

COUNTY OF RIVERSIDE • COMMUNITY HEALTH AGENCY
DEPARTMENT OF ENVIRONMENTAL HEALTH

October 19, 2011

Jeanine Townsend, Clerk of the Board
State Water Resources Control Board
PO Box 100
Sacramento, CA 95812-2000
commentletters@waterboards.ca.gov



SUBJECT: COMMENT LETTER - PALM SPRINGS OIL #1 UST CASE CLOSURE SUMMARY

RE: NOTICE OF OPPORTUNITY FOR PUBLIC COMMENT
On Underground Storage Tank Case Closure for Palm Springs Oil #1 Benton C. Beckley (Petitioner) 67-460 E. Palm Canyon Drive, Cathedral City, California

The County of Riverside, Department of Environmental Health opposes closure of the above referenced UST cleanup case and respectfully submits the following comments in response to the State Water Resources Control Board's *Notice of Opportunity to Comment on UST Case Closure for Palm Springs Oil #1, Benton C. Beckley (Petitioner), 67-460 E. Palm Canyon Drive, Cathedral City, California.*

1. The Board's August 8, 2011 *DRAFT UST Case Closure Summary Mr. Benton C. Beckley* (Summary) does not identify or address all volatile organic compounds (VOCs) that were detected at elevated concentrations in subsurface samples. The Summary discusses only benzene, toluene, ethylbenzene, xylenes, MTBE, and TBA, however, significant concentrations of VOCs were detected down to the bottom of the borings, including 260 ppm 1,2,4-TMB, 100 ppm 1,3,5-TMB, 54 ppm Naphthalene, etc. in the deepest (80-foot) sample from B1. The attached tables included with our September 23, 2009 letter show these concentrations. The vertical extent and mass of these compounds are not known.
2. The Summary includes numerous statements and conclusions regarding the remaining mass in-situ and the threat to groundwater. However, since the plume has not been vertically delineated and the geology below approximately 90 feet is in question, determinations regarding residual mass and the risk it poses to groundwater should only be made after adequate data has been gathered. Further assessment is necessary to obtain this information.
3. The Summary makes several statements regarding concentration trends in the subsurface; however, the data contradicts these statements. For example, TPH as gasoline (TPHg) is stated to have decreased with depth down to 80 feet below ground surface (bgs); however, the data shows that TPHg concentrations in boring B-2B increased from 19 ppm at 70 feet to 3,200 ppm at 75 feet. No samples were analyzed below this depth. Similar TPHg findings/trends were seen in VEW-1, where the highest concentrations of 3,300 ppm TPHg detected in the deepest sample at 80 feet bgs. The deepest sample also shows increasing concentrations for ethylbenzene, xylenes, 1,2,4-TMB, 1,3,5-TMB, isopropylbenzene, naphthalene, n-propylbenzene, and sec-butylbenzene.

Environmental Cleanup Programs

4. The detection limits for TBA in soil samples from VEW-1 were elevated (up to 13 ppm) and do not provide adequate information regarding the presence or absence of TBA, hence, this data should not be used to make conclusions regarding TBA.
5. Desert Water Agency recently sampled two water wells located near the site; the closest well is less than 2000 feet in a northern direction from the site. Fortunately, the laboratory results provided to our office indicate that neither of the wells had detectable concentrations of gasoline, diesel, oil, or volatile organic compounds; however, it should be noted that both of the wells are situated upgradient of the site based on regional groundwater flow direction (*Analog Model Study of the Ground-Water Basin of the Upper Coachella Valley, California - Geological Survey Water-Supply Paper 2027* by Stephen J. Tyley, 1974). While the groundwater data indicates that the water wells are not currently impacted, based on the distance from the wells to the site and upgradient locations, this data should not be used to determine if the groundwater below this site is impacted.

Numerous additional arguments against closure are discussed in our attached September 23, 2009 letter in response to the Site Closure Petition. Please consider these in addition to the above points when making a decision regarding closure of this case.

In closing, adequate data is not available to determine if residual impacts at this site threaten groundwater. Further assessment should be conducted to better understand the hydrogeologic conditions below this site, to determine the vertical extent of impact, and to ultimately protect drinking water resources. A decision regarding closure of the UST cleanup site should be delayed until additional data is collected and risk to groundwater is further evaluated. Again, denial of site closure at this time is respectfully requested until further information becomes available.

If you have any questions, I can be contacted at (951) 955-8982 or sbolting@rivcocha.org.

Sincerely,



Sharon Boltinghouse, PG
Associate Public Health Professional Geologist

Enclosure



COUNTY OF RIVERSIDE • COMMUNITY HEALTH AGENCY
DEPARTMENT OF ENVIRONMENTAL HEALTH

September 23, 2009

George W. Lockwood
Chief, UST Cleanup Unit 15-17
State Water Resources Control Board
Division of Water Quality
1001 "I" Street 15th Floor
Sacramento, CA 95814

RE: SWRCB Request for Agency Response to the Site Closure Petition of Benton C. Beckley for the Former Palm Springs Oil Station#1 located at 67-460 E. Palm Canyon Drive, Cathedral City. LOP Site #961149

Dear Mr. Lockwood:

As requested in your August 17, 2009 letter, the Riverside County, Department of Environmental Health (RCDEH) has prepared this response to the *Site Closure Petition* submitted by Mr. Benton Beckley regarding the above-referenced cleanup site.

The RCDEH and the California Regional Water Quality Control Board Colorado River Region (RWQCB) have discussed this case on several occasions and do not agree with contentions made by Mr. Beckley and his consultants. Specifically, the contention that "corrective action on this property has been fully completed and satisfactorily implemented". In contrast, when considering the high contaminant levels detected in the deepest soil samples collected at the site, vertical characterization of the former Palm Springs Oil #1 release is neither complete nor adequate. Additionally, the concentrations of volatile organic compounds (VOCs) consistently observed at the site are in excess of levels that warrant site closure.

Although Mr. Beckley and his consultant, Wayne Perry Inc., attempted to delineate the plume using two different drilling methods, both the hollow-stem and air percussion drill rigs hit refusal at 74 to 91 feet. Both methods are typically unable to drill through hard rock, whether the materials encountered are cobbles, boulders or bedrock. To date, soil samples have not been collected below 80 feet where heavily impacted soil was observed, hence, the vertical extent of contamination has not been defined. Vapor testing showed relatively stable total petroleum hydrocarbon (TPHg) concentrations and fluctuating, inconsistent concentrations of total xylenes and TBA concentrations during the test. The coarse materials and long well screens contributed to high air flow through the soils and dilution of vapor concentrations.

Plume characterization, and possible remediation of contamination, is required based on the following rationale:

- Mr. Beckley and his consultants have concluded that bedrock below the site will prevent the downward migration of contaminants, so further assessment or remedial measures are not warranted. In contrast, at multiple UST cleanup sites in Riverside County, contaminants have readily migrated through fractures in bedrock and impacted groundwater. Two of these sites include the Western Municipal Water District site and the former Riverside Raceway site. At both sites, drilling refusal was encountered at bedrock and further assessment revealed heavy

groundwater contamination. Further details regarding these cleanups can be provided upon request.

- The lack of benzene and other light-end hydrocarbon constituents in the soil (and presence of xylenes, ethylbenzene, naphthalene and other heavier hydrocarbon constituents) may indeed be attributed to natural degradation, however, it may also indicate that the lighter-end constituents have already migrated below the 80-foot sampling depth. Further investigation is necessary to determine exactly which scenario is taking place.
- The site is within the Coachella Valley Groundwater Basin, Indio Subbasin (7-21.01) (*California's Groundwater Bulletin 118*, Department of Water Resources, 2003). The groundwater is designated as Municipal, Industrial and Agricultural Beneficial Use (Water Quality Control Plan, California RWQCB, 2006). Groundwater from this basin is used heavily for domestic purposes as the Desert Water Agency operates numerous public water wells in the area (Aaron Carlson, Desert Water Agency, personal communication September 21, 2009). Due to its heavy use, protection of the groundwater is imperative.
- Borings drilled through the former UST cavity detected contamination from depths of 25 feet to 80 feet where refusal was encountered. To date, "clean" soil samples have not been collected from below 80 feet at this site. The highest concentrations of ethylbenzene and xylenes were detected in the deepest soil sample at 80 feet. Elevated concentrations of volatile organic compounds (VOCs) other than the benzene, toluene, ethylbenzene, xylenes and oxygenates were not mentioned in the text or tables of the reports submitted to our agency. The list below shows some of the highest and deepest soil concentrations detected at the site and Table 1 attached with this letter shows additional laboratory data for selected VOCs detections.

Compound	Maximum Concentration	Depth (below grade)	Deepest Sample Concentration	Depth (below grade)
TPHg	5750 ppm	45 feet	2700 ppm	80 feet
Benzene	ND<0.4 ppm 4.6 ppm	All boring samples UST Stockpile	ND<0.4 ppm -	All boring samples -
Toluene	33 ppm	50 feet	1.7 ppm	80 feet
Ethylbenzene	38 ppm	80 feet	38 ppm	80 feet
Xylenes	320 ppm	80 feet	320 ppm	80 feet
MTBE	ND<0.4 ppm	All boring samples	ND<0.4 ppm	All boring samples
1,2,4-TMB	320 ppm	50 feet	260 ppm	80 feet
1,3,5-TMB	140 ppm	50 feet	100 ppm	80 feet
Naphthalene	76 ppm	50 feet	54 ppm	80 feet
*Other VOCs were detected. See <i>Initial Site Assessment Report</i> (Wayne Perry Inc, October 31, 2000) for all results.				

Although the RCDEH is the lead agency, the RWQCB have been consulted on several occasions as well as met with Mr. Beckley regarding his request for site closure. Kai Dunn and Abdi Haile conclude that the plume has not been delineated and existing contamination may be a threat to groundwater based on the high contaminant concentrations at 80 feet, the coarse sands and gravels, and the mobility of contaminants through soils as seen by the impacts at 80 feet. The RWQCB oversaw the cleanup at The Wash, a nearby site located approximately 1600 feet to the southeast (See Figure 1). Difficult drilling conditions were also encountered at The Wash at similar depths as Mr. Beckley's site, however, deeper drilling identified groundwater contamination. Concentrations up to 1000 ppm TPH and 2100 ppb MTBE were detected in the groundwater at approximately 180

feet below grade. The RWQCB and our agency want to ensure drinking water protection in this area by completing assessment at Mr. Beckley's site.

RCDEH respectfully disagrees with many of the statements in Mr. Beckley's Petition, however, we will focus on disputing the most productive points as follows:

“It was further concluded by our geologist that what small concentrations of hydrocarbons that exist were not subject to movement due to the lack of incoming water from above...The area above this site is covered in all directions by state highway on one side and parking lot (blacktop) in all other directions, with runoff away from our site.”

Sources of surface and near-surface water are present at this site. There is an unlined storm channel adjacent to the northern property boundary and, according to the Desert Water Agency, the site does not have a sewer connection (Aaron Carlson, personal communication September 21, 2009). Consequently, the storm channel, the on-site septic system and any neighboring septic systems will continue to provide a source of water and the mechanism to drive contaminants (which have already reached 80 feet below this site) further downward through the porous alluvial materials or through fractures in the bedrock to groundwater. This contaminant migration was seen at The Wash where gasoline constituents reached groundwater at approximately 180 feet.

Further, surface runoff and subsurface inflow are significant sources of recharge to the Subbasin (*California's Groundwater Bulletin 118*, Department of Water Resources, 2003) as water readily percolate through the soils to groundwater. In fact, as a result of groundwater degradation due to near-surface waste water infiltration (septic systems), beginning 2012, the State is prohibiting septic systems in the Cathedral City Cove area (located approximately $\frac{3}{4}$ mile to the southeast). Assembly Bill AB 358, passed in 2001, states that the prohibition of septic systems is necessary “to protect the health and safety of the residents consuming the groundwater of the Upper Coachella Valley Groundwater Basin.” The Bill further states that disposal systems “impair present and future beneficial uses of water, and cause pollution and contamination of the groundwater...that is used as a water supply for much of the greater Coachella Valley.” If septic contaminants are migrating through subsurface materials to impact groundwater, what would stop hydrocarbon contaminants from being driven down to impact groundwater by the same mechanism?

“Also, the rock strata below the site would make any downward movement next to impossible.”

Although groundwater is deep below the surface (estimated greater than 150 feet deep), the coarse grained materials below the site have very high transmissivity allowing surface water (and contaminants) to easily migrate through the materials to groundwater. Gasoline from the underground storage tanks (USTs) has already migrated through the coarse subsurface materials to at least 80 feet below grade. If bedrock is indeed present at approximately 80 feet, fractures can further provide a direct conduit to groundwater. Fractured bedrock transport could actually be a greater threat to groundwater than alluvium transport because the contaminants are constrained within small fractures with little material to absorb and “capture” the hydrocarbons. Water and contaminants concentrated within the fracture zones can be readily flushed through the fractures until they reach a fracture set that comes in contact with the aquifer.

If alluvial cobbles and/or boulders are responsible for the drilling refusal, groundwater is threatened. Although the drill rig was unable to drill past what may have been cobbles and/or boulders, these

are not “barriers” or confining materials which will retard the downward transport of water or contaminants.

“Coring of the granite bedrock to determine permeability is not warranted, as granite is highly impermeable...The small size of the contamination area depth to groundwater and distance from other known water wells makes the risk for extensional contamination small.”

Although we agree that competent, non-weathered, and non-fractured bedrock can be impermeable, rarely does the upper zone of bedrock lack weathering and rarely is bedrock not fractured. Prior to evaluating risk at any site, the extent of impact must be known. Any conclusions made at this time regarding risk at this site would be questionable since the extent of impact has not been determined.

Our file includes Water Well Drillers Report for a water well drilled in 1971 for Mr. Beckley. We are unsure if this well is still active or its exact location, however, the township, range, and section indicates that it is within close proximity to this site. The log indicates that there were boulders to 93 feet followed by sand and gravels to 136 feet. To better understand groundwater usage in this area, further inquiry regarding the status and location of Mr. Beckley’s well and further investigation regarding the use of other private water wells in this area should be conducted.

The following is a brief summary of some of the geologic interpretations presented to our agency and our comments:

Initial Site Assessment Report (Wayne Perry Inc., 10/31/00) – Findings: “soil types found in Borings B1 and B2 consisted predominantly of fine- to coarse-grained sand with intermittent layers of gravel with cobbles up to 3 inches in diameter.” Summary and Conclusions: “Based on the concentrations of petroleum hydrocarbons detected in soil samples collected from Boring B1, additional site assessment is recommended in the area of the former gasoline USTs.”

Additional Site Assessment Report (Wayne Perry Inc., June 17, 2003) – Site Assessment Findings: “Soils observed during this assessment consisted of layers of fine- to coarse-grained sand and gravelly sand to a depth ranging from 88 to 91 feet. The site was then underlain by Granitic bedrock.” Summary and Recommendations: “The horizontal extent of hydrocarbon-impacted soils within the tank zone has been adequately delineated and appears to be limited to the area directly under the former gasoline USTs. However, due to auger refusal at 81 feet in VEW-1 and 91 feet in boring B-2B, WPI was unable to determine the vertical extent of impacted soil beneath the former USTs.” Wayne Perry Inc recommended conducting a 48-hour vapor extraction event “to determine the magnitude of the hydrocarbon-impacted soil at the site.”

A vapor test was conducted and site closure was requested in the *Soil Vapor Extraction Test Report and Request for Case Closure* (Wayne Perry Inc., August 15, 2004). The report stated that “Further definition of the vertical extent of impacted soil does not appear to be possible due to the presence of granitic bedrock at depths of approximately 80 to 90 feet...” The report concluded that “Based on the limited mass of residual hydrocarbons in the subsurface, the presence of relatively impermeable granitic bedrock...the remaining adsorbed hydrocarbons at the site do not appear to pose a significant environmental or health risk.” Since the plume has not been vertically delineated and the vapor testing was conducted on soils above 80 feet, statements regarding existing mass, or lack thereof, below 80 feet do not appear to be supported by data that has been submitted to our agency.

In our letter dated October 22, 2004, we stated that we were concerned about the elevated concentrations of TPHg found at the bottom of the three borings in the former tank cavity and "After reviewing the boring logs and soil lithology, it was not certain whether cobbles or bedrock were encountered." Wayne Perry Inc. responded to our letter in their *Quarterly Status Report – Second Quarter 2005* stating that "Following an extensive review of the boring logs for the site and available logs from other sites in the area as well as conversations with drilling companies and the WPI geologist on site during drilling, WPI is unable to definitively state whether or not the casing refusal met in Borings B-2B and B-3 was the result of bedrock or subsurface cobbles. Accordingly, WPI will prepare and submit a work plan for additional assessment upon receipt of approval to proceed from the State Water Resources Control Board UST Cleanup Fund."

The *Request for Case Closure* (Wayne Perry, Inc. September 7, 2007) was submitted in 2007, and the only new information provided was an estimate of the depth to bedrock below the site. By projecting the slope of the exposed bedrock hillside under the site, Wayne Perry Inc. estimated that bedrock is present at 61 feet below the site. Wayne Perry Inc. concluded that "Based on the site data, bedrock underlies the site at a depths ranging from approximately 74 to 91 feet. Groundwater was not found in any of the borings. Residual constituents consist primarily of ethylbenzene and xylenes. The absence of benzene in soil and vapor samples and the presence of TBA in the vapor samples appear to indicate that natural degradation of the hydrocarbons has occurred. The lateral extent of hydrocarbon-impacted soil is limited. Residual hydrocarbons extend to a depth of approximately 80 feet; however, further vertical migration would be very limited due to the nature of the underlying materials. Based on the data, additional assessment or remedial measures do not appear necessary at this time. Accordingly, WPI, on behalf of Mr. B. Charles Beckley, requests case closure for the former Palm Springs Oil Service Station."

Several of the above conclusions are questionable due to the lack of vertical plume delineation. Without deeper assessment, the following are not known: 1. whether benzene and other light-end hydrocarbon constituents have migrated further downward or have naturally degraded, 2. whether contaminants have migrated through fractured bedrock or around cobbles and boulders to greater depths, and 3. the actual threat to the drinking water aquifer. These questions must be answered before closing this case, however, further assessment is necessary to answer these questions.

In closing, environmental site closure of the former Palm Spring Oil #1 is premature at this time based on the available data. Further assessment is necessary to better understand the hydrogeologic conditions below this site, to determine the vertical extent of impact, and to protect drinking water. We previously provided several suggestions for accomplishing vertical delineation and are open to other investigative methods, nonetheless, further assessment is necessary and warranted at this site.

If you have any questions or need further information, please contact me at (951) 955-8982.

Sincerely,



Sharon Boltinghouse, PG
Associate Public Health Professional Geologist

Enclosures

cc: list attached

Benton C. Beckley PO Box 1006 Palm Springs, CA 92263	Tawney Beckley Address unknown
Neil Anenberg Palm Springs Oil 3410 E Foothill Blvd Pasadena, CA 91107	Terri Willis Wayne Perry, Inc. 8281 Commonwealth Ave Buena Park, CA 90621
Kai Dunn Abdi Haile State of California Regional Water Quality Control Board 73720 Fred Waring Drive, Suite 100 Palm Desert, CA 92260	Linda Shurlow County of Riverside Department of Environmental Health 47950 Arabia Street, Suite A Indio, CA 92201

Figure 1 GeoTracker map showing the location of Mr. Beckley's site and The Wash

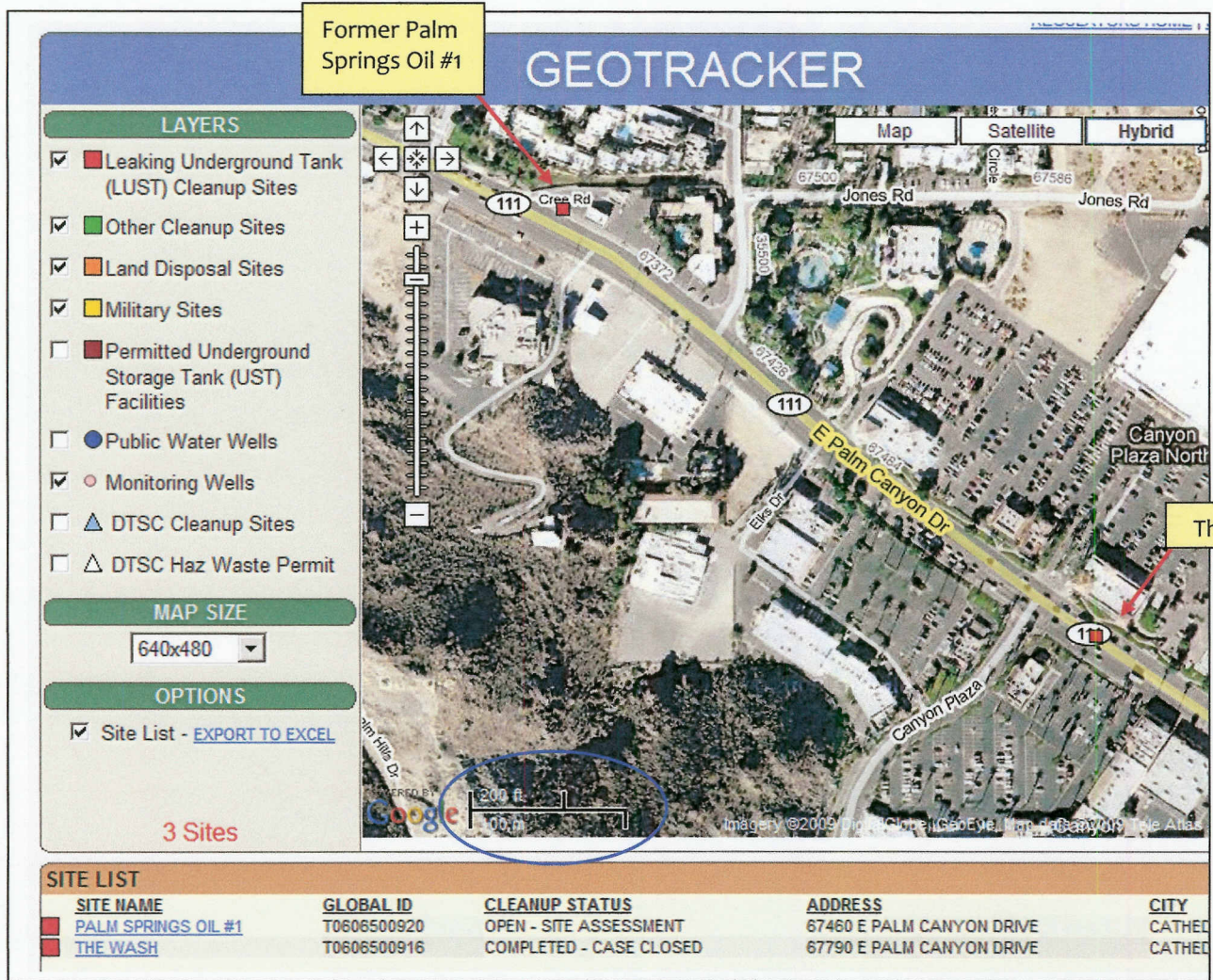


Table 1
 Former Palm Springs Oil #1
 Additional Analytes
 Selected Soil Sample Analytical Results*
 August 21, 2000 Assessment

Sample	EPA Method 8260B (ug/Kg)										
	1,2,4-TMB	1,3,5-TMB	Isopropylbenzene	Naphthalene	n-Propylbenzene	p-Isopropyltoluene	sec-Butylbenzene				
B1-5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
B1-10	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
B1-15	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
B1-20	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
B1-25	93,000	27,000	920	15,000	6,500	1,100	1,100	1,100	1,100	1,100	ND<80
B1-30	97,000	29,000	1,100	19,000	6,400	1,300	1,300	1,300	1,300	1,300	ND<80
B1-35	150,000	52,000	1,900	33,000	11,000	2,300	2,300	2,300	2,300	2,300	ND<80
B1-40	270,000	100,000	4,900	59,000	25,000	5,400	5,400	5,400	5,400	5,400	7,300
B1-45	240,000	110,000	5,900	65,000	31,000	6,200	6,200	6,200	6,200	6,200	8,500
B1-50	320,000	140,000	11,000	76,000	52,000	7,700	7,700	7,700	7,700	7,700	11,000
B1-55	270,000	130,000	13,000	73,000	51,000	7,000	7,000	7,000	7,000	7,000	10,000
B1-60	140,000	56,000	1,300	63,000	3,700	4,100	4,100	4,100	4,100	4,100	ND<80
B1-65	4,000	1,600	10	6,100	50	160	160	160	160	160	ND<5
B1-70	130,000	41,000	970	40,000	4,000	19,000	19,000	19,000	19,000	19,000	ND<80
B1-75	130,000	38,000	1,900	23,000	8,900	23,000	23,000	23,000	23,000	23,000	ND<80
B1-80	260,000	100,000	14,000	54,000	52,000	5,200	5,200	5,200	5,200	5,200	8,000

* This table only shows some of the detected compounds. The *Initial Site Assessment Report* (Wayne Perry Inc, October 31, 2000) contains the results for all constituents tested.

1,2,4-TMB - 1,2,4-Trimethylbenzene
 1,3,5-TMB - 1,3,5-Trimethylbenzene
 ND< - not detected < detection limit
 ug/Kg - micrograms per kilogram