Jack Walstad Oil Company, Inc.
Lovington Facility

Interim Hydrogeologic Investigation Report (On-Site)

for
Jack Walstad Oil Co., Inc.
and
New Mexico Environment Department

by
Billings & Associates, Inc.
June 1992

JACK WALSTAD OIL COMPANY, INC.

LOVINGTON FACILITY

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1.0
Introduction

Billings & Associates, Inc. (BAI) has been contracted by Jack Walstad Oil, Co. (Walstad Oil) of Hobbs, NM to develop a hydrogeologic investigation report to fulfill obligations under §1210C of the NM Environment Department (NMED) UST Corrective Action Regulations (USTR). The original scope of work was limited to on-site activities. Contamination was observed to such an extent that legal access to off-site areas is required to fully define the extent and possible sources of such contamination. This report describes those interim on-site activites performed to date. When appropriate access is obtained, an associated off-site hydrogeologic investigation report will be submitted. The two documents together could then be considered as a complete investigation pursuant to USTR §1210C.

The site under investigation is a closed Phillips 66 station at the Northwest corner of Main Street and US Highway 82 (NM 83) in Lovington, New Mexico. Prior work has been done at the facility by AEI Tank, Inc. of Clovis, NM beginning July 30, 1991. A report of those activities was presented by AEI to Walstad Oil and the NMED in April of 1992. A brief synopsis of the prior work is as follows: A set of shallow bores (<15 feet) were advanced around the site on July 30 - 31, 1991 which revealed soil contamination in excess of state action levels. Beginning in early November, 1991 four or five (report unclear) underground storage tanks were removed which previously stored unleaded gasolines of various grades and diesel. The associated piping and dispensers were then removed and an over-excavation process proceeded apparently in response to the presence of contaminated soils. In December, 1991, a single soil boring was advanced somewhere on the site to a depth of 40 feet. Soil samples obtained during the boring operation were analyzed in excess of action levels. On February 5, 1992, a single monitoring well was installed and a water sample was

obtained which was contaminated above state standards. On March 13, 1992, two more wells were installed. Ground water from those wells was also found to exceed standards.

Beginning on June 8, 1992, BAI began work at the site to obtain sufficient information for the filing of a hydrogeologic investigation report. A site map showing basic features is provided as Figure 1.

2.0
Soil Contamination

BAI activites initially began with the advancement of soil borings using a standard auger drilling rig. A total of six bores (see Figure 1 for locations) to a maximum depth of approximately 40 feet were completed in a two day period. Split spoon samples were taken for headspace and laboratory analysis every 5 feet in depth. The headspace samples partially filled a clean quart size "Mason" jar which was then capped with aluminum foil. The samples were allowed to heat in the sun until warm to the touch. An organic vapor meter (OVM) calibrated twice daily against a 100 ppm-v isobutylene standard was used to measure the level of soil-gas contamination in the provided headspace. A portion of each split spoon sample was placed in a 4 oz. teflon septum capped jar provided by the laboratory, labeled, and immediately placed on ice. The sample showing the highest headspace value above the action level (100 ppm) in each boring along with the deepest sample obtained from each boring were submitted to Hall Environmental Analysis Laboratory in Albuquerque, NM with appropriate chain of custody for analysis of total petroleum hydrocarbons (TPH).

The headspace data along with a compliation of laboratory soil data is given in Appendix A. Copies of the laboratory soil report are given in Appendix B. Figure 1 shows the locations of each of the six borings (B-4 thru 9). Headspace data gathered previously by AEI (B-1; W-1, 2, and 3) is also given in Appendix A. The exact location of B-1 is not known to BAI, but is presumably in the W-1 area. Boring logs for each of the BAI supervised borings showing observed lithology are given in Appendix C.

B-4 was placed immediately north of the station within a tank excavation area. Excavation backfill was encountered for the first nine feet before entering the native caliche. Soil-gas contamination in excess of the action level was observed to approximately 25 feet below ground surface. The highest level was observed just below the backfill. Laboratory analysis of soil from 10 feet revealed a TPH level of 6700 ppm as gasoline. Silts and fine sands of increasing percentage within the caliche were observed beginning at 20 feet. A hard, fine to medium grained sandstone was encountered at 40 feet which could not be penetrated by the auger. The last splitspoon sample (35 feet) was analyzed by the lab as being less than 10 ppm TPH.

B-5 was advanced on the Southeast corner of a tank excavation area located immediately West of the station. Again backfill was encountered for 10 feet before entering caliche. A mild, hydrocarbon aroma was noted at 10 feet. Silts and fine sands within the caliche were first observed at about 17 feet. By 20 feet, a mixed diesel/gasoline aroma was observed. The sandstone was encountered at 40.5 feet. Headspace values above the action level were measured to a depth of 20 feet. Subsequent lab analysis of the 20 foot sample revealed contamination at 5800 ppm

TPH as diesel. The 35 foot sample was analyzed at less than 10 ppm TPH.

B-6 was advanced near the East dispenser island. Excavation backfill was observed to 7 feet before entering the native caliche. An appreciable fine sand content within the caliche was first noted at 32 feet. The sandstone was again encountered at 40 feet. The splitspoon samples all had a subtle sweet aroma throughout the bore more like an ether than fuel. The OVM was sensitive to whatever soil gas chemical constituent was present, measuring a peak level of 385 ppm-v at 25 feet. The 25 and 35 foot samples were analyzed by the laboratory as both being less than 10 ppm TPH. The laboratory technician noted the odor when opening the sample and initially ran both samples at a 10X dilution. When the the gas chromatograph failed to detect any compund, he ran the samples again undiluted. Again no compounds was observed.

B-7 was advanced between the southern dispensers. The first 6 feet of the bore was fill, thereafter caliche to 27 feet where an approximate 10% fine sand content was noted. Sandstone stringers were encountered beginning at 33 feet until refusal by the auger at 37 feet. Headspace values above the action level were measured to the bottom of the bore. Insufficient sample was returned from the spoon at 35 feet to allow a headspace and lab sample, thus the 10 and 30 foot samples were submitted for analysis. Subsequent lab results revealed 3400 ppm and 2500 ppm TPH (both as gasoline) from the 10 and 30 foot samples respectively.

B-8 was advanced in the Southwest corner of the property. This boring was placed in an area not previously excavated. A loamy topsoil with some caliche content was encountered for the first two feet, thereafter a hard caliche was observed. Refusal of

the auger in the hard caliche was met at 13.5 feet. There were no olfactory or headspace indications of contamination. The single lab sample from 10 feet was analyzed at less than 10 ppm TPH.

B-9 was placed in the far Northwest corner of the property. This area had not been previously excavated. Loamy topsoil was met for the first 3 feet before entering the caliche. Moderate olfactory indications of hydrocarbon were observed beginning at 5 feet. By 10 feet the sweet aroma noted in boring B-6 was observed. At a depth of 13 feet the caliche was interspersed with about 30% silt. Consistent caliche was then observed beginning at 18 feet down to 30 feet, whereupon a fine sand with no hydrocarbon aroma was encountered. Sandstone (and auger refusal) was met at a depth of 37 feet. The highest observed headspace value of 276 ppm-v came from the 10 foot sample, diminishing to less than the action level between 20 and 25 feet. Lab analysis of both the 10 and 35 foot samples indicated a TPH less than 10 ppm.

A small soil pile was found near one of the excavation areas West of the station proper. A headspace sample from 3.5 feet into the pile registered only 3.5 ppm-v and had no visual or olfactory indications of contamination.

3.0
Free Product

As previously mentioned, a set of three monitoring wells were previously installed during early 1992 by AEI. Some brief period after installation, 1/16 to 1/8" of free phase hydrocarbon product was noted in some or all the wells. Each of the wells were

sampled for water quality analysis in the same time period, but to BAI's knowledge the extent of product was not again checked until June 8, 1992. At that time BAI personnel checked for the presence of product in each of the wells using a clear bailer. In each well the thickness of product was observed to be greater that 30 inches (the usable length of the bailer). The product thickness was again checked by BAI on June 24, 1992 with the same outcome. These three wells are all located in the Southeast portion of the property, with W's-2 and 3 being very near the East and South boundaries respectively. Each of these wells are constructed using 4 inch diameter PVC.

Three additonal monitoring wells (W-4, 5, and 6) were installed on June 23, 1992 under BAI supervision. The new wells were completed using 2 inch diameter threaded PVC casing and screens. Inspection the next day did not reveal the presence of any free product or strong aroma in the groundwater from these wells.

4.0
Water Quality

Due to the inability of a standard auger to penetrate the sandstone layer encountered at an approximate depth of 40 feet across the site, no monitoring wells could be installed during the inital operations on June 8 - 10, 1992. On June 19, 1992 a variance was obtained from Steve Wild of the NMED to use an air-rotary drilling rig to emplace neccessary wells. The drilling and installation of three monitor wells was completed on June 23, 1992. No soil samples were obtained during these operations. Borings logs for the three wells can be found in Appendix C. Pertinent well information can be found in Appendix D.

Each of the wells was developed shortly after completion by pumping and bailing until formation fines were no longer observed in the water. Approximate depth to water beneath the site is 55 to 60 feet. After allowing the wells to stabilize they were then sampled on June 24, 1992. A minimum of three bore volumes of ground water was removed from each well using disposable bailers immediately prior to sampling. Each sample was slowly obtained from the bottom of the bailers into two clean 40 ml volatile organic analysis bottles provided by the laboratory. Prior to filling, each bottle was spiked with two drops of a 4 molar solution of mercuric chloride ($HgCl_2$) in distilled water as a preservative. The bottles were then capped with a septum top and carefully checked for the presence of any air bubbles. They were then labeled and refrigerated until they reached the lab with appropriate chain of custody.

The water samples were analyzed for benzene, toluene, ethylbenzene, total xylenes (BTEX), and methyl tertiary butyl ether (MTBE, a gasoline oxygenating additive) by Hall Environmental Analysis Lab in Albuquerque. A tabular compliation of this organic water quality data is presented as Appendix E. Copies of the actual laboratory water analysis reports can be found in Appendix F. BTEX constituents were noted in all three wells. The level of benzene exceeded state standards in all sampled wells. The level of toluene in the sample from W-6 was in excess of state standard. MTBE was not noted in the water from any of the sampled wells.

The most probable location for the installation of a deep-screened well for the determination of the vertical extent of groundwater contamination would be in the Southeast portion of the property where the free product exists, and thus by inference the highest dissolved-phase contamination. There is a strong concern at present that the magnitude of product in that area poses a difficulty in the proper drilling and completion

of a deep well through the product and still be able to acquire a representative sample some depth into the saturated aquifer.

5.0
Hydrogeology

The ground-water system in question exists in medium to fine grained, silty sands beneath a sandstone of variable thickness. Prior available information indicated a depth to water on the order of 60 feet below ground surface. This system is likely part of the greater Ogallala Aquifer. The sandstone is overlain by fine sands of variable thickness beneath a thick caliche layer to surface of varying hardness and permeability. There was a lack of visible biodegradation of contaminated soils or free product.

The previous AEI report indicates that the nearest public water supply wells are located 5 to 13 miles Southeast of Lovington. The total depth of these wells range from 60 to 180 feet.

The top of casing elevations of all on-site wells was surveyed on June 24, 1992. Static depths to water were measured in those wells not containing free product on the same day, prior to sampling. Well elevation, depth to water, and relative water table elevation information can be found in Appendix G. A map depicting the infered potentiometric surface is presented as Figure 2. The observed potentiometric gradient trends to the southeast at a rate of 0.0029 ft/ft.

Aquifer characteristics beneath the site were quanitified by performing slug injection testing on monitoring well W-5 on June 24, 1992, after the well had been sampled for organic water quality. A fresh water slug sufficient to instantaneously raise the water level several feet above its static level was gravity injected. A down-hole pressure transducer recorded the water level response. A total of three injection events were performed consecutively on the well. The gathered data was later analyzed according to the "Cooper" method (Cooper, Bredehoeft, and Papadopoulos; WWR, 1967; Vol. 3, No. 1).

The method consists of semilogarithmically plotting the ratio of observed water level deflection above the static level to the peak head change (H/H_o) versus time since the instantaneous change. The plot is then compared to a family of standard curves of H/H_o versus relative transmissivity (β) for various fixed values of storativity (α). The family of curves is derived by numerical solution of an integral equation representing the theoretical response of a well to instantaneous recharge. The data curve is superimposed on the set of standard curves and a matching procedure is implemented. A match point time is selected which can then be used to determine the local aquifer transmissivity. The aquifer storativity can also be broadly determined from the standard curves. The determination of storativity by such means is less accurate than that of transmissivity, as an order of magnitude change in α generates an only slightly different standard curve. Storativity can be better defined by analysis of drawdown data from pumping tests. The true need for such a test and the required level of effort are clearly not dictated in this case at this time.

The raw and normalized slug test data for each of the three tests is graphically represented in Figures 3 thru 8. The set of standard curves is given as Figure 9. Using

such means the average value of transmissivity for the upper portion of the aquifer is 8 ft^2/day. The average storativity is estimated at 0.02. Storativities for unconfined (water table) aquifers normally range from 0.01 to 0.3

The hydraulic conductivity of the aquifer in the immediate vicinity of the monitoring well was estimated by dividing the transmissivity by the saturated thickness intercepted by the well (total depth minus depth to water). The static saturated thickness at that time in W-5 was about 8 feet. Thus the hydraulic conductivity would then be 1 ft/day.

Based on available data, an estimate of general ground-water flow velocity (v) can be made utilizing a derivation of the Darcy equation. Using an average hydraulic gradient (i) of 0.0029 ft/ft, an effective porosity (n) between 2 and 20%, and an average hydraulic conductivity (k) of 1 ft/day, the range of groundwater velocity is within:

$$v = [k \times i]/n = 0.015 \text{ to } 0.145 \text{ ft/day} = 5.3 \text{ to } 53 \text{ ft/year}$$

6.0
Summary

• Contaminated soils above the state action level exist on-site. While headspace readings of soil-gas were found above the action level at several locations about the site, lab analysis of soils reveals that contamination at the maximum augering depth (~40 feet) exists only in the B-7 area. In the other areas assessed, contamination was observed to diminish below the state action level at shallower depths.

• Free-phase hydrocarbon product on the water table exists beneath the site. The actual

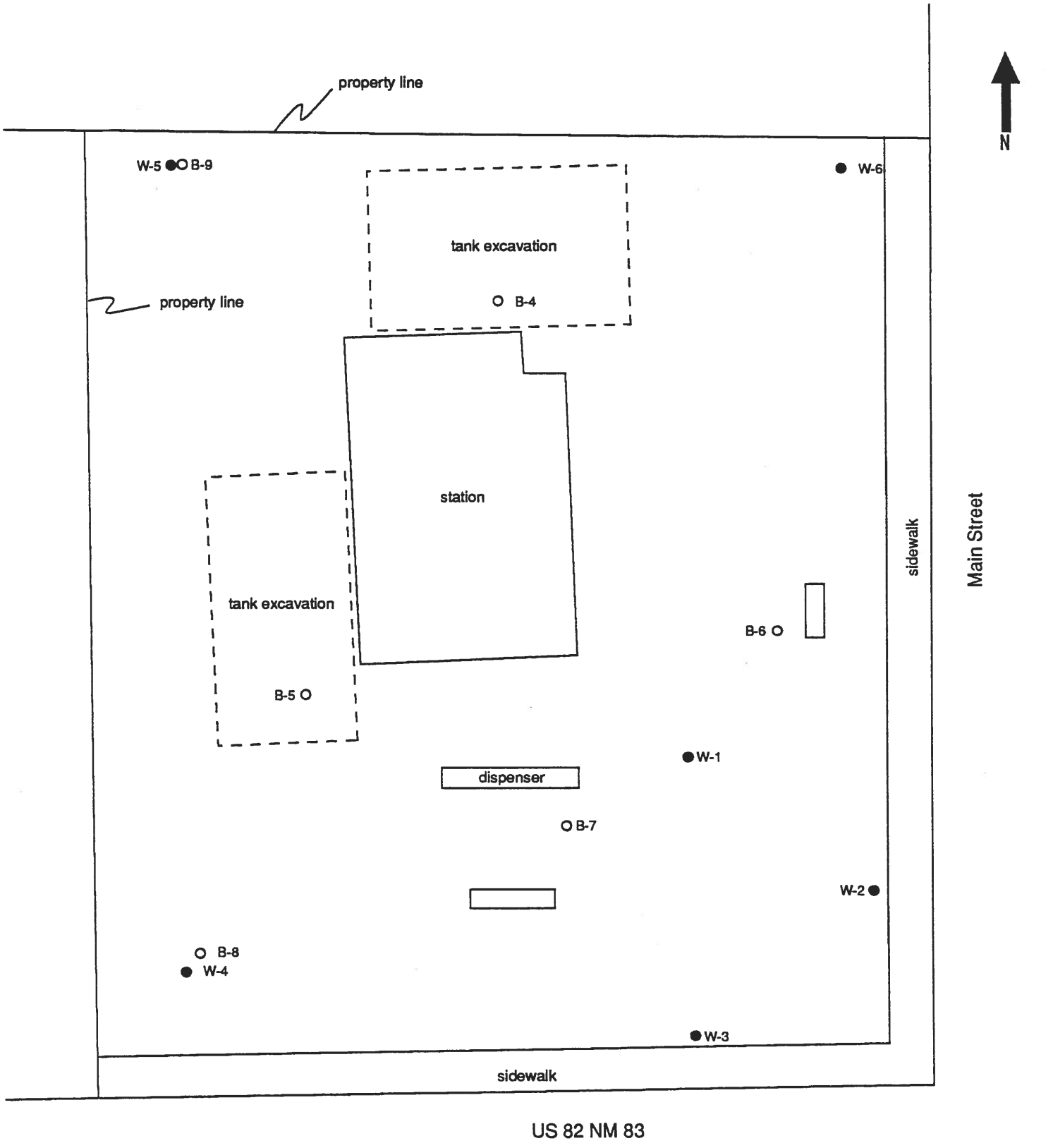
apparent thickness of the product is unknown but is at least 30 inches.

- Ground water beneath the site in the three new on-site monitoring wells is contaminated above state standards. Each of these wells is in a nominal upgradient direction.

- Further investigation activities should proceed off-site to establish the extent of free product, soil and ground-water contamination. There are other potential sources for contamination in the area that should be segregated.

- Free product recovery and soil venting operations should be initiated.

Figures



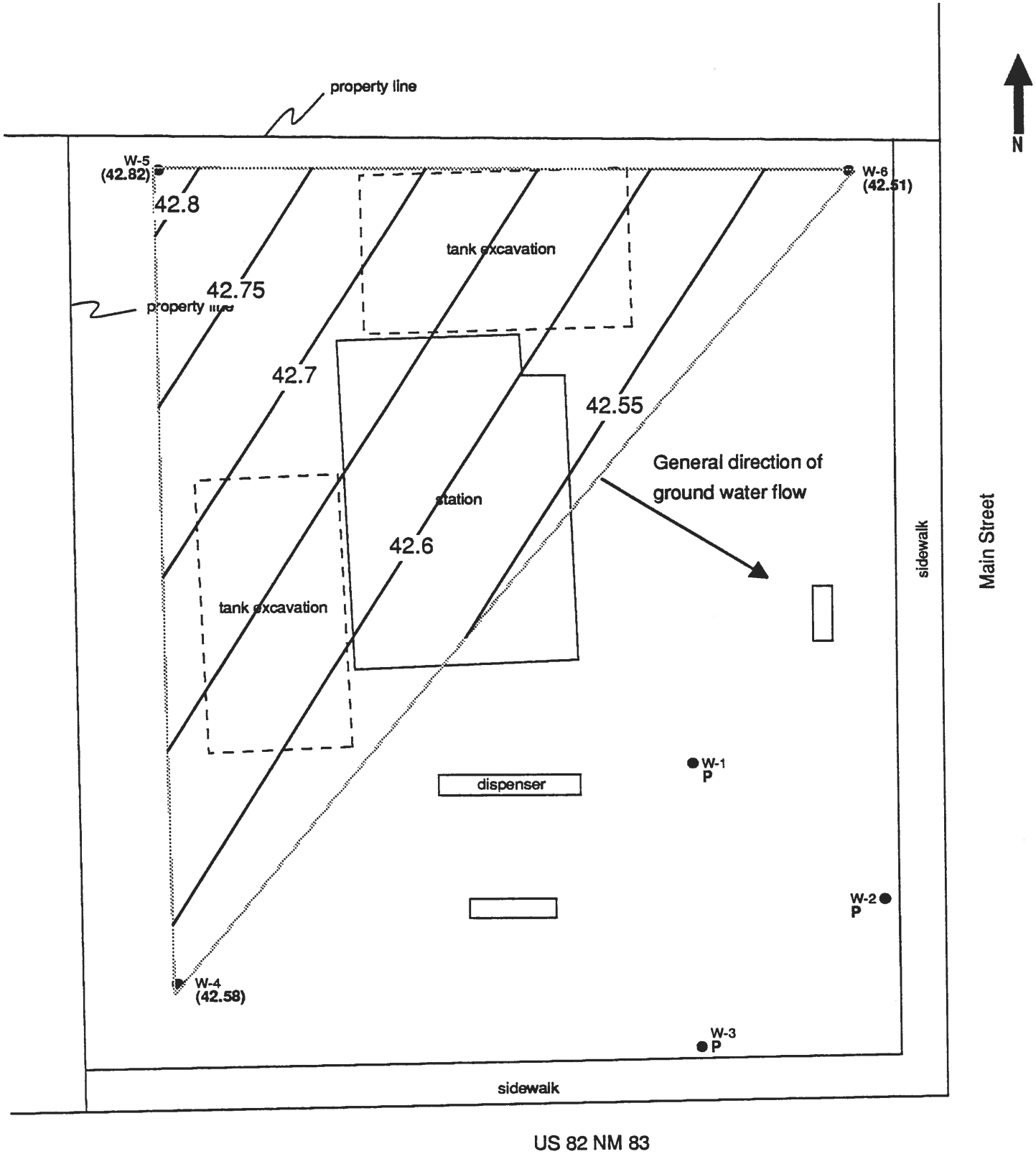
Scale 1"=25'

0 25 50

● monitor well location
○ boring location

FIGURE 1

Base Map
Walstad Oil: Lovington, NM
Billings & Associates, Inc. June, 1992



Scale 1"=25'

0 25 50

● monitor well location

(42.58) relative water table elevation

P product

Based on data taken on 6/24/92

FIGURE 2

Potentiometric Surface
Walstad Oil: Lovington, NM
Billings & Associates, Inc. June, 1992

Figure 3: Raw Slug Test Data Test #1 W-5 Walstad/Lovington Site 6/24/92

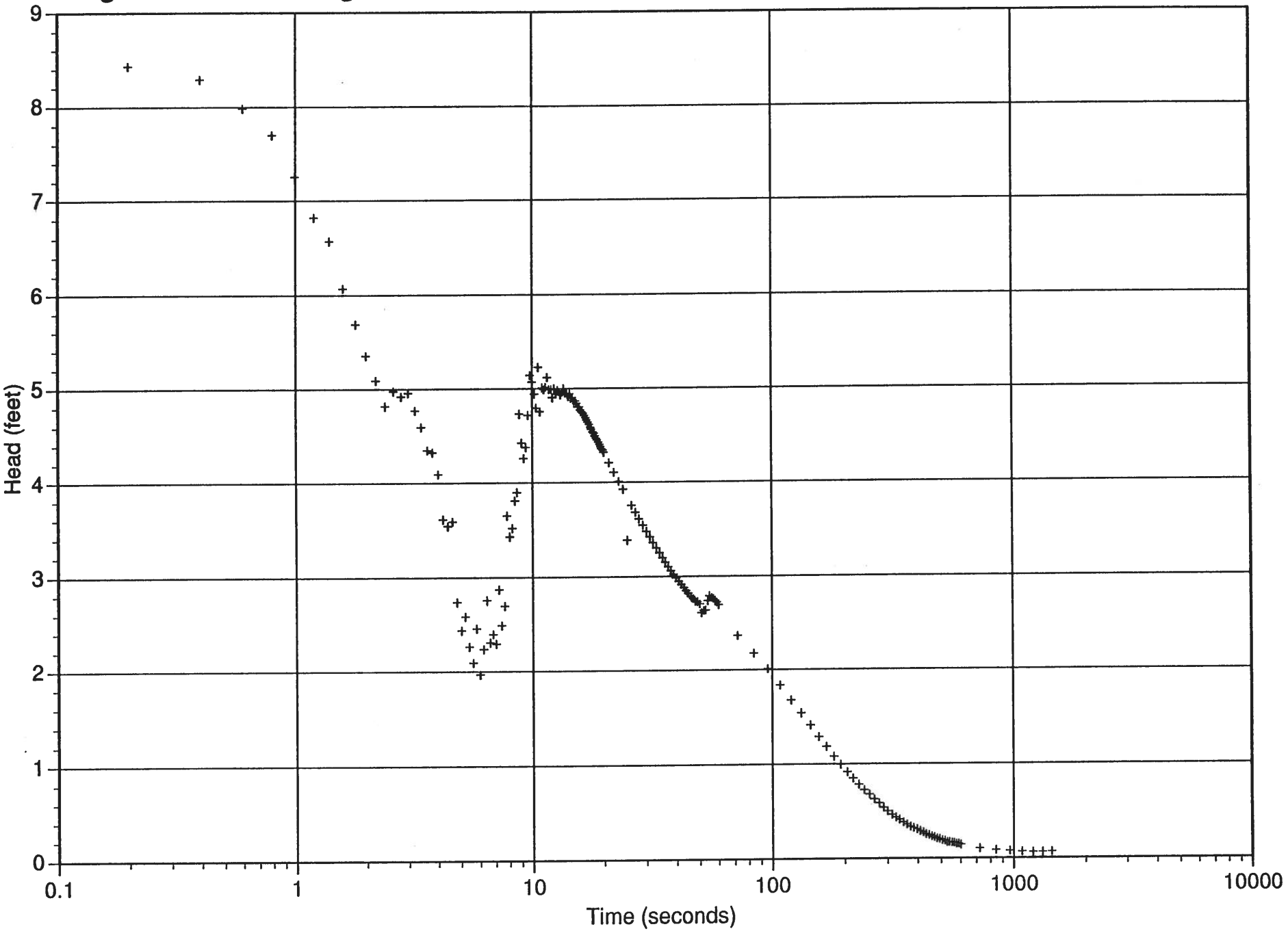


Figure 4: Raw Slug Test Data Test #2 W-5 Walstad/Lovington Site 6/24/92

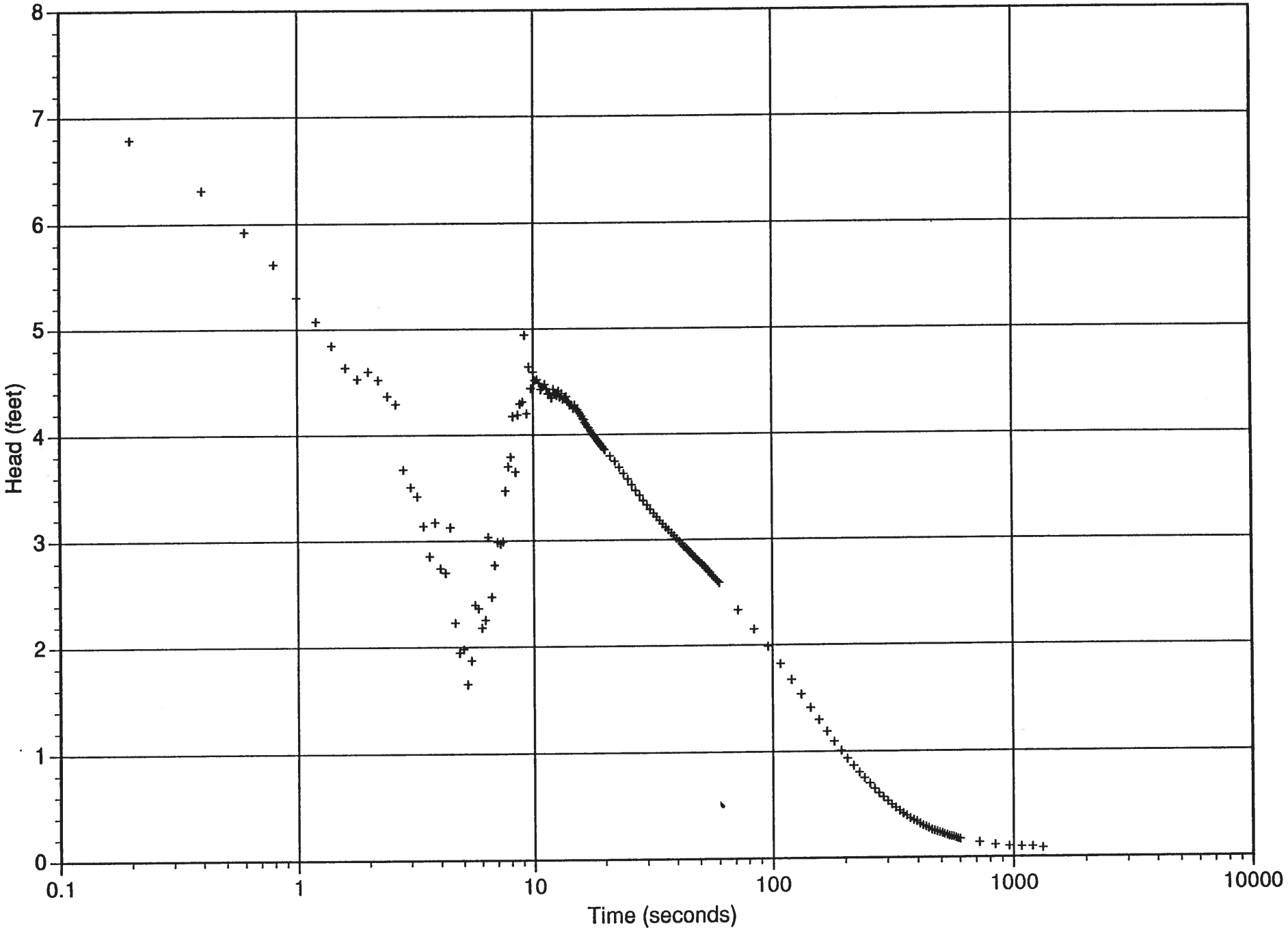


Figure 5: Raw Slug Test Data Test #3 W-5 Walstad/Lovington Site 6/24/92

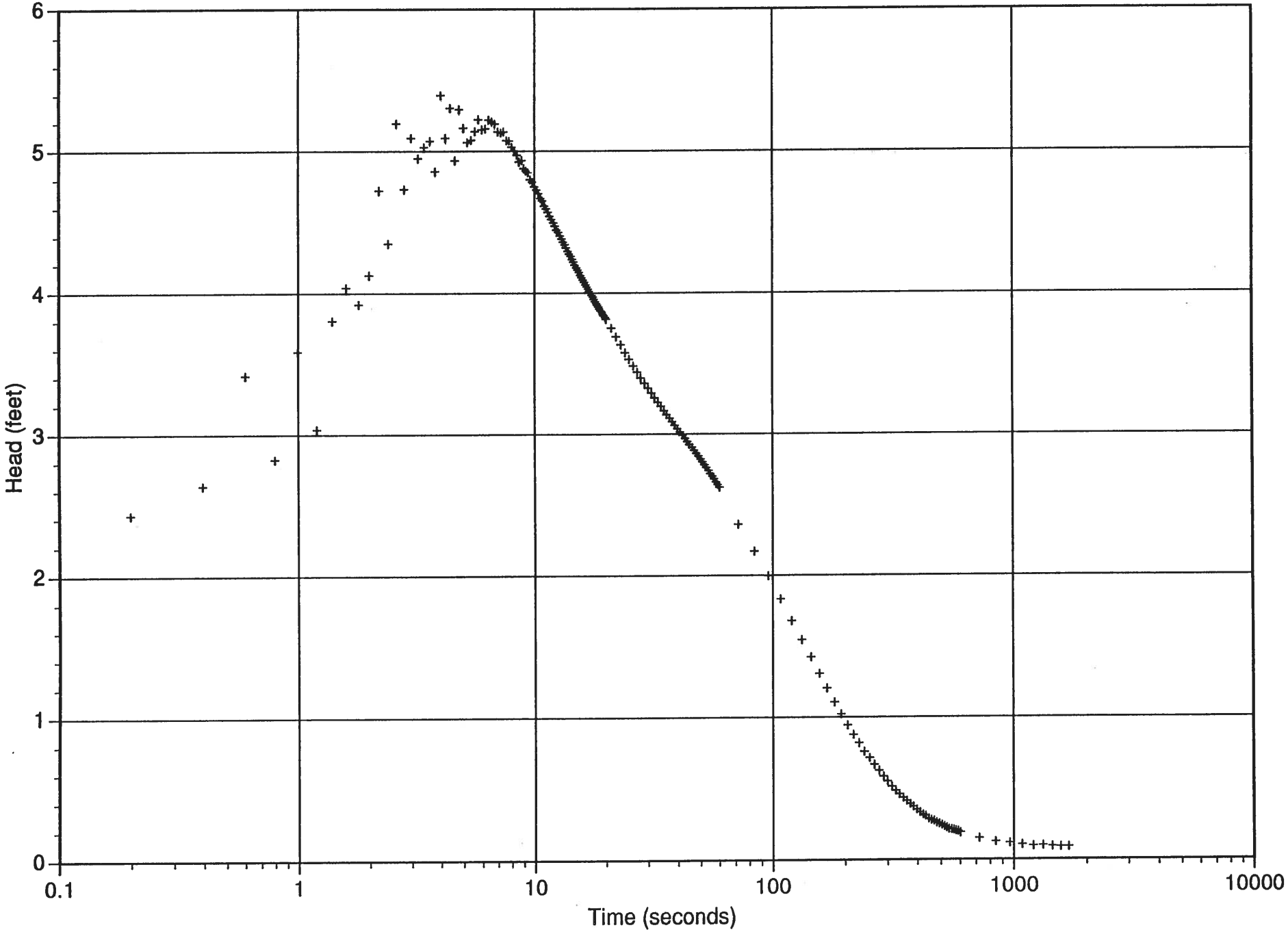


Figure 6: Reduced Slug Test Data Test #1 W-5 Walstad/Lovington Site 6/24/92

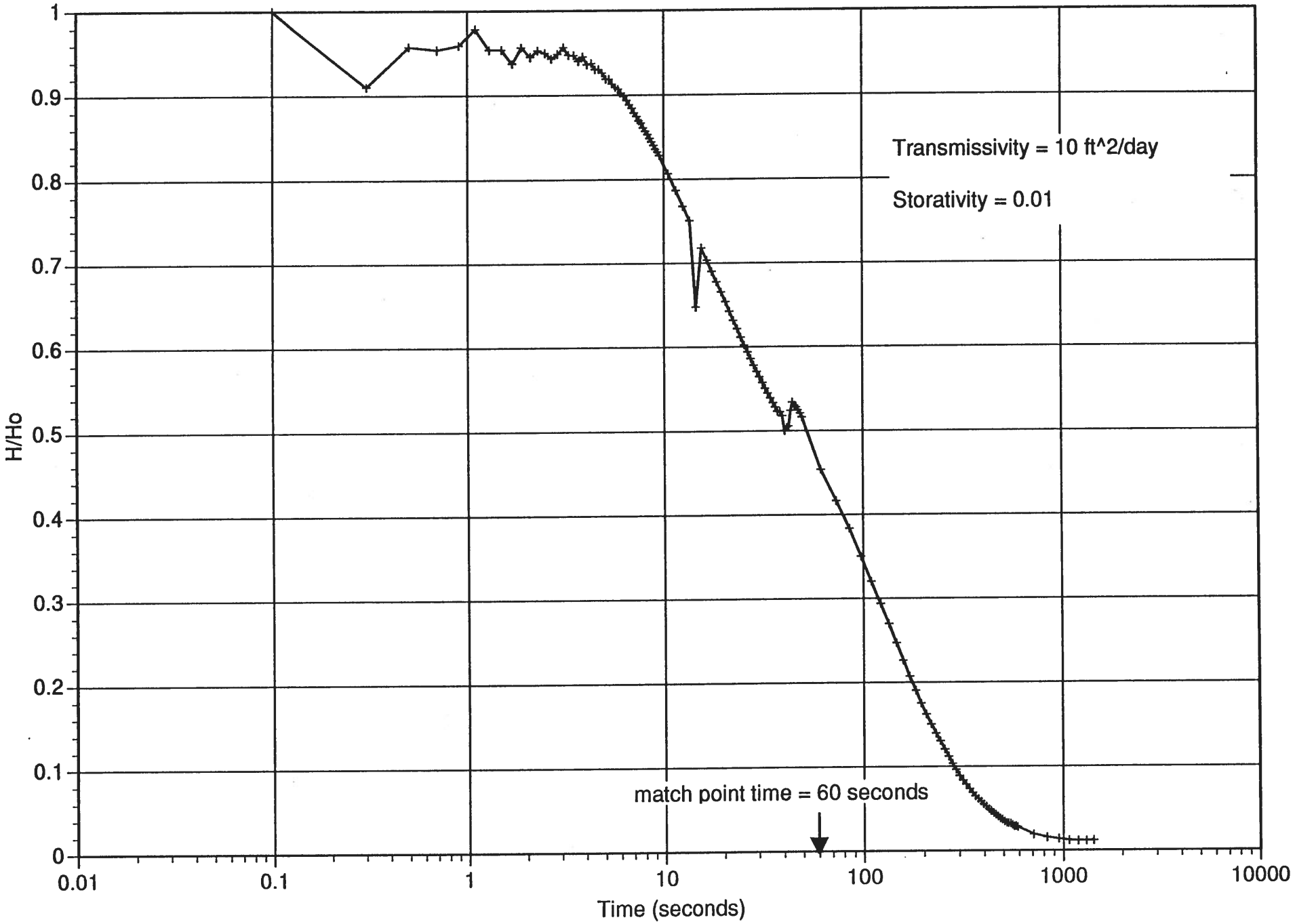


Figure 7: Reduced Slug Test Data Test #2 W-5 Walstad/Lovington Site 6/24/92

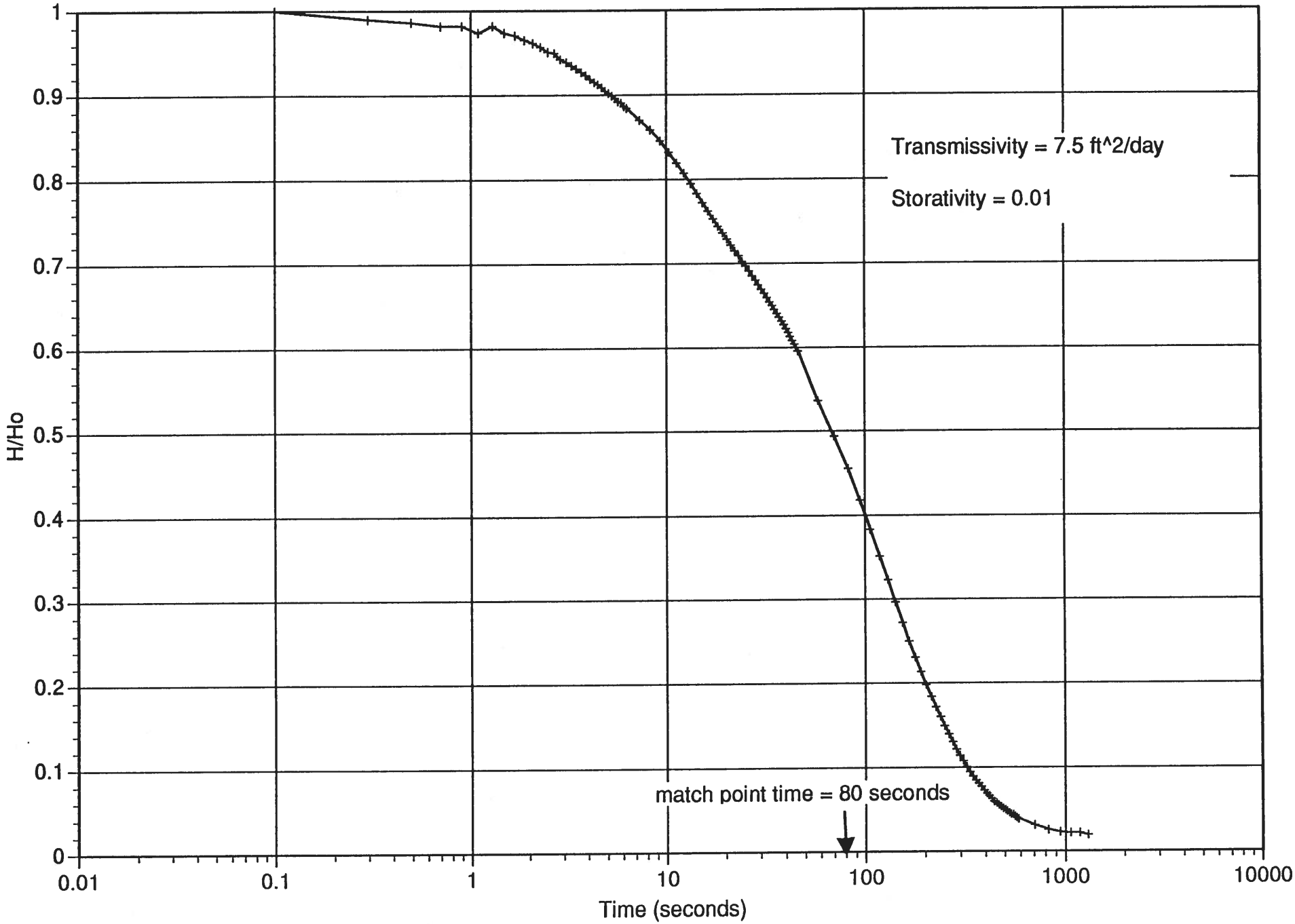


Figure 8: Reduced Slug Test Data Test #3 W-5 Walstad/Lovington Site 6/24/92

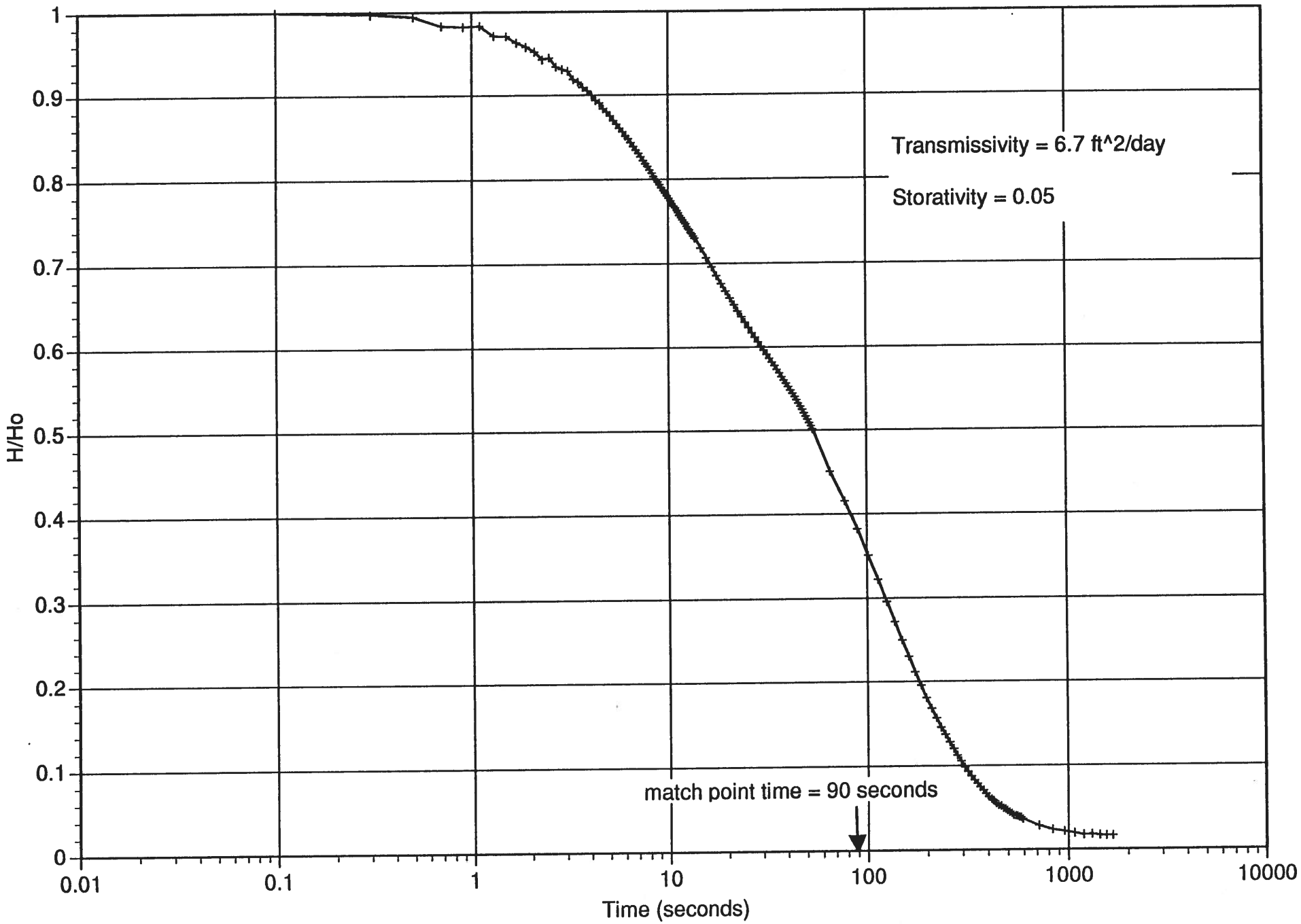
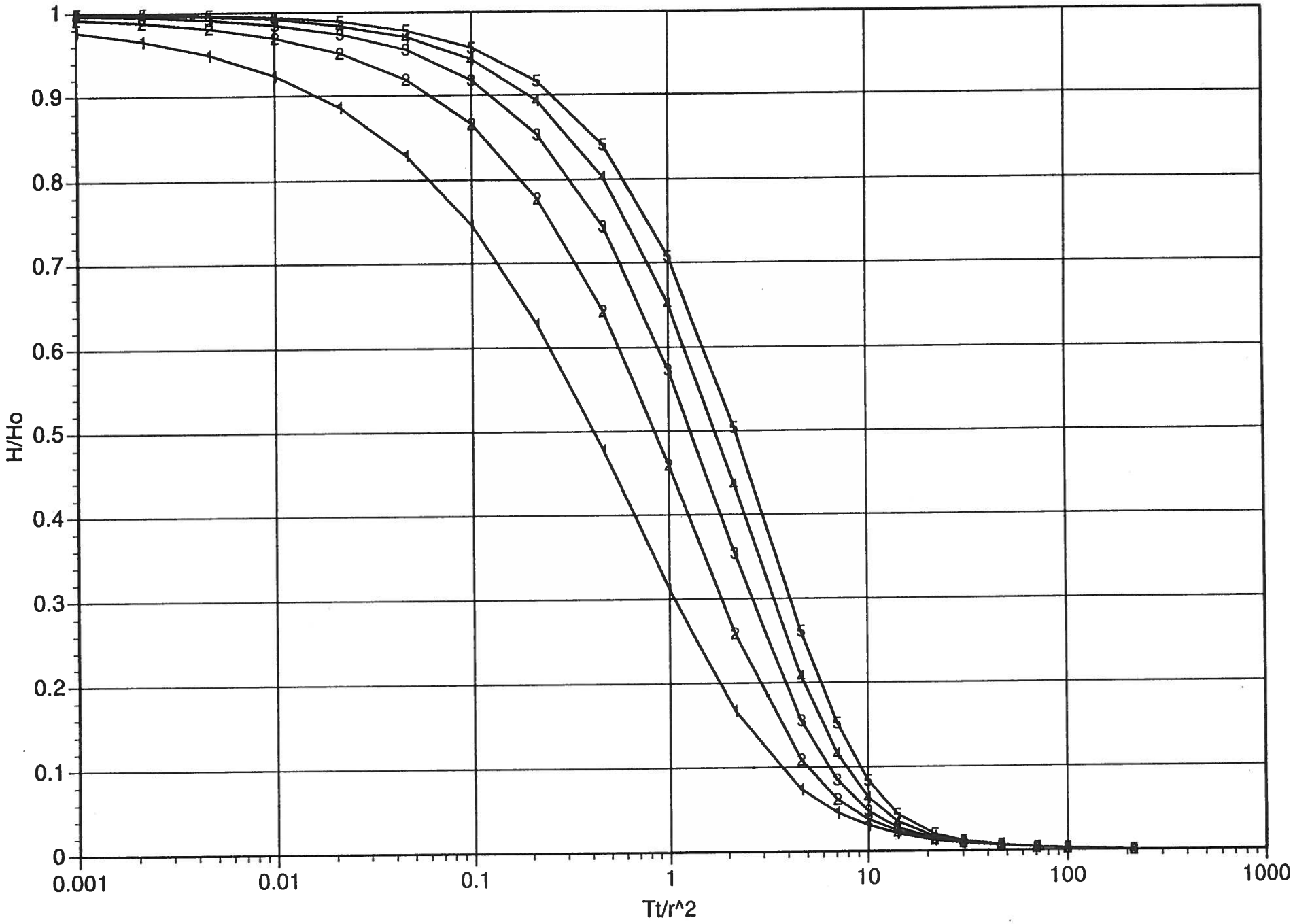


Figure 9: Type Curves for H/Ho Versus Tt/r^2 for Five Values of Storativity



Appendices

Appendix A

Soil Headspace and Lab Data

Soil Headspace and Lab Data

Walstad Oil
Lovington, NM

Boring	Date	Depth (feet)	OVM (ppm-v)	TPH (ppm)
B-1	12/24/91	20	400	
		39	300	
W-1	2/12/92	40	332	
		50	424	
		60	494	
		70	477	
		80	237	
W-2	3/13/92	40	323	
		50	314	
W-3	3/13/92	40	46	
		50	289	
B-4	6/9/92	10	586	6700
		15	222	
		25	115.7	
		30	44.5	
		35	15.4	<10
B-5	6/9/92	10	0.0	
		15	76.3	
		20	133.9	5800 (diesel)
		25	78.4	
		30	28.2	
		35	23.4	<10
B-6	6/9/92	10	13.8	
		15	168	
		20	319	
		25	385	<10
		30	240	
		35	201	<10
B-7	6/10/92	10	667	3400
		15	659	
		20	275	
		25	293	
		30	270	2500
		35	268	

Soil Headspace and Lab Data (page 2)
Walstad Oil
Lovington, NM

Boring	Date	Depth (feet)	OVM (ppm-v)	TPH (ppm)
B-8	6/10/92	5	7.2	
		10	1.3	<10
B-9	6/10/92	5	260	
		10	276	<10
		15	193	
		20	129.3	
		25	76.2	
		30	30.8	
		35	10.1	<10

OVM - organic vapor meter (headspace analysis) calibrated against 100 ppm-v isobutylene standard.

TPH - total petroleum hydrocarbons (lab analysis) as gasoline unless otherwise noted.

Soil data for boring B-1 and monitoring wells W-1, 2, and 3 derived from investigation report completed by AEI Tank, Inc. April, 1992. All other data obtained by BAI personnel.

Appendix B

Lab Soil Data

Entered
6-18-92
JF

6/17/92

Hall Environmental Analysis Laboratory
2403 San Mateo N.E., Suite P-13
Albuquerque, N.M. 87110
(505) 880-1803

Billings and Associates, Inc.
3816 Academy Parkway N.E.
Albuquerque, N.M. 87109

Dear Mr. Jim Griswold,

Enclosed are the results for the analyses that were requested. These were done according to E.P.A. procedures or the equivalent.

Please don't hesitate to contact me for any additional information or clarifications.

Sincerely,

Scott Hallenbeck, Lab Manager

Project: Walstad

Results for sample : Sample B-4, 10'

Date collected: 6/9/92 Date received: 6/12/92
Date extracted: 6/13/92 Date injected: 6/17/92
Client: Billings and Associates, Inc.
Project Name: Walstad HEAL #: 920618-6
Project Manager: Jim Griswold Sampled by: Jim Griswold

Compound	Amount	Units
Gasoline	6,700	PPM (MG/KG)

DNOP (Surrogate) Recovery = 101 %

Dilution Factor = 50

Results for sample : Sample B-4, 35'

Date collected: 6/9/92 Date received: 6/12/92
Date extracted: 6/13/92 Date injected: 6/17/92
Client: Billings and Associates, Inc.
Project Name: Walstad HEAL #: 920618-7
Project Manager: Jim Griswold Sampled by: Jim Griswold

Compound	Amount	Units
Gasoline	<10	PPM (MG/KG)
Diesel	<10	PPM (MG/KG)

DNOP (Surrogate) Recovery = 111 %

Dilution Factor = 1

Results for sample : Sample B-5, 20'

Date collected: 6/9/92 Date received: 6/12/92
Date extracted: 6/13/92 Date injected: 6/17/92
Client: Billings and Associates, Inc.
Project Name: Walstad HEAL #: 920618-8
Project Manager: Jim Griswold Sampled by: Jim Griswold

Compound	Amount	Units
Diesel	5,800	PPM (MG/KG)

DNOP (Surrogate) Recovery = 98 %

Dilution Factor = 50

Results for sample : Sample B-5, 35'

Date collected: 6/9/92 Date received: 6/12/92
Date extracted: 6/13/92 Date injected: 6/17/92
Client: Billings and Associates, Inc.
Project Name: Walstad HEAL #: 920618-9
Project Manager: Jim Griswold Sampled by: Jim Griswold

Compound	Amount	Units
Gasoline	<10	PPM (MG/KG)
Diesel	<10	PPM (MG/KG)

DNOP (Surrogate) Recovery = 109 %

Dilution Factor = 1

Results for sample = Sample B-6, 25'

Date collected: 6/9/92 Date received: 6/12/92
Date extracted: 6/13/92 Date injected: 6/17/92
Client: Billings and Associates, Inc.
Project Name: Walstad HEAL #: 920618-10
Project Manager: Jim Griswold Sampled by: Jim Griswold

Compound	Amount	Units
Gasoline	<10	PPM (MG/KG)
Diesel	<10	PPM (MG/KG)

DNOP (Surrogate) Recovery = 108 %

Dilution Factor = 1

Results for sample : Sample B-6, 35'

Date collected: 6/9/92 Date received: 6/12/92
Date extracted: 6/13/92 Date injected: 6/17/92
Client: Billings and Associates, Inc.
Project Name: Walstad HEAL #: 920618-II
Project Manager: Jim Griswold Sampled by: Jim Griswold

Compound	Amount	Units
Gasoline	<10	PPM (MG/KG)
Diesel	<10	PPM (MG/KG)

DNOP (Surrogate) Recovery = 105 %

Dilution Factor = 1

Results for sample = Sample B-7, 10'

Date collected: 6/10/92 Date received: 6/12/92
Date extracted: 6/13/92 Date injected: 6/17/92
Client: Billings and Associates, Inc.
Project Name: Walstad HEAL #: 920618-12
Project Manager: Jim Griswold Sampled by: Jim Griswold

Compound	Amount	Units
Gasoline	3,400	PPM (MG/KG)

DNOP (Surrogate) Recovery = 101 %

Dilution Factor = 100

Results for sample : Sample B-7, 30'

Date collected: 6/10/92 Date received: 6/12/92
Date extracted: 6/13/92 Date injected: 6/17/92
Client: Billings and Associates, Inc.
Project Name: Walstad HEAL #: 920618-13
Project Manager: Jim Griswold Sampled by: Jim Griswold

Compound	Amount	Units
Gasoline	2,500	PPM (MG/KG)

DNOP (Surrogate) Recovery = 106 %

Dilution Factor = 10

Results for sample : Sample B-8, 10'

Date collected: 6/10/92	Date received: 6/12/92
Date extracted: 6/13/92	Date injected: 6/17/92
Client: Billings and Associates, Inc.	
Project Name: Walstad	HEAL #: 920618-14
Project Manager: Jim Griswold	Sampled by: Jim Griswold

Compound	Amount	Units
Gasoline	<10	PPM (MG/KG)
Diesel	<10	PPM (MG/KG)

DNOP (Surrogate) Recovery = 101 %

Dilution Factor = 1

Results for sample : Sample B-9, 10'

Date collected: 6/10/92 Date received: 6/12/92
Date extracted: 6/13/92 Date injected: 6/17/92
Client: Billings and Associates, Inc.
Project Name: Walstad HEAL #: 920618-15
Project Manager: Jim Griswold Sampled by: Jim Griswold

Compound	Amount	Units
Gasoline	<10	PPM (MG/KG)
Diesel	<10	PPM (MG/KG)

DNOP (Surrogate) Recovery = 111 %

Dilution Factor = 1

Results for sample : Sample B-9, 35'

Date collected: 6/10/92 Date received: 6/12/92
Date extracted: 6/13/92 Date injected: 6/17/92
Client: Billings and Associates, Inc.
Project Name: Walstad HEAL #: 920618-16
Project Manager: Jim Griswold Sampled by: Jim Griswold

Compound	Amount	Units
Gasoline	<10	PPM (MG/KG)
Diesel	<10	PPM (MG/KG)

DNOP (Surrogate) Recovery = 105 %

Dilution Factor = 1

Results for QC: Reagent Blank

Date extracted: 6/13/92 Date injected: 6/16/92
Client: Billings and Associates, Inc.
Project Name: Walstad HEAL #: RB 6/13
Project Manager: Jim Griswold

Compound	Amount	Units
Gasoline	<10	PPM (MG/KG)
Diesel	<10	PPM (MG/KG)

DNOP (Surrogate) Recovery = 79 %

Results for QC: Matrix Spike/Matris Spike Dup

Date extracted: 6/13/92 Date injected: 6/17/92
Client: Billings and Associates, Inc.
Project Name: Walstad HEAL #: MS/MSD 6/16
Project Manager: Jim Griswold

Compound	Sample Result	Amount Added	Matrix Spike	MS %	MS Dup	MSD %	RPD
Diesel	<10	50	44	88	42	84	5

HALL ENVIRONMENTAL ANALYSIS LABORATORY
2403 SAN MATEO NE, SUITE P-13 • ALBUQUERQUE, NM 87110 • (505) 880-1803

CHAIN-OF-CUSTODY RECORD

ANALYSIS REQUEST

CLIENT: Billings + Assoc., Inc.	**PROJECT MANAGER:** Jim Griswold
ADDRESS: 3816 Academy Pky NNE, Alb., NM 87109	**PHONE #:** 345-1116
	FAX #: 345-1756
PROJECT NAME: Walsted	**SAMPLER:** J. Griswold
	PROJECT #:

DATE	TIME	MATRIX	SAMPLE I.D. NO.	NUMBER/ VOLUME	PRESERVATIVE			BTEX (METHOD 602)	BTEX + MTBE (602)	TPH (METHOD 8015 MOD)	BTEX + TPH COMBINATION	601/602	601 ONLY	602 ONLY			AIR BUBBLES OR HEADSPACE (Y OR N)	SAMPLES COLD: (Y OR N) / HEAL #
					$HgCl_2$	HCl	OTHER											
6/9/92	10:00	Soil	B-4 10'	1 @ 4oz						✓								920618-6
6/9/92	10:00	Soil	B-4 35'							✓								-7
6/9/92	14:20	Soil	B-5 20'							✓								-8
6/9/92	14:20	Soil	B-5 35'							✓								-9
6/9/92	16:40	Soil	B-6 25'							✓								-10
6/9/92	16:40	Soil	B-6 35'							✓								-11
6/10/92	9:26	Soil	B-7 10'							✓								-12
6/10/92	9:30	Soil	B-7 30'							✓								-13
6/10/92	10:40	Soil	B-8 10'							✓								-14
6/10/92	12:00	Soil	B-9 10'							✓								-15
6/10/92	12:23	Soil	B-9 35'							✓								-16
																		-17

RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY:
J. Griswold	6/12/92	1345	Vince Speshock
RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY:

REMARKS:

Appendix C

Boring Logs

Billings & Associates, Inc.

BORING LOG

Project No.: Walstad Oil Company
Boring No.: B-4

Installation Date: 6/9/92
Location: In excavation North of Station

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
1					
2					
3					
4					
5		N			back fill of excavation
6					med. to fine sand
7					
8					
9					
10		Y	586	6700	
11					
12					
13					off white caliche, damp
14					
15		Y	222		
16					
17					
18					
19					
20					no splitspoon return

* Field Monitoring Point

Water Table: Not Intercepted
Completion Depth: 40'

Billings & Associates, Inc.

BORING LOG

Project No.: Walstad Oil Company
Boring No.: B-4

Installation Date: 6/9/92
Location: In excavation North of Station

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
21					
22					
23					caliche as above with small tan silty stringers
24					
25		Y	115.7		
26					
27					caliche
28					
29		Y	44.5		
30					
31					fine sand, tan, dry
32					
33					
34					
35		N	15.4	<10	
36					
37					fine sand as above, with 20% hard caliche
38					
39					
40					sandstone, auger refusal

* Field Monitoring Point

Water Table: Not Intercepted
Completion Depth: 40'

Billings & Associates, Inc.

BORING LOG

Project No.: Walstad Oil Company
Boring No.: B-5

Installation Date: 6/9/92
Location: SE corner of West excavation pit

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
1					
2					
3					
4					topsoil/fill of fine silty sand
5		N			
6					
7					
8					
9					
10		Y	0.0		
11					
12					caliche, off white to tan
13					
14					
15		Y	76.3		
16					very hard caliche
17					
18					
19					caliche with small amounts of silty sand
20		Y	133.9	5800 (diesel)	mixed gasoline/diesel aroma, moderate

* Field Monitoring Point

Water Table: Not Intercepted
Completion Depth: 40.5'

Billings & Associates, Inc.

BORING LOG

Project No.: Walstad Oil Company
Boring No.: B-5

Installation Date: 6/9/92
Location: SE corner of West excavation pit

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
21					
22					
23					
24					caliche with small amounts of silty sand
25		Y	78.4		
26					
27					
28					
29					
30		N	28.2		grading from caliche to fine sand
31					
32					
33					fine silty sand
34					
35		N	23.4	<10	
36					hard caliche with rock-like fragments
37					
38					
39					
40					sandstone, auger refusal

* Field Monitoring Point

Water Table: Not Intercepted
Completion Depth: 40.5'

Billings & Associates, Inc.

BORING LOG

Project No.: Walstad Oil Company
Boring No.: B-6

Installation Date: 6/9/92
Location: East dispenser

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
1					
2					
3					
4					backfill with fine silty sand
5					
6					
7					
8					
9					caliche, off-white
10		N	13.8		
11					
12					
13					
14					
15		Y	168		caliche with hard rock-like fragments, subtle sweet aroma, not HC more like ether
16					
17					
18					
19					
20			319		

* Field Monitoring Point

Water Table: Not Intercepted
Completion Depth: 40'

Billings & Associates, Inc.

BORING LOG

Project No.: Walstad Oil Company
Boring No.: B-6

Installation Date: 6/9/92
Location: East dispenser

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
21					
22					
23					
24					
25			385	<10	off-white caliche
26					
27					
28					
29					
30			240		
31					
32					
33					
34					grading from caliche to fine sand, ~50/50 @ 35'
35			201	<10	
36					
37					
38					
39					fine sand
40					sandstone, auger refusal

* Field Monitoring Point

Water Table: Not Intercepted
Completion Depth: 40'

Billings & Associates, Inc.

BORING LOG

Project No.: Walstad Oil Company
Boring No.: B-7

Installation Date: 6/10/92
Location: South dispensers

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
1–5		N			backfill of fine sand
6–9					
10		Y	667	3400	off-white caliche with hard fragments
11–14					
15		Y	659		
16–18					
19					caliche
20		Y	275		

* Field Monitoring Point

Water Table: Not Intercepted
Completion Depth: 37'

Project No.: Walstad Oil Company
Boring No.: B-7

Installation Date: 6/10/92
Location: South dispensers

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
21					
22					
23					
24					
25		Y	293		caliche
26					
27					
28					
29					
30		Y	270	2500	caliche with 10% fine sand
31					
32					
33					
34					
35		Y	268		caliche with sandstone stringers
36					
37					refusal
38					
39					
40					

* Field Monitoring Point

Water Table: Not Intercepted
Completion Depth: 37'

Billings & Associates, Inc.

BORING LOG

Project No.: Walstad Oil Company
Boring No.: B-8

Installation Date: 6/10/92
Location: SW corner of property

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
1		N			topsoil
2					
3					
4					
5		N	7.2		
6					
7					caliche with hard fragments
8					
9					
10		N	1.3	<10	
11					
12					
13		N			refusal
14					
15					
16					
17					
18					
19					
20					

* Field Monitoring Point

Water Table: Not Intercepted
Completion Depth: 13.5'

Billings & Associates, Inc.

BORING LOG

Project No.: Walstad Oil Company
Boring No.: B-9

Installation Date: 6/10/92
Location: NW corner of property

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
1					loamy clay, topsoil, dark brown
2					
3					
4					
5		Y	260		
6					
7					off-white caliche
8					
9					
10		Y	276	<10	sweet aroma, not HC
11					
12					
13					
14					
15		Y	193		caliche with ~ 30% medium brown silt
16					
17					
18					
19					caliche
20		Y	129.3		

* Field Monitoring Point

Water Table: Not Intercepted
Completion Depth: 37'

Billings & Associates, Inc.

BORING LOG

Project No.: Walstad Oil Company
Boring No.: B-9

Installation Date: 6/10/92
Location: NW corner of property

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
21					
22					
23					
24					
25		Y	76.2		caliche
26					
27					
28					
29					
30		N	30.8		
31					
32					
33					fine grained sand, light brown
34					
35		N	10.1	<10	
36					
37					
38					sandstone, refusal
39					
40					

* Field Monitoring Point

Water Table: Not Intercepted
Completion Depth: 37'

Billings & Associates, Inc.

BORING LOG

Project No.: Walstad Oil Company
Boring No.: W-4

Installation Date: 6/23/92
Location: SW corner of property

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
1					
2					
3					
4					
5		N			
6					
7					
8					caliche, off-white, drilled with air rotary
9					
10		N			
11					
12					
13					
14					
15		N			
16					
17					
18					
19					
20		N			

* Field Monitoring Point

Water Table: 60'
Completion Depth: 65'

Billings & Associates, Inc.

BORING LOG

Project No.: Walstad Oil Company
Boring No.: W-4

Installation Date: 6/23/92
Location: SW corner of property

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
21					
22					
23					
24					
25		N			
26					
27					caliche
28					
29					
30		N			
31					
32					
33					
34					
35		N			
36					
37					fine grained sand
38					
39					
40		N			sandstone

* Field Monitoring Point

Water Table: 60'
Completion Depth: 65'

Billings & Associates, Inc.

BORING LOG

Project No.: Walstad Oil Company
Boring No.: W-4

Installation Date: 6/23/92
Location: SW corner of property

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
41					sandstone
42					fine sand
43					
44					
45		N			
46					sandstone
47					
48					
49					
50		N			
51					
52					fine sand
53					
54					
55		N			
56					sandstone
57					
58					
59					medium to fine sand, light brown to tan with ~15% silt
60		N			

* Field Monitoring Point

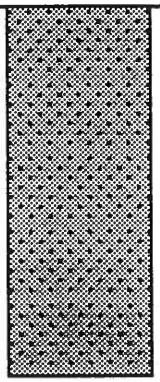
Water Table: 60'
Completion Depth: 65'

Billings & Associates, Inc.

BORING LOG

Project No.: Walstad Oil Company
Boring No.: W-4

Installation Date: 6/23/92
Location: SW corner of property

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
61					
62					
63					medium to fine sand, light brown to tan with ~15% silt
64					
65		N			
66					
67					
68					
69					
70					
71					
72					
73					
74					
75					
76					
77					
78					
79					
80					

* Field Monitoring Point

Water Table: 60'
Completion Depth: 65'

Billings & Associates, Inc.

BORING LOG

Project No.: Walstad Oil Company
Boring No.: W-5

Installation Date: 6/23/92
Location: NW corner of property

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
1					
2					
3					
4					
5		Y			
6					
7					off-white caliche, drilled with air rotary
8					aroma to 30' but sweet and non-hydrocarbon
9					
10		Y			
11					
12					
13					
14					
15		Y			
16					fine sand
17					
18					
19					caliche
20		Y			

* Field Monitoring Point

Water Table: 60'
Completion Depth: 65'

Billings & Associates, Inc.

BORING LOG

Project No.: Walstad Oil Company
Boring No.: W-5

Installation Date: 6/23/92
Location: NW corner of property

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
21					
22					
23					
24					
25		Y			caliche aroma to 30' but sweet and non-hydrocarbon
26					
27					
28					
29					
30		Y			
31					
32					
33					
34					fine sand, dry
35		N			
36					
37					
38					
39					
40		N			sandstone

* Field Monitoring Point

Water Table: 60'
Completion Depth: 65'

Billings & Associates, Inc.

BORING LOG

Project No.: Walstad Oil Company
Boring No.: W-5

Installation Date: 6/23/92
Location: NW corner of property

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
21					
22					
23					
24					
25		Y			caliche aroma to 30' but sweet and non-hydrocarbon
26					
27					
28					
29					
30		Y			
31					
32					
33					
34					fine sand, dry
35		N			
36					
37					
38					
39					
40		N			sandstone

* Field Monitoring Point

Water Table: 60'
Completion Depth: 65'

Project No.: Walstad Oil Company
Boring No.: W-5

Installation Date: 6/23/92
Location: NW corner of property

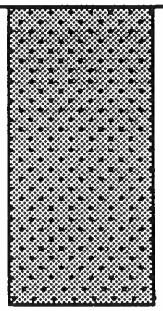
Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
41					
42					sandstone
43					
44					
45		N			
46					
47					fine sand
48					
49					
50		N			
51					
52					sand stone
53					
54					
55		N			
56					
57					medium to fine sand, medium brown
58					
59					
60		N			

* Field Monitoring Point

Water Table: 60'
Completion Depth: 65'

Project No.: Walstad Oil Company
Boring No.: W-5

Installation Date: 6/23/92
Location: NW corner of property

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
61					
62					medium to fine grained sand, medium brown
63					
65		N			
66					
67					
67					
68					
69					
70					
71					
72					
73					
74					
75					
76					
77					
78					
79					
80					

* Field Monitoring Point

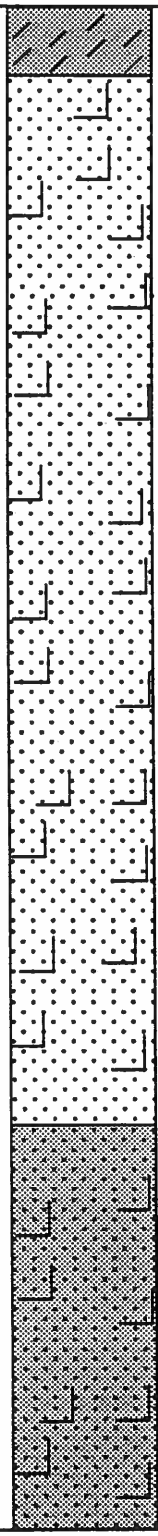
Water Table: 60'
Completion Depth: 65'

Billings & Associates, Inc.

BORING LOG

Project No.: Walstad Oil Company
Boring No.: W-6

Installation Date: 6/23/92
Location: NE corner of property

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
1					dark brown, loamy clay topsoil
2					
3					
4		N			
5					
6					
7					off-white caliche, drilled with air rotary
8					
9					
10		N			
11					
12					
13					
14					
15		N			
16					
17					caliche with ~15% fine sand to silt
18					
19					
20		N			

* Field Monitoring Point

Water Table: 60'
Completion Depth: 65'

BORING LOG

Project No.: Walstad Oil Company
Boring No.: W-6

Installation Date: 6/23/92
Location: NE corner of property

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
21					caliche with ~15% sand to silt
22					
23					
24					
25		N			
26					
27					
28					
29					
30		N			fine sand, medium to light brown
31					
32					
33					
34					
35		N			
36					
37					
38					
39					
40		N			

* Field Monitoring Point

Water Table: 60'
Completion Depth: 65'

Billings & Associates, Inc.

BORING LOG

Project No.: Walstad Oil Company
Boring No.: W-6

Installation Date: 6/23/92
Location: NE corner of property

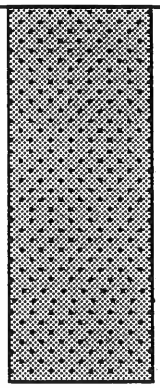
Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
41					
42					
43					
44					fine sand, medium to light brown
45		N			
46					
47					
48					
49					
50		N			
51					
52					sandstone stringers
53					
54					
55		N			
56					fine sand
57					
58					sandstone stringers
59					
60		N			medium to fine sand, medium brown

* Field Monitoring Point

Water Table: 60'
Completion Depth: 65'

Project No.: Walstad Oil Company
Boring No.: W-6

Installation Date: 6/23/92
Location: NE corner of property

Depth (ft)	Profile Sketch	Odor (y/n)	PID Field Data (ppm)	Lab Data TPH (ppm)	Description
61					
62					
63					medium to fine sand, medium brown
64					
65		N			
66					
67					
68					
69					
70					
71					
72					
73					
74					
75					
76					
77					
78					
79					
80					

* Field Monitoring Point

Water Table: 60'
Completion Depth: 65'

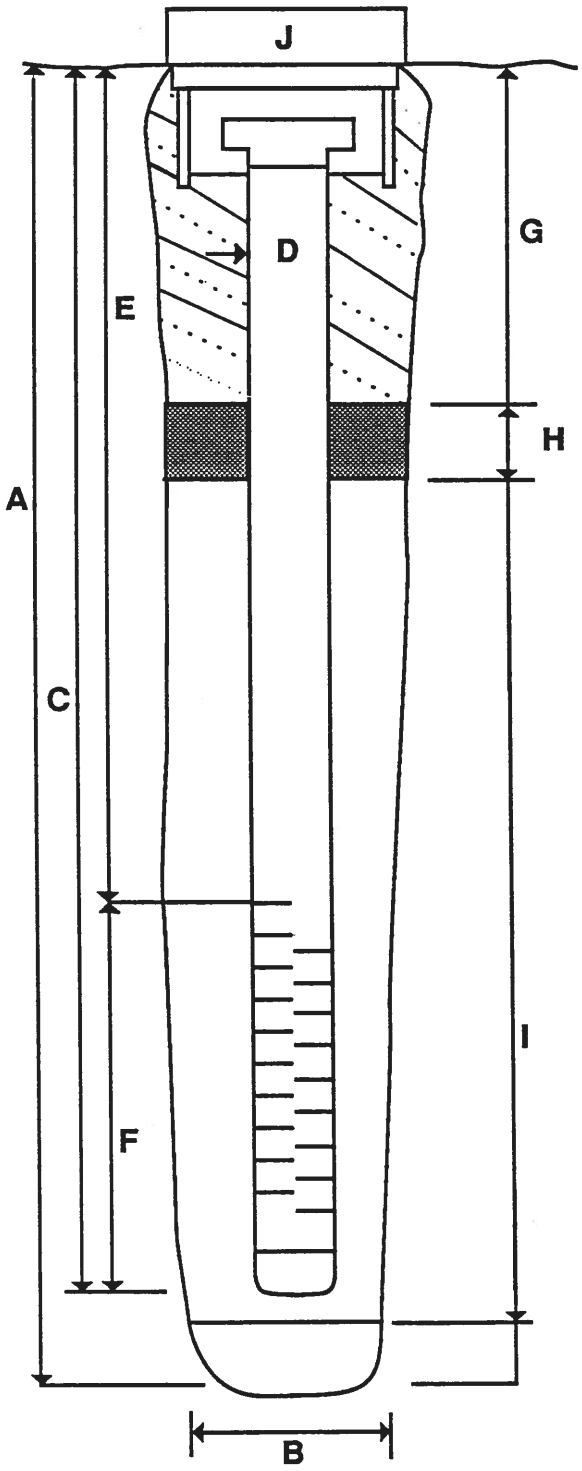
Appendix D

Well Completion Logs

WELL DETAILS

PROJECT NAME: Walstad Oil
PROJECT NUMBER:
WELL PERMIT NO:
BORING /WELL NO: W-4

COMPLETION DATE: 6/23/92
CASING ELEVATION:
SURFACE ELEVATION:
BY: Jim Griswold



A. Total depth: 65 feet

B. Boring Diameter: 4.5 inches

Drilling method: Air Rotary

C. Casing Length: 55 feet

Material: Threaded PVC

D. Casing Diameter: 2 inch

E. Depth to Perforations: 55 feet BGS

F. Perforated Length: 10 feet

Perforated Interval: 55 feet to 65 feet

Perforation Type: Factory slot

Perforation Size: .020

G. Surface Seal: 0 foot to 52 feet

Seal Material: grout

H. Pack Seal: 52-54 feet

Seal Material: 1/2" bentonite pellets

I. Gravel Pack: 54 feet to 65 feet

Pack Material: Silica sand

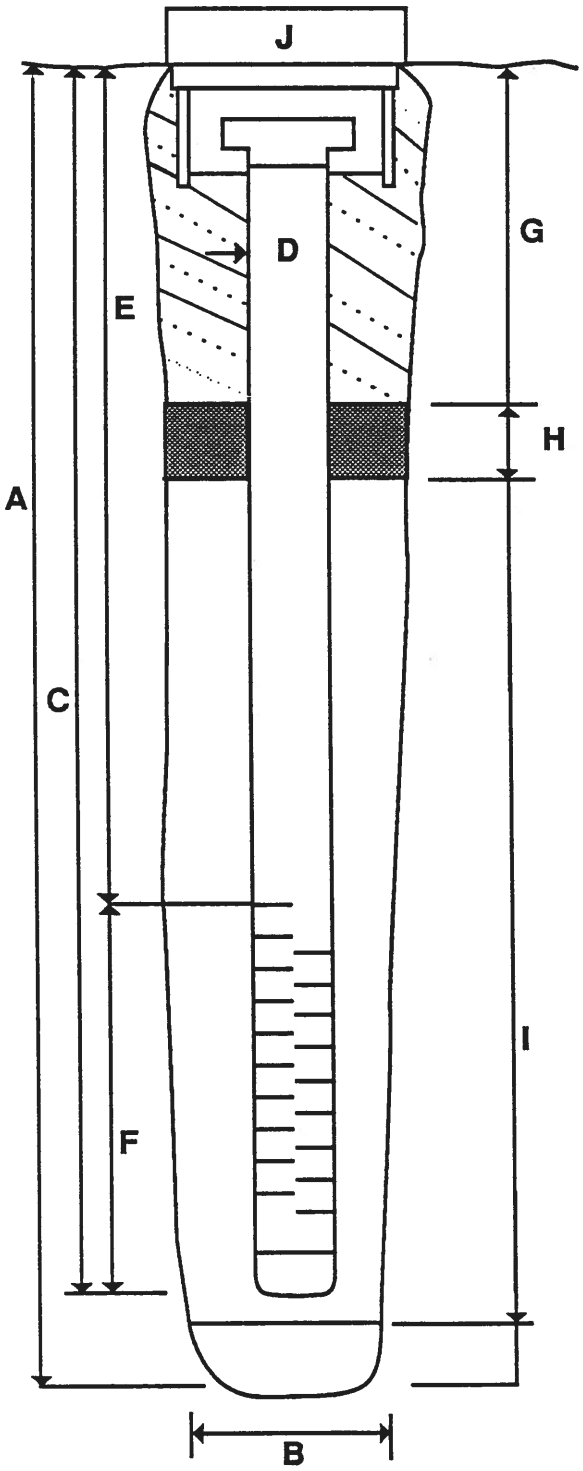
Size: 10-20 mesh

J. Surface Mount: 8" flush mount
Remarks:

WELL DETAILS

PROJECT NAME: Walstad Oil
PROJECT NUMBER:
WELL PERMIT NO:
BORING /WELL NO: W-5

COMPLETION DATE: 6/23/92
CASING ELEVATION:
SURFACE ELEVATION:
BY: Jim Griswold



A. Total depth: 65 feet

B. Boring Diameter: 4.5 inches

Drilling method: Air Rotary

C. Casing Length: 55 feet

Material: Threaded PVC

D. Casing Diameter: 2 inch

E. Depth to Perforations: 55 feet BGS

F. Perforated Length: 10 feet

Perforated Interval: 55 feet to 65 feet

Perforation Type: Factory slot

Perforation Size: .020

G. Surface Seal: 0 foot to 52 feet

Seal Material: grout

H. Pack Seal: 52-54 feet

Seal Material: 1/2" bentonite pellets

I. Gravel Pack: 54 feet to 65 feet

Pack Material: Silica sand

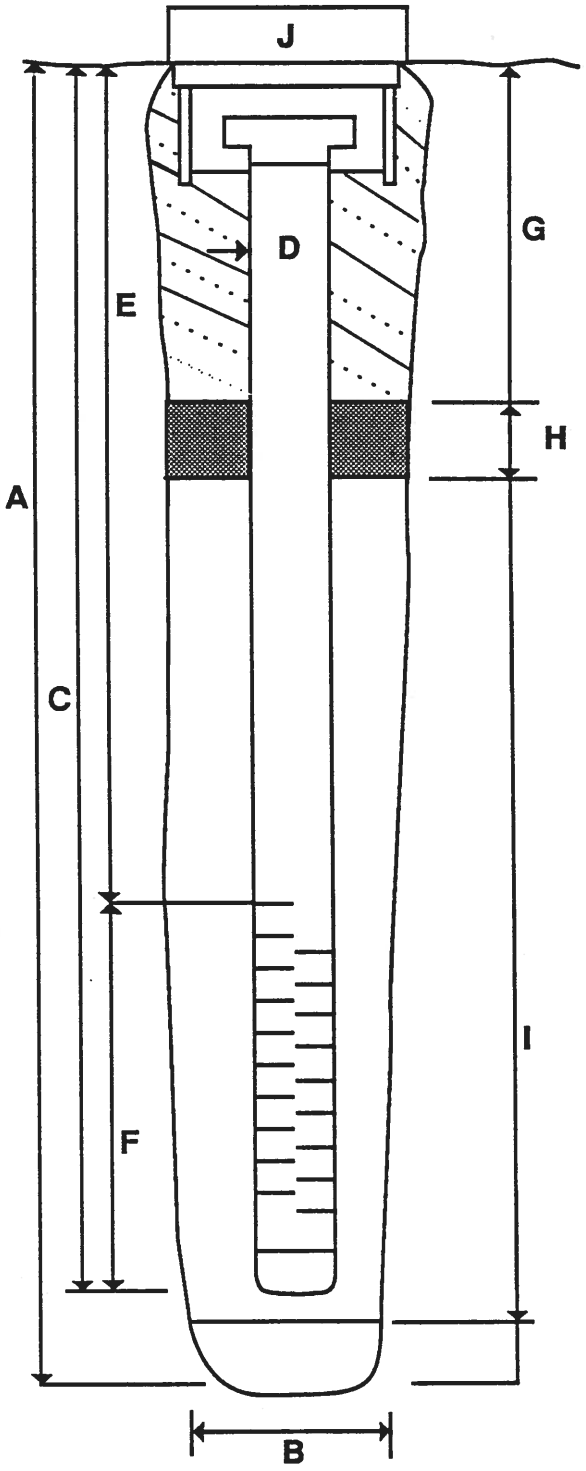
Size: 10-20 mesh

J. Surface Mount: 8" flush mount
Remarks:

WELL DETAILS

PROJECT NAME: Walstad Oil
PROJECT NUMBER:
WELL PERMIT NO:
BORING /WELL NO: W-6

COMPLETION DATE: 6/23/92
CASING ELEVATION:
SURFACE ELEVATION:
BY: Jim Griswold



A. Total depth: 65 feet

B. Boring Diameter: 4.5 inches

Drilling method: Air Rotary

C. Casing Length: 55 feet

Material: Threaded PVC

D. Casing Diameter: 2 inch

E. Depth to Perforations: 55 feet BGS

F. Perforated Length: 10 feet

Perforated Interval: 55 feet to 65 feet

Perforation Type: Factory slot

Perforation Size: .020

G. Surface Seal: 0 foot to 52 feet

Seal Material: grout

H. Pack Seal: 52-54 feet

Seal Material: 1/2" bentonite pellets

I. Gravel Pack: 54 feet to 65 feet

Pack Material: Silica sand

Size: 10-20 mesh

J. Surface Mount: 8" flush mount
Remarks:

Appendix E

Organic Water Quality Data

Organic Water Quality Data
Walstad Oil
Lovington, NM

All values are in parts per billion (ppb)

Well	Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
W-4	6/24/92	200	53	21	40	<5.0
W-5	6/24/92	470	250	41	290	<10
W-6	6/24/92	1400	1200	48	500	<25

Appendix F

Lab Water Data

Hall Environmental Analysis Laboratory
2403 San Mateo N.E., Suite P-13
Albuquerque, N.M. 87110
(505) 880-1803

6/30/92

Billings and Associates, Inc.
3816 Academy Parkway N.E.
Albuquerque, N.M. 87109

Dear Mr. Jim Griswold,

Enclosed are the results for the analyses that were requested. These were done according to E.P.A. procedures or the equivalent.

Please don't hesitate to contact me for any additional information or clarifications.

Sincerely,

Scott Hallenbeck 6/30/92

Scott Hallenbeck, Lab Manager

Results for sample : Sample W-4

Date collected: 6/24/92 Date received: 6/25/92
Date extracted: NA Date injected: 6/30/92
Client: Billings and Associates, Inc.
Project Name: Walstad HEAL #: 920639-1
Project Manager: Jim Griswold Sampled by: Jim Griswold

Compound	Amount	Units
MTBE	<5.0	PPB (UG/L)
Benzene	200	PPB (UG/L)
Toluene	53	PPB (UG/L)
Ethyl Benzene	21	PPB (UG/L)
Total Xylene	40	PPB (UG/L)

BFB (Surrogate) Recovery = 106 %

Dilution Factor = 2

Results for sample = Sample W-5

Date collected: 6/24/92 Date received= 6/25/92
Date extracted: NA Date injected= 6/30/92
Client: Billings and Associates, Inc.
Project Name: Walstad HEAL #: 920639-2
Project Manager= Jim Griswold Sampled by= Jim Griswold

Compound	Amount	Units
MTBE	<10	PPB (UG/L)
Benzene	470	PPB (UG/L)
Toluene	250	PPB (UG/L)
Ethyl Benzene	41	PPB (UG/L)
Total Xylene	290	PPB (UG/L)

BFB (Surrogate) Recovery = 101 %

Dilution Factor = 4

Results for sample : Sample W-6

Date collected: 6/24/92 Date received: 6/25/92
Date extracted: NA Date injected: 6/30/92
Client: Billings and Associates, Inc.
Project Name: Walstad HEAL #: 920639-3
Project Manager: Jim Griswold Sampled by: Jim Griswold

Compound	Amount	Units
MTBE	<25	PPB (UG/L)
Benzene	1,400	PPB (UG/L)
Toluene	1,200	PPB (UG/L)
Ethyl Benzene	48	PPB (UG/L)
Total Xylene	500	PPB (UG/L)

BFB (Surrogate) Recovery = 99 %

Dilution Factor = 50

Results for QC: Reagent Blank

Date extracted: NA Date injected: 6/30/92
Client: Billings and Associates, Inc.
Project Name: Walstad HEAL #: RB 6/30
Project Manager: Jim Griswold

Compound	Amount	Units
MTBE	<2.5	PPB (UG/L)
Benzene	<0.5	PPB (UG/L)
Toluene	<0.5	PPB (UG/L)
Ethyl Benzene	<0.5	PPB (UG/L)
Total Xylene	<0.5	PPB (UG/L)

BFB (Surrogate) Recovery = 90 %

Results for QC: Blank Spike/Blank Spike Dup

Date extracted: NA
Date injected: 6/29/92
Client: Billings and Associates, Inc.
Project Name: Walstad
HEAL #: BS/BSD 6/29
Project Manager: Jim Griswold
Sampled by: NA

Compound	Sample Result	Amount Added	Blank Spike	BS %	BS Dup	BSD %	RPD
MTBE	<2.5	40.0	40.0	100	35.2	88	13
Benzene	<0.5	20.0	19.1	96	18.7	94	2
Toluene	<0.5	20.0	19.0	95	18.6	92	3
Ethyl Benzene	<0.5	20.0	19.0	95	18.6	93	2
Total Xylene	<0.5	60.0	57.6	96	56.5	94	2

HALL ENVIRONMENTAL ANALYSIS LABORATORY
2403 SAN MATEO NE, SUITE P-13 • ALBUQUERQUE, NM 87110 • (505) 880-1803

CHAIN-OF-CUSTODY RECORD

ANALYSIS REQUEST

CLIENT: Billings + Assoc., Inc.	**PROJECT MANAGER:** Jim Griswold
ADDRESS: 3816 Academy Pky NNE, Albq., NM 87109	**PHONE #:** 345-1116
	FAX #: 345-1756
PROJECT NAME: Walstad	**SAMPLER:** J. Griswold
	PROJECT #:

DATE	TIME	MATRIX	SAMPLE I.D. NO.	NUMBER/ VOLUME	PRESERVATIVE			BTEX (METHOD 602)	BTEX + MTBE (602)	TPH (METHOD 8015 MOD)	BTEX + TPH COMBINATION	601/602	601 ONLY	602 ONLY			AIR BUBBLES OR HEADSPACE (Y OR N)	SAMPLES COLD: (Y OR N) / HEAL #
					$HgCl_2$	HCl	OTHER											
6/24/92	10:15	Water	W-4	2 @ 40ml	✓				✓								N	720639-1
6/24/92	10:26	Water	W-5	2 @ 40ml	✓				✓								N	-2
6/24/92	10:50	Water	W-6	2 @ 40ml	✓				✓								N	-3

RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY:
	6/25/92	9:20 a.m.	
RELINQUISHED BY: (Signature)	**DATE:**	**TIME:**	**RECEIVED BY:**

REMARKS:

Appendix G

Water Table Elevation and Free Product Data

Water Table Elevation and Free Product Data
Walstad Oil
Lovington, NM

Well	Date	TOC Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)
W-1	2/12/92		~1/8" free product (AEI Tank)	
	6/8/92		>30" free product (BAI)	
	6/24/92	100.00	>30" free product (BAI)	
W-2	3/13/92		~1/8" free product (AEI Tank)	
	6/8/92		>30" free product (BAI)	
	6/24/92	99.12	>30" free product (BAI)	
W-3	3/13/92		~1/8" free product (AEI Tank)	
	6/8/92		>30" free product (BAI)	
	6/24/92	99.13	>30" free product (BAI)	
W-4	6/24/92	99.62	57.04	42.58
W-5	6/24/92	100.41	57.59	42.82
W-6	6/24/92	99.48	56.97	42.51

TOC - Top of Casing

All elevations are relative to monitoring well W-1, which was arbitrarily set to to an elevation of 100.00 feet.