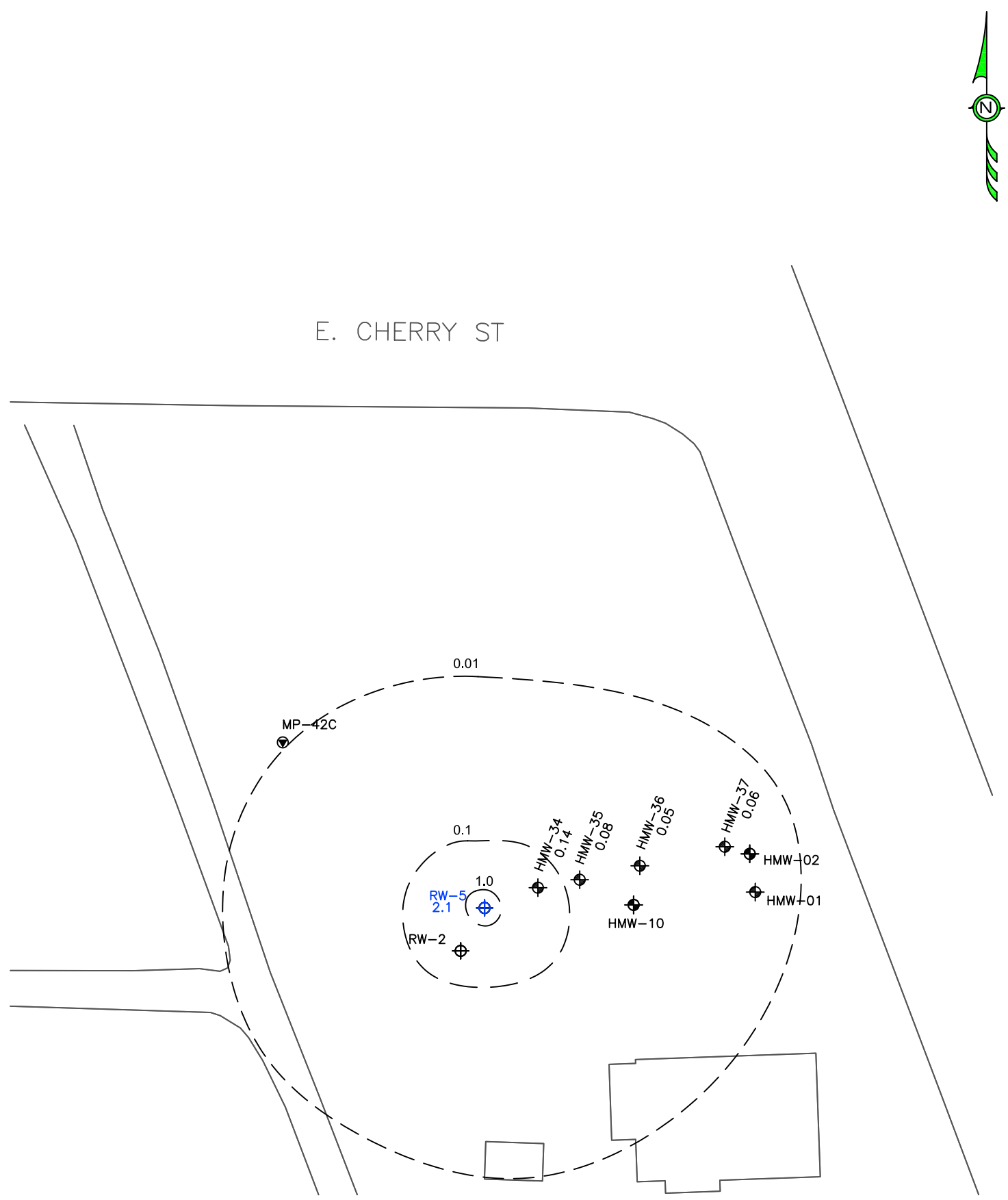


Figure 265: RW-5 Continuous DPE Drawdown ROI Data
The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
H_2A Environmental, Ltd.





LEGEND

RMW-7C, RB-44	MONITORING WELL
RW-1	RECOVERY WELL
MP-29	MONITORING PROBE
P-2	PRODUCTION WELL
0.1	LOGARITHMIC CI (1.0, 0.1, 0.01)

NOTES:

1. TOP OF CASING (TOC) ELEVATIONS USED IN THIS MAP FOR VILLAGE WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2003 AND 2004. TOC ELEVATIONS FOR ALL PREMCOR FACILITY WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2004 AND 2005. TOC ELEVATIONS FOR ALL OTHER WELLS WERE OBTAINED FROM HISTORICAL SURVEYS BY CMT, INC.
2. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS, INC.
3. BLUE WELLS SIGNIFY WELLS AT WHICH HVR PILOT TESTING WAS PERFORMED.

SCALE IN FEET

0 10 20 30 60

CHECK BY	JMH
DRAWN BY	MLR
DATE	12/20/05
SCALE	AS SHOWN
CAD NO.	154.001.266
PRJ NO.	154.001

RW-5 CONTINUOUS DPE PILOT TEST
MAXIMUM DRAWDOWN (feet)

THE HARTFORD AREA HYDROCARBON PLUME SITE
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

H2A ENVIRONMENTAL, LTD.

FIGURE

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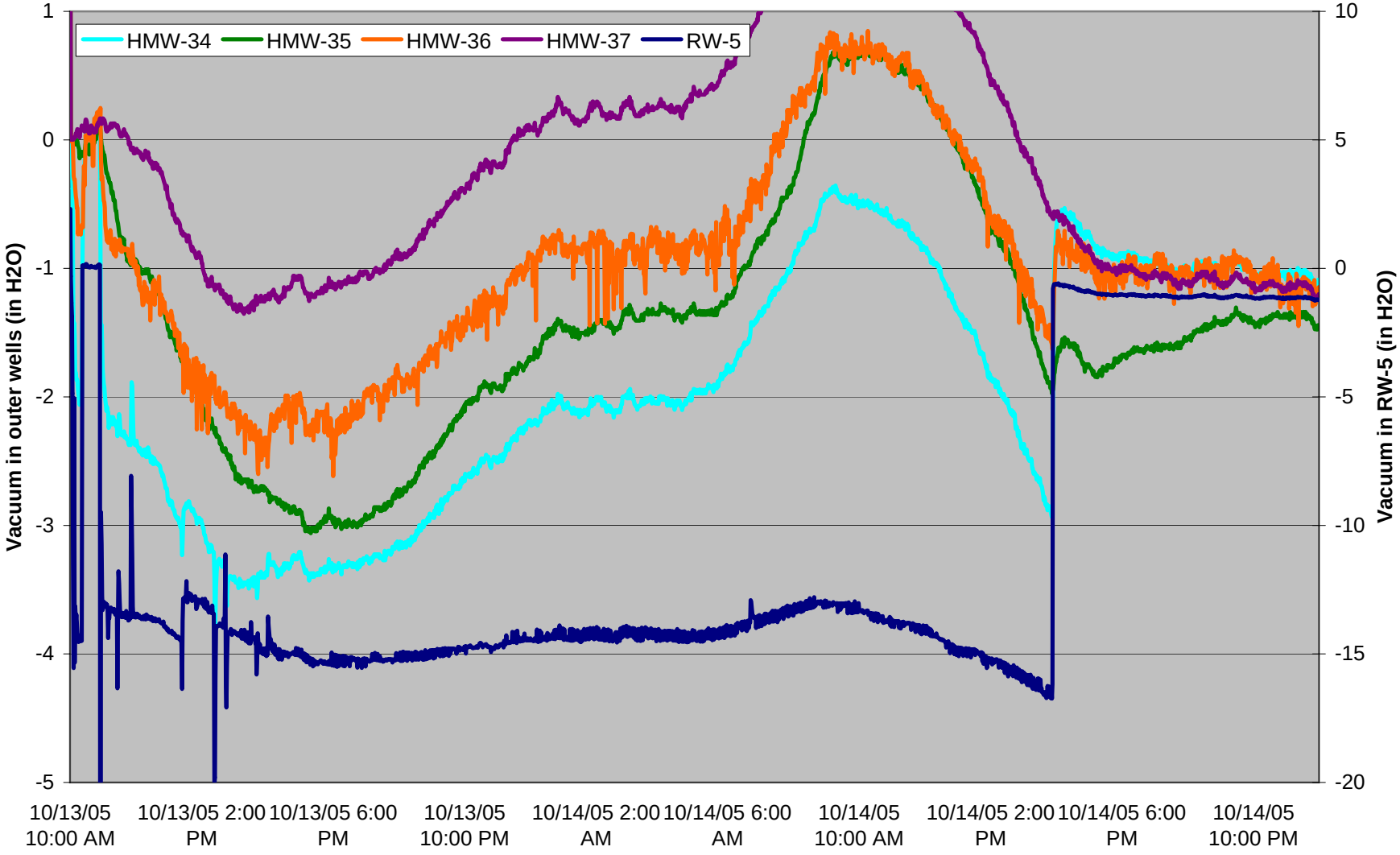
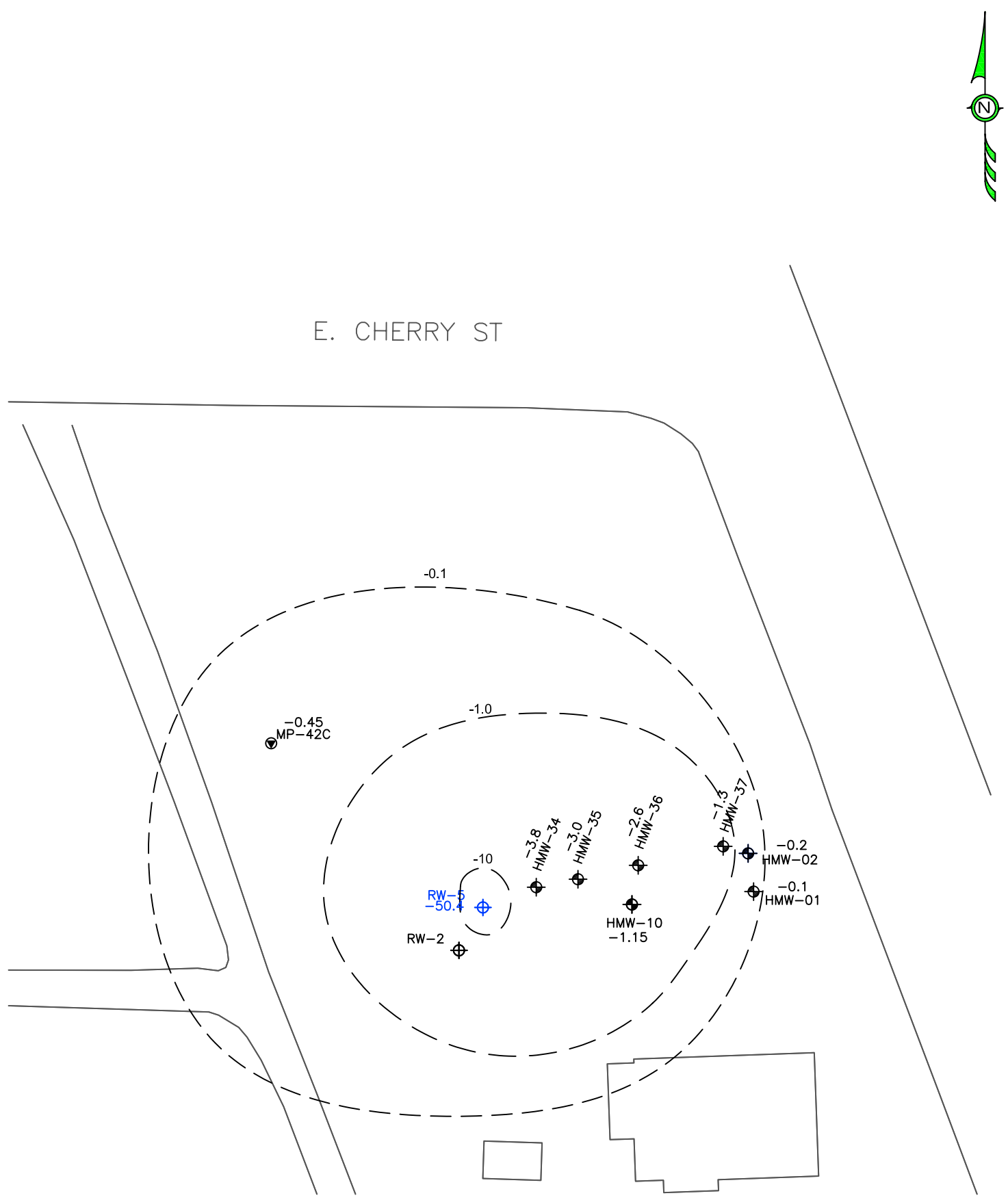
Figure 267: RW-5 Continuous DPE Vacuum ROI Data
The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
H_2A Environmental, Ltd.





LEGEND

RMW-7C, RB-44	MONITORING WELL
RW-1	RECOVERY WELL
MP-29	MONITORING PROBE
P-2	PRODUCTION WELL
-1.0	LOGARITHMIC CI (10, 1.0, 0.1)

NOTES:

1. TOP OF CASING (TOC) ELEVATIONS USED IN THIS MAP FOR VILLAGE WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2003 AND 2004. TOC ELEVATIONS FOR ALL PREMCOR FACILITY WELLS WERE OBTAINED BY SURVEYS COMPLETED BY CMT, INC. IN 2004 AND 2005. TOC ELEVATIONS FOR ALL OTHER WELLS WERE OBTAINED FROM HISTORICAL SURVEYS BY CMT, INC.
2. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS, INC.
3. BLUE WELLS SIGNIFY WELLS AT WHICH HVR PILOT TESTING WAS PERFORMED.

SCALE IN FEET

0 10 20 30 60

CHECK BY	JMH
DRAWN BY	MLR
DATE	12/20/05
SCALE	AS SHOWN
CAD NO.	154.001.268
PRJ NO.	154.001

RW-5 CONTINUOUS DPE PILOT TEST
MAXIMUM VACUUM ROI (in H2O)

THE HARTFORD AREA HYDROCARBON PLUME SITE
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

H2A ENVIRONMENTAL, LTD.

FIGURE

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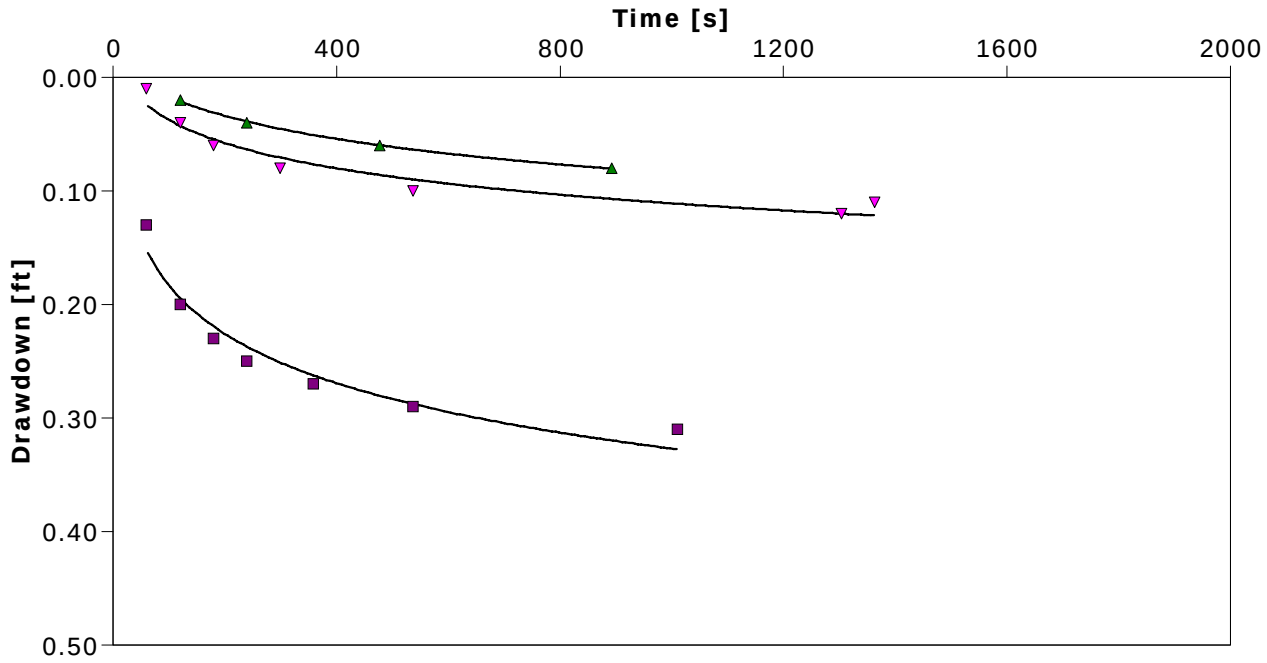
Figure 269: RW-5 Pumping Test Analysis Report

H2A Environmental, Ltd. **430 N. Carroll Ave., Suite 120** **Southlake, TX 76092**	**Pumping Test Analysis Report**
	Project: Hartford Area Hydrocarbon Plume
	Number: 154.001.301
	Client: HWG

Location: Hartford, IL	Pumping Test: RW-5 DPE Test	Pumping well: RW-5
Test conducted by: H2A		Test date: 10/13/2005
Analysis performed by: JMH	Recharge Analysis - Obs Wells	Date: 11/7/2005
Aquifer Thickness: 50.00 ft	Discharge: variable, average rate 10 [U.S. gal/min]	



Calculation after AGARWAL + Theis

Observation well	Transmissivity [ft²/d]	K [ft/d]	Storage coefficient	Radial distance to PW [ft]	
HMW-34	2.42×10^{3}	4.84×10^{1}	2.10×10^{-3}	13.1	
HMW-35	4.25×10^{3}	8.50×10^{1}	2.18×10^{-2}	22.78	
HMW-36	4.37×10^{3}	8.75×10^{1}	3.59×10^{-3}	36.95	
Average	3.68×10^{3}	7.36×10^{1}	9.15×10^{-3}		

Figure 270: RW-5
Comparison of Continuous HVR and DPE Production

The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group
H_2A Environmental, Ltd.

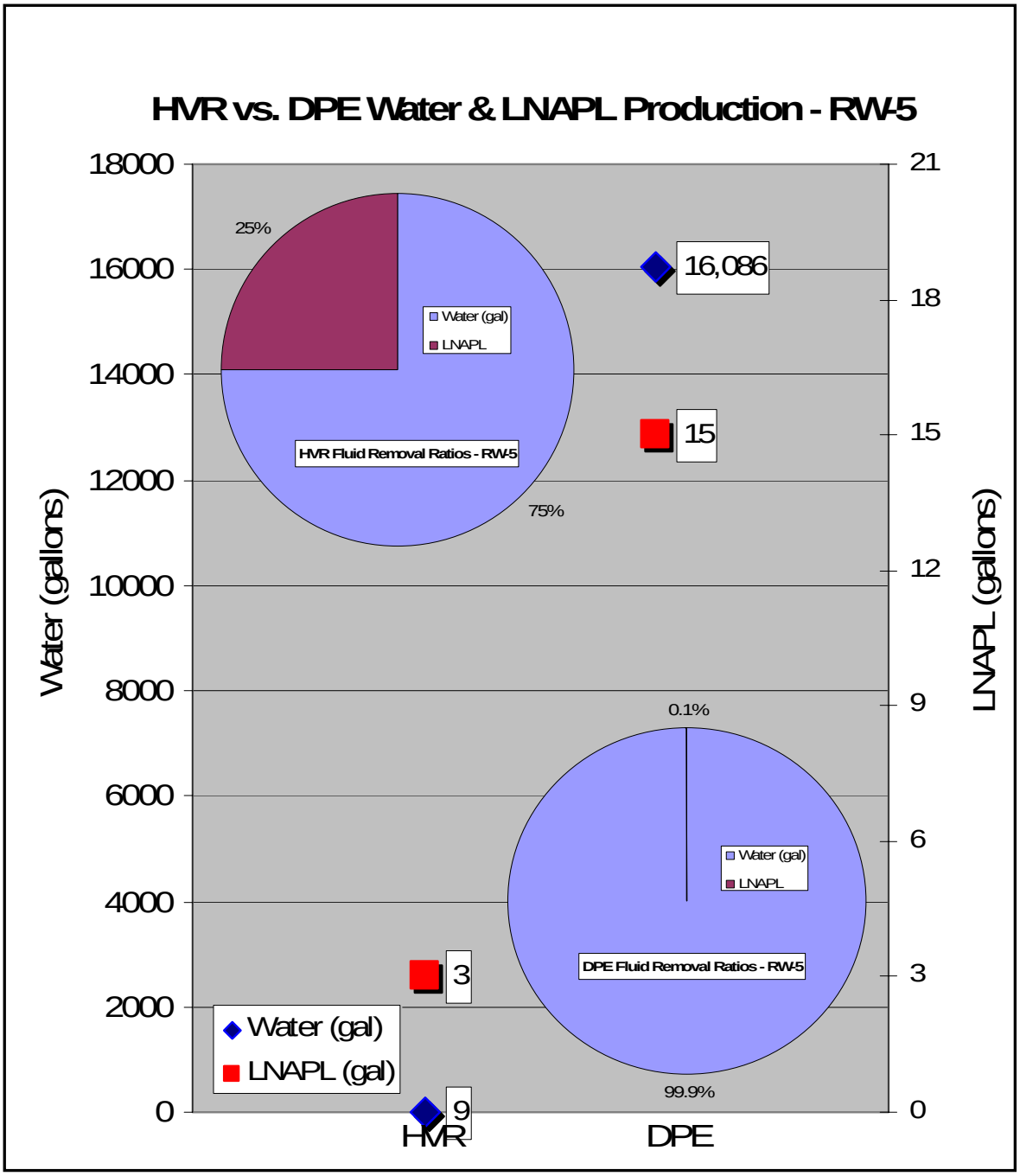


Table 1
Multi-Site Daily Rate and Recovery Report

Project	Date	Hours	Vapor Recovery	Product Recovery	Hydro-Carbon Recovery	Rate of Recovery	Water Recovery	Percent Hydro-Carbon
HMW-19								
052305, HVR 01	05/23/2005	8.4	16.1	51.8	67.9	8.1	18	79.1%
060705, HVR 02	06/07/2005	8.3	15.1	20.9	36.0	4.4	4	90.1%
062105, HVR 03	06/21/2005	8.3	16.1	49.3	65.4	7.9	53	55.4%
070805, HVR 04	07/08/2005	8.3	15.2	47.7	62.9	7.6	262	19.4%
072205, HVR 05	07/22/2005	8.4	16.0	28.5	44.5	5.3	257	14.7%
080905, HVR 06	08/09/2005	8.2	15.7	18.8	34.5	4.2	4	88.6%
081005, HVR 07	08/10/2005	8.6	15.4	18.8	34.2	4.0	15	69.8%
081105, HVR 08	08/11/2005	8.3	15.8	62.0	77.8	9.4	86	47.4%
081205, HVR 09	08/12/2005	8.2	15.8	47.6	63.4	7.8	67	48.6%
081605, HVR 10	08/16/2005	8.1	14.1	37.3	51.3	6.4	56	47.6%
081705, HVR 11	08/17/2005	8.2	13.6	40.1	53.7	6.6	77	41.1%
081805, HVR 12	08/18/2005	8.1	5.9	26.6	32.4	4.0	52	38.4%
081905, HVR 13	08/19/2005	8.0	9.0	25.5	34.4	4.3	66	34.2%
082205, HVR 14	08/22/2005	8.4	11.6	5.9	17.5	2.1	15	54.3%
082305, HVR 15	08/23/2005	8.1	15.1	22.3	37.4	4.6	45	45.6%
	Totals	123.6	210.4	503.0	713.4	5.8	1,077	39.8%
HMW-20								
051605, HVR 01	05/16/2005	6.0	5.7	15.8	21.5	3.6	1,475	1.4%
053105, HVR 02	05/31/2005	7.1	5.3	1.5	6.8	1.0	1,678	0.4%
061405, HVR 03	06/14/2005	8.4	6.0	5.4	11.3	1.3	345	3.2%
062805, HVR 04	06/28/2005	8.3	5.3	6.4	11.8	1.4	1,063	1.1%
071505, HVR 05	07/15/2005	6.7	3.0	1.0	4.0	0.6	1,109	0.4%
102605, HVR 06	10/26/2005	8.1	8.7	10.0	18.7	2.3	254	6.9%
	Totals	44.5	34.1	40.0	74.1	1.7	5,925	1.2%
HMW-44C								
051305, HVR 01	05/13/2005	8.0	15.0	179.1	194.1	24.4	28	87.3%
052705, HVR 02	05/27/2005	6.2	11.6	61.7	73.4	11.9	0	
061305, HVR 03	06/13/2005	8.3	14.9	228.1	243.0	29.1	8	96.8%
062705, HVR 04	06/27/2005	8.3	14.5	187.7	202.1	24.5	214	48.6%
071405, HVR 05	07/14/2005	8.2	14.3	142.5	156.8	19.2	121	56.4%
072505, HVR 06	07/25/2005	8.3	14.1	227.9	242.0	29.3	195	55.4%
072605, HVR 07	07/26/2005	8.2	14.3	192.8	207.1	25.4	195	51.5%
072705, HVR 08	07/27/2005	8.2	15.8	209.2	225.0	27.6	304	42.5%
072805, HVR 09	07/28/2005	8.3	15.6	212.7	228.3	27.7	339	40.2%
072905, HVR 10	07/29/2005	8.1	14.9	202.6	217.5	27.0	468	31.7%
080105, HVR 11	08/01/2005	8.3	15.6	168.5	184.1	22.3	103	64.1%
080205, HVR 12	08/02/2005	8.1	15.8	162.1	177.9	22.1	65	73.3%
080305, HVR 13	08/03/2005	8.3	15.5	184.8	200.3	24.3	75	72.9%
080405, HVR 14	08/04/2005	8.3	15.2	171.1	186.3	22.6	34	84.6%
080505, HVR 15	08/05/2005	8.2	15.4	178.4	193.7	23.8	23	89.4%
080805, HVR 16	08/08/2005	8.3	15.7	194.2	210.0	25.4	3	98.6%
110405, HVR 17	11/04/2005	8.0	14.2	118.5	132.7	16.7	158	45.6%
	Totals	137.0	252.6	3,022.0	3,274.6	23.9	2,334	58.4%
HMW-48C								
052005, HVR 01	05/20/2005	6.7	2.5	8.9	11.4	1.7	510	2.2%

Table 1
Multi-Site Daily Rate and Recovery Report

Project	Date	Hours	Vapor Recovery	Product Recovery	Hydro-Carbon Recovery	Rate of Recovery	Water Recovery	Percent Hydro-Carbon
HMW-48C								
060605, HVR 02	06/06/2005	8.3	7.0	2.0	9.0	1.1	269	3.2%
062005, HVR 03	06/20/2005	7.9	1.9	14.6	16.5	2.1	457	3.5%
070705, HVR 04	07/07/2005	8.2	2.7	29.9	32.6	4.0	594	5.2%
072105, HVR 05	07/21/2005	8.3	2.6	8.1	10.7	1.3	408	2.6%
	Totals	39.2	16.6	63.5	80.1	2.0	2,238	3.5%
MP-29D								
051105, HVR 01	05/11/2005	6.1	4.7	11.8	16.5	2.7	1,615	1.0%
052405, HVR 02	05/24/2005	6.8	6.1	29.2	35.3	5.2	1,383	2.5%
060805, HVR 03	06/08/2005	8.3	2.5	92.2	94.6	11.5	985	8.8%
062205, HVR 04	06/22/2005	8.3	3.3	8.3	11.5	1.4	1,200	1.0%
071105, HVR 05	07/11/2005	8.1	2.9	9.3	12.2	1.5	1,575	0.8%
	Totals	37.4	19.5	150.7	170.2	4.5	6,757	2.5%
MP-39C								
102405, HVR-01	10/24/2005	8.2	13.2	5.0	18.2	2.2	126	12.6%
	Totals	8.2	13.2	5.0	18.2	2.2	126	12.6%
MP-47C								
050905, HVR 01	05/09/2005	2.6	4.2	9.3	13.5	5.1	86	13.6%
051005, HVR 02	05/10/2005	7.0	11.6	16.0	27.6	3.9	722	3.7%
052505, HVR 03	05/25/2005	7.7	14.6	5.9	20.6	2.7	0	
060905, HVR 04	06/09/2005	8.3	16.4	29.7	46.1	5.6	133	25.7%
062305, HVR 05	06/23/2005	8.2	16.3	54.0	70.2	8.6	1,091	6.0%
071205, HVR 06	07/12/2005	8.3	16.6	17.9	34.5	4.1	1,274	2.6%
102505, HVR 07	10/25/2005	8.2	14.4	51.7	66.1	8.1	144	31.4%
	Totals	50.3	94.1	184.5	278.6	5.5	3,449	7.5%
MP-49C								
110305, HVR-01	11/03/2005	7.9	13.9	2.0	15.8	2.0	181	8.1%
	Totals	7.9	13.9	2.0	15.8	2.0	181	8.1%
MP-50C								
051205, HVR 01	05/12/2005	8.3	13.7	22.4	36.0	4.4	873	4.0%
052605, HVR 02	05/26/2005	8.1	12.5	24.8	37.2	4.6	1,585	2.3%
061005, HVR 03	06/10/2005	8.2	10.4	282.7	293.2	35.9	363	44.7%
062405, HVR 04	06/24/2005	4.4	5.6	6.7	12.3	2.8	572	2.1%
071305, HVR 05	07/13/2005	8.3	10.5	20.0	30.5	3.7	1,276	2.3%
082405, HVR 06	08/24/2005	7.9	13.7	2.0	15.7	2.0	1,453	1.1%
082505, HVR 07	08/25/2005	8.3	14.9	1.0	15.9	1.9	1,315	1.2%
082605, HVR 08	08/26/2005	8.1	15.0	0.0	15.0	1.9	0	
082905, HVR 09	08/29/2005	8.0	16.5	0.0	16.5	2.1	0	
	Totals	69.5	112.7	359.5	472.2	6.8	7,437	6.0%
MP-51D								
110105, HVR-01	11/01/2005	8.1	9.4	7.8	17.2	2.1	343	4.8%
	Totals	8.1	9.4	7.8	17.2	2.1	343	4.8%

Table 1
Multi-Site Daily Rate and Recovery Report

Project	Date	Hours	Vapor Recovery	Product Recovery	Hydro-Carbon Recovery	Rate of Recovery	Water Recovery	Percent Hydro-Carbon
MP-52C								
103105, HVR-01	10/31/2005	8.0	14.0	3.0	16.9	2.1	212	7.4%
	Totals	8.0	14.0	3.0	16.9	2.1	212	7.4%
MP-53C								
051705, HVR 01	05/17/2005	8.1	11.6	7.9	19.5	2.4	1,429	1.3%
060105, HVR 02	06/01/2005	8.4	16.3	56.6	73.0	8.6	395	15.6%
061605, HVR 03	06/16/2005	8.3	14.9	18.5	33.4	4.1	459	6.8%
070505, HVR 04	07/05/2005	4.5	7.3	18.2	25.5	5.7	696	3.5%
071905, HVR 05	07/19/2005	8.1	9.8	23.8	33.6	4.2	1,613	2.0%
	Totals	37.3	60.0	125.0	185.1	5.0	4,592	3.9%
MP-54C								
110205, HVR-01	11/02/2005	8.1	4.4	3.0	7.4	0.9	345	2.1%
	Totals	8.1	4.4	3.0	7.4	0.9	345	2.1%
MP-55C								
051905, HVR 01	05/19/2005	8.3	14.8	35.1	49.9	6.0	798	5.9%
060305, HVR 02	06/03/2005	8.0	15.0	62.4	77.4	9.7	287	21.2%
061705, HVR 03	06/17/2005	8.4	16.0	38.6	54.6	6.5	649	7.8%
070605, HVR 04	07/06/2005	8.3	15.1	84.3	99.4	12.0	506	16.4%
072005, HVR 05	07/20/2005	8.2	15.7	58.0	73.7	9.0	817	8.3%
102705, HVR 06	10/27/2005	8.0	14.3	24.7	39.0	4.9	117	25.0%
	Totals	49.0	90.8	303.1	393.9	8.0	3,174	11.0%
MP-56C								
051805, HVR 01	05/18/2005	5.1	1.0	2.0	3.0	0.6	1,535	0.2%
060205, HVR 02	06/02/2005	7.2	1.8	1.0	2.8	0.4	1,356	0.2%
061505, HVR 03	06/15/2005	8.4	2.0	1.0	3.0	0.4	323	0.9%
062905, HVR 04	06/29/2005	6.6	1.2	0.0	1.2	0.2	1,702	0.1%
071805, HVR 05	07/18/2005	8.2	1.9	1.0	2.9	0.4	955	0.3%
	Totals	35.4	7.9	5.0	12.9	0.4	5,871	0.2%
MP-57C								
102805, HVR-01	10/28/2005	8.0	2.3	2.0	4.3	0.5	275	1.5%
	Totals	8.0	2.3	2.0	4.3	0.5	275	1.5%
MP-79C								
101905, HVR-01	10/19/2005	8.2	13.9	16.4	30.4	3.7	195	13.5%
102005, HVR-02	10/20/2005	7.5	13.6	5.0	18.6	2.5	317	5.5%
102105, HVR-03	10/21/2005	7.0	10.7	5.0	15.7	2.2	317	4.7%
	Totals	22.7	38.3	26.4	64.7	2.9	829	7.2%
RW-4A								
083005, HVR-01	08/30/2005	7.1	6.5	30.0	36.5	5.1	1,198	3.0%
083105, HVR-02	08/31/2005	8.3	5.3	8.0	13.3	1.6	391	3.3%
090905, HVR-04	09/09/2005	0.8	0.3	0.0	0.3	0.4	0	
090905, HVR-03	09/09/2005	0.8	0.4	0.0	0.4	0.5	0	
091005, HVR-06	09/10/2005	0.9	0.3	0.0	0.3	0.3	0	
091005, HVR-08	09/10/2005	0.9	0.3	1.4	1.7	1.8	8	17.2%

Table 1
Multi-Site Daily Rate and Recovery Report

Project	Date	Hours	Vapor Recovery	Product Recovery	Hydro-Carbon Recovery	Rate of Recovery	Water Recovery	Percent Hydro-Carbon
RW-4A								
091005, HVR-07	09/10/2005	0.9	0.4	2.6	3.0	3.2	0	92.7%
091105, HVR-09	09/11/2005	0.9	0.5	1.8	2.3	2.5	76	2.9%
091205, HVR-11	09/12/2005	2.5	1.2	3.9	5.1	2.0	173	2.9%
091205, HVR-10	09/12/2005	1.0	0.6	0.9	1.5	1.5	10	13.0%
091305, HVR-12	09/13/2005	0.9	0.5	1.8	2.3	2.5	59	3.8%
0914_1705, HVR-13	09/14/2005	12.0	4.7	2.0	6.8	0.6	74	8.3%
0914_1705, HVR-13	09/15/2005	36.1	8.4	3.6	12.0	0.3	132	8.3%
0914_1705, HVR-13	09/16/2005	60.0	7.5	3.2	10.7	0.2	118	8.3%
0914_1705, HVR-13	09/17/2005	76.0	4.9	2.1	6.9	0.1	76	8.4%
092205, HVR-14	09/22/2005	14.9	11.9	9.3	21.2	1.4	4,724	0.4%
092205, HVR-14	09/23/2005	20.8	3.5	2.7	6.2	0.3	1,361	0.5%
	Totals	245.2	57.2	73.3	130.5	0.5	8,401	1.5%
RW-5								
090105, HVR-01	09/01/2005	8.2	12.9	9.5	22.4	2.7	677	3.2%
090205, HVR-02	09/02/2005	8.1	12.4	2.0	14.3	1.8	419	3.3%
092805, HVR-04	09/28/2005	1.0	1.6	0.0	1.6	1.6	0	
092805, HVR-03	09/28/2005	0.9	1.6	0.0	1.6	1.7	0	
092805, HVR-05	09/28/2005	1.0	1.6	0.0	1.6	1.6	0	
092905, HVR-07	09/29/2005	0.9	1.6	0.9	2.5	2.6	0	
092905, HVR-06	09/29/2005	0.9	1.6	0.0	1.6	1.8	0	
100105, HVR-09	10/01/2005	0.9	0.9	0.9	1.8	1.9	81	2.2%
100105, HVR-08	10/01/2005	0.9	0.8	1.8	2.6	2.8	64	3.9%
100205, HVR-10	10/02/2005	0.9	1.1	0.9	1.9	2.1	7	21.6%
100205, HVR-11	10/02/2005	2.0	3.1	1.9	5.0	2.5	130	3.7%
100305, HVR-14	10/03/2005	0.8	0.7	0.9	1.6	1.9	7	17.9%
100305, HVR-12	10/03/2005	1.0	0.8	0.9	1.7	1.6	2	47.9%
100305, HVR-13	10/03/2005	1.0	1.7	0.0	1.7	1.7	0	
100405, HVR-15	10/04/2005	1.0	0.9	1.8	2.7	2.6	4	37.8%
100505, HVR-16	10/05/2005	1.0	1.1	1.8	2.9	2.8	5	35.3%
100605, HVR-17	10/06/2005	1.0	1.3	0.9	2.2	2.1	10	17.8%
1007_0805, HVR-18	10/07/2005	4.3	4.3	1.0	5.3	1.2	3	64.9%
1007_0805, HVR-18	10/08/2005	22.5	9.3	2.0	11.4	0.5	6	64.9%
1013_1405, HVR-19	10/13/2005	13.8	21.7	13.9	35.6	2.6	7,554	0.5%
1013_1405, HVR-19	10/14/2005	29.7	24.5	15.6	40.1	1.4	8,479	0.5%
	Totals	102.2	105.6	56.7	162.4	1.6	17,449	0.9%
	Grand Totals	**1,041.3**	**1,157.1**	**4,935.5**	**6,092.6**	**5.9**	**71,013**	**7.9%**

TABLE 2

HVR EXTRACTION EVENT SUMMARY DATA

HVR Events from May through November 2005

H_2A Environmental, Ltd.

The Hartford Area Hydrocarbon Plume Site
The Hartford Working Group

Well	MP-56C	MP-57C	MP-54C	RW-4A	HMW-20	RW-5	MP-49C	HMW-48C	MP-52C	MP-51D	MP-39C	MP-79C	MP-29D	MP-53C	MP-47C	HMW-19	MP-50C	MP-55C	HMW-44C	Non-RW Totals/Avgs
Total LNAPL	5	2	3	73.3	40	56.7	2	63.5	3	7.8	5	26.4	150.7	125	184.5	503	359.5	303.1	2903.5	4817
Total Vapor	7.9	2.3	4.4	57.2	34.1	105.6	13.9	16.6	14	9.4	13.2	38.3	19.5	60	94.1	210.4	112.7	90.8	238.4	1142.8
Total HC	12.9	4.3	7.4	130.5	74.1	162.4	15.8	80.1	16.9	17.2	18.2	64.7	170.2	185.1	278.6	713.4	472.2	393.9	3141.9	5959.8
Total Water	5871	275	345	8401	5925	17449	181	2238	212	343	126	829	6757	4592	3449	1077	7437	3174	2175	70856
Avg HC Recovery Rate (gal per hour)	0.4	0.5	0.9	1.0	1.7	1.9	2.0	2.0	2.1	2.1	2.2	2.9	4.6	5.0	5.5	5.8	6.8	8.0	24.4	6.6
Max HC Recovery Rate (gal per hour)	0.6	0.5	0.9	5.1	3.6	2.8	2	4	2.1	2.1	2.2	3.7	11.5	8.6	8.1	9.4	35.9	12	29.3	7.6
Min HC Recovery Rate (gal per hour)	0.2	0.5	0.9	0.3	0.6	0.5	2	1.1	2.1	2.1	2.2	2.2	1.4	2.4	2.7	2.1	1.9	4.9	11.9	2.2
Total HC as % of Water	0%	2%	2%	2%	1%	1%	9%	4%	8%	5%	14%	8%	3%	4%	8%	66%	6%	12%	144%	8%
Average LNAPL Rate (gal per hour)	0.1	0.3	0.4	0.5	0.9	0.7	0.3	1.6	0.4	1.0	0.6	1.2	4.0	3.4	3.7	4.1	5.2	6.2	22.5	5.3
Average LNAPL Rate (calculated gal per 24 hour Day)	3.4	6.0	8.9	12.8	21.6	16.2	6.1	38.9	9.0	23.1	14.6	27.9	96.7	80.4	88.0	97.7	124.1	148.5	540.2	127.4
Max Daily LNAPL	2	2	3	30	15.8	15.6	2	29.9	3	7.8	5	16.4	92.2	56.6	54	62	282.7	84.3	228.1	992.4
Min Daily LNAPL	0	2	3	0	1	0	2	2	3	7.8	5	5	8.3	7.9	5.9	5.9	0	24.7	61.7	145.2
Average Vapor Rate (gal per hour)	0.2	0.3	0.5	0.4	0.8	1.3	1.8	0.4	1.8	1.2	1.6	1.7	0.5	1.6	1.9	1.7	1.6	1.9	1.8	1.3
Max Daily Vapor	2	2.3	4.4	11.9	8.7	24.5	13.9	7	14	9.4	13.2	13.9	6.1	16.3	16.6	16.1	16.5	16	15.8	228.6
Min Daily Vapor	1	2.3	4.4	0.3	3	0.7	13.9	1.9	14	9.4	13.2	10.7	2.5	7.3	4.2	5.9	5.6	14.3	11.6	126.2
Average Water Rate (gal per hour)	165.8	34.4	42.6	61.3	133.1	207.5	22.9	57.1	26.5	42.3	15.4	36.5	180.7	123.1	68.6	8.7	107.0	64.8	16.9	78.1
Max Daily Water	1702	275	345	6085	1678	8479	181	594	212	343	126	317	1615	1613	1274	262	1585	798	468	27952
Min Daily Water	323	275	345	0	254	0	181	269	212	343	126	195	985	395	0	4	0	117	0	4024
LNAPL Removal Category (Low, Mod, High, V High)	Low	Low	Low	Low	Mod	Low	Low	Mod	Low	Mod	Low	Mod	High	High	High	High	High	High	V High	High
Total HC Removal Category (Low, Mod, High, V High)	Low	Low	Low	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	High	High	High	High	High	High	V High	High
Primary Removal Phase during HVR	Vapor	Vapor	Vapor	LNAPL	LNAPL	Vapor	Vapor	LNAPL	Vapor	Vapor	Vapor	Vapor	LNAPL	LNAPL	LNAPL	LNAPL	LNAPL	LNAPL	LNAPL	LNAPL

ATTACHMENT 1

Daily HVR Event Summary Reports

H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-19 Date: 5/23/05 Day: Monday Sys/Type: 186B ICE

	Gallon Equivelants Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.00	18	52	16.1	68.1

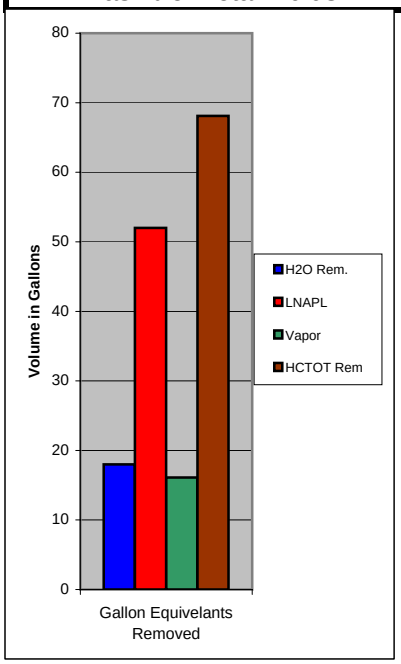
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

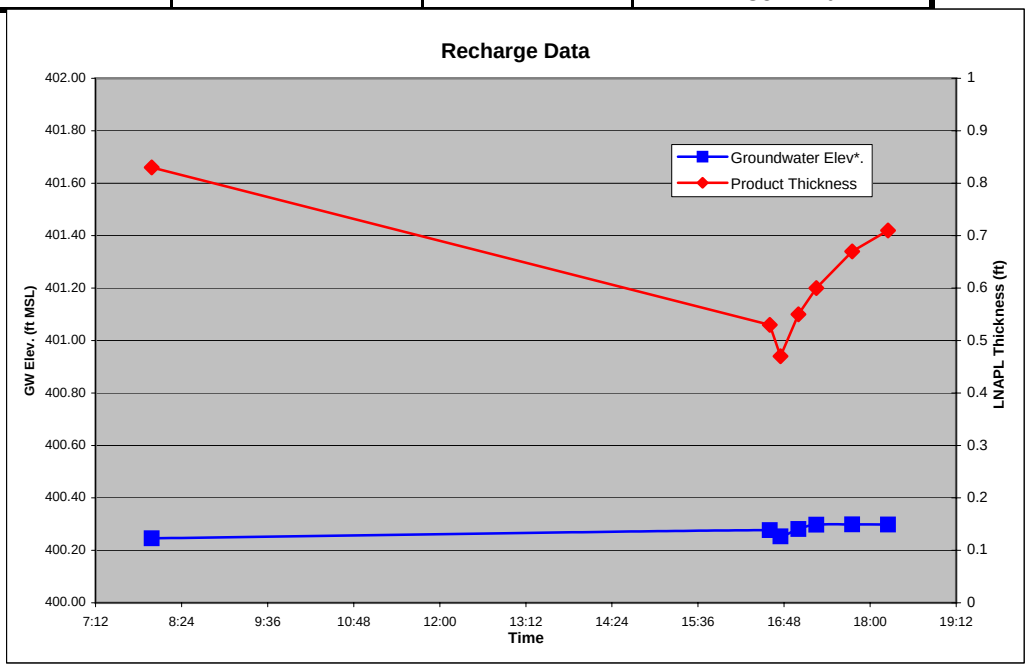
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:59	8:30	12:30	16:31	16:36	16:45	17:00	17:15	17:45	18:15
TOC Elevation	431.8				431.80	431.8	431.8	431.8	431.8	431.8
$DTScreen_{TOC}$		--	--	--	0	0	0	0	0	0
DTP_{TOC}	31.33	--	--	--	31.38	31.42	31.37	31.34	31.32	31.31
DTW_{TOC}	32.16	--	--	--	31.91	31.89	31.92	31.94	31.99	32.02
Product Thickness	0.83	--	--	--	0.53	0.47	0.55	0.6	0.67	0.71
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	400.25				400.28	400.25	400.28	400.3	400.3	400.3
$Stinger\ Depth_{TOC}$	31.81	31.88	31.81	31.81						
$Stinger\ Immersion_{DTP}$	0.48									
Stinger Immersion as %**	57.8%									
$Stinger\ Depth_{CGW}$	0.26									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.54	20.12	20.52
Stinger Vac (in Hg)	17.4	1.58	6.43
Well Flow in scfm	19	10	15.18
Well Casing Vac (in Hg)	1.26	0.1	
Average Hrly HC_{TOT} Rec (gal)			8.51
Hrly LNAPL Rec (gal)			6.50
Hrly Vapor Rec (gal)			2.01
Hrly H2O Rec (gal)			2
LNAPL as % of Total Fluids			189.17%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-19 Date: Tuesday, June 07, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
7.88	4	21	15.1	36.1

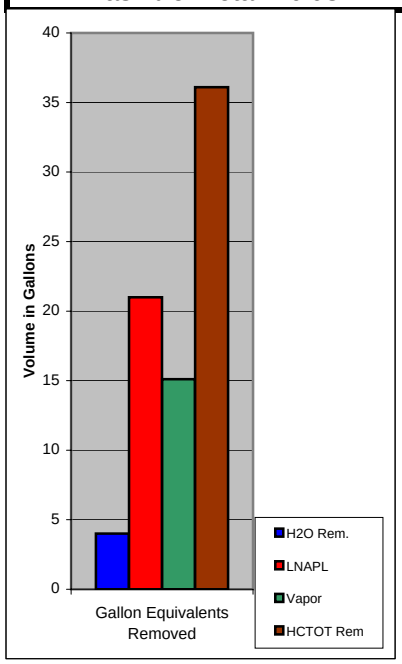
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

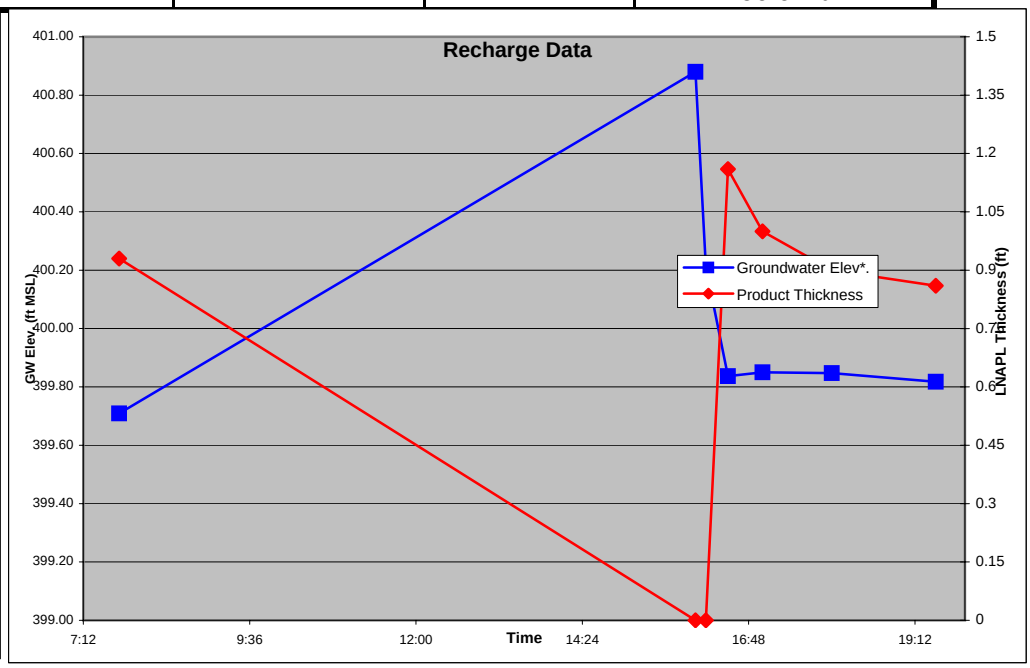
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:43	8:07	10:39	16:00	16:02	16:11	16:30	17:00	18:00	19:30
TOC Elevation	431.8				431.80	431.8	431.8	431.8	431.8	431.8
$DTScreen_{TOC}$		--	--	--	0	0	0	0	0	0
DTP_{TOC}	31.84	--	--	--			31.65	31.68	31.71	31.75
DTW_{TOC}	32.77	--	--	--	30.92	31.59	32.81	32.68	32.61	32.61
Product Thickness	0.93	--	--	--	0	0	1.16	1	0.9	0.86
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	399.71				400.88	400.21	399.84	399.85	399.85	399.82
Stinger $Depth_{TOC}$	32.34	32.34	32.84	31.84						
Stinger Tip Elevation	399.46	399.46	398.96	399.96						
Stinger $Immersion_{DTP}$	0.5	0.5	1	0						
Stinger Immersion as %**	53.8%	53.8%	107.5%	0.0%						
Stinger $Depth_{CGW}$	0.25									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.23	19.64	20.23
Stinger Vac (in Hg)	17.24	0.79	4.71
Well Flow in scfm	33	9	14
Well Casing Vac (in Hg)	2.18	0.9	
Average Hrly HC_{TOT} Rec (gal)			4.58
Hrly LNAPL Rec (gal)			2.66
Hrly Vapor Rec (gal)			1.92
Hrly H2O Rec (gal)			1
LNAPL as % of Total Fluids			90.02%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-19 Date: Tuesday, June 21, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
7.95	53.21	49.85	16.1	65.95

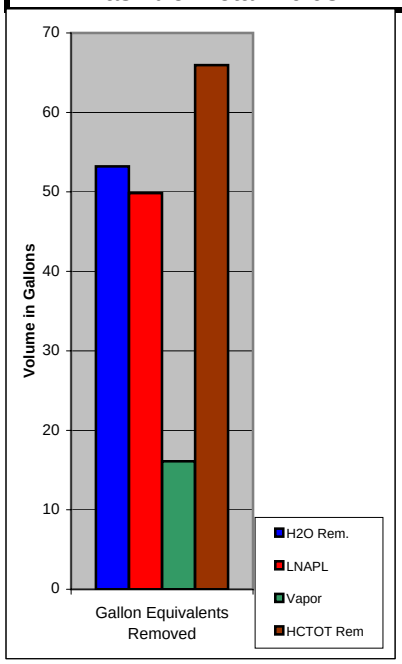
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

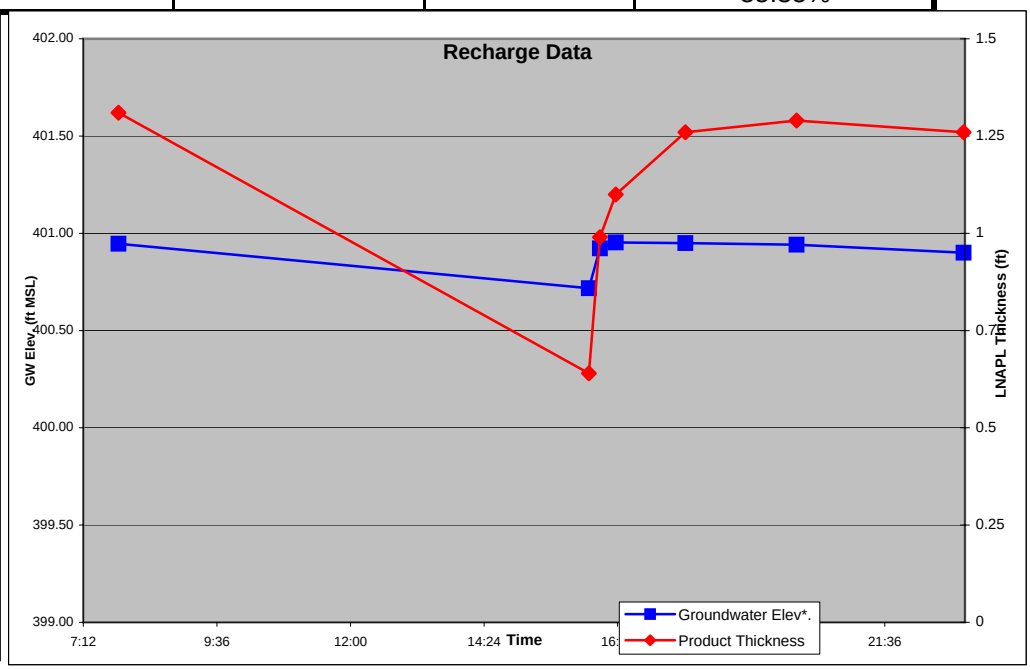
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:50	8:16	10:34	16:13	16:17	16:29	16:46	18:01	20:01	23:01
TOC Elevation	431.8				431.80	431.8	431.8	431.8	431.8	431.8
$DTScreen_{TOC}$	31.83	--	--	--	31.83	31.83	31.83	31.83	31.83	31.83
DTP_{TOC}	30.5	--	--	--	30.91	30.61	30.55	30.51	30.51	30.56
DTW_{TOC}	31.81	--	--	--	31.55	31.6	31.65	31.77	31.8	31.82
Product Thickness	1.31	--	--	--	0.64	0.99	1.1	1.26	1.29	1.26
Fluid Above Screen (Y/N)	Y	--	--	--	Y	Y	Y	Y	Y	Y
Groundwater Elev*.	400.95				400.72	400.92	400.95	400.95	400.94	400.9
Stinger $Depth_{TOC}$	31.03	31.03	31.78	31.78						
Stinger Tip Elevation	400.77	400.77	400.02	400.02						
Stinger $Immersion_{DTP}$	0.53	0.53	1.28	1.28						
Stinger Immersion as %**	40.5%	40.5%	97.7%	97.7%						
Stinger $Depth_{CGW}$	0.18									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.54	20.12	20.53
Stinger Vac (in Hg)	17.56	1.9	7.22
Well Flow in scfm	17	12	14.5
Well Casing Vac (in Hg)	1.16	0.73	
Average Hrly HC_{TOT} Rec (gal)			8.30
Hrly LNAPL Rec (gal)			6.27
Hrly Vapor Rec (gal)			2.03
Hrly H2O Rec (gal)			7
LNAPL as % of Total Fluids			55.35%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-19 Date: Friday, July 08, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
7.95	264.9	48.3	15.2	63.5

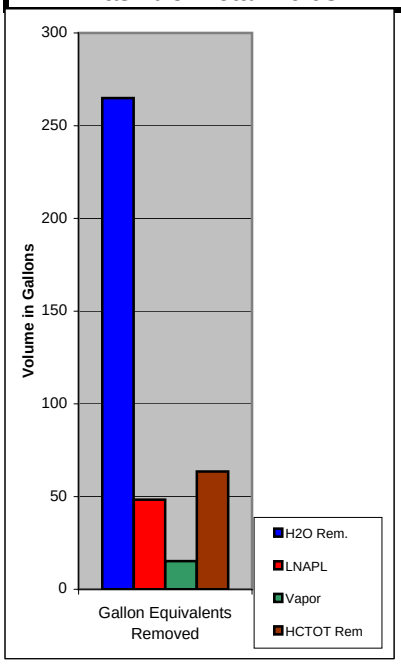
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

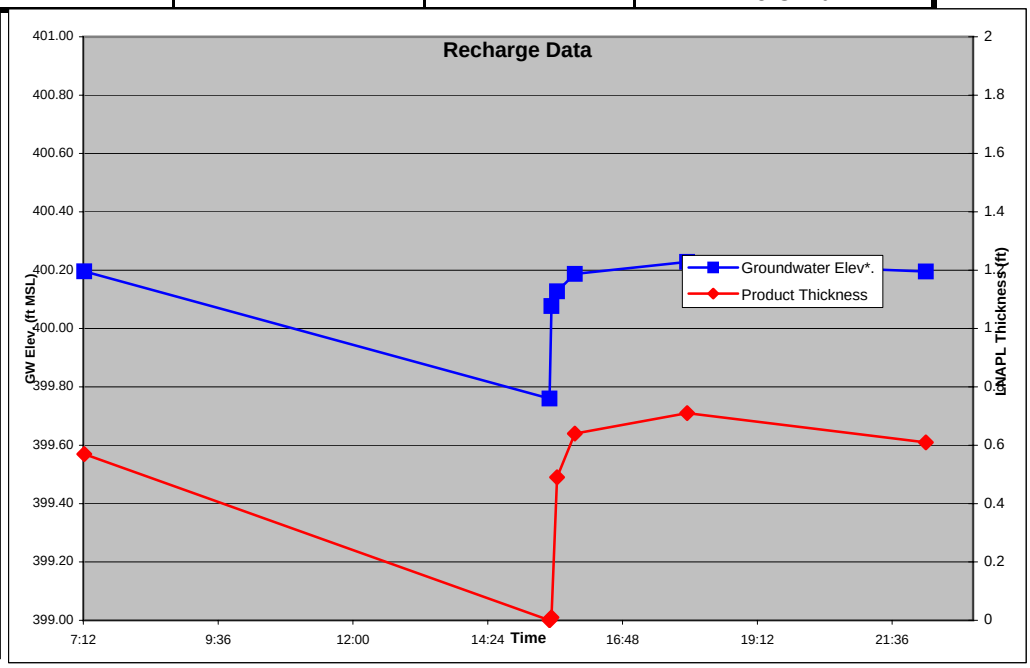
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:13	7:32	7:43	15:29	15:30	15:32	15:38	15:57	17:57	22:12
TOC Elevation	431.8				431.80	431.8	431.8	431.8	431.8	431.8
$DTScreen_{TOC}$		--	--	--	0	0	0	0	0	0
DTP_{TOC}	31.45	--	--	--		31.72	31.54	31.44	31.38	31.44
DTW_{TOC}	32.02	--	--	--	32.04	31.73	32.03	32.08	32.09	32.05
Product Thickness	0.57	--	--	--	0	0.01	0.49	0.64	0.71	0.61
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	400.20				399.76	400.08	400.13	400.19	400.23	400.2
Stinger $Depth_{TOC}$	31.7	31.7	32.05	31.7						
Stinger Tip Elevation	400.1	400.1	399.75	400.1						
Stinger $Immersion_{DTP}$	0.25	0.25	0.6	0.25						
Stinger Immersion as %**	43.9%	43.9%	105.3%	43.9%						
Stinger $Depth_{CGW}$	0.10									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.86	20.28	20.79
Stinger Vac (in Hg)	18.82	6.8	7.85
Well Flow in scfm	14	3	5.51
Well Casing Vac (in Hg)	0.43	0.24	
Average Hrly HC_{TOT} Rec (gal)			7.99
Hrly LNAPL Rec (gal)			6.08
Hrly Vapor Rec (gal)			1.91
Hrly H_2O Rec (gal)			33
LNAPL as % of Total Fluids			19.34%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-19 Date: Friday, July 22, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.18	260.4	28.8	16	44.8

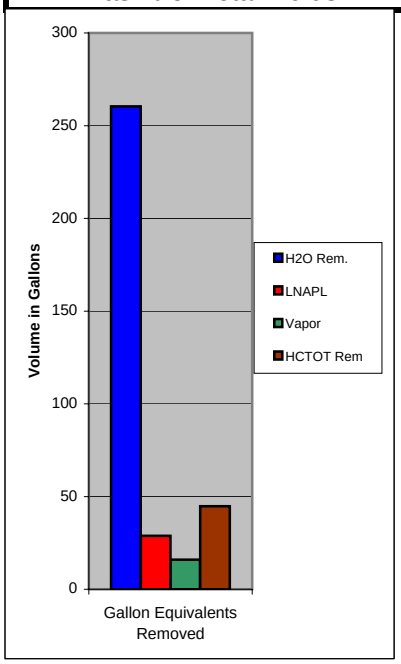
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

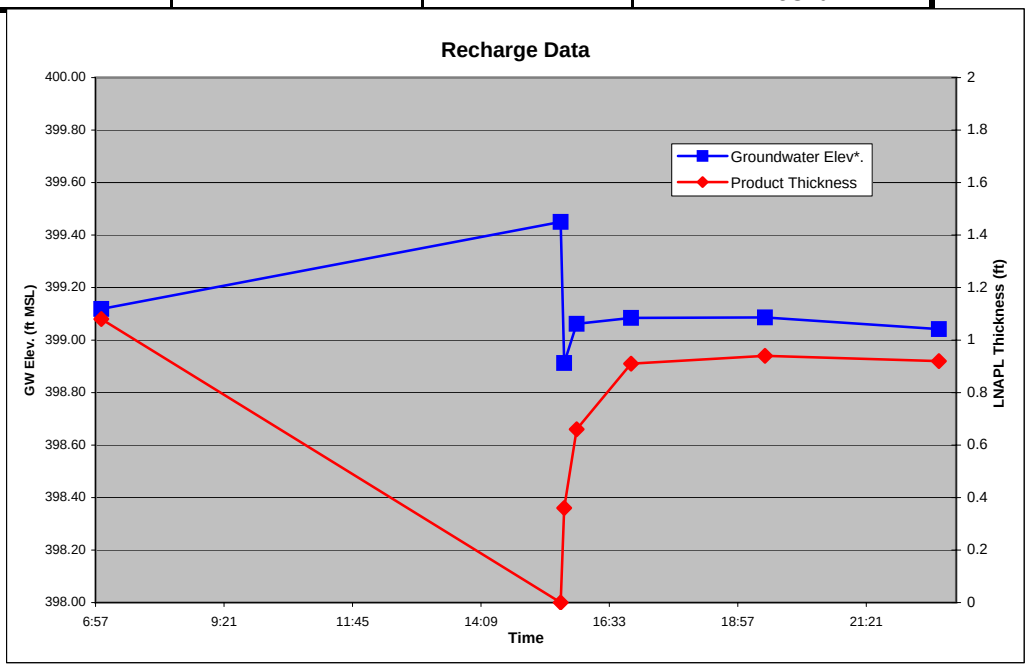
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:04	7:26	7:45	15:37	15:39	15:43	15:57	16:58	19:28	22:43
TOC Elevation	431.8				431.80	431.8	431.8	431.8	431.8	431.8
$DTScreen_{TOC}$		--	--	--	0	0	0	0	0	0
DTP_{TOC}	32.39	--	--	--		32.79	32.56	32.47	32.46	32.51
DTW_{TOC}	33.47	--	--	--	32.35	33.15	33.22	33.38	33.4	33.43
Product Thickness	1.08	--	--	--	0	0.36	0.66	0.91	0.94	0.92
Fluid Above Screen (Y/N)		--	--	--						
Groundwater Elev*.	399.12				399.45	398.91	399.06	399.08	399.09	399.04
Stinger $Depth_{TOC}$	32.79	32.79	33.04	33.29						
Stinger Tip Elevation	399.01	399.01	398.76	398.51						
Stinger $Immersion_{DTP}$	0.4	0.4	0.65	0.9						
Stinger Immersion as %**	37.0%	37.0%	60.2%	83.3%						
Stinger $Depth_{CGW}$	0.11									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.38	20.12	20.41
Stinger Vac (in Hg)	18.03	6.33	8.23
Well Flow in scfm	14	2	3.09
Well Casing Vac (in Hg)	0.72	0.2	
Average Hrly HC_{TOT} Rec (gal)			5.47
Hrly LNAPL Rec (gal)			3.52
Hrly Vapor Rec (gal)			1.96
Hrly H2O Rec (gal)			32
LNAPL as % of Total Fluids			14.68%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-19 Date: Tuesday, August 09, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.00	4.5	19	15.7	34.7

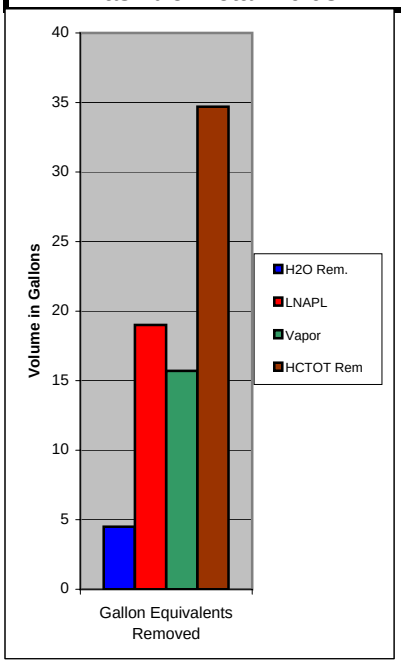
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

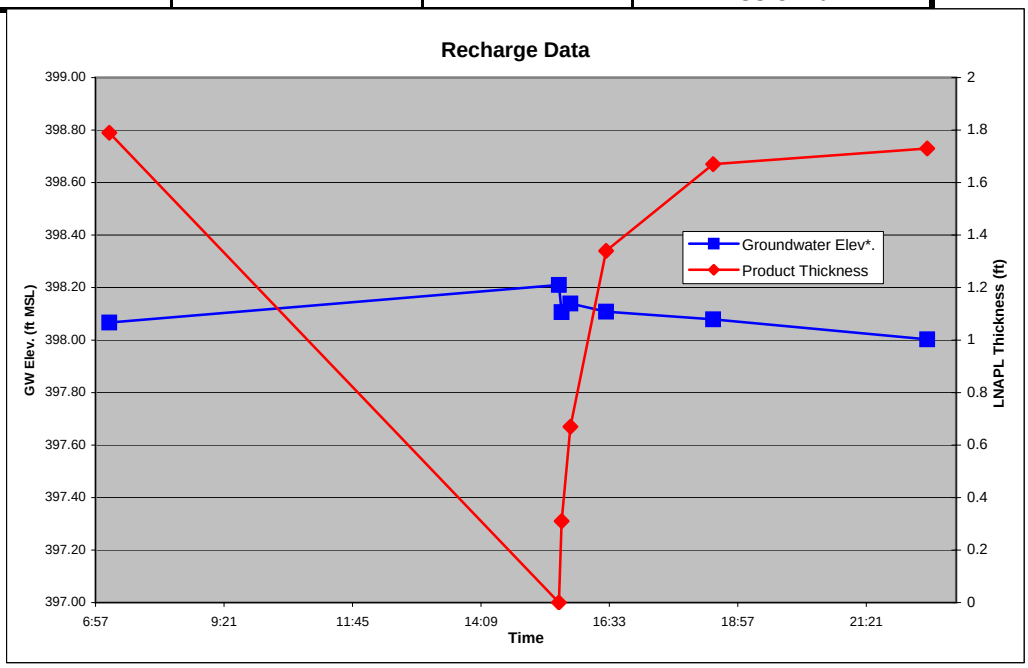
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:13	7:36	12:24	15:36	15:37	15:40	15:50	16:30	18:30	22:30
TOC Elevation	431.8				431.80	431.8	431.8	431.8	431.8	431.8
$DTScreen_{TOC}$	26.51	--	--	--	26.51	26.51	26.51	26.51	26.51	26.51
DTP_{TOC}	33.25	--	--	--		33.61	33.48	33.33	33.27	33.33
DTW_{TOC}	35.04	--	--	--	33.59	33.92	34.15	34.67	34.94	35.06
Product Thickness	1.79	--	--	--	0	0.31	0.67	1.34	1.67	1.73
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	398.07				398.21	398.11	398.14	398.11	398.08	398
$Stinger\ Depth_{TOC}$	33.73	33.73	34.03	34.83						
Stinger Tip Elevation	398.07	398.07	397.77	396.97						
$Stinger\ Immersion_{DTP}$	0.48	0.48	0.78	1.58						
Stinger Immersion as %**	26.8%	26.8%	43.6%	88.3%						
$Stinger\ Depth_{CGW}$	0.00									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.54	19.64	20.17
Stinger Vac (in Hg)	12.65	0.63	5.93
Well Flow in scfm	13	2	3.95
Well Casing Vac (in Hg)	0.76	0.18	
Average Hrly HC_{TOT} Rec (gal)			4.34
Hrly LNAPL Rec (gal)			2.38
Hrly Vapor Rec (gal)			1.96
Hrly H_2O Rec (gal)			1
LNAPL as % of Total Fluids			88.52%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-19 Date: Wednesday, August 10, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.40	15	19	15.4	34.4

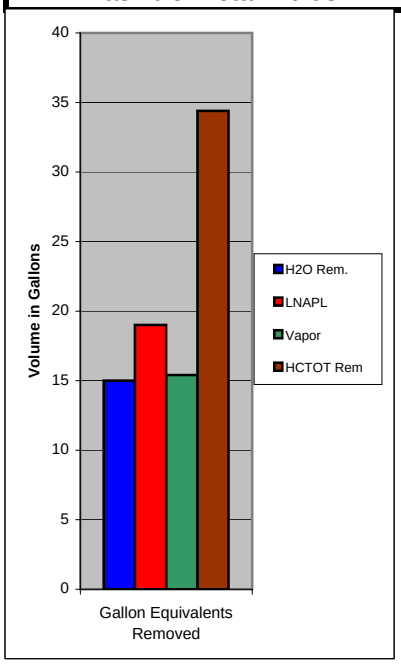
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

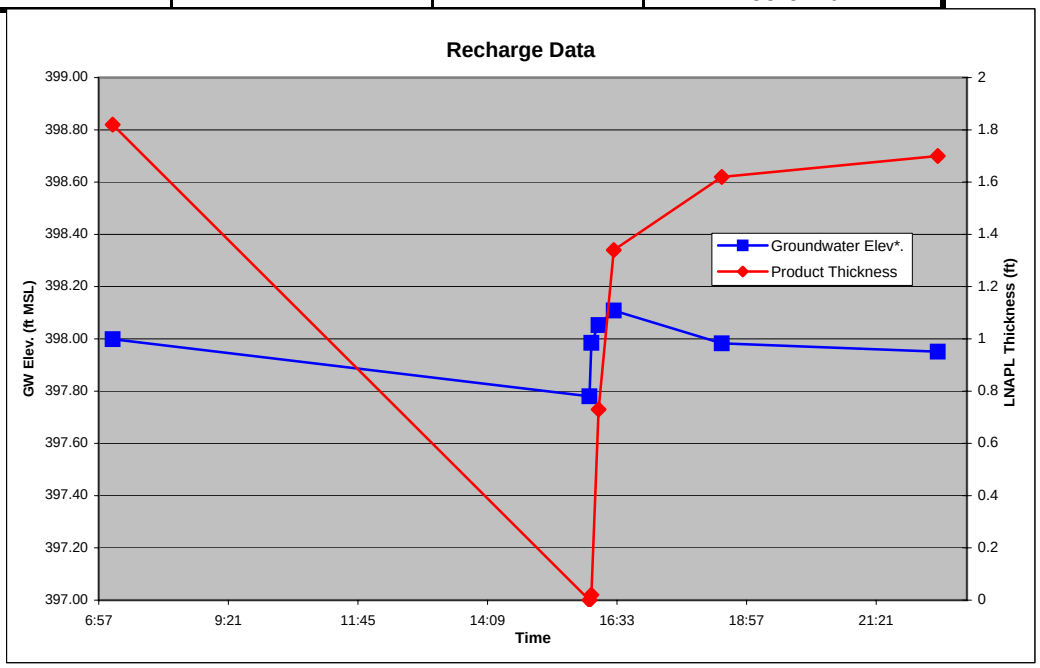
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:13	7:38	8:37	16:02	16:03	16:05	16:13	16:30	18:30	22:30
TOC Elevation	431.8				431.80	431.8	431.8	431.8	431.8	431.8
$DTScreen_{TOC}$	26.51	--	--	--	26.51	26.51	26.51	26.51	26.51	26.51
DTP_{TOC}	33.31	--	--	--		33.81	33.55	33.33	33.38	33.39
DTW_{TOC}	35.13	--	--	--	34.02	33.83	34.28	34.67	35	35.09
Product Thickness	1.82	--	--	--	0	0.02	0.73	1.34	1.62	1.7
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	398.00				397.78	397.98	398.05	398.11	397.98	397.95
Stinger $Depth_{TOC}$	34.34	34.34	35.09	37.34						
Stinger Tip Elevation	397.46	397.46	396.71	394.46					33.43	
Stinger $Immersion_{DTP}$	1.03	1.03	1.78	4.03					34.54	
Stinger Immersion as %**	56.6%	56.6%	97.8%	221.4%						
Stinger $Depth_{CGW}$	0.54									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.54	18.69	20.06
Stinger Vac (in Hg)	13.6	0.63	4.08
Well Flow in scfm	26	2	6.67
Well Casing Vac (in Hg)	1.19	0.12	
Average Hrly HC_{TOT} Rec (gal)			4.10
Hrly LNAPL Rec (gal)			2.26
Hrly Vapor Rec (gal)			1.83
Hrly H_2O Rec (gal)			2
LNAPL as % of Total Fluids			69.64%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-19 Date: Thursday, August 11, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.00	87.26	62.74	15.8	78.54

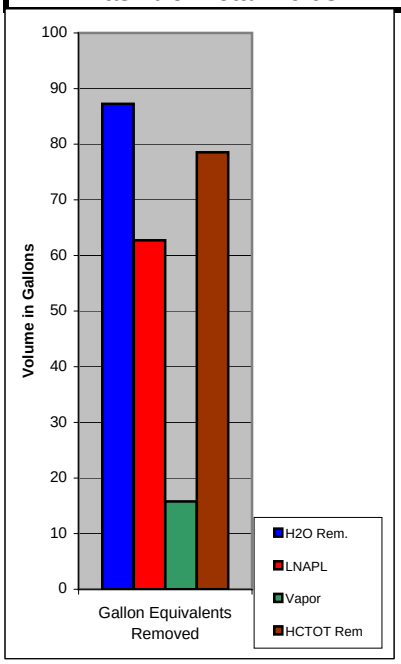
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

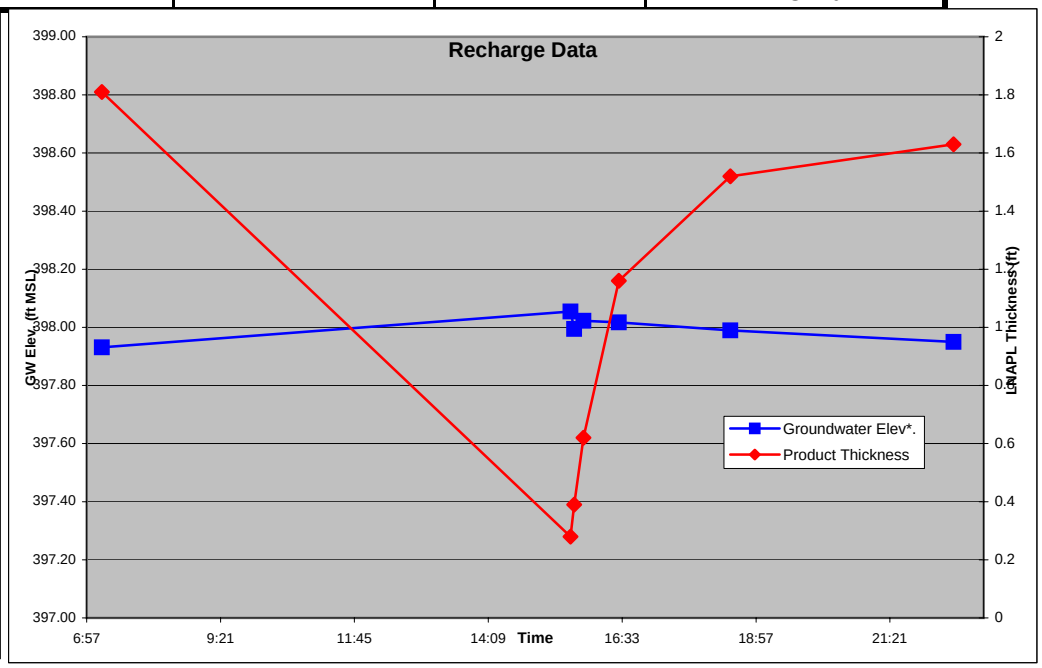
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:14	7:37	8:02	15:37	15:38	15:42	15:52	16:30	18:30	22:30
TOC Elevation	431.8				431.80	431.8	431.8	431.8	431.8	431.8
$DTScreen_{TOC}$	26.51	--	--	--	26.51	26.51	26.51	26.51	26.51	26.51
DTP_{TOC}	33.38	--	--	--	33.67	33.7	33.61	33.47	33.4	33.41
DTW_{TOC}	35.19	--	--	--	33.95	34.09	34.23	34.63	34.92	35.04
Product Thickness	1.81	--	--	--	0.28	0.39	0.62	1.16	1.52	1.63
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	397.93				398.05	397.99	398.02	398.02	397.99	397.95
Stinger $Depth_{TOC}$	36.83	36.83	35.33	34.83						
Stinger Tip Elevation	394.97	394.97	396.47	396.97						
Stinger $Immersion_{DTP}$	3.45	3.45	1.95	1.45						
Stinger Immersion as %**	190.6%	190.6%	107.7%	80.1%						
Stinger $Depth_{CGW}$	2.96									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.7	19.64	20.16
Stinger Vac (in Hg)	16.77	3.64	7.67
Well Flow in scfm	6	2	2.76
Well Casing Vac (in Hg)	0.61	0.43	
Average Hrly HC_{TOT} Rec (gal)			9.82
Hrly LNAPL Rec (gal)			7.84
Hrly Vapor Rec (gal)			1.98
Hrly H_2O Rec (gal)			11
LNAPL as % of Total Fluids			47.37%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-19 Date: Friday, August 12, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.03	67.80	48.21	15.8	64.01

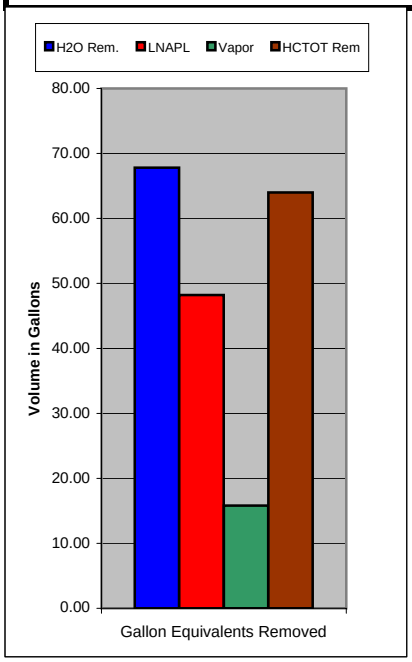
LNAPL Type	G_s
Gasoline	0.7415

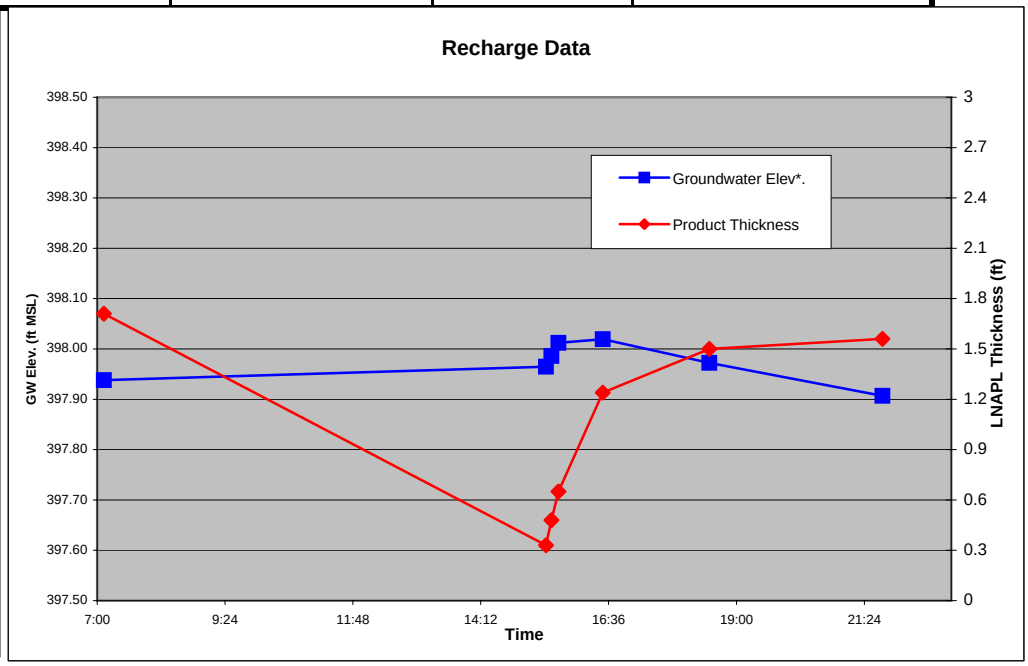
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:08	7:25	11:57	15:27	15:26	15:32	15:40	16:30	18:30	21:45
TOC Elevation	431.80				431.80	431.80	431.80	431.80	431.80	431.80
$DTScreen_{TOC}$	26.51	--	--	--	26.51	26.51	26.51	26.51	26.51	26.51
DTP_{TOC}	33.42	--	--	--	33.75	33.69	33.62	33.46	33.44	33.49
DTW_{TOC}	35.13	--	--	--	34.08	34.17	34.27	34.7	34.94	35.05
Product Thickness	1.71	--	--	--	0.33	0.48	0.65	1.24	1.5	1.56
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	397.94				397.96	397.99	398.01	398.02	397.97	397.91
Stinger $Depth_{TOC}$	34.03	34.03	34.53	34.53						
Stinger Tip Elevation	397.77	397.77	397.27	397.27						
Stinger $Immersion_{DTP}$	0.61	0.61	1.11	1.11						
Stinger Immersion as %**	35.7%	35.7%	64.9%	64.9%						
Stinger $Depth_{CGW}$	0.17									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.54	19.8	20.34
Stinger Vac (in Hg)	9.02	1.27	6.11
Well Flow in scfm	14	2	6.45
Well Casing Vac (in Hg)	0.43	0.15	
Average Hrly HC_{TOT} Rec (gal)			7.97
Hrly LNAPL Rec (gal)			6.00
Hrly Vapor Rec (gal)			1.97
Hrly H2O Rec (gal)			8.44
LNAPL as % of Total Fluids			48.6%





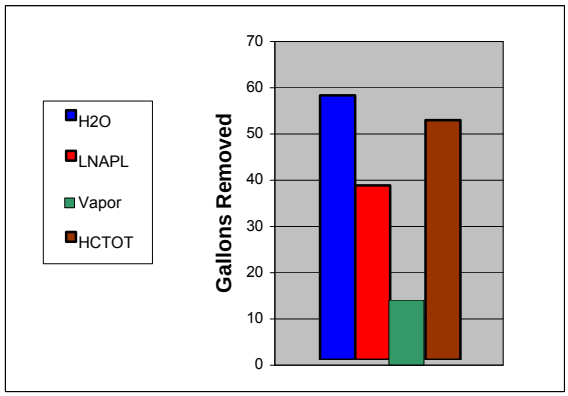
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-19 Date: Tuesday, August 16, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
8.00	57.20	37.73	14.1	51.83

LNAPL Type	G_s
Gasoline	0.7415



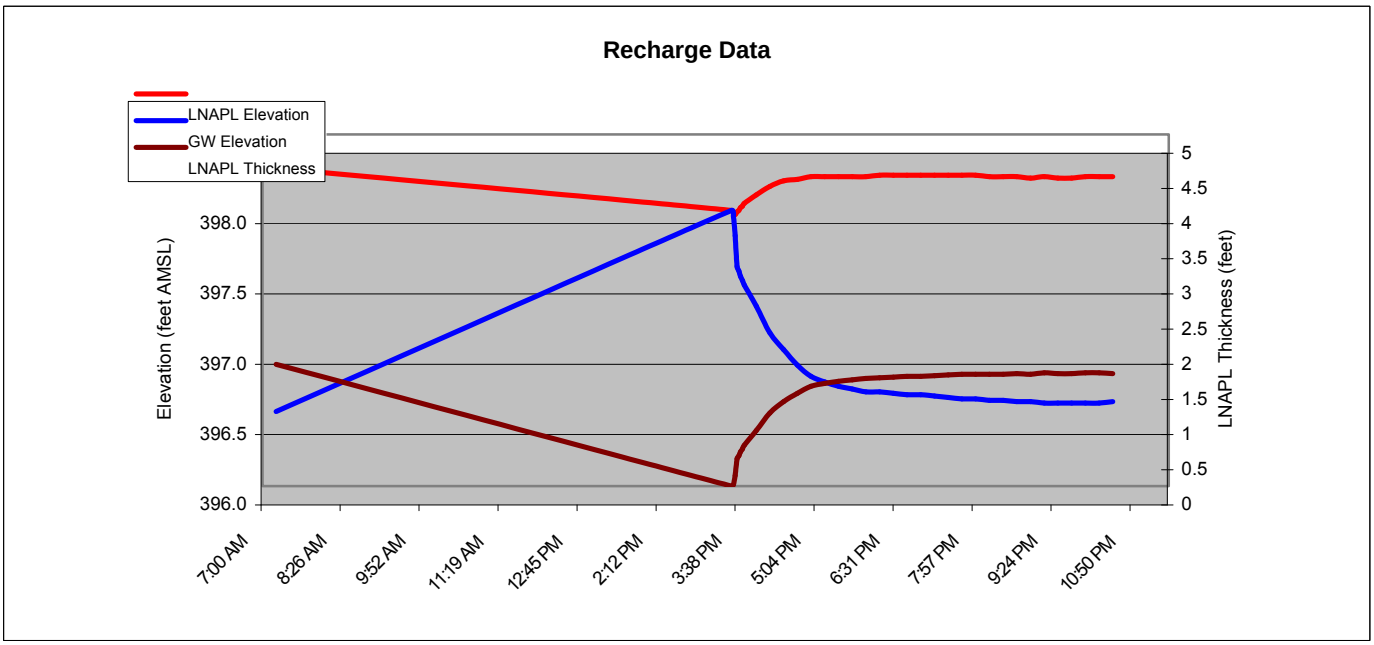
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	21.70	20.28	20.96
Stinger Vac (in Hg)	8.54	1.42	5.70
Well Flow in scfm	15	2	9.44
Well Casing Vac (in Hg)	0.44	0.08	0.24
Average Hrly HC_{TOT} Rec (gal)			6.48
Hrly LNAPL Rec (gal)			4.72
Hrly Vapor Rec (gal)			1.76
Hrly H_2O Rec (gal)			7.15
LNAPL as % of Total Fluids			47.5%

Gauging (ft)	Pre-Test	Start			Operating			End
Time (24 hour clock)	7:15	7:30	9:05	10:14	11:34	13:04	14:29	15:30
TOC Elevation	431.80							
$DTScreen_{TOC}$	26.51	--	--	--	--	--	--	--
DTP_{TOC}	33.54	--	--	--	--	--	--	--
DTW_{TOC}	35.27	--	--	--	--	--	--	--
Product Thickness	1.73	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)	N	--	--	--	--	--	--	--
Groundwater Elev*.	397.81							
Stinger $Depth_{TOC}$	34.16	34.16	34.16	34.41	34.66	34.66	34.66	34.41
Stinger Tip Elevation	397.64	397.64	397.64	397.39	397.14	397.14	397.14	397.39
Stinger $Immersion_{DTP}$	0.62	0.62	0.62	0.87	1.12	1.12	1.12	0.87
Stinger Immersion as %**	35.8%	35.8%	35.8%	50.3%	64.7%	64.7%	64.7%	50.3%
Stinger $Depth_{CGW}$	0.17							

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



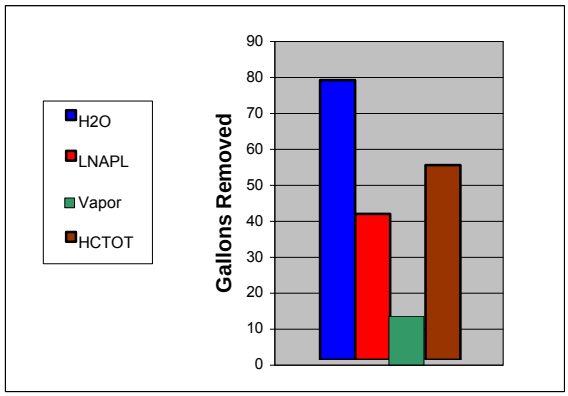
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-19 Date: Wednesday, August 17, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
8.07	77.76	40.56	13.6	54.16

LNAPL Type	G_s
Gasoline	0.7415



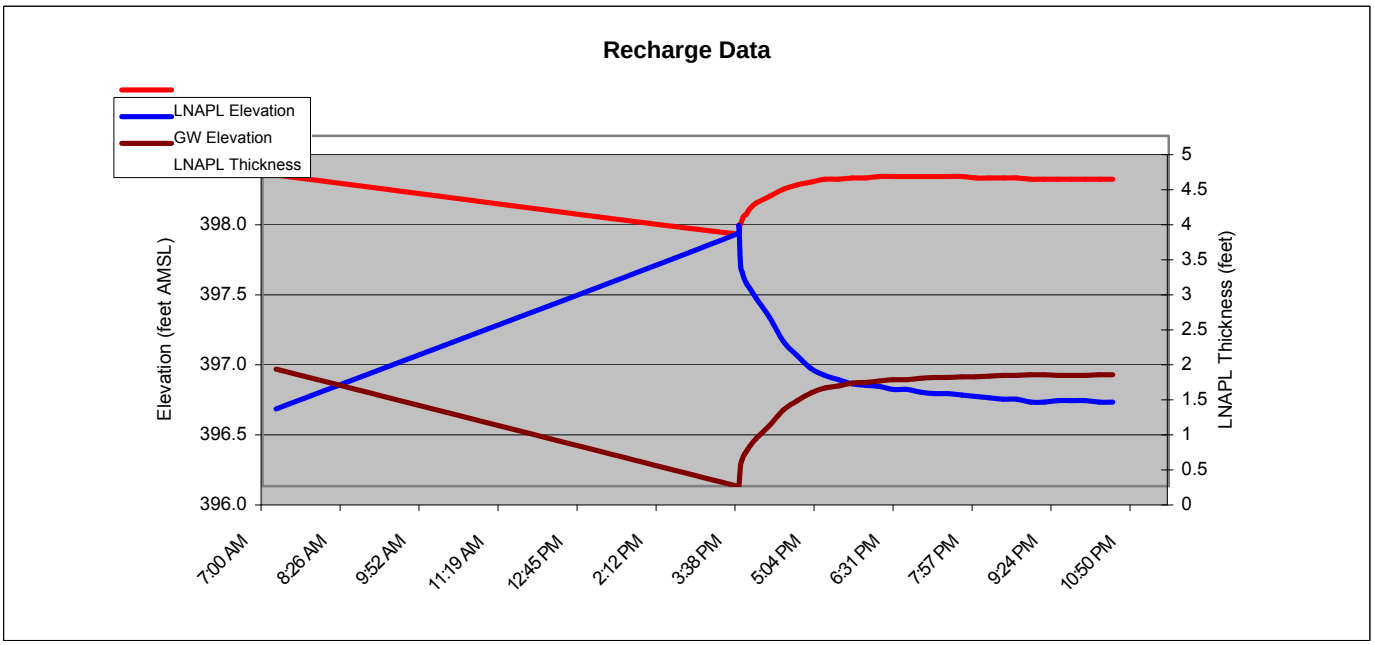
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	21.86	20.28	20.68
Stinger Vac (in Hg)	18.66	0.47	6.61
Well Flow in scfm	12	4	7.44
Well Casing Vac (in Hg)	0.36	0.14	0.25
Average Hrly HC_{TOT} Rec (gal)			6.71
Hrly LNAPL Rec (gal)			5.03
Hrly Vapor Rec (gal)			1.69
Hrly H_2O Rec (gal)			9.64
LNAPL as % of Total Fluids			41.1%

Gauging (ft)	Pre-Test	Start			Operating			End
Time (24 hour clock)	7:15	7:34	8:59	10:29	11:34	13:04	14:03	15:38
TOC Elevation	431.80							
$DTScreen_{TOC}$	26.51	--	--	--	--	--	--	--
DTP_{TOC}	33.58	--	--	--	--	--	--	--
DTW_{TOC}	35.25	--	--	--	--	--	--	--
Product Thickness	1.67	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)	N	--	--	--	--	--	--	--
Groundwater Elev*.	397.79							
Stinger $Depth_{TOC}$	34.16	34.16	34.41	34.41	34.16	34.16	34.41	34.41
Stinger Tip Elevation	397.64	397.64	397.39	397.39	397.64	397.64	397.39	397.39
Stinger $Immersion_{DTP}$	0.58	0.58	0.83	0.83	0.58	0.58	0.83	0.83
Stinger Immersion as %**	34.7%	34.7%	49.7%	49.7%	34.7%	34.7%	49.7%	49.7%
Stinger $Depth_{CGW}$	0.15							

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



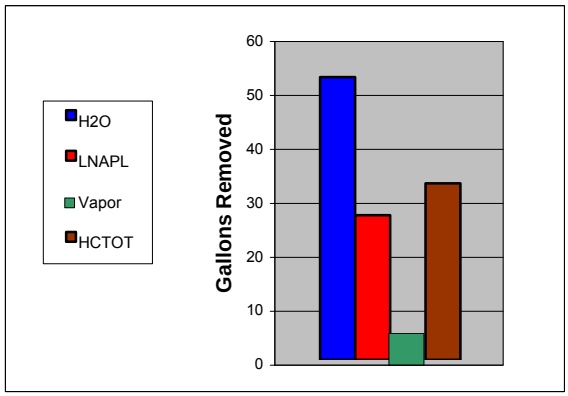
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-19 Date: Thursday, August 18, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
7.98	52.40	26.82	5.9	32.72

LNAPL Type	G_s
Gasoline	0.7415



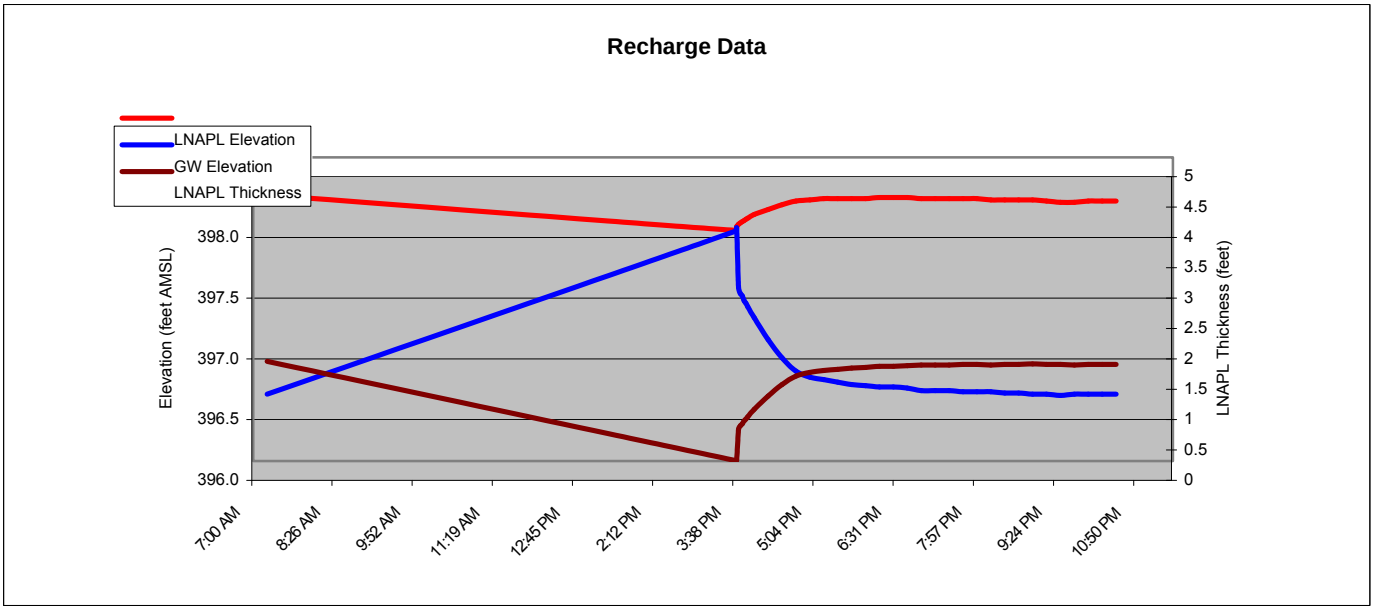
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	21.07	19.48	20.40
Stinger Vac (in Hg)	11.55	0.32	6.28
Well Flow in scfm	32	2	3.43
Well Casing Vac (in Hg)	0.39	0.01	0.09
Average Hrly HC_{TOT} Rec (gal)			4.10
Hrly LNAPL Rec (gal)			3.36
Hrly Vapor Rec (gal)			0.74
Hrly H_2O Rec (gal)			6.56
LNAPL as % of Total Fluids			38.4%

Gauging (ft)	Pre-Test	Start			Operating			End
Time (24 hour clock)	7:15	7:34	8:34	9:27	11:02	13:02	14:31	15:33
TOC Elevation	431.80							
$DTScreen_{TOC}$	26.51	--	--	--	--	--	--	--
DTP_{TOC}	33.61	--	--	--	--	--	--	--
DTW_{TOC}	35.25	--	--	--	--	--	--	--
Product Thickness	1.64	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)	N	--	--	--	--	--	--	--
Groundwater Elev*.	397.77							
Stinger $Depth_{TOC}$	34.16	34.16	34.91	33.91	34.66	34.66	34.66	34.66
Stinger Tip Elevation	397.64	397.64	396.89	397.89	397.14	397.14	397.14	397.14
Stinger $Immersion_{DTP}$	0.55	0.55	1.3	0.3	1.05	1.05	1.05	1.05
Stinger Immersion as %**	33.5%	33.5%	79.3%	18.3%	64.0%	64.0%	64.0%	64.0%
Stinger $Depth_{CGW}$	0.13							
Well Casing Vac (in Hg)	---	---	0.5	2.25	1.9	5.3	0.2	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



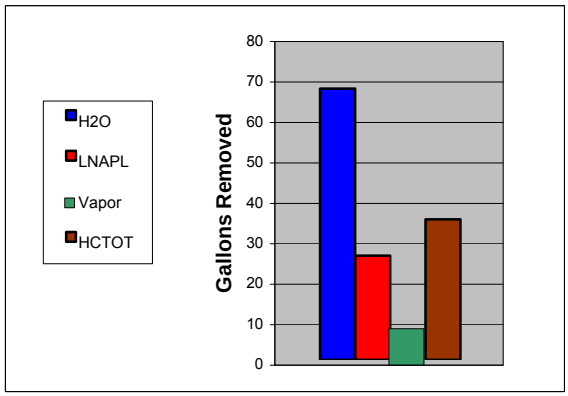
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-19 Date: Friday, August 19, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
8.00	67.03	25.73	9.0	34.73

LNAPL Type	G_s
Gasoline	0.7415



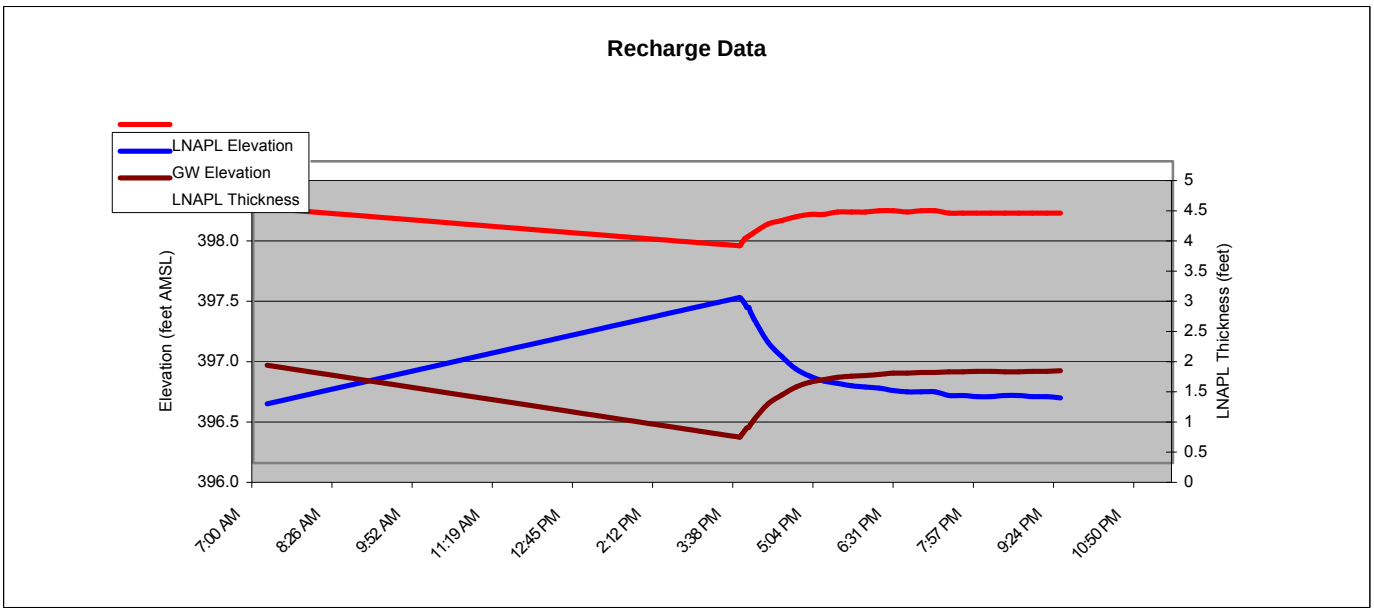
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	20.91	19.48	19.96
Stinger Vac (in Hg)	9.65	0.79	7.41
Well Flow in scfm	3	2	2.01
Well Casing Vac (in Hg)	0.30	0.01	0.14
Average Hrly HC_{TOT} Rec (gal)			4.34
Hrly LNAPL Rec (gal)			3.22
Hrly Vapor Rec (gal)			1.12
Hrly H_2O Rec (gal)			8.38
LNAPL as % of Total Fluids			34.1%

Gauging (ft)	Pre-Test	Start			Operating			End
Time (24 hour clock)	7:15	7:35	8:30	9:00	9:59	11:34	13:34	15:35
TOC Elevation	431.80							
$DTScreen_{TOC}$	26.51	--	--	--	--	--	--	--
DTP_{TOC}	33.69	--	--	--	--	--	--	--
DTW_{TOC}	35.31	--	--	--	--	--	--	--
Product Thickness	1.62	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)	N	--	--	--	--	--	--	--
Groundwater Elev*.	397.69							
Stinger $Depth_{TOC}$	34.15	34.15	34.65	34.9	34.9	34.9	34.9	34.9
Stinger Tip Elevation	397.65	397.65	397.15	396.90	396.90	396.90	396.90	396.90
Stinger $Immersion_{DTP}$	0.46	0.46	0.96	1.21	1.21	1.21	1.21	1.21
Stinger Immersion as %**	28.4%	28.4%	59.3%	74.7%	74.7%	74.7%	74.7%	74.7%
St. $Imm._{CGW}$ ADV %	0.04	50%	25%	10%	5%	5%	5%	5%
Well Casing Vac (in Hg)	---	---	0.35	1.35	2.05	1.5	1.75	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



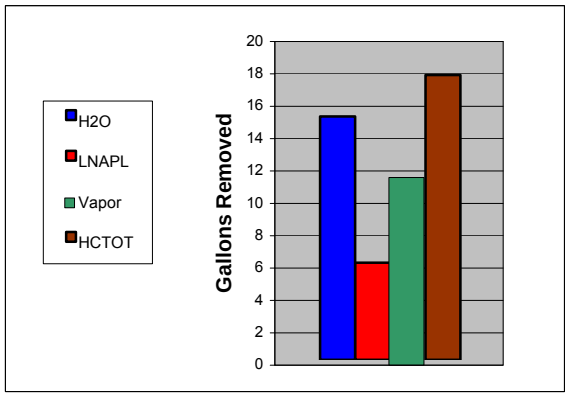
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-19 Date: Monday, August 22, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
8.40	15.04	6.00	11.6	17.60

LNAPL Type	G_s
Gasoline	0.7415



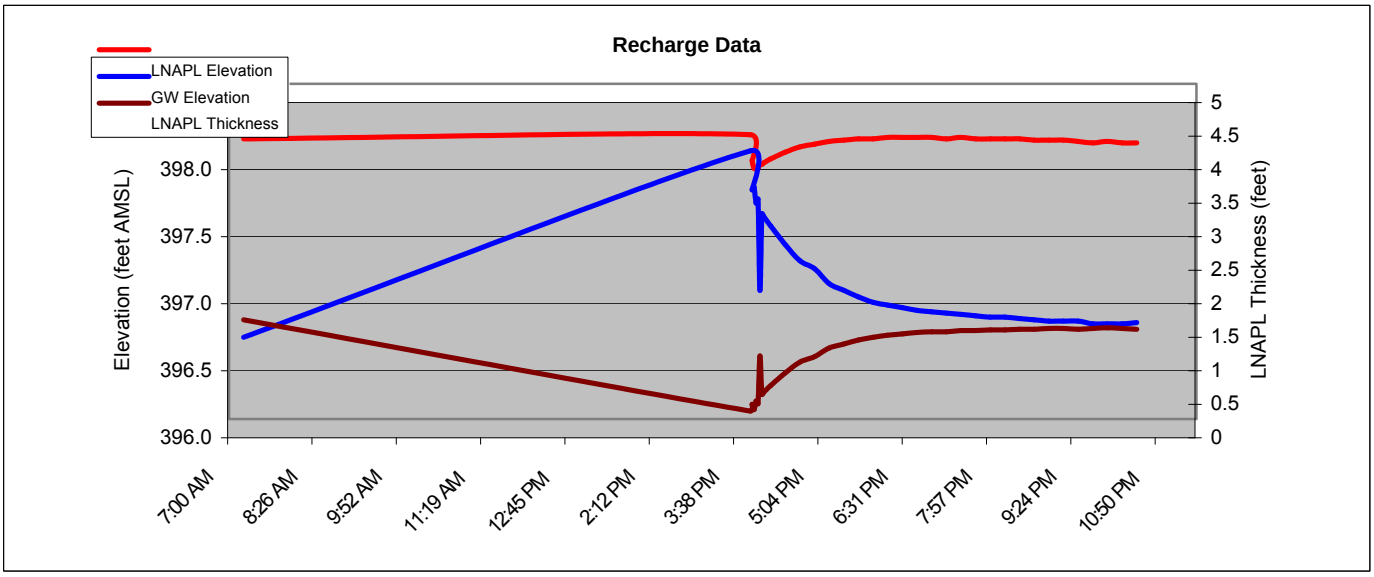
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	21.07	19.64	20.29
Stinger Vac (in Hg)	15.34	0.16	5.81
Well Flow in scfm	30	2	4.31
Well Casing Vac (in Hg)	0.47	0.24	0.36
Average Hrly HC_{TOT} Rec (gal)			2.10
Hrly LNAPL Rec (gal)			0.71
Hrly Vapor Rec (gal)			1.38
Hrly H_2O Rec (gal)			1.79
LNAPL as % of Total Fluids			53.9%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		7:15	7:30	8:30	11:00	12:30	14:00	15:00	15:54
TOC Elevation		431.80							
$DTScreen_{TOC}$		26.5100002	--	--	--	--	--	--	--
DTP_{TOC}		33.71	--	--	--	--	--	--	--
DTW_{TOC}		35.19	--	--	--	--	--	--	--
Product Thickness		1.48	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		N	--	--	--	--	--	--	--
Groundwater Elev*.		397.71							
Stinger $Depth_{TOC}$		34.22	34.22	32.92	34.09	34.25	34.42	34.42	34.42
Stinger Tip Elevation		397.58	397.58	398.88	397.71	397.55	397.38	397.38	397.38
Stinger $Immersion_{DTP}$		0.51	0.51	-0.79	0.38	0.54	0.71	0.71	0.71
Stinger Immersion as %**		34.5%	34.5%	-53.4%	25.7%	36.5%	48.0%	48.0%	48.0%
St. $Imm._{CGW}$	ADV %	0.13	15%	0%	25%	5%	25%	25%	25%
Well Casing Vac (in Hg)		---	---	4.05	4.95	5.95	4.15	4.7	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



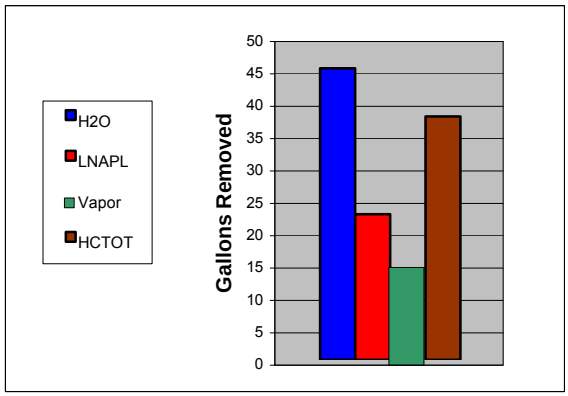
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-19 Date: Tuesday, August 23, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
7.83	45.04	22.50	15.1	37.60

LNAPL Type	G_s
Gasoline	0.7415



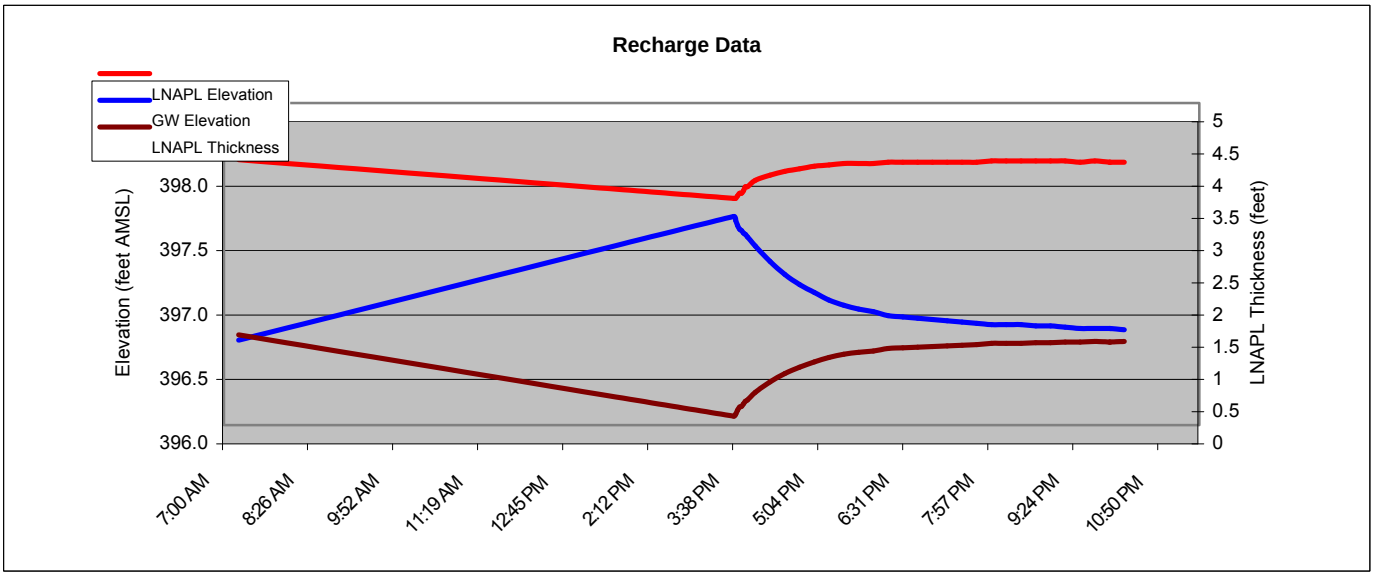
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	21.86	20.43	20.65
Stinger Vac (in Hg)	16.77	4.27	7.07
Well Flow in scfm	8	2	4.23
Well Casing Vac (in Hg)	0.67	0.16	0.38
Average Hrly HC_{TOT} Rec (gal)			4.80
Hrly LNAPL Rec (gal)			2.87
Hrly Vapor Rec (gal)			1.93
Hrly H_2O Rec (gal)			5.75
LNAPL as % of Total Fluids			45.5%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		7:15	7:49	8:29	9:59	11:28	12:58	14:28	15:39
TOC Elevation		431.80							
$DTScreen_{TOC}$		26.5100002	--	--	--	--	--	--	--
DTP_{TOC}		33.74	--	--	--	--	--	--	--
DTW_{TOC}		35.14	--	--	--	--	--	--	--
Product Thickness		1.4	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		N	--	--	--	--	--	--	--
Groundwater Elev*.		397.70							
Stinger $Depth_{TOC}$		33.93	33.93	33.93	34.18	34.43	34.68	34.43	34.43
Stinger Tip Elevation		397.87	397.87	397.87	397.62	397.37	397.12	397.37	397.37
Stinger $Immersion_{DTP}$		0.19	0.19	0.19	0.44	0.69	0.94	0.69	0.69
Stinger Immersion as %**		13.6%	13.6%	13.6%	31.4%	49.3%	67.1%	49.3%	49.3%
St. $Imm._{CGW}$	ADV %	-0.17	10%	10%	10%	25%	25%	25%	25%
Well Casing Vac (in Hg)		---	---	6.3	5.9	4.15	4.5	4.3	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-20 Date: 5/16/05 Day: Monday Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
6.0	1490	16	5.7	21.7

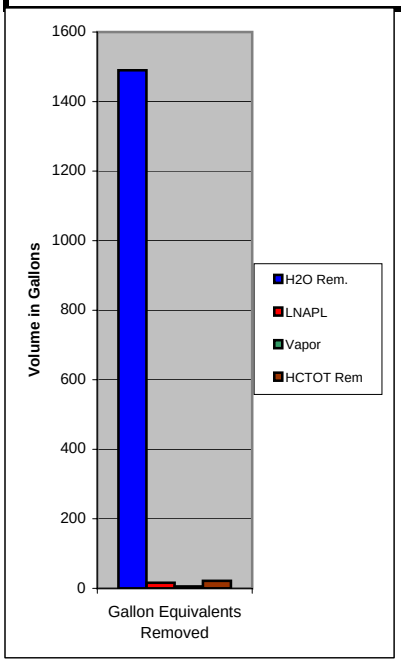
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

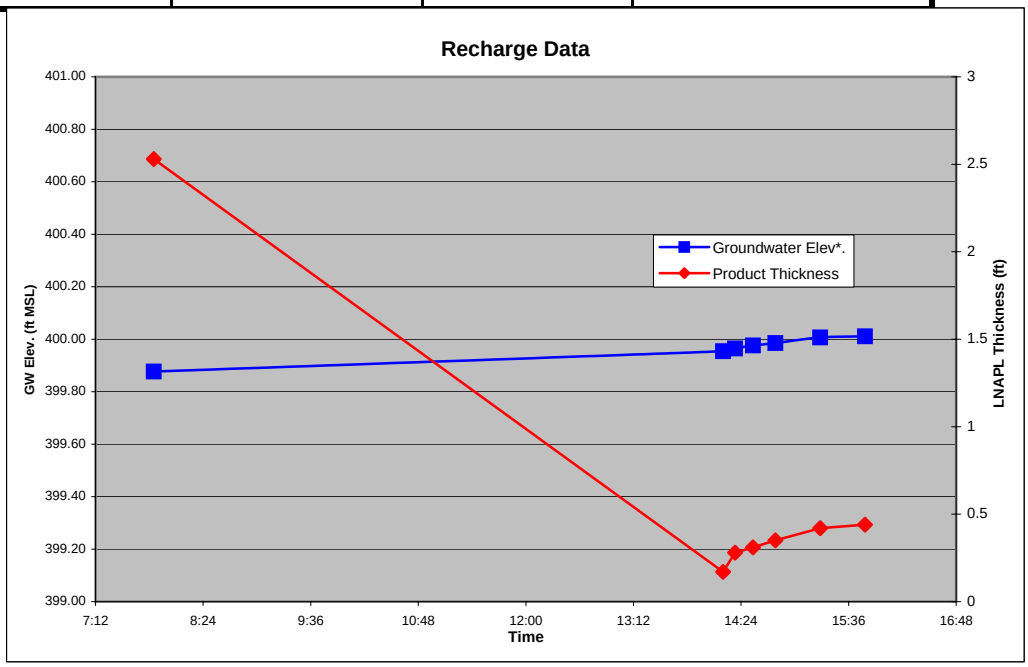
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:51	8:10	10:43	14:10	14:12	14:20	14:32	14:47	15:17	15:47
TOC Elevation	430.65				430.65	430.65	430.65	430.65	430.65	430.65
$DTScreen_{TOC}$	26.75	--	--	--	26.75	26.75	26.75	26.75	26.75	26.75
DTP_{TOC}	30.09	--	--	--	30.65	30.61	30.59	30.57	30.53	30.52
DTW_{TOC}	32.62	--	--	--	30.82	30.89	30.9	30.92	30.95	30.96
Product Thickness	2.53	--	--	--	0.17	0.28	0.31	0.35	0.42	0.44
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	399.88				399.95	399.96	399.98	399.99	400.01	400.01
$Stinger\ Depth_{TOC}$	30.85	30.85	30.35	31.35						
$Stinger\ Immersion_{DTP}$	0.76	0.76	0.26	1.26						
Stinger Immersion as %**	30.0%	30.0%	10.3%	49.8%						
$Stinger\ Depth_{CGW}$	0.08									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	22.33	3.48	20.57
Stinger Vac (in Hg)	18.51	2.84	16.06
Well Flow in scfm	27	6	15.21
Well Casing Vac (in Hg)	1.86	0.43	
Average Hrly HC_{TOT} Rec (gal)			3.62
Hrly LNAPL Rec (gal)			2.67
Hrly Vapor Rec (gal)			0.95
Hrly H2O Rec (gal)			248
LNAPL as % of Total Fluids			1.44%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-20 Date: 5/31/05 Day: Tuesday Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
7.0	1687	1.5	5.3	6.8

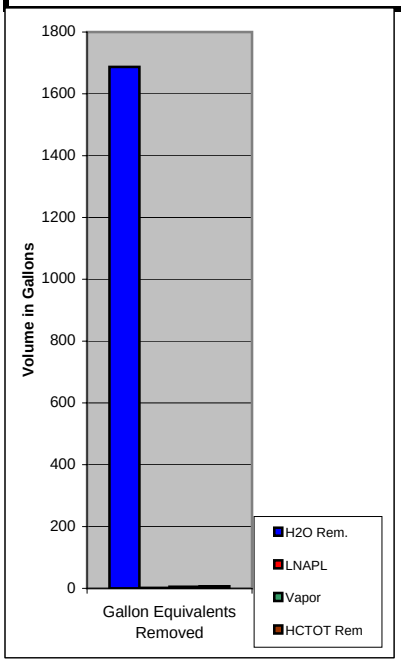
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

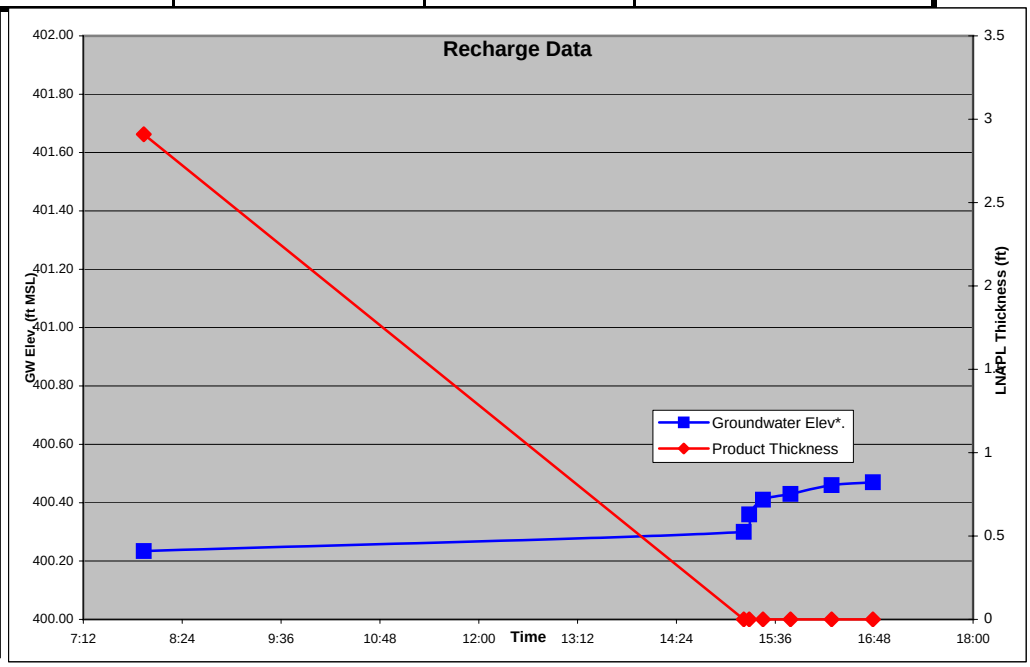
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:56	8:12	12:12	15:12	15:13	15:17	15:27	15:47	16:17	16:47
TOC Elevation	430.65				430.65	430.65	430.65	430.65	430.65	430.65
$DTScreen_{TOC}$	26.75	--	--	--	26.75	26.75	26.75	26.75	26.75	26.75
DTP_{TOC}	29.63	--	--	--						
DTW_{TOC}	32.54	--	--	--	30.35	30.29	30.24	30.22	30.19	30.18
Product Thickness	2.91	--	--	--	0	0	0	0	0	0
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	400.23				400.3	400.36	400.41	400.43	400.46	400.47
$Stinger\ Depth_{TOC}$	30.42	30.42	30.42	30.67						
$Stinger\ Immersion_{DTP}$	0.79	0.79	0.79	1.04						
Stinger Immersion as %**	27.1%	27.1%	27.1%	35.7%						
$Stinger\ Depth_{CGW}$	0.00									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.7	20.12	20.56
Stinger Vac (in Hg)	17.7	0.95	15.54
Well Flow in scfm	32	9	21.4
Well Casing Vac (in Hg)	1.44	0.07	
Average Hrly HC_{TOT} Rec (gal)			0.97
Hrly LNAPL Rec (gal)			0.21
Hrly Vapor Rec (gal)			0.76
Hrly H2O Rec (gal)			241
LNAPL as % of Total Fluids			0.40%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-20 Date: Tuesday, June 14, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.13	348	5.4	6	11.4

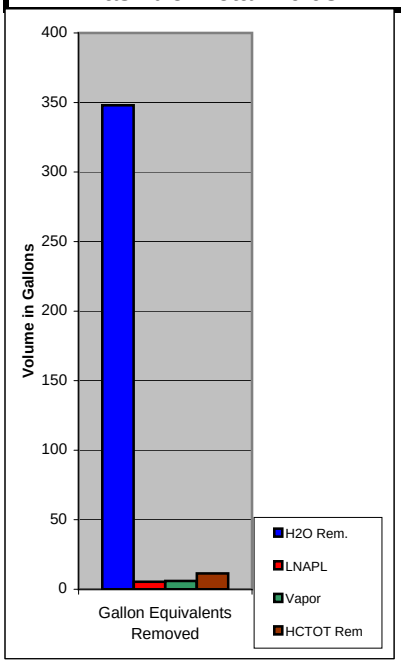
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

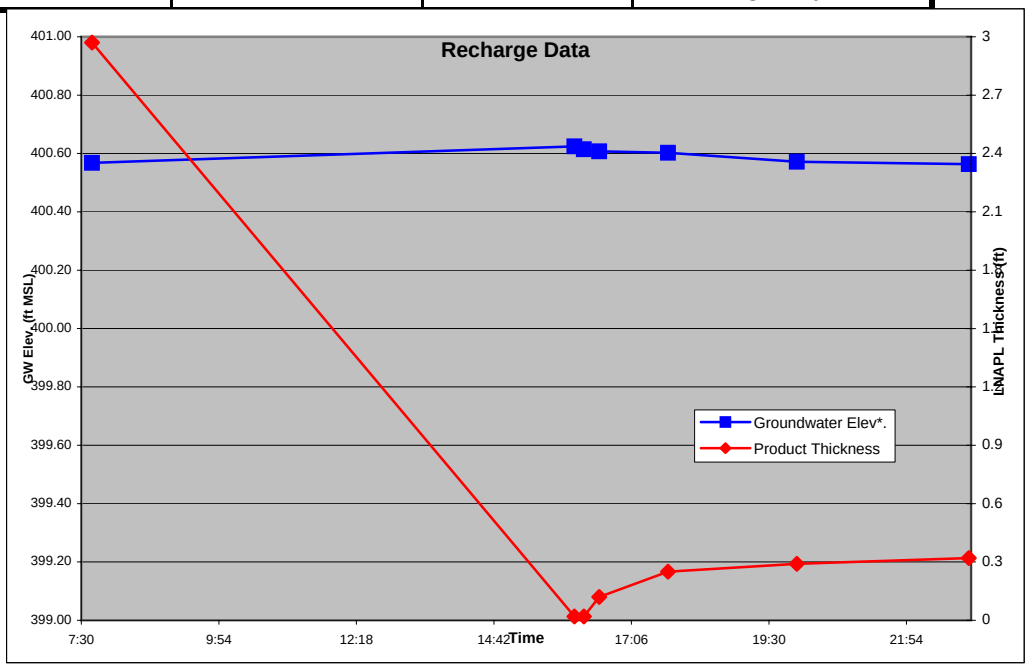
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:42	7:57	10:30	16:05	16:07	16:17	16:33	17:45	20:00	23:00
TOC Elevation	430.65				430.65	430.65	430.65	430.65	430.65	430.65
$DTScreen_{TOC}$	26.75	--	--	--	26.75	26.75	26.75	26.75	26.75	26.75
DTP_{TOC}	29.28	--	--	--	30.02	30.03	30.01	29.98	30.00	30.00
DTW_{TOC}	32.25	--	--	--	30.04	30.05	30.13	30.23	30.29	30.32
Product Thickness	2.97	--	--	--	0.02	0.02	0.12	0.25	0.29	0.32
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	400.57				400.62	400.61	400.61	400.6	400.57	400.56
Stinger $Depth_{TOC}$	29.82	29.82	27.32	27.32						
Stinger Tip Elevation	400.83	400.83	403.33	403.33						
Stinger $Immersion_{DTP}$	0.54	0.54	-1.96	-1.96						
Stinger Immersion as %**	18.2%	18.2%	-66.0%	-66.0%						
Stinger $Depth_{CGW}$	-0.26									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.23	19.96	20.22
Stinger Vac (in Hg)	17.4	1.27	9.22
Well Flow in scfm	47	11	41.63
Well Casing Vac (in Hg)	2.97	1	
Average Hrly HC_{TOT} Rec (gal)			1.40
Hrly LNAPL Rec (gal)			0.66
Hrly Vapor Rec (gal)			0.74
Hrly H2O Rec (gal)			43
LNAPL as % of Total Fluids			3.17%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-20 Date: Tuesday, June 28, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.05	1076.8	6.5	5.3	11.8

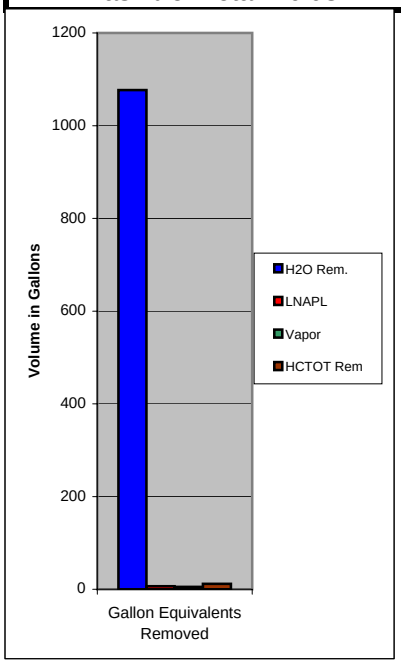
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

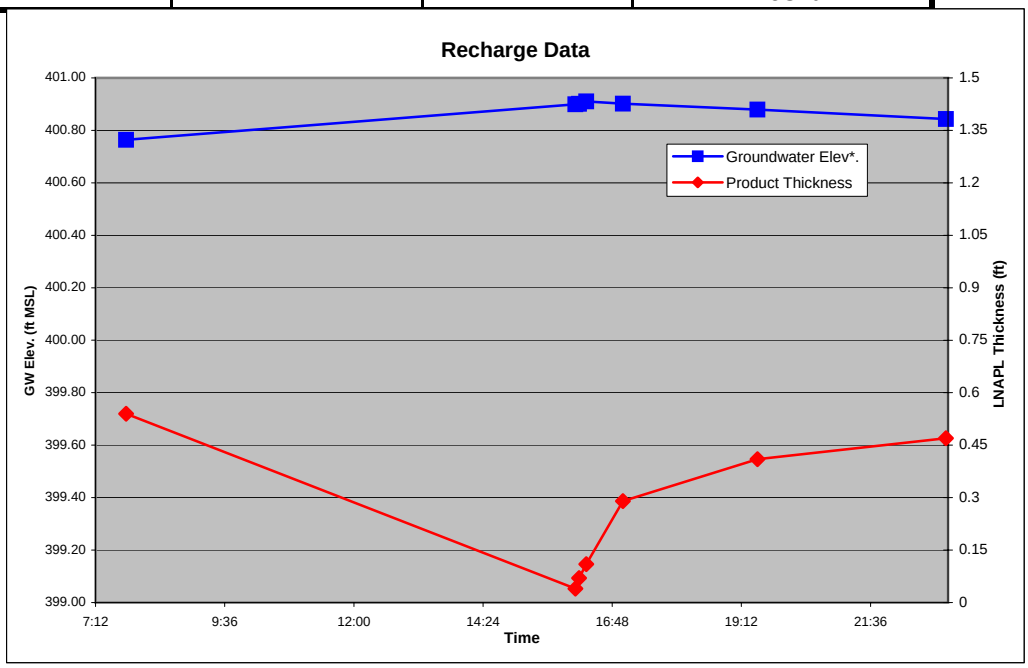
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:46	8:01	10:39	16:04	16:07	16:11	16:19	17:00	19:30	23:00
TOC Elevation	430.65				430.65	430.65	430.65	430.65	430.65	430.65
$DTScreen_{TOC}$	26.75	--	--	--	26.75	26.75	26.75	26.75	26.75	26.75
DTP_{TOC}	29.74	--	--	--	29.74	29.73	29.71	29.67	29.66	29.68
DTW_{TOC}	30.28	--	--	--	29.78	29.8	29.82	29.96	30.07	30.15
Product Thickness	0.54	--	--	--	0.04	0.07	0.11	0.29	0.41	0.47
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	400.76				400.9	400.9	400.91	400.9	400.88	400.84
$Stinger\ Depth_{TOC}$	27.42	27.42	27.42	27.42						
Stinger Tip Elevation	403.23	403.23	403.23	403.23						
$Stinger\ Immersion_{DTP}$	-2.32	-2.32	-2.32	-2.32						
Stinger Immersion as %**	-429.6%	-429.6%	-429.6%	-429.6%						
$Stinger\ Depth_{CGW}$	-2.47									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.07	15.21	19.97
Stinger Vac (in Hg)	16.61	1.9	15.4
Well Flow in scfm	43	19	19.19
Well Casing Vac (in Hg)	2.72	2.22	
Average Hrly HC_{TOT} Rec (gal)			1.47
Hrly LNAPL Rec (gal)			0.81
Hrly Vapor Rec (gal)			0.66
Hrly H2O Rec (gal)			134
LNAPL as % of Total Fluids			1.08%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-20 Date: Friday, July 15, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
6.42	1126.6	1	3	4

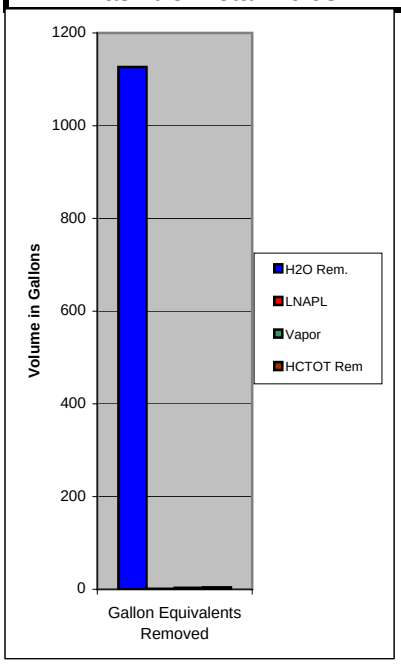
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

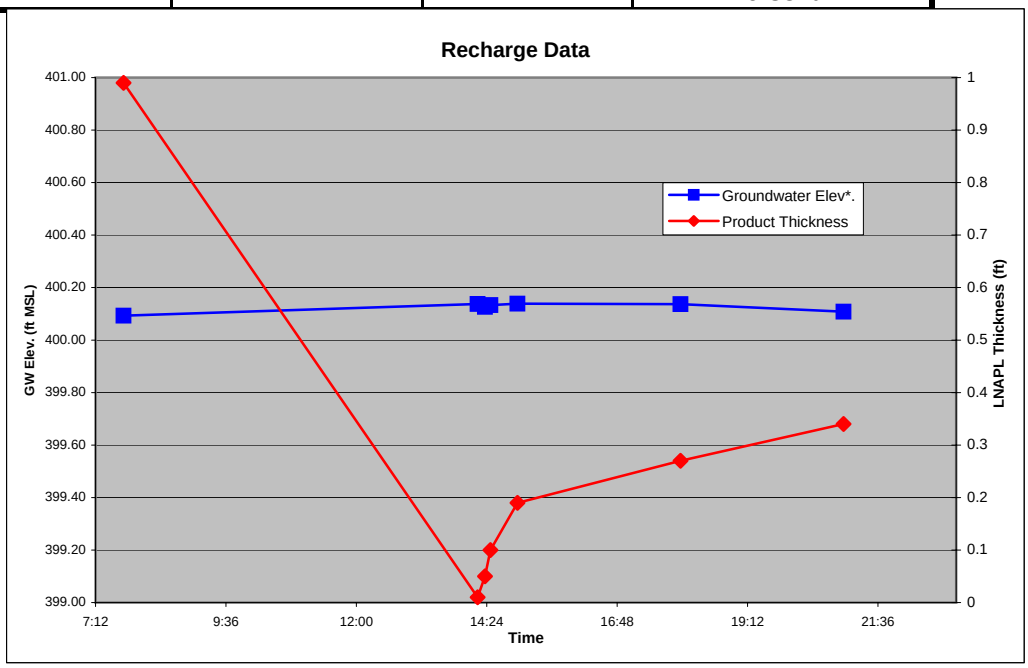
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:43	7:48	8:48	14:13	14:14	14:22	14:28	14:58	17:58	20:58
TOC Elevation	430.65				430.65	430.65	430.65	430.65	430.65	430.65
$DTScreen_{TOC}$	26.75	--	--	--	26.75	26.75	26.75	26.75	26.75	26.75
DTP_{TOC}	30.29	--	--	--	30.51	30.51	30.49	30.46	30.44	30.45
DTW_{TOC}	31.28	--	--	--	30.52	30.56	30.59	30.65	30.71	30.79
Product Thickness	0.99	--	--	--	0.01	0.05	0.1	0.19	0.27	0.34
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	400.09				400.14	400.13	400.13	400.14	400.14	400.11
$Stinger\ Depth_{TOC}$	31.06	31.06	30.81	29.81						
Stinger Tip Elevation	399.59	399.59	399.84	400.84						
$Stinger\ Immersion_{DTP}$	0.77	0.77	0.52	-0.48						
Stinger Immersion as %**	77.8%	77.8%	52.5%	-48.5%						
$Stinger\ Depth_{CGW}$	0.50									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.7	20.43	20.8
Stinger Vac (in Hg)	20.09	3.16	13.26
Well Flow in scfm	15	2	6.88
Well Casing Vac (in Hg)	0.99	0.03	
Average Hrly HC_{TOT} Rec (gal)			0.62
Hrly LNAPL Rec (gal)			0.16
Hrly Vapor Rec (gal)			0.47
Hrly H2O Rec (gal)			176
LNAPL as % of Total Fluids			0.35%





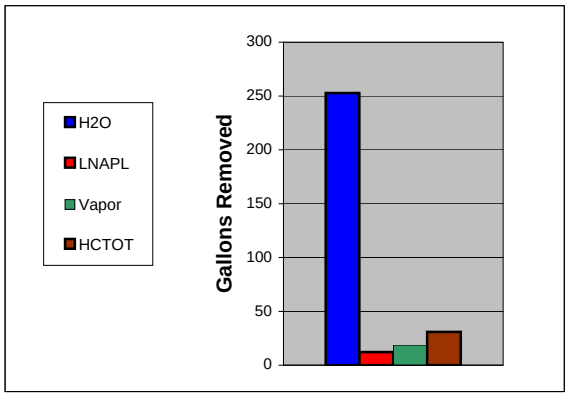
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-20 Date: Wednesday, October 26, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
8.00	252.72	12.21	18.7	30.91

LNAPL Type	G_s
Gasoline	0.7428



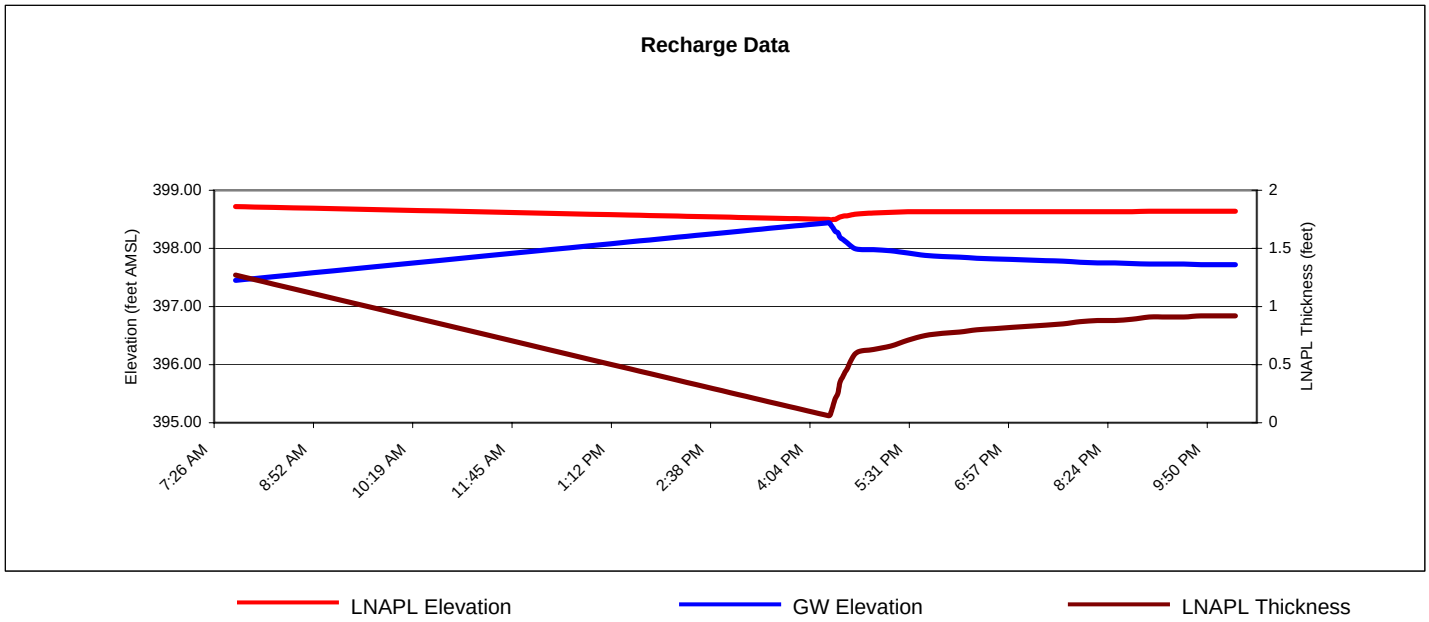
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	22.60	21.30	21.61
Stinger Vac (in Hg)	11.83	5.73	7.99
Well Flow in scfm	19	4	9.93
Well Casing Vac (in Hg)	2.15	0.29	1.63
Average Hrly HC_{TOT} Rec (gal)			3.86
Hrly LNAPL Rec (gal)			1.53
Hrly Vapor Rec (gal)			2.34
Hrly H_2O Rec (gal)			31.59
LNAPL as % of Total Fluids			10.9%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		10/26/2005 7:45	8:20	9:52	11:22	12:52	14:22	15:22	16:20
TOC Elevation		430.65							
$DTScreen_{TOC}$		26.75	--	--	--	--	--	--	--
DTP_{TOC}		31.93	--	--	--	--	--	--	--
DTW_{TOC}		33.2	--	--	--	--	--	--	--
Product Thickness		1.27	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		N	--	--	--	--	--	--	--
Groundwater Elev*.		398.39							
Stinger $Depth_{TOC}$		32.6	32.6	30.55	29.8	29.8	29.8	29.8	29.8
Stinger Tip Elevation		398.05	398.05	400.10	400.85	400.85	400.85	400.85	400.85
Stinger $Immersion_{DTP}$		0.67	0.67	-1.38	-2.13	-2.13	-2.13	-2.13	-2.13
Stinger Immersion as %**		52.8%	52.8%	-108.7%	-167.7%	-167.7%	-167.7%	-167.7%	-167.7%
St. $Imm._{CGW}$	ADV %	0.34	25%	10%	30%	30%	30%	30%	30%
Well Casing Vac (in H2O)		---	---	28.1	26.5	25.8	6.4	6.3	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-44C Date: 5/13/05 Day: Friday Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
7.78	29	181	14.9	195.9

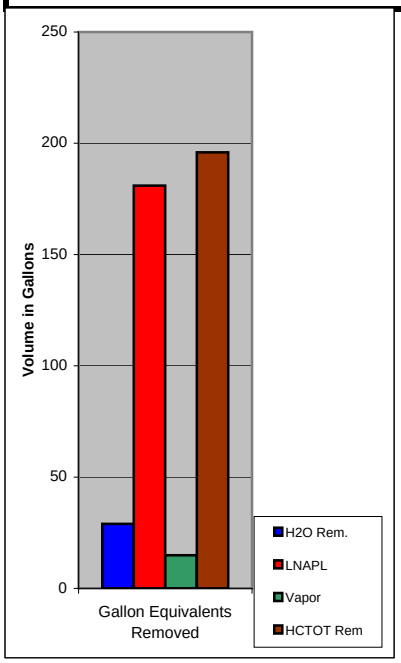
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

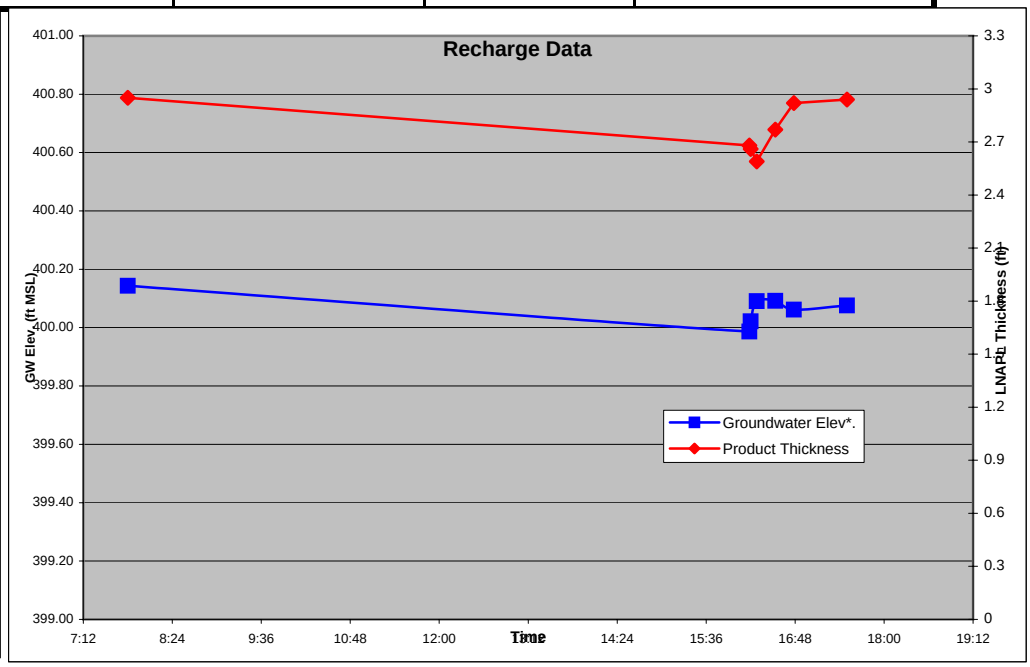
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:48	8:22	8:53	16:09	16:11	16:12	16:17	16:32	16:47	17:30
TOC Elevation	429.44				429.44	429.44	429.44	429.44	429.44	429.44
$DTScreen_{TOC}$	26.86	--	--	--	26.86	26.86	26.86	26.86	26.86	26.86
DTP_{TOC}	28.5	--	--	--	28.73	28.7	28.65	28.6	28.59	28.57
DTW_{TOC}	31.45	--	--	--	31.41	31.36	31.24	31.37	31.51	31.51
Product Thickness	2.95	--	--	--	2.68	2.66	2.59	2.77	2.92	2.94
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	400.14				399.99	400.02	400.09	400.09	400.06	400.08
$Stinger\ Depth_{TOC}$	29.4	29.4	29.15	29.15						
$Stinger\ Immersion_{DTP}$	0.9	0.9	0.65	0.65						
Stinger Immersion as %**	30.5%	30.5%	22.0%	22.0%						
$Stinger\ Depth_{CGW}$	0.10									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	20.91	2.53	20.04
Stinger Vac (in Hg)	17.56	0.79	6.66
Well Flow in scfm	14	8	9.75
Well Casing Vac (in Hg)	0.82	0.16	
Average Hrly HC_{TOT} Rec (gal)			25.18
Hrly LNAPL Rec (gal)			23.26
Hrly Vapor Rec (gal)			1.92
Hrly H2O Rec (gal)			4
LNAPL as % of Total Fluids			87.1%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-44C Date: 5/27/05 Day: Friday Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
6	0	62.5	11.6	74.1

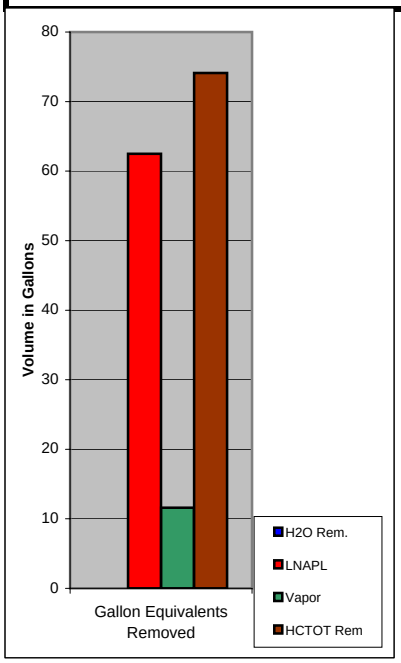
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

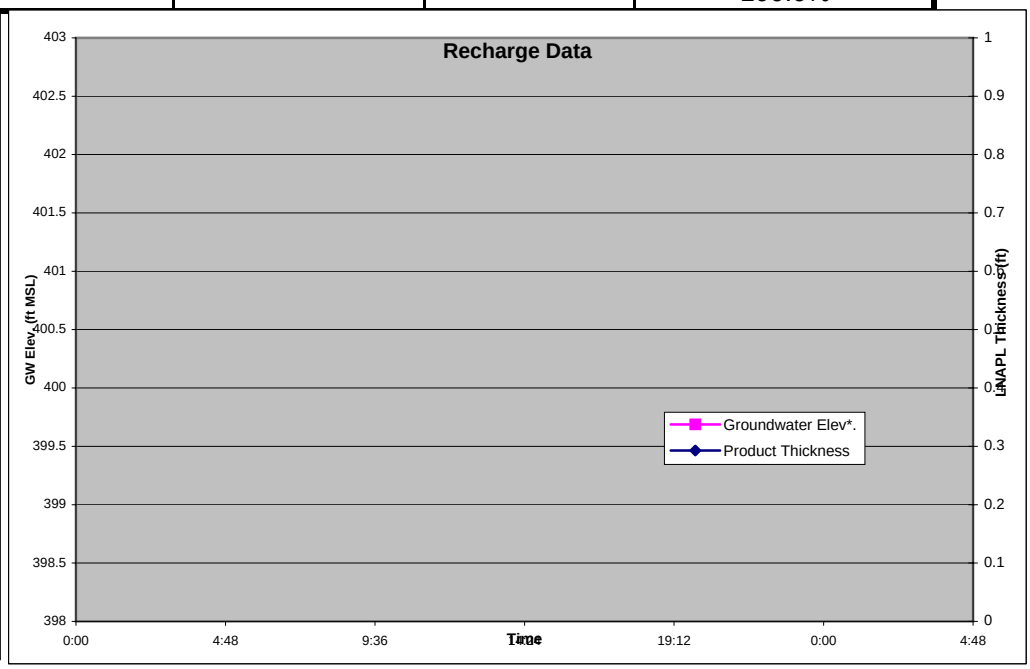
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	8:30	9:00	12:00	15:12						
TOC Elevation	429.44				429.44	429.44	429.44	429.44	429.44	429.44
$DTScreen_{TOC}$	26.86	--	--	--	26.86	26.86	26.86	26.86	26.86	26.86
DTP_{TOC}	28.28	--	--	--						
DTW_{TOC}	31.37	--	--	--						
Product Thickness	3.09	--	--	--	0	0	0	0	0	0
Fluid Above Screen (Y/N)	N	--	--	--	Y	Y	Y	Y	Y	Y
Groundwater Elev*.	400.33									
Stinger $Depth_{TOC}$	29.17	29.17	29.17	29.17						
Stinger $Immersion_{DTP}$	0.89	0.89	0.89	0.89						
Stinger Immersion as %**	28.8%	28.8%	28.8%	28.8%						
Stinger $Depth_{CGW}$	0.06									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.38	19.48	20.78
Stinger Vac (in Hg)	16.13	2.06	4.92
Well Flow in scfm	17	4	11.8
Well Casing Vac (in Hg)	0.82	0.16	
Average Hrly HC_{TOT} Rec (gal)			12.35
Hrly LNAPL Rec (gal)			10.42
Hrly Vapor Rec (gal)			1.93
Hrly H2O Rec (gal)			0
LNAPL as % of Total Fluids			100.0%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-44C Date: Monday, June 13, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.00	8	230.8	14.9	245.7

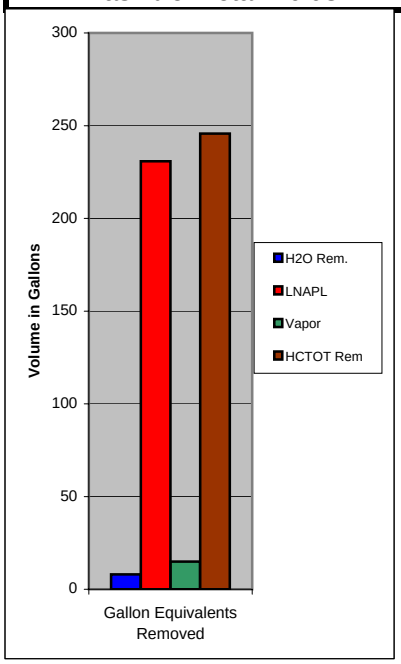
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

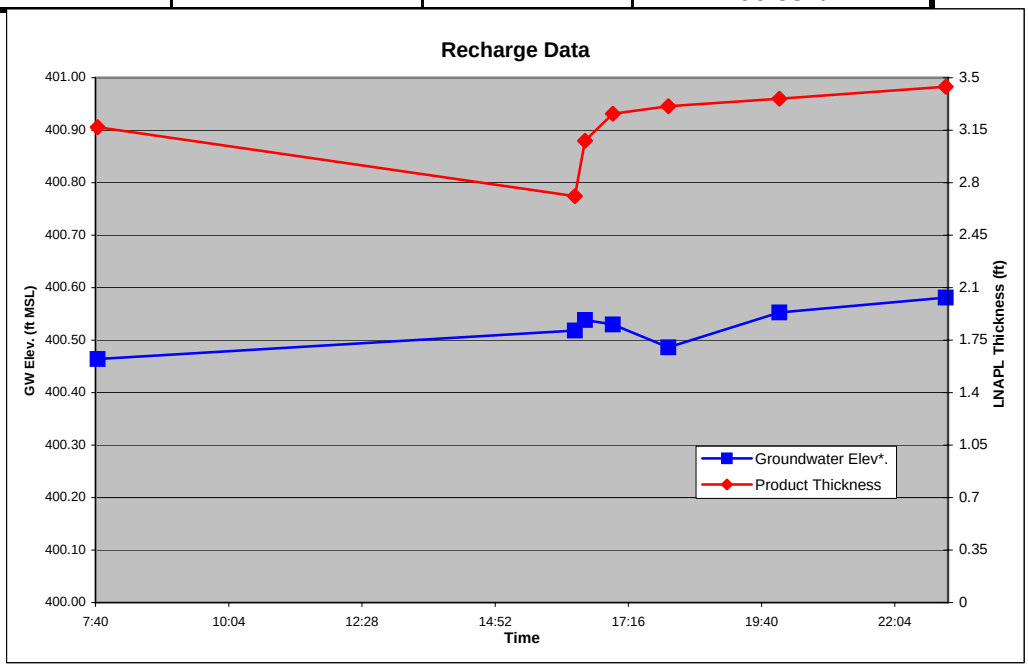
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:43	8:14	8:47	16:14	16:19	16:30	17:00	18:00	20:00	23:00
TOC Elevation	429.44				429.44	429.44	429.44	429.44	429.44	429.44
$DTScreen_{TOC}$	26.86	--	--	--	26.86	26.86	26.86	26.86	26.86	26.86
DTP_{TOC}	28.12	--	--	--	28.19	28.07	28.03	28.06	27.98	27.93
DTW_{TOC}	31.29	--	--	--	30.9	31.15	31.29	31.37	31.34	31.37
Product Thickness	3.17	--	--	--	2.71	3.08	3.26	3.31	3.36	3.44
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	400.46				400.52	400.54	400.53	400.49	400.55	400.58
Stinger $Depth_{TOC}$	28.6	28.6	30.35	31.35						
Stinger Tip Elevation	400.84	400.84	399.09	398.09						
Stinger $Immersion_{DTP}$	0.48	0.48	2.23	3.23						
Stinger Immersion as %**	15.1%	15.1%	70.3%	101.9%						
Stinger $Depth_{CGW}$	-0.38									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	20.59	3.01	19.88
Stinger Vac (in Hg)	14.55	0.95	5.48
Well Flow in scfm	29	6	10.73
Well Casing Vac (in Hg)	0.98	0.18	
Average Hrly HC_{TOT} Rec (gal)			30.71
Hrly LNAPL Rec (gal)			28.85
Hrly Vapor Rec (gal)			1.86
Hrly H2O Rec (gal)			1
LNAPL as % of Total Fluids			96.85%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-44C Date: Monday, June 27, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
7.98	216.7	190	14.5	204.5

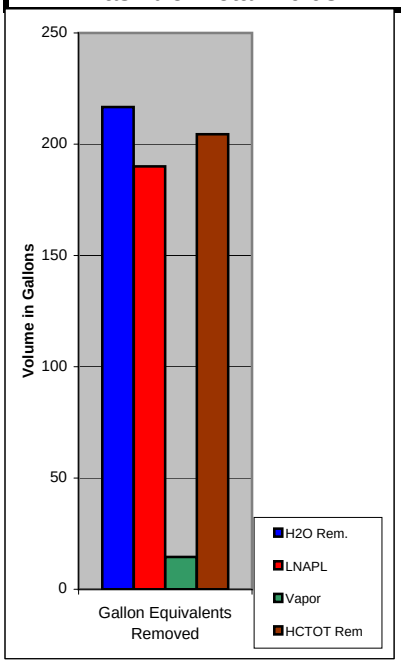
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

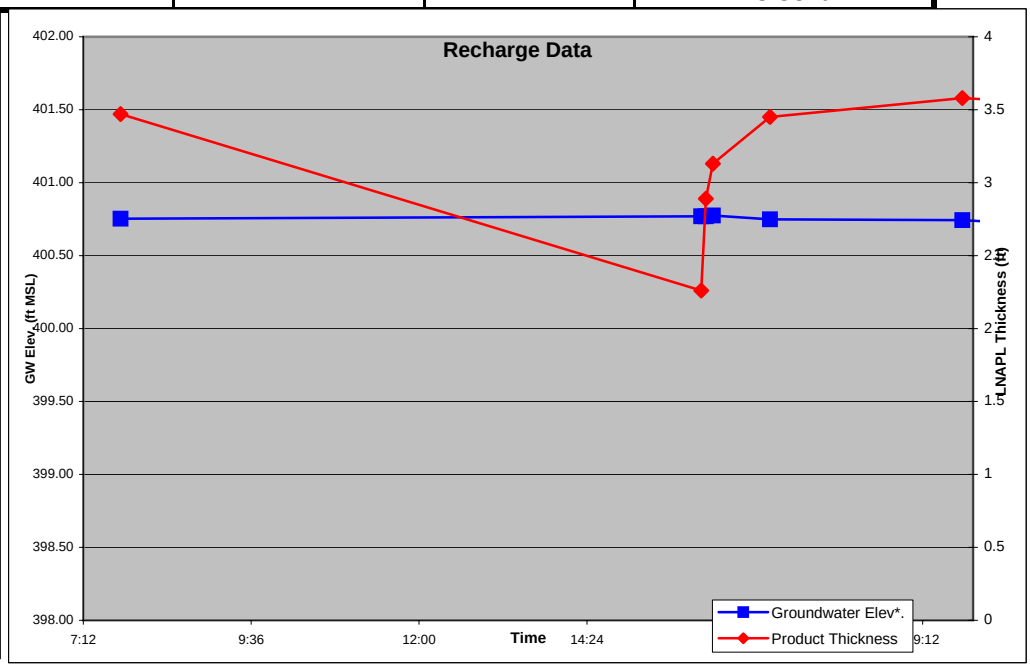
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:44	8:02	10:30	16:01	16:02	16:06	16:12	17:01	19:46	23:01
TOC Elevation	429.44				429.44	429.44	429.44	429.44	429.44	429.44
$DTScreen_{TOC}$	26.86	--	--	--	26.86	26.86	26.86	26.86	26.86	26.86
DTP_{TOC}	27.75	--	--	--	28.06	27.89	27.82	27.76	27.73	27.84
DTW_{TOC}	31.22	--	--	--	30.32	30.78	30.95	31.21	31.31	31.33
Product Thickness	3.47	--	--	--	2.26	2.89	3.13	3.45	3.58	3.49
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	400.75				400.77	400.77	400.77	400.75	400.74	400.66
Stinger $Depth_{TOC}$	29.88	29.88	29.38	30.38						
Stinger Tip Elevation	399.56	399.56	400.06	399.06						
Stinger $Immersion_{DTP}$	2.13	2.13	1.63	2.63						
Stinger Immersion as %**	61.4%	61.4%	47.0%	75.8%						
Stinger $Depth_{CGW}$	1.19									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.07	2.85	19.47
Stinger Vac (in Hg)	17.4	2.15	7.89
Well Flow in scfm	19	6	7.93
Well Casing Vac (in Hg)	0.375	0.301	
Average Hrly HC_{TOT} Rec (gal)			25.62
Hrly LNAPL Rec (gal)			23.80
Hrly Vapor Rec (gal)			1.82
Hrly H2O Rec (gal)			27
LNAPL as % of Total Fluids			48.55%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-44C Date: Thursday, July 14, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
7.98	122.9	144.3	14.3	158.6

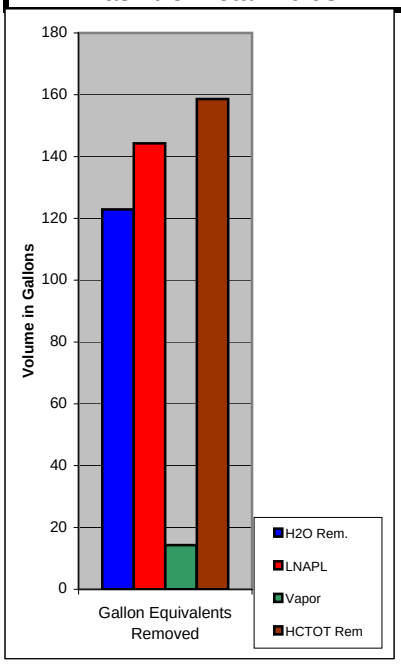
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

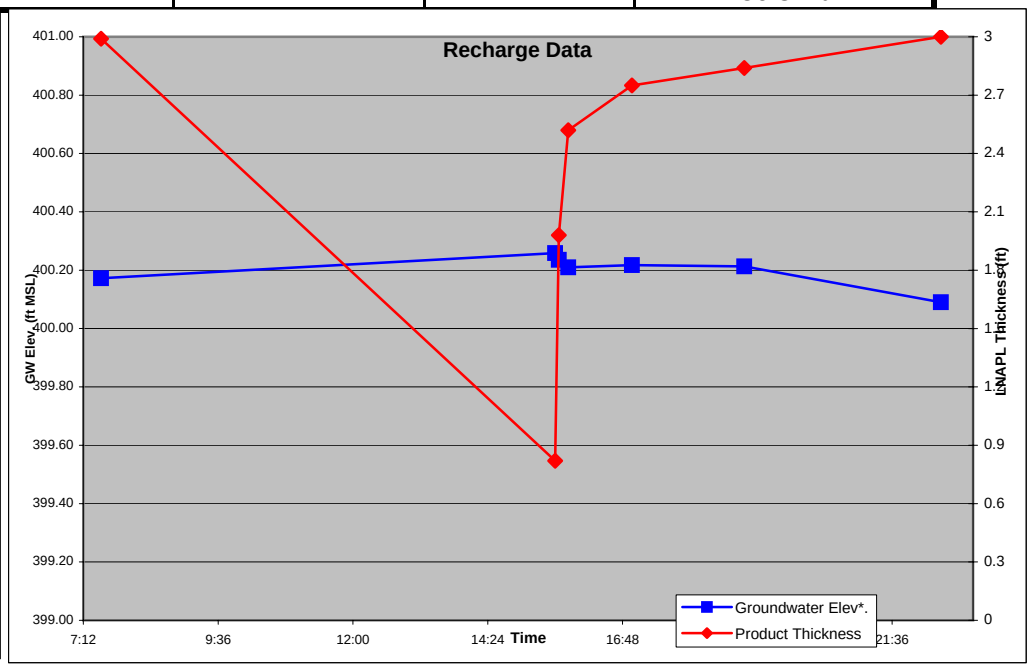
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:31	7:36	9:06	15:35	15:36	15:40	15:50	16:58	18:58	22:28
TOC Elevation	429.44				429.44	429.44	429.44	429.44	429.44	429.44
$DTScreen_{TOC}$	26.86	--	--	--	26.86	26.86	26.86	26.86	26.86	26.86
DTP_{TOC}	28.46	--	--	--	28.96	28.67	28.55	28.48	28.46	28.54
DTW_{TOC}	31.45	--	--	--	29.78	30.65	31.07	31.23	31.3	31.54
Product Thickness	2.99	--	--	--	0.82	1.98	2.52	2.75	2.84	3
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	400.17				400.26	400.24	400.21	400.22	400.21	400.09
Stinger $Depth_{TOC}$	27.84	27.84	28.74	28.84						
Stinger Tip Elevation	401.6	401.6	400.7	400.6						
Stinger $Immersion_{DTP}$	-0.62	-0.62	0.28	0.38						
Stinger Immersion as %**	-20.7%	-20.7%	9.4%	12.7%						
Stinger $Depth_{CGW}$	-1.43									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.38	17.11	20.51
Stinger Vac (in Hg)	17.24	0.63	6.98
Well Flow in scfm	15	2	2.66
Well Casing Vac (in Hg)	0.31	0.03	
Average Hrly HC_{TOT} Rec (gal)			19.87
Hrly LNAPL Rec (gal)			18.08
Hrly Vapor Rec (gal)			1.79
Hrly H2O Rec (gal)			15
LNAPL as % of Total Fluids			56.34%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-44C Date: Monday, July 25, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.00	197.5	230.7	14.1	244.8

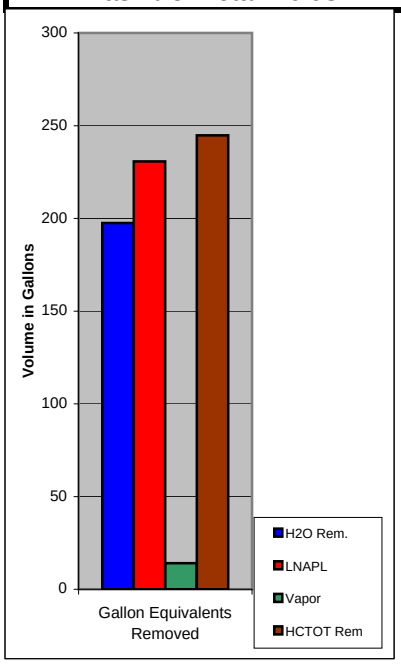
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

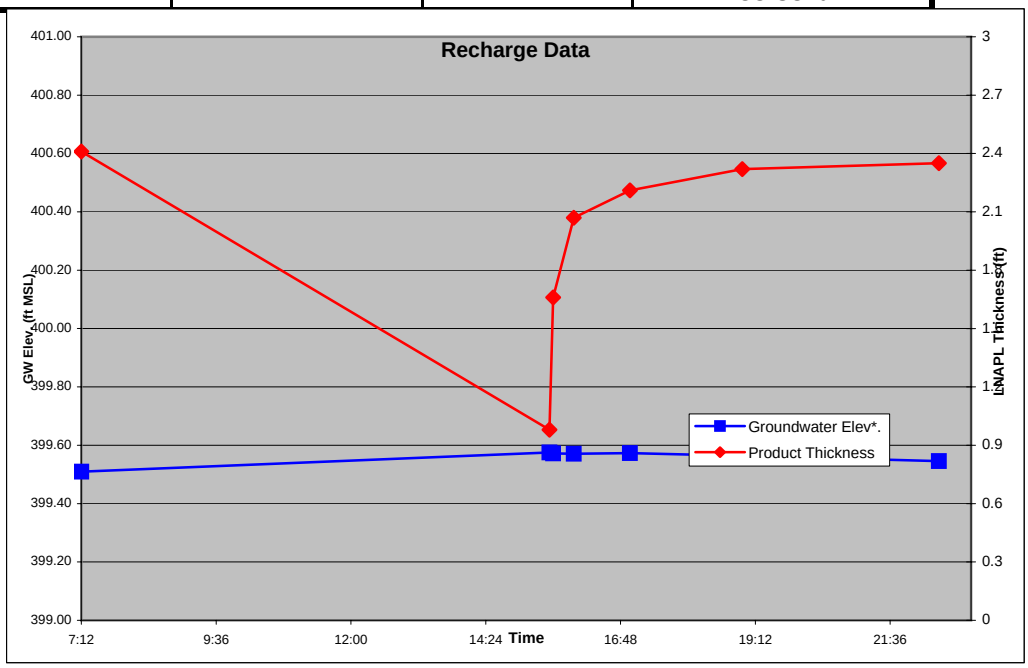
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:12	7:31	7:54	15:31	15:32	15:36	15:58	16:58	18:58	22:28
TOC Elevation	429.44				429.44	429.44	429.44	429.44	429.44	429.44
$DTScreen_{TOC}$	26.86	--	--	--	26.86	26.86	26.86	26.86	26.86	26.86
DTP_{TOC}	29.28	--	--	--	29.6	29.42	29.31	29.27	29.25	29.26
DTW_{TOC}	31.69	--	--	--	30.58	31.08	31.38	31.48	31.57	31.61
Product Thickness	2.41	--	--	--	0.98	1.66	2.07	2.21	2.32	2.35
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	399.51				399.58	399.57	399.57	399.57	399.56	399.55
$Stinger\ Depth_{TOC}$	29.86	29.86	30.36	30.46						
Stinger Tip Elevation	399.58	399.58	399.08	398.98						
$Stinger\ Immersion_{DTP}$	0.58	0.58	1.08	1.18						
Stinger Immersion as %**	24.1%	24.1%	44.8%	49.0%						
$Stinger\ Depth_{CGW}$	-0.07									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.23	3.01	19.4
Stinger Vac (in Hg)	14.24	1.74	7.28
Well Flow in scfm	4	2	2
Well Casing Vac (in Hg)	0.3	0.02	
Average Hrly HC_{TOT} Rec (gal)			30.60
Hrly LNAPL Rec (gal)			28.84
Hrly Vapor Rec (gal)			1.76
Hrly H2O Rec (gal)			25
LNAPL as % of Total Fluids			55.35%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-44C Date: Tuesday, July 26, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.03	197.5	195.1	14.3	209.4

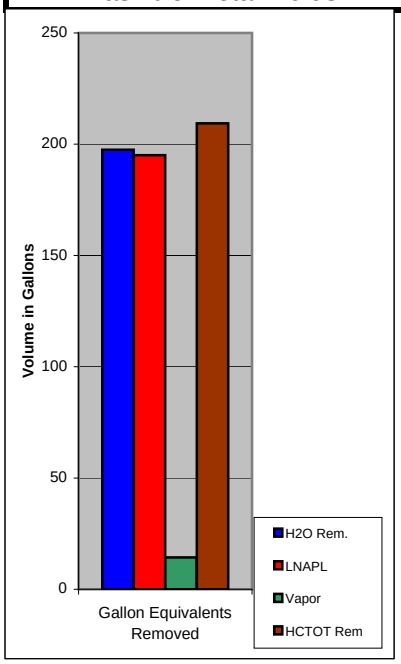
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

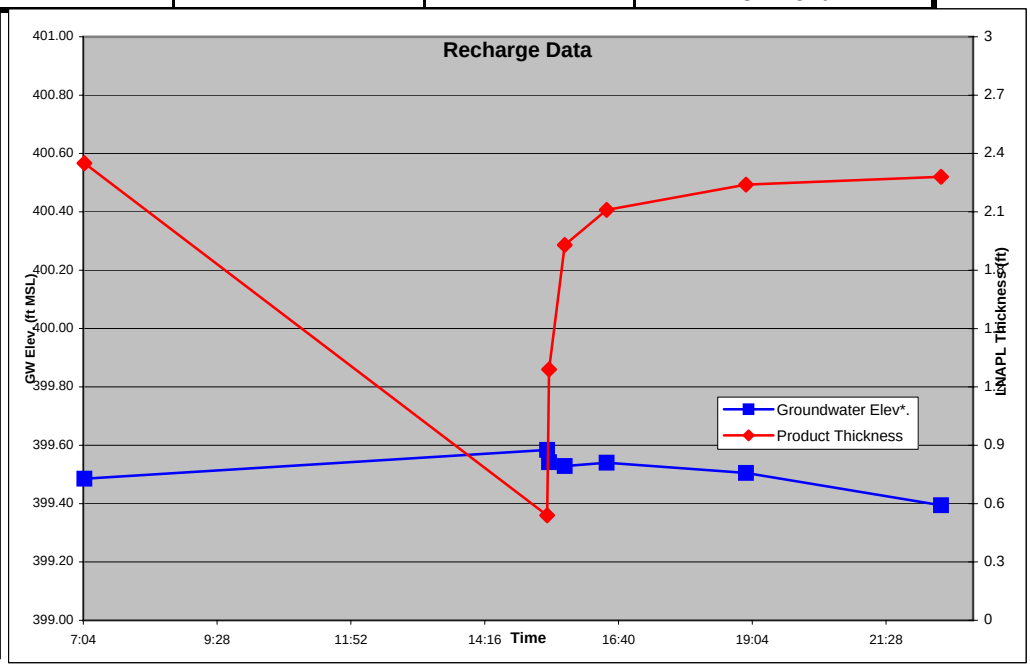
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:06	7:21	7:35	15:23	15:24	15:26	15:43	16:28	18:58	22:28
TOC Elevation	429.44				429.44	429.44	429.44	429.44	429.44	429.44
$DTScreen_{TOC}$	26.86	--	--	--	26.86	26.86	26.86	26.86	26.86	26.86
DTP_{TOC}	29.32	--	--	--	29.71	29.55	29.39	29.33	29.33	29.43
DTW_{TOC}	31.67	--	--	--	30.25	30.84	31.32	31.44	31.57	31.71
Product Thickness	2.35	--	--	--	0.54	1.29	1.93	2.11	2.24	2.28
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	399.49				399.58	399.54	399.53	399.54	399.51	399.39
$Stinger\ Depth_{TOC}$	29.86	29.86	30.36	30.36						
Stinger Tip Elevation	399.58	399.58	399.08	399.08						
$Stinger\ Immersion_{DTP}$	0.54	0.54	1.04	1.04						
Stinger Immersion as %**	23.0%	23.0%	44.3%	44.3%						
$Stinger\ Depth_{CGW}$	-0.09									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	20.91	2.53	19.78
Stinger Vac (in Hg)	13.13	5.69	8.58
Well Flow in scfm	2	2	2
Well Casing Vac (in Hg)	0.18	0.1	
Average Hrly HC_{TOT} Rec (gal)			26.07
Hrly LNAPL Rec (gal)			24.29
Hrly Vapor Rec (gal)			1.78
Hrly H2O Rec (gal)			25
LNAPL as % of Total Fluids			51.46%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-44C Date: Wednesday, July 27, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.00	307.35	211.6	15.8	227.4

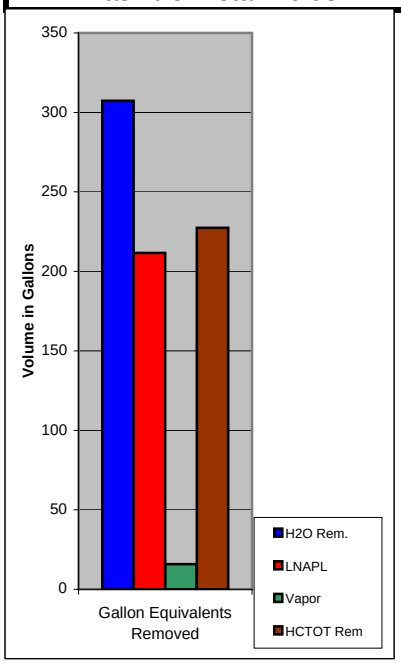
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

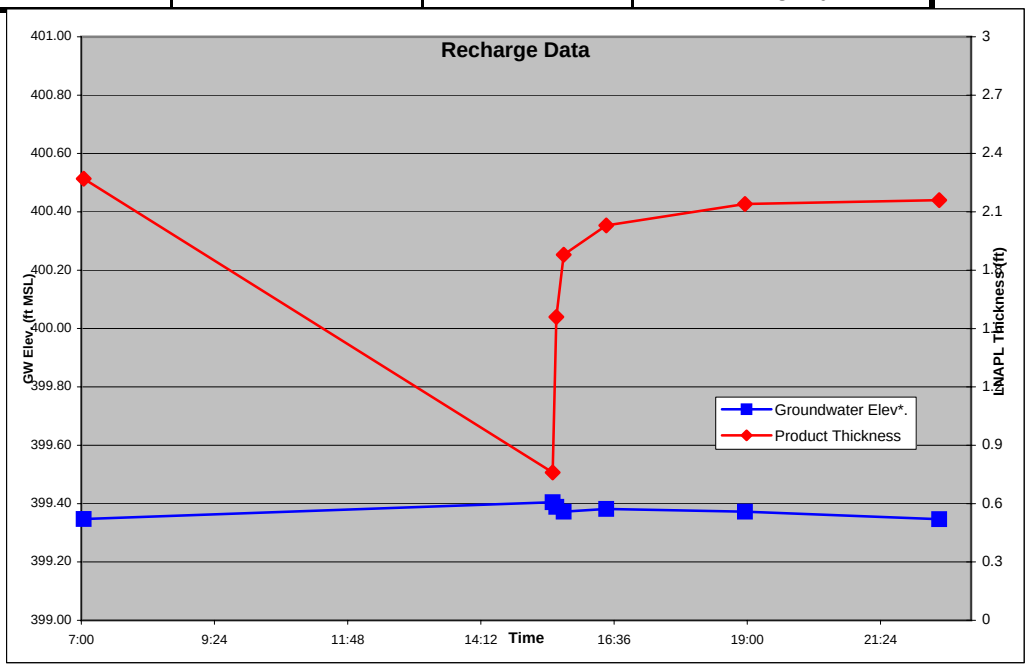
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:03	7:29	8:12	15:29	15:30	15:34	15:42	16:28	18:58	22:28
TOC Elevation	429.44				429.44	429.44	429.44	429.44	429.44	429.44
$DTScreen_{TOC}$	26.86	--	--	--	26.86	26.86	26.86	26.86	26.86	26.86
DTP_{TOC}	29.48	--	--	--	29.83	29.63	29.56	29.51	29.49	29.51
DTW_{TOC}	31.75	--	--	--	30.59	31.19	31.44	31.54	31.63	31.67
Product Thickness	2.27	--	--	--	0.76	1.56	1.88	2.03	2.14	2.16
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	399.35				399.4	399.39	399.37	399.38	399.37	399.35
Stinger $Depth_{TOC}$	30.12	30.12	30.87	31.12						
Stinger Tip Elevation	399.32	399.32	398.57	398.32						
Stinger $Immersion_{DTP}$	0.64	0.64	1.39	1.64						
Stinger Immersion as %**	28.2%	28.2%	61.2%	72.2%						
Stinger $Depth_{CGW}$	0.03									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.86	20.75	21.21
Stinger Vac (in Hg)	18.35	0.95	8.35
Well Flow in scfm	8	3	5.48
Well Casing Vac (in Hg)	0.57	0.01	
Average Hrly HC_{TOT} Rec (gal)			28.43
Hrly LNAPL Rec (gal)			26.45
Hrly Vapor Rec (gal)			1.98
Hrly H2O Rec (gal)			38
LNAPL as % of Total Fluids			42.52%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-44C Date: Thursday, July 28, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.05	343.45	215.2	15.6	230.8

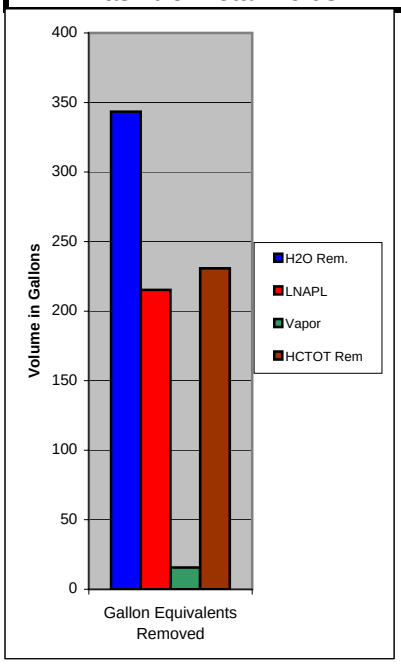
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

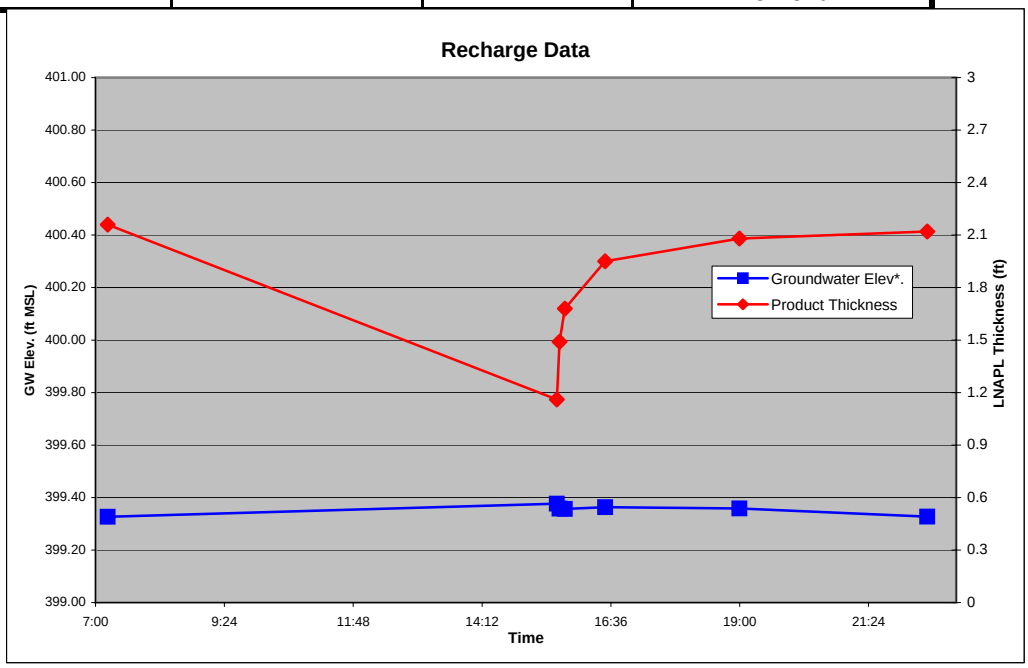
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:14	7:32	8:09	15:35	15:36	15:39	15:45	16:30	19:00	22:30
TOC Elevation	429.44				429.44	429.44	429.44	429.44	429.44	429.44
$DTScreen_{TOC}$	26.86	--	--	--	26.86	26.86	26.86	26.86	26.86	26.86
DTP_{TOC}	29.53	--	--	--	29.75	29.68	29.63	29.55	29.52	29.54
DTW_{TOC}	31.69	--	--	--	30.91	31.17	31.31	31.5	31.6	31.66
Product Thickness	2.16	--	--	--	1.16	1.49	1.68	1.95	2.08	2.12
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	399.33				399.38	399.36	399.36	399.36	399.36	399.33
$Stinger\ Depth_{TOC}$	30.6	30.6	30.85	30.75						
Stinger Tip Elevation	398.84	398.84	398.59	398.69						
$Stinger\ Immersion_{DTP}$	1.07	1.07	1.32	1.22						
Stinger Immersion as %**	49.5%	49.5%	61.1%	56.5%						
$Stinger\ Depth_{CGW}$	0.49									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.86	20.43	20.86
Stinger Vac (in Hg)	12.81	2.21	8.64
Well Flow in scfm	10	2	4.24
Well Casing Vac (in Hg)	0.15	0.03	
Average Hrly HC_{TOT} Rec (gal)			28.67
Hrly LNAPL Rec (gal)			26.73
Hrly Vapor Rec (gal)			1.94
Hrly H2O Rec (gal)			43
LNAPL as % of Total Fluids			40.19%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-44C Date: Friday, July 29, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
7.90	473.7	205.1	14.9	220

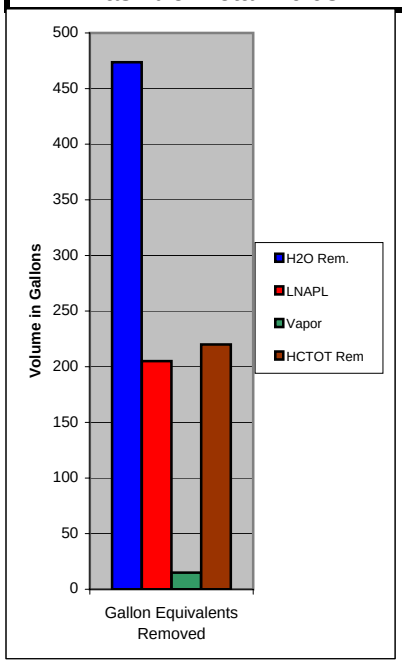
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

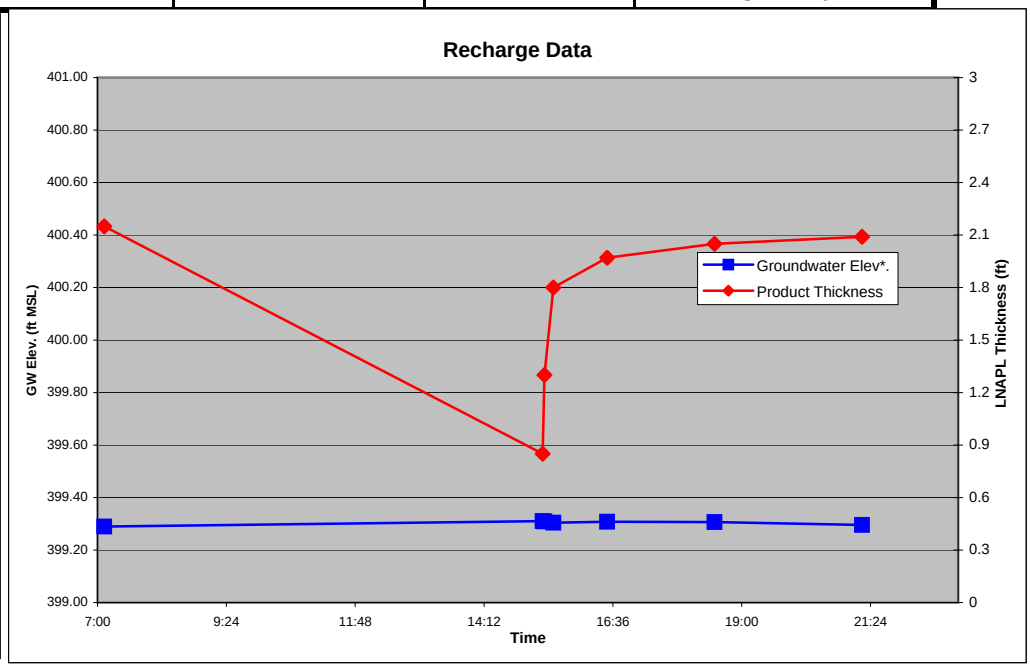
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:08	7:21	8:00	15:15	15:18	15:20	15:30	16:30	18:30	21:15
TOC Elevation	429.44				429.44	429.44	429.44	429.44	429.44	429.44
$DTScreen_{TOC}$	26.86	--	--	--	26.86	26.86	26.86	26.86	26.86	26.86
DTP_{TOC}	29.57	--	--	--	29.9	29.78	29.65	29.6	29.58	29.58
DTW_{TOC}	31.72	--	--	--	30.75	31.08	31.45	31.57	31.63	31.67
Product Thickness	2.15	--	--	--	0.85	1.3	1.8	1.97	2.05	2.09
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	399.29				399.31	399.31	399.3	399.31	399.31	399.3
$Stinger\ Depth_{TOC}$	30.35	30.35	30.85	31.1						
Stinger Tip Elevation	399.09	399.09	398.59	398.34						
$Stinger\ Immersion_{DTP}$	0.78	0.78	1.28	1.53						
Stinger Immersion as %**	36.3%	36.3%	59.5%	71.2%						
$Stinger\ Depth_{CGW}$	0.20									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.86	20.59	20.94
Stinger Vac (in Hg)	16.61	2.06	9.13
Well Flow in scfm	9	2	3.9
Well Casing Vac (in Hg)	0.29	0.07	
Average Hrly HC_{TOT} Rec (gal)			27.85
Hrly LNAPL Rec (gal)			25.96
Hrly Vapor Rec (gal)			1.89
Hrly H2O Rec (gal)			60
LNAPL as % of Total Fluids			31.71%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-44C Date: Monday, August 01, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.00	104.32	170.34	15.6	185.94

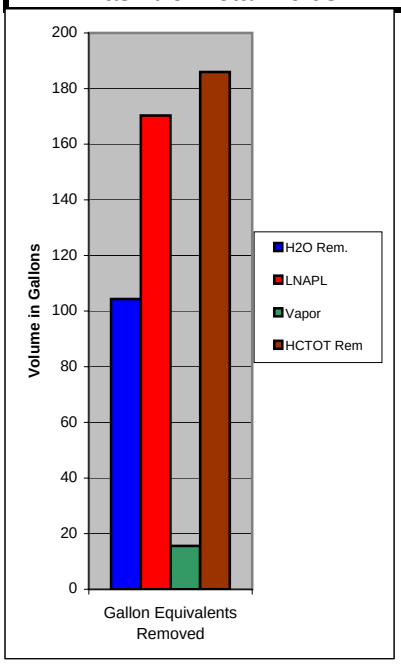
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

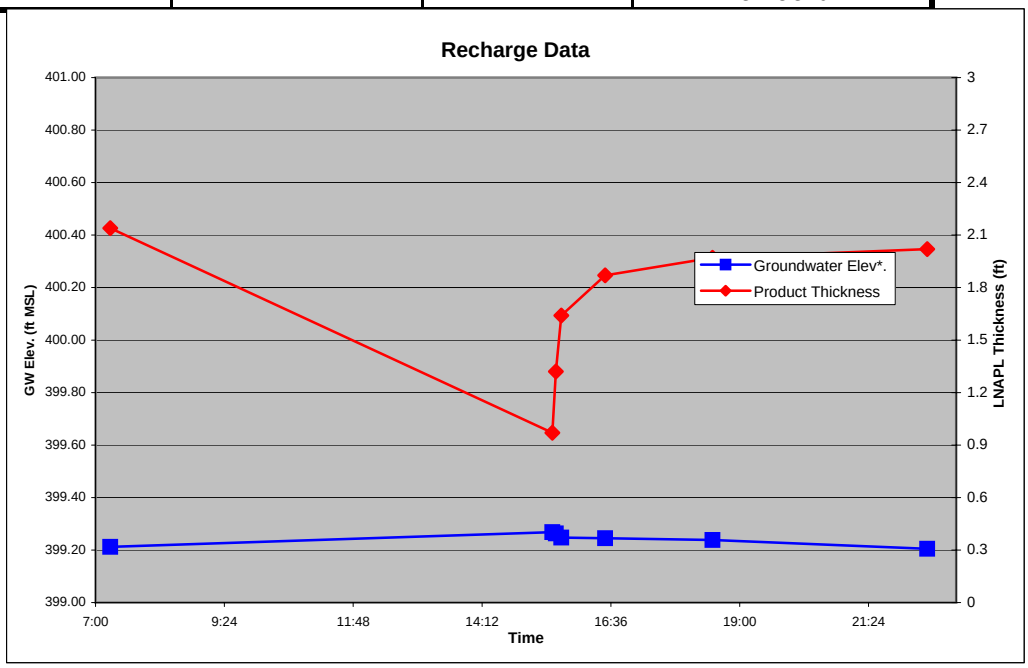
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:17	7:31	8:04	15:31	15:31	15:35	15:41	16:30	18:30	22:30
TOC Elevation	429.44				429.44	429.44	429.44	429.44	429.44	429.44
$DTScreen_{TOC}$	26.86	--	--	--	26.86	26.86	26.86	26.86	26.86	26.86
DTP_{TOC}	29.65	--	--	--	29.91	29.82	29.75	29.69	29.67	29.69
DTW_{TOC}	31.79	--	--	--	30.88	31.14	31.39	31.56	31.64	31.71
Product Thickness	2.14	--	--	--	0.97	1.32	1.64	1.87	1.97	2.02
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	399.21				399.27	399.26	399.25	399.25	399.24	399.2
$Stinger\ Depth_{TOC}$	30.16	30.16	30.61	31.11						
Stinger Tip Elevation	399.28	399.28	398.83	398.33						
$Stinger\ Immersion_{DTP}$	0.51	0.51	0.96	1.46						
Stinger Immersion as %**	23.8%	23.8%	44.9%	68.2%						
$Stinger\ Depth_{CGW}$	-0.07									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.38	20.28	20.64
Stinger Vac (in Hg)	11.55	1.42	7.22
Well Flow in scfm	13	2	3.53
Well Casing Vac (in Hg)	0.72	0.08	
Average Hrly HC_{TOT} Rec (gal)			23.24
Hrly LNAPL Rec (gal)			21.29
Hrly Vapor Rec (gal)			1.95
Hrly H2O Rec (gal)			13
LNAPL as % of Total Fluids			64.06%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-44C Date: Tuesday, August 02, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.00	68.8	172.23	15.8	188.03

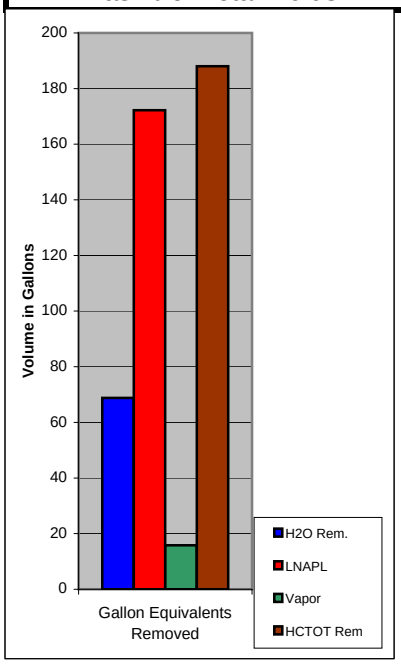
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

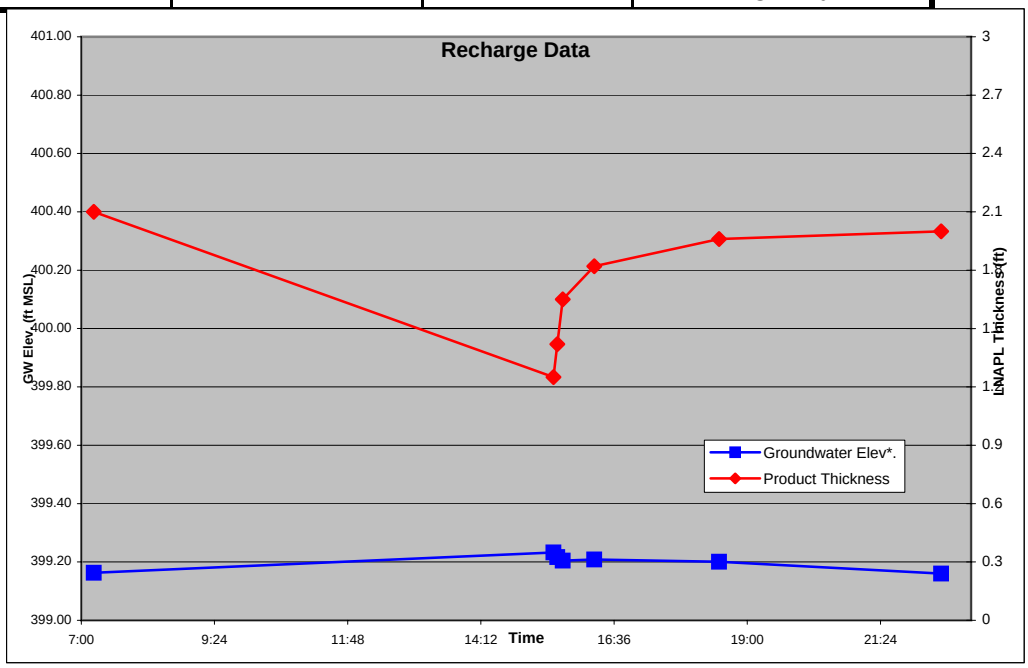
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:14	7:30	9:32	15:30	15:31	15:35	15:41	16:15	18:30	22:30
TOC Elevation	429.44				429.44	429.44	429.44	429.44	429.44	429.44
$DTScreen_{TOC}$	26.86	--	--	--	26.86	26.86	26.86	26.86	26.86	26.86
DTP_{TOC}	29.71	--	--	--	29.87	29.84	29.79	29.74	29.71	29.74
DTW_{TOC}	31.81	--	--	--	31.12	31.26	31.44	31.56	31.67	31.74
Product Thickness	2.1	--	--	--	1.25	1.42	1.65	1.82	1.96	2
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	399.16				399.23	399.22	399.2	399.21	399.2	399.16
$Stinger\ Depth_{TOC}$	30.35	30.35	30.85	30.85						
Stinger Tip Elevation	399.09	399.09	398.59	398.59						
$Stinger\ Immersion_{DTP}$	0.64	0.64	1.14	1.14						
Stinger Immersion as %**	30.5%	30.5%	54.3%	54.3%						
$Stinger\ Depth_{CGW}$	0.07									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.38	20.4	20.72
Stinger Vac (in Hg)	9.41	5.59	6.37
Well Flow in scfm	6	2	3
Well Casing Vac (in Hg)	0.66	0.24	
Average Hrly HC_{TOT} Rec (gal)			23.50
Hrly LNAPL Rec (gal)			21.53
Hrly Vapor Rec (gal)			1.98
Hrly H2O Rec (gal)			9
LNAPL as % of Total Fluids			73.21%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-44C Date: Wednesday, August 03, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.00	75.25	186.5	15.5	202

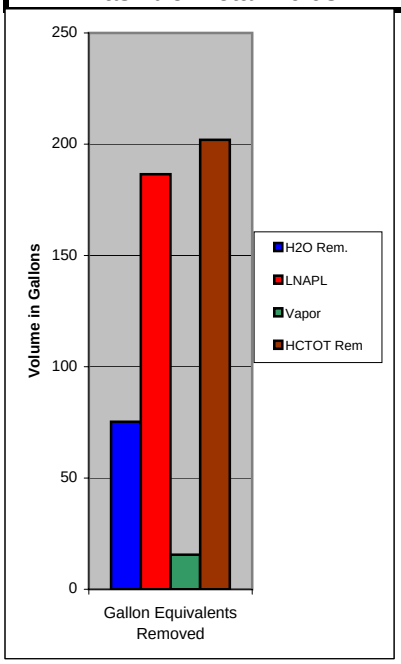
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

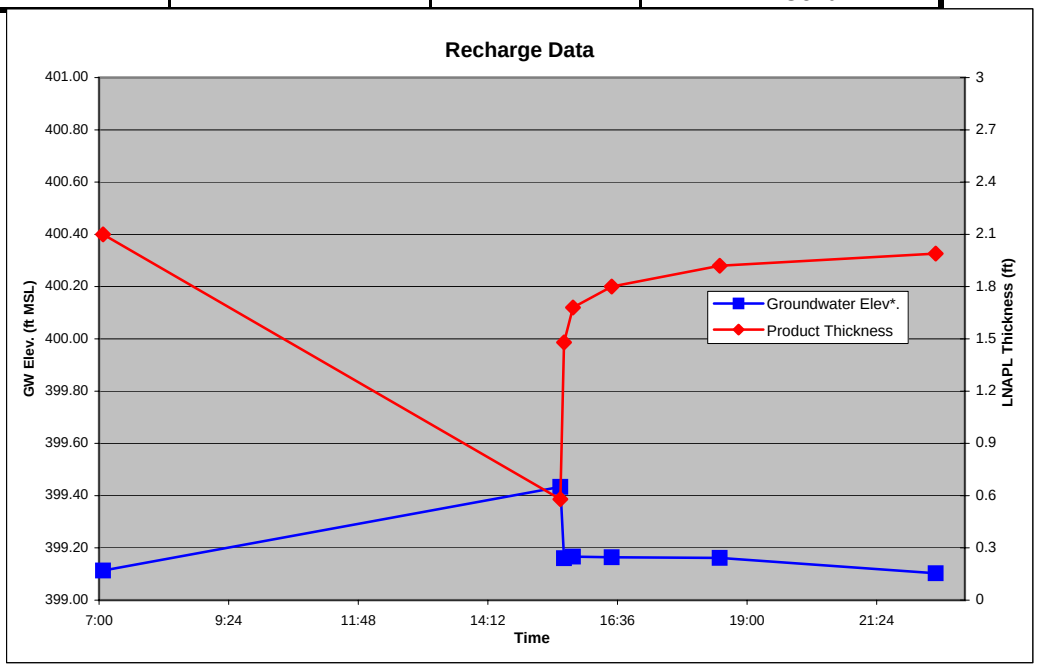
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:05	7:32	8:07	15:32	15:33	15:37	15:47	16:30	18:30	22:30
TOC Elevation	429.44				429.44	429.44	429.44	429.44	429.44	429.44
$DTScreen_{TOC}$	26.86	--	--	--	26.86	26.86	26.86	26.86	26.86	26.86
DTP_{TOC}	29.76	--	--	--	29.85	29.88	29.82	29.79	29.76	29.8
DTW_{TOC}	31.86	--	--	--	30.43	31.36	31.5	31.59	31.68	31.79
Product Thickness	2.1	--	--	--	0.58	1.48	1.68	1.8	1.92	1.99
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	399.11				399.43	399.16	399.17	399.16	399.16	399.1
Stinger $Depth_{TOC}$	30.26	30.26	30.61	30.86						
Stinger Tip Elevation	399.18	399.18	398.83	398.58						
Stinger $Immersion_{DTP}$	0.5	0.5	0.85	1.1						
Stinger Immersion as %**	23.8%	23.8%	40.5%	52.4%						
Stinger $Depth_{CGW}$	-0.07									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.23	19.8	20.4
Stinger Vac (in Hg)	15.82	0.47	6.79
Well Flow in scfm	9	2	2.67
Well Casing Vac (in Hg)	0.75	0.12	
Average Hrly HC_{TOT} Rec (gal)			25.25
Hrly LNAPL Rec (gal)			23.31
Hrly Vapor Rec (gal)			1.94
Hrly H2O Rec (gal)			9
LNAPL as % of Total Fluids			72.86%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-44C Date: Thursday, August 04, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.00	34.44	173.1	15.2	188.3

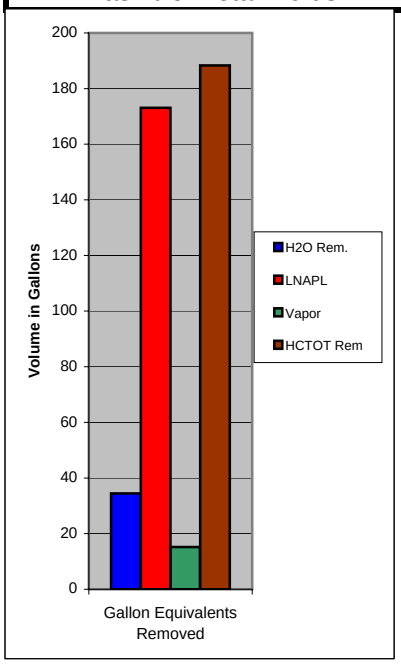
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

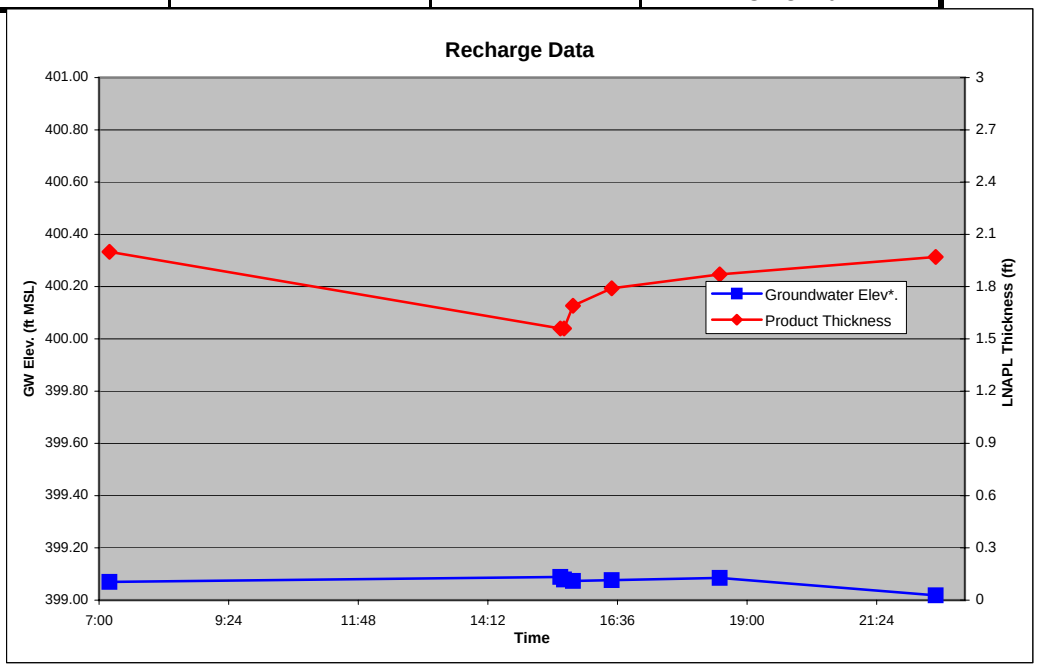
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:12	7:32	7:50	15:32	15:33	15:37	15:47	16:30	18:30	22:30
TOC Elevation	429.44				429.44	429.44	429.44	429.44	429.44	429.44
$DTScreen_{TOC}$	26.86	--	--	--	26.86	26.86	26.86	26.86	26.86	26.86
DTP_{TOC}	29.83	--	--	--	29.93	29.94	29.91	29.88	29.85	29.89
DTW_{TOC}	31.83	--	--	--	31.49	31.5	31.6	31.67	31.72	31.86
Product Thickness	2	--	--	--	1.56	1.56	1.69	1.79	1.87	1.97
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	399.07				399.09	399.08	399.07	399.08	399.09	399.02
Stinger $Depth_{TOC}$	30.3	30.3	30.55	30.55						
Stinger Tip Elevation	399.14	399.14	398.89	398.89						
Stinger $Immersion_{DTP}$	0.47	0.47	0.72	0.72						
Stinger Immersion as %**	23.5%	23.5%	36.0%	36.0%						
Stinger $Depth_{CGW}$	-0.07									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.54	20.43	20.77
Stinger Vac (in Hg)	12.34	0.95	6.52
Well Flow in scfm	10	2	2.96
Well Casing Vac (in Hg)	0.85	0.32	
Average Hrly HC_{TOT} Rec (gal)			23.54
Hrly LNAPL Rec (gal)			21.64
Hrly Vapor Rec (gal)			1.90
Hrly H2O Rec (gal)			4
LNAPL as % of Total Fluids			84.54%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-44C Date: Friday, August 05, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.00	23.16	180.42	15.4	195.82

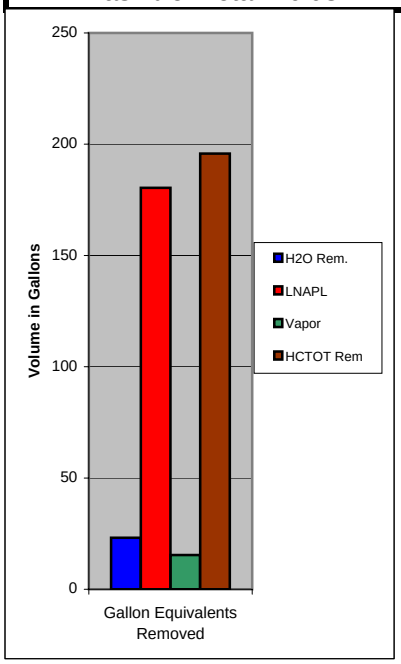
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

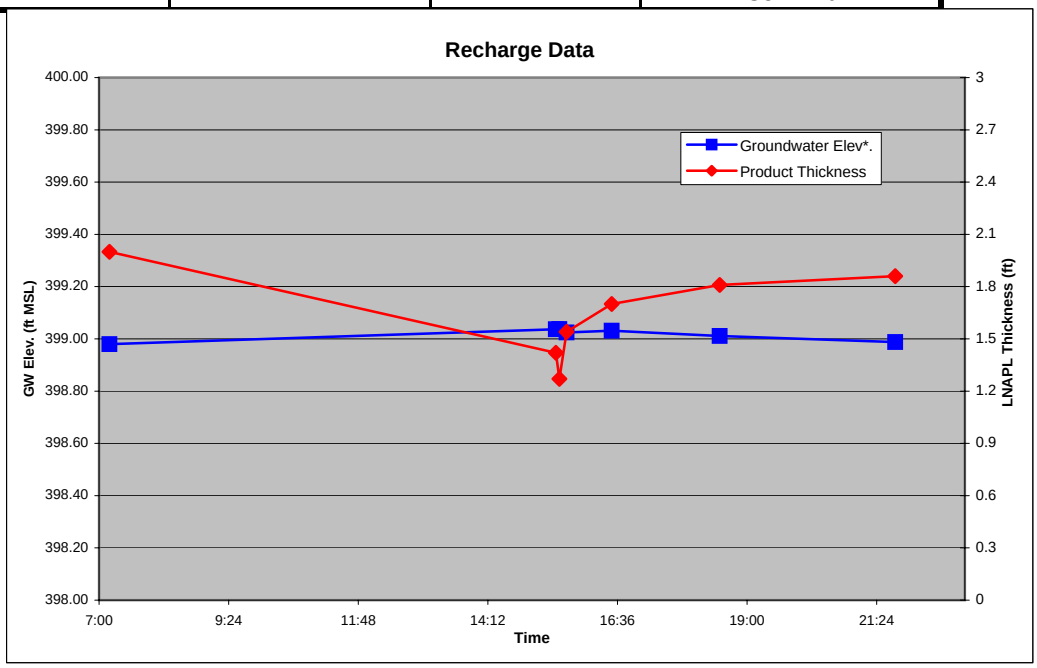
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:12	7:27	12:06	15:27	15:28	15:32	15:40	16:30	18:30	21:45
TOC Elevation	429.44				429.44	429.44	429.44	429.44	429.44	429.44
$DTScreen_{TOC}$	26.86	--	--	--	26.86	26.86	26.86	26.86	26.86	26.86
DTP_{TOC}	29.92	--	--	--	30.02	30.06	30	29.95	29.94	29.95
DTW_{TOC}	31.92	--	--	--	31.44	31.33	31.54	31.65	31.75	31.81
Product Thickness	2	--	--	--	1.42	1.27	1.54	1.7	1.81	1.86
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	398.98				399.04	399.04	399.02	399.03	399.01	398.99
Stinger $Depth_{TOC}$	30.53	30.53	30.53	30.53						
Stinger Tip Elevation	398.91	398.91	398.91	398.91						
Stinger $Immersion_{DTP}$	0.61	0.61	0.61	0.61						
Stinger Immersion as %**	30.5%	30.5%	30.5%	30.5%						
Stinger $Depth_{CGW}$	0.07									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.86	20.91	21.21
Stinger Vac (in Hg)	18.51	2.85	6.72
Well Flow in scfm	11	3	4.3
Well Casing Vac (in Hg)	0.97	0.42	
Average Hrly HC_{TOT} Rec (gal)			24.48
Hrly LNAPL Rec (gal)			22.55
Hrly Vapor Rec (gal)			1.93
Hrly H_2O Rec (gal)			3
LNAPL as % of Total Fluids			89.42%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-44C Date: Monday, August 08, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.00	3.04	196.54	15.7	212.24

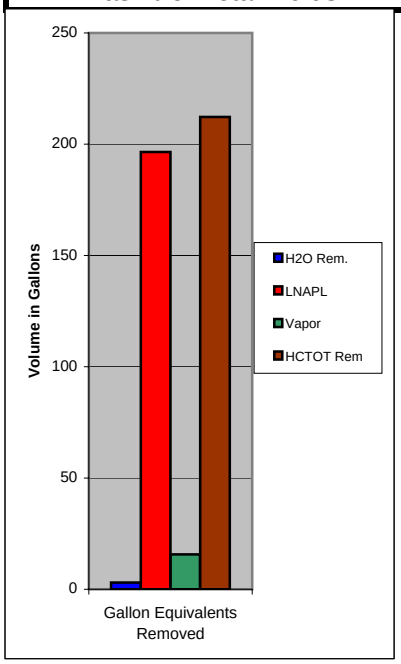
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

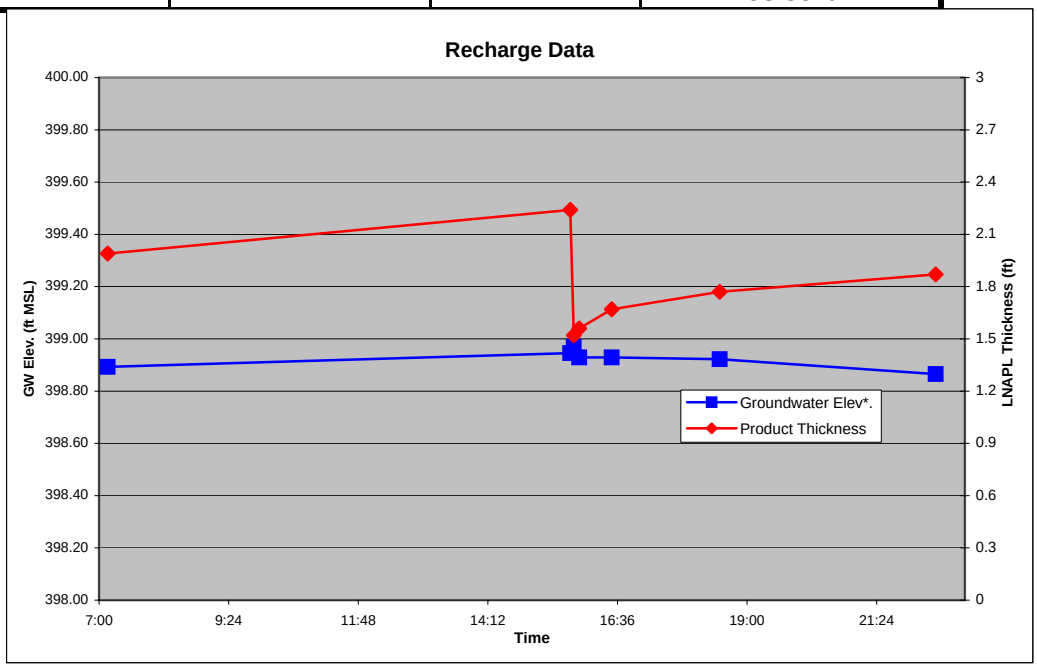
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:10	7:43	12:15	15:43	15:44	15:48	15:54	16:30	18:30	22:30
TOC Elevation	429.44				429.44	429.44	429.44	429.44	429.44	429.44
$DTScreen_{TOC}$	26.86	--	--	--	26.86	26.86	26.86	26.86	26.86	26.86
DTP_{TOC}	30.01	--	--	--	29.89	30.06	30.09	30.06	30.04	30.07
DTW_{TOC}	32	--	--	--	32.13	31.58	31.65	31.73	31.81	31.94
Product Thickness	1.99	--	--	--	2.24	1.52	1.56	1.67	1.77	1.87
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	398.89				398.95	398.97	398.93	398.93	398.92	398.87
$Stinger\ Depth_{TOC}$	30.75	30.75	30.75	30.75						
Stinger Tip Elevation	398.69	398.69	398.69	398.69						
$Stinger\ Immersion_{DTP}$	0.74	0.74	0.74	0.74						
Stinger Immersion as %**	37.2%	37.2%	37.2%	37.2%						
$Stinger\ Depth_{CGW}$	0.20									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.54	20.12	20.5
Stinger Vac (in Hg)	10.28	2.69	6.54
Well Flow in scfm	11	2	2.76
Well Casing Vac (in Hg)	1.18	0.82	
Average Hrly HC_{TOT} Rec (gal)			26.53
Hrly LNAPL Rec (gal)			24.57
Hrly Vapor Rec (gal)			1.96
Hrly H2O Rec (gal)			0
LNAPL as % of Total Fluids			98.59%





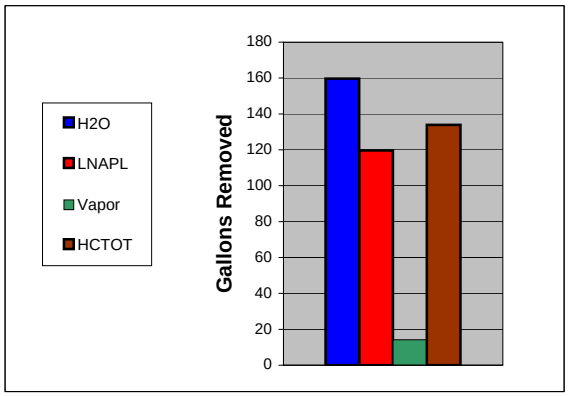
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-44C Date: Friday, November 04, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
8.00	159.71	119.69	14.2	133.89

LNAPL Type	G_s
Gasoline	0.7641



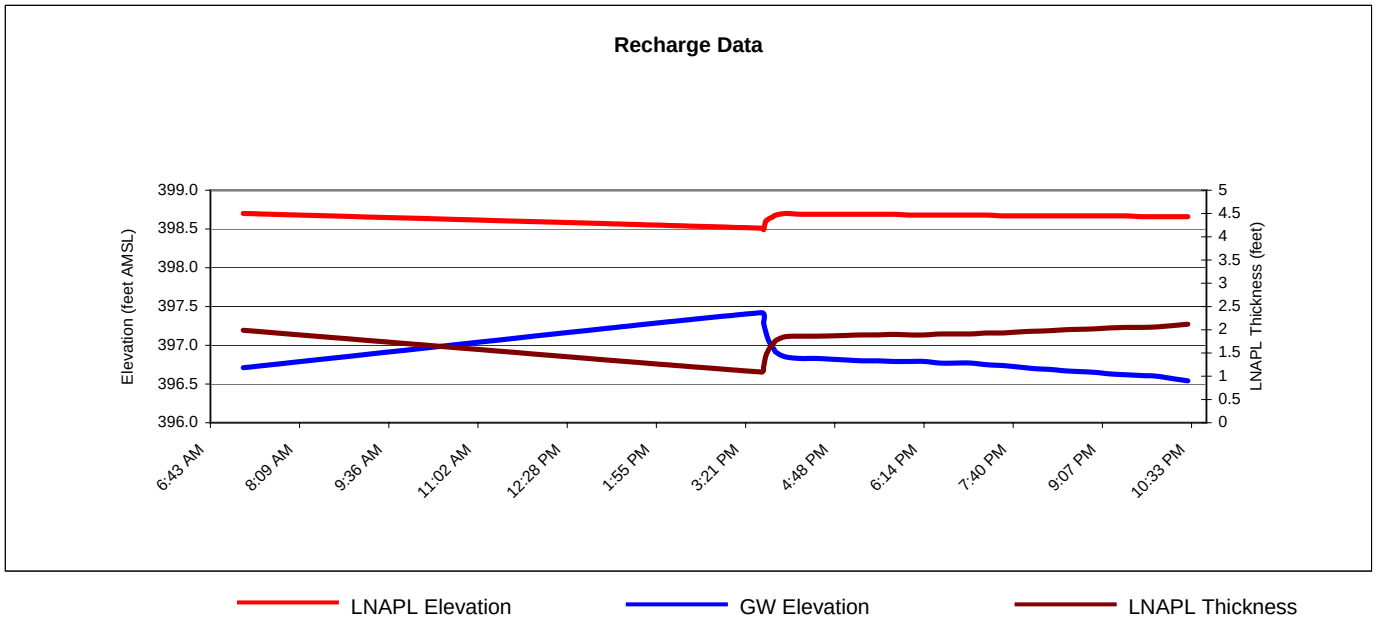
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	21.38	20.12	20.34
Stinger Vac (in Hg)	15.66	4.90	8.33
Well Flow in scfm	11	4	7.84
Well Casing Vac (in Hg)	0.35	0.11	0.26
Average Hrly HC_{TOT} Rec (gal)			16.74
Hrly LNAPL Rec (gal)			14.96
Hrly Vapor Rec (gal)			1.77
Hrly H_2O Rec (gal)			19.96
LNAPL as % of Total Fluids			45.6%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		7:15	7:36	8:15	9:45	10:45	12:45	14:15	15:36
TOC Elevation		429.44							
$DTScreen_{TOC}$		26.86	--	--	--	--	--	--	--
DTP_{TOC}		30.74	--	--	--	--	--	--	--
DTW_{TOC}		32.73	--	--	--	--	--	--	--
Product Thickness		1.99	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		N	--	--	--	--	--	--	--
Groundwater Elev*.		398.23							
Stinger $Depth_{TOC}$		30.81	30.81	30.81	30.56	30.31	30.31	30.31	30.31
Stinger Tip Elevation		398.63	398.63	398.63	398.88	399.13	399.13	399.13	399.13
Stinger $Immersion_{DTP}$		0.07	0.07	0.07	-0.18	-0.43	-0.43	-0.43	-0.43
Stinger Immersion as %**		3.5%	3.5%	3.5%	-9.0%	-21.6%	-21.6%	-21.6%	-21.6%
St. $Imm._{CGW}$	ADV %	-0.40	20%	10%	10%	15%	10%	10%	10%
Well Casing Vac (in Hg)		---	---	1.5	3.8	3.4	4.55	4.25	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-48C Date: 5/20/05 Day: Friday Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
6.75	516	9	2.5	11.5

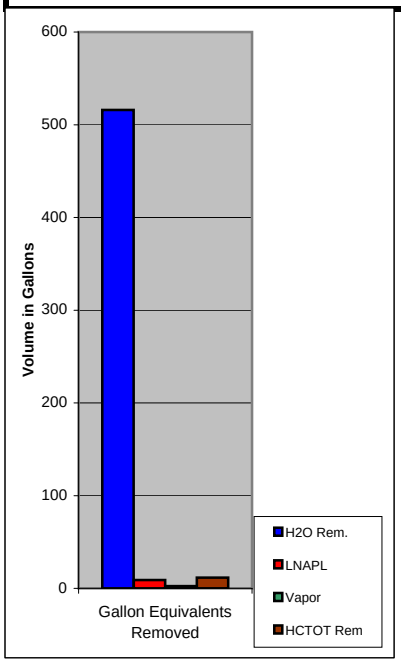
	LNAPL Type	G_s
	Gasoline	0.73
X	Diesel	0.85
	Specify Other	

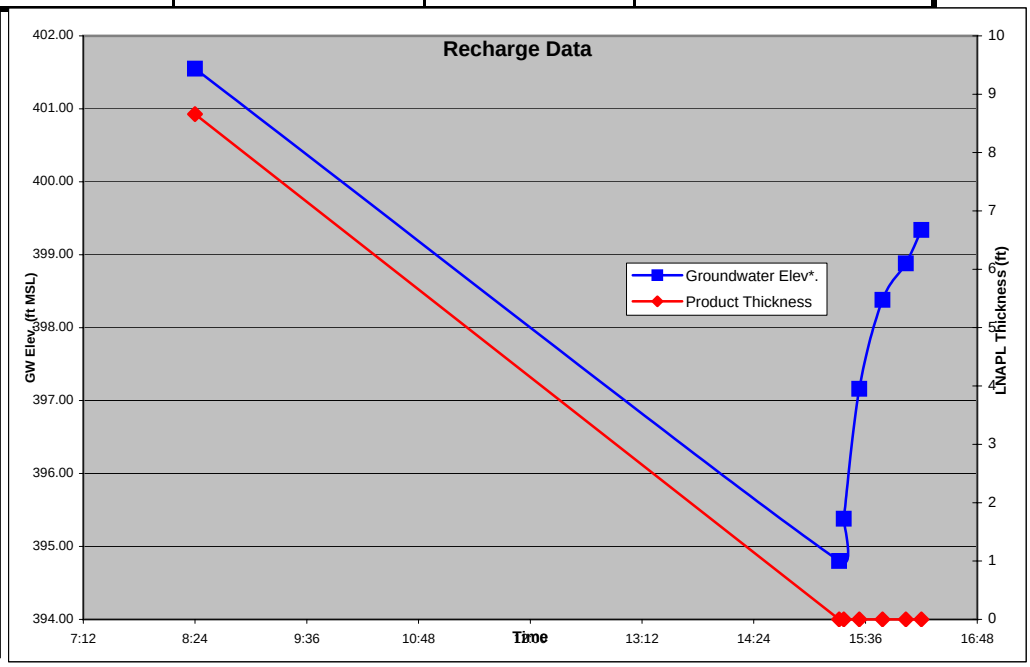
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	8:24	8:33	12:30	15:18	15:19	15:22	15:32	15:47	16:02	16:12
TOC Elevation	429.10				429.10	429.10	429.10	429.10	429.10	429.10
$DTScreen_{TOC}$	31.76	--	--	--	31.76	31.76	31.76	31.76	31.76	31.76
DTP_{TOC}	26.25	--	--	--						
DTW_{TOC}	34.91	--	--	--	34.3	33.72	31.94	30.72	30.22	29.76
Product Thickness	8.66	--	--	--	0	0	0	0	0	0
Fluid Above Screen (Y/N)	Y	--	--	--	N	N	N	Y	Y	Y
Groundwater Elev*.	401.55				394.8	395.38	397.16	398.38	398.88	399.34
$Stinger\ Depth_{TOC}$	29.3	29.3	35.8	35.8						
$Stinger\ Immersion_{DTP}$	3.05	3.05	9.55	9.55						
Stinger Immersion as %**	35.2%	35.2%	110.3%	110.3%						
$Stinger\ Depth_{CGW}$	1.75									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.54	20.75	20.97
Stinger Vac (in Hg)	18.19	4.9	17.42
Well Flow in scfm	34	11	19.41
Well Casing Vac (in Hg)	9.41	6.18	
Average Hrly HC_{TOT} Rec (gal)			1.70
Hrly LNAPL Rec (gal)			1.33
Hrly Vapor Rec (gal)			0.37
Hrly H2O Rec (gal)			76
LNAPL as % of Total Fluids			2.18%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-48C Date: 6/6/05 Day: Monday Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
7.98	269.5	2	7	9

Note: HVR Test Extracting also from HMW-48B

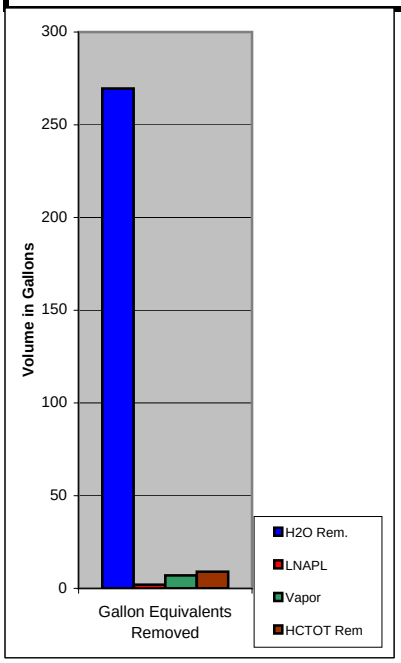
	LNAPL Type	G_s
	Gasoline	0.73
X	Diesel	0.85
	Specify Other	

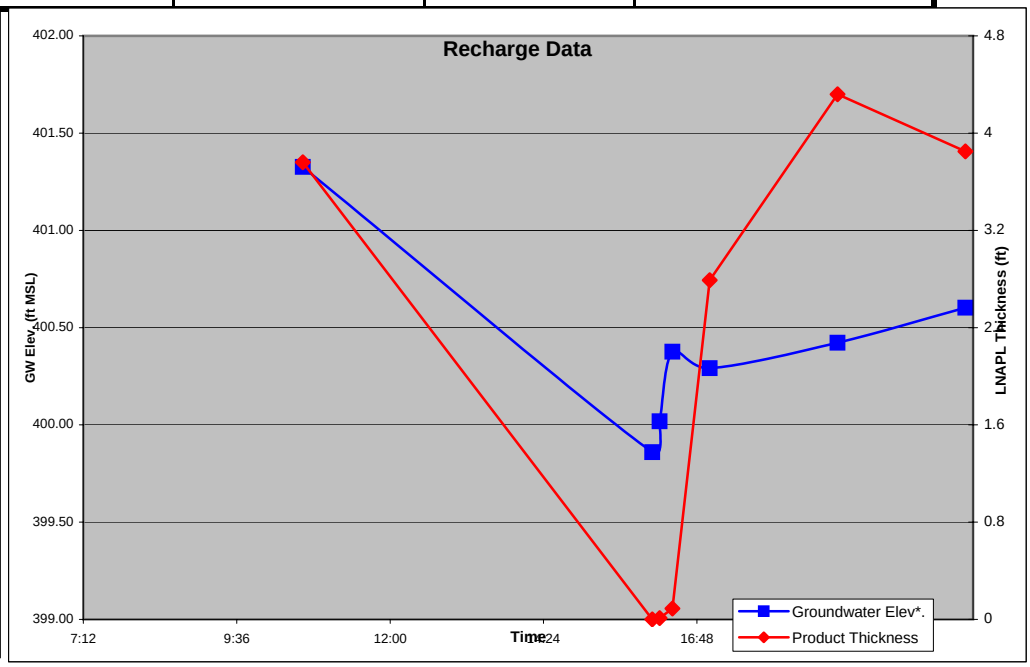
Gauging (ft)	**Pre-Test**	START **OPERATING**		END	**RECHARGE**					
Time (24 hour clock)	10:38	10:41	10:59	16:05	16:06	16:13	16:25	17:00	19:00	21:00
TOC Elevation	429.10				429.10	429.10	429.10	429.10	429.10	429.10
$DTScreen_{TOC}$	31.76	--	--	--	31.76	31.76	31.76	31.76	31.76	31.76
DTP_{TOC}	27.21	--	--	--		29.08	28.71	28.39	28.03	27.92
DTW_{TOC}	30.97	--	--	--	29.24	29.09	28.8	31.18	32.35	31.77
Product Thickness	3.76	--	--	--	0	0.01	0.09	2.79	4.32	3.85
Fluid Above Screen (Y/N)	Y	--	--	--	Y	Y	Y	Y	Y	Y
Groundwater Elev*.	401.33				399.86	400.02	400.38	400.29	400.42	400.6
$Stinger\ Depth_{TOC}$	27.69	27.69	29.44	29.44						
$Stinger\ Immersion_{DTP}$	0.48	0.48	2.23	2.23						
Stinger Immersion as %**	12.8%	12.8%	59.3%	59.3%						
$Stinger\ Depth_{CGW}$	-0.08									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	**Maximum**	**Minimum**	**Mean**
Engine Vac (in Hg)	21.07	19.8	20.17
Stinger Vac (in Hg)	17.4	2.06	11.44
Well Flow in scfm	48	13	43.72
Well Casing Vac (in Hg)	6.57	1.85	
Average Hrly HC_{TOT} Rec (gal)			1.13
Hrly LNAPL Rec (gal)			0.25
Hrly Vapor Rec (gal)			0.88
Hrly H2O Rec (gal)			34
LNAPL as % of Total Fluids			3.23%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-48C Date: Monday, June 20, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
7.67	463	14.8	1.9	16.7

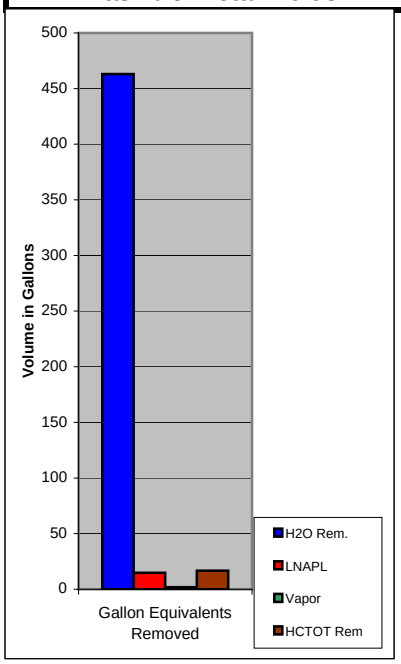
	LNAPL Type	G_s
	Gasoline	0.73
X	Diesel	0.85
	Specify Other	

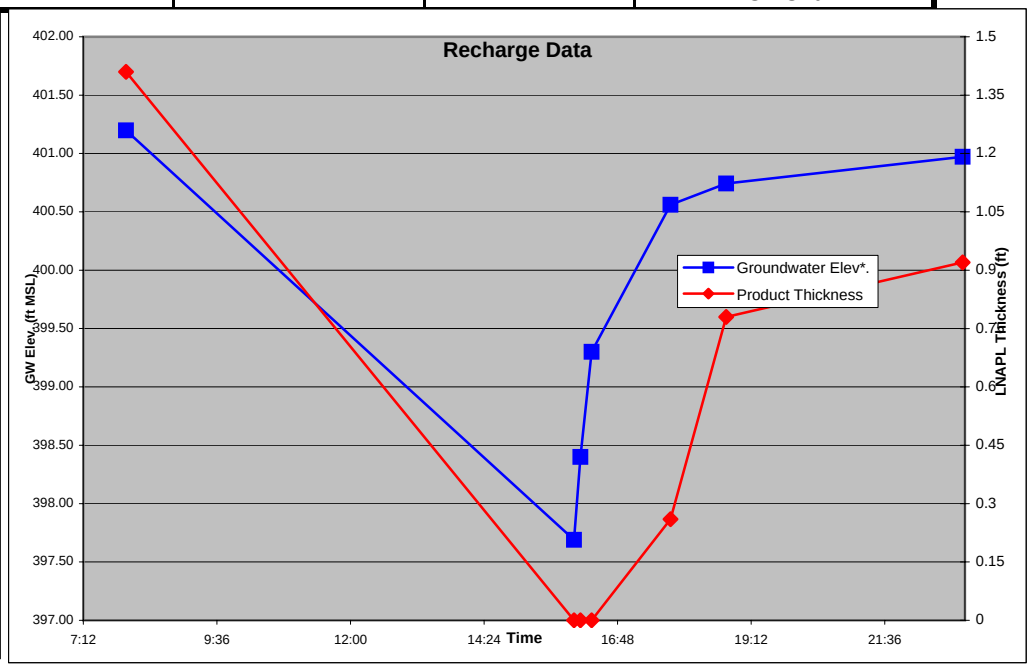
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:58	8:20	8:45	16:00	16:01	16:08	16:20	17:45	18:45	23:00
TOC Elevation	429.1				429.10	429.1	429.1	429.1	429.1	429.1
$DTScreen_{TOC}$	31.76	--	--	--	31.76	31.76	31.76	31.76	31.76	31.76
DTP_{TOC}	27.69	--	--	--				28.5	28.24	27.99
DTW_{TOC}	29.1	--	--	--	31.41	30.7	29.8	28.76	29.02	28.91
Product Thickness	1.41	--	--	--	0	0	0	0.26	0.78	0.92
Fluid Above Screen (Y/N)	Y	--	--	--	Y	Y	Y	Y	Y	Y
Groundwater Elev*.	401.20				397.69	398.4	399.3	400.56	400.74	400.97
Stinger $Depth_{TOC}$	28.9	28.9	27.9	27.4						
Stinger Tip Elevation	400.2	400.2	401.2	401.7						
Stinger $Immersion_{DTP}$	1.21	1.21	0.21	-0.29						
Stinger Immersion as %**	85.8%	85.8%	14.9%	-20.6%						
Stinger $Depth_{CGW}$	1.00									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.7	20.12	20.57
Stinger Vac (in Hg)	17.72	4.11	16.86
Well Flow in scfm	28	5	24.46
Well Casing Vac (in Hg)	11.55	9.34	
Average Hrly HC_{TOT} Rec (gal)			2.18
Hrly LNAPL Rec (gal)			1.93
Hrly Vapor Rec (gal)			0.25
Hrly H_2O Rec (gal)			60
LNAPL as % of Total Fluids			3.48%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-48C Date: Tuesday, June 07, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.00	600.1	30.2	2.7	32.9

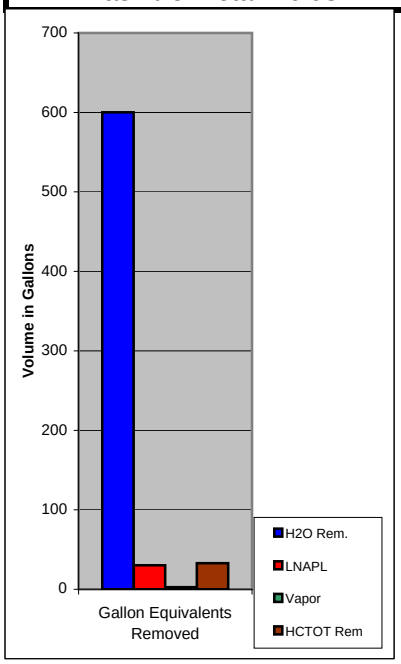
	LNAPL Type	G_s
	Gasoline	0.73
X	Diesel	0.85
	Specify Other	

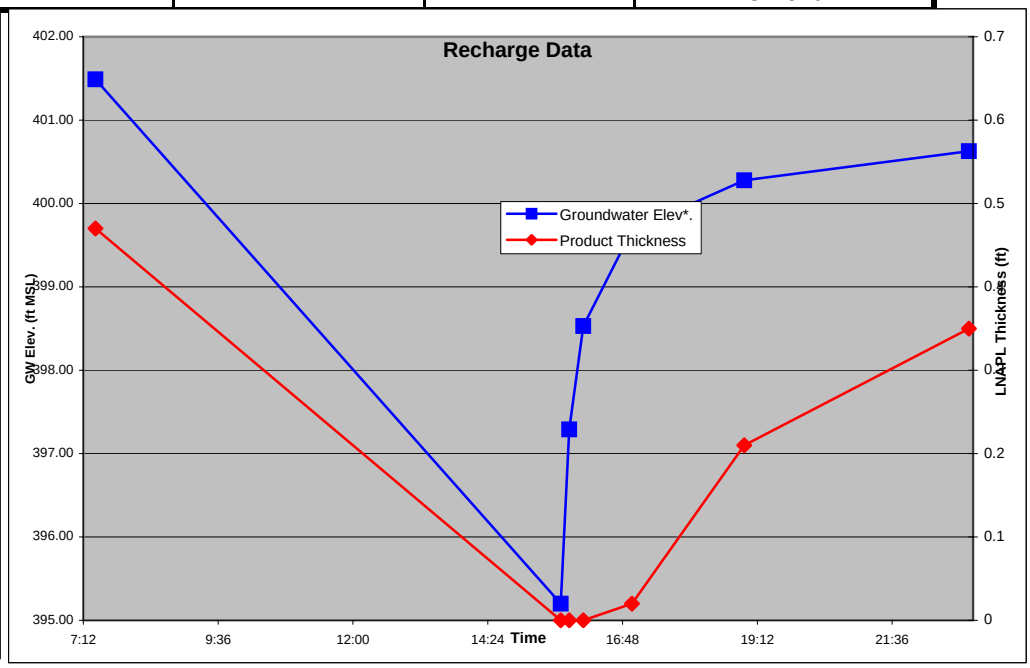
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:25	7:40	7:52	15:40	15:42	15:51	16:06	16:58	18:58	22:58
TOC Elevation	429.1				429.10	429.1	429.1	429.1	429.1	429.1
$DTScreen_{TOC}$	31.76	--	--	--	31.76	31.76	31.76	31.76	31.76	31.76
DTP_{TOC}	27.54	--	--	--				29.42	28.79	28.42
DTW_{TOC}	28.01	--	--	--	33.9	31.81	30.57	29.44	29	28.77
Product Thickness	0.47	--	--	--	0	0	0	0.02	0.21	0.35
Fluid Above Screen (Y/N)	Y	--	--	--	N	N	Y	Y	Y	Y
Groundwater Elev*.	401.49				395.2	397.29	398.53	399.68	400.28	400.63
Stinger $Depth_{TOC}$	27.53	27.53	28.78	32.78						
Stinger Tip Elevation	401.57	401.57	400.32	396.32						
Stinger $Immersion_{DTP}$	-0.01	-0.01	1.24	5.24						
Stinger Immersion as %**	-2.1%	-2.1%	263.8%	1114.9%						
Stinger $Depth_{CGW}$	-0.08									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.54	20.28	20.62
Stinger Vac (in Hg)	18.98	8.38	18.11
Well Flow in scfm	21	9	11.15
Well Casing Vac (in Hg)	10.71	9.63	
Average Hrly HC_{TOT} Rec (gal)			4.11
Hrly LNAPL Rec (gal)			3.78
Hrly Vapor Rec (gal)			0.34
Hrly H2O Rec (gal)			75
LNAPL as % of Total Fluids			5.20%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: HMW-48C Date: Thursday, July 21, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.00	411.7	8.2	2.6	10.8

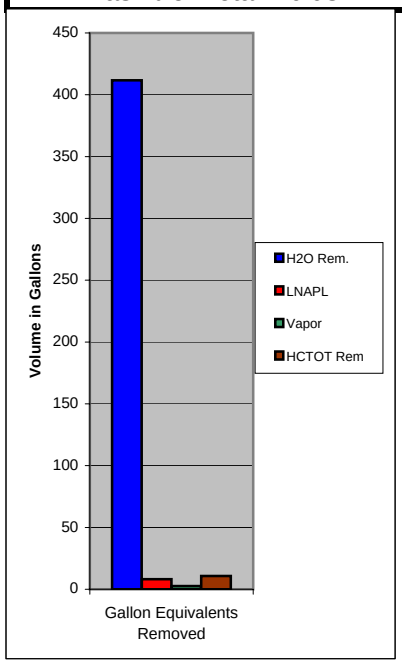
	LNAPL Type	G_s
	Gasoline	0.73
X	Diesel	0.85
	Specify Other	

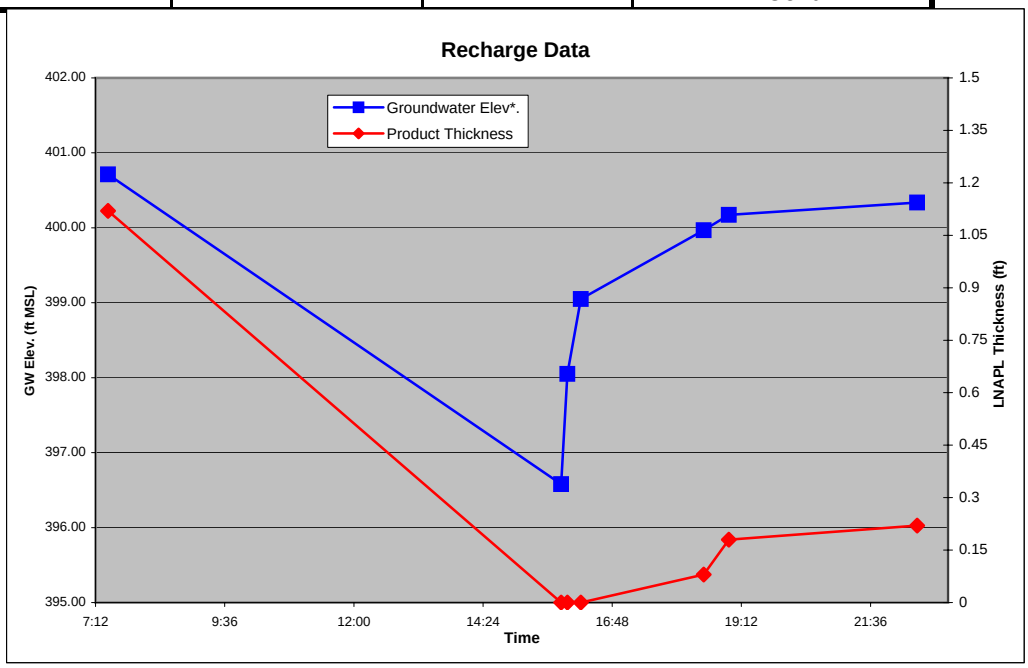
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:26	7:49	7:57	15:49	15:51	15:58	16:13	18:30	18:58	22:28
TOC Elevation	429.1				429.10	429.1	429.1	429.1	429.1	429.1
$DTScreen_{TOC}$	31.76	--	--	--	31.76	31.76	31.76	31.76	31.76	31.76
DTP_{TOC}	28.22	--	--	--				29.12	28.9	28.73
DTW_{TOC}	29.34	--	--	--	32.52	31.05	30.05	29.2	29.08	28.95
Product Thickness	1.12	--	--	--	0	0	0	0.08	0.18	0.22
Fluid Above Screen (Y/N)	Y	--	--	--	N	Y	Y	Y	Y	Y
Groundwater Elev*.	400.71				396.58	398.05	399.05	399.97	400.17	400.34
$Stinger\ Depth_{TOC}$	28.51	28.51	29.16	32.91						
Stinger Tip Elevation	400.59	400.59	399.94	396.19						
$Stinger\ Immersion_{DTP}$	0.29	0.29	0.94	4.69						
Stinger Immersion as %**	25.9%	25.9%	83.9%	418.7%						
$Stinger\ Depth_{CGW}$	0.12									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	31.38	20.12	20.41
Stinger Vac (in Hg)	15.81	5.54	12.06
Well Flow in scfm	34	12	25.14
Well Casing Vac (in Hg)	5.61	1.1	
Average Hrly HC_{TOT} Rec (gal)			1.35
Hrly LNAPL Rec (gal)			1.03
Hrly Vapor Rec (gal)			0.33
Hrly H2O Rec (gal)			51
LNAPL as % of Total Fluids			2.56%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-29D Date: 5/11/05 Day: Wednesday Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
5.98	1644	12	5.2	17.2

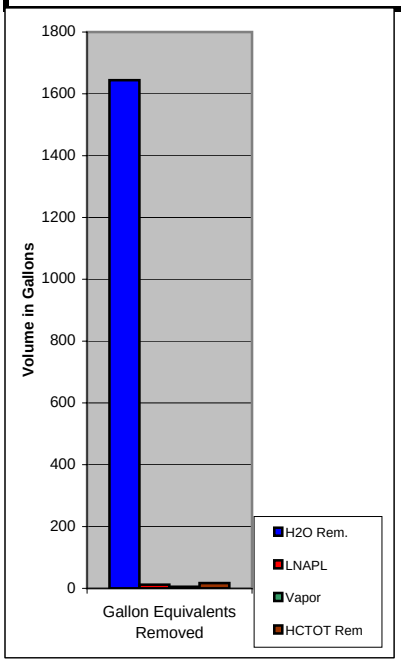
	LNAPL Type	G_s
	Gasoline	0.73
X	Diesel	0.85
	Specify Other	

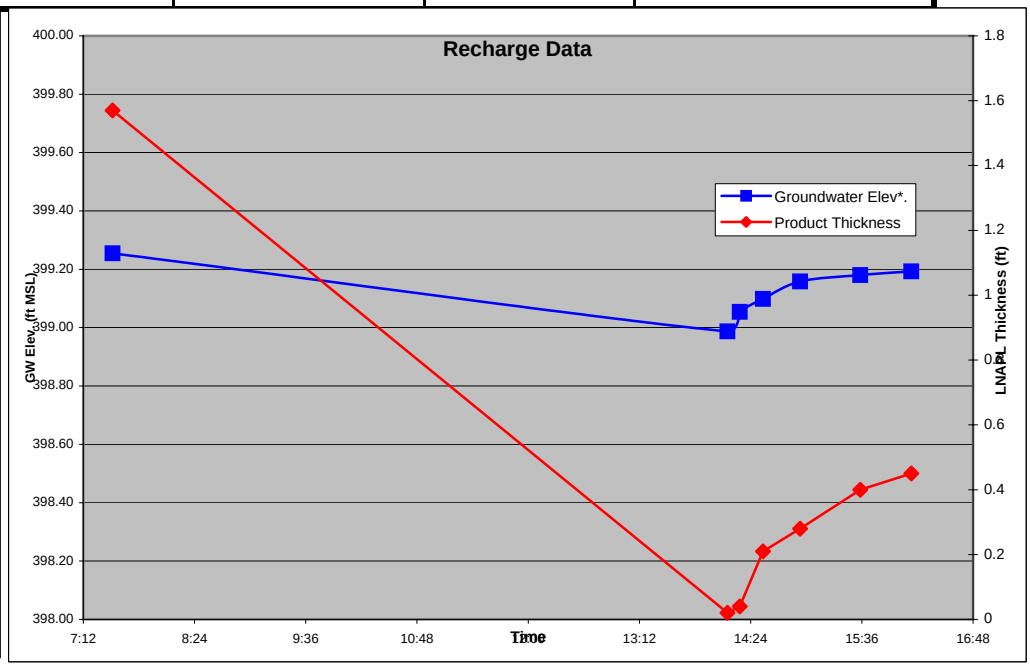
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:31	8:05	8:30	14:00	14:09	14:17	14:32	14:56	15:35	16:08
TOC Elevation	429.47				429.47	429.47	429.47	429.47	429.47	429.47
$DTScreen_{TOC}$	31.23	--	--	--	31.23	31.23	31.23	31.23	31.23	31.23
DTP_{TOC}	29.98	--	--	--	30.48	30.41	30.34	30.27	30.23	30.21
DTW_{TOC}	31.55	--	--	--	30.5	30.45	30.55	30.55	30.63	30.66
Product Thickness	1.57	--	--	--	0.02	0.04	0.21	0.28	0.4	0.45
Fluid Above Screen (Y/N)	N	--	--	--	Y	Y	Y	Y	Y	Y
Groundwater Elev*.	399.25				398.99	399.05	399.1	399.16	399.18	399.19
$Stinger\ Depth_{TOC}$	30.84	30.84	33.09	33.34						
$Stinger\ Immersion_{DTP}$	0.86	0.86	3.11	3.36						
Stinger Immersion as %**	54.8%	54.8%	198.1%	214.0%						
$Stinger\ Depth_{CGW}$	0.62									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.38	3.48	19.4
Stinger Vac (in Hg)	17.56	11.86	15.8
Well Flow in scfm	26	12	22
Well Casing Vac (in Hg)	1.18	0.03	
Average Hrly HC_{TOT} Rec (gal)			2.88
Hrly LNAPL Rec (gal)			2.01
Hrly Vapor Rec (gal)			0.87
Hrly H2O Rec (gal)			275
LNAPL as % of Total Fluids			1.04%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-29D Date: 5/24/05 Day: Tuesday Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
6.5	1383	29.2	6.1	35.3

Note: HVR Test Extracting also from MP-29C

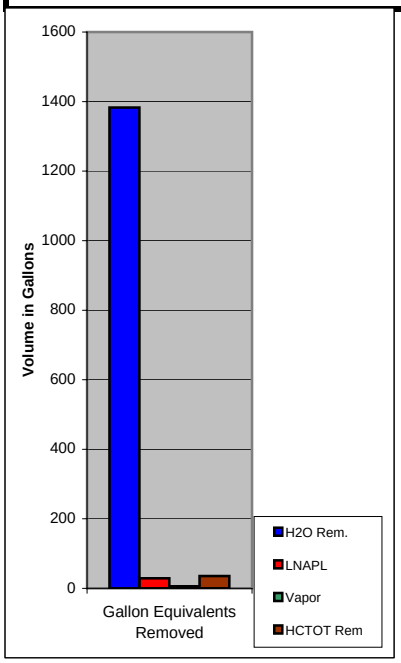
	LNAPL Type	G_s
	Gasoline	0.73
X	Diesel	0.85
	Specify Other	

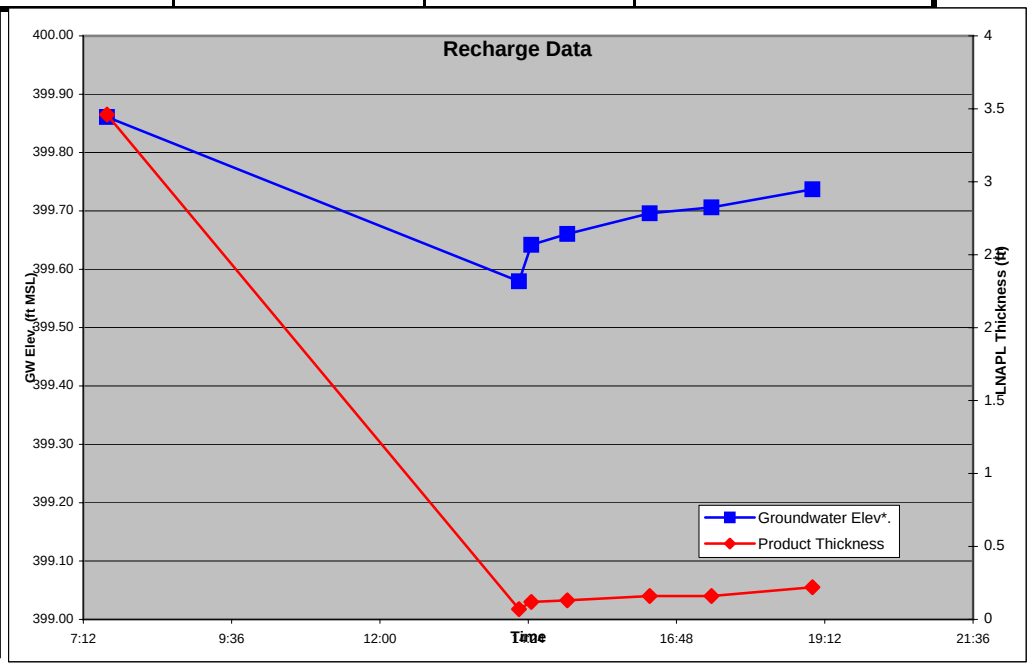
Gauging (ft)	**Pre-Test**	START **OPERATING**		END	**RECHARGE**					
Time (24 hour clock)	7:35	8:00	12:30	14:07	14:15	14:27	15:02	16:22	17:22	19:00
TOC Elevation	429.47				429.47	429.47	429.47	429.47	429.47	429.47
$DTScreen_{TOC}$	31.23	--	--	--	31.23	31.23	31.23	31.23	31.23	31.23
DTP_{TOC}	29.09	--	--	--	29.88	29.81	29.79	29.75	29.74	29.7
DTW_{TOC}	32.55	--	--	--	29.95	29.93	29.92	29.91	29.9	29.92
Product Thickness	3.46	--	--	--	0.07	0.12	0.13	0.16	0.16	0.22
Fluid Above Screen (Y/N)	N	--	--	--	Y	Y	Y	Y	Y	Y
Groundwater Elev*.	399.86				399.58	399.64	399.66	399.7	399.71	399.74
Stinger $Depth_{TOC}$	30.44	30.44	30.44	30.44						
Stinger $Immersion_{DTP}$	1.35	1.35	1.35	1.35						
Stinger Immersion as %**	39.0%	39.0%	39.0%	39.0%						
Stinger $Depth_{CGW}$	0.83									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	**Maximum**	**Minimum**	**Mean**
Engine Vac (in Hg)	21.38	7.44	20.35
Stinger Vac (in Hg)	17.87	3.64	15.8
Well Flow in scfm	44	11	30.47
Well Casing Vac (in Hg)	2.57	0.88	
Average Hrly HC_{TOT} Rec (gal)			5.43
Hrly LNAPL Rec (gal)			4.49
Hrly Vapor Rec (gal)			0.94
Hrly H2O Rec (gal)			213
LNAPL as % of Total Fluids			2.49%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-29D Date: Wednesday, June 08, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
7.73	990.3	92.7	2.5	95.2

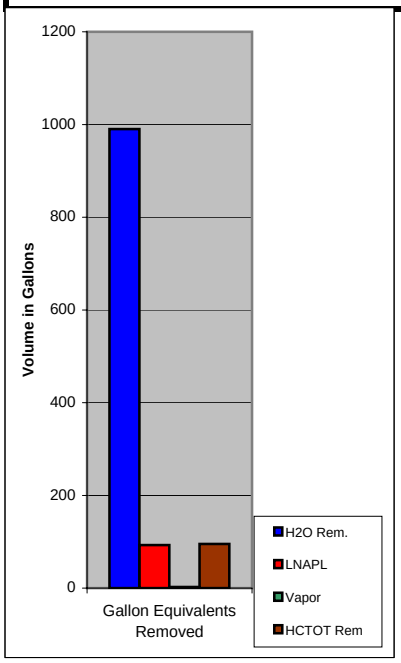
	LNAPL Type	G_s
	Gasoline	0.73
X	Diesel	0.85
	Specify Other	

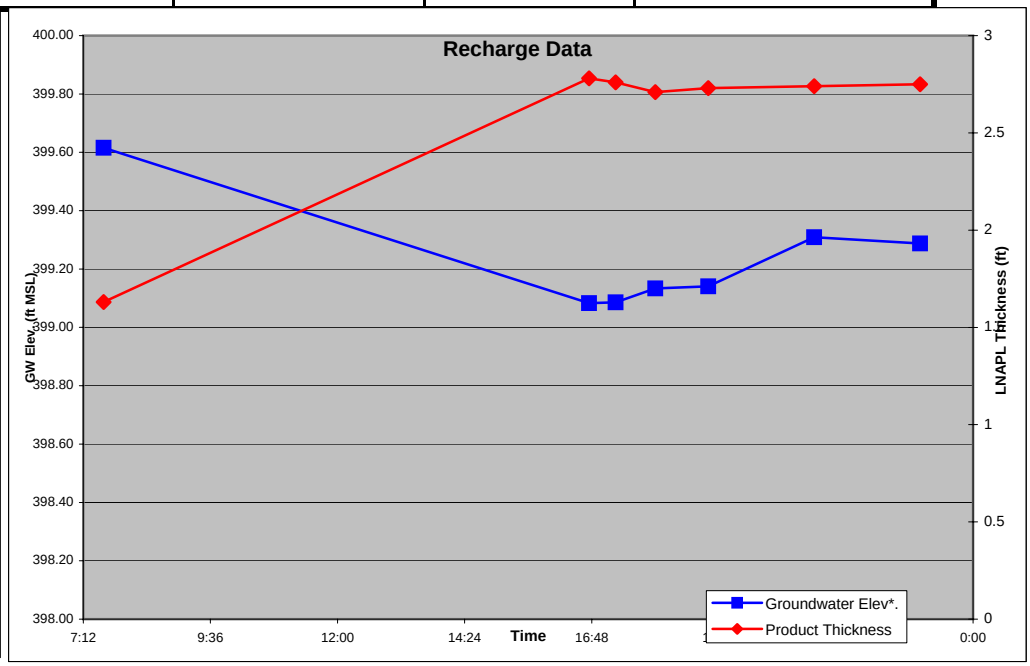
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:35	8:15	11:45	15:59	16:45	17:15	18:00	19:00	21:00	23:00
TOC Elevation	429.47				429.47	429.47	429.47	429.47	429.47	429.47
$DTScreen_{TOC}$	31.23	--	--	--	31.23	31.23	31.23	31.23	31.23	31.23
DTP_{TOC}	29.61	--	--	--	29.97	29.97	29.93	29.92	29.75	29.77
DTW_{TOC}	31.24	--	--	--	32.75	32.73	32.64	32.65	32.49	32.52
Product Thickness	1.63	--	--	--	2.78	2.76	2.71	2.73	2.74	2.75
Fluid Above Screen (Y/N)	Y	--	--	--	Y	Y	Y	Y	Y	Y
Groundwater Elev*.	399.62				399.08	399.09	399.13	399.14	399.31	399.29
Stinger $Depth_{TOC}$	30.85	30.85	28.85	29.35						
Stinger Tip Elevation	398.62	398.62	400.62	400.12						
Stinger $Immersion_{DTP}$	1.24	1.24	-0.76	-0.26						
Stinger Immersion as %**	76.1%	76.1%	-46.6%	-16.0%						
Stinger $Depth_{CGW}$	1.00									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.38	5.23	19.83
Stinger Vac (in Hg)	18.35	0.32	14.47
Well Flow in scfm	51	2	38.84
Well Casing Vac (in Hg)	3.38	1.1	
Average Hrly HC_{TOT} Rec (gal)			12.31
Hrly LNAPL Rec (gal)			11.99
Hrly Vapor Rec (gal)			0.32
Hrly H2O Rec (gal)			128
LNAPL as % of Total Fluids			8.77%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-29D Date: Wednesday, June 22, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
7.97	1193.04	8.33	3.3	11.63

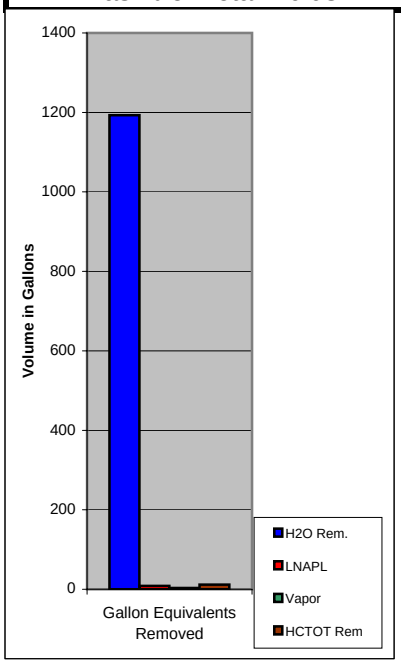
	LNAPL Type	G_s
	Gasoline	0.73
x	Diesel	0.85
	Specify Other	

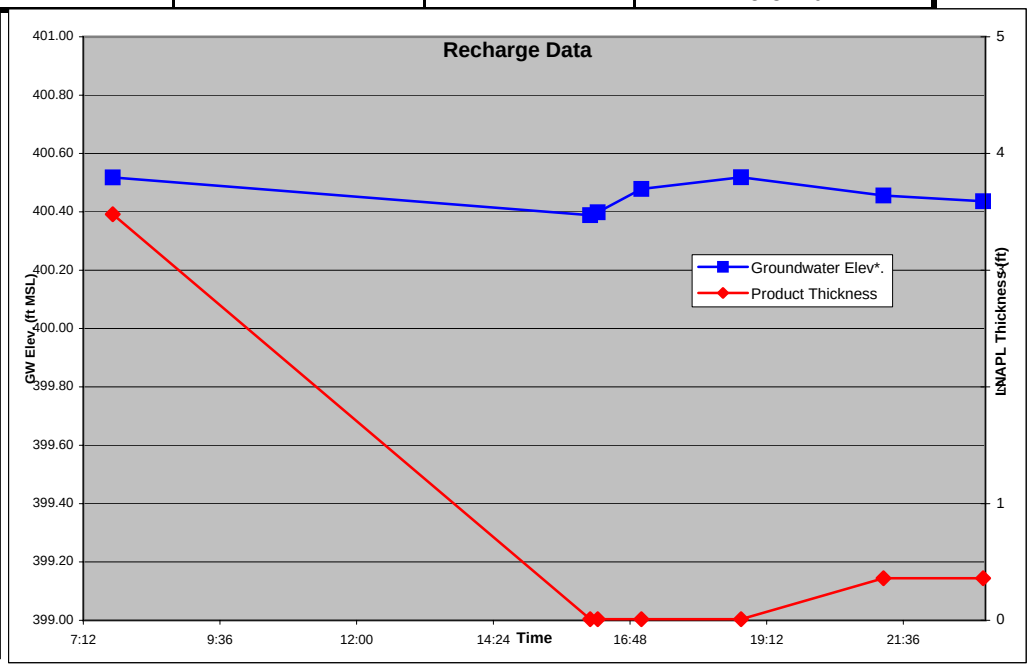
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:43	8:08	10:30	16:06	16:06	16:14	17:00	18:45	21:15	23:00
TOC Elevation	429.47				429.47	429.47	429.47	429.47	429.47	429.47
$DTScreen_{TOC}$	31.23	--	--	--	31.23	31.23	31.23	31.23	31.23	31.23
DTP_{TOC}	28.43	--	--	--	29.08	29.07	28.99	28.95	28.96	28.98
DTW_{TOC}	31.91	--	--	--	29.09	29.08	29	28.96	29.32	29.34
Product Thickness	3.48	--	--	--	0.01	0.01	0.01	0.01	0.36	0.36
Fluid Above Screen (Y/N)	Y	--	--	--	Y	Y	Y	Y	Y	Y
Groundwater Elev*.	400.52				400.39	400.4	400.48	400.52	400.46	400.44
$Stinger\ Depth_{TOC}$	28.79	28.79	24.79	24.79						
Stinger Tip Elevation	400.68	400.68	404.68	404.68						
$Stinger\ Immersion_{DTP}$	0.36	0.36	-3.64	-3.64						
Stinger Immersion as %**	10.3%	10.3%	-104.6%	-104.6%						
$Stinger\ Depth_{CGW}$	-0.16									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	20.75	3.48	19.9
Stinger Vac (in Hg)	17.72	8.38	16.15
Well Flow in scfm	37	9	30.97
Well Casing Vac (in Hg)	5.43	3.17	
Average Hrly HC_{TOT} Rec (gal)			1.46
Hrly LNAPL Rec (gal)			1.05
Hrly Vapor Rec (gal)			0.41
Hrly H2O Rec (gal)			150
LNAPL as % of Total Fluids			0.97%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-29D Date: Monday, July 11, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
7.93	1581	9.3	2.9	12.2

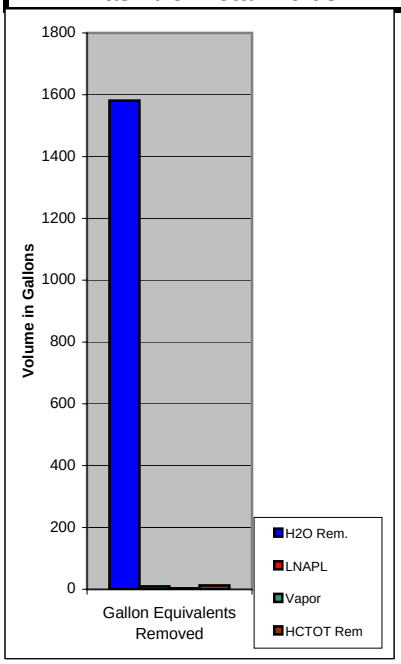
	LNAPL Type	G_s
	Gasoline	0.73
X	Diesel	0.85
	Specify Other	

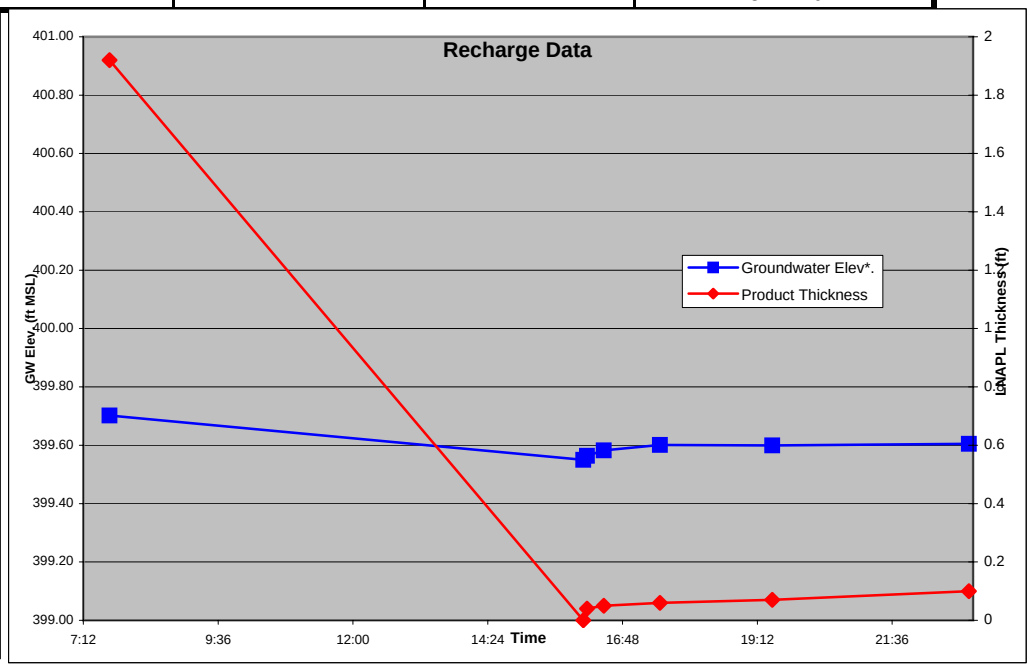
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:40	8:08	9:12	16:04	16:06	16:10	16:28	17:28	19:28	22:58
TOC Elevation	429.47				429.47	429.47	429.47	429.47	429.47	429.47
$DTScreen_{TOC}$	31.23	--	--	--	31.23	31.23	31.23	31.23	31.23	31.23
DTP_{TOC}	29.48	--	--	--		29.9	29.88	29.86	29.86	29.85
DTW_{TOC}	31.4	--	--	--	29.92	29.94	29.93	29.92	29.93	29.95
Product Thickness	1.92	--	--	--	0	0.04	0.05	0.06	0.07	0.1
Fluid Above Screen (Y/N)	Y	--	--	--	Y	Y	Y	Y	Y	Y
Groundwater Elev*.	399.70				399.55	399.56	399.58	399.6	399.6	399.61
$Stinger\ Depth_{TOC}$	29.8	29.8	30.8	29.8						
Stinger Tip Elevation	399.67	399.67	398.67	399.67						
$Stinger\ Immersion_{DTP}$	0.32	0.32	1.32	0.32						
Stinger Immersion as %**	16.7%	16.7%	68.8%	16.7%						
$Stinger\ Depth_{CGW}$	0.03									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.38	20.59	20.83
Stinger Vac (in Hg)	18.51	5.06	12.5
Well Flow in scfm	29	2	7.79
Well Casing Vac (in Hg)	1.3	0.4	
Average Hrly HC_{TOT} Rec (gal)			1.54
Hrly LNAPL Rec (gal)			1.17
Hrly Vapor Rec (gal)			0.37
Hrly H2O Rec (gal)			199
LNAPL as % of Total Fluids			0.77%





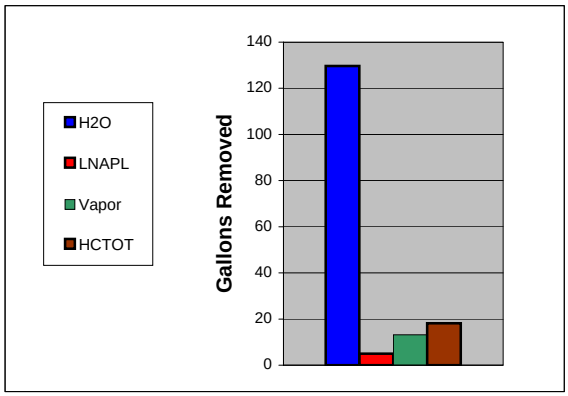
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-39C Date: Monday, October 24, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
8.03	129.67	5.00	13.2	18.20

LNAPL Type	G_s
Gasoline	0.7481



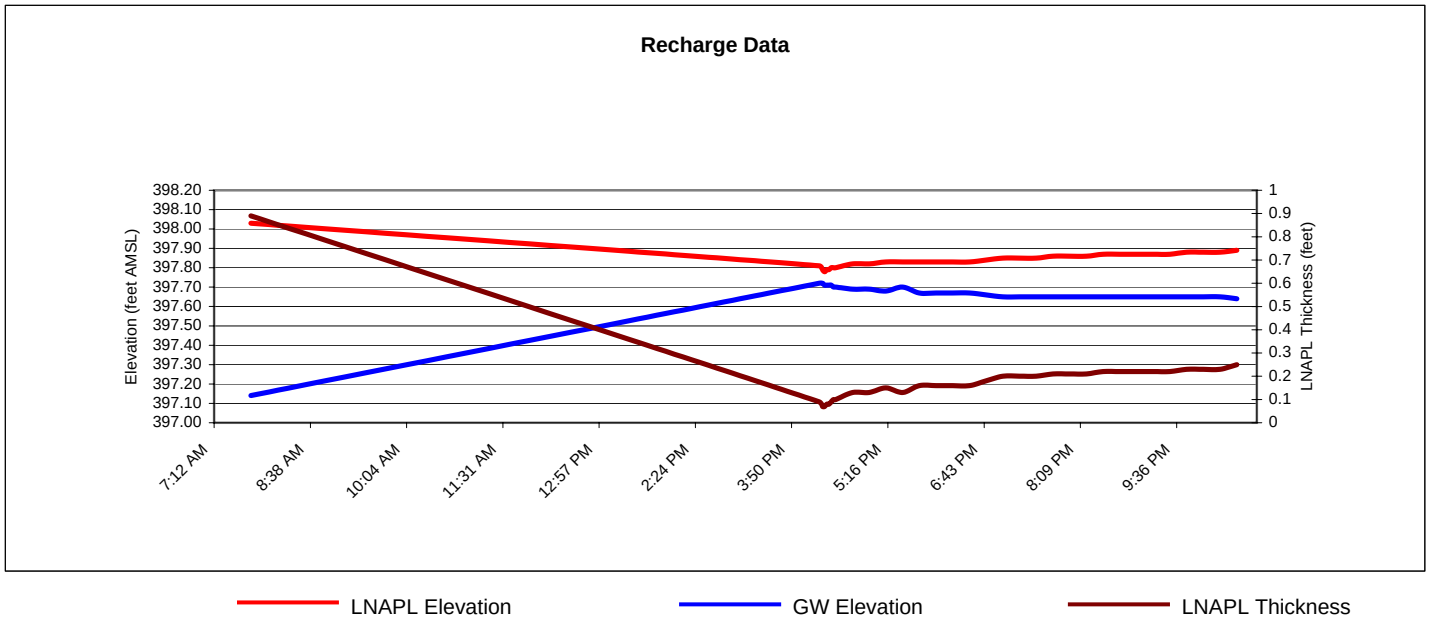
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	21.60	21.20	21.37
Stinger Vac (in Hg)	9.48	3.60	8.19
Well Flow in scfm	29	7	18.13
Well Casing Vac (in Hg)	0.83	0.57	0.72
Average Hrly HC_{TOT} Rec (gal)			2.27
Hrly LNAPL Rec (gal)			0.62
Hrly Vapor Rec (gal)			1.64
Hrly H_2O Rec (gal)			16.14
LNAPL as % of Total Fluids			12.3%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		7:45	8:10	9:12	10:12	12:12	13:42	14:42	16:12
TOC Elevation		432.07							
$DTScreen_{TOC}$		28.73	--	--	--	--	--	--	--
DTP_{TOC}		34.04	--	--	--	--	--	--	--
DTW_{TOC}		34.93	--	--	--	--	--	--	--
Product Thickness		0.89	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		N	--	--	--	--	--	--	--
Groundwater Elev*.		397.81							
Stinger $Depth_{TOC}$		34.11	34.11	34.11	34.11	33.81	33.81	34.81	34.81
Stinger Tip Elevation		397.96	397.96	397.96	397.96	398.26	398.26	397.26	397.26
Stinger $Immersion_{DTP}$		0.07	0.07	0.07	0.07	-0.23	-0.23	0.77	0.77
Stinger Immersion as %**		7.9%	7.9%	7.9%	7.9%	-25.8%	-25.8%	86.5%	86.5%
St. $Imm._{CGW}$	ADV %	-0.15	10%	25%	25%	25%	25%	25%	25%
Well Casing Vac (in H2O)		---	---	9.25	10	11.3	9.4	10.3	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-47C Date: 5/9/05 Day: Monday Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
2.2	88	9.5	4.2	13.7

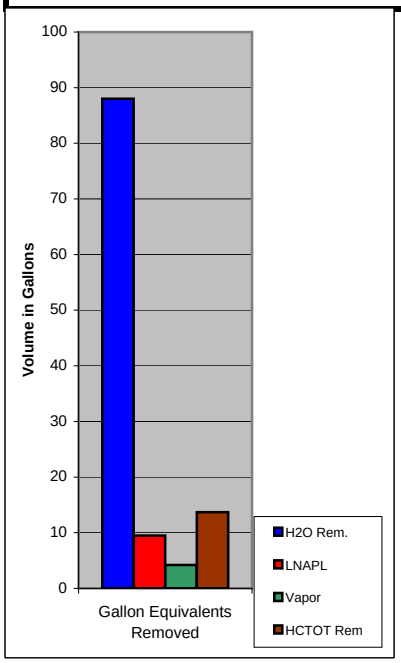
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

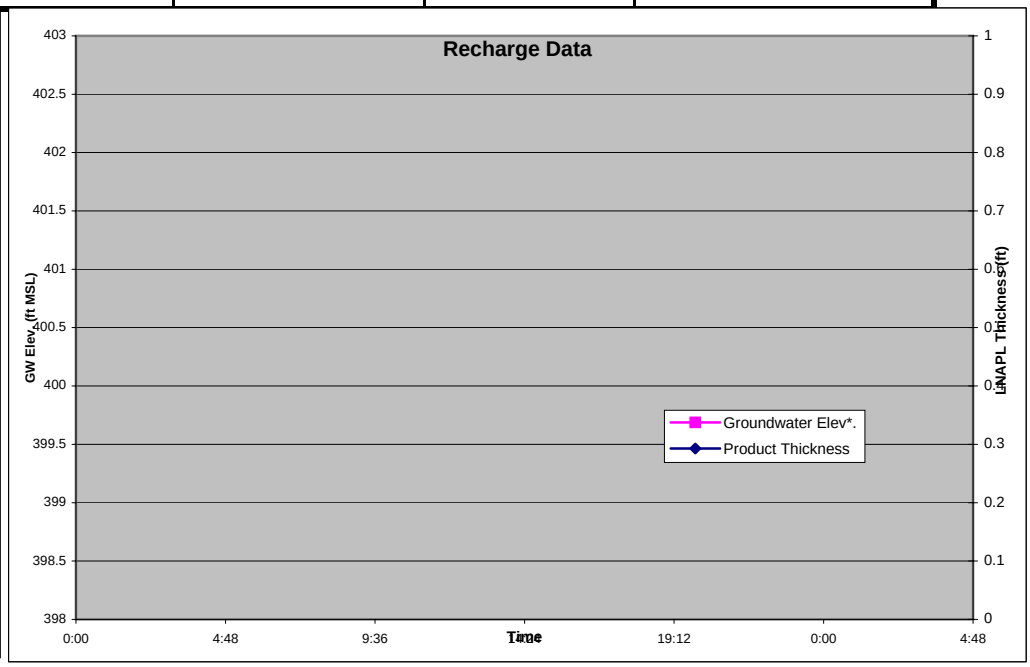
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	10:55	11:33	12:35	13:45						
TOC Elevation	429.01				429.01	429.01	429.01	429.01	429.01	429.01
$DTScreen_{TOC}$	23.39	--	--	--	23.39	23.39	23.39	23.39	23.39	23.39
DTP_{TOC}	28.26	--	--	--						
DTW_{TOC}	30.65	--	--	--						
Product Thickness	2.39	--	--	--	0	0	0	0	0	0
Fluid Above Screen (Y/N)	N	--	--	--	Y	Y	Y	Y	Y	Y
Groundwater Elev*.	400.10									
$Stinger\ Depth_{TOC}$	29.25	29.25	29.55	29.55						
$Stinger\ Immersion_{DTP}$	0.99									
Stinger Immersion as %**	41.4%									
$Stinger\ Depth_{CGW}$	0.34									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.7	20.12	20.56
Stinger Vac (in Hg)	17.7	0.95	15.54
Well Flow in scfm	32	9	21.4
Well Casing Vac (in Hg)	1.44	0.07	
Average Hrly HC_{TOT} Rec (gal)			6.23
Hrly LNAPL Rec (gal)			4.32
Hrly Vapor Rec (gal)			1.91
Hrly H2O Rec (gal)			40
LNAPL as % H2O Removed			15.57%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-47C Date: 5/10/05 Day: Tuesday Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
6.25	722	16	11.6	27.6

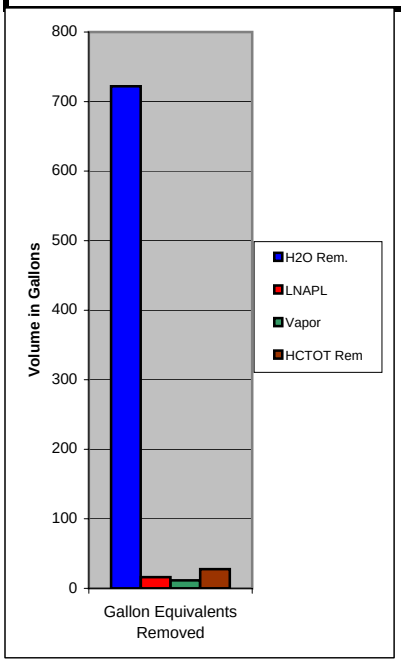
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

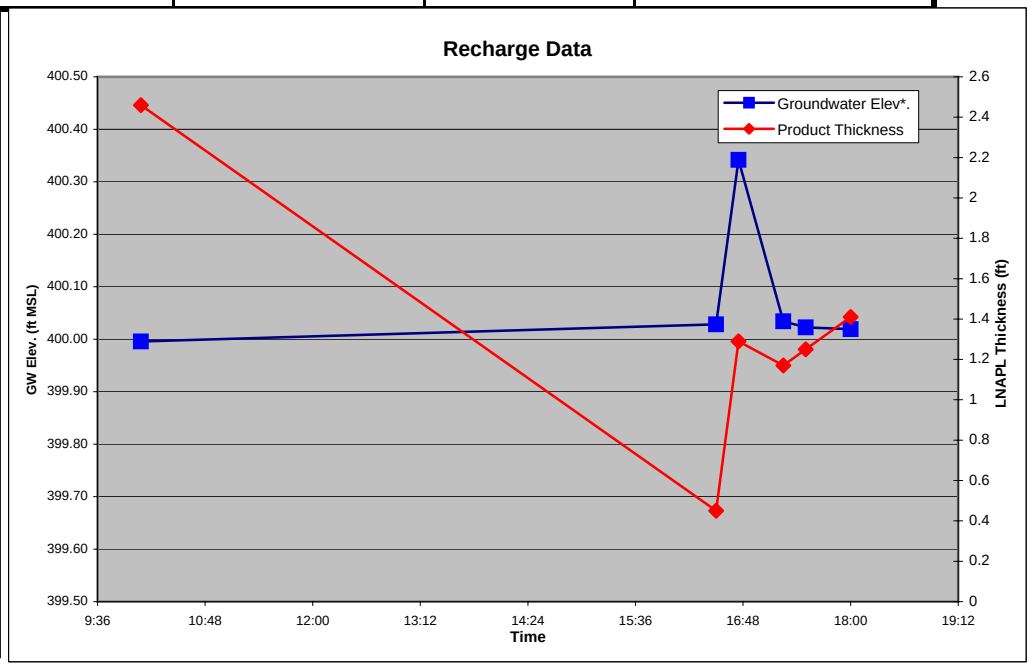
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	10:05	10:15	12:53	16:29	16:30	16:45	17:15	17:30	18:00	
TOC Elevation	429.01				429.01	429.01	429.01	429.01	429.01	429.01
$DTScreen_{TOC}$	23.39	--	--	--	23.39	23.39	23.39	23.39	23.39	23.39
DTP_{TOC}	28.35	--	--	--	28.86	28.32	28.66	28.65	28.61	
DTW_{TOC}	30.81	--	--	--	29.31	29.61	29.83	29.9	30.02	
Product Thickness	2.46	--	--	--	0.45	1.29	1.17	1.25	1.41	0
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	Y
Groundwater Elev*.	400.00				400.03	400.34	400.03	400.02	400.02	
Stinger $Depth_{TOC}$	29.34	29.34	29.34	29.34						
Stinger $Immersion_{DTP}$	0.99	0.99	0.99	0.99						
Stinger Immersion as %**	40.2%	40.2%	40.2%	40.2%						
Stinger $Depth_{CGW}$	0.33									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	20.75	3.01	19
Stinger Vac (in Hg)	17.6	8.54	10.6
Well Flow in scfm	17	11	13.36
Well Casing Vac (in Hg)	0.96	0.63	
Average Hrly HC_{TOT} Rec (gal)			4.42
Hrly LNAPL Rec (gal)			2.56
Hrly Vapor Rec (gal)			1.86
Hrly H2O Rec (gal)			116
LNAPL as % of Total Fluids			3.68%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-47C Date: 5/25/05 Day: Wednesday Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
7.53	0	6	14.6	20.6

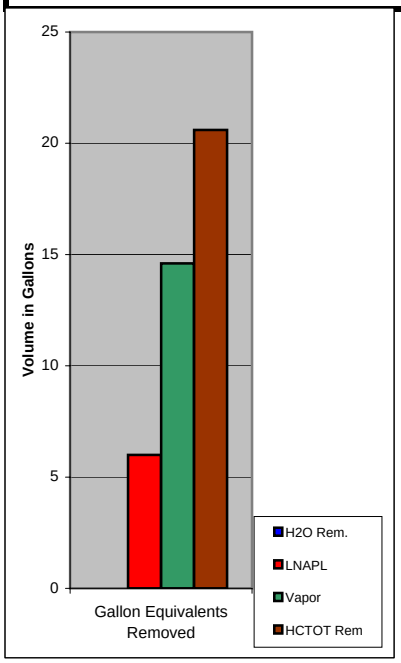
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

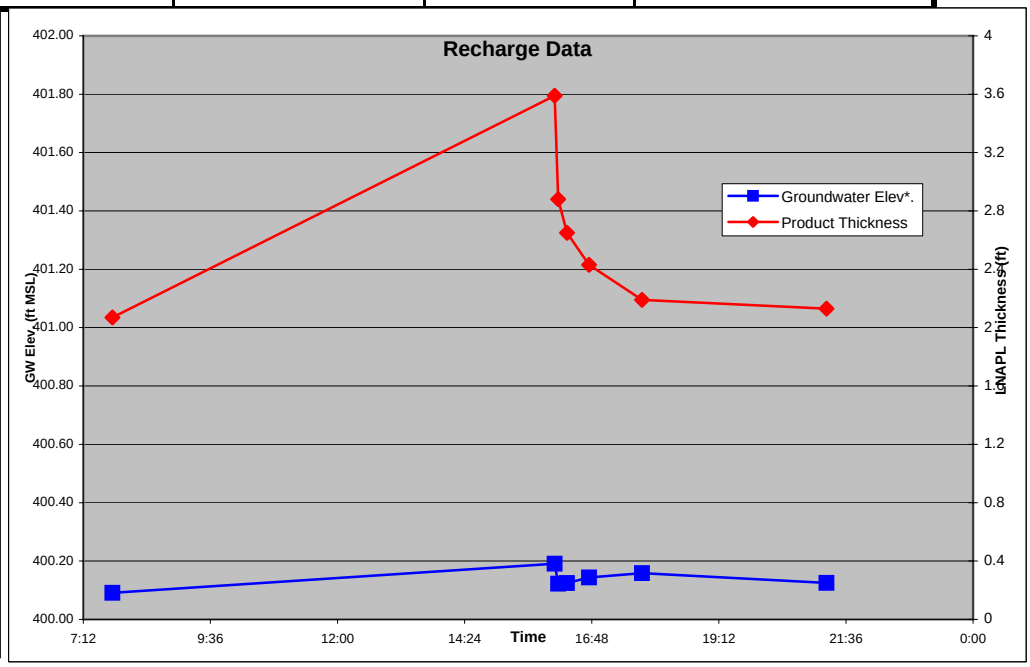
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:45	8:30	12:12	16:02	16:06	16:10	16:20	16:45	17:45	21:14
TOC Elevation	429.01				429.01	429.01	429.01	429.01	429.01	429.01
$DTScreen_{TOC}$	23.39	--	--	--	23.39	23.39	23.39	23.39	23.39	23.39
DTP_{TOC}	28.36	--	--	--	27.85	28.11	28.17	28.21	28.26	28.31
DTW_{TOC}	30.43	--	--	--	31.44	30.99	30.82	30.64	30.45	30.44
Product Thickness	2.07	--	--	--	3.59	2.88	2.65	2.43	2.19	2.13
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	400.09				400.19	400.12	400.12	400.14	400.16	400.12
Stinger $Depth_{TOC}$	28.94	28.94	28.94	28.94						
Stinger $Immersion_{DTP}$	0.58	0.58	0.58	0.58						
Stinger Immersion as %**	28.0%	28.0%	28.0%	28.0%						
Stinger $Depth_{CGW}$	0.02									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.54	20.28	20.58
Stinger Vac (in Hg)	3.32	0.32	2.5
Well Flow in scfm	39	17	29.1
Well Casing Vac (in Hg)	1.28	0.35	
Average Hrly HC_{TOT} Rec (gal)			2.74
Hrly LNAPL Rec (gal)			0.80
Hrly Vapor Rec (gal)			1.94
Hrly H2O Rec (gal)			0
LNAPL as % of Total Fluids			100.00%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-47C Date: Thursday, June 09, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs:min)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
7.77	134.9	30.1	16.4	46.5

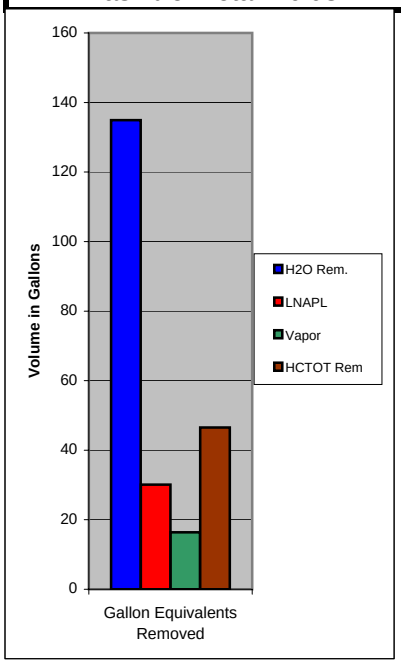
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

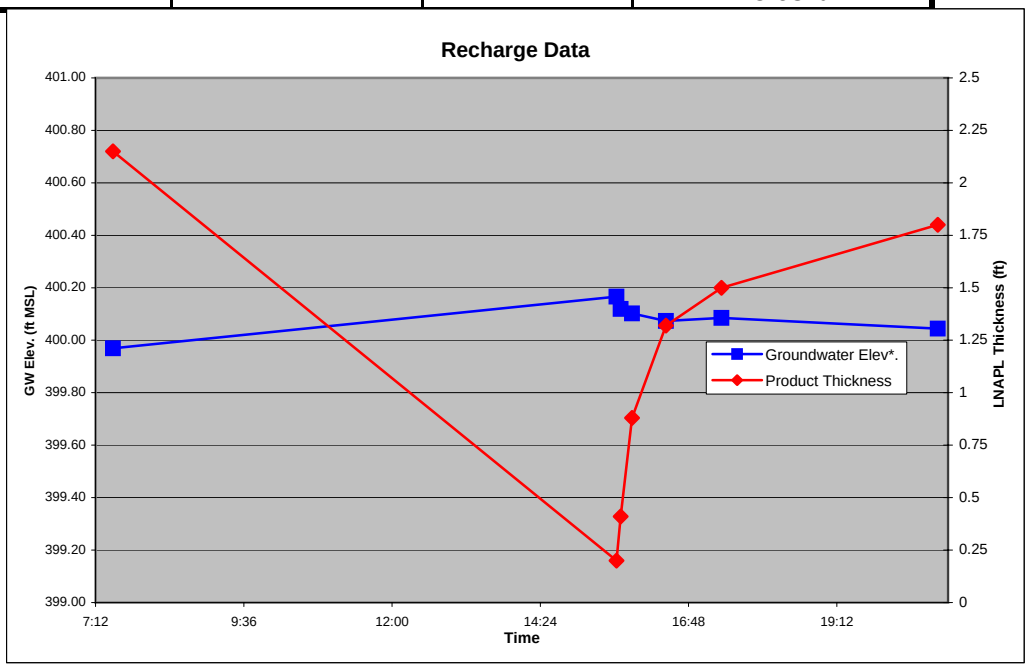
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:29	7:44	10:20	15:30	15:38	15:42	15:53	16:26	17:20	20:50
TOC Elevation	429.01				429.01	429.01	429.01	429.01	429.01	429.01
$DTScreen_{TOC}$	23.39	--	--	--	23.39	23.39	23.39	23.39	23.39	23.39
DTP_{TOC}	28.46	--	--	--	28.79	28.78	28.67	28.58	28.52	28.48
DTW_{TOC}	30.61	--	--	--	28.99	29.19	29.55	29.9	30.02	30.28
Product Thickness	2.15	--	--	--	0.2	0.41	0.88	1.32	1.5	1.8
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	399.97				400.17	400.12	400.1	400.07	400.09	400.04
$Stinger\ Depth_{TOC}$	29.36	29.36	30.61	30.61						
Stinger Tip Elevation	399.65	399.65	398.4	398.4						
$Stinger\ Immersion_{DTP}$	0.9	0.9	2.15	2.15						
Stinger Immersion as %**	41.9%	41.9%	100.0%	100.0%						
$Stinger\ Depth_{CGW}$	0.32									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.38	19.32	19.82
Stinger Vac (in Hg)	13.29	0.63	6.06
Well Flow in scfm	30	7	13.65
Well Casing Vac (in Hg)	1.81	1.01	
Average Hrly HC_{TOT} Rec (gal)			5.99
Hrly LNAPL Rec (gal)			3.88
Hrly Vapor Rec (gal)			2.11
Hrly H2O Rec (gal)			17
LNAPL as % of Total Fluids			25.63%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

MP-47C Date: Thursday, June 23, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
7.97	1097	54.3	16.3	70.6

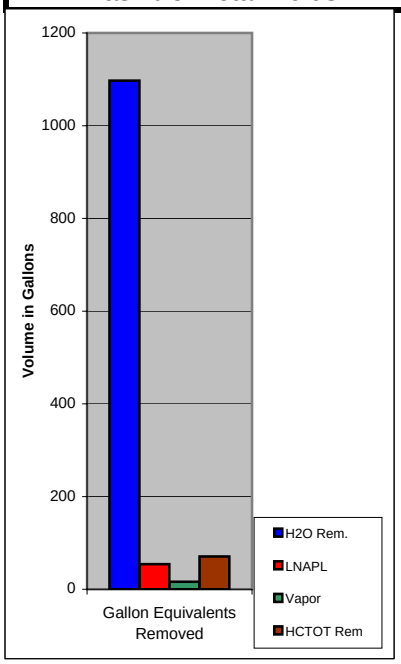
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

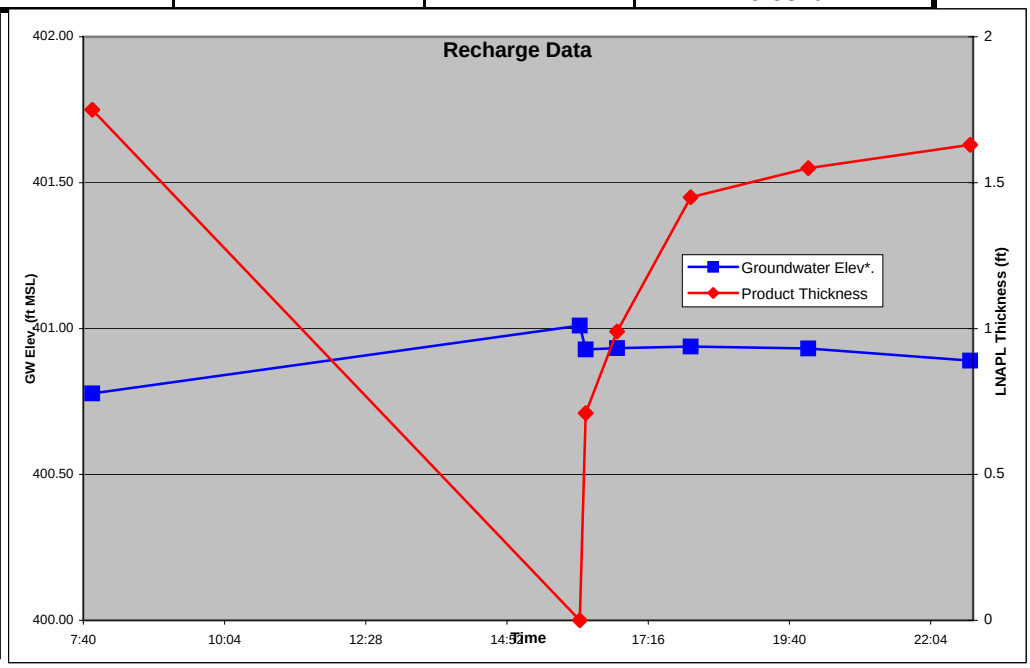
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:50	8:06	11:00	16:04	16:07	16:13	16:45	18:00	20:00	22:45
TOC Elevation	429.01				429.01	429.01	429.01	429.01	429.01	429.01
$DTScreen_{TOC}$	23.39	--	--	--	23.39	23.39	23.39	23.39	23.39	23.39
DTP_{TOC}	27.76	--	--	--		27.89	27.81	27.68	27.66	27.68
DTW_{TOC}	29.51	--	--	--	28	28.6	28.8	29.13	29.21	29.31
Product Thickness	1.75	--	--	--	0	0.71	0.99	1.45	1.55	1.63
Fluid Above Screen (Y/N)	N	--	--	--	Y	N	N	N	N	N
Groundwater Elev*.	400.78				401.01	400.93	400.93	400.94	400.93	400.89
Stinger $Depth_{TOC}$	29.48	29.48	29.48	29.48						
Stinger Tip Elevation	399.53	399.53	399.53	399.53						
Stinger $Immersion_{DTP}$	1.72	1.72	1.72	1.72						
Stinger Immersion as %**	98.3%	98.3%	98.3%	98.3%						
Stinger $Depth_{CGW}$	1.25									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.07	19.64	20.08
Stinger Vac (in Hg)	16.77	9.17	9.8
Well Flow in scfm	19	10	16.7
Well Casing Vac (in Hg)	0.59	0.53	
Average Hrly HC_{TOT} Rec (gal)			8.86
Hrly LNAPL Rec (gal)			6.82
Hrly Vapor Rec (gal)			2.05
Hrly H_2O Rec (gal)			138
LNAPL as % of Total Fluids			6.05%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-47C Date: Tuesday, July 12, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.05	1281.9	18	16.6	34.6

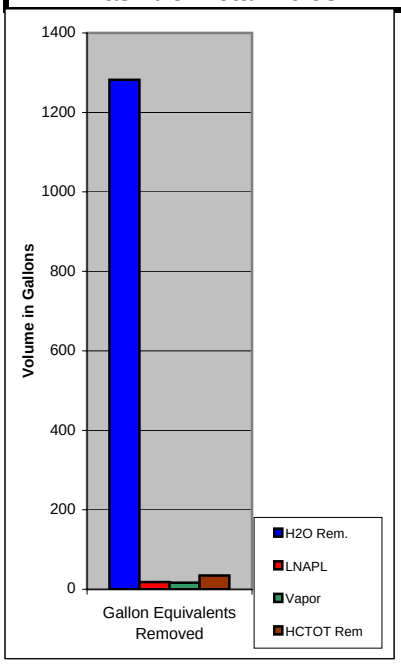
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

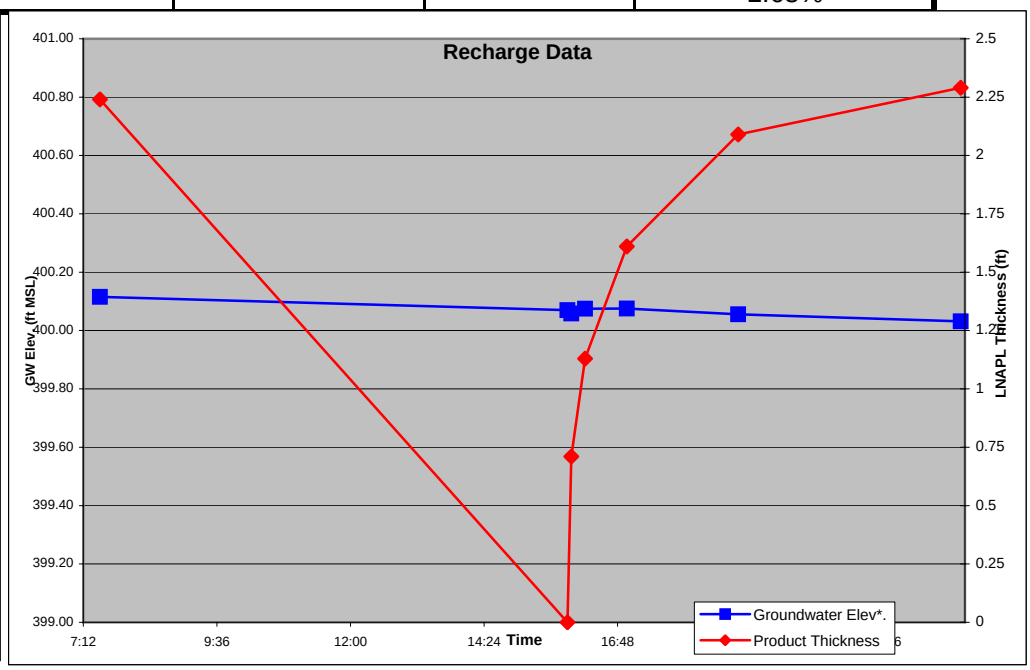
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:30	7:50	12:30	15:53	15:54	15:58	16:13	16:58	18:58	22:58
TOC Elevation	429.01				429.01	429.01	429.01	429.01	429.01	429.01
$DTScreen_{TOC}$	23.39	--	--	--	23.39	23.39	23.39	23.39	23.39	23.39
DTP_{TOC}	28.29	--	--	--		28.76	28.63	28.5	28.39	28.36
DTW_{TOC}	30.53	--	--	--	28.94	29.47	29.76	30.11	30.48	30.65
Product Thickness	2.24	--	--	--	0	0.71	1.13	1.61	2.09	2.29
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	400.12				400.07	400.06	400.07	400.08	400.06	400.03
Stinger $Depth_{TOC}$	28.77	28.77	28.77	28.77						
Stinger Tip Elevation	400.24	400.24	400.24	400.24						
Stinger $Immersion_{DTP}$	0.48	0.48	0.48	0.48						
Stinger Immersion as %**	21.4%	21.4%	21.4%	21.4%						
Stinger $Depth_{CGW}$	-0.12									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.54	20.43	20.75
Stinger Vac (in Hg)	20.4	5.06	10.77
Well Flow in scfm	14	6	9.89
Well Casing Vac (in Hg)	0.77	0.54	
Average Hrly HC_{TOT} Rec (gal)			4.30
Hrly LNAPL Rec (gal)			2.24
Hrly Vapor Rec (gal)			2.06
Hrly H_2O Rec (gal)			159
LNAPL as % of Total Fluids			2.63%





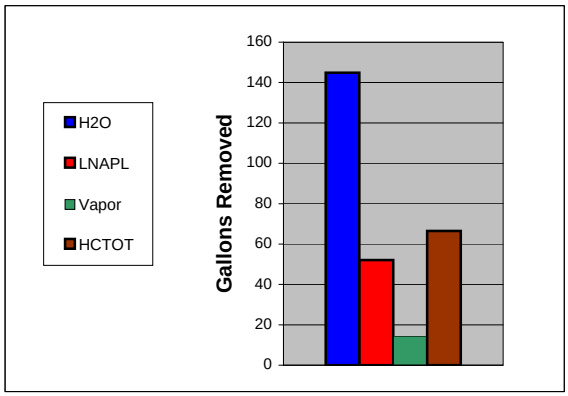
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-47C Date: Tuesday, October 25, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
8.03	144.86	52.10	14.4	66.50

LNAPL Type	G_s
Gasoline	0.7569



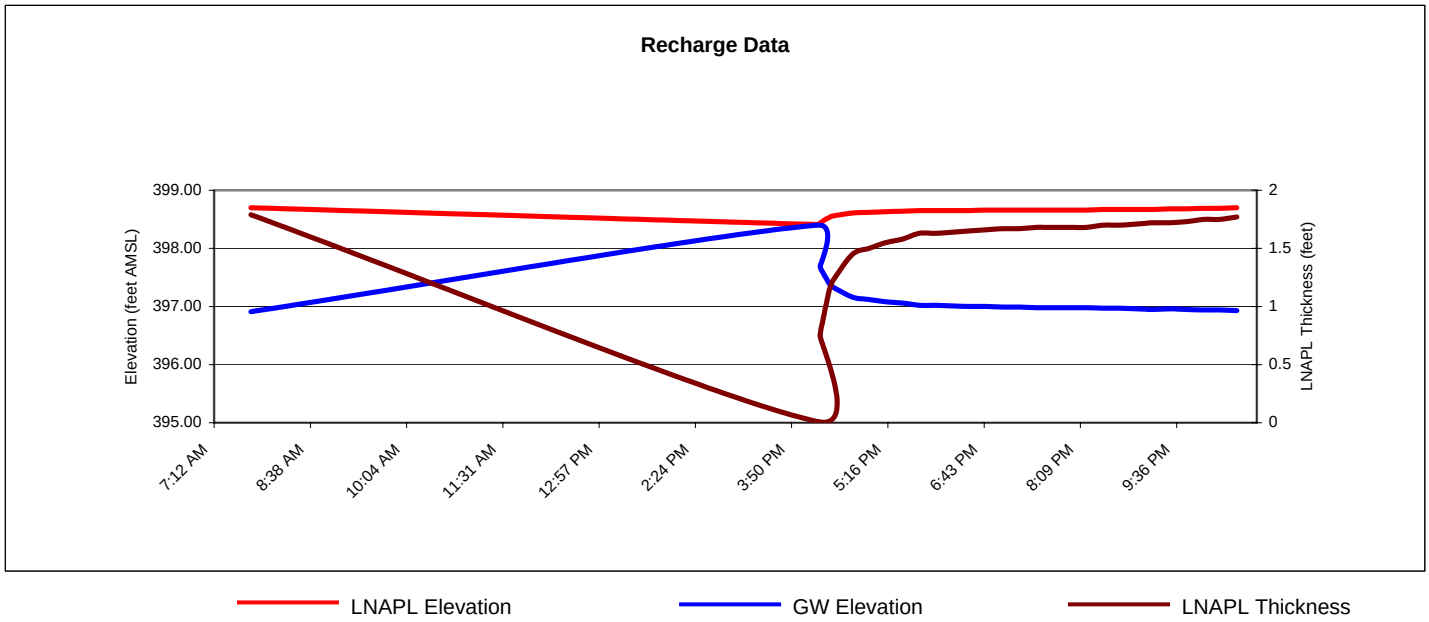
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	22.90	21.00	21.75
Stinger Vac (in Hg)	9.04	5.15	6.48
Well Flow in scfm	16	2	10.00
Well Casing Vac (in Hg)	0.23	0.08	0.17
Average Hrly HC_{TOT} Rec (gal)			8.28
Hrly LNAPL Rec (gal)			6.49
Hrly Vapor Rec (gal)			1.79
Hrly H_2O Rec (gal)			18.03
LNAPL as % of Total Fluids			31.5%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		10/25/2005 7:45	8:10	9:12	10:42	12:42	14:12	15:12	16:12
TOC Elevation		429.01							
$DTScreen_{TOC}$		23.39	--	--	--	--	--	--	--
DTP_{TOC}		30.31	--	--	--	--	--	--	--
DTW_{TOC}		32.1	--	--	--	--	--	--	--
Product Thickness		1.79	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		N	--	--	--	--	--	--	--
Groundwater Elev*.		398.26							
Stinger $Depth_{TOC}$		30.82	30.82	30.82	31.32	30.32	30.32	30.32	30.32
Stinger Tip Elevation		398.19	398.19	398.19	397.69	398.69	398.69	398.69	398.69
Stinger $Immersion_{DTP}$		0.51	0.51	0.51	1.01	0.01	0.01	0.01	0.01
Stinger Immersion as %**		28.5%	28.5%	28.5%	56.4%	0.6%	0.6%	0.6%	0.6%
St. $Imm._{CGW}$	ADV %	0.07	25%	25%	30%	10%	10%	10%	10%
Well Casing Vac (in H2O)		---	---	3.05	1.4	2.8	2.05	2.7	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



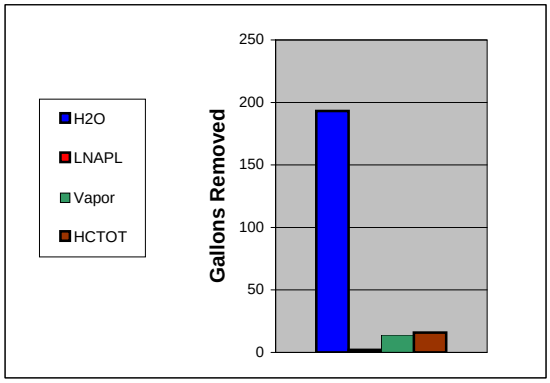
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-49C Date: Thursday, November 03, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
8.00	193.11	2.00	13.9	15.90

LNAPL Type	G_s
Gasoline	0.7335

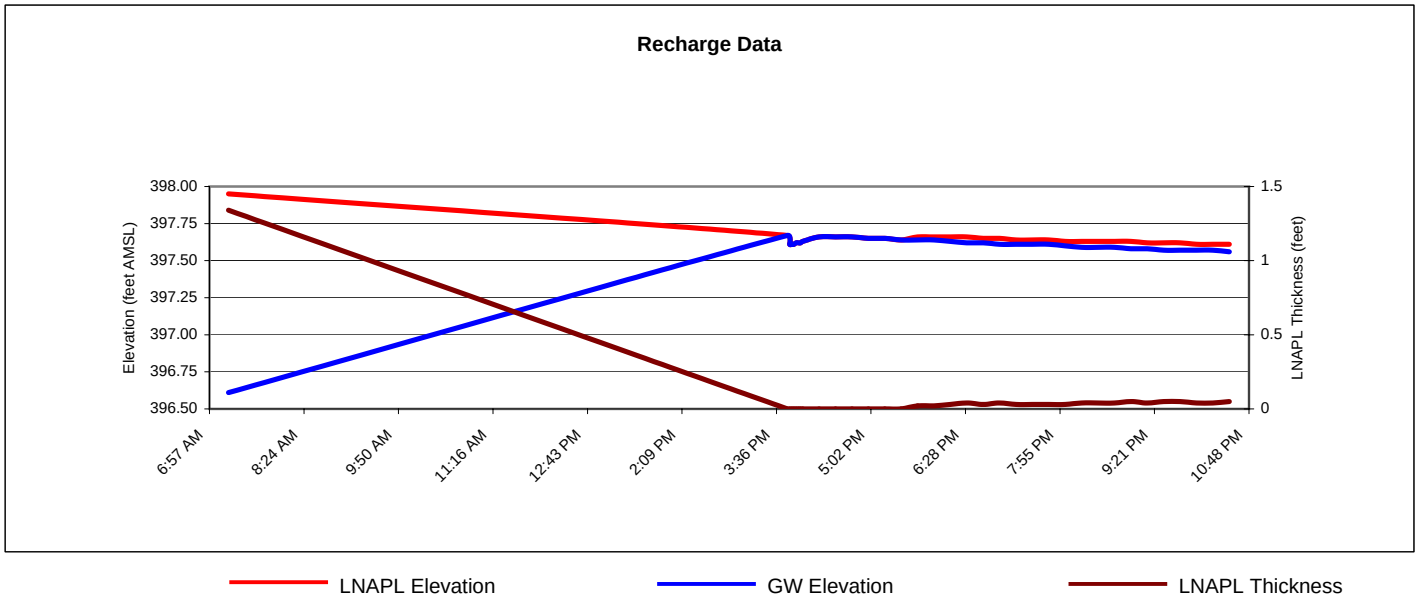


Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	21.70	20.50	20.93
Stinger Vac (in Hg)	8.89	6.91	8.26
Well Flow in scfm	4	2	2.20
Well Casing Vac (in Hg)	0.23	0.15	0.19
Average Hrly HC_{TOT} Rec (gal)			1.99
Hrly LNAPL Rec (gal)			0.25
Hrly Vapor Rec (gal)			1.74
Hrly H_2O Rec (gal)			24.14
LNAPL as % of Total Fluids			7.6%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		11/3/2005 7:15	7:45	8:45	9:45	11:15	12:15	14:15	15:45
TOC Elevation		431.06							
$DTScreen_{TOC}$		28	--	--	--	--	--	--	--
DTP_{TOC}		33.11	--	--	--	--	--	--	--
DTW_{TOC}		34.45	--	--	--	--	--	--	--
Product Thickness		1.34	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		N	--	--	--	--	--	--	--
Groundwater Elev*.		397.59							
Stinger $Depth_{TOC}$		34.3	34.3	34.3	34.3	33.8	34.05	34.55	34.55
Stinger Tip Elevation		396.76	396.76	396.76	396.76	397.26	397.01	396.51	396.51
Stinger $Immersion_{DTP}$		1.19	1.19	1.19	1.19	0.69	0.94	1.44	1.44
Stinger Immersion as %**		88.8%	88.8%	88.8%	88.8%	51.5%	70.1%	107.5%	107.5%
St. $Imm._{CGW}$	ADV %	0.83	20%	20%	10%	10%	10%	10%	20%
Well Casing Vac (in H2O)		---	---	2.25	2.75	2.1	1.75	1.85	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well* *** Stinger Immersion as % of LNAPL Thickness*



H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-50C Date: 5/12/05 Day: Thursday Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.00	906	23.2	13.5	36.7

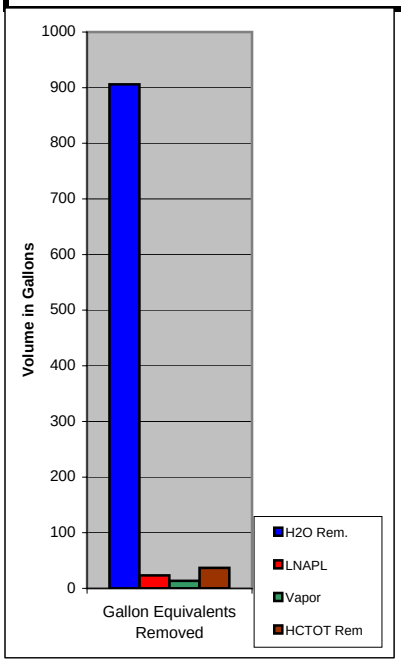
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

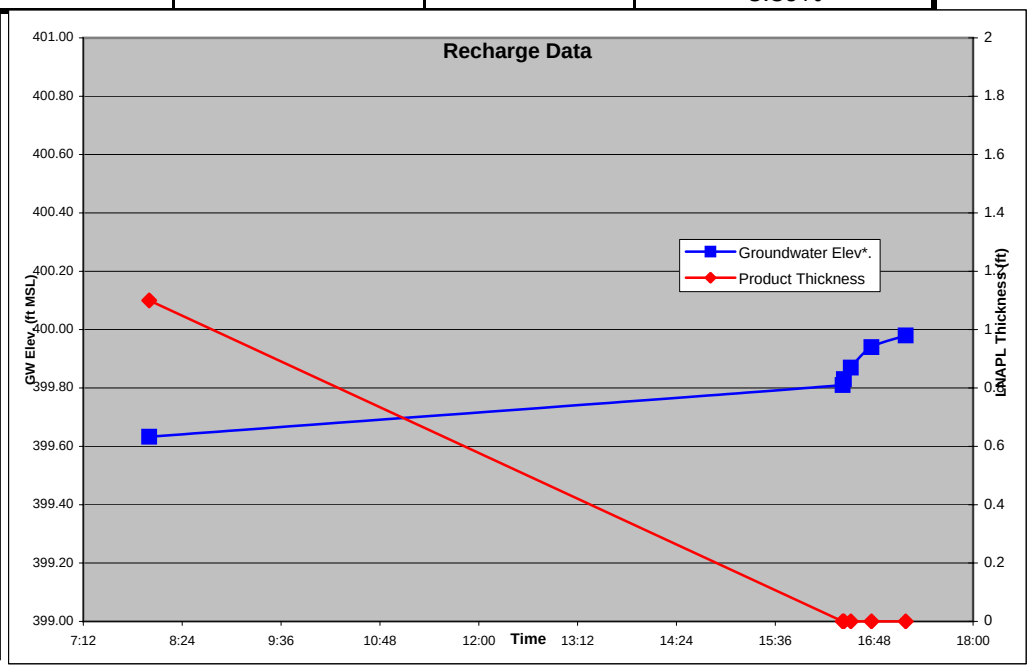
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	8:00	8:23	10:15	16:24	16:25	16:26	16:31	16:46	17:11	
TOC Elevation	430.23				430.23	430.23	430.23	430.23	430.23	430.23
$DTScreen_{TOC}$	28.96	--	--	--	28.96	28.96	28.96	28.96	28.96	28.96
DTP_{TOC}	30.3	--	--	--						
DTW_{TOC}	31.4	--	--	--	30.42	30.4	30.36	30.29	30.25	
Product Thickness	1.1	--	--	--	0	0	0	0	0	0
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	Y
Groundwater Elev*.	399.63				399.81	399.83	399.87	399.94	399.98	
$Stinger\ Depth_{TOC}$	28.65	28.65	30.65	30.65						
$Stinger\ Immersion_{DTP}$	-1.65	-1.65	0.35	0.35						
Stinger Immersion as %**	-150.0%	-150.0%	31.8%	31.8%						
$Stinger\ Depth_{CGW}$	-1.95									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.86	3.96	19.59
Stinger Vac (in Hg)	16.13	3.01	9.56
Well Flow in scfm	39	12	26.26
Well Casing Vac (in Hg)			
Average Hrly HC_{TOT} Rec (gal)			4.59
Hrly LNAPL Rec (gal)			2.90
Hrly Vapor Rec (gal)			1.69
Hrly H2O Rec (gal)			113
LNAPL as % of Total Fluids			3.89%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-50C Date: 5/26/05 Day: Thursday Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
7.87	1600	25	12.5	37.5

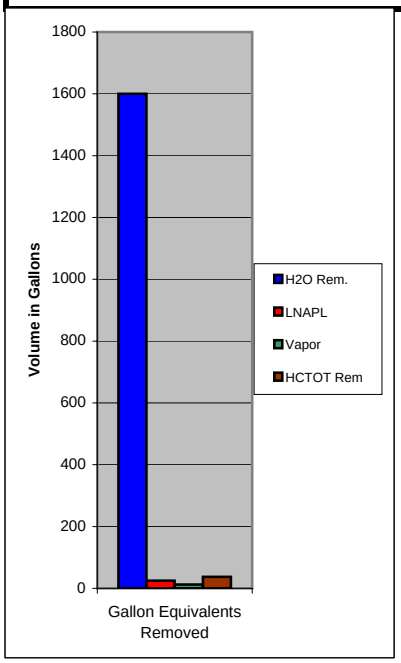
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

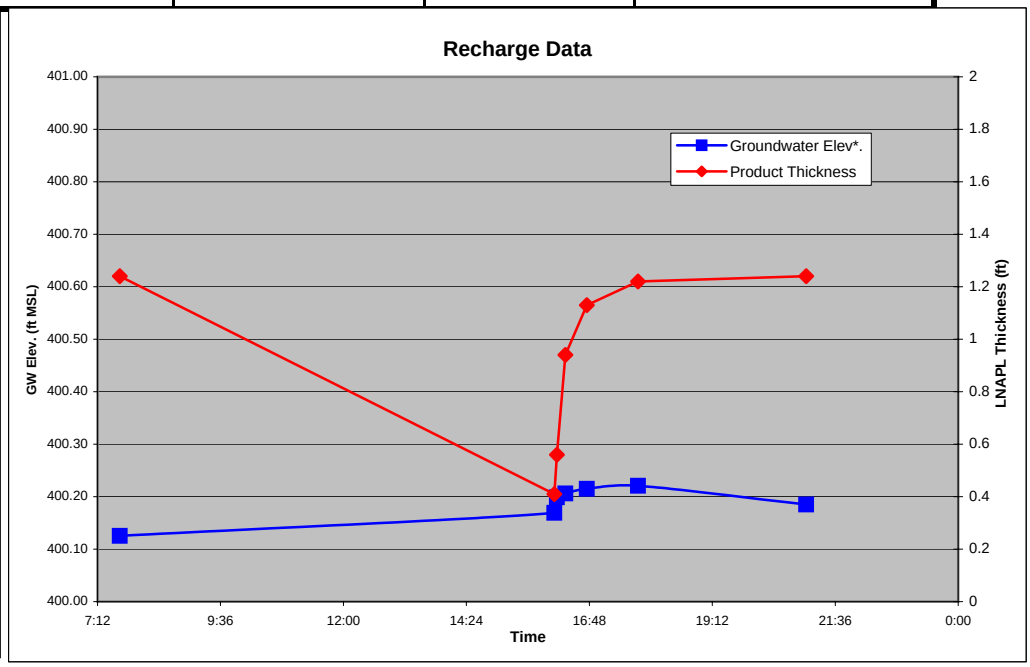
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:38	8:15	9:35	16:04	16:07	16:10	16:20	16:45	17:45	21:02
TOC Elevation	430.23				430.23	430.23	430.23	430.23	430.23	430.23
$DTScreen_{TOC}$	28.96	--	--	--	28.96	28.96	28.96	28.96	28.96	28.96
DTP_{TOC}	29.77	--	--	--	29.95	29.88	29.77	29.71	29.68	29.71
DTW_{TOC}	31.01	--	--	--	30.36	30.44	30.71	30.84	30.9	30.95
Product Thickness	1.24	--	--	--	0.41	0.56	0.94	1.13	1.22	1.24
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	400.13				400.17	400.2	400.21	400.21	400.22	400.19
Stinger $Depth_{TOC}$	30.35	30.35	30.1	30.1						
Stinger $Immersion_{DTP}$	0.58	0.58	0.33	0.33						
Stinger Immersion as %**	46.8%	46.8%	26.6%	26.6%						
Stinger $Depth_{CGW}$	0.25									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.54	6.34	20.42
Stinger Vac (in Hg)	17.4	4.27	15.13
Well Flow in scfm	35	10	27.09
Well Casing Vac (in Hg)	0.99	0.23	
Average Hrly HC_{TOT} Rec (gal)			4.76
Hrly LNAPL Rec (gal)			3.18
Hrly Vapor Rec (gal)			1.59
Hrly H2O Rec (gal)			203
LNAPL as % of Total Fluids			2.29%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-50C Date: Friday, June 10, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
7.88	363.6	283.3	10.4	293.7

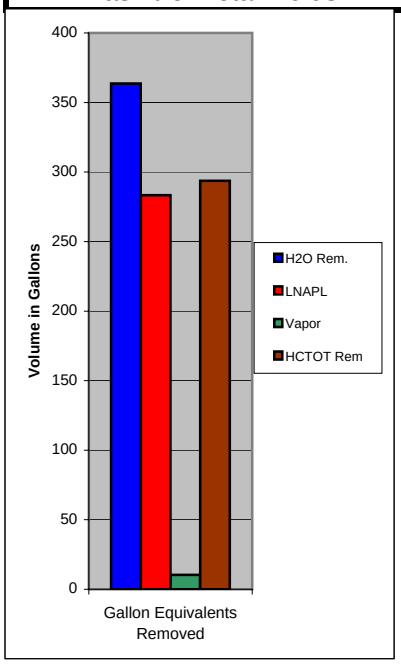
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

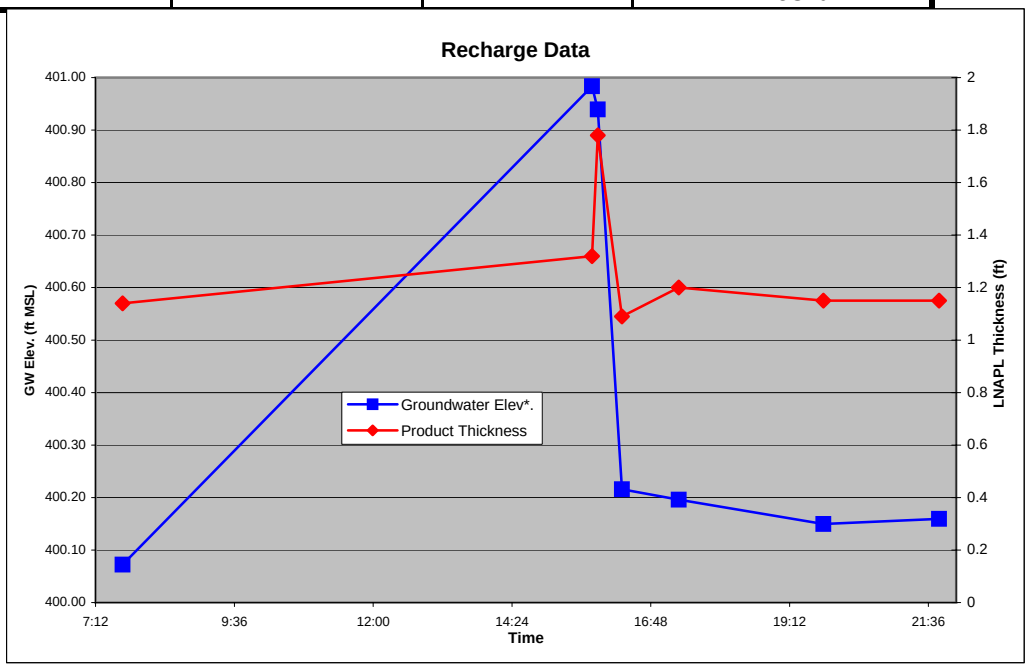
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:40	7:52	8:02	15:45	15:47	15:53	16:18	17:17	19:47	21:47
TOC Elevation	430.23				430.23	430.23	430.23	430.23	430.23	430.23
$DTScreen_{TOC}$	28.96	--	--	--	28.96	28.96	28.96	28.96	28.96	28.96
DTP_{TOC}	29.85	--	--	--	28.89	28.81	29.72	29.71	29.77	29.76
DTW_{TOC}	30.99	--	--	--	30.21	30.59	30.81	30.91	30.92	30.91
Product Thickness	1.14	--	--	--	1.32	1.78	1.09	1.2	1.15	1.15
Fluid Above Screen (Y/N)	N	--	--	--	Y	Y	N	N	N	N
Groundwater Elev*.	400.07				400.98	400.94	400.22	400.2	400.15	400.16
Stinger $Depth_{TOC}$	29.35	29.35	30.35	27.85						
Stinger Tip Elevation	400.88	400.88	399.88	402.38						
Stinger $Immersion_{DTP}$	-0.5	-0.5	0.5	-2						
Stinger Immersion as %**	-43.9%	-43.9%	43.9%	-175.4%						
Stinger $Depth_{CGW}$	-0.81									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.23	10.77	20.04
Stinger Vac (in Hg)	17.08	1.74	11.54
Well Flow in scfm	50	16	39.1
Well Casing Vac (in Hg)	3.68	0.68	
Average Hrly HC_{TOT} Rec (gal)			37.26
Hrly LNAPL Rec (gal)			35.94
Hrly Vapor Rec (gal)			1.32
Hrly H2O Rec (gal)			46
LNAPL as % of Total Fluids			44.68%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-50C Date: Friday, June 24, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
4.28	583.8	6.8	5.6	12.4

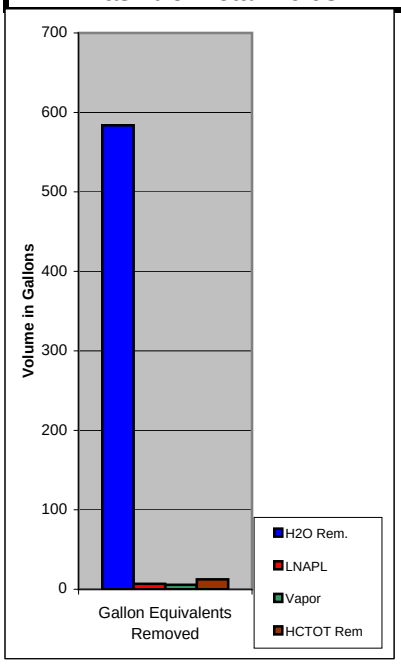
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

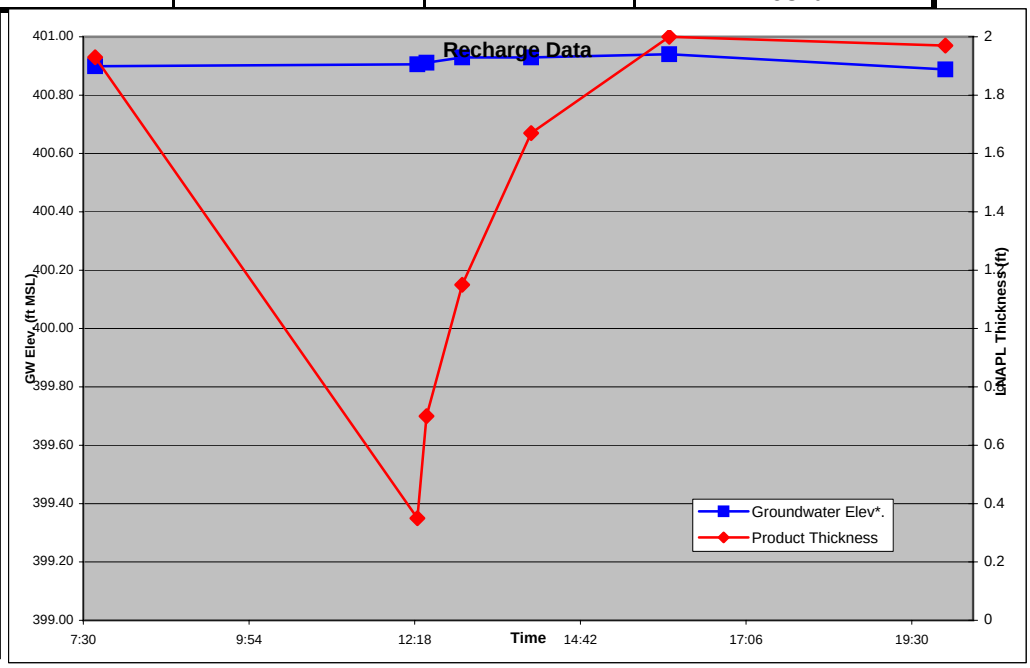
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:41	8:00	8:40	12:17	12:21	12:29	13:00	14:00	16:00	20:00
TOC Elevation	430.23				430.23	430.23	430.23	430.23	430.23	430.23
$DTScreen_{TOC}$	28.96	--	--	--	28.96	28.96	28.96	28.96	28.96	28.96
DTP_{TOC}	28.81	--	--	--	29.23	29.13	28.99	28.85	28.75	28.81
DTW_{TOC}	30.74	--	--	--	29.58	29.83	30.14	30.52	30.75	30.78
Product Thickness	1.93	--	--	--	0.35	0.7	1.15	1.67	2	1.97
Fluid Above Screen (Y/N)	Y	--	--	--	N	N	N	Y	Y	Y
Groundwater Elev*.	400.90				400.91	400.91	400.93	400.93	400.94	400.89
Stinger $Depth_{TOC}$	26.88	26.88	27.88	27.88						
Stinger Tip Elevation	403.35	403.35	402.35	402.35						
Stinger $Immersion_{DTP}$	-1.93	-1.93	-0.93	-0.93						
Stinger Immersion as %**	-100.0%	-100.0%	-48.2%	-48.2%						
Stinger $Depth_{CGW}$	-2.45									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	20.75	19.64	20.14
Stinger Vac (in Hg)	16.61	1.58	14.24
Well Flow in scfm	41	19	36.06
Well Casing Vac (in Hg)	3.32	1.21	
Average Hrly HC_{TOT} Rec (gal)			2.89
Hrly LNAPL Rec (gal)			1.59
Hrly Vapor Rec (gal)			1.31
Hrly H2O Rec (gal)			136
LNAPL as % of Total Fluids			2.08%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-50C Date: Wednesday, July 13, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.02	1281.8	20.1	10.5	30.6

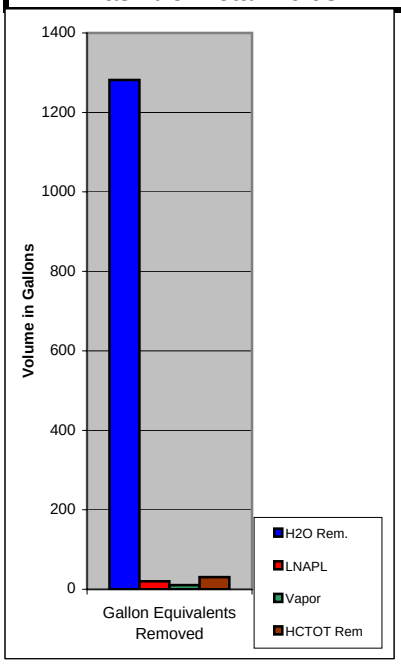
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

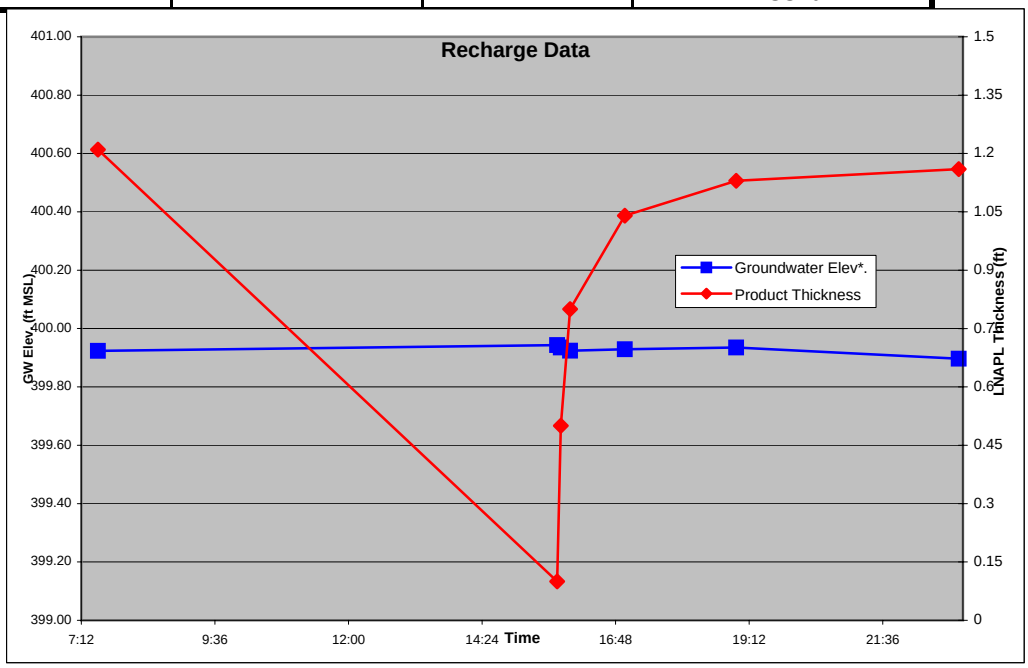
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:30	7:43	9:00	15:44	15:45	15:49	15:59	16:58	18:58	22:58
TOC Elevation	430.23				430.23	430.23	430.23	430.23	430.23	430.23
$DTScreen_{TOC}$	28.96	--	--	--	28.96	28.96	28.96	28.96	28.96	28.96
DTP_{TOC}	29.98	--	--	--	30.26	30.16	30.09	30.02	29.99	30.02
DTW_{TOC}	31.19	--	--	--	30.36	30.66	30.89	31.06	31.12	31.18
Product Thickness	1.21	--	--	--	0.1	0.5	0.8	1.04	1.13	1.16
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	399.92				399.94	399.94	399.92	399.93	399.93	399.9
Stinger $Depth_{TOC}$	29.78	29.78	29.28	30.03						
Stinger Tip Elevation	400.45	400.45	400.95	400.2						
Stinger $Immersion_{DTP}$	-0.2	-0.2	-0.7	0.05						
Stinger Immersion as %**	-16.5%	-16.5%	-57.9%	4.1%						
Stinger $Depth_{CGW}$	-0.53									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.7	20.59	20.93
Stinger Vac (in Hg)	18.98	0.16	11.68
Well Flow in scfm	20	1	8.78
Well Casing Vac (in Hg)	1.57	0.04	
Average Hrly HC_{TOT} Rec (gal)			3.82
Hrly LNAPL Rec (gal)			2.51
Hrly Vapor Rec (gal)			1.31
Hrly H2O Rec (gal)			160
LNAPL as % of Total Fluids			2.33%





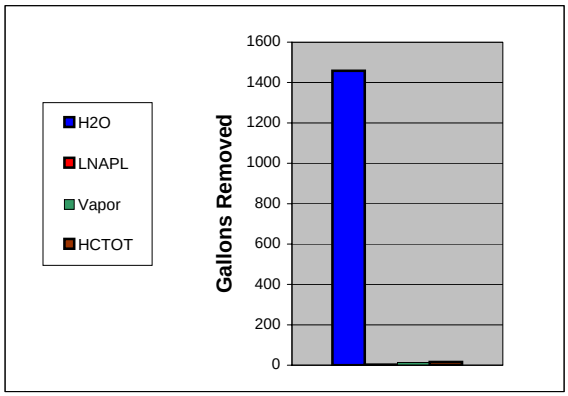
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-50C Date: Wednesday, August 24, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
7.88	1458.00	2.00	13.7	15.70

LNAPL Type	G_s
Gasoline	0.741



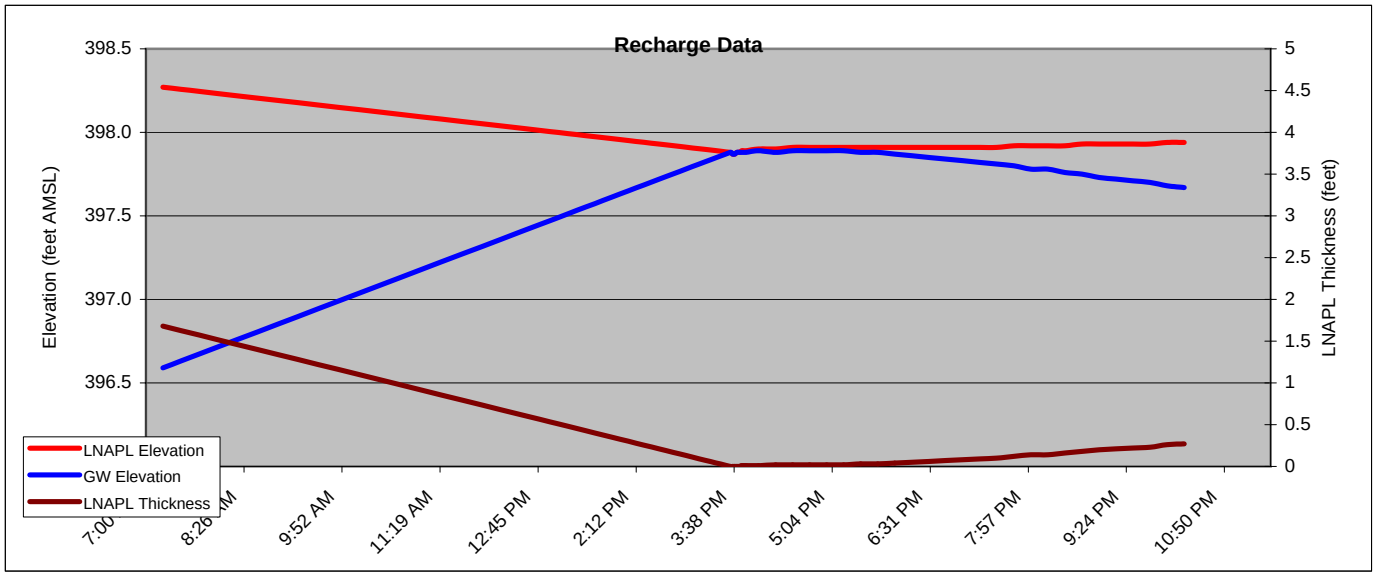
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	21.54	13.46	20.13
Stinger Vac (in Hg)	20.09	7.12	12.52
Well Flow in scfm	14	2	9.20
Well Casing Vac (in Hg)	0.43	0.19	0.30
Average Hrly HC_{TOT} Rec (gal)			1.99
Hrly LNAPL Rec (gal)			0.25
Hrly Vapor Rec (gal)			1.74
Hrly H_2O Rec (gal)			184.95
LNAPL as % of Total Fluids			1.1%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		7:15	7:46	9:00	10:29	11:59	13:28	14:28	15:39
TOC Elevation		430.23							
$DTScreen_{TOC}$		28.9599991	--	--	--	--	--	--	--
DTP_{TOC}		31.96	--	--	--	--	--	--	--
DTW_{TOC}		33.64	--	--	--	--	--	--	--
Product Thickness		1.68	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		N	--	--	--	--	--	--	--
Groundwater Elev*.		397.83							
Stinger $Depth_{TOC}$		32.43	32.43	32.43	32.43	32.43	32.43	32.43	32.43
Stinger Tip Elevation		397.80	397.80	397.80	397.80	397.80	397.80	397.80	397.80
Stinger $Immersion_{DTP}$		0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47
Stinger Immersion as %**		28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%
St. $Imm._{CGW}$	ADV %	0.03	10%	10%	50%	50%	50%	50%	50%
Well Casing Vac (in Hg)		---	---	5.25	2.6	3.55	3.5	4.6	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



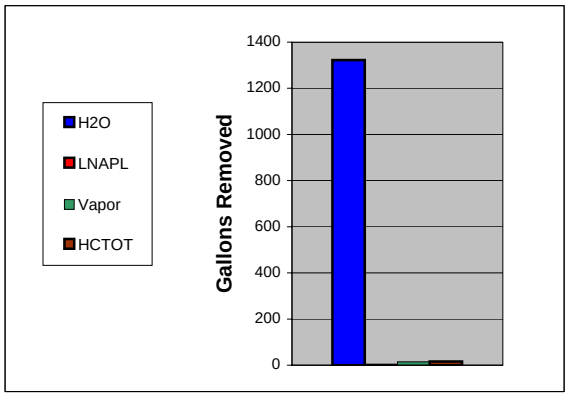
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-50C Date: Thursday, August 25, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
8.32	1322.0	1.0	14.9	15.9

LNAPL Type	G_s
Gasoline	0.741



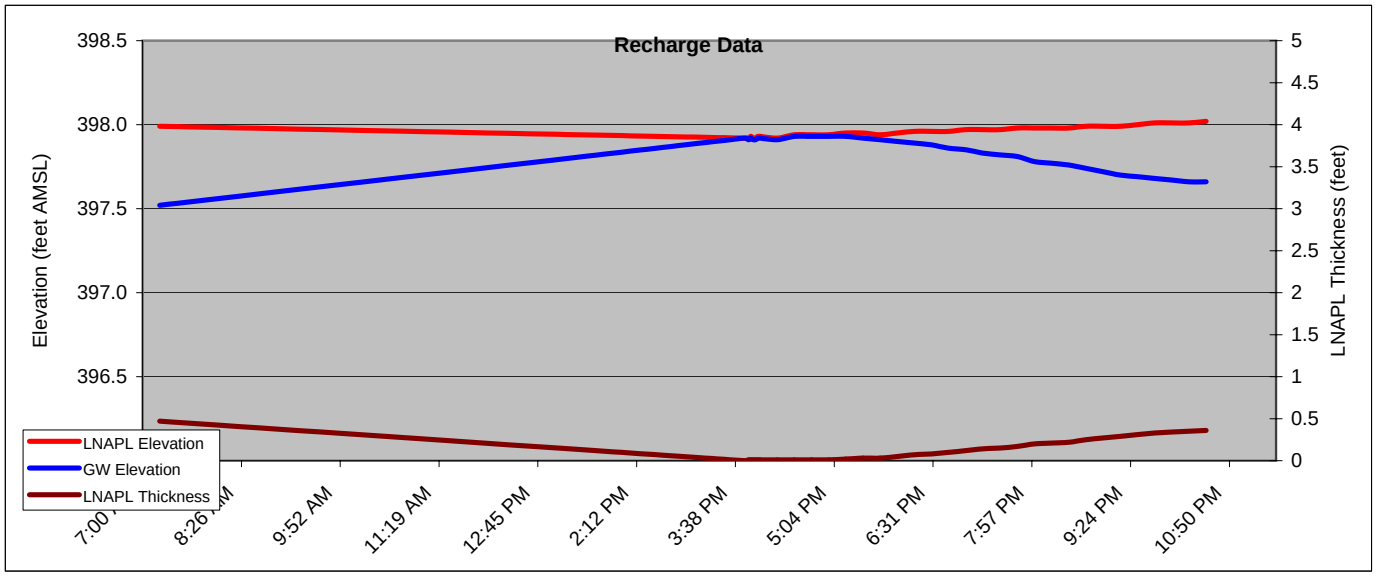
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	21.23	19.80	20.08
Stinger Vac (in Hg)	20.25	5.22	11.57
Well Flow in scfm	10	2	6.89
Well Casing Vac (in Hg)	0.45	0.30	0.39
Average Hrly HC_{TOT} Rec (gal)			1.91
Hrly LNAPL Rec (gal)			0.12
Hrly Vapor Rec (gal)			1.79
Hrly H_2O Rec (gal)			158.96
LNAPL as % of Total Fluids			1.2%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		7:15	7:28	8:58	10:28	11:58	13:32	14:32	15:47
TOC Elevation		430.23							
$DTScreen_{TOC}$		28.9599991	--	--	--	--	--	--	--
DTP_{TOC}		32.24	--	--	--	--	--	--	--
DTW_{TOC}		32.71	--	--	--	--	--	--	--
Product Thickness		0.47	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		N	--	--	--	--	--	--	--
Groundwater Elev*.		397.87							
Stinger $Depth_{TOC}$		32.54	32.54	32.54	32.54	32.54	32.54	32.54	32.54
Stinger Tip Elevation		397.69	397.69	397.69	397.69	397.69	397.69	397.69	397.69
Stinger $Immersion_{DTP}$		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Stinger Immersion as %**		63.8%	63.8%	63.8%	63.8%	63.8%	63.8%	63.8%	63.8%
St. $Imm._{CGW}$	ADV %	0.18	10%	10%	10%	10%	10%	10%	10%
Well Casing Vac (in Hg)		---	---	5.65	6.15	5	5.35	5.45	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



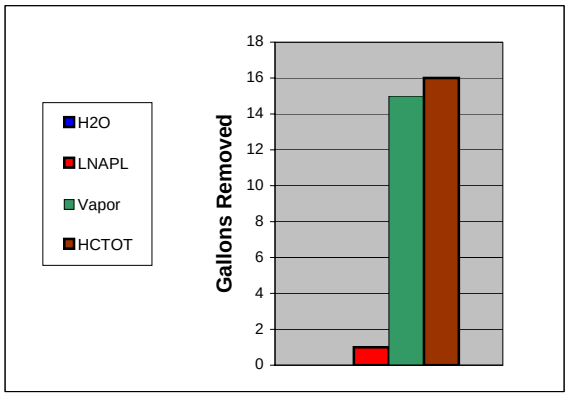
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-50C Date: Friday, August 26, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
8.02	0.00	1.00	15.0	16.00

LNAPL Type	G_s
Gasoline	0.741



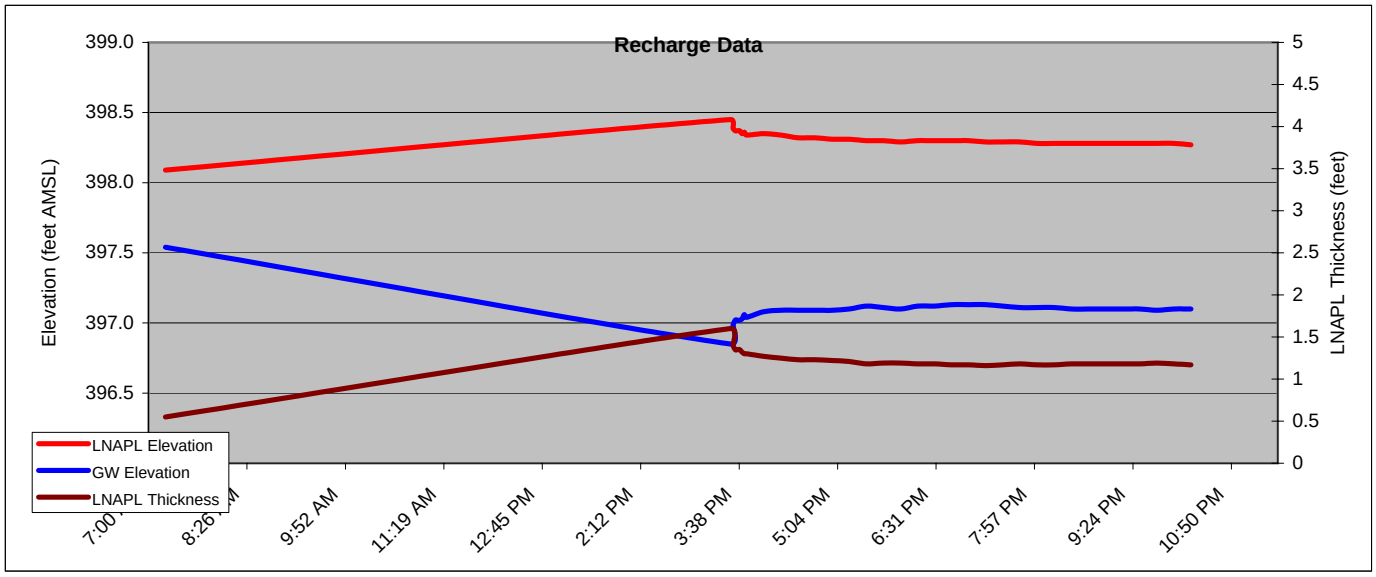
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	20.91	18.22	19.66
Stinger Vac (in Hg)	5.06	0.32	1.11
Well Flow in scfm	9	2	5.22
Well Casing Vac (in Hg)	0.66	0.43	0.49
Average Hrly HC_{TOT} Rec (gal)			2.00
Hrly LNAPL Rec (gal)			0.12
Hrly Vapor Rec (gal)			1.87
Hrly H_2O Rec (gal)			0.00
LNAPL as % of Total Fluids			100.0%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		7:15	7:29	8:28	9:58	11:28	13:29	14:28	15:30
TOC Elevation		430.23							
$DTScreen_{TOC}$		28.9599991	--	--	--	--	--	--	--
DTP_{TOC}		32.14	--	--	--	--	--	--	--
DTW_{TOC}		32.69	--	--	--	--	--	--	--
Product Thickness		0.55	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		N	--	--	--	--	--	--	--
Groundwater Elev*.		397.95							
Stinger $Depth_{TOC}$		17.78	17.78	17.78	17.78	17.78	17.78	17.78	17.78
Stinger Tip Elevation		412.45	412.45	412.45	412.45	412.45	412.45	412.45	412.45
Stinger $Immersion_{DTP}$		-14.36	-14.36	-14.36	-14.36	-14.36	-14.36	-14.36	-14.36
Stinger Immersion as %**		-2610.9%	-2610.9%	-2610.9%	-2610.9%	-2610.9%	-2610.9%	-2610.9%	-2610.9%
St. $Imm._{CGW}$	ADV %	-14.50	0%	0%	0%	0%	0%	0%	0%
Well Casing Vac (in Hg)		---	---	6.65	6.4	6.85	6.65	6.2	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



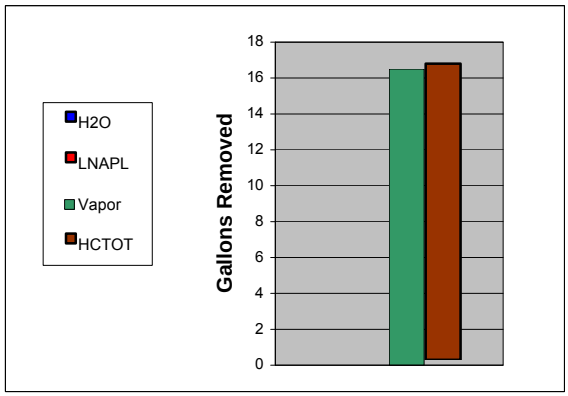
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-50C Date: Monday, August 29, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
7.97	0.00	0.00	16.5	16.50

LNAPL Type	G_s
Gasoline	0.741



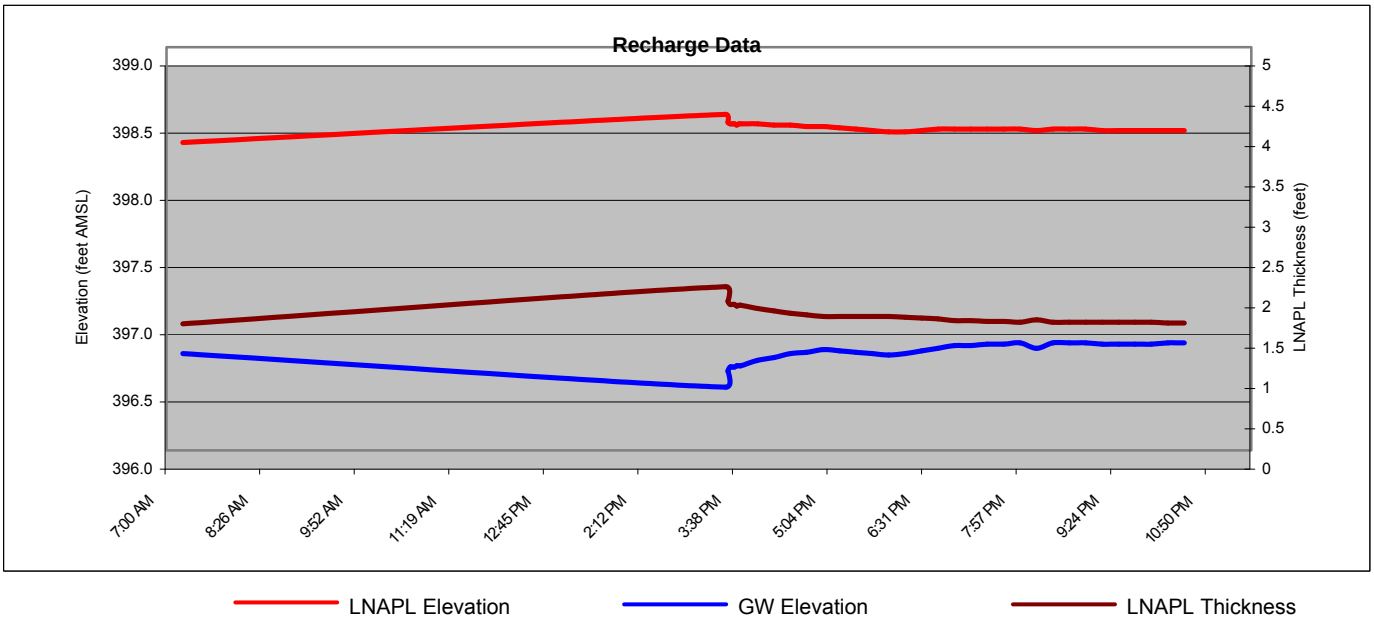
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	20.43	18.53	19.45
Stinger Vac (in Hg)	2.06	0.16	0.27
Well Flow in scfm	6	2	4.03
Well Casing Vac (in Hg)	0.48	0.43	0.46
Average Hrly HC_{TOT} Rec (gal)			2.07
Hrly LNAPL Rec (gal)			0.00
Hrly Vapor Rec (gal)			2.07
Hrly H_2O Rec (gal)			0.00
LNAPL as % of Total Fluids			100.0%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		7:15	7:30	8:30	9:59	11:29	12:59	13:59	15:28
TOC Elevation		430.23							
$DTScreen_{TOC}$		28.9599991	--	--	--	--	--	--	--
DTP_{TOC}		31.94	--	--	--	--	--	--	--
DTW_{TOC}		33.51	--	--	--	--	--	--	--
Product Thickness		1.57	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		N	--	--	--	--	--	--	--
Groundwater Elev*.		397.88							
Stinger $Depth_{TOC}$		17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8
Stinger Tip Elevation		412.43	412.43	412.43	412.43	412.43	412.43	412.43	412.43
Stinger $Immersion_{DTP}$		-14.14	-14.14	-14.14	-14.14	-14.14	-14.14	-14.14	-14.14
Stinger Immersion as %**		-900.6%	-900.6%	-900.6%	-900.6%	-900.6%	-900.6%	-900.6%	-900.6%
St. $Imm._{CGW}$	ADV %	-14.55	0%	0%	0%	0%	0%	0%	0%
Well Casing Vac (in Hg)		---	---	5.9	6.45	6.15	6.25	6.5	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



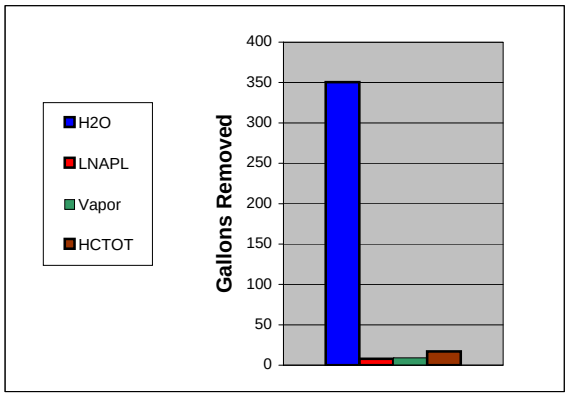
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-51D Date: Tuesday, November 01, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
8.02	350.43	8.00	9.1	17.10

LNAPL Type	G_s
Gasoline	0.7508



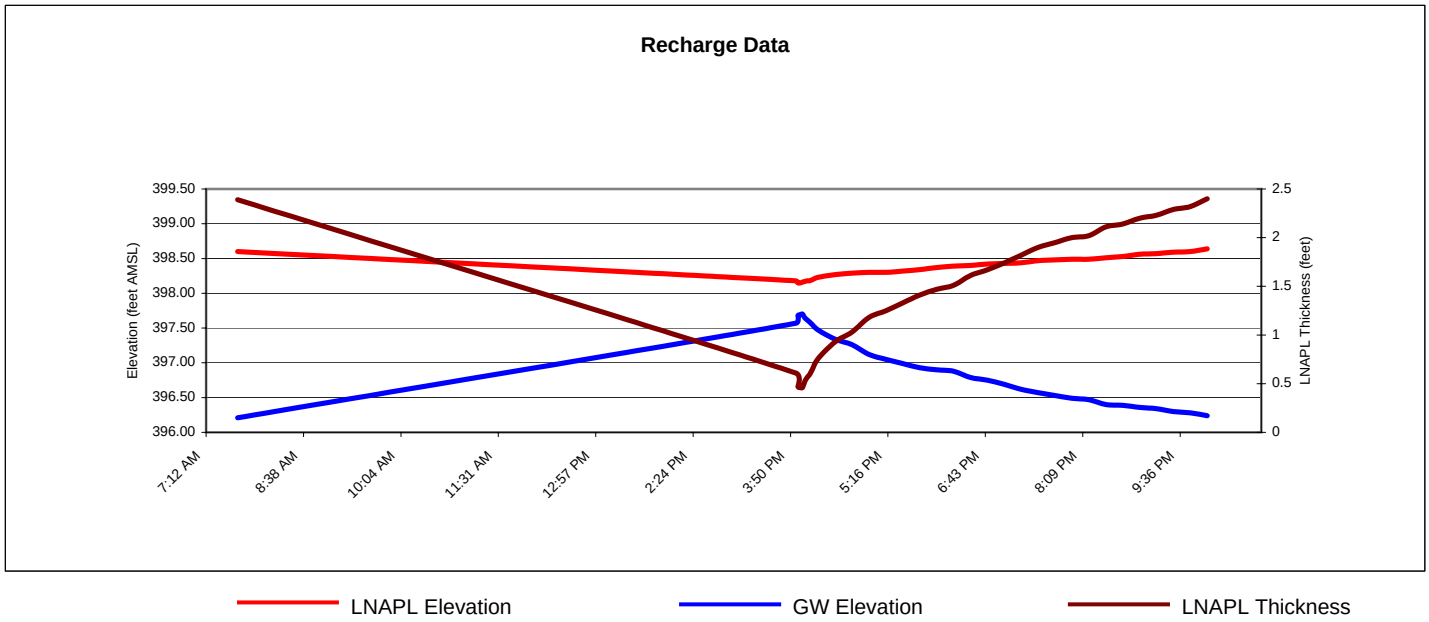
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	22.00	20.30	21.39
Stinger Vac (in Hg)	11.83	3.90	8.06
Well Flow in scfm	7	2	5.10
Well Casing Vac (in Hg)	0.22	0.07	0.16
Average Hrly HC_{TOT} Rec (gal)			2.13
Hrly LNAPL Rec (gal)			1.00
Hrly Vapor Rec (gal)			1.14
Hrly H_2O Rec (gal)			43.71
LNAPL as % of Total Fluids			4.7%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		11/1/2005 7:40	7:55	8:30	10:00	11:00	13:00	15:00	15:56
TOC Elevation		430.99							
$DTScreen_{TOC}$		28	--	--	--	--	--	--	--
DTP_{TOC}		32.39	--	--	--	--	--	--	--
DTW_{TOC}		34.78	--	--	--	--	--	--	--
Product Thickness		2.39	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		N	--	--	--	--	--	--	--
Groundwater Elev*.		398.00							
Stinger $Depth_{TOC}$		32.56	32.56	32.56	32.56	32.56	32.31	31.81	31.81
Stinger Tip Elevation		398.43	398.43	398.43	398.43	398.43	398.68	399.18	399.18
Stinger $Immersion_{DTP}$		0.17	0.17	0.17	0.17	0.17	-0.08	-0.58	-0.58
Stinger Immersion as %**		7.1%	7.1%	7.1%	7.1%	7.1%	-3.3%	-24.3%	-24.3%
St. $Imm._{CGW}$	ADV %	-0.43	20%	20%	20%	25%	15%	10%	10%
Well Casing Vac (in H2O)		---	---	2	2.2	0.9	3.4	7.2	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



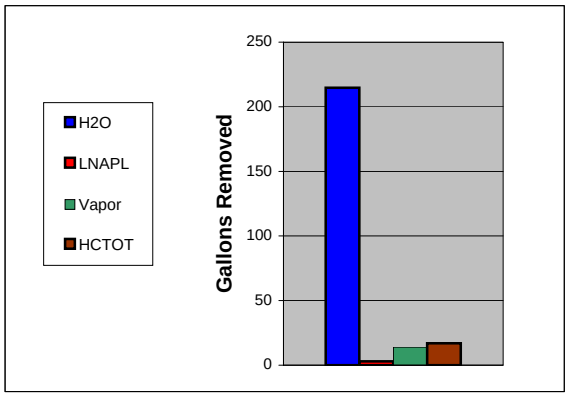
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-52C Date: Monday, October 31, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
8.00	214.72	3.00	14.0	17.00

LNAPL Type	G_s
Gasoline	0.736



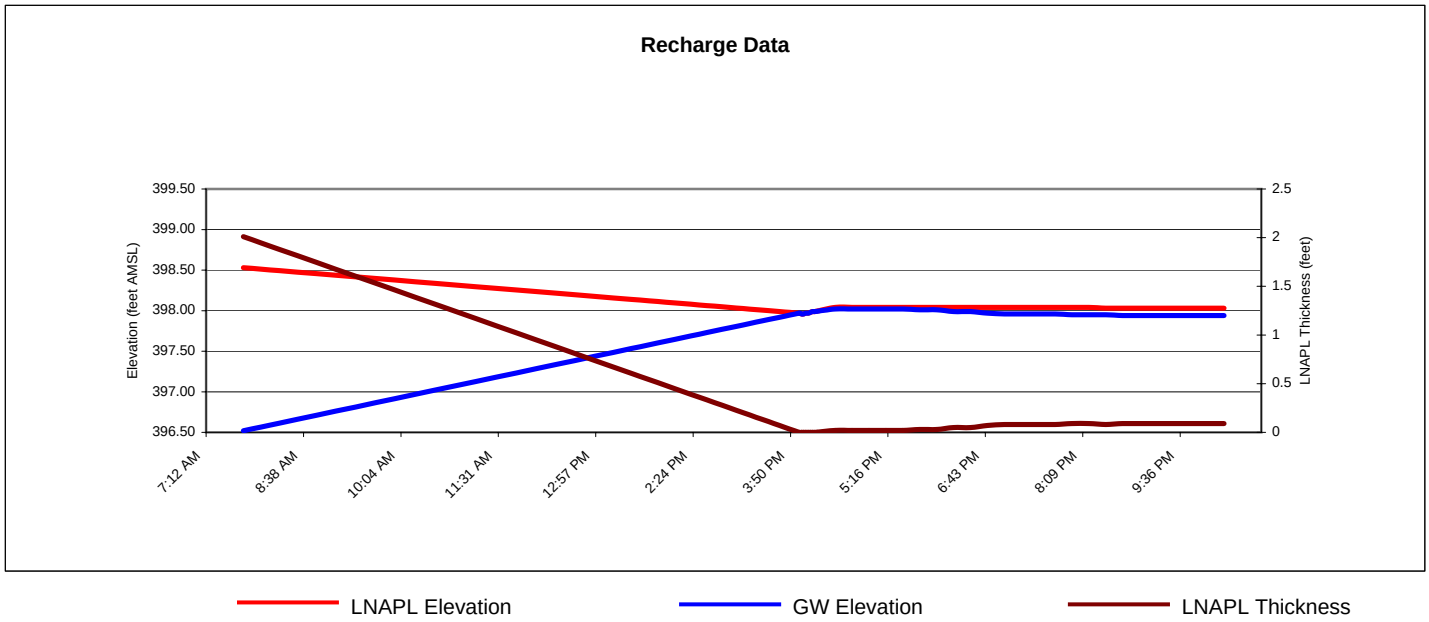
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	21.70	21.30	21.44
Stinger Vac (in Hg)	9.48	7.35	8.45
Well Flow in scfm	14	9	12.06
Well Casing Vac (in Hg)	1.07	0.50	0.85
Average Hrly HC_{TOT} Rec (gal)			2.12
Hrly LNAPL Rec (gal)			0.37
Hrly Vapor Rec (gal)			1.75
Hrly H_2O Rec (gal)			26.84
LNAPL as % of Total Fluids			7.3%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		10/31/2005 7:45	7:55	8:57	10:27	11:57	13:27	14:57	15:55
TOC Elevation		429.99							
$DTScreen_{TOC}$		27.68	--	--	--	--	--	--	--
DTP_{TOC}		31.46	--	--	--	--	--	--	--
DTW_{TOC}		33.47	--	--	--	--	--	--	--
Product Thickness		2.01	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		N	--	--	--	--	--	--	--
Groundwater Elev*.		398.00							
Stinger $Depth_{TOC}$		31.82	31.82	31.82	32.32	31.32	31.32	31.32	31.32
Stinger Tip Elevation		398.17	398.17	398.17	397.67	398.67	398.67	398.67	398.67
Stinger $Immersion_{DTP}$		0.36	0.36	0.36	0.86	-0.14	-0.14	-0.14	-0.14
Stinger Immersion as %**		17.9%	17.9%	17.9%	42.8%	-7.0%	-7.0%	-7.0%	-7.0%
St. $Imm._{CGW}$	ADV %	-0.17	30%	30%	30%	30%	30%	30%	30%
Well Casing Vac (in H2O)		---	---	12.4	12.6	13.6	13.9	14.2	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-53C Date: 05/17/05 Day: Tuesday Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.08	1449	8	11.6	19.6

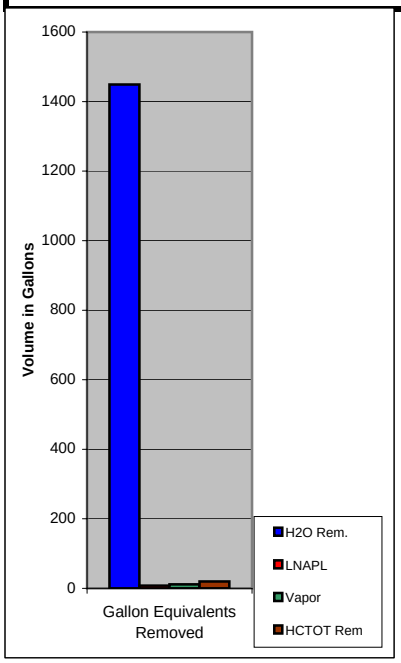
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

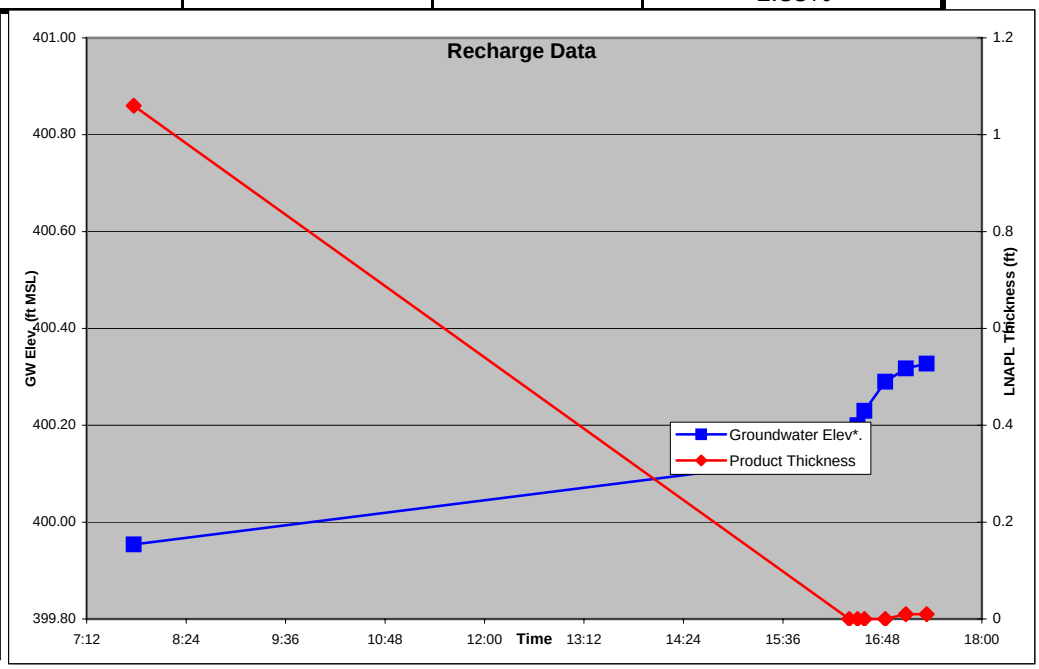
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:46	8:18	9:50	16:23	16:24	16:30	16:35	16:50	17:05	17:20
TOC Elevation	430.64				430.64	430.64	430.64	430.64	430.64	430.64
$DTScreen_{TOC}$	29.06	--	--	--	29.06	29.06	29.06	29.06	29.06	29.06
DTP_{TOC}	30.4	--	--	--					30.32	30.31
DTW_{TOC}	31.46	--	--	--	30.5	30.44	30.41	30.35	30.33	30.32
Product Thickness	1.06	--	--	--	0	0	0	0	0.01	0.01
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	399.95				400.14	400.2	400.23	400.29	400.32	400.33
$Stinger\ Depth_{TOC}$	30.95	30.95	30.65	30.75						
$Stinger\ Immersion_{DTP}$	0.55	0.55	0.25	0.35						
Stinger Immersion as %**	51.9%	51.9%	23.6%	33.0%						
$Stinger\ Depth_{CGW}$	0.26									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	22.02	3.48	19.92
Stinger Vac (in Hg)	17.24	0	12.63
Well Flow in scfm	34	9	22.12
Well Casing Vac (in Hg)	0.88	0.11	
Average Hrly HC_{TOT} Rec (gal)			2.43
Hrly LNAPL Rec (gal)			0.99
Hrly Vapor Rec (gal)			1.44
Hrly H2O Rec (gal)			179.33
LNAPL as % Hof Total Fluids			1.33%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-53C Date: 06/01/05 Day: Wednesday Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.2	399.3	57.3	16.3	73.6

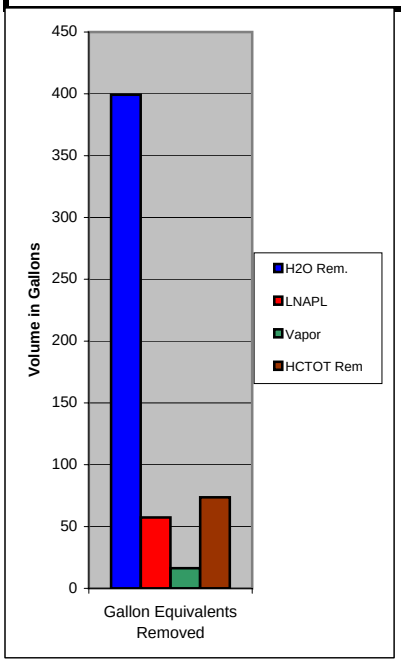
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

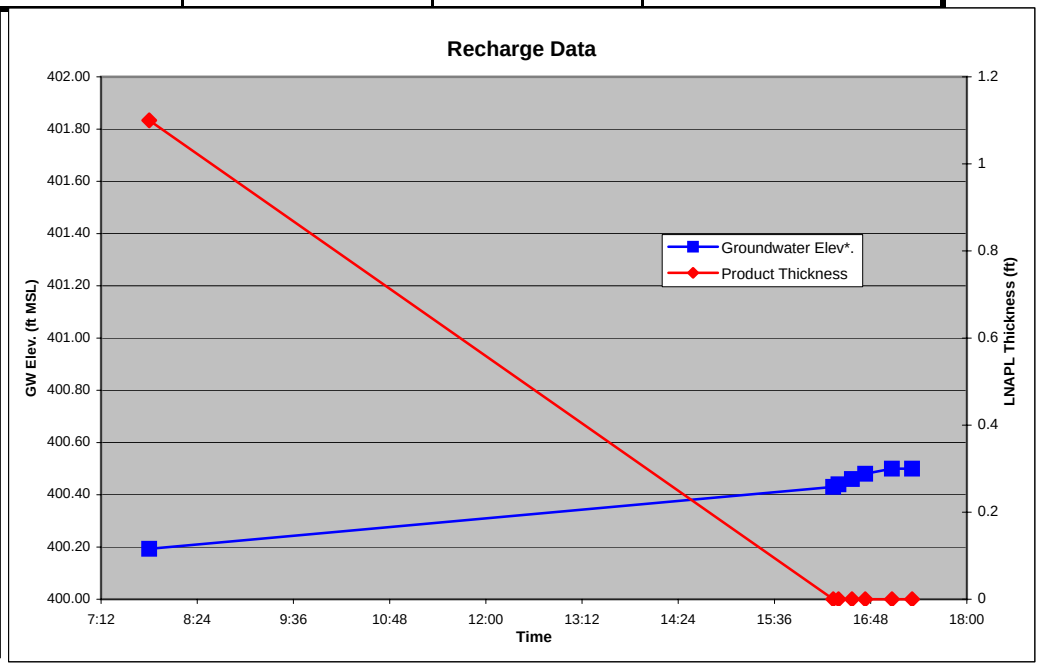
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:48	8:04	12:18	16:16	16:20	16:24	16:34	16:44	17:04	17:19
TOC Elevation	430.64				430.64	430.64	430.64	430.64	430.64	430.64
$DTScreen_{TOC}$	29.06	--	--	--	29.06	29.06	29.06	29.06	29.06	29.06
DTP_{TOC}	30.15	--	--	--						
DTW_{TOC}	31.25	--	--	--	30.21	30.2	30.18	30.16	30.14	30.14
Product Thickness	1.1	--	--	--	0	0	0	0	0	0
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	400.19				400.43	400.44	400.46	400.48	400.5	400.5
Stinger $Depth_{TOC}$	30.84	30.84	30.84	30.84						
Stinger $Immersion_{DTP}$	0.69	0.69	0.69	0.69						
Stinger Immersion as %**	62.7%	62.7%	62.7%	62.7%						
Stinger $Depth_{CGW}$	0.39									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.54	19.96	20.48
Stinger Vac (in Hg)	17.6	2.21	7.02
Well Flow in scfm	24	7	15.71
Well Casing Vac (in Hg)	3.42	0.18	
Average Hrly HC_{TOT} Rec (gal)			8.98
Hrly LNAPL Rec (gal)			6.99
Hrly Vapor Rec (gal)			1.99
Hrly H2O Rec (gal)			48.70
LNAPL as % Hof Total Fluids			15.56%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-53C Date: Thursday, June 16, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.03	463.2	18.7	14.9	33.6

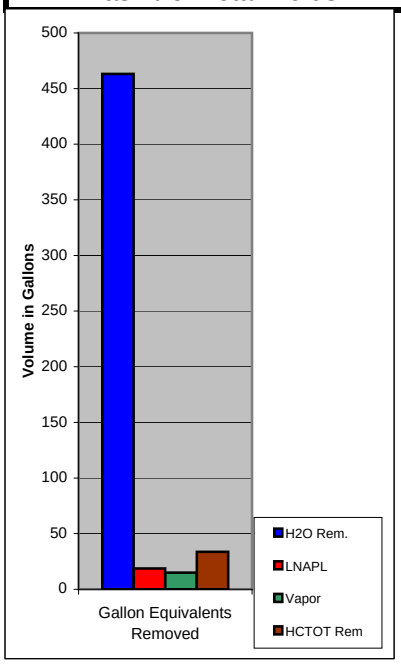
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

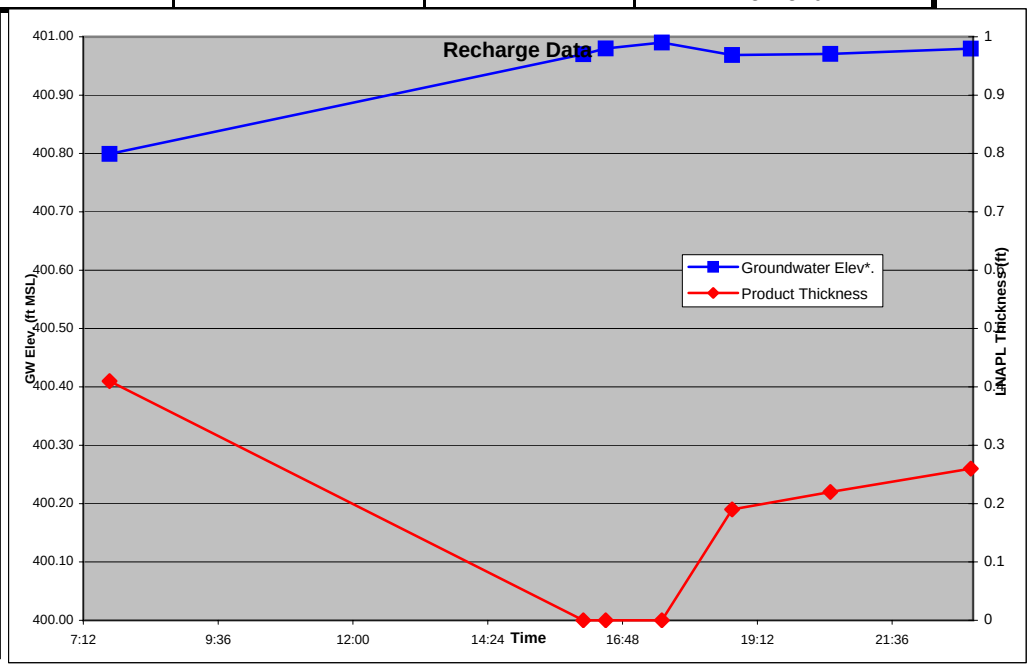
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:40	8:00	10:17	16:02	16:06	16:30	17:30	18:45	20:30	23:00
TOC Elevation	430.64				430.64	430.64	430.64	430.64	430.64	430.64
$DTScreen_{TOC}$	29.06	--	--	--	29.06	29.06	29.06	29.06	29.06	29.06
DTP_{TOC}	29.73	--	--	--				29.62	29.61	29.59
DTW_{TOC}	30.14	--	--	--	29.67	29.66	29.65	29.81	29.83	29.85
Product Thickness	0.41	--	--	--	0	0	0	0.19	0.22	0.26
Fluid Above Screen (Y/N)	N	--	--	--	Y	Y	Y	N	N	N
Groundwater Elev*.	400.80				400.97	400.98	400.99	400.97	400.97	400.98
$Stinger\ Depth_{TOC}$	30.16	30.16	27.91	28.91						
Stinger Tip Elevation	400.48	400.48	402.73	401.73						
$Stinger\ Immersion_{DTP}$	0.43	0.43	-1.82	-0.82						
Stinger Immersion as %**	104.9%	104.9%	-443.9%	-200.0%						
$Stinger\ Depth_{CGW}$	0.32									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.54	20.12	20.49
Stinger Vac (in Hg)	9.17	1.74	7.61
Well Flow in scfm	42	19	34.38
Well Casing Vac (in Hg)	1.51	0.46	
Average Hrly HC_{TOT} Rec (gal)			4.18
Hrly LNAPL Rec (gal)			2.33
Hrly Vapor Rec (gal)			1.85
Hrly H_2O Rec (gal)			58
LNAPL as % of Total Fluids			6.76%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-53C Date: Tuesday, July 05, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
4.22	709.6	18.5	7.3	25.8

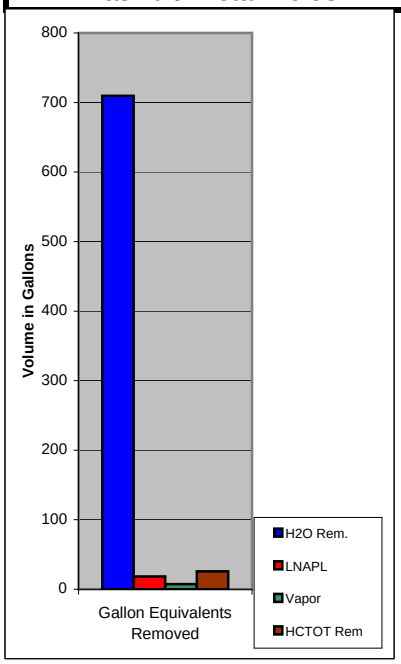
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

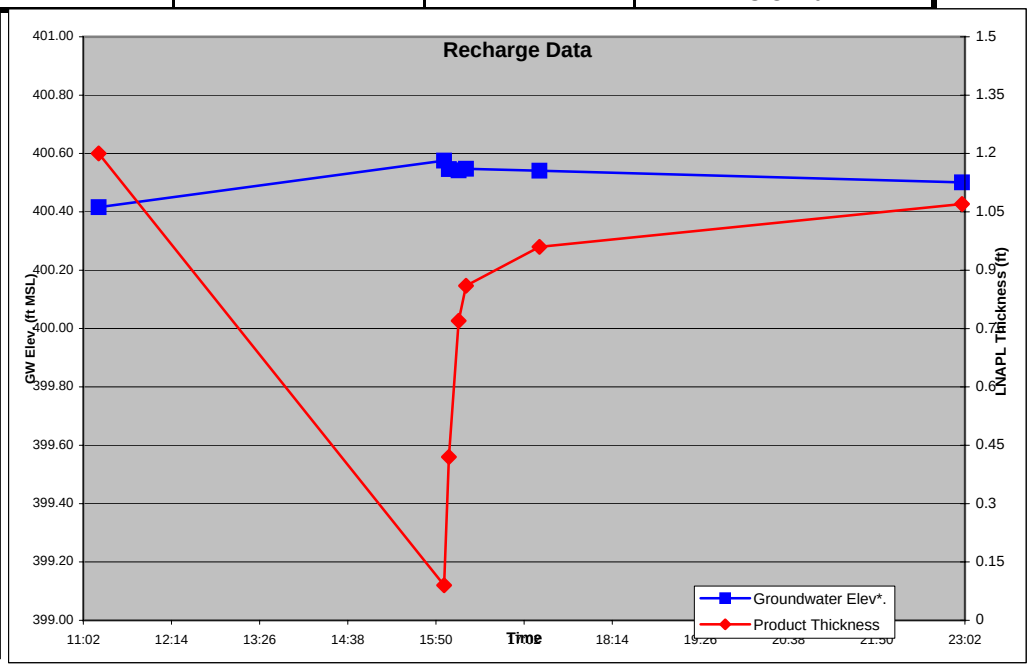
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	11:15	11:43	13:29	15:56	15:57	16:01	16:09	16:15	17:15	23:00
TOC Elevation	430.64				430.64	430.64	430.64	430.64	430.64	430.64
$DTScreen_{TOC}$	29.06	--	--	--	29.06	29.06	29.06	29.06	29.06	29.06
DTP_{TOC}	29.9	--	--	--	30.04	29.98	29.89	29.86	29.84	29.85
DTW_{TOC}	31.1	--	--	--	30.13	30.4	30.66	30.72	30.8	30.92
Product Thickness	1.2	--	--	--	0.09	0.42	0.77	0.86	0.96	1.07
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	400.42				400.58	400.55	400.54	400.55	400.54	400.5
$Stinger\ Depth_{TOC}$	30.78	30.78	30.78	30.78						
Stinger Tip Elevation	399.86	399.86	399.86	399.86						
$Stinger\ Immersion_{DTP}$	0.88	0.88	0.88	0.88						
Stinger Immersion as %**	73.3%	73.3%	73.3%	73.3%						
$Stinger\ Depth_{CGW}$	0.56									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	20.91	4.12	19.35
Stinger Vac (in Hg)	18.34	0.16	10.36
Well Flow in scfm	15	7	10.4
Well Casing Vac (in Hg)	0.38	0.01	
Average Hrly HC_{TOT} Rec (gal)			6.12
Hrly LNAPL Rec (gal)			4.39
Hrly Vapor Rec (gal)			1.73
Hrly H2O Rec (gal)			168
LNAPL as % of Total Fluids			3.51%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-53C Date: Tuesday, July 19, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
7.90	1645.4	24.3	9.8	34.1

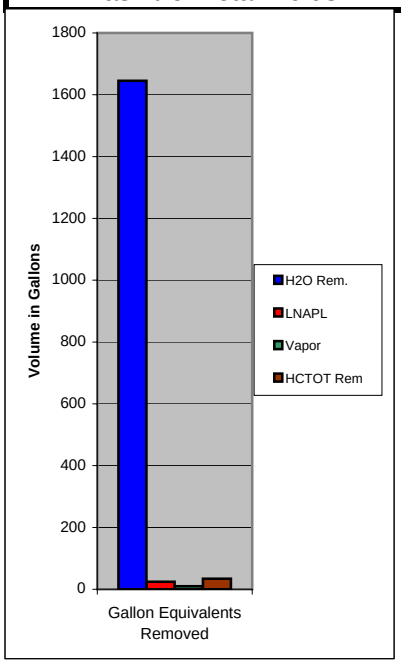
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

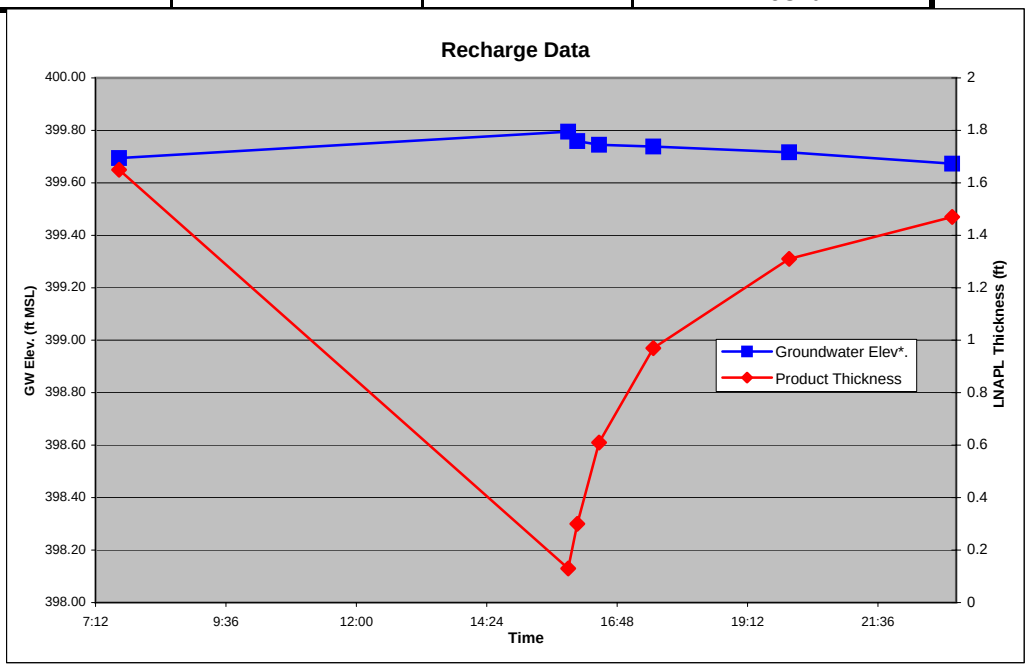
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:38	7:59	8:12	15:53	15:54	16:04	16:28	17:28	19:58	22:58
TOC Elevation	430.64				430.64	430.64	430.64	430.64	430.64	430.64
$DTScreen_{TOC}$	29.06	--	--	--	29.06	29.06	29.06	29.06	29.06	29.06
DTP_{TOC}	30.5	--	--	--	30.81	30.8	30.73	30.64	30.57	30.57
DTW_{TOC}	32.15	--	--	--	30.94	31.1	31.34	31.61	31.88	32.04
Product Thickness	1.65	--	--	--	0.13	0.3	0.61	0.97	1.31	1.47
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	399.69				399.79	399.76	399.75	399.74	399.72	399.67
Stinger $Depth_{TOC}$	30.85	30.85	31.1	29.85						
Stinger Tip Elevation	399.79	399.79	399.54	400.79						
Stinger $Immersion_{DTP}$	0.35	0.35	0.6	-0.65						
Stinger Immersion as %**	21.2%	21.2%	36.4%	-39.4%						
Stinger $Depth_{CGW}$	-0.10									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.38	19.64	20.33
Stinger Vac (in Hg)	18.19	1.74	12.48
Well Flow in scfm	10	2	2.34
Well Casing Vac (in Hg)	1.07	0.01	
Average Hrly HC_{TOT} Rec (gal)			4.32
Hrly LNAPL Rec (gal)			3.08
Hrly Vapor Rec (gal)			1.24
Hrly H2O Rec (gal)			208
LNAPL as % of Total Fluids			2.03%





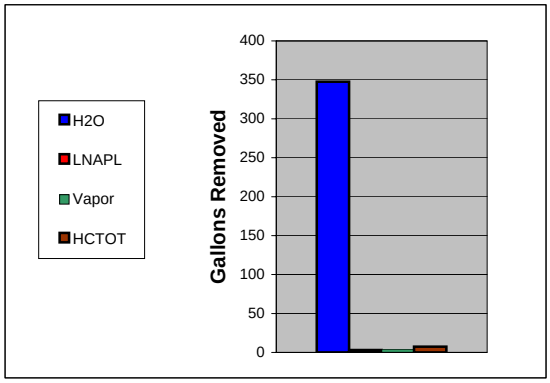
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-54C Date: Wednesday, November 02, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
8.02	347.58	3.00	4.4	7.40

LNAPL Type	G_s
Gasoline	0.748



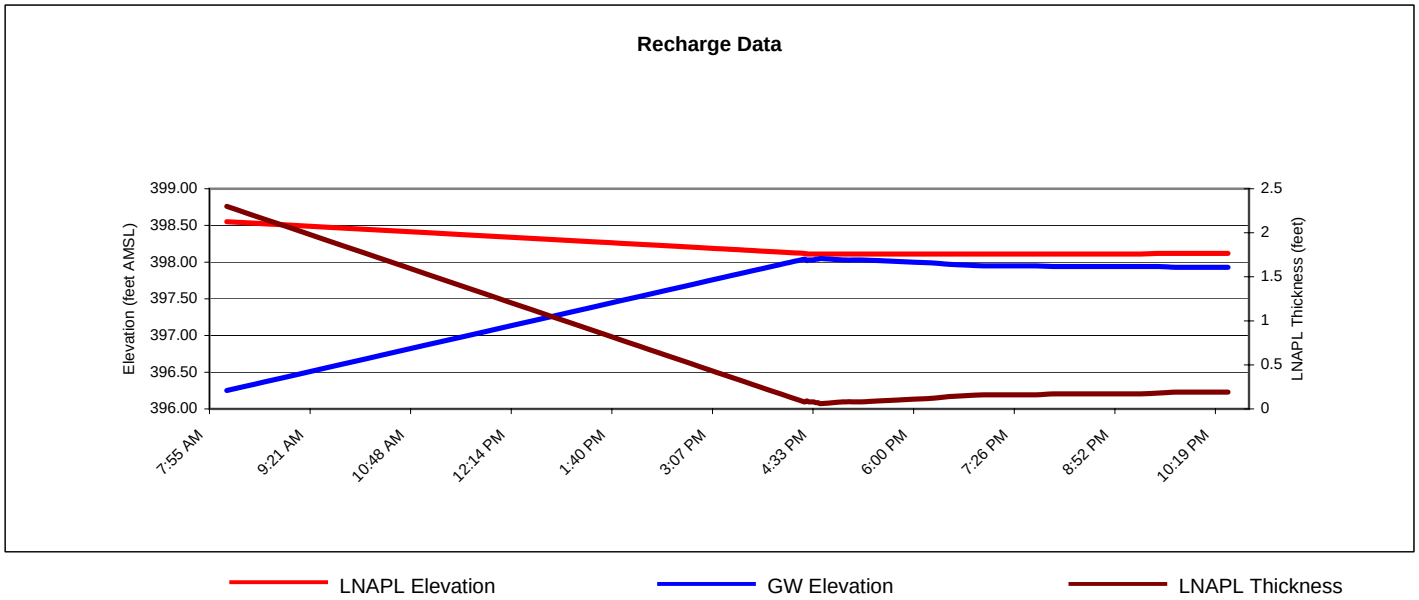
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	22.20	21.10	21.36
Stinger Vac (in Hg)	8.89	2.35	5.98
Well Flow in scfm	34	5	28.20
Well Casing Vac (in Hg)	1.01	0.01	0.69
Average Hrly HC_{TOT} Rec (gal)			0.92
Hrly LNAPL Rec (gal)			0.37
Hrly Vapor Rec (gal)			0.55
Hrly H_2O Rec (gal)			43.36
LNAPL as % of Total Fluids			2.1%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		11/2/2005 8:10	8:24	9:30	10:30	11:30	13:30	15:30	16:25
TOC Elevation		430.06							
$DTScreen_{TOC}$		31.2	--	--	--	--	--	--	--
DTP_{TOC}		31.51	--	--	--	--	--	--	--
DTW_{TOC}		33.81	--	--	--	--	--	--	--
Product Thickness		2.3	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		N	--	--	--	--	--	--	--
Groundwater Elev*.		397.97							
Stinger $Depth_{TOC}$		31.56	31.56	30.81	29.31	29.31	29.31	29.31	29.31
Stinger Tip Elevation		398.50	398.50	399.25	400.75	400.75	400.75	400.75	400.75
Stinger $Immersion_{DTP}$		0.05	0.05	-0.7	-2.2	-2.2	-2.2	-2.2	-2.2
Stinger Immersion as %**		2.2%	2.2%	-30.4%	-95.7%	-95.7%	-95.7%	-95.7%	-95.7%
St. $Imm._{CGW}$	ADV %	-0.53	20%	50%	75%	75%	75%	75%	75%
Well Casing Vac (in H2O)		---	---	3.1	13.7	10.4	12.7	12.3	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-55C Date: 5/19/05 Day: Thursday Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.2	807	35.5	14.7	50.2

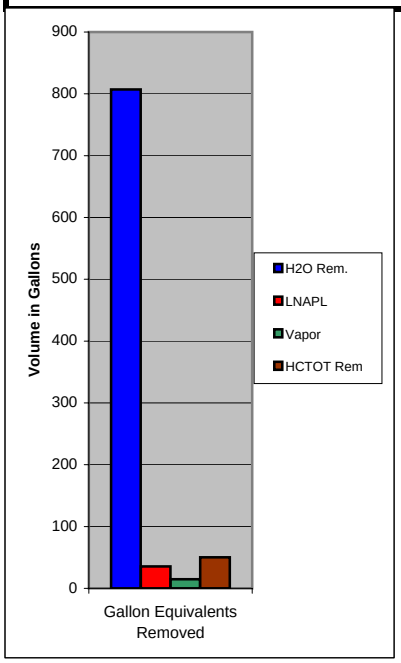
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

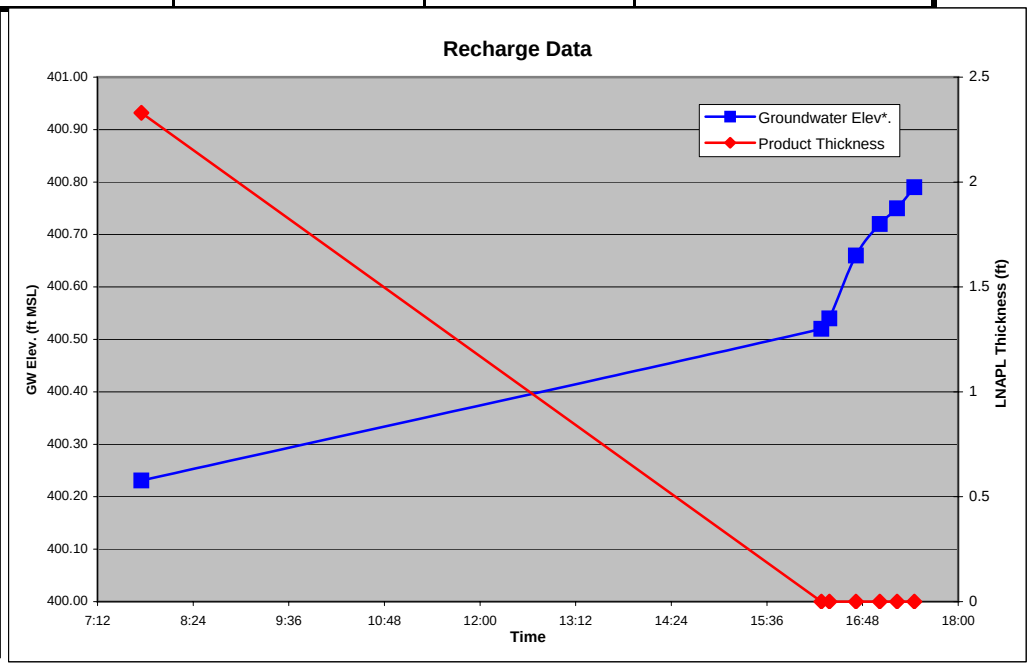
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:45	8:03	12:12	16:15	16:17	16:23	16:43	17:01	17:14	17:27
TOC Elevation	429.67				429.67	429.67	429.67	429.67	429.67	429.67
$DTScreen_{TOC}$	28.19	--	--	--	28.19	28.19	28.19	28.19	28.19	28.19
DTP_{TOC}	28.81	--	--	--						
DTW_{TOC}	31.14	--	--	--	29.15	29.13	29.01	28.95	28.92	28.88
Product Thickness	2.33	--	--	--	0	0	0	0	0	0
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	400.23				400.52	400.54	400.66	400.72	400.75	400.79
Stinger $Depth_{TOC}$	30.1	30.1	29.85	29.85						
Stinger $Immersion_{DTP}$	1.29	1.29	1.04	1.04						
Stinger Immersion as %**	55.4%	55.4%	44.6%	44.6%						
Stinger $Depth_{CGW}$	0.66									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.23	3.48	20.16
Stinger Vac (in Hg)	14.55	3.8	9.67
Well Flow in scfm	16	7	12.57
Well Casing Vac (in Hg)	0.68	0.42	
Average Hrly HC_{TOT} Rec (gal)			6.12
Hrly LNAPL Rec (gal)			4.33
Hrly Vapor Rec (gal)			1.79
Hrly H2O Rec (gal)			98
LNAPL as % of Total Fluids			5.86%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-55C Date: 6/3/05 Day: Friday Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
7.68	290	63	15	78

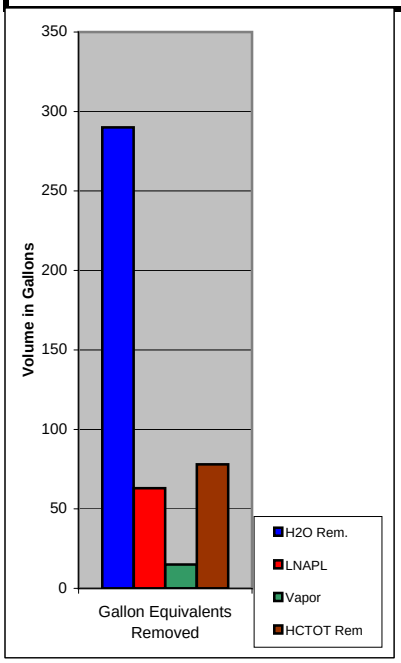
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

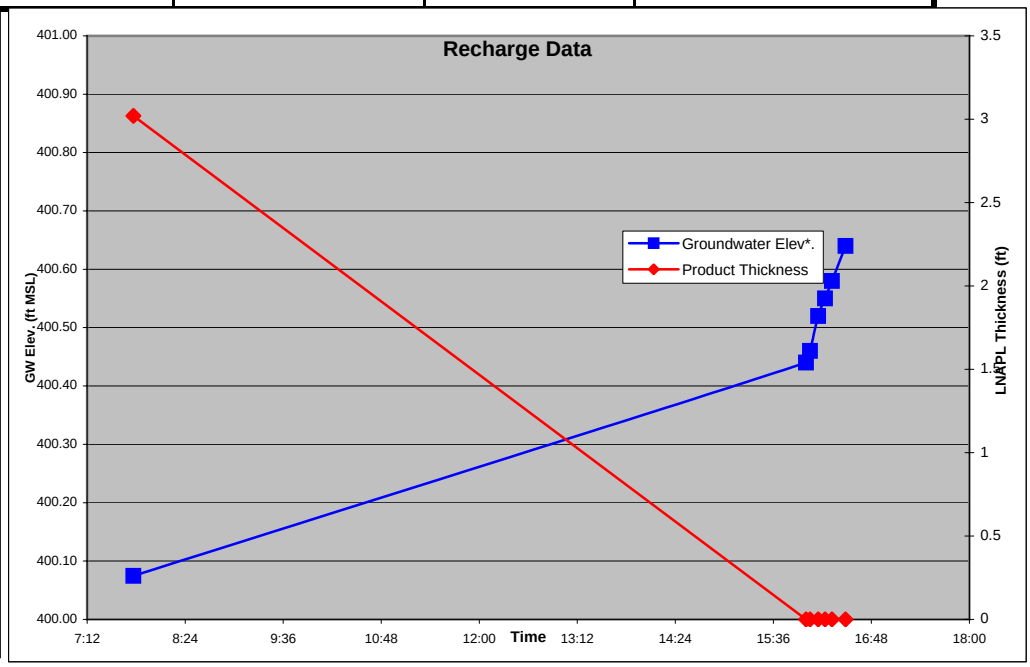
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:46	8:18	9:21	15:59	16:00	16:03	16:09	16:14	16:19	16:29
TOC Elevation	429.67				429.67	429.67	429.67	429.67	429.67	429.67
$DTScreen_{TOC}$	28.19	--	--	--	28.19	28.19	28.19	28.19	28.19	28.19
DTP_{TOC}	28.78	--	--	--						
DTW_{TOC}	31.8	--	--	--	29.23	29.21	29.15	29.12	29.09	29.03
Product Thickness	3.02	--	--	--	0	0	0	0	0	0
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	400.07				400.44	400.46	400.52	400.55	400.58	400.64
Stinger $Depth_{TOC}$	29.38	29.38	29.53	29.93						
Stinger $Immersion_{DTP}$	0.6	0.6	0.75	1.15						
Stinger Immersion as %**	19.9%	19.9%	24.8%	38.1%						
Stinger $Depth_{CGW}$	-0.22									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.38	20.12	20.67
Stinger Vac (in Hg)	17.24	1.27	7.83
Well Flow in scfm	19	5	7.47
Well Casing Vac (in Hg)	1.04	0.67	
Average Hrly HC_{TOT} Rec (gal)			10.16
Hrly LNAPL Rec (gal)			8.20
Hrly Vapor Rec (gal)			1.95
Hrly H2O Rec (gal)			38
LNAPL as % of Total Fluids			21.20%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-55C Date: Friday, June 17, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.07	656.8	39.1	16	55.1

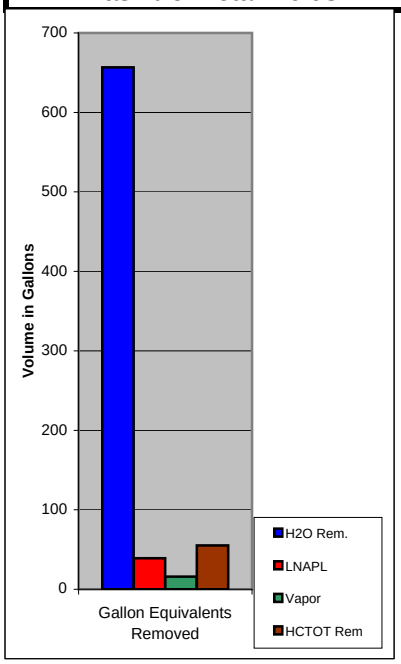
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

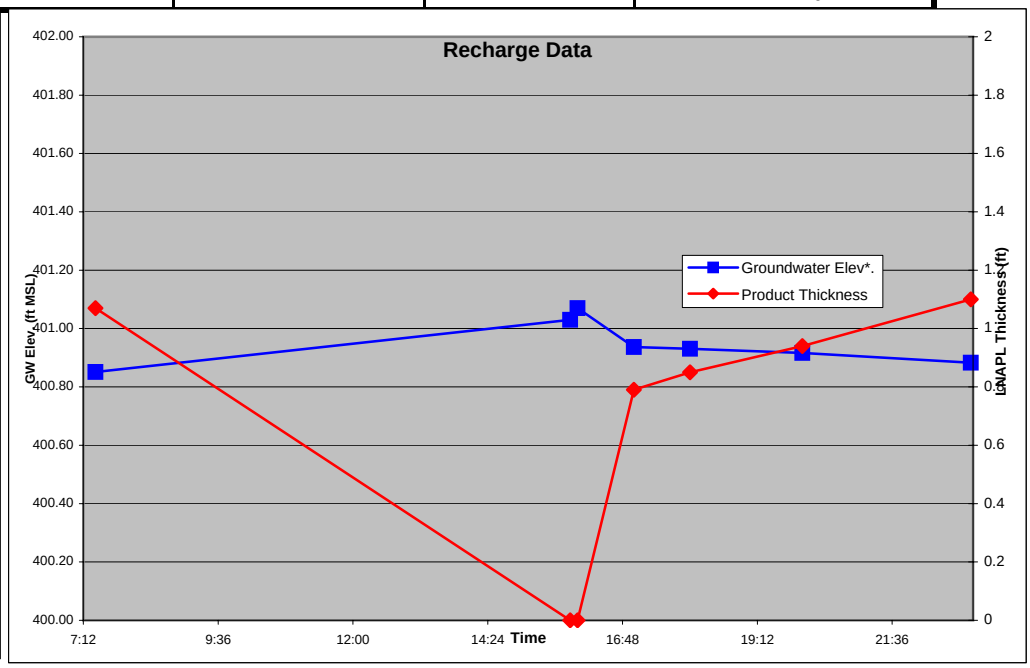
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:25	7:38	8:22	15:42	15:52	16:00	17:00	18:00	20:00	23:00
TOC Elevation	429.67				429.67	429.67	429.67	429.67	429.67	429.67
$DTScreen_{TOC}$	28.19	--	--	--	28.19	28.19	28.19	28.19	28.19	28.19
DTP_{TOC}	28.53	--	--	--			28.52	28.51	28.5	28.49
DTW_{TOC}	29.6	--	--	--	28.64	28.6	29.31	29.36	29.44	29.59
Product Thickness	1.07	--	--	--	0	0	0.79	0.85	0.94	1.1
Fluid Above Screen (Y/N)	N	--	--	--	Y	Y	N	N	N	N
Groundwater Elev*.	400.85				401.03	401.07	400.94	400.93	400.92	400.88
$Stinger\ Depth_{TOC}$	28.93	28.93	29.93	28.93						
Stinger Tip Elevation	400.74	400.74	399.74	400.74						
$Stinger\ Immersion_{DTP}$	0.4	0.4	1.4	0.4						
Stinger Immersion as %**	37.4%	37.4%	130.8%	37.4%						
$Stinger\ Depth_{CGW}$	0.11									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.7	19.96	20.49
Stinger Vac (in Hg)	11.39	1.11	8.3
Well Flow in scfm	24	14	19.62
Well Casing Vac (in Hg)	1.35	0.44	
Average Hrly HC_{TOT} Rec (gal)			6.83
Hrly LNAPL Rec (gal)			4.85
Hrly Vapor Rec (gal)			1.98
Hrly H2O Rec (gal)			81
LNAPL as % of Total Fluids			7.74%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-55C Date: Wednesday, July 06, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.00	505.8	84.3	15.1	99.4

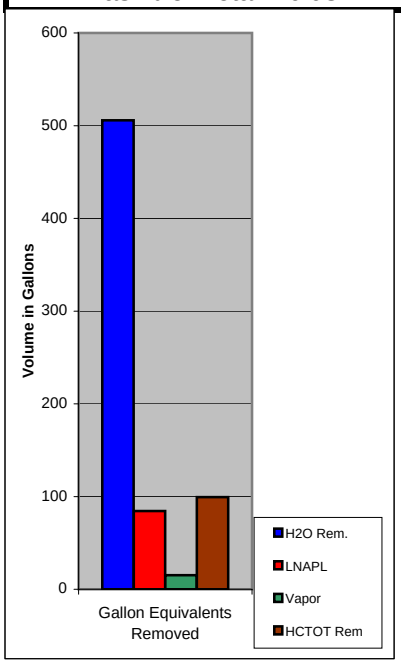
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

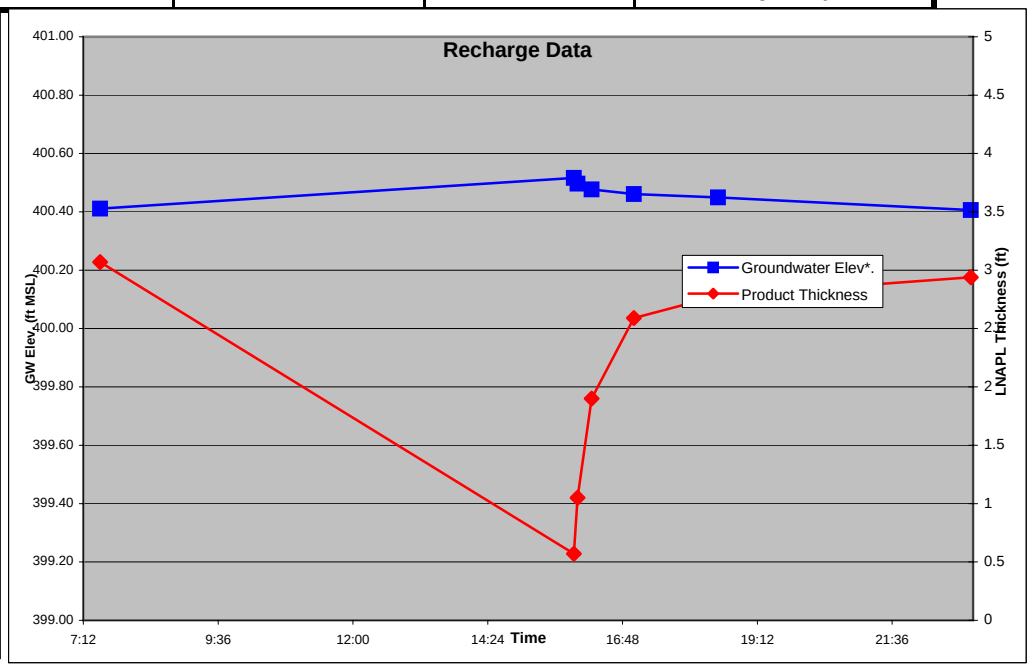
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:30	7:55	8:54	15:55	15:56	16:00	16:15	17:00	18:30	23:00
TOC Elevation	429.67				429.67	429.67	429.67	429.67	429.67	429.67
$DTScreen_{TOC}$	28.19	--	--	--	28.19	28.19	28.19	28.19	28.19	28.19
DTP_{TOC}	28.43	--	--	--	29	28.89	28.68	28.51	28.47	28.47
DTW_{TOC}	31.5	--	--	--	29.57	29.94	30.58	31.1	31.25	31.41
Product Thickness	3.07	--	--	--	0.57	1.05	1.9	2.59	2.78	2.94
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	400.41				400.52	400.5	400.48	400.46	400.45	400.41
Stinger $Depth_{TOC}$	28.94	28.94	29.19	29.1						
Stinger Tip Elevation	400.73	400.73	400.48	400.57						
Stinger $Immersion_{DTP}$	0.51	0.51	0.76	0.67						
Stinger Immersion as %**	16.6%	16.6%	24.8%	21.8%						
Stinger $Depth_{CGW}$	-0.32									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.54	20.28	20.73
Stinger Vac (in Hg)	18.66	3.18	7.99
Well Flow in scfm	7	2	3.12
Well Casing Vac (in Hg)	0.48	0.03	
Average Hrly HC_{TOT} Rec (gal)			12.43
Hrly LNAPL Rec (gal)			10.54
Hrly Vapor Rec (gal)			1.89
Hrly H2O Rec (gal)			63
LNAPL as % of Total Fluids			16.42%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-55C Date: Wednesday, July 20, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.00	825.9	58.6	15.7	74.3

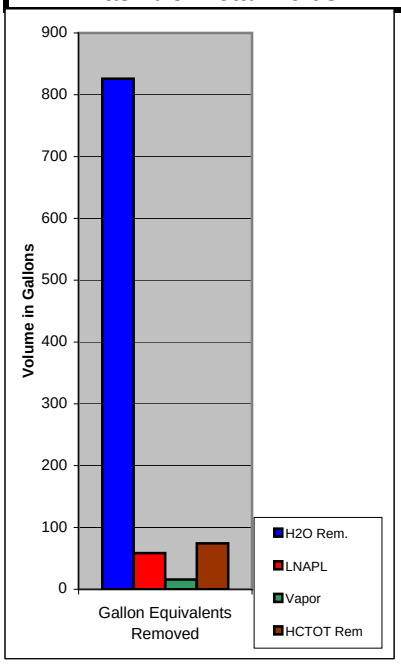
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

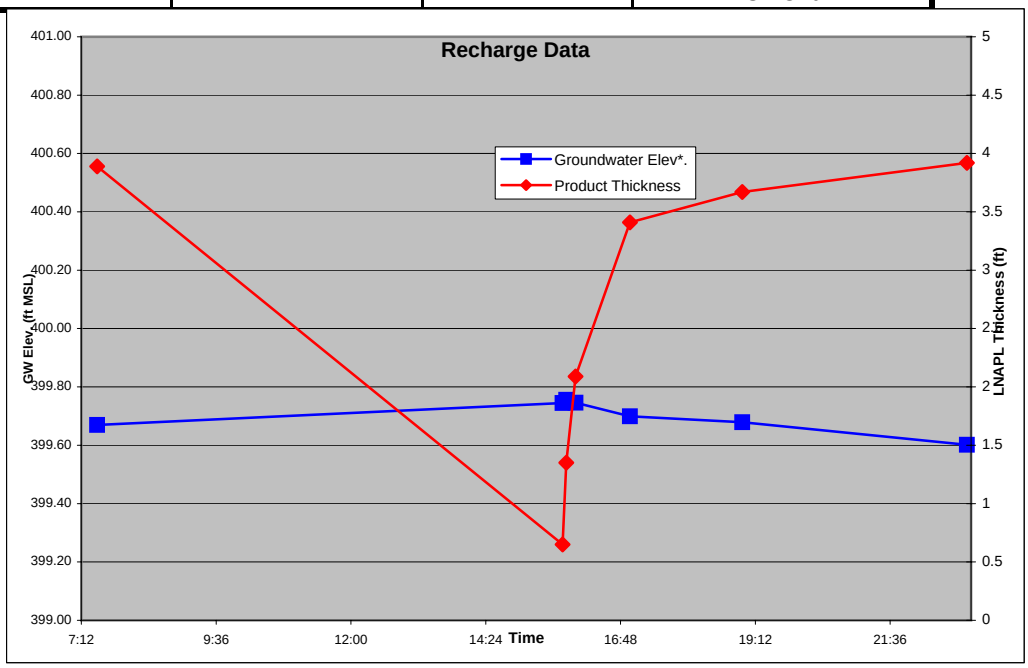
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:29	7:44	7:52	15:44	15:46	15:50	16:00	16:58	18:58	22:58
TOC Elevation	429.67				429.67	429.67	429.67	429.67	429.67	429.67
$DTScreen_{TOC}$	28.19	--	--	--	28.19	28.19	28.19	28.19	28.19	28.19
DTP_{TOC}	28.95	--	--	--	29.75	29.55	29.36	29.05	29	29.01
DTW_{TOC}	32.84	--	--	--	30.4	30.9	31.45	32.46	32.67	32.93
Product Thickness	3.89	--	--	--	0.65	1.35	2.09	3.41	3.67	3.92
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	399.67				399.74	399.76	399.75	399.7	399.68	399.6
Stinger $Depth_{TOC}$	29.61	29.61	29.86	29.36						
Stinger Tip Elevation	400.06	400.06	399.81	400.31						
Stinger $Immersion_{DTP}$	0.66	0.66	0.91	0.41						
Stinger Immersion as %**	17.0%	17.0%	23.4%	10.5%						
Stinger $Depth_{CGW}$	-0.39									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.38	20.12	20.52
Stinger Vac (in Hg)	14.39	1.15	9.42
Well Flow in scfm	12	2	3.62
Well Casing Vac (in Hg)	0.47	0.03	
Average Hrly HC_{TOT} Rec (gal)			9.29
Hrly LNAPL Rec (gal)			7.33
Hrly Vapor Rec (gal)			1.96
Hrly H2O Rec (gal)			103
LNAPL as % of Total Fluids			8.25%





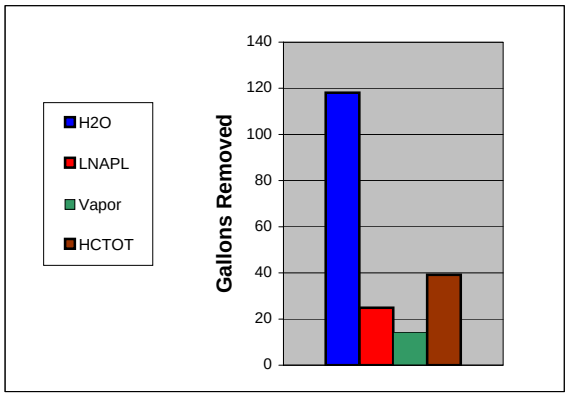
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-55C Date: Thursday, October 27, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
8.00	118.06	24.86	14.3	39.16

LNAPL Type	G_s
Gasoline	0.7705



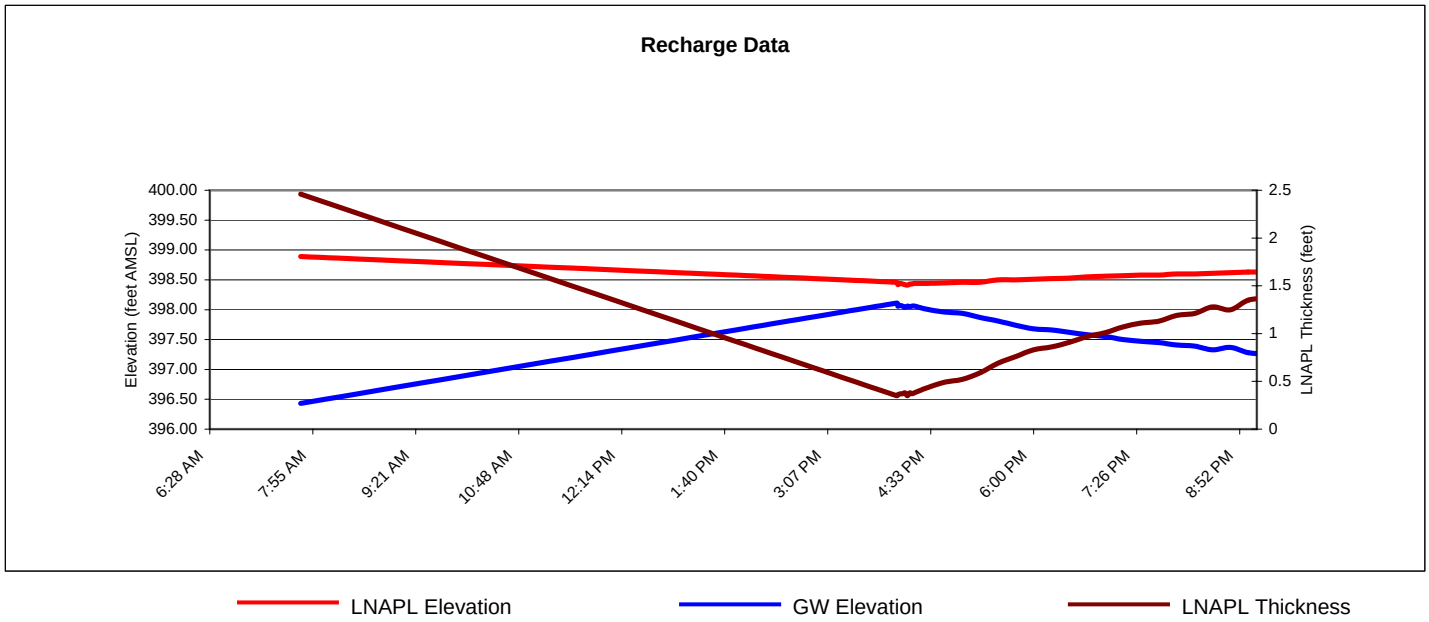
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	22.20	21.20	21.71
Stinger Vac (in Hg)	10.22	6.32	7.32
Well Flow in scfm	18	4	12.50
Well Casing Vac (in Hg)	0.49	0.31	0.42
Average Hrly HC_{TOT} Rec (gal)			4.90
Hrly LNAPL Rec (gal)			3.11
Hrly Vapor Rec (gal)			1.79
Hrly H_2O Rec (gal)			14.76
LNAPL as % of Total Fluids			24.9%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		10/27/2005 7:45	8:04	9:06	10:36	12:06	13:36	15:07	16:04
TOC Elevation		429.67							
$DTScreen_{TOC}$		28.19	--	--	--	--	--	--	--
DTP_{TOC}		30.78	--	--	--	--	--	--	--
DTW_{TOC}		33.24	--	--	--	--	--	--	--
Product Thickness		2.46	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		N	--	--	--	--	--	--	--
Groundwater Elev*.		398.33							
Stinger $Depth_{TOC}$		31.27	31.27	31.27	30.52	30.52	30.52	30.52	30.52
Stinger Tip Elevation		398.40	398.40	398.40	399.15	399.15	399.15	399.15	399.15
Stinger $Immersion_{DTP}$		0.49	0.49	0.49	-0.26	-0.26	-0.26	-0.26	-0.26
Stinger Immersion as %**		19.9%	19.9%	19.9%	-10.6%	-10.6%	-10.6%	-10.6%	-10.6%
St. $Imm._{CGW}$	ADV %	-0.07	25%	25%	10%	25%	25%	25%	25%
Well Casing Vac (in H2O)		---	---	4.8	5.5	5.9	5.7	4.6	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-56C Date: 5/18/05 Day: Wednesday Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
4.97	1542	2	1	3

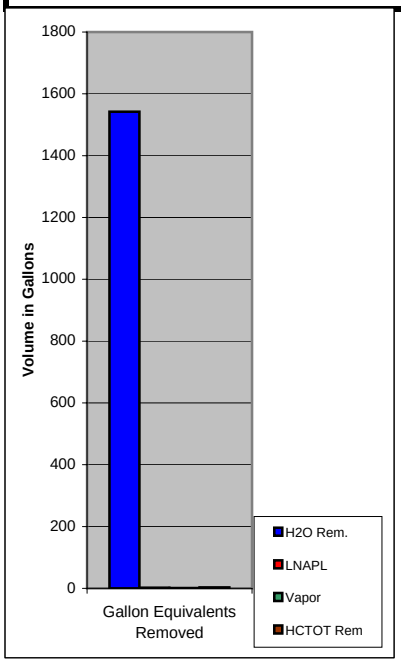
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

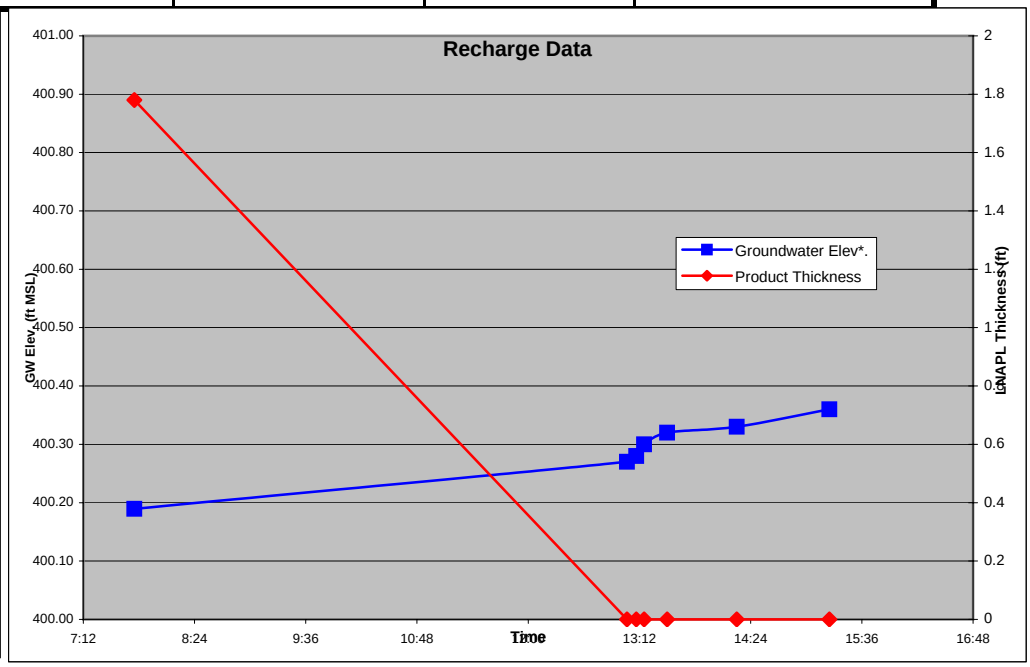
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:45	8:04	9:13	13:02	13:04	13:10	13:15	13:30	14:15	15:15
TOC Elevation	430.15				430.15	430.15	430.15	430.15	430.15	430.15
$DTScreen_{TOC}$	29.65	--	--	--	29.65	29.65	29.65	29.65	29.65	29.65
DTP_{TOC}	29.48	--	--	--						
DTW_{TOC}	31.26	--	--	--	29.88	29.87	29.85	29.83	29.82	29.79
Product Thickness	1.78	--	--	--	0	0	0	0	0	0
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	400.19				400.27	400.28	400.3	400.32	400.33	400.36
$Stinger\ Depth_{TOC}$	30.1	30.1	30.85	29.1						
$Stinger\ Immersion_{DTP}$	0.62	0.62	1.37	-0.38						
Stinger Immersion as %**	34.8%	34.8%	77.0%	-21.3%						
$Stinger\ Depth_{CGW}$	0.14									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.86	3.64	20.44
Stinger Vac (in Hg)	18.03	3.8	16.87
Well Flow in scfm	26	7	16.71
Well Casing Vac (in Hg)	1.44	0.45	
Average Hrly HC_{TOT} Rec (gal)			0.60
Hrly LNAPL Rec (gal)			0.40
Hrly Vapor Rec (gal)			0.20
Hrly H2O Rec (gal)			310
LNAPL as % Total Fluids			0.19%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-56C Date: 6/2/05 Day: Thursday Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
7.0	1367	1	1.8	2.8

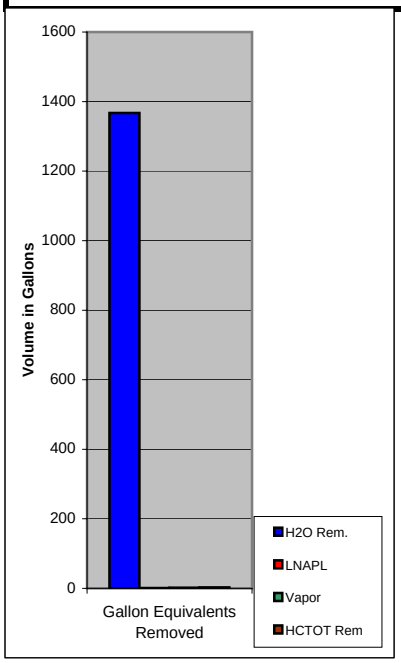
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

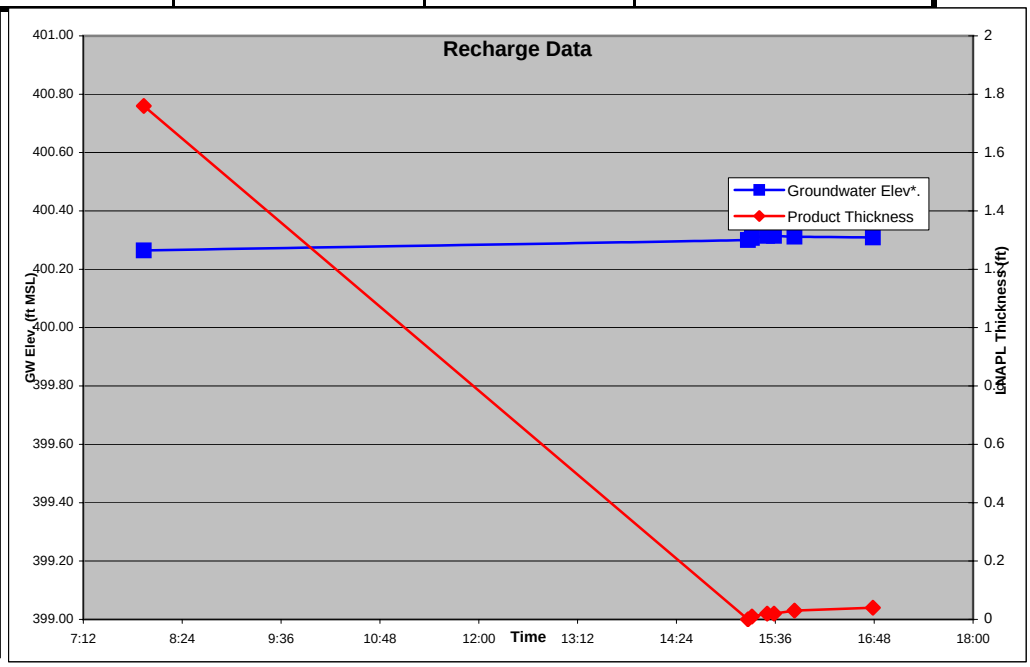
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:56	8:16	12:05	15:15	15:16	15:19	15:30	15:35	15:50	16:47
TOC Elevation	430.15				430.15	430.15	430.15	430.15	430.15	430.15
$DTScreen_{TOC}$	29.65	--	--	--	29.65	29.65	29.65	29.65	29.65	29.65
DTP_{TOC}	29.41	--	--	--		29.84	29.83	29.83	29.83	29.83
DTW_{TOC}	31.17	--	--	--	29.85	29.85	29.85	29.85	29.86	29.87
Product Thickness	1.76	--	--	--	0	0.01	0.02	0.02	0.03	0.04
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	400.26				400.3	400.31	400.31	400.31	400.31	400.31
Stinger $Depth_{TOC}$	29.94	29.94	29.94	29.94						
Stinger $Immersion_{DTP}$	0.53	0.53	0.53	0.53						
Stinger Immersion as %**	30.1%	30.1%	30.1%	30.1%						
Stinger $Depth_{CGW}$	0.05									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.54	20.43	20.8
Stinger Vac (in Hg)	18.19	1.74	17.04
Well Flow in scfm	21	7	16.85
Well Casing Vac (in Hg)	1.45	1.04	
Average Hrly HC_{TOT} Rec (gal)			0.40
Hrly LNAPL Rec (gal)			0.14
Hrly Vapor Rec (gal)			0.26
Hrly H2O Rec (gal)			195
LNAPL as % Total Fluids			0.20%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-56C Date: Wednesday, June 15, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.07	324.4	1	2	3

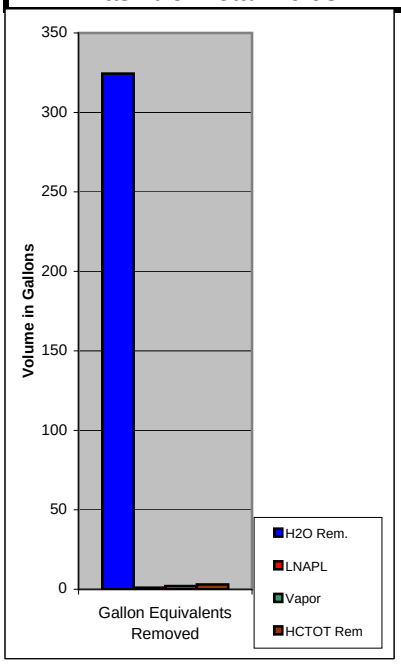
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

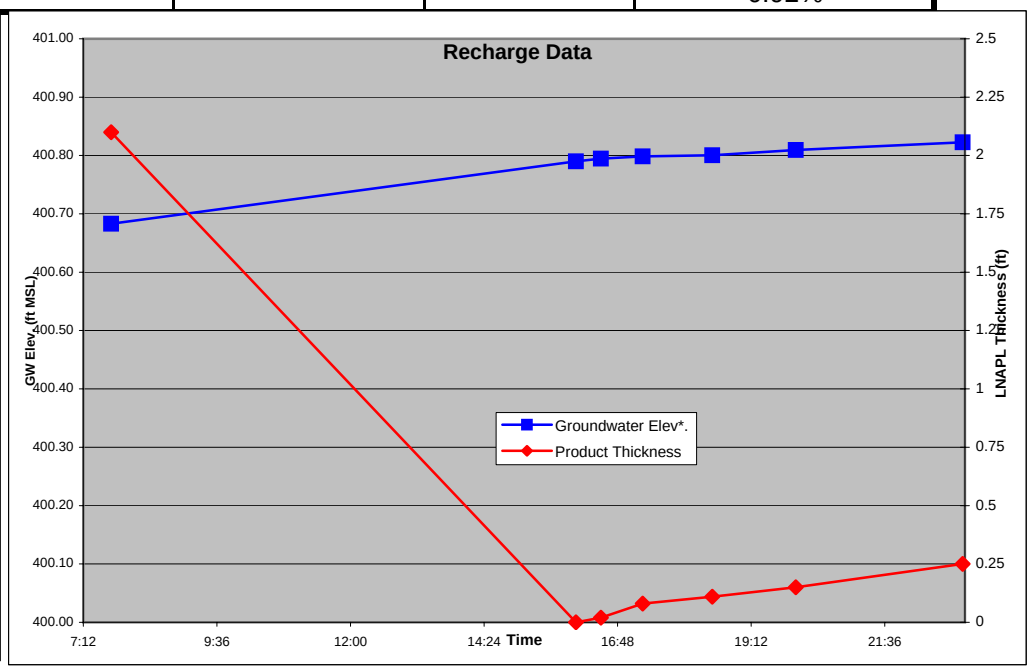
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:42	7:58	9:23	16:02	16:03	16:30	17:15	18:30	20:00	23:00
TOC Elevation	430.15				430.15	430.15	430.15	430.15	430.15	430.15
$DTScreen_{TOC}$	29.65	--	--	--	29.65	29.65	29.65	29.65	29.65	29.65
DTP_{TOC}	28.9	--	--	--		29.35	29.33	29.32	29.3	29.26
DTW_{TOC}	31	--	--	--	29.36	29.37	29.41	29.43	29.45	29.51
Product Thickness	2.1	--	--	--	0	0.02	0.08	0.11	0.15	0.25
Fluid Above Screen (Y/N)	Y	--	--	--	Y	Y	Y	Y	Y	Y
Groundwater Elev*.	400.68				400.79	400.79	400.8	400.8	400.81	400.82
$Stinger\ Depth_{TOC}$	30.34	30.34	30.84	30.84						
Stinger Tip Elevation	399.81	399.81	399.31	399.31						
$Stinger\ Immersion_{DTP}$	1.44	1.44	1.94	1.94						
Stinger Immersion as %**	68.6%	68.6%	92.4%	92.4%						
$Stinger\ Depth_{CGW}$	0.87									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.38	20.28	20.54
Stinger Vac (in Hg)	9.02	5.06	8.42
Well Flow in scfm	16	4	12.61
Well Casing Vac (in Hg)	0.77	0.04	
Average Hrly HC_{TOT} Rec (gal)			0.37
Hrly LNAPL Rec (gal)			0.12
Hrly Vapor Rec (gal)			0.25
Hrly H2O Rec (gal)			40
LNAPL as % of Total Fluids			0.92%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-56C Date: Wednesday, June 29, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
6.33	1711.5	0	1.2	1.2

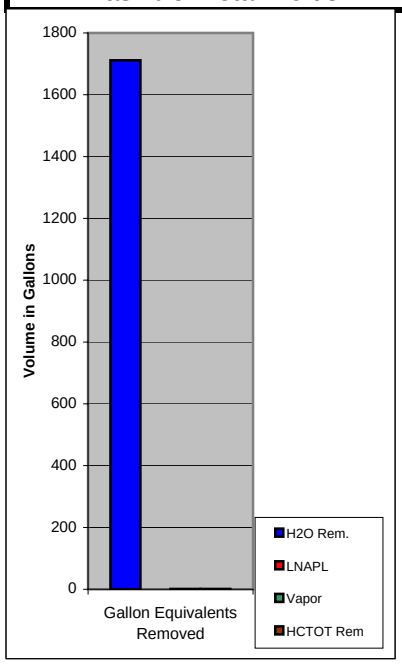
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

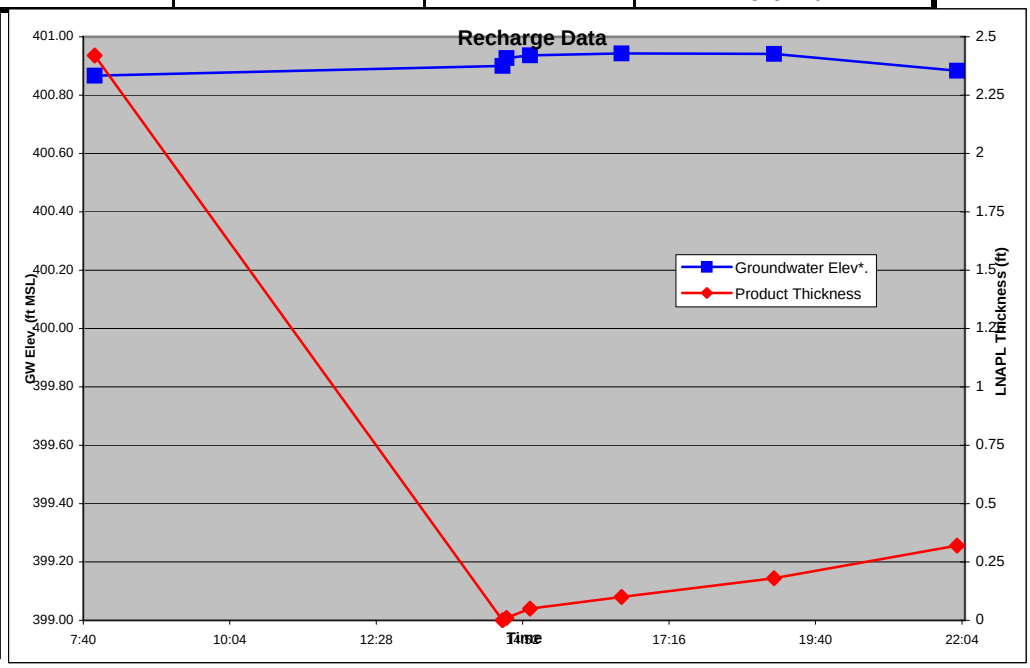
Gauging (ft)	Pre-Test	START OPERATING		END	RECHARGE					
Time (24 hour clock)	7:52	8:12	11:00	14:32	14:33	14:37	15:00	16:30	19:00	22:00
TOC Elevation	430.15				430.15	430.15	430.15	430.15	430.15	430.15
$DTScreen_{TOC}$	29.65	--	--	--	29.65	29.65	29.65	29.65	29.65	29.65
DTP_{TOC}	28.63	--	--	--		29.22	29.2	29.18	29.16	29.18
DTW_{TOC}	31.05	--	--	--	29.25	29.23	29.25	29.28	29.34	29.5
Product Thickness	2.42	--	--	--	0	0.01	0.05	0.1	0.18	0.32
Fluid Above Screen (Y/N)	Y	--	--	--	Y	Y	Y	Y	Y	Y
Groundwater Elev*.	400.87				400.9	400.93	400.94	400.94	400.94	400.88
$Stinger\ Depth_{TOC}$	30.88	30.88	26.88	30.38						
Stinger Tip Elevation	399.27	399.27	403.27	399.77						
$Stinger\ Immersion_{DTP}$	2.25	2.25	-1.75	1.75						
Stinger Immersion as %**	93.0%	93.0%	-72.3%	72.3%						
$Stinger\ Depth_{CGW}$	1.60									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	20.91	3.48	19.91
Stinger Vac (in Hg)	17.72	0.32	15.22
Well Flow in scfm	35	8	20.95
Well Casing Vac (in Hg)	6.43	0.07	
Average Hrly HC_{TOT} Rec (gal)			0.19
Hrly LNAPL Rec (gal)			0.00
Hrly Vapor Rec (gal)			0.19
Hrly H2O Rec (gal)			270
LNAPL as % of Total Fluids			0.07%





H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-56C Date: Monday, July 18, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	$H2O_{Rem}$	LNAPL	Vapor	$HC_{TOT\ Rem}$
8.00	963.9	1	1.9	2.9

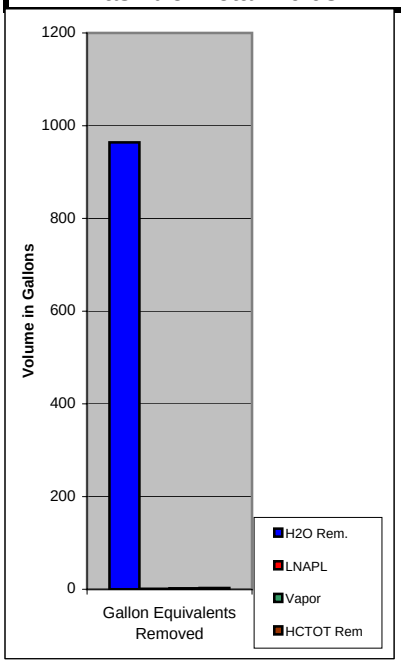
	LNAPL Type	G_s
X	Gasoline	0.73
	Diesel	0.85
	Specify Other	

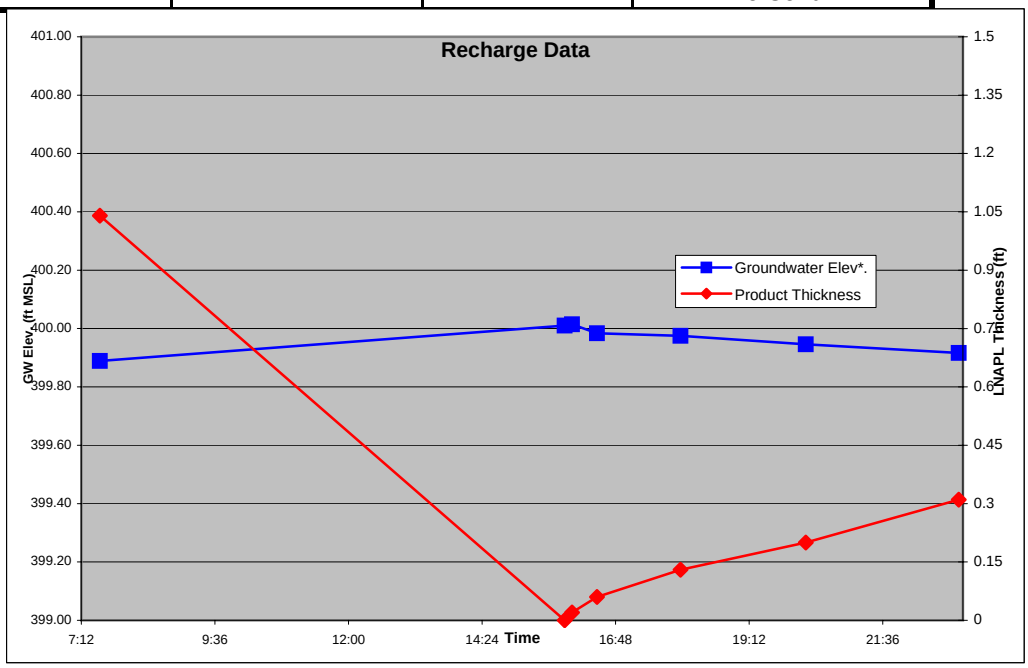
Gauging (ft)	Pre-Test	START	OPERATING	END	RECHARGE					
Time (24 hour clock)	7:32	7:51	7:56	15:51	15:53	16:01	16:28	17:58	20:13	22:58
TOC Elevation	430.15				430.15	430.15	430.15	430.15	430.15	430.15
$DTScreen_{TOC}$	29.65	--	--	--	29.65	29.65	29.65	29.65	29.65	29.65
DTP_{TOC}	29.98	--	--	--		30.13	30.15	30.14	30.15	30.15
DTW_{TOC}	31.02	--	--	--	30.14	30.15	30.21	30.27	30.35	30.46
Product Thickness	1.04	--	--	--	0	0.02	0.06	0.13	0.2	0.31
Fluid Above Screen (Y/N)	N	--	--	--	N	N	N	N	N	N
Groundwater Elev*.	399.89				400.01	400.01	399.98	399.97	399.95	399.92
Stinger $Depth_{TOC}$	30.36	30.36	30.11	30.11						
Stinger Tip Elevation	399.79	399.79	400.04	400.04						
Stinger $Immersion_{DTP}$	0.38	0.38	0.13	0.13						
Stinger Immersion as %**	36.5%	36.5%	12.5%	12.5%						
Stinger $Depth_{CGW}$	0.10									

** Groundwater Elevation Corrected for Presence of LNAPL in Well*
*** Stinger Immersion as % of LNAPL Thickness*

Operations

Parameter	Maximum	Minimum	Mean
Engine Vac (in Hg)	21.54	20.28	20.65
Stinger Vac (in Hg)	16.45	10.44	13
Well Flow in scfm	4	2	2.11
Well Casing Vac (in Hg)	0.39	0.11	
Average Hrly HC_{TOT} Rec (gal)			0.36
Hrly LNAPL Rec (gal)			0.13
Hrly Vapor Rec (gal)			0.24
Hrly H2O Rec (gal)			120
LNAPL as % of Total Fluids			0.30%





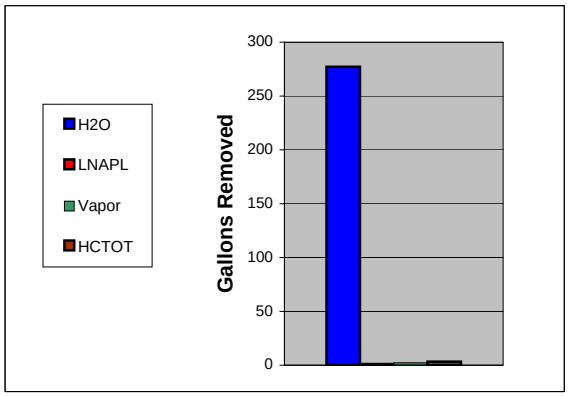
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-57C Date: Friday, October 28, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
8.00	277.16	1.00	2.3	3.30

LNAPL Type	G_s
Gasoline	0.7567



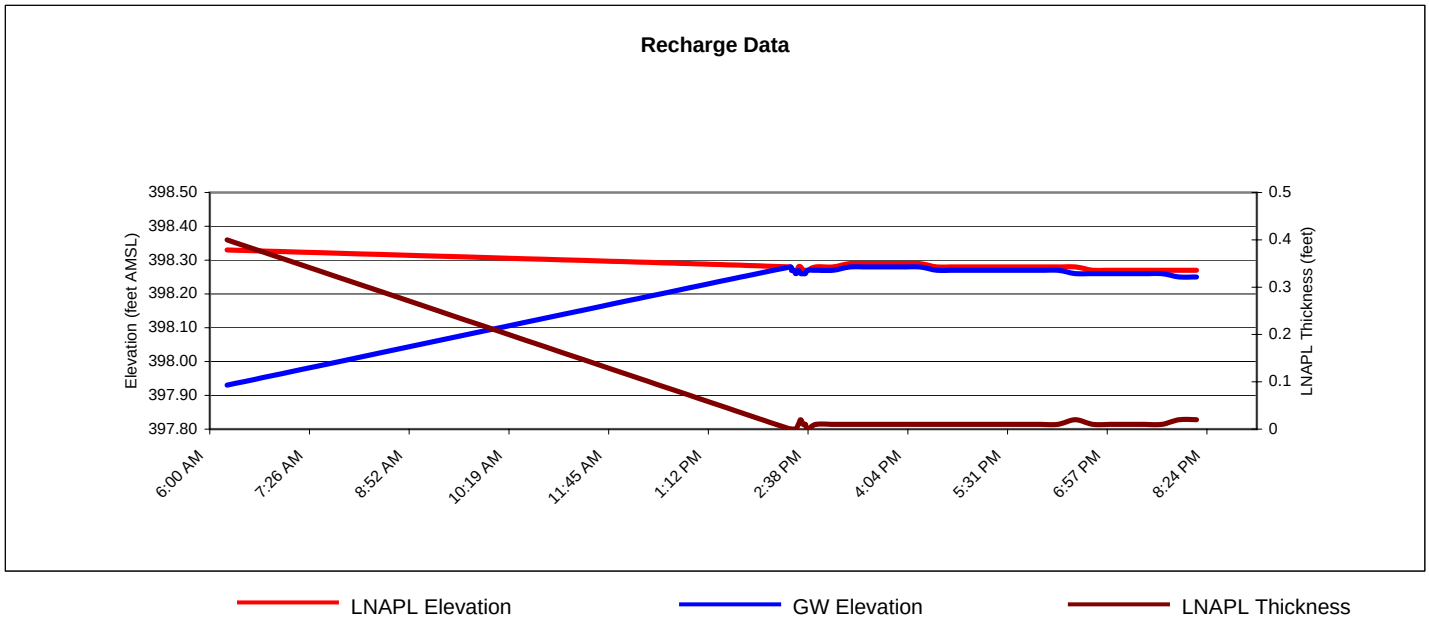
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	22.90	21.50	22.09
Stinger Vac (in Hg)	11.17	7.35	8.91
Well Flow in scfm	12	5	10.13
Well Casing Vac (in Hg)	3.47	0.95	2.63
Average Hrly HC_{TOT} Rec (gal)			0.41
Hrly LNAPL Rec (gal)			0.12
Hrly Vapor Rec (gal)			0.29
Hrly H2O Rec (gal)			34.64
LNAPL as % of Total Fluids			1.2%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		10/28/2005 6:15	6:22	7:24	8:54	10:24	11:53	13:25	14:22
TOC Elevation		428.99							
$DTScreen_{TOC}$		29.18	--	--	--	--	--	--	--
DTP_{TOC}		30.66	--	--	--	--	--	--	--
DTW_{TOC}		31.06	--	--	--	--	--	--	--
Product Thickness		0.4	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		N	--	--	--	--	--	--	--
Groundwater Elev*.		398.23							
Stinger $Depth_{TOC}$		29.7	29.7	29.7	26.7	26.7	26.7	25.7	25.7
Stinger Tip Elevation		399.29	399.29	399.29	402.29	402.29	402.29	403.29	403.29
Stinger $Immersion_{DTP}$		-0.96	-0.96	-0.96	-3.96	-3.96	-3.96	-4.96	-4.96
Stinger Immersion as %**		-240.0%	-240.0%	-240.0%	-990.0%	-990.0%	-990.0%	-1240.0%	-1240.0%
St. $Imm._{CGW}$	ADV %	-1.06	30%	30%	30%	30%	30%	30%	30%
Well Casing Vac (in H2O)		---	---	12.9	45.6	45.9	43.8	56.9	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



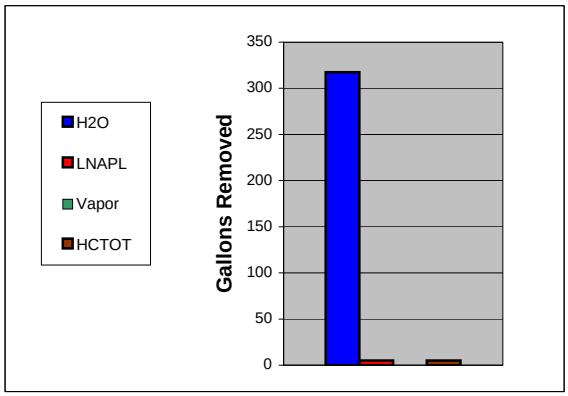
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-79C Date: Wednesday, October 19, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
8.00	317.35	5.00	0.0	5.00

LNAPL Type	G_s
Gasoline	0.7616



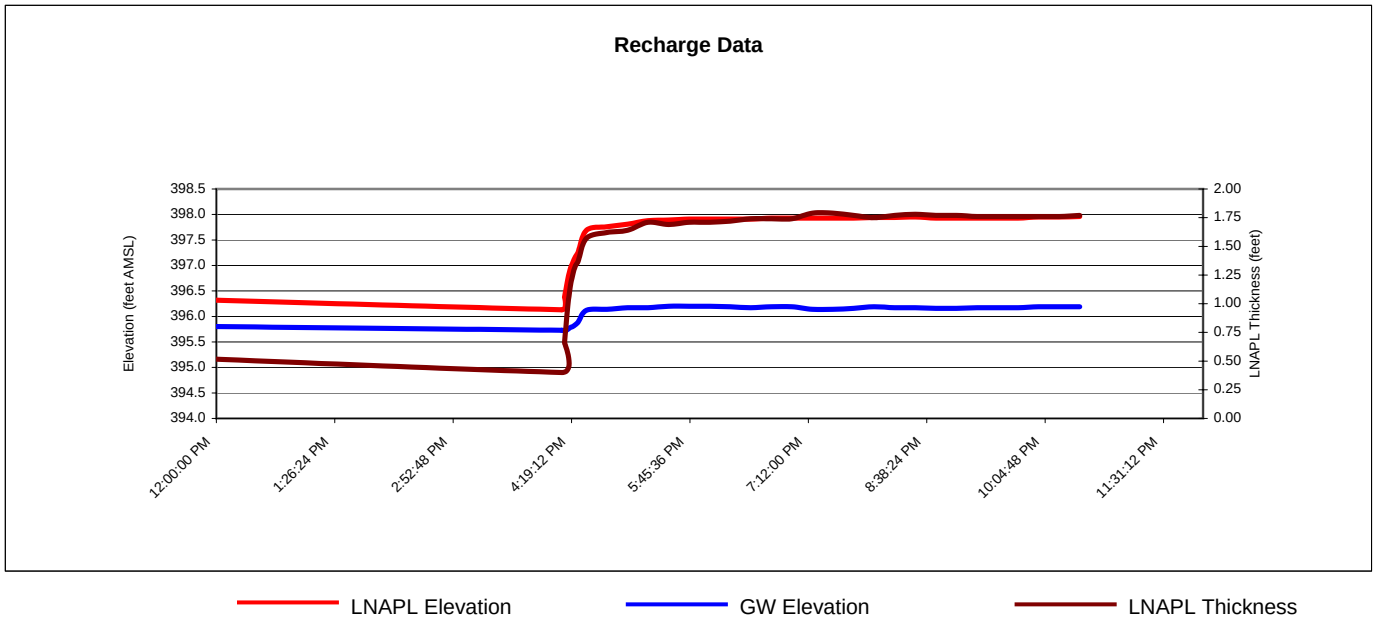
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	21.80	21.10	21.29
Stinger Vac (in Hg)	12.57	9.19	11.67
Well Flow in scfm	26	20	22.88
Well Casing Vac (in Hg)	-3.14	-5.03	-4.58
Average Hrly HC_{TOT} Rec (gal)			0.62
Hrly LNAPL Rec (gal)			0.62
Hrly Vapor Rec (gal)			0.00
Hrly H_2O Rec (gal)			39.67
LNAPL as % of Total Fluids			1.6%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		7:15	8:15	9:17	10:47	12:17	13:57	14:57	16:15
TOC Elevation		429.59							
$DTScreen_{TOC}$		34.93	--	--	--	--	--	--	--
DTP_{TOC}		31.86	--	--	--	--	--	--	--
DTW_{TOC}		33.3	--	--	--	--	--	--	--
Product Thickness		1.44	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		Y	--	--	--	--	--	--	--
Groundwater Elev*.		397.39							
Stinger $Depth_{TOC}$		33.02	31.42	31.42	31.42	31.42	31.72	0	0
Stinger Tip Elevation		396.57	398.17	398.17	398.17	398.17	397.87	0.00	0.00
Stinger $Immersion_{DTP}$		1.16	-0.44	-0.44	-0.44	-0.44	-0.14	0	0
Stinger Immersion as %**		80.6%	-30.6%	-30.6%	-30.6%	-30.6%	-9.7%	0.0%	0.0%
St. $Imm._{CGW}$	ADV %	0.82	50%	25%	20%	20%	25%	0%	0%
Well Casing Vac (in H2O)		---	-65.8	-65.8	-66.2	-68.4	-50.1	0	0

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



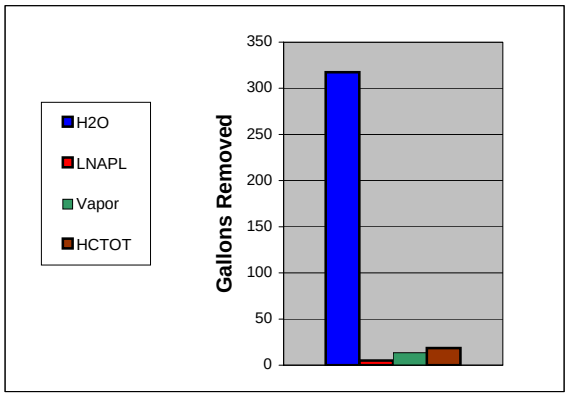
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MP-79C Date: Thursday, October 20, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
8.00	317.35	5.00	13.6	18.60

LNAPL Type	G_s
Gasoline	0.7616



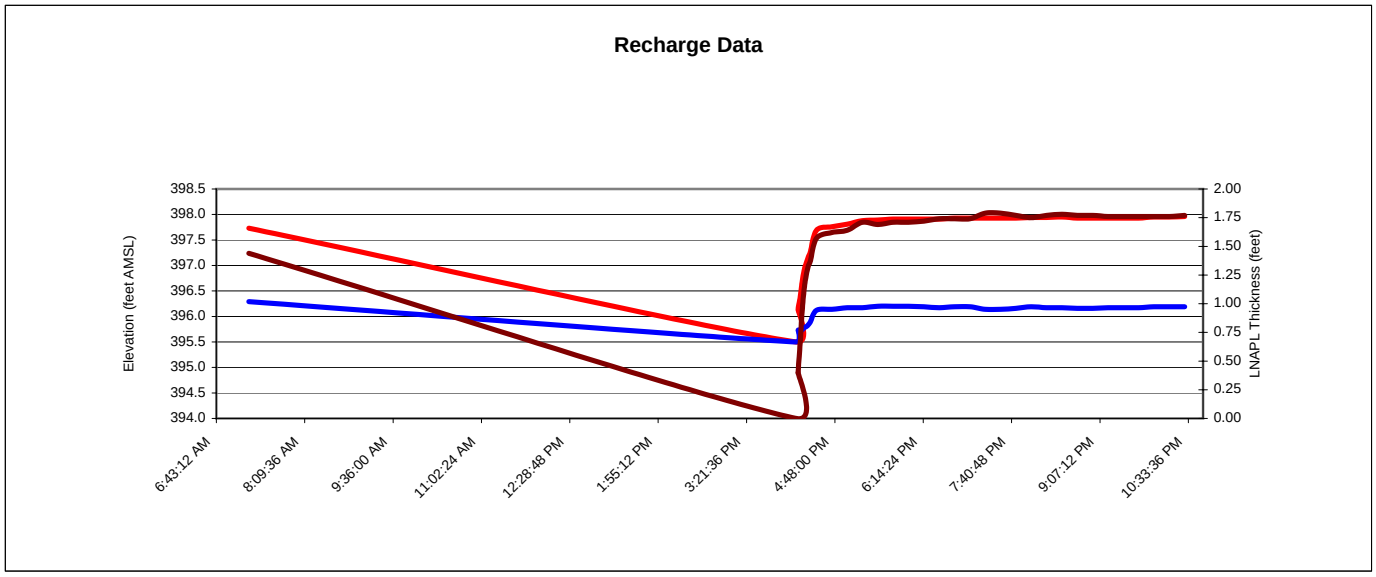
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	21.80	21.10	21.29
Stinger Vac (in Hg)	12.57	9.19	11.67
Well Flow in scfm	26	20	22.88
Well Casing Vac (in Hg)	6.81	4.01	5.97
Average Hrly HC_{TOT} Rec (gal)			2.33
Hrly LNAPL Rec (gal)			0.63
Hrly Vapor Rec (gal)			1.70
Hrly H_2O Rec (gal)			39.67
LNAPL as % of Total Fluids			5.5%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		7:15	8:10	8:55	10:25	11:55	13:25	14:25	16:10
TOC Elevation		429.59							
$DTScreen_{TOC}$		34.93	--	--	--	--	--	--	--
DTP_{TOC}		31.86	--	--	--	--	--	--	--
DTW_{TOC}		33.3	--	--	--	--	--	--	--
Product Thickness		1.44	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		Y	--	--	--	--	--	--	--
Groundwater Elev*.		397.39							
Stinger $Depth_{TOC}$		33.02	33.02	33.02	33.02	33.02	33.02	33.02	33.02
Stinger Tip Elevation		396.57	396.57	396.57	396.57	396.57	396.57	396.57	396.57
Stinger $Immersion_{DTP}$		1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16
Stinger Immersion as %**		80.6%	80.6%	80.6%	80.6%	80.6%	80.6%	80.6%	80.6%
St. $Imm._{CGW}$	ADV %	0.82	25%	25%	20%	20%	20%	15%	15%
Well Casing Vac (in H2O)		---	74.6	74.6	79.2	81.2	88.6	90.9	90.9

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



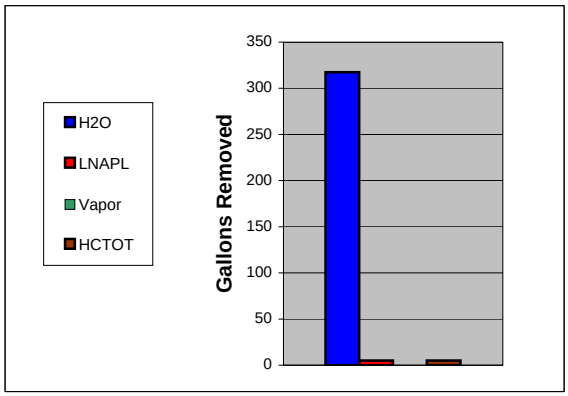
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: MW-79C Date: Friday, October 21, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
7.58	317.35	5.00	0.0	5.00

LNAPL Type	G_s
Gasoline	0.757

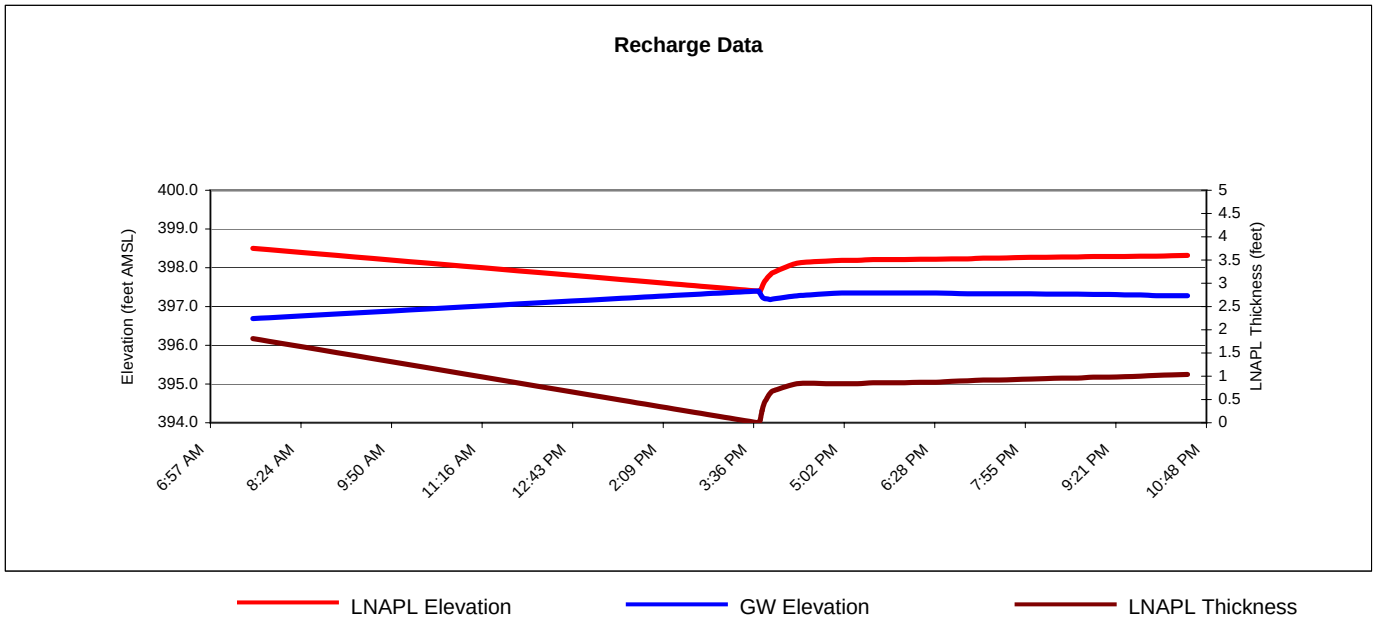


Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	21.80	21.40	21.61
Stinger Vac (in Hg)	18.23	5.95	14.29
Well Flow in scfm	41	21	32.07
Well Casing Vac (in Hg)	10.76	1.95	6.73
Average Hrly HC_{TOT} Rec (gal)			0.66
Hrly LNAPL Rec (gal)			0.66
Hrly Vapor Rec (gal)			0.00
Hrly H_2O Rec (gal)			41.85
LNAPL as % of Total Fluids			1.6%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		7:38	8:00	9:02	11:03	12:32	14:02	15:02	15:35
TOC Elevation		430.15							
$DTScreen_{TOC}$		29.6499996	--	--	--	--	--	--	--
DTP_{TOC}		31.65	--	--	--	--	--	--	--
DTW_{TOC}		33.46	--	--	--	--	--	--	--
Product Thickness		1.81	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		N	--	--	--	--	--	--	--
Groundwater Elev*.		398.06							
Stinger $Depth_{TOC}$		32.29	32.29	32.29	32.29	32.29	32.29	32.29	32.29
Stinger Tip Elevation		397.86	397.86	397.86	397.86	397.86	397.86	397.86	397.86
Stinger $Immersion_{DTP}$		0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64
Stinger Immersion as %**		35.4%	35.4%	35.4%	35.4%	35.4%	35.4%	35.4%	35.4%
St. $Imm._{CGW}$	ADV %	0.20	15%	15%	35%	35%	35%	35%	50%
Well Casing Vac (in H2O)		---	---	146.4	99.7	45	103	108.1	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well* *** Stinger Immersion as % of LNAPL Thickness*



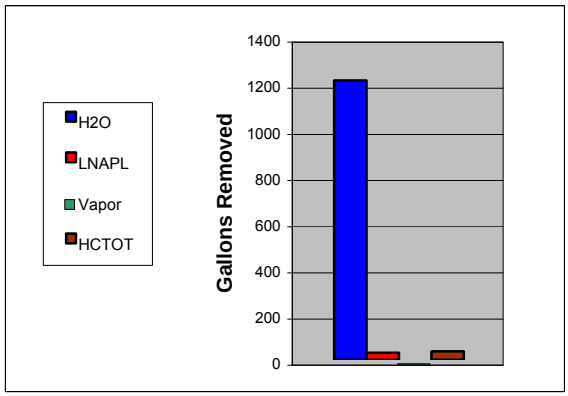
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: RW-4A Date: Tuesday, August 30, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
7.13	1210.41	30.31	6.5	36.81

LNAPL Type	G_s
Gasoline	0.757



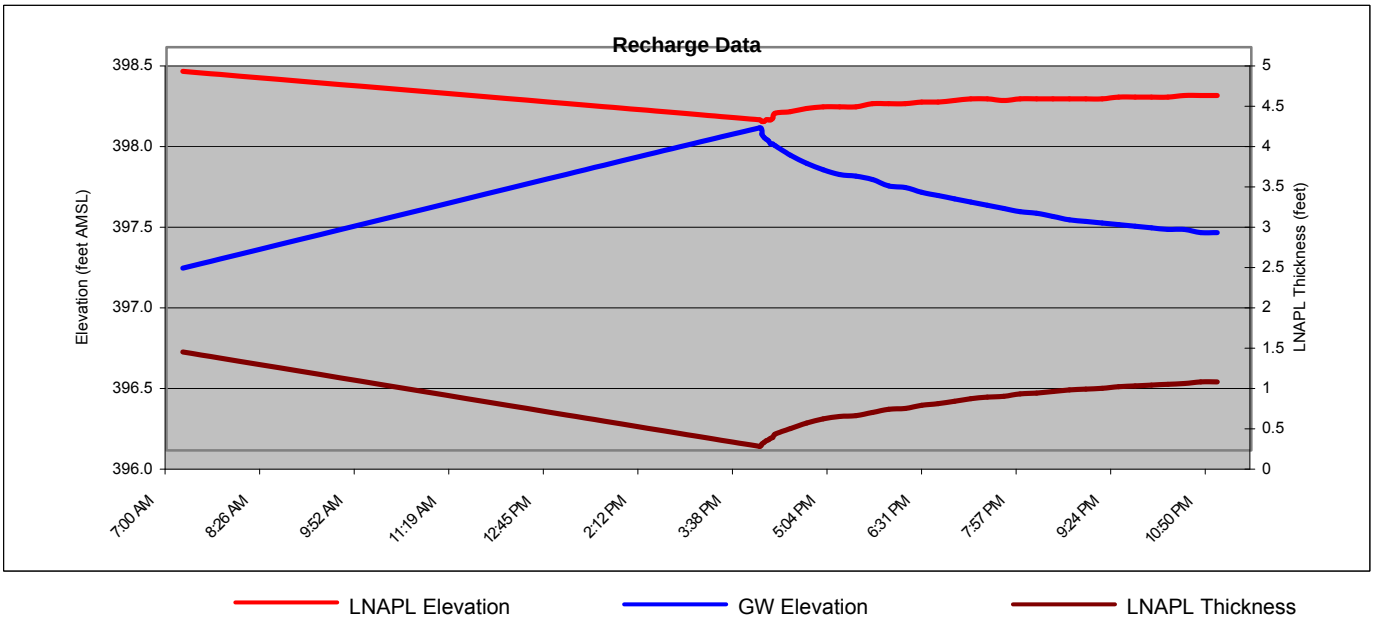
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	21.23	20.59	20.72
Stinger Vac (in Hg)	19.30	12.02	12.96
Well Flow in scfm	10	1	5.68
Well Casing Vac (in Hg)	2.02	1.35	1.64
Average Hrly HC_{TOT} Rec (gal)			5.16
Hrly LNAPL Rec (gal)			4.25
Hrly Vapor Rec (gal)			0.91
Hrly H_2O Rec (gal)			169.68
LNAPL as % of Total Fluids			3.0%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		7:15	8:54	9:58	10:58	12:28	13:58	15:02	16:02
TOC Elevation		430.15							
$DTScreen_{TOC}$		29.6499996	--	--	--	--	--	--	--
DTP_{TOC}		31.8	--	--	--	--	--	--	--
DTW_{TOC}		33.02	--	--	--	--	--	--	--
Product Thickness		1.22	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		N	--	--	--	--	--	--	--
Groundwater Elev*.		398.05							
Stinger $Depth_{TOC}$		34.38	34.38	34.38	34.38	32.38	32.38	32.38	32.38
Stinger Tip Elevation		395.77	395.77	395.77	395.77	397.77	397.77	397.77	397.77
Stinger $Immersion_{DTP}$		2.58	2.58	2.58	2.58	0.58	0.58	0.58	0.58
Stinger Immersion as %**		211.5%	211.5%	211.5%	211.5%	47.5%	47.5%	47.5%	47.5%
St. $Imm._{CGW}$	ADV %	2.28	10%	25%	25%	10%	10%	10%	10%
Well Casing Vac (in Hg)		---	---	18.4	18.6	24	22.5	27.5	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



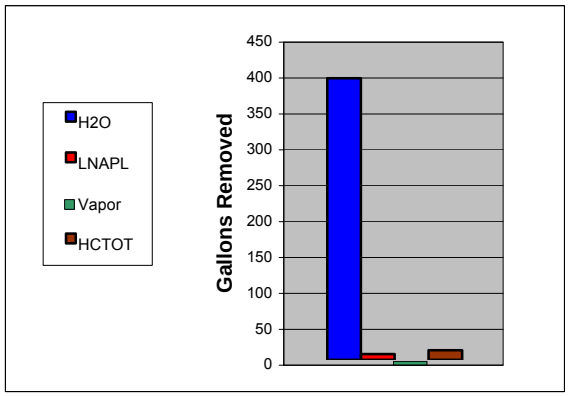
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: RW-4A Date: Wednesday, August 31, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
7.98	392.27	8.00	5.3	13.30

LNAPL Type	G_s
Gasoline	0.757



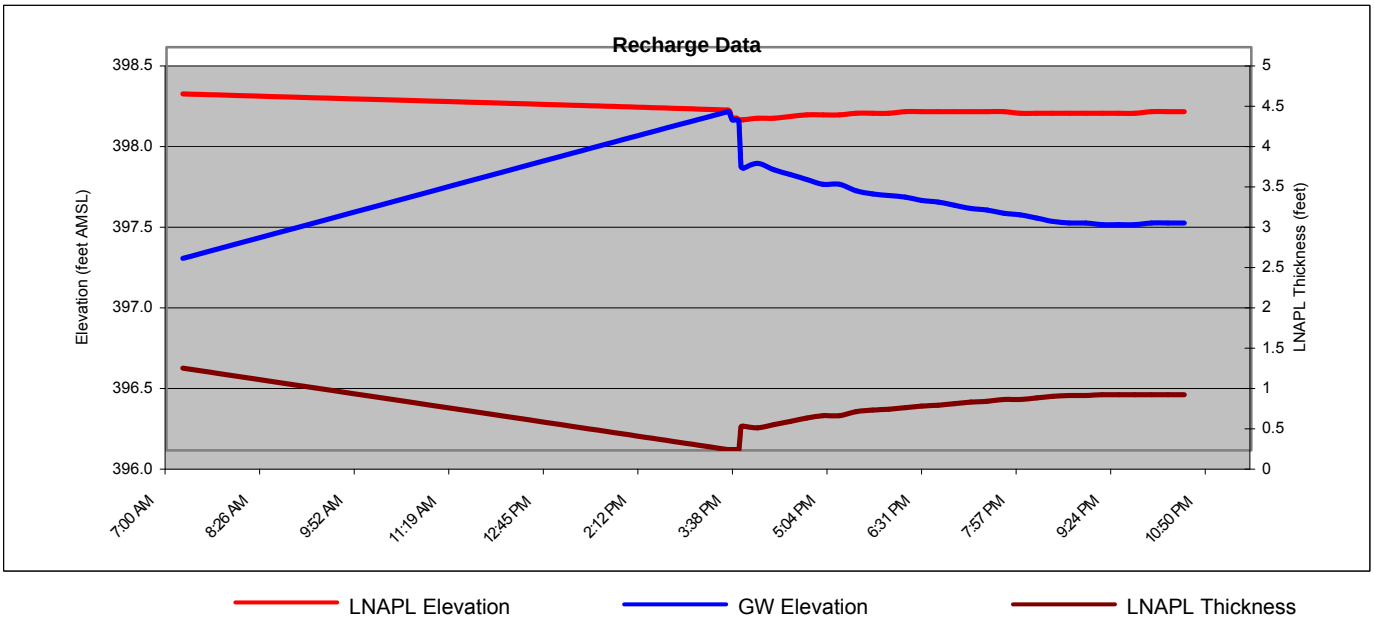
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	21.70	20.28	20.68
Stinger Vac (in Hg)	17.87	1.42	5.83
Well Flow in scfm	26	1	17.69
Well Casing Vac (in Hg)	2.21	0.37	1.11
Average Hrly HC_{TOT} Rec (gal)			1.67
Hrly LNAPL Rec (gal)			1.00
Hrly Vapor Rec (gal)			0.66
Hrly H_2O Rec (gal)			49.14
LNAPL as % of Total Fluids			3.3%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		7:15	7:31	8:31	10:01	11:31	13:01	14:01	15:30
TOC Elevation		430.15							
$DTScreen_{TOC}$		29.6499996	--	--	--	--	--	--	--
DTP_{TOC}		31.94	--	--	--	--	--	--	--
DTW_{TOC}		32.96	--	--	--	--	--	--	--
Product Thickness		1.02	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		N	--	--	--	--	--	--	--
Groundwater Elev*.		397.96							
Stinger $Depth_{TOC}$		32.21	32.21	32.21	32.21	32.21	32.21	32.21	32.96
Stinger Tip Elevation		397.94	397.94	397.94	397.94	397.94	397.94	397.94	397.19
Stinger $Immersion_{DTP}$		0.27	0.27	0.27	0.27	0.27	0.27	0.27	1.02
Stinger Immersion as %**		26.5%	26.5%	26.5%	26.5%	26.5%	26.5%	26.5%	100.0%
St. $Imm._{CGW}$	ADV %	0.02	10%	75%	75%	100%	100%	100%	25%
Well Casing Vac (in Hg)		---	---	30.1	16.2	15.2	12.3	9.8	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



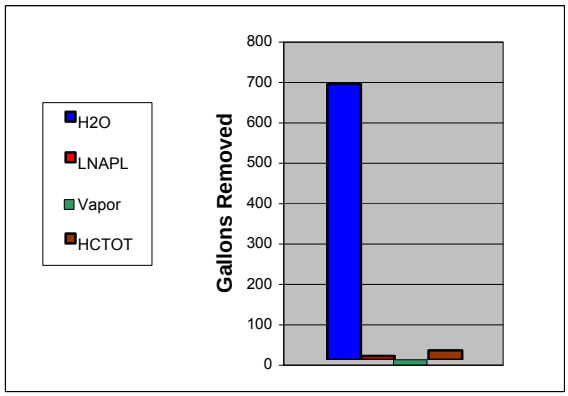
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: RW-5 Date: Thursday, September 01, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
8.10	683.49	9.61	13.6	23.21

LNAPL Type	G_s
Gasoline	0.757



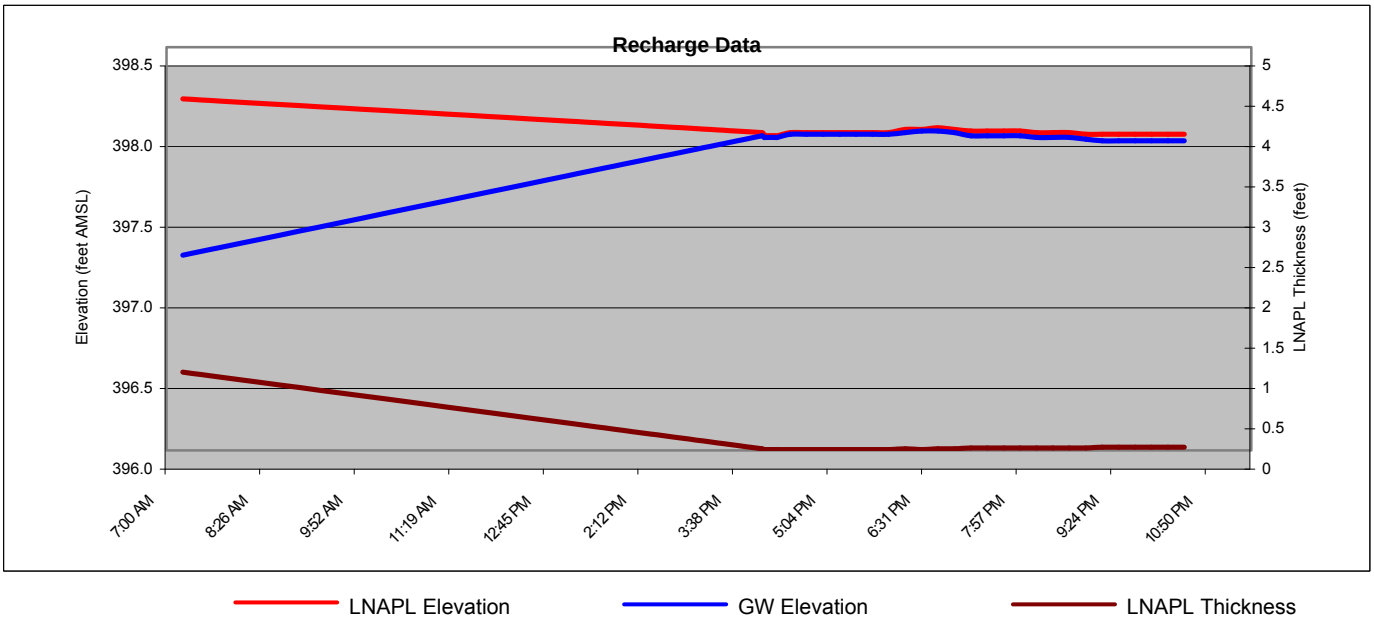
Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	21.38	19.64	20.13
Stinger Vac (in Hg)	15.98	1.11	9.28
Well Flow in scfm	8	3	6.73
Well Casing Vac (in Hg)	0.27	0.16	0.21
Average Hrly HC_{TOT} Rec (gal)			2.87
Hrly LNAPL Rec (gal)			1.19
Hrly Vapor Rec (gal)			1.68
Hrly H_2O Rec (gal)			84.38
LNAPL as % of Total Fluids			3.3%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		7:15	7:55	8:58	10:28	12:31	14:01	15:01	16:01
TOC Elevation		430.15							
$DTScreen_{TOC}$		29.6499996	--	--	--	--	--	--	--
DTP_{TOC}		31.97	--	--	--	--	--	--	--
DTW_{TOC}		32.94	--	--	--	--	--	--	--
Product Thickness		0.97	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		N	--	--	--	--	--	--	--
Groundwater Elev*.		397.94							
Stinger $Depth_{TOC}$		32.3	32.3	32.3	32.3	32.3	32.3	32.3	32.3
Stinger Tip Elevation		397.85	397.85	397.85	397.85	397.85	397.85	397.85	397.85
Stinger $Immersion_{DTP}$		0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Stinger Immersion as %**		34.0%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%
St. $Imm._{CGW}$	ADV %	0.09	10%	10%	25%	25%	25%	25%	25%
Well Casing Vac (in Hg)		---	---	2.4	2.8	3.2	3.3	2.4	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*



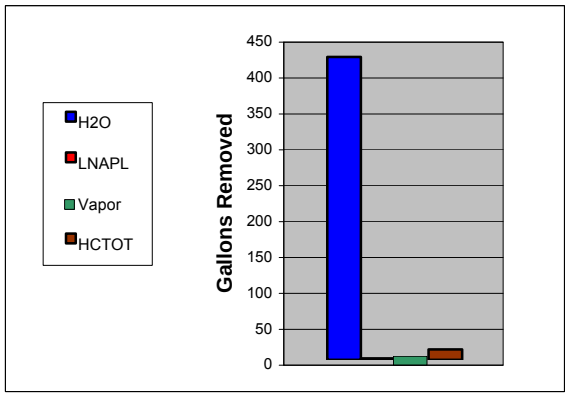
H2A Environmental, Ltd.
Mobile High Vacuum Remediation
Daily Pilot Test Summary

Prepared for
The Hartford Working Group
Hartford, IL

Well ID: RW-5 Date: Friday, September 02, 2005 Sys/Type: 186B ICE

	Gallon Equivalents Removed			
Runtime(hrs)	H2O	LNAPL	Vapor	HC_{TOT}
7.97	421.98	2.00	12.4	14.40

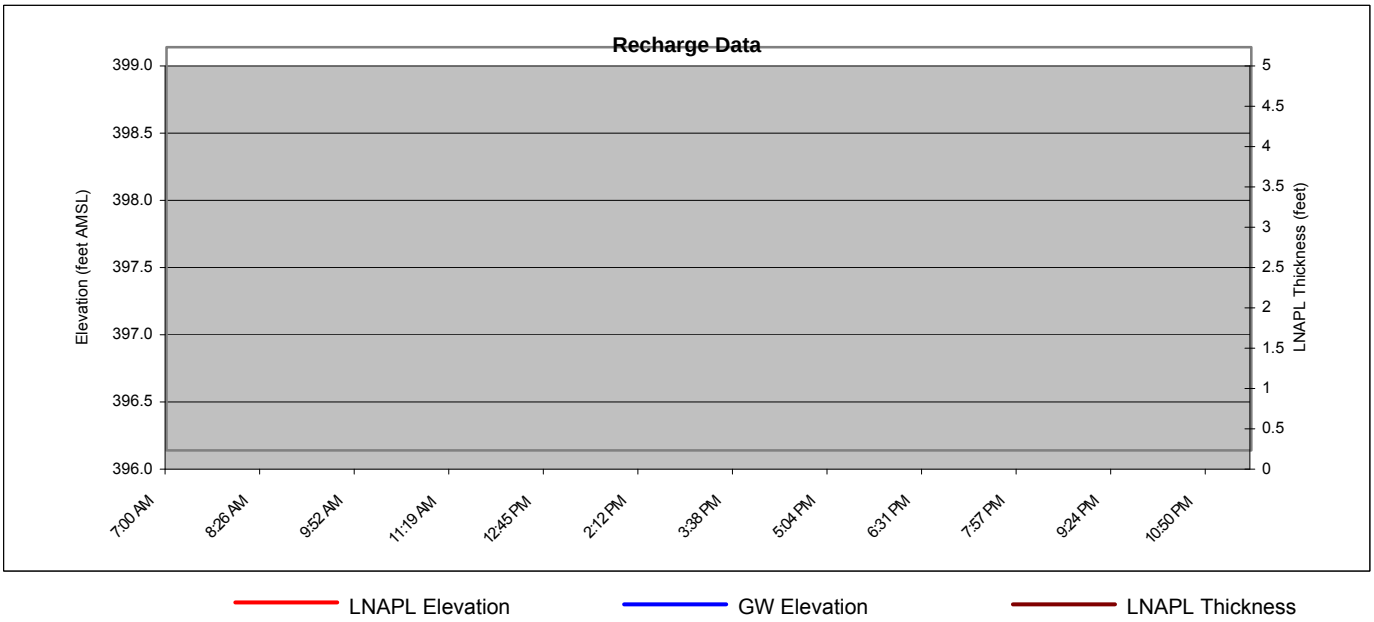
LNAPL Type	G_s
Gasoline	0.757



Operations

Parameter	Max	Min	Mean
Engine Vac (in Hg)	21.38	20.12	20.34
Stinger Vac (in Hg)	15.66	4.90	8.33
Well Flow in scfm	11	4	7.84
Well Casing Vac (in Hg)	1.21	0.51	0.99
Average Hrly HC_{TOT} Rec (gal)			1.81
Hrly LNAPL Rec (gal)			0.25
Hrly Vapor Rec (gal)			1.56
Hrly H_2O Rec (gal)			52.97
LNAPL as % of Total Fluids			3.3%

Gauging (ft)		Pre-Test	Start			Operating			End
Time (24 hour clock)		7:15	7:30	8:29	9:59	11:29	12:59	13:58	15:28
TOC Elevation		430.15							
$DTScreen_{TOC}$		29.6499996	--	--	--	--	--	--	--
DTP_{TOC}		32.22	--	--	--	--	--	--	--
DTW_{TOC}		32.28	--	--	--	--	--	--	--
Product Thickness		0.06	--	--	--	--	--	--	--
Fluid Above Screen (Y/N)		N	--	--	--	--	--	--	--
Groundwater Elev*.		397.92							
Stinger $Depth_{TOC}$		32.22	32.22	32.22	32.22	32.22	32.22	32.22	32.22
Stinger Tip Elevation		397.93	397.93	397.93	397.93	397.93	397.93	397.93	397.93
Stinger $Immersion_{DTP}$		0	0	0	0	0	0	0	0
Stinger Immersion as %**		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
St. $Imm._{CGW}$	ADV %	-0.01	10%	10%	10%	10%	10%	10%	10%
Well Casing Vac (in Hg)		---	---	16.3	12.7	14.6	13.4	12.3	---

** Groundwater Elevation Corrected for Presence of LNAPL in Well*

*** Stinger Immersion as % of LNAPL Thickness*