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Natural Resource Technology, Inc.

UST AND AST SITE INVESTIGATION REPORT

CITGO PETROLEUM CORPORATION 9235 NORTH 107th STREET MILWAUKEE, WISCONSIN

Project No. 1096

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"I, Rebecca J. Koepke, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code." Hydrogeologist "I, Timothy E. Mueller, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code." Timothy E. Mueller Hydrogeologist "I, Robert J. Karnauskas, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code." $\frac{11-03-95}{\text{Date}}$

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EXECUTIVE SUMMARY

This remedial investigation report summarizing site investigation work was prepared by Natural Resource Technology, Inc. (NRT) on behalf of CITGO Petroleum Corporation (CITGO) to conduct a site investigation for the CITGO Bulk Storage Terminal facility located at 9235 North 107th Street, Milwaukee, Wisconsin (site).

Previous investigations of the property were related to a 600-gallon gasoline spill in 1985 and an apparent leakage observed during the removal of two 20,000-gallon Underground Storage Tanks (USTs) (one ethanol tank and one diesel/gasoline "pourback" tank) in 1991. Twin City Testing Corporation (TCT) conducted an environmental assessment of the site in 1987 which included ten soil borings and installation of eight monitoring wells. Groundwater samples from two wells (adjacent to the former UST locations) contained concentrations of benzene and methyl tert-butyl ether (MTBE) in exceedence of state groundwater quality standards. Foth & Van Dyke (F&VD) assessed the soil quality on the southeast portion of the site in 1991 through the installation of seven soil borings. Monitoring wells which contained petroleum-related impacts in 1987 were resampled in 1991 and 1994 by F&VD and Dahl & Associates (Dahl), respectively. Continued impact concentrations in exceedence of state groundwater quality standards prompted further investigation for soil impacts and a source(s) for groundwater impacts.

Two areas of the CITGO property were evaluated for this investigation - the bermed aboveground storage tank area (AST area) and the UST area surrounding the fuel dispensing racks.

Soils encountered on the site generally consist of one to six feet of clay fill overlying clay till. The clay till is absent in the southwest corner of the property and increases to a thickness of approximately 16 feet in the borings performed in the eastern portion of the property. Sand and silty sand alluvium are encountered below the clay till. The water table was typically encountered 2.5 to 5 feet below ground surface during investigation activities. Groundwater flow in the AST area was generally east-southeast and generally southeast in the UST area.

In response to groundwater quality standard exceedences in former monitoring wells MW-1 and MW-2, NRT developed an investigation to assess potential impact source(s) and groundwater quality in the UST area. NRT's scope of investigation included a soil gas survey, soil borings to confirm possible source areas, construction of monitoring wells to assess groundwater quality and flow, and abandonment of monitoring wells which did not meet NR 141 standards.

The soil gas survey was developed to assess and focus on localized impacts which likely occur as localized "hot spots" in the upper clay till unit. A total of 44 soil vapor probes were installed on the property. The soil gas survey identified a "hotspot" directly south of the former UST excavation and the east end of the underground product piping trench. Three soil samples were analyzed from the "hotspot" area. One soil sample was taken from the area exhibiting the highest PID response (>2,500 ppm) and contained concentrations of benzene, ethylbenzene, toluene, and total xylene (58,000 ppb, 18,000 ppb, 48,000 ppb, and 87,000 ppb, respectively) in exceedence

of NR 720 Residual Contaminant Levels (RCLs) of 5.5 ppb, 2,900 ppb, 1,500 ppb, and 4,100 ppb, respectively. Two soil samples were collected from medium ranged PID areas (100 ppm to 1,000 ppm). The concentration of benzene, GRO, and DRO (170 ppb, 130 ppm, and 120 ppm, respectively) in one of the borings exceeded their respective RCLs (5.5 ppb, 100 ppm, and 100 ppm, respectively).

Six monitoring wells and two piezometers were installed in the UST area and six monitoring wells were constructed in the AST area to assess groundwater quality and to evaluate horizontal and vertical groundwater gradients and flow direction. Benzene and MTBE were detected in concentrations in exceedence of state groundwater quality standards in monitoring wells and one piezometer located down gradient of the UST area. Petroleum-related impacts in exceedence of state ground water quality standards were not detected in well samples located up-gradient of the UST area or within the bermed AST area.

All monitoring wells previously constructed on the property by TCT were abandoned and replaced with wells constructed are in accordance with NR 141 requirements.

Soil impacts appear to be limited to the southeast portion of the site just south of the fuel dispensing racks as described above. The extent of groundwater impacts has not been fully assessed. Additional down gradient monitoring wells and piezometers are recommended within the UST area.

Site investigation data indicates petroleum-related impacts are not presently of concern in the AST area. Further investigation in the AST area is not recommended.

1.0 INTRODUCTION

1.1 Overview

This remedial investigation report was prepared by Natural Resource Technology, Inc. (NRT) on behalf of CITGO Petroleum Corporation (CITGO) summarizing site investigation work performed at the CITGO Terminal facility property located at 9235 North 107th Street, Milwaukee, Wisconsin. The site is located in the SE 1/4 of the NE 1/4 of Section 6, Township 8N, Range 21E, Milwaukee County, Wisconsin (Figure 1).

The project contacts include the following:

Responsible Party:

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At present, the site operates as a bulk fuel terminal storing and dispensing fuel oils, non-lead gasolines and ethanol from nine above ground storage tanks (ASTs) ranging in size from approximately 5 to 80,000 barrels. These ASTs are located in the west portion of the site with an earth berm. Fuel is dispensed from three fuel dispensing racks located in the eastern portion of the site. Two 20,000 gallon underground storage tanks (USTs) containing ethanol and diesel/gasoline were formerly located in the fuel dispensing rack area referred to in this report as the UST Area. Plate 1 shows the general present layout of the site.



In March, 1987, Twin City Testing Corporation (TCT) conducted an environmental assessment which consisted of the performance of ten soil borings and installation of eight monitoring wells (Plate 1). TCT's investigation indicated subsurface conditions consist of zero to 15 feet of clay till overlying sand and silty sand alluvium with the till thickness increasing to the east across the site. Groundwater occurs within 5 to 8 feet of the ground surface with flow in an easterly direction.

Field screening of soil samples showed no indications of the presence of volatile organic compounds (VOCs). Low levels of total petroleum hydrocarbons (TPH) characteristic of No. 2 fuel oil were detected in groundwater samples from several monitoring wells located in the UST Area. Gasoline constituents, as benzene and methyl tert-butyl ether (MTBE), were detected above NR 140 Groundwater Quality Enforcement Standards (ES) in groundwater samples collected from wells MW-1 and MW-2, both of which were located in the UST Area (Plate 1, Table 1).

Foth & Van Dyke (F&VD) conducted an evaluation of the southeast portion of the property in November, 1991 which consisted of the performance of seven additional borings. Soil samples were field screened for the presence of VOC's with a photoionization detector (PID). PID responses ranging from 600 to 932 parts per million (ppm) were observed in several borings in the 2.5 to 4 foot interval. Review of borings logs indicated PID responses decreased to background within 7 to 10 feet of the ground surface, indicating the depth of impacts is of limited extent. Comparison of PID readings with TPH, as gasoline range organics (GRO), analyses of soil samples showed a poor correlation with TPH values exceeding 300 ppm at sampling depths where no PID responses were observed. Similarly, poor correlation was also observed for TPH, as diesel range organics (DRO) results. The Wisconsin Department of Natural Resources (WDNR) abandoned the use of TPH analyses in the Leaking Underground Storage Tank (LUST) program due to the high values generally produced by the TPH method and false indications of the presence of petroleum hydrocarbons.

F&VD also resampled MW-2 (erroneously identified in their report as MW-1). The sample contained 1.9 ppb benzene. Benzene concentrations in MW-2 have decreased from 111 ppb in



1987 to 1.9 ppb in 1991. More recent sampling of monitoring wells MW-1 and MW-2 by Dahl & Associates on October 19, 1994 indicated a benzene concentration in MW-2 of 13 ppb. MTBE was also detected in samples collected from both wells (MW-1 and MW-2) at concentrations of 1,700 and 28 parts per billion (ppb), respectively.

The current available data provides a useful indication of the probable limited extent of horizontal and vertical petroleum hydrocarbon impacts. However, the data produced to-date does not reflect analytical protocols which are comparable to GRO and DRO soil quality standards under NR 720. In addition, the NR 140 ES exceedences of MTBE and, to a lesser extent, benzene warranted further evaluation of site subsurface.

1.2 Objectives

The objectives of the site investigation conducted by NRT were as follows:

- Evaluate the extent of impacted soil on the property through a soil gas survey in areas previous site information indicates releases may have occurred;
- ♦ Confirm the magnitude of these soil impacts, if present, with confirmatory borings; and
- Evaluate the probable magnitude and extent of groundwater impacts on-site with installation of monitoring wells and piezometers, and abandonment of existing wells not meeting current NR 141 requirements.



2.0 QUALITY ASSURANCE

2.1 Investigation Procedures

NRT has developed numerous technical Standard Practices to provide documentation of the use of widely recognized protocols and standards in the performance of all field operations. The list of Standard Practices and source documents are provided in Appendix A. Copies of these standard practices for relevant aspects of the field investigation can be provided to WDNR if review of these practices is necessary.

Field investigation procedures followed were in accordance with the Site Investigation Work Plan dated August 8, 1995. Deviations from the work plan are discussed within Section 3.0 (Site Investigation Results).

2.2 Equipment Decontamination

The drilling subcontractor provide a steam cleaner for decontamination of the GeoProbeTM, drill rig, drill augers used. Oils, greases, or other petroleum based products were not permitted on downhole equipment. Sampling equipment, including split-spoons, sampling spatulas, etc. were cleaned by thoroughly washing in Alconox detergent followed by triple rinses with distilled water prior to the collection of each sample.

2.3 Laboratory Quality Assurance

Analysis of environmental media samples was performed by a laboratory certified by WDNR under NR 149. Soil and groundwater samples were analyzed for petroleum volatile organics (PVOCs) by U.S. EPA Method 8020, VOCs by U.S. EPA Method 8021, poly nuclear aromatic hydrocarbons (PAHs) by U.S. EPA Method 8310, total lead by 7420 or 239.2 and GRO and DRO by the Wisconsin Modified Methods. Duplicate and laboratory control trip blanks were also analyzed for applicable parameters as a quality control measure.



3.0 SITE INVESTIGATION RESULTS

The investigation was performed, evaluated and discussed as two separate areas: the AST area within the berm or dike and the UST area surrounding the fuel dispensing racks. Since monitoring well MW-112 was constructed between the two areas (down gradient of the AST area and upgradient of the UST area), the data collected from this well is included in both evaluations and subsequent discussions.

3.1 Regional and Site Geology and Hydrogeology

3.1.1 Regional Geology and Hydrology

The geology of the region consists of Paleozoic bedrock units of sedimentary deposits overlain by unconsolidated Quaternary glacial sediments. The regional bedrock strata is a sequence of Cambrian sandstone; Ordovician dolomite, sandstone, and shale; and Silurian dolomite. Precambrian crystalline rock underlies the sedimentary units. The Cambrian and Ordovician bedrock units have varying thicknesses, and each is the uppermost bedrock unit at various locations in the county. The bedrock units generally dip gently east-southeast.

The Quaternary deposits overlying the Cambrian, Ordovician, and Silurian sequence of bedrock units are unconsolidated and include: glacial till; glacial outwash sediments; ground and end moraine deposits; reworked stream and river sediments; and lake-basin sediments. These deposits consist of clays, silts, sands, gravels, cobbles, and boulders.

Three aquifer systems have been identified within the region. These three aquifers are: 1) the sand-and-gravel aquifer of the unconsolidated glacial deposits; 2) the Silurian dolomite (or Niagara) aquifer; and 3) the sandstone aquifers of the Ordovician and Cambrian rocks. The Galena-Platteville formation is the upper unit in the sandstone aquifer. The glacial deposits of the sand-and-gravel aquifer cover approximately half the county and are spread throughout. In the eastern part of the county, where the thickness of the glacial deposits may be as great as 300



feet, the sand-and-gravel aquifer can supply large quantities of water and can be rapidly recharged.

The Galena-Platteville formation is generally the upper bedrock unit. Water in the Galena-Platteville formation is under water table conditions in areas where the glacial sediments are either thin or absent. The Ordovician and Cambrian age sandstone aquifer underlies the entire county. Well yields in the sandstone aquifer range from less than 100 gallons per minute (gpm) to over 1,000 gpm. Most urban and high-capacity wells in the county obtain water from this aquifer.

3.1.2 Site Geology

Soils encountered on the site include generally consist of clay fill, clay till, sand, and silty sand. Cross sections illustrating soil lithologies are presented on Figures 2 and 3 (Sections A-A', B-B', C-C'). Generally, the ground surface is covered with concrete or asphalt in high traffic areas and gravel in the AST area. Surficial soils consisting of approximately 4 to 7 feet of clay fill. Zero to 10 feet of clay till underlies the clay fill. The clay till is not present in the southwest corner of the AST area and generally increases in thickness to the east. Alluvium, which generally grades from a sand to a silty sand is encountered below the till to the terminus of borings in which it is encountered. The alluvium is generally a fine grained sand grading to a fine grained silty sand with depth.

Bedrock under the site is Silurian dolomite and is estimated to occur at depths of approximately 100 to 200 feet.

3.1.3 Site Hydrogeology

Water level elevation measurements for existing monitoring wells and piezometers are presented on Table 2. The water table was typically encountered 3.5 to 5 feet below ground surface during investigation activities. Monitoring wells MW-101 through MW-105 (UST area) screen only the



clay till unit. Monitoring wells MW-106 through MW-112 (AST area) screen the upper portion of the sand alluvium and the clay till (if present).

Water table elevation contours for October 17, 1995 are shown on Figure 4. Horizontal groundwater flow in the AST area was to the east-southeast with a horizontal gradient of 7.1×10^{-3} feet/foot. In the UST area, flow is predominantly to the southeast with a horizontal gradient of 1.5×10^{-2} feet/foot. Calculations for the horizontal hydraulic gradients are presented in Appendix B.

Data collected from nested wells MW/PZ-101 and MW/PZ-102 were used to evaluate the depth of groundwater impacts and vertical hydraulic gradients in the UST area. An upward hydraulic gradient (flow direction) of 3.8 x 10⁻² feet/feet was measured in well nest MW/PZ 101 and a downward gradient of 3.8 x 10⁻³ feet/feet was calculated in well nest MW/PZ-102. Calculations are presented in Appendix B.

3.2 Underground Storage Tank Area Investigation

In response to groundwater quality standard exceedences in former monitoring wells MW-1 and MW-2, NRT developed an investigation to assess possible impact sources and groundwater quality in the UST area. NRT's scope of investigation included a soil gas survey, soil borings to confirm possible source areas, construction of monitoring wells to assess groundwater quality and flow, and abandonment of monitoring wells which did not meet NR 141 standards.

3.2.1 Soil Gas Survey

Previous investigative data collected by previous consultants, indicated large contiguous impacted areas are not present in the UST area. Therefore, the soil gas survey was performed to assess impacts which likely occur as localized "hot spots" in the upper clay till unit. VOCs, if present in soil, diffuse by volatilization through the soil pore spaces. These compounds can be detected in the soil gas if the source of the VOCs is within reasonable proximity to the sampling location,



which is dependent on subsurface conditions. The survey was limited to areas of known releases and fuel handling in the southeast portion of the property. The results of the soil gas survey were confirmed by analyses of soil samples collected from soil borings GP-1, SB-102, and SB-103.

A sampling grid was established in the southeast portion of the site (Figure 5) for installation of soil gas probes. The probes were initially installed on a larger grid spacing of approximately 20 to 25 feet. In areas of the grid where elevated (greater than 100 ppm) PID responses were detected, the grid spacing was reduced to determine the location(s) of maximum PID response suggesting the location of source areas. A total of 44 soil vapor probes were installed on the property. The probes remain in-place in the event additional future measurements from the probes are desired.

The aluminum tipped probes (approximately three inches in length) were placed below ground surface to a depth of approximately 5 feet in a 2-inch diameter hole installed with a GeoProbeTM. TeflonTM tubing extended from the probe to the ground surface and sand was placed around the probes to approximately one foot below ground surface with bentonite placed to the surface to seal the probe annular space. Following several hours of equilibration of the soil, an evacuated TedlarTM bag was connected to the tubing inside a vacuum box for sample extraction. Soil gas collected was analyzed with a PID equipped with a 10.6 eV lamp and calibrated with isobutylene to 100 ppm. Peak PID readings were recorded (Table 3) and plotted in the field (Figure 5).

The soil gas survey was performed on June 6 and 7, 1995. Peak PID field screening readings from the soil vapor probe are shown on Table 3. As illustrated on Figure 5, the PID concentrations peak directly south of the eastern end of the underground product piping trench (>2500 ppm relative to isobutylene) at vapor probe VP-22 and decrease rapidly (<100 ppm) 80 feet to the east (VP-2, VP-3, VP-44), 50 feet to the west (VP-14, VP-19, VP-41), and 40 feet to the south (VP-8, VP-9, VP-10). Vapor probes could not be extended directly north of VP-22 due to the proximity of the product piping trench. PID readings ranging from 500 ppm to 1,000 ppm (VP-7, VP-26, and VP-36) were detected directly south of the estimated location of the former USTs removed in 1991. PID readings from probes placed in the approximate area of the 600-



gallon gasoline spill (VP-1, VP-2, VP-6, Vp-30, VP-31) were below 50 ppm. PID readings from probes (VP-3, VP-4, VP-5) placed east of the former UST excavation and the present AST area were less than 25 ppm.

3.2.2 Soil Borings and Soil Analytical Data

Based upon soil vapor probe field screening, the GeoProbeTM was used to extend two shallow soil borings (to 11 feet below ground surface) adjacent to VP-22 (PID >2,500 ppm) and VP-18 (PID 906 ppm). Soil boring logs and borehole abandonment forms are included in Appendix C. Soil samples were collected continuously in two foot intervals from one foot below ground surface. Soil samples were screened for the presence of VOCs with the PID using the WDNR jar headspace method. Soils encountered were clay and PID readings peaked in the 3 to 5 feet samples at 680 ppm (GP-1) and 230 ppm (GP-2). A soil sample from GP-1 (sampling depth 3 to 5 feet below ground surface) was analyzed for PVOCs, GRO, and DRO to assess the maximum impact concentrations in the survey area. Analytical data is summarized on Table 4 and the analytical report is included in Appendix D. Analytical results of sample GP-1 revealed that benzene, ethylbenzene, toluene and total xylenes (58,000 ppb, 18,000 ppb, 48,000 ppb and 87,000 ppb, respectively) concentrations exceeded NR 720 Residual Contaminant Levels (RCLs) of 5.5 ppb, 2,900 ppb, 1,500 ppb and 4,100 ppb, respectively.

On August 18, 1995 two soil borings (SB-102 and SB-103) were drilled in the area of the soil gas survey probes in which peak PID readings were between 500 to 1,000 ppm and 100 to 500 ppm, respectively, to collect soil samples for analyses within the impact area interpreted from the soil gas results (Figure 5). The borings are located approximately 20 to 30 feet west and southeast of GP-1 (respectively). Soil boring logs and borehole abandonment forms are included in Appendix C. The soil borings were drilled with hollow stem augers and samples were collected at a five foot sampling interval with a two foot split spoon sampler. The soil samples were collected from the 2.5 to 4.5 foot sampling interval. These samples were analyzed to assess the impact concentrations in the survey area within the vadose zone. Soil samples were analyzed for VOCs, total lead, GRO, DRO and PAHs.



Soil analytical data is summarized on Table 4. VOCs, GRO, DRO and lead were detected in both samples. PAHs were detected in the sample from SB-102 only. The benzene concentration in SB-102 (110 ppb) exceeded the RCL for benzene of 5.5 ppb. The concentration of benzene, GRO, and DRO (170 ppb, 130 ppm, and 120 ppm, respectively) in SB-103 exceeded their respective RCLs (5.5 ppb, 100 ppm, and 100 ppm, respectively). The results observed at SB-102 and SB-103 indicate that impact levels decrease rapidly (two order of magnitude decrease) at short distances from the impacted area identified by the soil gas survey.

3.2.3 Monitoring Wells and Piezometers

Six monitoring wells (MW-101 through MW-105 and MW-112) and two piezometers (PZ-101 and PZ-102) were installed in the UST area to assess groundwater quality and to evaluate horizontal and vertical groundwater gradients and flow direction in August 1995. Monitoring wells MW-101 through MW-105 screen the upper clay till only. Monitoring well MW-112 was constructed at a location where the upper clay till terminated approximately 6 feet below ground surface. Therefore, the well is screening the clay till and underlying alluvium. The piezometers (PZ-101 and PZ-102) were constructed in well nests with MW-101 and MW-102, respectively. The piezometers are screened 20 to 25 feet below the ground surface, within the silty sand alluvium. Soil boring logs, groundwater construction forms, and monitoring well development forms are presented in Appendix E.

3.2.3.1 Soil Sampling Analytical Data

One soil sample from the vadose zone from each monitoring well was selected for laboratory analysis. Soil analytical samples were collected from 2.0 to 4.5 feet below ground surface and were analyzed for PAHs, VOCs, total lead, DRO and GRO. Soil analytical data is summarized on Table 4 and the analytical reports are presented in Appendix D.

All soil samples contained lead concentrations ranging from 12 (MW-102) to 82 ppm (MW-103). VOCs were not detected in any of the samples. Methylene chloride was detected in all soil



samples; however, this compound is a probable laboratory contaminant. Low concentrations of GRO and DRO were detected in soils from MW-103 and MW-104. Low concentrations of PAHs (<100 ppb) were detected in soil collected from borings MW-101, MW-102 and MW-103. Based on the above, no significant surface releases appear to have occurred at the locations of the monitoring well locations.

3.2.3.2 Groundwater Sampling Analytical Data

Groundwater samples were collected from the monitoring wells and piezometers in August 1995. In September 1995, a second round of samples were collected from monitoring wells which contained compound concentrations in exceedence of NR140 groundwater quality standards to confirm the initial analyses (MW-101, MW-102, MW-103 and PZ-101).

Groundwater samples were analyzed for PAHs, VOCs, total lead, DRO and GRO. Analytical data is summarized on Table 5 and analytical reports are included in Appendix F.

VOCs were detected in MW-101, MW-102, MW-103 and PZ-101. Benzene was detected in PZ-101 at concentrations of 55 and 230 ppb which exceed the NR 140 benzene ES of 5 ppb. MTBE was detected in all four well samples in concentrations (66, 130, 140 and 1,000 ppb, respectively) exceeding the NR 140 MTBE ES of 60 ppb. With the exception of samples collected from well MW-103, all samples exceeding NR 140 groundwater quality ESs were retrieved from wells downgradient of the fuel dispensing racks, former USTs and the release area identified from the soil gas survey. Samples collected from upgradient wells did not contain detectable concentrations of VOCs. The groundwater sample collected from well MW-103 did however contain an elevated concentrations of MTBE (140 and 80 ppb) which is believed to be the upgradient fringe of the plume. PAHs were not detected in any of the samples collected from the UST area. DRO was detected in all monitoring well samples at relatively low concentrations (0.2 to 0.6 ppm).



3.2.4 Microbial and Nutrient Analytical Data

Selective soil and groundwater samples from the UST area were analyzed for microbial and nutrient parameters for a preliminary assessment of in-situ bioremediation. The soil samples were collected from MW-102 (downgradient), MW-104 (upgradient), and SB-102 (within the impact area) from within the vadose zone. Groundwater samples were collected from MW-102 (down gradient), MW-103 (side-gradient), and MW-104 (up-gradient). Soil and groundwater analytical data is summarized on Tables 6 and 7, respectively. Laboratory reports are included in Appendix G.

Soil samples were separately analyzed for microbial colony forming units (cfu) for total populations and degrader populations for both diesel and weathered gasoline carbon sources. Soil characteristics analysis included percent air-filled pore space, percent moisture, percent water holding capacity, and moisture as percent water holding capacity. A general nutrient panel was performed which included:

- total kieldahl nitrogen
- available potassium
- manganese
- Ph

- nitrogen as ammonia
- percent organic matter
- calcium
- sulfur as sulfate
- available phosphorous
- total organic carbon
- cation exchange capacity
- nitrogen as nitrate

Colony forming degraders and nutrients were evaluated for the groundwater samples.

3.2.4.1 Soil Analysis

Overall, soil analysis revealed severe to moderate limitations which would likely require significant augmentation of site conditions for in-situ bioremediation. A preliminary assessment of data indicates these limiting conditions are due to high soil Ph (>8.5), the high ratio of total organic carbon to phosphorous (>120), and the low to moderate levels of degrader populations (<100 cfu/g and <100,000 cfu/g, respectively). Additional testing and evaluation is required for a complete assessment.

3.2.4.2 Groundwater Analysis

Groundwater analysis indicates moderate to slight limitations for in-situ bioremediation. Degrader populations (diesel and weathered gasoline) were present in the upper moderate range of levels required for active in-situ bioremediation. Additional testing and evaluation is required for a complete assessment.

3.2.5 Monitoring Well Abandonment

Two monitoring wells (MW-1 and MW-2) in the UST area were abandoned in accordance with NR 141. These wells were in poor condition and screened both the upper clay till and the underlying alluvium. It is believed the upper clay fill and clay till (when present) are a locally confining layer. Therefore, new water table wells and piezometers were constructed to screen the upper clay and underlying alluvium as described previously. Monitoring well abandonment forms are included in Appendix H.

3.3 Above Ground Storage Tank Area Investigation

Six monitoring wells (MW-106 through MW-112) were installed in the AST area to assess groundwater quality and to evaluate horizontal groundwater gradients and flow direction in August 1995. Monitoring wells MW-106 through MW-111 are constructed within the bermed AST area on the west half of the property and MW-112 is constructed east of the bermed area. The monitoring wells screen the upper clay till (if present) and the underlying alluvium.

3.3.1 Soil Sampling Analytical Data

One soil sample from the vadose zone from each monitoring well was selected for laboratory analysis. Soil analytical samples were collected from 2.0 to 4.5 feet below ground surface and were analyzed for PVOCs and PAHs. Low concentrations of PVOCs (<10 ppb) were detected in MW-112. PVOCs were not detected in the remaining monitoring well samples. PAH



concentrations (9 to 980 ppb) were detected in soil samples from MW-109 (northwest corner) and MW-112 (east of berm). Of the PVOCs which currently have established RCLs (i.e. benzene, toluene, ethyl benzene and xylenes), none were detected in soil samples collected in the AST area borings. Subsequently, none of their respective RCLs were exceeded, nor near being exceeded. At present, RCLs for PAH compounds are not established in NR 720. Soil analytical data is summarized on Table 4 and the analytical reports are presented in Appendix D.

3.3.2 Groundwater Sampling Analytical Data

Groundwater samples were collected from the monitoring wells in August 1995. Groundwater samples were analyzed for PVOCs and PAHs. Groundwater analytical data is summarized on Table 5 and analytical reports are included in Appendix F.

VOCs were not detected in the AST monitoring wells. PAHs were detected MW-110 (north-central bermed area) only in low concentrations (<1 ppb). NR 140 groundwater quality standards were not attained or exceeded.

3.3.3 Monitoring Well Abandonment

Six monitoring wells (MW-3 and MW-8) in the AST area were abandoned in accordance with NR 141. These wells were in poor condition and were not constructed in accordance with current NR 141 requirements. Monitoring well abandonment forms are included in Appendix H.



4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of this investigation, the conclusions presented below are made by NRT.

4.1 Underground Storage Tank Area

Review of the soil gas survey data and soil sample analyses indicate that soil impacts above NR 720 RCLs are limited to the area south of the fuel dispensing racks and former USTs. The soil sample from boring GP-1 contained impacts concentrations which exceed NR 720 RCLs for benzene, ethylbenzene, toluene, total xylenes, GRO and DRO. Soil samples from borings SB-102 and SB-103 contained concentrations of benzene at significantly lower levels. GRO and DRO concentrations in SB-103 were less than 50 ppm above their respective RCLs. The impact levels observed in SB-102 and SB-103 indicate that impact levels decrease rapidly at short distances from the impacted area identified by the soil gas survey. Soil samples analyzed from outside of the impacted area (MW-101, MW-102, MW-103 and MW-104) did not contain petroleum-related impacts. However, the horizontal extent of impacts immediately to the north of the soil survey area was not evaluated due to the presence of buried product piping and the fuel dispensing racks. In-situ remediation of this soil may be difficult due to the severe to moderate limitations which would likely require significant augmentation of site conditions for in-situ bioremediation.

Benzene concentrations in exceedence of the NR 140 ESs were detected in samples collected from well PZ-101 only. MTBE concentrations in exceedence of NR 140 ESs were detected in wells (MW-101, MW-102 and PZ-101) located downgradient of the soil impact area and also in samples collected from side gradient well MW-103. Based on the analytical results, impacts to groundwater are present in the clay till and the underlying sand (alluvium) unit. Groundwater impacts appear to be migrating to the south-southeast and may potentially be present off-site. Subsequently, the downgradient extent of groundwater impact has not been completely defined. NRT recommends that one additional well nest (one water table well and one piezometer) be installed off-site to the southeast (downgradient) to delineate the lateral extent of groundwater impact detected during this investigation. In order to determine the vertical extent of VOC



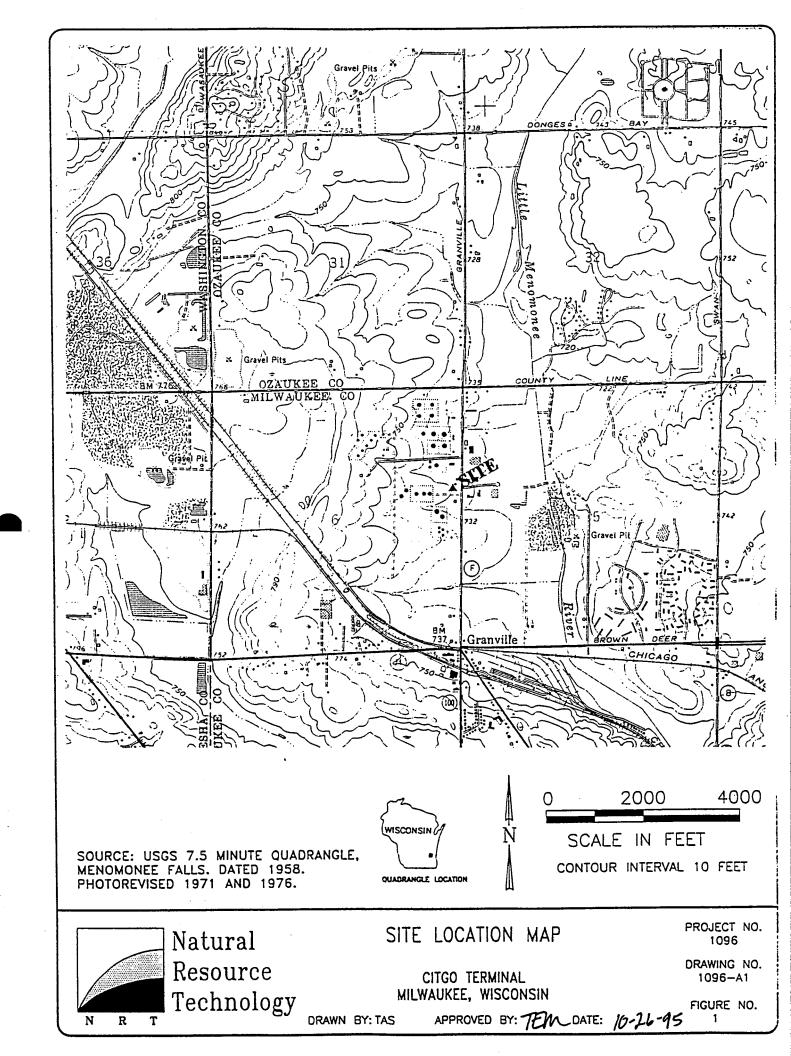
impact, the installation and sampling of a deeper on-site piezometer should also be considered. In addition, a well survey should be conducted to identify off-site well uses within a one-mile radius. Following the collection and evaluation of the additional recommended data, remedial alternatives should be evaluated and proposed to the WDNR as specified in NR 722.

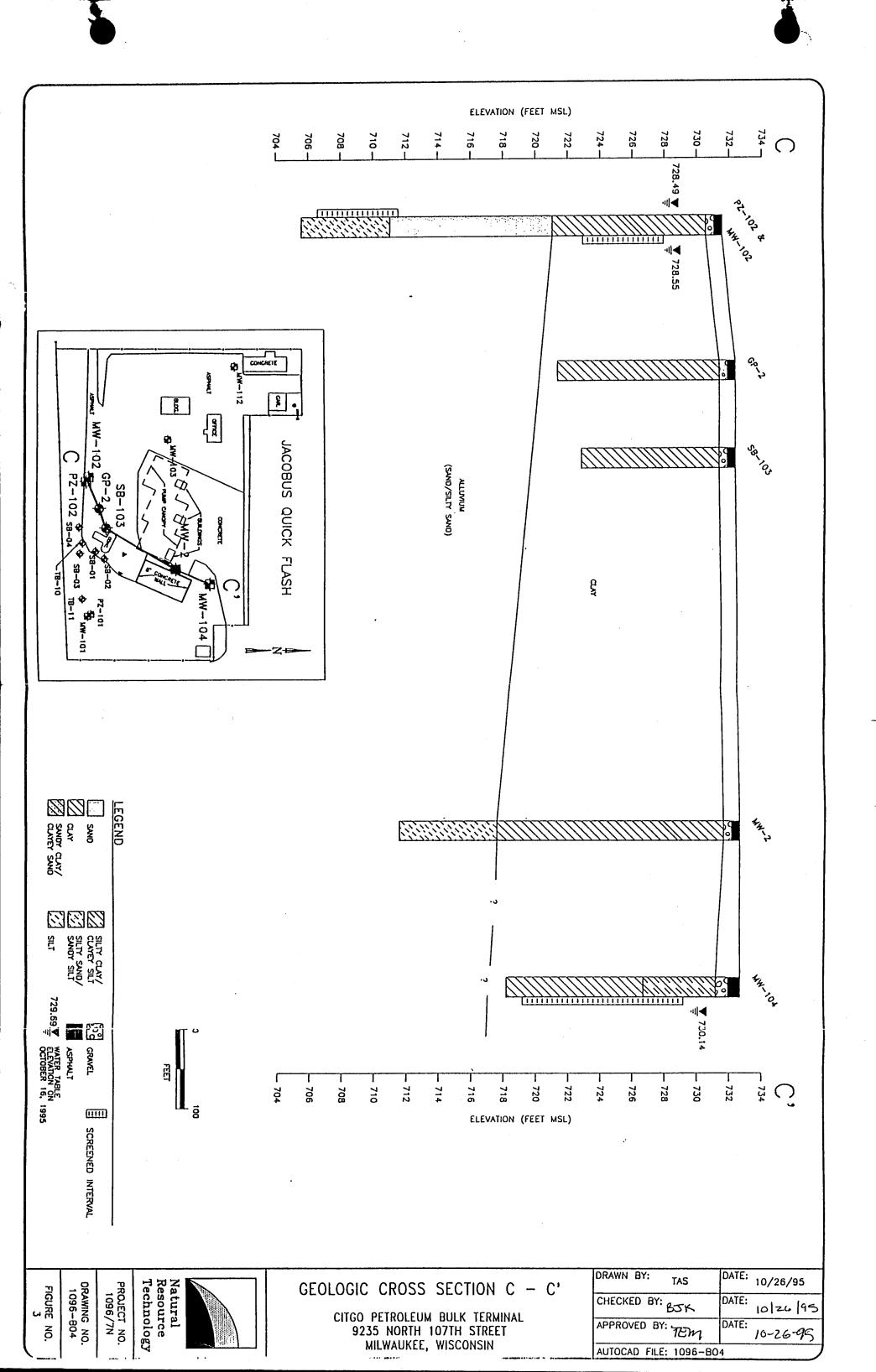
4.2 Above Ground Storage Tank Area

Data collected during this site investigation did not identify petroleum-related impacts of concern in the AST area. Further investigation of the AST area is not recommended.

5.0 REFERENCES

- Dahl & Associates, Inc., 1995. <u>Groundwater Monitoring Laboratory Results. CITGO Petroleum Terminal. Milwaukee, Wisconsin.</u> Letter report date January 31, 1995, addresses to Mr. Scott Buckner.
- Foth & Van Dyke, 1991. Phase II Environmental Site Assessment, 9235 North 107th Street. Milwaukee, Wisconsin. Report dated November 18, 1991.
- Foth & Van Dyke, 1992. <u>Addendum to Foth & Van Dyke Report Titled "Phase II 9235 North 107th Street, Milwaukee, Wisconsin.</u> Letter report dated January 13, 1992.
- Natural Resource Technology, Inc., 1995. <u>Site Investigation Work Plan, Citgo Petroleum Corporation</u>, 9235 North 107th Street, Milwaukee, Wisconsin. Report dated August 8, 1995.
- Twin City Testing Corporation, 1987. Environmental Assessment, Jacobus Oil Company, Granville Terminal, 9301 North 107th Street, Milwaukee, Wisconsin. Report dated March 18, 1987.
- Zimpro Environmental & Energy Systems, 1987. Letter dated March 213, 1987 and addressed to Mr. Bob Levra (Twin City Testing).





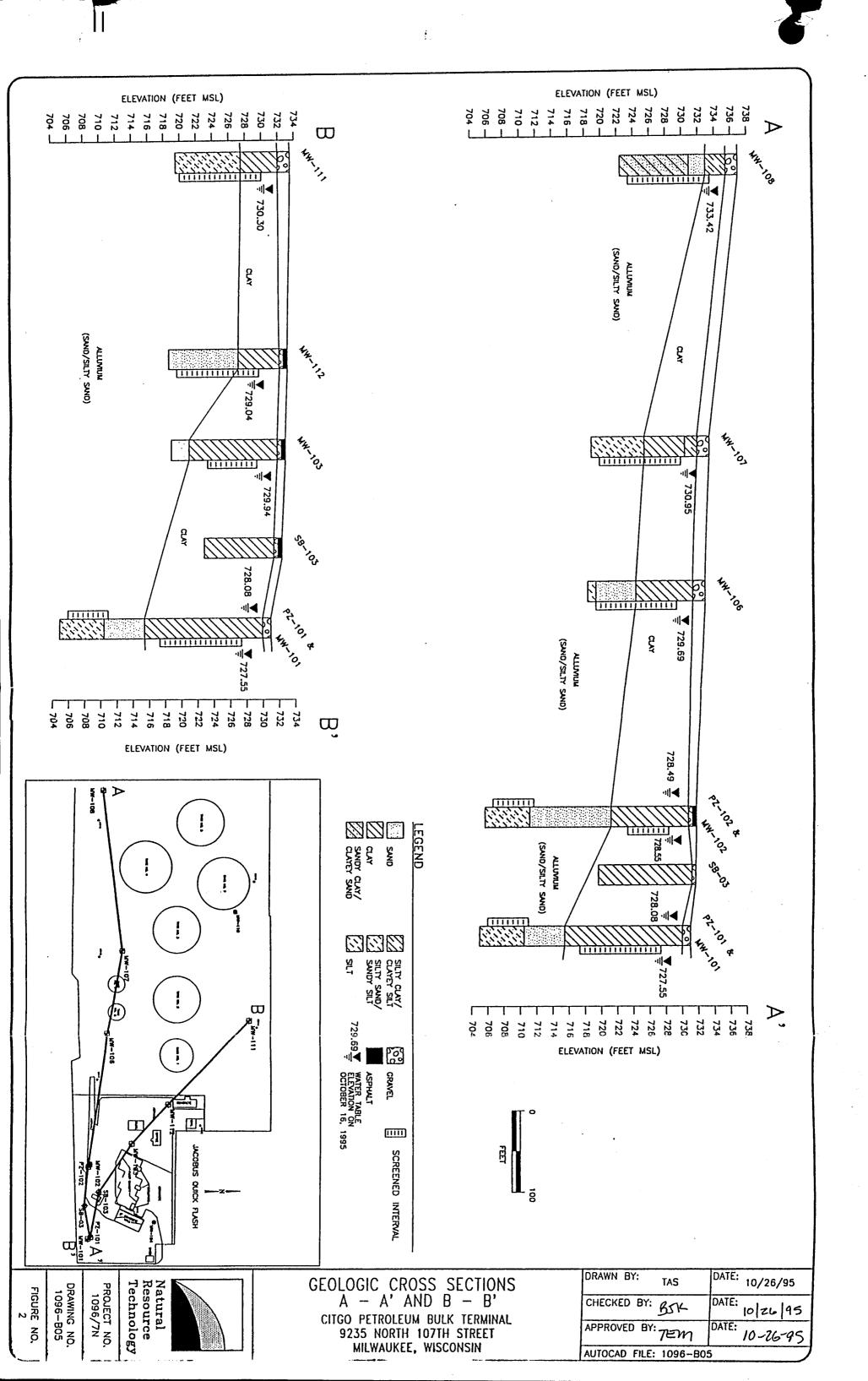


Table 1 **Abandoned Monitoring Wells Groundwater Analytical Summary**

Citgo Bulk Petroleum Terminal 9235 North 107th Street, Milwaukee, WI

				Volatile O	rganics Com	pounds (VOCs			Total Petroleur	n Hydrocarbons
Monitoring Location	Sample Date	Benzene (ug/L)	Ethyl- benzene (ug/L)	Toluene (ug/L)	Total Xylenes (ug/L)	Methyl-t butyl ether (ug/L)	1,2,4- Trimethyl- benzene (ug/L)	1,3,5- Trimethyl- benzene (ug/L)	Gasoline (ug/L)	#2 Fuel Oil (ug/L)
MW-1	Feb-87	3	, nd	2	84	na	na	na	95	200
	19-Mar-87	26.5	nd	nd	2.6	na	na	na	nd	nd
	26-Nov-91	nd	nd	nd	nd	1000	na	na	1500	nd
	19-Oct-94	nd	nd	nd	nd	1700	na	na	na	na
MW-2	Feb-87	111	nd	1	14	na	na	na	130	nd
	19-Mar-87	2.4	nd	nd	nd	na	na	na	nd	nd
	26-Nov-91	nd	nd	nd	nđ	37	na	na	nd	nd
	19-Oct-94	13	2.5	nd	11.7	28	3.2	na	na	na
MW-3	Feb-87	na	na	na	na	na	na	na	na	600
	19-Mar-87	nd	nd	nd	nd .	na	na	na	nd	nd
MW-4	Feb-87	nd	nd	nd	nd	na	na	na	nd	nd
	19-Mar-87	nd	nd	nd	nd	na	na	na	nd	nd
MW-5	Feb-87	na	na	na	na	na	na	na	na	700
	19-Mar-87	na	na	na	na	na	na	na	ла	na
MW-6	Feb-87	nd	nd	nd	22	na	na	na	24	200
	19-Mar-87	nd	nd	nd	nd	na	na	na	nd	nd
MW-7	Feb-87	na	na	na	na	na	na	na	na	300
	19-Mar-87	nd	3.6	nd	14.5	na	na	na	130	nd
MW-8	Feb-87	na	na	na	na	na	na	na	na	nd
	19-Mar-87	nd	nd	nd	nd	na	na	na	nd	nd
			Wisco	nsin Ground	water Qualit	y Standards (N	R 140.10)			
Preventive Action		0.5	140	68.6	124	12	ne	ue	ne	ne
Enforcement Sta	andard (ES)	. 5	700	343	620	60	ne	ne	ne ne	ne

Not detected at or above the laboratory method detection limit as reported in the laboratory analytical report

ne: Groundwater quality standards have not been established for this compound.

Table 2
Monitoring Well Information and Groundwater Elevation Data

Citgo Bulk Petroleum Terminal 9235 North 107th Street, Milwaukee, WI

Monitoring	Ground Surface Elevation	Top of Casing Elevation	Monitoring	Depth to Water	Groundwater Elevation
Location	(MSL)	(MSL)	Date	(feet)	(feet)
	,	Water Table (Observation We	ells	
MVV-101	730.66	733.23	25-Aug-95 16-Oct-95	14.47 5.68	718.76 727.55
MW-102	731.60	731.14	25-Aug-95 16-Oct-95	2.63 2.59	728.51 728.55
MW-103	732.78	732.44	25-Aug-95 16-Oct-95	2.49 2.50	729.95 729.94
MW-104	732.71	735.06	25-Aug-95 16-Oct-95	10.57 4.92	724.49 730.14
MW-105	730.38	729.88	25-Aug-95 16-Oct-95	10.1 1 2.90	719.77 726.98
MW-106	732.79	735.50	28-Aug-95 16-Oct-95	3.81 5.81	731.69 729.69
MW-107	733.30	736.31	29-Aug-95 16-Oct-95	3.45 5.36	732.86 730.95
MW-108	736.90	739.82	29-Aug-95 16-Oct-95	3.48 6.40	736.34 733.42
MW-109	734.28	737.14	28-Aug-95 16-Oct-95	4.61 3.61	732.53 733.53
MW-110	734.48	736.97	29-Aug-95 16-Oct-95	3.51 4.87	733.46 732.10
MW-111	733.48	736.00	25-Aug-95 16-Oct-95	5.86 5.70	730.14 730.30
MW-112	733.09	732.62	28-Aug-95 16-Oct-95	3.64 3.58	728.98 729.04
		Piez	zometers		•
PZ-101	730.96	733.40	25-Aug-95 16-Oct-95	5.38 5.32	728.02 728.08
PZ-102	731.60	731.21	28-Aug-95 16-Oct-95	2.90 2.72	728.31 728.49

na: not applicable

msl: Elevations are referenced to the USGS mean sea level datum

Table 3
Soil Vapor Probe PID Analysis Summary

Citgo Bulk Petroleum Terminal 9235 North 107th Street, Milwaukee, WI

Vapor Monitoring Location	Probe Depth (feet)	Sampling Date	PID Reading (ppm*)
VP-1	5	06/06/95	21
VP-2	5	06/06/95	9.3
VP-3	5	06/06/95	3.3
VP-4	5	06/06/95	3.8
VP-5	5	06/06/95	24
VP-6	5	06/06/95	47
VP-7	5	06/06/95	689
VP-8	5	06/06/95	10
VP-9	5	06/06/95	89
VP-10	5	06/06/95	9.1
VP-11	5	06/06/95	34
VP-12	3	06/06/95	3.7
VP-13	5	06/06/95	6.8
VP-14	5	06/06/95	21
VP-15	5	06/06/95	349
VP-16	5	06/06/95	1739
VP-17	5	06/06/95	703
VP-18	5	06/06/95	906
VP-19	3	06/06/95	56
VP-20	5	06/06/95	110
VP-21	5	06/06/95	1634
VP-22	5	06/06/95	>2500

Vapor Monitoring Location	Probe Depth (feet)	Sampling Date	PID Reading (ppm*)
VP-23	5	06/06/95	129
VP-24	5	06/06/95	153
VP-25	5	06/06/95	190
VP-26	5	06/06/95	768
VP-27	3	06/07/95	67
VP-28	5	06/06/95	30
VP-29	5	06/06/95	29
VP-30	5	06/06/95	10
VP-31	5	06/06/95	3
VP-32	5	06/07/95	963
VP-33	5	06/07/95	519
VP-34	5	06/07/95	1338
VP-35	5	06/07/95	1143
VP-36	5	06/07/95	1105
VP-37	5	06/07/95	718
VP-38	5	06/07/95	168
VP-39	5	06/07/95	47
VP-40	5	06/07/95	10
VP-41	5	06/07/95	33
VP-42	5	06/07/95	418
VP-43	5	06/07/95	385
VP-44	5	06/07/95	65

PID: Photoionization detector, IS-3000 Microtip with 10.6 eV lamp calibrated to 100 ppm isobutylene

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ppm*: PID readings are relative to isobutylene

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BJK/TEM(10/25/95)

Table 4 Soil Analytical Summary

Citgo Bulk Petroleum Terminal 9235 North 107th Street, Milwaukee, WI

			F = 1, 9F V T	are to the		· · · · · · · · · · · · · · · · · · ·	olatile Org	ganic Compo	unds (VOCs) (ug/Kg)			The second second	<u> </u>	Gasoline	Diesel
	Sample		1				Iso-	1,3,5-	1,2,4-	Methyl	sec-	n-	for the Control	Total	Range	Range
Monitoring	Depth	Sample	_	Ethyl-		Total	propyl-	Trimethyl-	Trimethyl-	tertiary	Butyl-	Butyl-	Methylene	Lead	Organics	Organics
Location	(feet)		Benzene	benzene	Toluene	xylenes	benzene	benzene	benzene	butyl ether		benzene	chloride	(mg/Kg)	(mg/Kg)	(mg/Kg)
	elui ervit	vier tradiçõelic	la 140 tan 1964 t	r istēga ildi:	. ETATA (A. wil	3 (1.17) To 1	US	T AREA SOI	L SAMPLES		Assisting.	irtri ochrittete)	e-Magniericuse	etary rice do F	t v 12992 it Desc	en and a second
GP-1	2.0-4.0	07-Jun-95	5800	18000	48000	87000	nd	14000	45000	890	na	па	na	na	670	120
SB-102	2.5-4.5	18-Aug-95	110	nd	nd	nd	nd	nd	nd	nd	nd	nd	8	23	24	11
SB-103	2.5-4.5	18-Aug-95	170	490	64	1683	110	950	2200	nd	430	620	10	37	130	120
MW-101	2.0-4.0	16-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	9	37	nd	nd
MW-102	2.0-4.0	17-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nđ	nd	9	12	nd	nd
MW-103	2.0-4.0	17-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	9	82	6.9	5.5
MW-104	2.5-4.5	18-Aug-95	nd	nd	nđ	nd	nd	nd	nd	nd	nd	nd	9	35	14	6.3
MW-105	2.0-4.0	16-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	10	19	nd	nd
Physique to the		vji teraksidik				ration.	AS	T AREA SO	LSAMPLES		errolas Largija.		Marener Cor	er indegay		tallanen era
MW-106	2.5-4.5	25-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	na	na	na	na	na	na
MW-107	2.5-4.5	25-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	na	na	na	na	na	na
MW-108	2.5-4.5	25-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	na	na	na	na	na	na
MW-109	2.5-4.5	25-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	na	na	na	na	na	na
MW-110	2.5-4.5	23-Aug-95	nd	nd	nd	nd	nd	nd .	nd	nd	na	na	na	na	na	na
MW-111	2.5-4.5	24-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	na	na	na	na	na	na
MW-112	2.5-4.5	18-Aug-95	nd	nd	nd	nd	nd	2	8	nd	na	na	na	na	na	na
	Terugatina j	site of the state of	grafia (d. 1814)		154154-191	WC	NR Soil R	esidual Cont	aminant Lev	els (RCLs)	。 女子 初野 だか	*				
RCLs (Industria	ıl)		5.5	2900	1500	4100	ne	ne	ne	ne	ne	ne	ne	500	100	100

Table 4 continued... Soil Analytical Summary

Monitoring Location	Sample Depth (feet)	Sample Date	Anthra- cene (ug/Kg)	Benzo (a) anthra- cene (ug/Kg)	Benzo (a) pyrene (ug/Kg)	Fluor- anthene (ug/Kg)	Benzo (k) Fluor- anthene (ug/Kg)	Benzo (ghi) perylene (ug/Kg) FAREA SO	Chrysene (ug/Kg) L SAMPLES	Fluor- anthene (ug/Kg)	Fluorene (ug/Kg)	Naph- thalene (ug/Kg)	1-Methyl- naph- thalene (ug/Kg)	2-Methyl- naph- thalene (ug/Kg)	Phen- anthrene (ug/Kg)	Pyrene (ug/Kg)
	2040	07-Jun-95	na	na	na	na	na	na	na	na	na	na	na	na	na	na
GP-1										19	34	110	65	65	23	nd
SB-102	2.5-4.5	18-Aug-95	1	nd	2	5	2	nd	nd	19						
SB-103	2.5-4.5	18-Aug-95	- nd	nđ	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW-101	2.0-4.0	16-Aug-95	nd	5	6	8	3	nd	8	11	nd	0.9	0.5	0.4	4	10
MW-102	2.0-4.0	17-Aug-95	nd	0.3	0.1	8.0	0.2	nd	nd	nd	nd	nd	nd	nd	1	1
MW-103	2.0-4.0	17-Aug-95	nd	0.9	nd	nd	nd	0.9	1	2	nd	nd	nd	nd	2	2
MW-104	2.5-4.5	18-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW-105	2.0-4.0	16-Aug-95	nd	nd	nd	nđ	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
				Marrie 154	r Detak		AS	T AREA SO	IL SAMPLES			er Brotzfeller	aying period (Alba)	ungkan ding ag	adata e e e	er dom send
MW-106	2.5-4.5	25-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW-107	2.5-4.5	25-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW-108	2.5-4.5	25-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nđ	nd	nd	nd
MW-109	2.5-4.5	25-Aug-95	23	330	230	290	120	57	560	760	nd	nd	nd	nd	250	690
MW-110	2.5-4.5	23-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW-111	2.5-4.5	24-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW-112	2.5-4.5	18-Aug-95	nd	nd	11	23	9	nd	nd	nd	nd	510	580	980	nd	nd

not analyzed

A standard has not been established for this compound

ug/Kg: mg/Kg: micrograms per kilogram which is equivalent to parts per billion

milligram per kilogram which is equivalent to parts per million

Constituent concentration exceeded RCL

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not detected at or above laboratory method detection limit as reported in the laboratory analytical report included as Appendix D.

SAV/BJK/TEM(10/25/95)

Table 5 Groundwater Analytical Summary

Citgo Bulk Petroleum Terminal 9235 North 107th Street, Milwaukee, WI

				Volatile O	ganics Com	pounds (VC	Cs) (ug/L)	· · · · · · · · · · · · · · · · · · ·		Polynuclea	r Aromatic Hyd	rocarbons (PAHs) (ug/L		Gasoline
Monitoring Location	Sample Date	Benzene	Ethyl- benzene	Toluene	Total Xylenes	Methyl-t butyl ether	1,1- Dichloro- ethane	1,1,1- Trichloro- ethane	Di- isopropyl ether	Anthra- cene	Benzo (a) anthracene	Chrysene	Phenan- threne	Range Organics (mg/L)	Range Organics (mg/L)
			Tryosomus A			UST A	Area Monitor	ing Well Sai	nples					ija kilja, jadod T	real participation
MW-101	25-Aug-95 21-Sep-95	nd nd	nd . nd	nd nd	nd nd	30 66	1.0 na	3.0 na	nd na	nd na	nd na	nd na	nd na	0.5 na	nd na
PZ-101	25-Aug-95 21-Sep-95	55 230	nd nd	nd nd	nd nd	nd 1000	46 na	15 na	430 na	nd na	nd na	nd na	nd na	0.5 na	0.2 na
MW-102	25-Aug-95 21-Sep-95	nd nd	nd nd	nd nd	nd nd	130 94	nd na	nd na	nd na	nd na	nd na	nd na	nd na	0.4 na	nd na
PZ-102	28-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.2	nd
MW-103	25-Aug-95 21-Sep-95	nd nd	nd nd	nd nd	nd nd	140 80	nd na	nd na	nd na	nd na	nd na	nd na	nd na	0.6 na	nd na
MW-104	25-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.6	nd
MW-105	25-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.4	nd
MW-112	28-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
	在原列的	litatoje opansi so	oned projetic i	物.描色用效	EMPER OF	AST Area l	Monitoring V	Vell Sample:							49.448666
MW-106	29-Aug-95	nd	nd	nd	nd	nd	na	na	na	nd	nd	nd	nd	na	na
MW-107	29-Aug-95	nd	nd	nd	nd	nd	na	na	na	nd	nd	nd	nd	na	na
MW-108	29-Aug-95	nd	nd	nd	nd	nđ	na	na	na	nd	nd	nd	nd	na	na
MW109	28-Aug-95	nd	nd	nd	nd	nđ	na	na	na	nd	nd	nd	nd	na	na
MW-110	29-Aug-95	nd	nd	nd	nd	nd	na	na	na	0.08	0.03	0.03	1	na	na
MW-111	28-Aug-95	nd	nd	nd	nd	nd	na	na	na	nd	nd	nd	nd	na	na
iddl ddi di					Nacharda (n.	Quality As	surance / Q	iality Contro	ol Samples					je saktak	
MW-DD	29-Aug-95	nd	nd	nd	nd	nd	na	na	na	nd	nd	nd	nd	na	na
MW-ZZ	25-Aug-95	nd	nd	nd	nd	nd	nd	nd	130	nd	nd	nd	nd	0.6	0.6
		principal de la composition della composition de	Since Marie				undwater Qu							· · · · · · · · · · · · · · · · · · ·	ntalie (16
Preventive Act Enforcement S	tion Limit (PAL) Standard (ES)	0.5 5	140 700	68.6 343	124 620	12 60	85 850	40 200	ne ne	ne ne	ne ne	ne ne	ne ne	ne ne	ne ne

na; not analyzed

230

ne: Groundwater quality standards have not been established for this compound

Preventive Action Limit exceedance concentrations are in bold and are boxed.

Enforcement Standard exceedance concentrations are in bold and are boxed and shaded.

nd:

not detected at or above laboratory method detection limit as reported in the laboratory analytical report included as Appendix D.

MW-DD: Field duplicate for MW-108
MW-ZZ: Field duplicate for MW-103

Table 6 Soil Nutrient and Microbial Analytical Summary

Citgo Bulk Petroleum Terminal 9235 North 107th Street, Milwaukee, WI

Sampling Location	Sampling Depth (feet)	Sampling Date	Total Kjeldahl Nitrogen (ppm)	Nitrogen as Ammonia (ppm)	Available Phos- phorous (ppm)	Available Pota- ssium (ppm)	% Organic Matter	Total Organic Carbon (ppm)	C:N	C:P	Man- ganese (ppm)	Calcium (ppm)	Cation Exchange Capacity (Meq/100g)	рН	Sulfur as Sulfate (ppm)	Nitrogen as Nitrate (ppm)
MW-102	2.0-4.0	17-Aug-95	234	2.5	<1	105	0.4	1560	7	>1560	nr	nr	กเ	8.6	nr	nr
MW-104	2.5-4.5	18-Aug-95	176	3.5	1	70	0.3	1170	7	1170	nr	nr	nr	8.7	nr	nr
SB-102	2.5-4.5	18-Aug-95	96	3	<1	65	0.3	1170	13	>1170	nr	nr	nr	8.8	nr	nr

+ 4 + 1	Sampling	TO THE T	otal Populatio	ns		Gasoline Car ader Popula	TO THE SHAPE SHAPE SHOULD	Diesel Carbon Source Degrader Populations			
Sampling Location	Depth (feet)	Mean (cfu/gm)	Low (cfu/gm)	High (cfu/gm)	Mean (cfu/gm)	Low (cfu/gm)	High (cfu/gm)	Mean (cfu/gm)	Low (cfu/gm)	High (cfu/gm)	
MW-102	2.0-4.0	1.91E+04	1.78E+04	2.06E+04	1.27E+04	1.17E+04	1.38E+04	1.39E+04	1.26E+04	1.51E+04	
MW-104	2.5-4.5	7.33E+03	6.61E+03	8.13E+03	6.22E+04	5.54E+04	6.95E+04	6.59E+04	5.87E+04	7.36E+04	
SB-102	2.5-4.5	1.66E+05	1.55E+05	1.78E+05	5.05E+00	1.05E+00	3.82E+00	2.17E+02	1.14E+02	3.86E+02	
Marginal Inc	culum	na	na	na	na	1.00E+01	1.00E+03	na	1.00E+01	1.00E+03	
noculum Le		na	na	na	na	1.00E+03	1.00E+06	na	1.00E+03	1.00E+06	
ctive Degra	adation Level	na	na	na	na	1.00E+06	1.00E+09	na -	1.00E+06	1.00E+09	

Notes:

Not applicable.

na: Not applicable.

r: Analysis not requested.

C:N: Ratio of Total Organic Carbon (TOC) to Nitrogen.

C:P: Ratio of Total Organic Carbon (TOC) to Phosphorous.

: Degrader populations present at levels required for active degredation.

Degrader populations present at levels which would require augmentation for active degredation.

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BJK/TEM(10/25/95)

Table 7 Groundwater Nutrient and Microbial Analytical Summary

Citgo Bulk Petroleum Terminal 9235 North 107th Street, Milwaukee, WI

Sampling Location	Sampling Date	Total Kjeldahl Nitrogen (ppm)	Nitrogen as Ammonia (ppm)	Available Phos- phorous (ppm)	Available Pota- sslum (ppm)	% Organic Matter	Total Organic Carbon (ppm)	C:N	C:P	Man- ganese (ppm)	Calcium (ppm)	Cation Exchange Capacity (Meq/100g)	рН	Sulfur as Sulfate (ppm)	Nitrogen as Nitrate (ppm)
MW-102	29-Aug-95	1	<0.5	0.2	6	nr	nr	nr	nr	nr	nr	nr	7.5	nr	1
MW-103	29-Aug-95	14	<0.5	0.2	4	nr	nr	nr	nr	nr	nr	nι	7.5	nr	<0.5
MW-104	29-Aug-95	4	<0.5	0.1	3.5	nr	nr	· nr	nr	nr	nr	nr	7.8	nr	<0.5
WDNR Minlmu NAS Minlmum		ne ne	ne ne	ne ne	ne na	ne ne	ne ne	<40 <6	<120 <30	ne ne	ne ne	ne ne	ne ne	ne ne	ne ne

		Total Populations				Gasoline Ca rader Popula	rbon Source tions	Diesel Carbon Source Degrader Populations					
Sampling Location	Sample Date	Mean (cfu/gm)	Low (cfu/gm)	High (cfu/gm)	Mean (cfu/gm)	Low (cfu/gm)	High (cfu/gm)	Mean (cfu/gm)	Low (cfu/gm)	High (cfu/gm)			
MW-102	29-Aug-95	1.61E+06	1.50E+06	1.72E+06	1.15E+06	1.06E+06	1.26E+06	1.39E+04	1.26E+04	1.51E+04			
MW-103	29-Aug-95	8.92E+05	8.01E+05	9.89E+05	1.93E+05	1.79E+05	2.08E+05	6.59E+04	5.87E+04	7.36E+04			
MW-104	29-Aug-95	1.24E+06	1.15E+06	1.34E+06	5.05E+00	1.05E+00	3.82E+00	2.17E+02	1.14E+02	3.86E+02			
Marginal Inoculum		na	na	na	na	1.00E+01	1.00E+03	na	1.00E+01	1.00E+03			
inoculum Le	1	na	na	na	na	1.00E+03	1.00E+06	na	1.00E+03	1.00E+06			
Active Degra	dation Level	na	na	na	na	1.00E+06	1.00E+09	na	1.00E+06	1.00E+09			

Notes: na: Not applicable.

nr: Analysis not requested.

C:N: Ratio of Total Organic Carbon (TOC) to Nitrogen.
C:P: Ratio of Total Organic Carbon (TOC) to Phosphorous.

Degrader populations present at levels required for active degredation.

Degrader populations present at levels which would require augmentation for active degredation.

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BJK/TEM(10/25/95)

APPENDIX A

STANDARD OPERATING PROCEDURES TABLE OF CONTENTS

NATURAL RESOURCE TECHNOLOGY STANDARD PRACTICES MANUAL

Section:

Site Investigation 07-TC

Number: Date:

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Eff. Date

Initiator

Apprv'd

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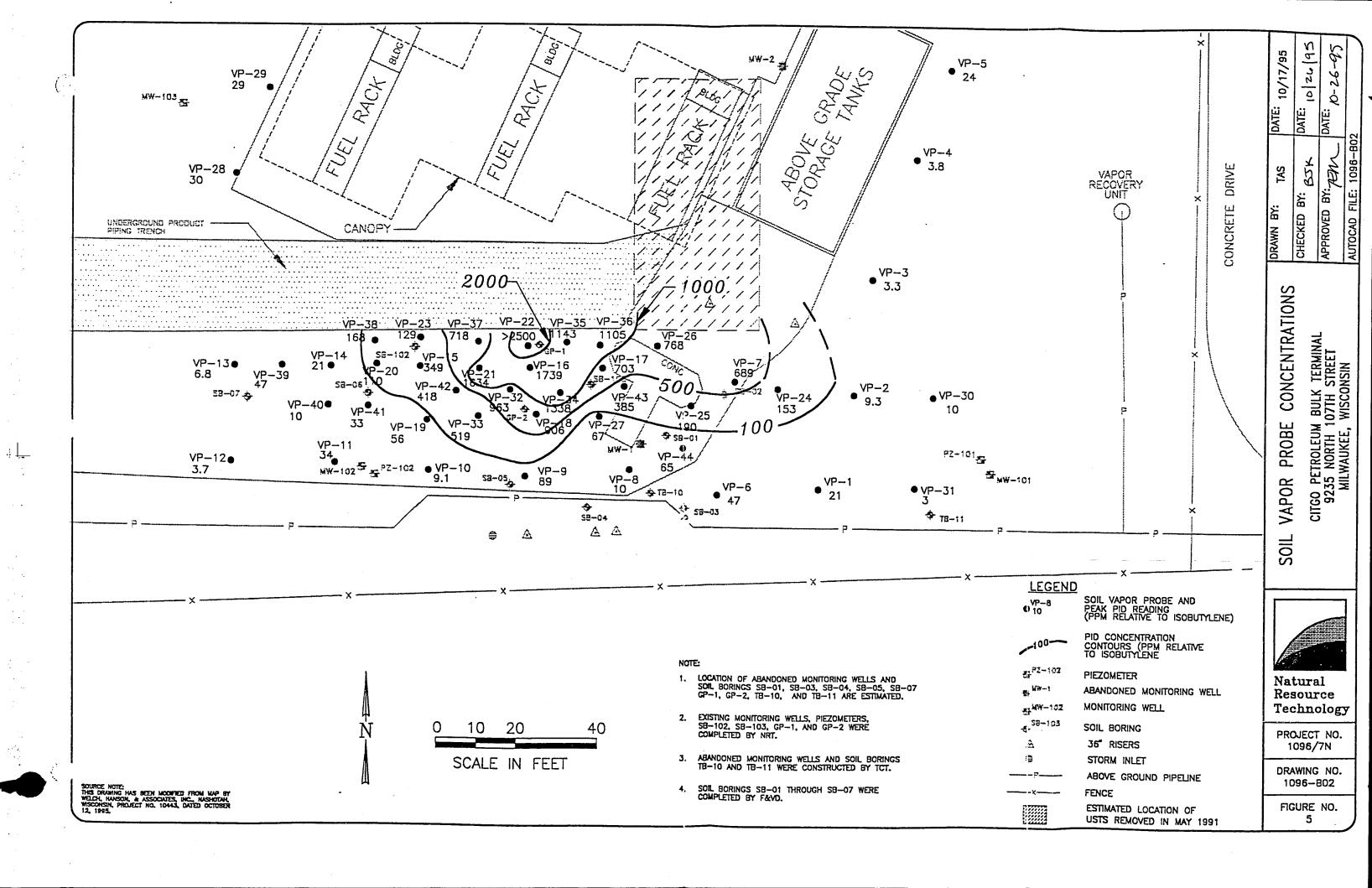
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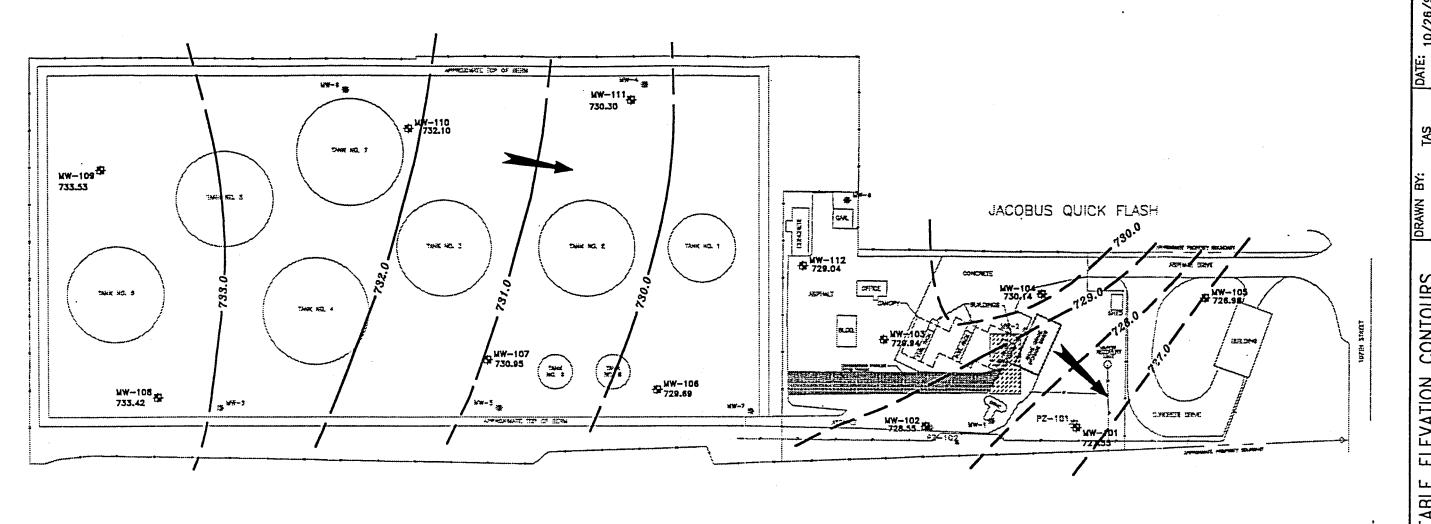
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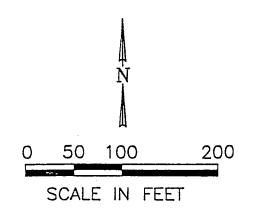
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07-08-02 07-08-03	Ground-Water Sampling







- MONITORING WELLS MW—101 THRU MW—105 (UST AREA) ARE SCREENING THE UPPER CLAY UNIT.
- 3. MONITORING WELLS MW-106 THRU MW-112
 (AST AREA) ARE SCREENING THE UPPER PROTION
 OF THE SAND UNIT AND THE CLAY UNIT (IF PRESENT).
- EXISTING MONITORING WELLS AND PREZOMETERS WERE COMPLETED BY NRT.

LEGEND

MONITORING WELL AND WATER TABLE ELEVATION (MSL)

WATER TABLE ELEVATION CONTOUR (MSL)

APPARENT GROUNDWATER FLOW DIRECTION

PIEZOMETER

ABANDONED MONITORING WELL

BENCH MARK

STORM INLET

PIPELINE

ESTIMATED LOCATION OF USTS REMOVED IN MAY 1991

TER TABLE ELEVATION CONTOURS OCTOBER 16,1995
CITGO PETROLEUM BULK TERMINAL 9235 NORTH 107TH STREET MILWAUKEE, WISCONSIN WATER

26/22/01

DATE:

BSK

B;:

CHECKED

9

BY: TEM

10/26/95

TAS



Natural Resource Technology

> PROJECT NO. 1096/7N

DRAWING NO. 1096-803

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- 17. Solinist Water Level Indicator Instruction Manual

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APPENDIX B HYDRAULIC GRADIENT CALCULATIONS

SITE:

Citgo Bulk Petroleum, Milwaukee, WI

PROJECT:

Site Investigation

PROJECT #:

1082

PREPARED BY:

Rebecca J. Koepke

10/26/95

CHECKED BY:

Stephanie A. Van Dyke 10/26/95

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HORIZONTAL HYDRAULIC GRADIENT CALCULATIONS

hydraulic gradient = dh/dL

dh = change in head

dL = change in horizontal distance

AST AREA

dh = 3

3 feet = 7.1×10^{-3} feet/foot east-southeast

dL = 425

425 feet

UST AREA

dh = 2

2 feet = 1.5×10^{-2} feet/foot southeast

dL = 130

130 feet

VERTICAL HYDRAULIC GRADIENT CALCULATIONS

MW-101 and PZ-101

dh = -0.53 feet

-0.53 feet = 3.8×10^{-2} feet/foot upward

dL = -14 feet

-14 feet

MW-102 and PZ-102

dh = 0.06 feet

 $0.06 \text{ feet} = 3.8 \times 10^{-3} \text{ feet/foot downward}$

dL = -16 feet

-16 feet

APPENDIX C SOIL BORING LOGS AND ABANDONMENT FORMS

State				D C	esources	Route	To: lid Waste	Г	SOIL BORING LOG INFORMATOR Haz. Waste Form 4400-122 Rev. 1										RMATION Rev. 5–92
Бераг	mene	01 140		110	ssources	□ Em	ergency Respon stewater perfund	se 🗜		ground Resou		i		FU	1111 440	00-12	.2		
	y/Proj			[ni	vestigation-10			<u> </u>	Licen	se/Per	mit/Mor	nitoring	Numbe	er .	Boring SB-101		er		Page 1 of 1
	Drille	By (Firm r	nam	e and name o		chief)		Date 08/18		Starte	đ	Date Drilling Completed 08/18/95				Drilling Method 4-1/4" (ID) HSA		
DNR F	acility	Well N	o. Þ	VI U	Jnique Well No.	,	Common Well Na SB-101	me	Final Feet	Water I	Surfac Feet		ation	Borehole Diameter 8 inches					
Boring Location Feet N State Plane Feet E SE 1/4 of Ne 1/4 of Section 6, T8N, R21									Lat Long	•			Local	Grid Lo	cation N S	(if ap) <i>E</i> <i>W</i>	
County	,	· · · · · ·						DNR (County	Code	Civil To			Village					
Sam						· <u>·</u>										Prope	erties		
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet			and Ge	ock Description ologic Origin For th Major Unit			nscs	Graphic Log	Weil Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid	Plasticity Index	P 200	RGD/ Comments
			E					ASPH	777										
SB-101 (3.5) SB-101 (8.5)	24		2 4 6 8 10 12 14 16 18 2 2 2	3	5/3) and versubang. GR petroleum of 7.5-9.5' CL yellowish bro	ry dark AVEL, k dor (FI AY, bro bwn (10 ne suba	ILT. mottled brow gray (10YR 3/1), ow plasticity, soft LL) wn (7.5YR 5/3), was 178 5/6) mottling, ng. GRAVEL, med moist, no odor	15% fine , moist, u/ 5% tr5%	•	CL (FILL)			110						
· —	by cer ture	rtify	hat th	ne ir	nformation on	this fo	rm is true and c	orrect	to the							1			
		lu	n	<u> </u>	ca /		ye		<u> </u>	Nati	ural Res	BOUTCE	Techn	ology					

This form is authorized by Chapter 144.147 and 62, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

State of Wisconsin Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT Form 3300-5W 11-89

Ill abandonment work shall be performed in accordance with the dmin. Code, whichever is applicable. Also, see instructions on	provisions of Chapters NR 111, NR 112 or NR 141, Wis. back.
	2) FACILITY NAME
Well/Drillhole/Borehole Location SB-101 County	Onginai Well Owner (LE Known) CITGO PETROLEUM COAPORATION
5E 1/4 of NE 1/4 of Sec. 6 : T. 8 N. R. Z1 ☐ ₩	Present Well Owner AS ABOUE
(If applicable) Gov't Lot Grid Number	Street or Route 2316 TERMINAL DRIVE
Grid Location 5 T F T W	City, State, Zip Code ARLINGTON HEIGHTS IL 60065
Civil Town Name	racinty Weil No. and/or Name (If Applicable) WI Unique Weil No.
CITY OF IT INWAUKEE	Reason For Abandonment
Street Address of Weil 9235 NORTH 107TH STREET	COMPLETION OF BORING Date of Abandonment
City, Village CITY OF MILWAUKEE	08 18 195
WELL/DRILLHOLE/BOREHOLE INFORMATION	
(3) Original Weil/Drillhole/Borehole Construction Completed On	(4) Depth to Water (Feet)
(Date) 08/18/95	Pump & Piping Removed? Yes No Not Applicable
	Liner(s) Removed? Yes No Mot Applicable
Monitoring Well Construction Report Available?	Screen Removed? Yes Not Applicable
☐ Water Well ☐ Yes ☐ No NA	Casing Left in Place? Yes No
Drillhole	If No. Explain ALL DRILL CASING
Borehole	Was Casing Cut Off Below Surface? Yes 18 No
Construction Type:	
■ Drilled □ Driven (Sandpoint) □ Dug	
Other (Specify)	If Yes, Was Hole Recopped? Yes No
	(5) Required Method of Placing Sealing Material
Formation Type:	Gonductor Pipe-Gravity Conductor Pipe-Pumped
Unconsolidated Formation Bedrock	Dumo Bailer Other (Explain)
Total Weil Depth (ft.) 9.5 Casing Diameter (ins.) NA	(0) Seating Materials For monitoring wells and
(From groundsurface)	Neat Cement Grout monitoring well boreholes only
(From groundstrate)	Sand-Cement (Concrete) Grout
Casing Depth (ft.) NA	Concrete Bentonite Pellets
Casing Deput (IL)	☐ Clay-Sand Slurry ☐ Granular Bentonite
Was Well Annular Space Grouzzi? Yes No Unknown	Bentonite-Sand Slurry Bentonite - Cement Grout
If Yes, To What Depth? Feet	Chipped Bentonite
	No. Yards.
(7) Sealing Material Used	From (FL) To (FL) Sacks Sealant Mix Ratio or Mud Weight or Volume
3/8" CHIPPED BENTONITE	Surface 9.5
(8) Comments:	
(9) Name of Person or Firm Doing Sealing Work	(10) FOR DNR OR COUNTY USE ONLY
$\Delta (1)$	to measure and the contract of
	†
Signature of Prison Doing Work Date Signed	Renewer/Inspector:
Street or Route Telephone Number	
(')	Follow-up Necessary
City, State, Zip Code	
•	

DNR/COUNTY

Depar	tment	of Na	itural		J Solid Waste] Emergency Respor] Wastewater	nse 🗏	JHaz. 1 ⊈Under]Water	ground	d Tanks			Fo	rm 44	00-12	22		Rev. 5-92	
					Superfund	_] Other										Page 1 of	
Litgo	y/Proje Bulk Te	ect Na erminal	me //Site l	Investigation (1096	s)		Licen	se/Per	mit/Mor	itoring	Numbe	er	Boring SB-10.		er			
Boring		By (Firm na	ame and name of c			Date 08/18	_	Starte	d	Date 0		Completed Drilling Method 4-1/4" (ID) F					
DNR F	acility	Well N	o. W	Unique Well No.	Common Well Na	eme	Final Feet		Water i	.evel	Surfac 732.35				Borehole Diameter 8 inches			
State			f Sect	ion 6, T8N, R21	Feet N Feet E		Lat Long	•			Local Grid Location (if applicable) 1852.3 feet N 1882.9 feet E S N							
County Milwau	•					DNR (County		Civil To			Village						
Sam														il Properties				
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	I	oil/Rock Description 1 Geologic Origin For Each Major Unit	•		SOSA	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments	
			E	ASPHALT AND	GRAVEL SUBGRADE			ASPH GP										
SBI02 (3.5)	23		4	5/3) & v. dk.	W/ SILT, mottled brow gray (10YR 3/1), 15% f st., soft, moist, petrole	. subar	ng.	CL (FILL)			820							
MW102 (8.5)	24		8	brown (IOYR 5 subang gravel, odor	, brown (7.5YR 5/3), 5 /6) mottling, trc-5% si med plast., hard, sl. r	it, tro f	•	CL										
			12	EOB @ 9.5'														
			14	4														
			18															
			= 20 = 22														į	
			E															
1	by cer	tify th	at the	information on the	is form is true and c	orrect	to the Firm	best o Nat u	f my kn Iral Res	owled ource	ge. Techno	ology						
This f	orm is	author	ized b	y Chapter 144.14	and 62, Wis. State	s. Com	pletion	of this	report	is ma	ndatory	y. Pen	alties: I	Forfeit	t not les	ss		

or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.08, Wis. Stats.

State of Wisconsin

Route To:

SOIL BORING LOG INFORMATION

All abandonment work shall be pudmin. Code, whichever is applied	performed in accordance with the cable. Also, see instructions on t	provisions oback.	of Chapters	s NR 111, NR	112 or NR 141, Wis.
(1) GENERAL INFORMATION	i (2) FACILIT			
Well/Drillhole/Borehole Location S6-102	County MILWAUKEE		Vell Owner (1	i Known) Teoleum	COMPORATION
5E 1/4 of NE 1/4 of Sec		Present W			
(If applicable)	<u></u>	Street or 8	loute		2
Gov't Lot	Grid Number			RMINAL	DRIVE
Grid Location			e. Zip Code	11	- 11 1-001-
ft. N. S.,	ft. 🔲 E. 🗍 W.	HRLI	NGTON	HEIGHT	
Civil Town Name	hwaukee	•	5B-	102	— — — — —
Street Address of Weil			r Abandonm		0-0-1
9235 NORTH	+ 107TH STREET		LETIO	N OF	BORING
	11LWAUKEE	Date of A	banconment	08/18	195
WELL/DRILLHOLE/BOREHOL	E INFORMATION				
(3) Original Weil/Drillhole/Borehole	Construction Completed On	• •	Water (F⇔t)		. FTI No. 1881 Mare Amelicania
(Date) OB			Piping Remo		
		Liner(s) R			
Monitoring Weil	Construction Report Available?	Screen Re			
Water Well	☐ Yes ☐ 1% NA	-	eft in Place?	۰٬ لــا	– λ΄
Drillhole		If No. Ex		u Den	<u>CASING</u>
Borenole	•	Was Cari	EMOU	eiow Surface?	Yes No
				lise to Surface?	Yes No
Construction Type:	- (Sandrajar) Dug			ter 24 Hours?	∏ Yes ≅ No
Drilled Drive	n (Sandpoint) Usug		Was Hole Re		☐ Y≈ ☐ 1/6
Cther (Specify)					<u> </u>
				lacing Sealing Ma	
Formation Type:	□ n	Condi	:ctor Pipc -Gr	• ==	onductor Pipe-Pumped
Unconsolidated Formation	☐ Becirock	Dume			ther (Explain)
Total Well Depth (ft.) 9.5	Casing Diameter (ins.) NA	(6) Seating A			For monitoring wells and
(From groundsurface)			Cament Grou		monitoring well boreholes only
,		. =		ncrese) Grout	
Casing Depth (ft.) NA		Conc		i	Bentonite Pellets
<u> </u>			Sand Slurry	i !	Granular Bentonite
Was Well Annular Space Groute	d? 🔲 Yes 🗌 No 🔲 Unknown		mic-Sand Si		Bentonite - Cement Grout
If Yes, To What Depth?	Feet	Chip	ped Bentonius		
(7) Sealing Ma	uerial Used	From (FL)	To (Ft)	No. Yards. Sacks Sealant or Volume	Mix Ratio or Mud Weight
21 11 (2	Surface	9.5		
3/8 "CHIPPED !	DENTONITE		(,)		
				}	
		 -	<u> </u>		
				1	
		 			
			<u></u>		
(ŏ) Comments:					
(o) Comments.					
(9) Name of Person or Firm Doing	Sealing Work	(10)			OUNTY USE ONLY
MAWEST ENG	SINEERING SERVICE	→ Date	Received/Ins	peczd	District/County
Morranire of Person Douge Wor.	x Date Signed	*******			
Van Bouller		Ren	ewer/juspeca	CT.	
Sheet or Route	Telephone Number	I			
	()	Folk	ow-up Neces	sary	
City, State, Zip Code					

SOIL BORING LOG INFORMATION State of Wisconsin Route To: ☐ Solid Waste ☐ Haz. Waste Form 4400-122 Rev. 5-92 Department of Natural Resources Underground Tanks ☐ Emergency Response Water Resources ■ Wastewater Other: Superfund Page 1 of 1 **Boring Number** License/Permit/Monitoring Number y/Project Name SB-103 Citgo Bulk Terminal/Site Investigation (1096) Boring Drilled By (Firm name and name of crew chief) Date Drilling Started Date Drilling Completed Drilling Method 4-1/4" (ID) HSA 08/18/95 08/18/95 Midwest Engineering Services Borehole Diameter Final Static Water Level Surface Elevation WI Unique Well No. Common Well Name DNR Facility Well No. 732.37 Feet MSL 8 inches Feet MSL Local Grid Location (if applicable) Feet N **Boring Location** Lat 1843.0 feet ⊠ N 1926.2 feet ⊠ E State Plane Long Feet E $\square s$ SE 1/4 of Ne 1/4 of Section 6, T8N, R21 **DNR County Code** Civil Town/City/ or Village County City of Milwaukee 41 Milwaukee Soil Properties Sample Compressive Strength <u>ء</u> ۾ Depth in Fee! Soil/Rock Description Blow Counts RGD/ Comments Length Att. Recovered Moisture Content **Plasticity** And Geologic Origin For Well Diagram and Type Graphic Log PID/FID Each Major Unit Liquid Limit 200 nscs ASPH ASPHALT & GRAVEL SUBGRADE GP 2 2.5'-4.5' CLAY W/GRAVEL brown (10YR 5/3), 5% black mottling, med subang gravel, 10% silt, SB-103 510 17 (3.5)low plast., soft, v. moist, sl. petroleum odor (FILL) 6 CL 7.5'-9.5' CLAY, brown (7.5YR 5/3), 5% silt, 8 med. plast., trc med- crs sand, hard, sl. moist, SB-103 61 24 (8.5)no odor EOB @ 9.5° 10 eby certify that the information on this form is true and correct to the best of my knowledge. Firm Natural Resource Technology

This form is authorized by Chapters \$4.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

State of Wisconsin Department of Natural Resources

Well/Drillhole/Borehole Location SB-1D3 County SE 1/4 of NE 1/4 of Sec. 6: T. 8 N. R. Z1 N. (If applicable) Gov't Lot Grid Number Grid Location ft. N. S. ft. E. W. Civil Town Name CITY OF MILWAUKEE City, Village CITY OF MILWAUKEE	Present W AS Street or F Z 3 1 Ciry, Stat ARL1 Facility W	Vell Owner (L SO PE ell Owner ABOUE Route	RMINA	
Well/Drillhole/Borehole Location SB-1D3 MILWAUKEE SE 1/4 of NE 1/4 of Sec. 6: T. 8 N. R. ZI (If applicable) Gov't Lot Grid Number Grid Location ft. N. S ft. E. W. Civil Town Name CITY OF MILWAUKEE Street Address of Weil 9235 NORTH 1D7TH STREET City, Village CITY OF MILWAUKEE	Present W AS Street or F Z 3 1 Ciry, Stat ARL1 Facility W	ell Owner ABOUE Route Le TE E. Zip Code NG TON	RMINA	2
SE 1/4 of NE 1/4 of Sec. 6: T. 8 N. R. ZI W.	Present W AS Street or F Z 3 1 Ciry, Stat ARL1 Facility W	ell Owner ABOUE Route Le TE E. Zip Code NG TON	RMINA	2
Grid Location ft. N. S., it. E. W. Civil Town Name CITY OF MIWAUKEE Street Address of Weil 9235 NORTH 107TH STREET City, Village CITY OF MILWAUKEE	AS Street or F Z31 City, Stat ARLI Facility W	ABOU€ ROUTE Le TE e. Zip Code NGTON	RMINAL	DRIVE .
Grid Location ft. N. S it. E. W. Civil Town Name CITY OF MIWAUKEE Street Address of Weil 9235 NORTH 107TH STREET City, Village CITY OF MILWAUKEE	City, State ACLI Facility W	Le TE e. Zip Code NGTON		DRIVE
Grid Location ft. N. S it. E. W. Civil Town Name CITY OF MILWAUKEE Street Address of Weil 9235 NORTH 107TH STREET City, Village CITY OF MILWAUKEE	Ciry, Stat P. C. L. Facility W	e. Zip Code NGTON		DRIVE
ft. N. S., ft. E. W. Civil Town Name CITY OF MILWAUKEE Street Address of Well 9235 NORTH 107TH STREET Ciry, Village CITY OF MILWAUKEE	Facility W	NGTON	HEIGHT	
Civil Town Name CITY OF MILWAUKEE Street Address of Weil 9235 NORTH 107TH STREET City, Village CITY OF MILWAUKEE	гэсшіў W	OC TON	110101	15 1L 60065
CITY OF MILWAUKEE Street Address of Weil 9235 NORTH 107TH STREET City, Village CITY OF MILWAUKEE		SIT MOT TITLE		
Street Address of Well 9235 NORTH 107TH STREET City, Village CITY OF MILWAUKEE	9 and an Go	جري .	- 103	Temple) WI Oundrie Well Ivo
9235 NORTH 107TH STREET City OF MILWAUKEE		or Abandonm		
City, Village CITY OF MILWAUKEE		WETION		BORING
CITY OF MILWAUKEE		bandonment		
TO THE PERSON OF		Julio 2000	08/18	, 195
VELL/DRILLHOLE/BOREHOLE INFORMATION				
Original Weil/Drillhole/Borenole Construction Completed On	• •	Water (F⇔t)		
(Date) 08/18/95		Piping Remo		es 🗌 No 🖥 Not Applicate
	Line(s) R		<u> </u>	es 🗌 No 📕 Not Applicat
Monitoring Weil Construction Report Available?	Screen Re		L. 1	🕿 🔲 🌇 Mot Applicat
Water Well Yes NA	_	eft in Place?	~~	ස මූ %
Drillhole		plain <u>A</u>		_ CASING
Borehole		EMOUE	<u> </u>	- C7 V = V-
			elow Surface?	Yes No
Construction Type:			ise to Surface?	≣ Y≈ □ % □ Y≈ ≡ %
Drilled Driven (Sandpoint) Dug			er 24 Hours?	
Other (Specify)	ľ	Was Hoie Re		☐ Y¤ ☐ №
	(5) Recurred	Method of P!	acing Sealing M	
Formation Type:	■ Condi	:ctor Pipe -Gr	avity 🔲 C	onductor Pipe-Pumped
Unconsolidated Formation Bedrock	Dump			Other (Explain)
Total Well Depth (ft.) 9.5 Casing Diameter (ins.) NA	(6) Seating M	laterials		For monitoring wells and
(From groundsurface)	☐ Near	Cement Grou	t	monitoring well boreholes
(Sand-	Canent (Con	crete) Grout	_
Casing Depth (ft.) NA	Conc	ater	1	Bentonite Pellets
		Sand Slurry	į	Granular Bentonite
Was Well Annular Space Grouted? Yes No Unknown		mic-Sand Siv		Bentonite - Cement Gro
If Yes, To What Depth?	Chips	ed Bentonite	1	
			No. Yaras.	Mix Ratio or Mud Weigh
Sealing Material Used	From (FL)	To (FL)	Sacks Sealant or Volume	MILE RANGE OF MILES IN CIGIT
21 11 0	Surface	0 =		
3/8 CHIPPED BENTONITE	04.44	9.5		
	1		<u> </u>	
	1			
	<u> </u>		<u> </u>	
	!		<u> </u>	
(8) Comments:				
	((10))	FOR	DNR OR C	OUNTY USE ONLY
and the second s				District/County
(9) Name of Person or Firm Doing Sealing Work	- 1000	Kecevening	oected.	Engrandenme Summer
NAWEST ENGINEERING DERVICE	+>	Received/Ins	pected	District comes
(9) Name of Person or Firm Doing Sealing Work NOWERV ENGINEERING SERVICE AND DOING WORK Date Signed	200000	ewer/juspecin Kecerved/ius		Differentia
NOWERT ENGINEERING DERVICE Righanure of Person Doing Webx Date Signed M DATE	Ren	ewer/Inspecio		, Duti-denger,
NOWERT ENGINEERING DERVICE	Revi		I.	, Duit-feam,

DNR/COUNTY

State of Wisconsin Route To: ☐ Haz. Waste ☐ Solid Waste Form 4400-122 Rev. 5-92 Department of Natural Resources Underground Tanks ☐ Emergency Response □ Wastewater ☐ Water Resources Other: Superfund Page 1 of 1 y/Project Name Boring Number License/Permit/Monitoring Number SB-104 (log for MW-102 & PZ-102) Citgo Bulk Terminal/Site Investigation (1096) **Drilling Method** Date Drilling Completed Date Drilling Started Boring Drilled By (Firm name and name of crew chief) 4-1/4" (ID) HSA 08/17/95 08/17/95 Midwest Engineering Services Surface Elevation Borehole Diameter Common Well Name Final Static Water Level WI Unique Well No. DNR Facility Well No. 731.6 Feet MSL 8 inches Feet MSL Local Grid Location (if applicable) Feet N Boring Location Lat 1824 feet ⊠ N 1871 feet 🛛 E State Plane Long ' Feet E $\Box s$ SE 1/4 of NE 1/4 of Section 6, T8N, R 21 Civil Town/City/ or Village **DNR County Code** County City of Milwaukee Milwaukee Soil Properties Sample Compressive Strength in Feet ය 🕃 Soil/Rock Description Blow Counts RQD/ Comments Length Att. Recovered Moisture Content And Geologic Origin For and Type PID/FID Diagram Graphic Plasticit Index Depth | Each Major Unit Liquid Limit P 200 nscs ¥e ASPH ASPHALT & GRAVEL SUBGRADE GP 2 2'-4' CLAY, yellowish brown (10YR 5/4), 10% 58-104 dark yellowish brown (10YR 4/6) mottling, tro 16 CL (FILL) (3) black mottling, 5-10% f. subang gravel, med. water @ plast., firm, moist-v. moist, no odor, (FILL) 4 6 7'-9' CLAY, brown (10YR 4/3), Ittl silt, trc f. subang gravel, med plast., firm, moist, no odor SB-104 8 CL RI 17 21 (8) 10 12 12'-14' SAND, It brownish gray (2.5Y 6/2), prly SP SB-104 graded, Ittl silt, f., subrnd-rnd, soft, wet 34 23 52 (13) E08 @ 14' 20 22 ==eby certify that the information on this form is true and correct to the best of my knowledge. **≡**ture Natural Resource Technology

SOIL BORING LOG INFORMATION

This form is authorized by Chapter 144.147 and 62, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.08, Wis. Stats.

State of Wisconsin Department of Natural Resources

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. —\dmin. Code, whichever is applicable. Also, see instructions on back.

(i) GENERAL INFORMATION	(2) FACILITY NAME
Councy	Onginal Well Owner (Li Known)
Location SB-104 MILWAUKEE	CITGO PETROLEUM CORPORATION
	Present Well Owner
5E 1/4 of NE 1/4 of Sec. 6 : T. 8 N: R. ZI W	AS ABOUT
(If applicable)	Street or Route
Gov't Lot Grid Number	2316 TERMINAL DRIVE
Grid Location	Ciry, State, Zip Code
ft. N. S.,ft. E. W.	ARLINGTON HEIGHTS IL 60065
Civil Town Name	Facinity Weil No. and/or Name (It Applicante) WI Unique Weil No.
CITY OF MILWAUKEE	5B-104
Street Address of Weil	Reason For Abandonment
9235 NORTH 107TH STREET	COMPLETION OF BORING
City, Village	Date of Abandonment
CITY OF MILWAUKEE	08/17/95
WELL/DRILLHOLE/BOREHOLE INFORMATION	
(3) Original Well/Dnillhole/Borenole Construction Completed On	(4) Deput to Water (Feet) 79
00 1.7 100	Pumo & Piping Removed? Yes No Not Applicable
(Date) UB 17 195	Lines(s) Removed? Yes No Mot Applicable
Monitoring Weil Construction Report Available?	Screen Removed? Yes Yes Not Applicable
	Casing Left in Place? Yes No
U water weit	If No. Explain ALL DRILL CASING
Drillhole	REMOUED
Borehole	Was Casing Cut Off Below Surface? Yes No
	Did Sealing Material Rise to Surface? Yes No
Construction Type:	Did Material Settle After 24 Hours? Yes No
The pure Caucions —	If Yes, Was Hole Recopped? Yes No
Cther (Specify)	
	(5) Required Method of Placing Sealing Material
Formation Type:	■ Conductor Pipe-Gravity Conductor Pipe-Pumped
Unconsolidated Formation Bedrock	Dump Bailer Other (Explain)
Total Well Depth (ft.) 14 Casing Diameter (ins.) NA	(6) Seating Materials For monitoring wells and
Total Well Depart (III)	Neat Cement Grout monitoring well boreholes only
(From groundsurface)	Sand-Cement (Concrete) Grout
Casing Denth (ft) NA	Concrete ! Bentonite Pellets
Casing Depth (ft.) NH	Granular Bentonite
Was Wall Angular Space Contract? Yes No T Unknow	
Was Well Annual Space Cloudes.	Chipped Bentonite
If Yes, To What Depth?	
(7) Sealing Material Used	From (FL) To (FL) Sacks Sealant Mix Ratio or Mud Weight
Seating Material Oser	or Volume
21 11 0	Surface 14
3/8 CHIPPED BENTONITE	
(8) Comments:	
(9) Name of Person or Firm Doing Sealing Work	(10) FOR DNR OR COUNTY USE ONLY
MIRWEST ENGINEERING SERVICE	Date Received/Inspected District/County
Signature of Person Doing Work Date Signed	
	Keviewei/Juspector
Street or Route Telephone Number	
Street of tropine	Follow-up Necessary
City, State, Zip Code	
City, State, Lip Code	- Water Control of the Control of th
PAID	
DNR	COUNTY

SOIL BORING LOG INFORMATION State of Wisconsin Route To: ☐ Haz. Waste ☐ Solid Waste Form 4400-122 Rev. 5-92 Department of Natural Resources ■ Underground Tanks ☐ Emergency Response ■ Wastewater ☐ Water Resources ☐ Superfund Other: Page 1 of 1 License/Permit/Monitoring Number Boring Number ty/Project Name SB-105 (log for MW-103) Citgo Bulk Terminal/Site Investigation (1096) Boring Drilled By (Firm name and name of crew chief) Date Drilling Started Date Drilling Completed Drilling Method 08/17/95 4-1/4" (ID) HSA 08/17/95 Midwest Engineering Services Borehole Dlameter **Surface Elevation** Common Well Name Final Static Water Level DNR Facility Well No. WI Unique Well No. 732.8 Feet MSL 8 inches Feet MSL Local Grid Location (if applicable) **Boring Location** Feet N Lat 1913 feet 🖾 N 1827 feet 🖾 E State Plane Feet E Long $\Box s$ \square SE 1/4 of NE 1/4 of Section 6, T8N, R 21 **DNR County Code** Civil Town/City/ or Village County 41 City of Milwaukee Milwaukee Soil Properties Sample Compressive Strength ڪ ري Soil/Rock Description Blow Counts RGD/ Comments Length Att. Recovered And Geologic Origin For Moisture Content Plasticity Depth in Graphic Log and Type PID/FID Each Major Unit Liquid Limit uscs Mel ASPHALT W/ GRAVEL SUBGRADE (FILL) **ASPH** GP (FIL) 2 SB-105 2'-4' CLAY W/ SILT. pale brown (10YR 6/3) & 15 49 CL (FILL) (3) yellowish brown (10YR 5/6), low-med plast., firm, trc f. gravel, moist, no odor (FILL) 6 7'-9' CLAY, brown (10YR 5/3) few vf. lamin. SB-105 silt - dark yellowish brown (IOYR 4/6) & 61 23 8 10 greenish gray (10Y 6/1), trc f-med subang (8) CL gravel, med-high plast., hard, moist, no odor - 10 12 12'-14' SAND, light brownish gray (2.5Y 6/2), SB-105 prly graded, 5% silt , f., subrnd, compact, wet, SP 97 18 34 (13) no odor 14 E08 @ 14' 16 20 22 eby certify that the information on this form is true and correct to the best of my knowledge. Firm sture Natural Resource Technology This form is authorized by Chapters 144.147 and 162, Vis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days,

or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.08, Wis. Stats.

dmin. Code, whichever is applicable. Also, see instructions on bacterial descriptions of bacteri				NR 112 or NR 141,								
Well/Drillhole/Borehole County	FACILITY	NAME										
Well/Dillinde/Borenote		ell Owner (I	í Known)	^								
		,0 PE	TEOLEU	m Comport	MOITS							
5E 1/4 of NE 1/4 of Sec. 6 : T. 8 N. R. ZI N		H&oU€										
(If applicable)	Street or R			00								
Gov't Lot Grid Number			RMINA	- DRIVE	· · · · · · · · · · · · · · · · · · ·							
Grid Location		., Zip Code	HEIGH	HTS IL 60	065							
ft. N. S., ft. E. W.	Facility Me	il No. andio	r Name (II A									
Civil Town Name		B-10										
CITY OF IT INWAUKEE		r Abandonm										
9235 NORTH 107TH STREET		LE TIO		= BORING								
City, Village	Date of At	andonment	00 1	7 105								
CITY OF MILWAUKEE			08 11	7 195								
WELL/DRILLHOLE/BOREHOLE INFORMATION		V										
(3) Original Weil/Drillhole/Borenole Construction Completed On (4)	•	Vater (Feet)	79'	V.	Amplicabia							
(Date) 08/17/95		iping Remo	ved? 📙		A pp licable							
	Liner(s) Re		닏		Applicable Applicable							
Monitoring Weil Construction Report Available?		nover: ñ in Place?	님	Yes No	Whonczoie							
☐ Water Well ☐ Yes ☐ No NA	If No. Ext		\cup \bigcap_{e}^{\square}	CASING								
☐ Drillhole		EMOU		ILL CHAING								
Borenole			eiow Surface	? Yes No								
· ·			lise to Surface									
Construction Type:			er 24 Hours?									
Eriller (Sancount)		Was Hoie Re		☐ Yes ☐ %								
Other (Specify)	2 equired !	Mernori or 21	acing Sealing	Material								
Formation Type:		etor Pipe -Gr		Conductor Pipe-Pumpex	ł							
Unconsolidated Formation Bedrock			····	Other (Explain)	-							
	Dumo Bailer Other (Explain) (0) Sealing Materials For monitoring wells and											
Total Well Debut (IL)	-	Cement Grov	:t	monitoring well bo								
(From groundsurface)			crese) Grout									
Casing Depth (ft.) NA	Conce	ete		Bentonite Pellet	s ·							
	Clay-	Sand Slurry	Clay-Sand Slurry Granular Bentonite									
	= -			. —								
		nice-Sund Si		Bentonite - Cert								
Was Well Annular Space Groutze? Yes No Unknown		nive-Sand Si ed Benvonive		, =								
Was Weil Annular Space Grouted? Yes No Unknown If Yes, To What Depth?	Chipp	ed Bentonite	No. Yard	Bentonite - Cerr	eut Gront							
Was Weil Annular Space Grouted? Yes No Unknown If Yes, To What Depth?				Bentonite - Cerr	eut Gront							
Was Weil Annular Space Grouted? Yes No Unknown If Yes, To What Depth? Feet Sealing Material Used	Chipp From (FL)	ed Bentonite To (Ft.)	No. Yardı Sacks Seala	Bentonite - Cerr	eut Gront							
Was Weil Annular Space Grouted? Yes No Unknown If Yes, To What Depth? Feet Sealing Material Used	Chipp	ed Bentonite	No. Yardı Sacks Seala	Bentonite - Cerr	ent Grom							
Was Weil Annular Space Grouted? Yes No Unknown If Yes, To What Depth? Feet Sealing Material Used	Chipp From (FL)	ed Bentonite To (Ft.)	No. Yardı Sacks Seala	Bentonite - Cerr	ent Gront							
Was Weil Annular Space Grouted? Yes No Unknown If Yes, To What Depth? Feet Sealing Material Used	Chipp From (FL)	ed Bentonite To (Ft.)	No. Yardı Sacks Seala	Bentonite - Cerr	eut Gront							
Was Weil Annular Space Grouted? Yes No Unknown If Yes, To What Depth? Feet Sealing Material Used	Chipp From (FL)	ed Bentonite To (Ft.)	No. Yardı Sacks Seala	Bentonite - Cerr	eut Gront							
Was Weil Annular Space Grouted? Yes No Unknown If Yes, To What Depth? Feet Sealing Material Used	Chipp From (FL)	ed Bentonite To (Ft.)	No. Yardı Sacks Seala	Bentonite - Cerr	eut Gront							
Was Weil Annular Space Grouted? Yes No Unknown If Yes, To What Depth? Feet Sealing Material Used	Chipp From (FL)	ed Bentonite To (Ft.)	No. Yardı Sacks Seala	Bentonite - Cerr	ent Grom							
Was Weil Annular Space Groutzi? Yes No Unknown If Yes, To What Depth? Sealing Material Used 3/8 CHIPPED BENTONITE	Chipp From (FL)	ed Bentonite To (Ft.)	No. Yardı Sacks Seala	Bentonite - Cerr	eut Gront							
Was Weil Annular Space Grouted? Yes No Unknown If Yes, To What Depth? Feet Sealing Material Used	Chipp From (FL)	To (FL)	No. Yardi Sacks Seala or Volume	S. Mix Ratio or Muce	i Weight							
Was Well Annular Space Groutzi? Yes No Unknown If Yes, To What Depth? Sealing Material Used 3/8 "CHIPPED BENTONITE (8) Comments:	Chipp From (FL) Surface	ed Bentonite To (Ft.) '-	No. Yardi Sacks Seala or Volume	S. Mix Ratio or Muce Mix Ratio or Muce	i Weight							
Was Well Annular Space Grouze? Yes No Unknown If Yes, To What Depth? Feet Vest No Unknown	Chipp From (FL) Surface	To (FL)	No. Yardi Sacks Seala or Volume	S. Mix Ratio or Muce	i Weight							
Was Well Annular Space Grouze? Yes No Unknown If Yes, To What Depth? Feet Vest No Unknown	Chipp From (FL) Surface ((10)) Dine	EO Received/Ins	No. Yardi Sacks Seala or Volume	S. Mix Ratio or Muce Mix Ratio or Muce	i Weight							
Was Well Annular Space Grouzei? Yes No Unknown If Yes, To What Depth? Feet Vest No Unknown	Chipp From (FL) Surface ((10)) Dine	ed Bentonite To (Ft.) '-	No. Yardi Sacks Seala or Volume	S. Mix Ratio or Muce Mix Ratio or Muce	i Weight							
Was Well Annular Space Grouze? Yes No Unknown If Yes, To What Depth? Feet Vest No Unknown	Chipp From (FL) Surface ((10)) Dine Revie	FOE Received/Inspector	No. Yardi Sacks Seala or Volume	S. Mix Ratio or Muce Mix Ratio or Muce	i Weight							
Was Well Annular Space Grouted? Yes No Unknown If Yes, To What Depth? Feet The Ped Sealing Material Used The Ped Sentonite Was Well Annular Space Grouted? Yes No Unknown Feet The Ped Sealing Material Used The Ped Sentonite Was Well Annular Space Grouted? Yes No Unknown Feet The Ped Sealing Material Used The Ped Sealing Mork Was Well Annular Space Grouted? Yes No Unknown Feet The Ped Sealing Material Used The Ped Sealing Mork The Ped Sealing Work	Chipp From (FL) Surface ((10)) Dine Revie	EO Received/Ins	No. Yardi Sacks Seala or Volume	S. Mix Ratio or Muce Mix Ratio or Muce	i Weight							

DNR/COUNTY

SOIL BORING LOG INFORMATION State of Wisconsin Route To: Department of Natural Resources ☐ Solid Waste ☐ Haz. Waste Form 4400-122 Rev. 5-92 ☐ Emergency Response ☑ Underground Tanks ☐ Water Resources ■ Wastewater Other: ☐ Superfund Page 1 of 1 License/Permit/Monitoring Number .y/Project Name Boring Number Citgo Bulk Terminal/Site Investigation (1096) SB-106 (log for MW-111) Boring Drilled By (Firm name and name of crew chief) Date Drilling Started Date Drilling Completed **Drilling Method** Midwest Engineering Services 08/24/95 08/24/95 4-1/4" (ID) HSA Surface Elevation Borehole Diameter DNR Facility Well No. WI Unique Well No. Common Well Name Final Static Water Level Feet MSL 732.69 Feet MSL 8 inches Local Grid Location (if applicable) Boring Location Feet N Lat 1860.1 feet ⊠ N 1589.5 feet ⊠ E State Plane Feet E Long $\Box s$ SE 1/4 of NE 1/4 of Section 6, T8N, R21 **DNR County Code** Civil Town/City/ or Village County City of Milwaukee Milwaukee 41 Sample Soil Properties Compressive Strength Feet *a* ∈ Soil/Rock Description Blow Counts RQD/ Comments Length Att. Recovered and Type And Geologic Origin For Moisture Content Plasticity Graphic Log Well Diagram Depth in PID/FID Each Major Unit Liquid Limit uscs Index 200 0 GRAYEL, crs., ang., (FILL) GP (FILL) O - 2 CLAY W/ GRAVEL, brown (10YR 5/3) med. SB-106 plast., f.-crs. subang grave I, soft, sl. moist, 13 10 (FILL) (3.5)no odor (FILL) 6 7.5'-9.5' SILTY SAND. It yellowish brown (2.5Y 8 BB-10€ 6/3), prly graded, f., subrnd, trc clay, soft, wet, 8 32 (8.5)no odor - 10 SM 12 5% clay, light olive brown (2.5Y 5/3) SB-106 19 25 (13.5)- 14 EOB @ 14.5° 16 18 20 22 eby certify that the information on this form true and correct to the best of my knowledge. Firm Natural Resource Technology This form is authorized by Chapters 14.147 and 182, dis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less

than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 182.06, Wis. Stats.

Il abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Idmin. Code, whichever is applicable. Also, see instructions on back. FACILITY NAME GENERAL INFORMATION Onginal Well Owner (If Known) County Well/Drillhole/Borehole MILWAUKEE COMPORATION PETROLEUM CITGO Location 5B-106 Present Weil Owner N. R. ZI <u>5E 1/4 of NE</u> 1/4 of S∞. AS ASOU€ Street or Route (If applicable) TERMINAL جا314 Grid Number Gov't Lot City, State, Zip Code Grid Location HRLINGTON HEIGHTS 60065 ft. 🔲 E. 🔲 W. f. \square N. \square Facility Well No. and/or Name (II Applicable) WI Unique Well No. Civil Town Name 5B-106 11 how Aukee ITY OF Reason For Abandonment Street Address of Weil BORING OF Stree t DWDRELION 9235 NORTH Date of Abandonment City, Village 124 95 08 MILWAUKEE CITY OF WELL/DRILLHOLE/BOREHOLE INFORMATION Original Weil/Dnilhole/Borenole Construction Completed On Depth to Water (Feet) 47.5 Yes No Not Applicable Pump & Piping Removed? 081 24195 (Date) Liner(s) Removed? Yes Not Applicable Yes 🗍 No 🚪 Not Applicable Screen Removed? Construction Report Available? Monitoring Well Casing Left in Place? Yes NA ☐ Yes □ № Water Well If No. Explain ASING Drillhole REMOUED Borehole Yes No Was Casing Cut Off Below Surface? Did Sealing Material Rise to Surface? Construction Type: Yes 🖀 No Dug Did Material Settle After 24 Hours? Drilled Driven (Sandpoint) If Yes, Was Hole Recopped? Y5 | % Other (Specify) (5) Required Method of Placing Seating Material Formation Type: Conductor Pipe-Pumped Conductor Pice-Gravity Unconsolidated Formation ☐ Becirock Dumo Bailer Other (Explain) For monitoring wells and Total Well Depth (ft.) 14.5 Casing Diameter (ins.) NA Sealing Materials Meat Cement Grout monitoring well boreholes only (From groundsurface) Sand-Cament (Concrete) Grout Concrete Bentonite Pellets AM Casing Depth (ft.) Granular Bentonite Clay-Sand Slurry Bentonite - Cement Grout Benconice-Sand Siury Yes No Unknown Was Well Annular Space Grouted? Chipped Bentonite If Yes, To What Depth? No. Yaras. \bigcirc Sacks Sealant or Volume Mix Ratio or Mud Weight To (FL) From (FL) Sealing Material Used Surface BENTONITE 14.5 HIPPED Comments: (10) FOR DNR OR COUNTY USE ONLY (9) Name of Person or Firm Doing Sealing Work District/County Date Received/Inspected SEWICE! NGINEERING Date Signed Renewer/Inspector Telephone Number Street or Route () Follow-up Necessary City, State, Zip Code

State Depar				Res	sources 0	te To: Solid Waste Emergency Respon Jastewater	ise 🛮] Haz. V ■ Under] Water	groun		i.			OIL BO rm 44				RMATION Rev. 5-92		
	h. /Ben i	not Na				Superfund		Other:	:		itorine	Numbe	-	Boring	Numb	ar		Page 1 of 1		
Lity	Bulk To	erminal	/ Site	In	vestigation (109	6)		Licens		mit/ MOI	mroi miş	GP-1								
Briohi	-	onmenta			and name of cre ctors	w chief)		06/07		Starte	d	Date D 06/07		Comple		Drilling I GeoProi				
DNR F	acility	Well No). WI	Un	ique Well No.	Common Well Na	ame	Final:		Water	Level	Surfac 732.4			- 1	Borehole Diameter 2 inches				
State	Locat Plane 4, NE 1,		tion 6	, Tê	8N, R21E	Feet N Feet E		Lat Long	•			Local Grid Location (1854 feet 🖾 N				N 1905 feet 🛛 E				
Count Milwau	-						DNR (County	Code	Civil To			Village							
Sar	nple		·											Soil	Prope	erties				
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet		And G	Rock Description eologic Origin For ach Major Unit			sosn	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RGD/ Comments		
2 m	<u> </u>			t	0'-0.5': <u>ASPHAL</u> T				Aspha			 	0 07							
GP-1 (2)	22		2	\		base fill L brown (IOYR 5/3) nottling, medium plas			<u>GP</u>			430						;		
GP-1 (4)	18		4 4		moist, odor. trace of mot	ding, trace fine san	d, slight	tiy				680								
	23		6 6			trong odor. ight brown (7.5YR 6 5% mottling, slightly			CL.			310								
GP-1 (8)	20		_ 8 	\		brown (10YR 5/2), wet lower 2"	moist, f					100								
GP-1 (10)	23		= 10 =	L	very moist to	met lonel 2		,				61								
			12		END OF PROL	8E @ 11 FEET														
			18 																	
7	<u> </u>	414	_	<u> </u>	ormation on Att-	form in Arun and a	OFFO-1	to the	hes:	of my lea	Orloa	00]				<u></u>	<u></u>		
	ture		et the	e int	I au	form is true and c	OHECL	Firm				Techno	ology							
than	\$10 nor	more f	than \$	5,0	00 for each viola	and 182, Wis. State ation. Fined not le inued violation is a	ess tha	n \$10 o	r more	than \$	100 or	impriso	ned n	ot less	than 3	30 days	3S			

II abandonment work shall be pudmin. Code, whichever is appli	cable. Also, see instructions on	back.	•						
SON COLL INCODAL TION		(2) FACILIT	YNAME						
	Cormer	Ongmai V	/ell Owner (1	Known)	\wedge				
Weil/Drillhole/Borehole Location GP-1	MILWAUKEE	CITO Present W		TROLEUM	COMPORATION				
SE 1/4 of NE 1/4 of Sec. 1	'A: T. 8 N; R. Z1		eii Owner A&o U€						
(If applicable)		Street or 8		RMINA	DRIVE				
Gov't Lot	Grid Number		e, Zip Code	1011011	DAIDE				
Grid Location ft. N. S.,	ft. 🗌 E. 📗 W.	Aeu	NGTON						
Civil Town Name	liwaukee	Расшту W	GP-	r Name (II Appu	WI Unique Well 140.				
Street Address of Well		Reason Fo	r Abandonm	ent					
9235 NORTH	+ 107TH STREET		ETIO	U OF	BORING				
Ciry, Village CITY OF M	TILWAUKEE	Date of A	banconment	06/07	195				
WELL/DRILLHOLE/BOREHOL									
Onginal Weil/Dnilhole/Borenole	Construction Completed On	(4) Deput to	Water (F≈s)						
6 /	107195	Pump &	Piping Remo	ved? Ye	🛪 🔲 No 📕 Not Applicable				
(Date)	10 11 13	Liner(s) R	emoved?	☐ Y					
Monitoring Weil	Construction Report Available?	Screen Re	moved?	☐ Ye	z 🔲 🎾 📕 Not Applicable				
Water Well	YS NA	Casing L	eft in Place?	_ □ Y					
Drillhole		If No. Ex	plain <u>A</u>	u Den	_ CASING				
Borehole	i		Emous						
Poterore				eiow Surface?	Yes No				
Construction Type:				lise to Surface?	Yes 🔲 🖔				
	n (Sandpoint) 🔲 Dug			er 24 Hours?	Yes 1/6				
Other (Specify)	(0	If Yes.	Was Hole Re	mbbeq;	☐ Y¤ ☐ ⅓				
		(5) Required	Method of P	acing Sealing M	aterial				
Formation Type:					onductor Pipe-Pumped				
Unconsolidated Formation	☐ Becirock	☐ Conductor Pipe Gravity ☐ Conductor Pipe Pumped ☐ Dump Bailer ☐ Other (Explain)							
	Casing Diameter (ins.) NA	(6) Seating A			For monitoring wells and				
Total Well Depth (ft.)	Casing Dianese: (np.) 10.1	_	Cement Grou	ıt.	monitoring well boreholes on				
(From groundsurface)		1	Cement (Cor		_				
Casing Depth (ft.) NA		Conc		!	Bentonite Pellets				
Casing Depth (ft.)		Cay-	Sand Slurry	ì	Granular Bentonite				
Was Well Annular Space Grouter	i? Yes No Unknown	1 = '	mice-Sand Si	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	Bentonite - Cement Grout				
If Yes, To What Depth?	Feet		ped Bentonite		_				
(7) Sealing Ma	regial liced	From (FL)	To (FL)	No. Yaras. Sacks Sealant	Mix Ratio or Mud Weight				
25mig 1412				or Volume					
3/8 CHIPPED	SENTONITE	Surface	11						
		1		1	Í				
(8) Comments:									
44.00	Suite Wate	Feior	FOI	R&DNR&OR&G	OUNTY:: USE:: ONL:Y				
O Name of Person or Firm Doing	Sealing Work	(10) Date			OUNTY USE ONLY District/County				
(9) Name of Person or Firm Doing:	INFERING DERUICE	(10) Date	FOR Received/Ers		OUNTY USE ONLY District/County				
O Name of Person or Firm Doing	INFERING DERUICE	Date		pected	OUNTY USE ONLY District/County				
(9) Name of Person or Firm Doing Signature of Person Doing Wor	x Date Signed	Date Rev	Received/Ins	pected	OUNTY USE ONLY District/County				
(9) Name of Person or Firm Doing:	INFERING DERUICE	Date	Received/Ins	oectad u	OUNTY USE ONLY District/County				

State	of Wis	consi	n	Route		_	_					S	OIL BO	ORING	LOG	INFO	RMATION
Depar	tment	of Na	atural I	□ Em	lid Waste ergency Respor stewater	ise 📘] Water	ground Resou	d Tanks irces	;		Fo	rm 44	00-12	2		Rev. 5-92
				LJ Sup	perfund		Other										Page 1 of 1
	:y/Pro) bus/Cit			estigation			Licens	se/Per	mit/Mor	nitoring	Numbe	er	Boring GP-2	Numbe	er		
Briohi	_	onment		ame and name of crew tractors	chief)		Date 06/07		Starte	d	Date Drilling Completed 06/07/95				Drilling Method GeoProbe		
DNR F	acility	Well N	o. WI	Unique Well No.	Common Well Na	ame	Final:		Water I	Level	Surface Elevation Borehole Diameter 732.4 Feet MSL 2 inches					eter	
State	Local Plane		ction 6	s, TBN, R21E		Lat Long				Local Grid Location (if applicable) 1835 feet N 1904 feet E							
County DNR County Code Civil Town/City/ or Village Milwaukee City of Milwaukee																	
Sar	mple					<u> </u>		J					Soil	Prope	rties		
Number and Type	Length Att. G Recovered (in)	Blow Counts	Depth in Feet	And Ged	ock Description ologic Origin For h Major Unit			nscs	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RGD/ Comments
			E	O'-0.5': ASPHALT				Asphal GP	ال ₍)								
GP-2 (2)	17		_2	Gravel base fill 1'-11': CLAY w/ silt. 1				<u> </u>			120						
GP-2 (4)	18		4	grey (IOYR 7/1) mod moist, odor.			irm,				230						
<u></u>	22		E 6	odor. few light brown	htly moist, hard, s (7.5YR 6/3) silt i , 20% mottling, sil	laminatio	ons,	CL			185						
GP-2 (8)	23		- 8 - 1 - 1 - 1 - 1 - 1 - 1	moist.	rown (10YR 5/2),		ı ,				68						
GP-2 (10)	24		E 10	11	et at tip of sampl	ie, slighi	t				55						
I born		tify th	12 14 16 18 20	information on this for		orrect	to the	pest o	f my kn	owied.	Qe.						
 	ture	ary tr	lar ine	ea We	In 13 true and Ci	U11601	Firm	Nati	ıral Res	source	Techno	ology					
ł		W	M	io will	400												

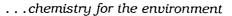
This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

WELL/DRILLHOLE/BOREHOLE ABANDONMENT Form 3300-5W 11-39

Admin. Code, whichever is applicable. Also, see instructions on	provisions of Chapters NR 111, NR 112 or NR 141, Wis. back.							
(i) GENERAL INFORMATION	I(2) FACILITY NAME							
Well/Drillhole/Borehole Location GP-Z County	Criginal Well Owner (Li Known) CITGO PETROLEUM COAPORATION							
SE 1/4 of NE 1/4 of Sec. 6 ; T. 8 N; R. Z1 ₩	Present Well Owner AS ABOU€							
(If applicable)	Street or Route 2316 TERMINAL DRIVE							
	City, State, Zip Code							
Grid Locationft. ☐ N. ☐ S.,ft. ☐ E. ☐ W.	ARLINGTON HEIGHTS IL 60065 Facility Well No. and/or Name (Il Applicable) WI Unique Well No.							
City Of MILWAUKEE	GP-Z							
Street Address of Weil 9235 NORTH 107TH STREET	Reason For Abandonment COMPLETION OF BORING							
City, Village CITY OF MILWAUKEE	Date of Abandonment 06 07 95							
WELL/DRILLHOLE/BOREHOLE INFORMATION								
(2) Original Weil/Drillhole/Borenole Construction Completed On	(4) Depth to Water (Feet) ~//							
(Date) 06 07 95	Pump & Piping Removed? Yes No Not Applicable							
	Liner(s) Removed? Yes Not Applicable Yes Not Applicable							
Monitoring Weil Construction Report Available?	Screen Removed? Yes Not Applicable							
☐ Water Well ☐ Yes ☐ No NA	Casing Left in Place? Yes Yes							
Drillhole	If No. Explain ALL DRILL CASING							
Borehole	<u>REMOUED</u>							
	Was Casing Cut Off Below Surface? Yes No							
Construction Type:	Did Sealing Material Rise to Surface? Yes 1 No							
Drilled Driven (Sancipoint) Dug	Did Material Settle After 24 Hours? Yes No							
Other (Specify)	If Yes, Was Hole Resopped? Yes 16							
·	(5) Required Method of Placing Sealing Material							
Formation Type: Unconsolidated Formation Bedrock	Conductor Pipe-Gravity Conductor Pipe-Pumped Dumo Bailer Carplain)							
Total Well Death (ft.) Casing Diameter (ins.) NA	(6) Sealing Materials For monitoring wells and							
Total Well Depth (ft.) 11 Casing Diameter (ins.) 107 (From groundsurface)	☐ Neat Cement Grout monitoring well boreholes oni							
	Sand-Cement (Concrete) Grout General Bentonite Pellets							
Casing Depth (ft.) NA								
	, =							
Was Well Annular Space Grouzer? Yes No Unknown	Bentonite-Sand Siury Bentonite - Cement Grout							
Was Well Annuiar Space Grouze? Yes No Unknown If Yes, To What Depth?	Chipped Bentonite							
•								
If Yes, To What Depth? Feet Sealing Material Used	Chipped Bentonite No. Yards. Sacks Sealant Mix Ratio or Mud Weight							
If Yes, To What Depth? Feet Sealing Material Used	From (FL) To (FL) Sacks Sealant or Volume Mix Ratio or Mud Weight							
If Yes, To What Depth? Feet Sealing Material Used	From (FL) To (FL) Sacks Sealant or Volume Mix Ratio or Mud Weight							
If Yes, To What Depth? Feet Sealing Material Used	From (FL) To (FL) Sacks Sealant or Volume Mix Ratio or Mud Weight							
If Yes, To What Depth? Feet Sealing Material Used 3/8 11 CHIPPED BENTONITE	From (FL) To (FL) Sacks Sealant or Volume Mix Ratio or Mud Weight							
If Yes, To What Depth? Feet Sealing Material Used Sealing Material Used BENTONITE (8) Comments:	From (Ft.) To (Ft.) Sacks Sealant or Volume Surface							
If Yes, To What Depth? Feet Sealing Material Used Sealing Material Used BENTONITE (8) Comments: (9) Name of Person or Firm Doing Sealing Work	From (Ft.) To (Ft.) Sacks Sealant or Volume Mix Ratio or Mud Weight Surface							
If Yes, To What Depth? Feet Sealing Material Used 3/8 "CHIPPED BENTONITE BENTONITE BY COMMENTS: What Depth? Feet Feet Sealing Material Used Feet Sealing Material Used Feet Sealing Material Used	From (Ft.) To (Ft.) Sacks Sealant or Volume Mix Ratio or Mud Weight Surface							
If Yes, To What Depth? Feet Sealing Material Used 3/8 "CHIPPED BENTONITE (8) Comments: (9) Name of Person or Firm Doing Sealing Work	From (Ft.) To (Ft.) Sacks Sealant or Volume Mix Ratio or Mud Weight Surface							
If Yes, To What Depth? Feet Sealing Material Used CHIPPED BENTONITE BENTONITE BY Name of Person or Firm Doing Sealing Work NIQUEST ENGINEERING SERVICE Signante of Person Doing Work Date Signed	From (Ft.) To (Ft.) Sacks Sealant or Volume Surface							
If Yes, To What Depth? Feet Sealing Material Used 3/8 "CHIPPED BENTONITE BENTONITE BY COMMENTS: What Depth? Feet Feet Sealing Material Used Feet Sealing Material Used Feet Sealing Material Used	From (Ft.) To (Ft.) Sacks Sealant or Volume Surface							
If Yes, To What Depth? Sealing Material Used BENTONITE (8) Comments: (9) Name of Person or Firm Doing Sealing Work MIQUEST ENGINEERING SERVICE Signante of Person Doing Work Date Signed	From (Ft.) To (Ft.) Sacks Sealant or Volume Surface							

DNR/COUNTY

APPENDIX D SOIL SAMPLE ANALYTICAL REPORTS





1795 Industrial Drive Green Bay, WI 54302 414-469-2436

414-469-2436 800-7-ENCHEM

FAX: 414-469-8827

Lab Certification No. 405132750

Location : JACOBUS/CITGO GRAINVILLE TERM.

En Chem Proj# : 9506159 Date Reported : 06/19/1995

Report to: NATURAL RESOURCE TECHNOLOGY, INC

Thank you for using En Chem! Samples were analyzed according to strict EPA or Wisconsin DNR methodology. Any comments or problems associated with the receipt of or analysis are reported below:

Sample no. 144887: Front peaks outside of DRO window, indicating lighter fuels are present.

PVOC soil spike exhibited low percent recoveries on individual compounds except the trimethylbenzenes.

Chromatogram has a typical gasoline pattern. Some peaks were outside of GRO window. Blank spike and Blank spike duplicate were within laboratory limits in the same extraction set. Soil spike results are within acceptable criteria, however low recoveries were observed for individual compounds. This is due to the spiking procedure which requires spiked samples to remain unpreserved for twenty-four hours before adding methanol.

MASTER PROJECT #_	FILE COPY
	DATA



1795 Industrial Drive

Green Bay, WI 54302

414-469-2436

800-7-ENCHEM

FAX: 414-469-8827

...chemistry

Lab Certification No. 405132750

Location : JACOBUS/CITGO GRAINVILLE TERM.

Your Sample ID: SB-01(4) (GP-1)Sample Desc. : PROBE 1/DEPTH 3-5

Sample Matrix : SOIL Date Collected: 06/07/1995 En Chem Proj# : 9506159 Date Received > 06/09/1995

En Chem Proj# : 9506159 Date Received > 06/09/1995
En Chem Lab # : 144887 Date Reported : 06/19/1995

Report to: NATURAL RESOURCE TECHNOLOGY, INC

21005 WATERTOWN ROAD #623 BROOKFIELD, WI 53008-0623

Bill to: NATURAL RESOURCE TECHNOLOGY, INC.

∙nalysis	Parameter	Result	Units	Detection Limit	Prep Method	Prep Date	Analysis Method	Analysis Date	Analyzed By
CILOSTC	Total Solids	85	Percent			•••••	EPA 160.3	06/12/199	S NJS
VOC-S-ME	Benzene	5800	ug/kg	290		06/12/1995	SW846 8020	06/13/1999	5 PMS
	Ethyl Benzene	18000	ug/kg	290					
	Methyl-tert-butyl ether	890	ug/kg	290					
	Toluene	48000	ug/kg	290					
	1,2,4-trimethylbenzene	45000	ug/kg	290					
	1,3,5-trimethylbenzene	14000	ug/kg	290					
	Xylenes, m + p	62000	ug/kg	290					
	Xylene, o	25000	ug/kg	290					
.RO-S	Gasoline Range Organics(GRO)-Soil	670	mg/kg	29		06/12/1995	WDNR MOD GRO	06/13/1995	5 PMS
	Blank spike	102	% recov	50					
	Blank spike duplicate	100	% recov	50					
	Soil spike	73	% recov	50					
RO-S	Diesel Range Organics(DRO)-Soil	120	mg/kg	7.0		06/09/1995	WONR MOD DRO	06/13/1995	5 NJS
	Blank spike		% recov	50					
	Blank spike duplicate	101	% recov	50					
	Soil spike	89	% recov	50					

"ND" Indicates no detectable analyte at or above the listed detection limit. All results reported on a dry weight basis. All subcontracted analyses are performed by Wisconsin DNR certified laboratories.

These results have been reviewed and their authenticity verified by:

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Printed on Reminiad Paner

CHAIN OF CUTY RECORD



																					N R F
Sample Collectors(s)/S REBECCA	Signature(s) J. Kre	PICE	Le	bew	16	lefe	NAT		SOURCE TECHNOLO KFIELD, WISCONSI		•	Laboratory Quote Nur	Sample	s are B lendum	eing Su Numb	ibmitted ber <u>Dr</u>	1 To: _ \ T E <u>(</u>	EN	<u>ς (</u> 04	HEM, IN	№
Site Name: TKO) Site Address: 923	SUS /CI 35 N. I VAUKEE	07 111	STRE	UE T	ERMINA	Natural Re 21005 Wa Brookfield	nager: <u>K/</u> source Tech tertown Roa , WI 53001	nology, Ind d, Box 623 3-0623	o/ <i>le(KY</i> Proj ドルミタビデ Task !	ct Number: _		3	tempera	ature as	recei	erveu or	ice". I	f all of	the ice	lank BOU e remaining, you ma was melted, the temp	
				ntained cu	istody of th	nese samples	as noted bel	ow:						Analy	ytical N	lethod	/ Num	bers	_		Lab Use Only
Relinquished By (Signature) Date/Time OG/09/75 D45 Received By (Signature) Date/Time Received By (Signature) Received By (Signature) Received By (Signature)							4/9/95		/Time /O	43AM											
Relinquished By (Sig	nature)	f) en		ne 7/9/	100	Received By	(Signature	V//t	atte	10/0	/Time	/400 # of	کی	9	3		/ }-/	//	//		Sample Conditions
Field ID Number	Collected	Collected	Media	Device		/ Description		Reading	Field Comments		уре	Cont.	- 9	112	/ 4	15		_		Lab D Number	@ Laboratory
5B-01(4)	06/07/15	1650	SOIL	GED Perpt	PROBE	FH 3-	5		Possible HILL Levels	Wie	TH	3	X	*	X					144887	1-505 it
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GP-1	10/23/95		ļ	,																	*
10.00	10/2/15																				
			<u> </u>							`	-									***************************************	
																			1		,
SPECIAL INSTRUC	TIONS							B	rj# 95	CSI.	59	2	 !		analyti	tory shall cal report	unless	indicated	lotherwis	ys after issuing se below.	



CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

DATE: 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: MW-103 (3)

PROJECT NO: 1096
MATRIX: SOIL

DATE SAMPLED: 08/17/95 11:30:00

DATE RECEIVED: 08/18/95

ANALYTICAL PARAMETER	DATA RESULTS	DETECTION	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB	6.9	LIMIT 5	mg/Kg
Date: 08/21/95 12:24:00			
Total Petroleum Hydrocarbons (DRO) WI LUST DRO # Analyzed by: Date: 08/28/95 10:11:00	5.5	2.9	mg/Kg
Sonication extraction METHOD 3550 *** Analyzed by: BD Date: 08/23/95 11:00:00	08/23/95		
Lead, Total Method 7420 *** Analyzed by: EH Date: 08/22/95 09:42:00	82	10	mg/Kg
Total Solids Method 2540G ** Analyzed by: DB	85.5	0.1	Weight %
Date: 08/29/95 16:00:00			

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed. ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CAG/John Troost, Laboratory Manager



CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL PROJECT NO: 1096 SITE: MILWAUKEE, WI/9235 N 107 ST. MATRIX: SOIL

SAMPLED BY: NATURAL RESOURCE TECH. DATE SAMPLED: 08/17/95 11:30:00

SAMPLE ID: MW-103 (3) **DATE RECEIVED:** 08/18/95

ANALYTICAL DATA							
PARAMETER	RESULTS	MDL*	UNITS				
Dichlorodifluoromethane	ND	14.5	μg/Ko				
Chloromethane	ND	4.0	μg/Ko				
Vinyl chloride	ND	9.0	μg/Ko				
Chloroethane	ND	26.0	μg/Ko				
Trichlorofluoromethane	ND	5.0	μg/Kg				
1,1-Dichloroethene	ND	6.5	μg/Ko				
Methylene Chloride	B 9	4.0	μg/Ko				
trans-1,2-Dichloroethene	ND	5.0	μg/Ko				
1,1-Dichloroethane	ND	3.5	μg/Ko				
2,2-Dichloropropane	ND	2.5	μg/Ko				
cis-1,2-Dichloroethene	ND	0.5	μg/Kg				
Chloroform	ND	2.5	μg/Kg				
1,1,1-Trichloroethane	ND	1.5	μg/Kg				
Carbon Tetrachloride	ND	6.0	μg/Ko				
Benzene	ND	10.0	μg/Kg				
1,2-Dichloroethane	ND	1.5	μg/Kg				
Trichloroethene	ND	6.0	μg/Ko				
1,2-Dichloropropane	ND	2.0	μg/Kg				
Bromodichloromethane	ND	5.0	μg/Ko				
Toluene	ND	10.0	μg/Ke				
1,1,2-Trichloroethane	ND	1.0	μg/Ke				
Tetrachloroethene	ND	1.5	μg/Ko				
1,3-Dichloropropane	ND	1.5	μg/Ko				
Dibromochloromethane	ND	4.5	μg/Ko				
1,2-Dibromoethane	ND	4.0	μg/Ko				
Chlorobenzene	ND	12.5	μg/Ko				
Ethyl benzene	ND	10.0	μg/Ko				
M and P Xylene	ND	10.0	μg/Ke				
O-Xylene	ND	10.0	μg/K				
Isopropylbenzene	ND	10.0	μg/K				
1,1,2,2-Tetrachloroethane	ND	1.5	μg/K				
n-Propyl benzene	ND	0.5	μg/Ke				
Bromobenzene	ND	1.5	μg/K				
1,3,5-Trimethylbenzene	ND	1.0	μg/K				
2-Chlorotoluene	ND	0.5	μg/K				
4-Chlorotoluene	ND	1.0	μg/K				
tert-Butylbenzene	ND	3.0	μg/K				
1,2,4-Trimethylbenzene	ND -	2.5	μg/K				

METHOD: Mod. 8021 (VOC) [SW 846] (continued on next page)



CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-103 (3)

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AN	ALYTICAL DATA (C	continued)	
PARAMETER	RESULTS	MDL*	UNITS
sec-Butylbenzene	ND	1.0	μg/Kg
p-Isopropyltoluene	ND	0.5	μg/Kg
1,3-Dichlorobenzene	ND	16.0	μg/Kg
1,4-Dichlorobenzene	ND	12.0	μ g/Kg
n-Butylbenzene	ND	1.0	μg/Kg
1,2-Dichlorobenzene	ND	7.5	μg/Kg
1,2-Dibromo-3-chloropropan	e ND	150	μg/Kg
1,2,4-Trichlorobenzene	ND	1.5	μg/Kg
Hexachlorobutadiene	ND	1.0	μg/Kg
Naphthalene	ND	3.0	μg/Kg
1,2,3-Trichlorobenzene	ND	1.0	μg/Kg
Di-isopropyl ether	ND	5.0	μg/Kg
Methyl-t-butyl ether	ND	40.0	μg/Kg
SURROGATES	% RI	ECOVERY	

DATE/TIME: 08/29/95 17:27:00 ANALYZED BY: PW

METHOD: Mod. 8021 (VOC) [SW 846]

Fluorobenzene

ND - Not Detected * - Method Detection Limit

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

Laboratory Manager



CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: MW-103 (3)

PROJECT NO: 1096 MATRIX: SOIL

DATE SAMPLED: 08/17/95 11:30:00

DATE RECEIVED: 08/18/95

ANALY	TICAL DATA		
PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	ND	0.06	μg/Kg
Acenaphthylene	ND	0.06	μg/Kg
Acenaphthene	ND	0.06	μg/Kg
Fluorene	ND	0.07	μg/Kg
Phenanthrene	2	0.06	μ g/Kg
Anthracene	ND	0.04	μg/Kg
Fluoranthene	2	0.05	μ g/Kg
Pyrene	2	0.04	μg/Kg
Chrysene	1	0.02	μg/Kg
Benzo (a) anthracene	0.9	0.01	μg/Kg
Benzo (b) fluoranthene	ND	0.01	μg/Kg
Benzo (k) fluoranthene	ND	0.02	μg/Kg
Benzo (a) pyrene	ND	0.03	μg/Kg
Dibenzo (a,h) anthracene	ND	0.02	μg/Kg
Benzo (g,h,i) perylene	0.9	0.03	μg/Kg
Indeno (1,2,3-cd) pyrene	ND	0.02	μg/Kg
1-Methylnaphthalene	ND	0.06	μg/Kg
2-Methylnaphthalene	ND	0.06	μg/Kg
SURROGATES	% REC	COVERY	
9,10-Diphenylanthracene	82		

DATE/TIME: 08/24/95 16:24:00 ANALYZED BY: SJ DATE/TIME: 08/23/95 11:00:00 EXTRACTED BY: BD

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

* - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CAG/John Troost Laboratory Manager





CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

DATE: 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: MW-102 (3)

PROJECT NO: 1096

MATRIX: SOIL

DATE SAMPLED: 08/17/95 10:40:00

DATE RECEIVED: 08/18/95

ANALYTICAL			
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/21/95 12:24:00	ИО	5	mg/Kg
Total Petroleum Hydrocarbons (DRO) WI LUST DRO # Analyzed by: AH Date: 08/26/95 04:03:00	ИD	2.9	mg/Kg
Sonication extraction METHOD 3550 *** Analyzed by: BD Date: 08/23/95 11:00:00	08/23/95		
Lead, Total Method 7420 *** Analyzed by: EH Date: 08/22/95 09:42:00	12	10	mg/Kg
Total Solids Method 2540G ** Analyzed by: DB Date: 08/29/95 16:00:00	85.7	0.1	Weight %

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CAG/John Troost Laboratory Manager



CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: MW-102 (3)

PROJECT NO: 1096
MATRIX: SOIL

DATE SAMPLED: 08/17/95 10:40:00 DATE RECEIVED: 08/18/95

ANALYT	ICAL DATA		
PARAMETER	RESULTS	MDL*	UNITS
Dichlorodifluoromethane	ND	14.5	μg/Kg
Chloromethane	ND	4.0	μg/Kg
Vinyl chloride	ND	9.0	μg/Kg
Chloroethane	ND	26.0	μg/Kg
Trichlorofluoromethane	ND	5.0	μg/Kg
1,1-Dichloroethene	ND	6.5	μg/Kg
Methylene Chloride	B 9	4.0	μg/Kg
trans-1,2-Dichloroethene	ND	5.0	μg/Kg
1,1-Dichloroethane	ND	3.5	μg/Kg
2,2-Dichloropropane	ND	2.5	μg/Kg
cis-1,2-Dichloroethene	ND	0.5	μg/Kg
Chloroform	ND	2.5	μg/Kg
1,1,1-Trichloroethane	ND	1.5	μg/Kg
Carbon Tetrachloride	ND	6.0	μg/Kg
Benzene	ND	10.0	μg/Kg
1,2-Dichloroethane	ND	1.5	μg/Kg
Trichloroethene	ND	6.0	μg/Kg
1,2-Dichloropropane	ND	2.0	μg/Kg
Bromodichloromethane	ND	5.0	μg/Kg
Toluene	ND	10.0	μg/Kg
1,1,2-Trichloroethane	ND	1.0	μg/Kg
Tetrachloroethene	ND	1.5	μg/Kg
1,3-Dichloropropane	ND	1.5	μg/Kg
Dibromochloromethane	ND	4.5	μg/Kg
1,2-Dibromoethane	ND	4.0	μg/Kg
Chlorobenzene	ND	12.5	μg/Kg
Ethyl benzene	ND	10.0	μg/Kg
M and P Xylene	ND	10.0	μg/Kg
O-Xylene	ND	10.0	μg/Kg
Isopropylbenzene	ND	10.0	μg/Kg
1,1,2,2-Tetrachloroethane	ND	1.5	μg/Kg
n-Propyl benzene	ND	0.5	μg/Kg
Bromobenzene	ND	1.5	μg/Kg
1,3,5-Trimethylbenzene	ND	1.0	μg/Kg
2-Chlorotoluene	ND	0.5	μg/Kg
4-Chlorotoluene	ND	1.0	μg/Kg
tert-Butylbenzene	ND	3.0	μg/Kg
1,2,4-Trimethylbenzene	ND	2.5	μg/Kg

METHOD: Mod. 8021 (VOC) [SW 846] (continued on next page)



CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-102 (3)

ANALYT	CAL DATA (co	ntinued)	
PARAMETER	RESULTS	MDL*	UNITS
sec-Butylbenzene	ND	1.0	μg/Kg
p-Isopropyltoluene	ND	0.5	μg/Kg
1,3-Dichlorobenzene	ND	16.0	μg/Kg
1,4-Dichlorobenzene	ND	12.0	μg/Kg
n-Butylbenzene	ND	1.0	μg/Kg
1,2-Dichlorobenzene	ND	7.5	μg/Kg
1,2-Dibromo-3-chloropropane	ND	150	μg/Kg
1,2,4-Trichlorobenzene	ND	1.5	μg/Kg
Hexachlorobutadiene	ND	1.0	μg/Kg
Naphthalene	ND	3.0	μg/Kg
1,2,3-Trichlorobenzene	ND	1.0	μg/Kg
Di-isopropyl ether	ND	5.0	μg/Kg
Methyl-t-butyl ether	ND	40.0	μg/Kg
SURROGATES	•	OVERY	
Fluorobenzene	10	08	

ANALYZED BY: PW DATE/TIME: 08/29/95 17:27:00

METHOD: Mod. 8021 (VOC) [SW 846]

NOTES: * - Method Detection Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CAG/John Troost, Laboratory Manager

LAFAYETTE AREA LAB 500 AMBASSADOR CAFFERY PKWY. SCOTT, LOUISIANA ZIP 70583-8544 PHONE. (318) 237-4775



Certificate of Analysis No. L1-9508804-02

CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: MW-102 (3)

PROJECT NO: 1096
MATRIX: SOIL

DATE SAMPLED: 08/17/95 10:40:00

DATE RECEIVED: 08/18/95

ANALY	CICAL DATA		
PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	ND	0.06	μg/Kg
Acenaphthylene	ND	0.06	μ g/Kg
Acenaphthene	ND	0.06	μg/Kg
Fluorene	ND	0.07	μg/Kg
Phenanthrene	1	0.06	μg/Kg
Anthracene	ND	0.04	μg/Kg
Fluoranthene	ND	0.05	μg/Kg
Pyrene	1	0.04	μg/Kg
Chrysene	ND	0.02	μg/Kg
Benzo (a) anthracene	0.3	0.01	μg/Kg
Benzo (b) fluoranthene	0.8	0.01	μg/Kg
Benzo (k) fluoranthene	0.2	0.02	μg/Kg
Benzo (a) pyrene	0.1	0.03	μg/Kg
Dibenzo (a,h) anthracene	ND	0.02	μg/Kg
Benzo (q,h,i) perylene	ND	0.03	μg/Kg
Indeno (1,2,3-cd) pyrene	ND	0.02	μg/Kg
1-Methylnaphthalene	ND	0.06	μg/Kg
2-Methylnaphthalene	ND	0.06	μg/Kg
SURROGATES	% REC	COVERY	
9,10-Diphenylanthracene	84		

ANALYZED BY: SJ DATE/TIME: 08/24/95 16:24:00 EXTRACTED BY: BD DATE/TIME: 08/23/95 11:00:00

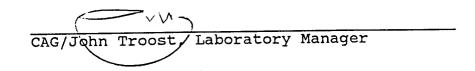
METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

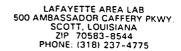
NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993







CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

DATE: 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: MW-105 (3)

PROJECT NO: 1096

MATRIX: SOIL

DATE SAMPLED: 08/16/95 13:50:00

DATE RECEIVED: 08/18/95

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/21/95 12:24:00	ИД	5	mg/Kg
Total Petroleum Hydrocarbons (DRO) WI LUST DRO # Analyzed by: AH Date: 08/26/95 04:50:00	ND	2.9	mg/Kg
Sonication extraction METHOD 3550 *** Analyzed by: BD Date: 08/23/95 11:00:00	08/23/95		
Lead, Total Method 7420 *** Analyzed by: EH Date: 08/22/95 09:42:00	19	10	mg/Kg
Total Solids Method 2540G ** Analyzed by: DB Date: 08/29/95 16:00:00	81.0	0.1	Weight %

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CAG/John Troost, Laboratory Manager





CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: MW-105 (3)

4-Chlorotoluene

tert-Butylbenzene

1,2,4-Trimethylbenzene

PROJECT NO: 1096 MATRIX: SOIL

μg/Kg

μg/Kg

μg/Kg

DATE SAMPLED: 08/16/95 13:50:00 DATE RECEIVED: 08/18/95

ANALYTICAL DATA UNITS MDL* RESULTS PARAMETER μq/Kq 14.5 Dichlorodifluoromethane 4.0 μg/Kg ND Chloromethane ND 9.0 μg/Kg Vinyl chloride ND 26.0 μg/Kg Chloroethane ND 5.0 μg/Kg Trichlorofluoromethane 6.5 ND μg/Kg 1,1-Dichloroethene B 10 4.0 μq/Kq Methylene Chloride 5.0 ND μg/Kg trans-1,2-Dichloroethene ND 3.5 μg/Kg 1,1-Dichloroethane 2.5 μg/Kg ND 2,2-Dichloropropane ND 0.5 μg/Kg cis-1,2-Dichloroethene 2.5 ND μg/Kg Chloroform ND 1.5 μg/Kg 1,1,1-Trichloroethane 6.0 μq/Kq ND Carbon Tetrachloride 10.0 ND μg/Kg Benzene 1.5 ND μg/Kg 1,2-Dichloroethane μg/Kg ND 6.0 Trichloroethene ND 2.0 μg/Kg 1,2-Dichloropropane ND 5.0 μg/Kg Bromodichloromethane ND 10.0 μg/Kg Toluene ND 1.0 μg/Kg 1,1,2-Trichloroethane ND 1.5 μg/Kg Tetrachloroethene ND 1.5 μg/Kg 1,3-Dichloropropane ND 4.5 μg/Kg Dibromochloromethane ND 4.0 μg/Kg 1,2-Dibromoethane 12.5 ND μg/Kg Chlorobenzene 10.0 ND μg/Kg Ethyl benzene 10.0 ND μq/Kq M and P Xylene ND 10.0 μg/Kg O-Xylene μg/Kg ND 10.0 Isopropylbenzene 1.5 μg/Kg ND 1,1,2,2-Tetrachloroethane 0.5 ND μg/Kg n-Propyl benzene ND 1.5 μg/Kg Bromobenzene μg/Kg 1.0 ND 1,3,5-Trimethylbenzene 0.5 μg/Kg ND 2-Chlorotoluene 1.0

> METHOD: Mod. 8021 (VOC) [SW 846] (continued on next page)

ND

ND

ND

3.0

2.5



CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-105 (3)

ANAL	YTICAL DATA (CO	ontinued)	
PARAMETER	RESULTS	MDL*	UNITS
sec-Butylbenzene	ND	1.0	μg/Kg
p-Isopropyltoluene	ND	0.5	μg/Kg
1,3-Dichlorobenzene	ND	16.0	μg/Kg
1,4-Dichlorobenzene	ND	12.0	μg/Kg
n-Butylbenzene	ИD	1.0	μg/Kg
1,2-Dichlorobenzene	ND	7.5	μg/Kg
1,2-Dibromo-3-chloropropane	ND	150	μg/Kg
1,2,4-Trichlorobenzene	ND	1.5	μg/Kg
Hexachlorobutadiene	ND	1.0	μg/Kg
Naphthalene	ND	3.0	μg/Kg
1,2,3-Trichlorobenzene	ND	1.0	μg/Kg
Di-isopropyl ether	ND	5.0	μg/Kg
Methyl-t-butyl ether	ND	40.0	μg/Kg
SURROGATES	% REC	COVERY	
Fluorobenzene	10	08	

ANALYZED BY: PW DATE/TIME: 08/29/95 17:27:00

METHOD: Mod. 8021 (VOC) [SW 846]

NOTES: * - Method Detection Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CAG/John Troost, Laboratory Manager





CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: MW-105 (3)

PROJECT NO: 1096
MATRIX: SOIL

DATE SAMPLED: 08/16/95 13:50:00

DATE RECEIVED: 08/18/95

ANALY	TICAL DATA		
PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	ND	0.06	μg/Kg
Acenaphthylene	ND	0.06	μg/Kg
Acenaphthene	ND	0.06	μg/Kg
Fluorene	ND	0.07	μg/Kg
Phenanthrene	ND	0.06	μg/Kg
Anthracene	ND	0.04	μg/Kg
Fluoranthene	ND	0.05	μg/Kg
Pyrene	ND	0.04	μg/Kg
Chrysene	ND	0.02	μg/Kg
Benzo (a) anthracene	ND	0.01	μg/Kg
Benzo (b) fluoranthene	ND	0.01	μg/Kg
Benzo (k) fluoranthene	ND	0.02	μg/Kg
Benzo (a) pyrene	ND	0.03	μg/Kg
Dibenzo (a,h) anthracene	ND	0.02	μg/Kg
Benzo (g,h,i) perylene	ND	0.03	μg/Kg
Indeno (1,2,3-cd) pyrene	ND	0.02	μg/Kg
1-Methylnaphthalene	ND	0.06	μg/Kg
2-Methylnaphthalene	ND	0.06	μg/Kg
SURROGATES	% REC	COVERY	
9,10-Diphenylanthracene	80		

ANALYZED BY: SJ DATE/TIME: 08/24/95 16:24:00 EXTRACTED BY: BD DATE/TIME: 08/23/95 11:00:00

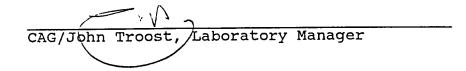
METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993







CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.#

#2642, TYPE WC

DATE: 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: MW-101 (3)

PROJECT NO: 1096

MATRIX: SOIL

DATE SAMPLED: 08/16/95 10:20:00

DATE RECEIVED: 08/18/95

ANALYTICA	L DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/21/95 12:24:00	ND	5	mg/Kg
Total Petroleum Hydrocarbons (DRO) WI LUST DRO # Analyzed by: AH Date: 08/26/95 05:38:00	ND	2.9	mg/Kg
Sonication extraction METHOD 3550 *** Analyzed by: BD Date: 08/23/95 11:00:00	08/23/95		
Lead, Total Method 7420 *** Analyzed by: EH Date: 08/22/95 09:42:00	37	10	mg/Kg
Total Solids Method 2540G ** Analyzed by: DB Date: 08/29/95 16:00:00	80.3	0.1	Weight %

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993





CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL PROJECT NO: 1096 SITE: MILWAUKEE, WI/9235 N 107 ST. MATRIX: SOIL

SAMPLED BY: NATURAL RESOURCE TECH. DATE SAMPLED: 08/16/95 10:20:00

SAMPLE ID: MW-101 (3) **DATE RECEIVED:** 08/18/95

		11.2	
	TICAL DATA	MDL*	WYT MG
PARAMETER	RESULTS	MDL* 14.5	UNITS
Dichlorodifluoromethane	ND ND	4.0	μg/Kg
Chloromethane	ND ND	9.0	μg/Kg
Vinyl chloride			μg/Kg
Chloroethane	ND	26.0	μg/Kg
Trichlorofluoromethane	ND	5.0	μg/Kg
1,1-Dichloroethene	ND	6.5	μg/Kg
Methylene Chloride	B 9	4.0	μg/Kg
trans-1,2-Dichloroethene	ND	5.0	μg/Kg
1,1-Dichloroethane	ND	3.5	μg/Kg
2,2-Dichloropropane	ND	2.5	μg/Kg
cis-1,2-Dichloroethene	ND	0.5	μg/Kg
Chloroform	ND	2.5	μg/Kg
1,1,1-Trichloroethane	ND	1.5	μg/Kg
Carbon Tetrachloride	ND	6.0	μg/Kg
Benzene	ND	10.0	μg/Kg
1,2-Dichloroethane	ND	1.5	μg/Kg
Trichloroethene	ND	6.0	μg/Kg
1,2-Dichloropropane	ND	2.0	μg/Kg
Bromodichloromethane	ND	5.0	μg/Kg
Toluene	ND	10.0	μg/Kg
1,1,2-Trichloroethane	ND	1.0	μg/Kg
Tetrachloroethene	ND	1.5	μg/Kg
1,3-Dichloropropane	ND	1.5	μg/Kg
Dibromochloromethane	ND	4.5	μg/Kg
1,2-Dibromoethane	ND	4.0	μg/Kg
Chlorobenzene	ND	12.5	μg/Kg
Ethyl benzene	ND	10.0	μg/Kg
M and P Xylene	ND	10.0	μg/Kg
O-Xylene	ND	10.0	μg/Kg
Isopropylbenzene	ND	10.0	μg/Kg
1,1,2,2-Tetrachloroethane	ND	1.5	μg/Kg
n-Propyl benzene	ND	0.5	μg/Kg
Bromobenzene	ND	1.5	μg/Kg
1,3,5-Trimethylbenzene	ND	1.0	μg/Kg
2-Chlorotoluene	ND	0.5	μg/Kg
4-Chlorotoluene	ND	1.0	μg/Kg
tert-Butylbenzene	ND	3.0	μg/Kg μg/Kg
1,2,4-Trimethylbenzene	ND	2.5	μg/Kg μg/Kg
1,2,4-II IMECHY IDENZENE	ND	2.5	m3/1/3

METHOD: Mod. 8021 (VOC) [SW 846] (continued on next page)



CITGO PETROLEUM CORPORATION SAMPLE ID: MW-101 (3)

ANALYTI	CAL DATA (co	ntinued)	
PARAMETER	RESULTS	MDL*	UNITS
sec-Butylbenzene	ND	1.0	μg/Kg
p-Isopropyltoluene	ND	0.5	μg/Kg
1,3-Dichlorobenzene	ND	16.0	μg/Kg
1,4-Dichlorobenzene	· ND	12.0	μg/Kg
n-Butylbenzene	ND	1.0	μg/Kg
1,2-Dichlorobenzene	ND	7.5	μg/Kg
1,2-Dibromo-3-chloropropane	ND	150	μg/Kg
1,2,4-Trichlorobenzene	ND	1.5	μg/Kg
Hexachlorobutadiene	ND	1.0	μg/Kg
Naphthalene	ND	3.0	μg/Kg
1,2,3-Trichlorobenzene	ND	1.0	μg/Kg
Di-isopropyl ether	ND	5.0	μg/Kg
Methyl-t-butyl ether	ND	40.0	μg/Kg
SURROGATES	% REC	OVERY	
Fluorobenzene	10	19	

ANALYZED BY: PW DATE/TIME: 08/29/95 17:27:00

METHOD: Mod. 8021 (VOC) [SW 846]

NOTES: * - Method Detection Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CAG/John Troost, Laboratory Manager



CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: MW-101 (3)

PROJECT NO: 1096 MATRIX: SOIL

DATE SAMPLED: 08/16/95 10:20:00

DATE RECEIVED: 08/18/95

ANALY	TICAL DATA		
PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	0.9	0.06	μg/Kg
Acenaphthylene	ND	0.06	μg/Kg
Acenaphthene	ND	0.06	μg/Kg
Fluorene	ND	0.07	μg/Kg
Phenanthrene	4	0.06	μg/Kg
Anthracene	ND	0.04	μg/Kg
Fluoranthene	11	0.05	μg/Kg
Pyrene	10	0.04	μg/Kg
Chrysene	8	0.02	μg/Kg
Benzo (a) anthracene	5	0.01	μg/Kg
Benzo (b) fluoranthene	8	0.01	μg/Kg
Benzo (k) fluoranthene	3	0.02	μg/Kg
Benzo (a) pyrene	6	0.03	μg/Kg
Dibenzo (a,h) anthracene	ND	0.02	μg/Kg
Benzo (g,h,i) perylene	ND	0.03	μg/Kg
Indeno (1,2,3-cd) pyrene	ND	0.02	μg/Kg
1-Methylnaphthalene	0.5	0.06	μg/Kg
2-Methylnaphthalene	0.4	0.06	μg/Kg
SURROGATES	% REC	COVERY	
9,10-Diphenylanthracene	81		

DATE/TIME: 08/24/95 16:24:00 ANALYZED BY: SJ DATE/TIME: 08/23/95 11:00:00 EXTRACTED BY: BD

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

* - Practical Quantitation Limit

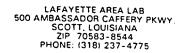
ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

Troost, Laboratory Manager





CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.#

#2642, TYPE WC

DATE: 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: METHANOL BLANK

PROJECT NO: 1096

MATRIX: SOIL

DATE SAMPLED:

DATE RECEIVED: 08/18/95

ANALYTICAL DATA

PARAMETER RESULTS DETECTION UNITS

LIMIT

TOTAL PETROLEUM HYDROCARBONS (GRO) ND 5 mg/Kg

WI LUST GRO #
Analyzed by: TB

Date: 08/21/95 12:24:00

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

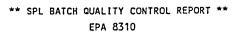
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CAGyJohn Troost, Laboratory Manager





Matrix: Units: Soil μg/Kg Batch Id: HPLC950824162400

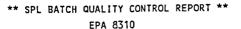
LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	Blank	Spike	QC Limits(**)
COMPOUNDS	Blank Result	Added	Result	Recovery	(Mandatory)
	<2>	<3>	<1>	×	% Recovery Range
Naphthalene	ND	3.30	2.72	82.4	30 - 122
Acenaphthylene	ND	3.30	2.94	89.1	30 - 126
Acenaphthene	ND	3.30	2.81	85.2	30 - 124
Fluorene	ND	3.30	3.15	95.5	30 - 142
Phenanthrene	ND	3.30	2.85	86.4	30 - 155
Anthracene	ND	3.30	1.98	60.0	30 - 126
Fluoranthene	DM	3.30	2.62	79.4	30 - 123
Pyrene	ND	3.30	2.80	84.8	30 - 140
Chrysene	ND	3.30	2.81	85.2	30 - 199
Benzo (a) anthracene	ND	3.30	2.83	85.8	30 - 135
Benzo (b) fluoranthene	ND	3.30	2.70	81.8	30 - 150
Benzo (k) fluoranthene	ND .	3.30	2.70	81.8	30 - 159
Benzo (a) pyrene	ND	3.30	2.47	74.8	30 - 128
Dibenzo (a,h) anthracene	ND	3.30	2.64	80.0	30 - 110
Benzo (g,h,i) perylene	ND	3.30	2.81	85.2	30 - 116
Indeno (1,2,3-cd) pyrene	ND	3.30	2.59	78.5	30 - 116
1-Methylnaphthalene	ND	3.30	2.81	85.2	30 - 130
2-Methylnaphthalene	ND	3.30	3.15	95.5	30 - 130

MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix	Spike	Matrix Dupli	Spike	MS/MSD Relative %		imits(***) Advisory)	
	<2>	<3>	Result <1>	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery	Range
NAPHTHALENE	3.5	3.30	4.91	42.7	4.11	18.5 *	79.1 *	30	30 -	122
ACENAPHTHYLENE	ND	3.30	2.43	73.6	2.82	85.5	15.0	30	30 -	126
ACENAPHTHENE	ND	3.30	2.94	89.1	2.56	77.6	13.8	30.	30 -	124
FLUORENE	ND	3.30	2.28	69.1	2.13	64.5	6.89	30	30 -	142
PHENANTHRENE	ND	3.30	3.20	97.0	2.74	83.0	15.6	30	30 -	155
ANTHRACENE	ND	3.30	2.12	64.2	2.03	61.5	4.30	30	30 -	126
FLUORANTHENE	ND	3.30	2.80	84.8	2.15	65.2	26.1	30	30 -	123
PYRENE	ND	3.30	3.20	97.0	3.12	94.5	2.61	30	30 -	140
CHRYSENE	0.5	3.30	3.93	104	2.46	59.4	54.6 *	30	30 -	199
BENZO (A) ANTHRACENE	ND	3.30	2.84	86.1	2.47	74.8	14.0	30	30 -	135
BENZO (B) FLUORANTHENE	ND	3.30	3.84	116	3.63	110	5.31	30	30 -	150
BENZO (K) FLUORANTHENE	ND	3.30	2.90	87.9	2.35	71.2	21.0	30	30 -	159
BENZO (A) PYRENE	ND	3.30	2.45	74.2	2.81	85.2	13.8	30	30 -	128
DIBENZO (A,H) ANTHRACENE	DN	3.30	2.76	83.6	2.30	69.7	18.1	30	30 -	130
BENZO (G,H,I) PERYLENE	סא	3.30	3.22	97.6	2.45	74.2	27.2	30	30 -	130
INDENO (1,2,3-CD) PYRENE	סא	3.30	2.40	72.7	2.10	63.6	13.4	30	30 -	116





Matrix:

Units:

Soil μg/Kg Batch Id: HPLC950824162400

MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix	Spike			MS/MSD QC Limits(***) Relative % (Advisory)		-
	<2>	<3>	Result <1>	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery Range
1-METHYLNAPHTHALENE 2-METHYLNAPHTHALENE	ND ND	3.30 3.30	3.86 4.20	1	3.24 3.80	!	17.5 9.92	30 30	30 - 130 30 - 130

Analyst: SJ

Sequence Date: 08/24/95

SPL ID of sample spiked: 9508814-05A

Sample File ID: 9508240120101

Method Blank File ID:

Blank Spike File ID: 9508250160101 Matrix Spike File ID: 9508250170101

Matrix Spike Duplicate File ID: 9508290030101

* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = |(<4> - <5>)| / [(<4> + <5>) x 0.5] x 100

(**) = Source: 8310 SW846 (***) = Source: 8310 SW846

SAMPLES IN BATCH(SPL ID):

 9508814-04A
 9508814-05A
 9508822-01C
 9508822-02B

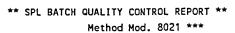
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 9508822-04C
 9508804-01C
 9508804-02C

 9508804-03C
 9508804-04C
 9508814-01A
 9508814-02A

9508814-03A

Karen Cruzall-





Matrix: Units:

Soil μg/Kg

Batch Id: HP00950829172700

LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	Blank	Spike	QC Limits(**)
COMPOUNDS	Blank Result	Added	Result	Recovery	(Mandatory)
	<2>	<3>	<1>	X .	% Recovery Range
DICHLORODIFLUOROMETHANE	. ND	15.0	10.1588	67.7	50 - 140
CHLOROMETHANE	ND	15.0	11.9650	79.8	50 - 140
VINYL CHLORIDE	DИ	15.0	14.1999	94.7	50 - 140
BROMOMETHANE	DN	15.0	14.0690	93.8	50 - 140
CHLOROETHANE	ND	15.0	13.8967	92.6	50 - 140
TRICHLOROFLUOROMETHANE	ND	15.0	13.3424	88.9	50 - 140
1,1-DICHLOROETHENE	ND	15.0	14.0249	93.5	50 - 140
METHYLENE CHLORIDE	8.7282	15.0	14.3194	95.5	50 - 140
TRANS-1,2-DICHLOROETHENE	ND	15.0	14.3523	95.7	50 - 140
1,1-DICHLOROETHANE	ND	15.0	15.6520	104	50 - 140
2,2-DICHLOROPROPANE	ND	15.0	15.6170	104	50 ~ 140
CIS-1,2-DICHLOROETHENE	ND	15.0	16.6364	111	50 - 140
CHLOROFORM	ND	15.0	16.1993	108	50 - 140
BROMOCHLOROMETHANE	ND	15.0	13.2430	88.3	50 - 140
1,1,1-TRICHLOROETHANE	ND	15.0	13.9952	93.3	50 - 140
1,1-DICHLOROPROPENE	ND	15.0	13.8919	92.6	50 - 140
CARBON TETRACHLORIDE	ND	15.0	14.2044	94.7	50 - 140
BENZENE	ND	15.0	14.7653	98.4	50 - 140
1,2-DICHLOROETHANE	ND	15.0	13.6859	91.2	50 - 140
TRICHLOROETHENE	DИ	15.0	14.0374	93.6	50 - 140
1.2-DICHLOROPROPANE	ND	15.0	14.0022	93.3	50 - 140
BROMOD I CHLOROMETHANE	ND	15.0	14.1002	94.0	50 - 140
DIBROMOMETHANE	ND	15.0	10.5000	70.0	50 - 140
CIS-1,3-DICHLOROPROPENE	ND	15.0	13.8845	92.6	50 - 140
TOLUENE	DИ	15.0	14.8498	99.0	50 - 140
TRANS-1,3-DICHLOROPROPENE	ND	15.0	13.6615	91.1	50 - 140
1,1,2-TRICHLOROETHANE	ND	15.0	14.2644	95.1	50 - 140
TETRACHLOROETHENE	ND	15.0	14.2262	94.8	50 - 140
1,3-DICHLOROPROPANE	ND	15.0	13.2212	88.1	50 - 140
DIBROMOCHLOROMETHANE	ND	15.0	14.6579	97.7	50 - 140
1,2-DIBROMOETHANE	ND	15.0	13.8998	92.7	50 - 140
CHLOROBENZENE	ND	15.0	14.0715	93.8	50 - 140
ETHYL BENZENE	ND	15.0	15.1 <i>7</i> 37	101	50 - 140
1,1,1,2-TETRACHLOROETHANE	ND	15.0	14.0873	93.9	50 - 140
M AND P XYLENE	ND	30.0	29.0101	96.7	50 - 140
O-XYLENE	ND	15.0	14.8202	98.8	50 - 140
STYRENE	ND	15.0	14.1552	94.4	50 - 140
ISOPROPYLBENZENE	ND DN	15.0	13.4352	89.6	50 - 140
BROMOFORM	ND ND	15.0	15.4367	103	50 - 140
	1	15.0	13.8460	92.3	50 - 140
1,1,2,2-TETRACHLOROETHANE	ND ND	1	16.4965	110	50 - 140
1,2,3-TRICHLOROPROPANE	ND ND	15.0	i		
N-PROPYL BENZENE	ND	15.0	16.5424	110	50 - 140





Matrix: Units:

Soil μg/Kg

Batch Id: HP00950829172700

LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	Blani	: Spike	QC Limits(**)
COMPOUNDS	Blank Result	Added	Result	Recovery	(Mandatory)
	<2>	<3>	<1>	×	% Recovery Range
BROMOBENZENE	DM	15.0	15.8126	105	50 - 140
1,3,5-TRIMETHYLBENZENE	ND	15.0	18.0975	121	50 - 140
2-CHLOROTOLUENE	ND	15.0	15.5191	103	50 - 140
4-CHLOROTOLUENE	ND	15.0	16.1557	108	50 - 140
TERT-BUTYLBENZENE	ND	15.0	16.3752	109	50 - 140
1,2,4-TRIMETHYLBENZENE	ND	15.0	13.5072	90.0	50 - 140
SEC-BUTYLBENZENE	ND	15.0	13.4839	89.9	50 - 140
P-ISOPROPYLTOLUENE	ND	15.0	13.4162	89.4	50 - 140
1,3-DICHLOROBENZENE	ND	15.0	13.5831	90.6	50 - 140
1,4-DICHLOROBENZENE	ND	15.0	12.7529	85.0	50 - 140
N-BUTYLBENZENE	ND	15.0	14.2348	94.9	50 - 140
1,2-DICHLOROBENZENE	ND .	15.0	14.5364	96.9	50 - 140
1,2-DIBROMO-3-CHLOROPROPAN	ND	15.0	20.1710	134	50 - 140
1,2,4-TRICHLOROBENZENE	ND	15.0	20.4816	137	50 - 140
HEXACHLOROBUTAD LENE	ND	15.0	17.6380	118	50 - 140
NAPHTHALENE	ND	15.0	20.1513	134	50 - 140
1,2,3-TRICHLOROBENZENE	ND	15.0	12.9749	86.5	50 - 140

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results	Spike Added	Matrix	Spike	Matrix Dupli	Spike cate	MS/MSD Relative %		imits(***) Advisory)	
	<2>	<3>	Result <1>	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery	Range
VINYL CHLORIDE	ND	25.0	26.8906	108	22.0159	88.1	20.3	30	50 -	140
CHLOROETHANE	ND	25.0	14.8107	59.2	22.7840	91.1	42.4 *	30	50 -	140
METHYLENE CHLORIDE	8.7282	25.0	27.7291	76.0	30.8540	88.5	15.2	30	50 -	140
1,1-DICHLOROETHANE	ОΝ	25.0	18.1752	72.7	22.2111	88.8	19.9	30	50 -	140
CHLOROFORM	ИD	25.0	19.0732	76.3	25.7030	103	29.8	30	50 -	140
1,1,1-TRICHLOROETHANE	ND	25.0	24.5692	98.3	29.4020	118	18.2	30	50 -	140
CARBON TETRACHLORIDE	ND	25.0	28.9150	116	30.8402	123	5.86	30	50 -	140
BENZENE	סא	25.0	27.6560	111	25.0683	100	10.4	30	50 -	14
1,2-DICHLOROETHANE	ND	25.0	25.0978	100	22.7409	91.0	9.42	30	50 -	14
TRICHLOROETHENE	ND	25.0	30.7148	123	31.6990	127	3.20	30	50 -	140
BROMODICHLOROMETHANE	- סא	25.0	27.4625	110	28.2521	113	2.69	30	50 -	14
TOLUENE	DIN	25.0	27.3918	110	25.3227	101	8.53	30	50 -	14
1,1,2-TRICHLOROETHANE	ND	25.0	23.5156	94.1	21.8858	87.5	7.27	30	50 -	14
TETRACHLOROETHENE	ND	25.0	29.9327	120	31.7590	127	5.67	30	50 -	14
CHLOROBENZENE	ND	25.0	25.8011	103	25.4625	102	0.976	30	50 -	14
ETHYL BENZENE	ND	25.0	25.4383	102	23.5165	94.1	8.06	30	50 -	14
M AND P XYLENE	ND	50.0	49.000	98.0	48.6036	97.2	0.820	30	50 -	14



SPL BATCH QUALITY CONTROL REPORT ** Method Mod. 8021 ***

LAFAYETTE AREA LAB
500 AMBASSADOR CAFFERY PKWY. SCOTT, LOUISIANA ZIP 70583-8544 PHONE: (318) 237-4775

PAGE

Matrix: Units:

Soil μg/Kg

Batch Id: HP00950829172700

MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	' 1	Spike	Matrix Spike Duplicate		MS/MSD Relative %	QC Limits(***) (Advisory)		
	<2>	<3>	Result <1>	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery	Range
O-XYLENE	ND	25.0	25.0766	100	25.0744	100	0	30	50 -	140
ISOPROPYLBENZENE	ND	25.0	24.2426	97.0	25.1598	101	4.04	30	50 -	140
1,1,2,2-TETRACHLOROETHANE	DN	25.0	20.6120	82.4	20.7195	82.9	0.605	30	50 -	140
SEC-BUTYLBENZENE	ND	25.0	23.5101	94.0	25.4000	102	8.16	30	50 -	140
P-ISOPROPYLTOLUENE	סא	25.0	20.4315	81.7	25.0284	100	20.1	30	50 -	140
1,3-DICHLOROBENZENE	ND	25.0	22.3167	89.3	23.9584	95.8	7.02	30	50 -	140
1,4-DICHLOROBENZENE	ND	25.0	19.2137	76.9	24.8694	99.5	25.6	30	50 -	140
N-BUTYLBENZENE	ND	25.0	22.9546	91.8	22.2006	88.8	3.32	30	50 -	140
1,2-DICHLOROBENZENE	DN	25.0	19.8557	79.4	22.5870	90.3	12.8	30	50 -	140
NAPHTHALENE	DN	25.0	20.2	80.8	16.8222	67.3	18.2	30	50 -	140

Analyst: PW

Sequence Date: 08/29/95

SPL ID of sample spiked: MBLANK

Sample File ID: \EH29202.ra

thod Blank File ID:

___ank Spike File ID: \EH29204.ra Matrix Spike File ID: \EH29214.ra

Matrix Spike Duplicate File ID: \EH29204.ra

* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = |(<4> - <5>)| / [(<4> + <5>) x 0.5] x 100

(**) = Source: SPL Lafayette, 11/94 (***) = Source: SPL Lafayette, 11/94

SAMPLES IN BATCH(SPL ID):

9508822-01A 9508822-03A 9508822-04A 9508804-01A

9508804-02A 9508804-03A 9508804-04A 9508822-01A





Matrix: Soil

Reported on: 08/23/95

Analyzed on: 08/21/95

Analyst:

TB

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Gasoline Range Organics WI LUST GRO #

SPL Sample ID Number	Blank Value mg/Kg	Amt Added	Matrix Spike Recovery	Matrix Spike Duplicate Recovery %	Relative Percent Difference %	QC Limits Recovery	RPD Max.
9508716-01A	ND	5.0	64.0	82.0	25	60 - 130	20

FIDB950821122400-9508985

Samples in batch:

9508804-01A

9508804-02A

9508804-03A

9508804-04A

9508804-05A

COMMENTS:

SAMPLE VIAL FOR MS CRACKED.

SPL, Incorporated



Matrix: Soil Reported on: 08/23/95

Analyzed on: 08/21/95

Analyst: ΤB

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

> Gasoline Range Organics WI LUST GRO #

SPL Sample ID Number	Blank Value mg/Kg		Measured Concentration mg/Kg	% Recovery	QC Limits Recovery
LCS	ND	2.5	2.5	100	60 - 130

FIDB950821122400-9508986

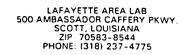
amples in batch:

9508804-01A 9508804-05A

9508804-02A 9508804-03A 9508804-04A

COMMENTS:

SPL, Incorporated





Matrix: Soil

Reported on: 08/30/95

Analyzed on: 08/26/95

Analyst:

ΑH

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Diesel Range Organics WI LUST DRO #

SPL Sample ID Number	Blank Value mg/Kg	Amt Added mg/Kg	Matrix Spike Recovery	Matrix Spike Duplicate Recovery %	Relative Percent Difference %	QC Limits Recovery	RPO Max.
BLANK_SPIKE	8.0	40	82.5	85.0	3.0	50 - 130	30

TPHD950821100000-9508D89

Samples in batch:

9508804-01B

9508804-02B

9508804-03B

9508804-048

9508822-01B

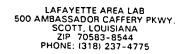
9508822-03B

9508822-04B

COMMENTS:

METHOD BLANK CONTRIBUTION OF LESS THAN 5 TIMES OF THE DETECTION LIMIT. UNABLE TO REEXTRACT DUE TO NO MORE SAMPLE AVAILABLE.

SPL, Incorporated





Matrix: Soil

Reported on: 08/22/95

Analyzed on: 08/22/95

Analyst:

ΕH

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Lead, Total Method 7420 ***

SPL Sample ID Number	Blank Value mg/Kg	Amt Added mg/Kg	Matrix Spike Recovery	Matrix Spike Duplicate Recovery %	Relative Percent Difference	QC Limits Recovery	RPD Max.
9508759-01B	ND	100	100	100	0	80 - 120	20

3100950822094200-9508955

Samples in batch:

9508759-01B 9508759-02B 9508790-01A 9508804-01D 9508804-02D 9508804-03D 9508804-04D 9508810-01A

COMMENTS:

SPL, Incorporated



Matrix: Soil

Reported on: 08/30/95

Analyzed on: 08/29/95

Analyst:

DB

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

Total Solids
Method 2540G **

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration	Duplicate Sample %	RPD	RPD Max.
9508B41-18A	88.3	88.3	0	20

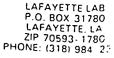
TSOL950829160000-9508E21

Samples in batch:

9508804-01D	9508804-02D	9508804-03D	9508804-04D
9300004-010	9308804-020	9500004-030	9308804-040
9508822-01D	9508822-02D	9508822-03D	9508822-04D
9508B41-09A	9508B41-10A	9508B41-11A	9508B41-12A
9508B41-13A	9508B41-14A	9508B41-15A	9508B41-16A
9508B41-17A	9508B41-18A		

COMMENTS:

SPL, Incorporated Land Ougast





ENVIRONMENTAL LABORATORY

DATE 8-18-95

IENT	CHEST: YES/NO SAMPLE LOGIN CHECKLIST		
1) 2)	IS A CHAIN-OF CUSTODY FORM PRESENT: IS THE COC PROPERLY COMPLETED: IF NO, DESCRIBE WHAT IS INCOMPLETE:	YES	NC
3)	HAS CLIENT BEEN CONTACTED ABOUT INCOMPLETE COC:		
4)	IS AIRBILL/PACKING LIST/BILL OF LADING ATTACHED TO SHIPMENT: IF YES, ID# 6501903866 Fed-X		
5)	ARE CUSTODY SEALS PRESENT ON THE PACKAGE: IF YES, ARE THEY INTACT UPON RECEIPT:		
6)	ARE ALL SAMPLES TAGGED OR LABELED: DO THE LABELS MATCH THE COC: IF NO, HAS CLIENT BEEN CONTACTED ABOUT IT: (PLACE SUBSEQUENT DOCUMENTATION FROM CLIENT IN REI	MARKS)	
7) ,	DO ALL SHIPPING DOCUMENTS AGREE: IF NO, DESCRIBE WHAT IS IN NONCONFORMITY:		
8)	CONDITION/TEMPERATURE OF SHIPPING CONTAINER:	يري من عن	
	0K 4°C	7	
9) (CONDITION OF SAMPLE CONTAINERS:		
	0K		
0) :	EAMPLE DISPOSAL: SPL RETURN TO KS/CONTACT/PHONE/DATE:	CLIENT	

4508804

CHAIN OF CUJIJJY RECORD

				1		Δ										
Sample Collectors(s)		Pre/		jelle		We NAT		SOURCE TECHNOLOG AUKEE, WISCONSIN	Y, INC.	1	y Samples ar		\sim		Attached: YES	NO
Site Name: CTT Site Address: TT	GOTE) 235 N, LWAUK	10-		rre c		Send Report Tor- Project Manager: Natural Resource Tecl 23713 W. Paul Road Pewaukee, WI 53072 Telephone (414) 523-	hnology (S)	LECTIC Project CCTY Task Nu CDEPK (414) 523-9001			If sample(s	To were receive as "receive	emperatur ived on ic ed on ice"	e of temperatur	ice remaining, you ma	
I hereby certify that	I received, proj	perly handled	d, and mai	intained c	ustody of t	hese samples as noted be	low:	•			A	nalytical M	ethod / N	umbers		Lab Use Only
Relinquished By (Si Relinquished By (Si	4 (11)	h_	Date/Tin	7/49	074	Received By (Signature 5 FEOE) Received By (Signature		5019038	Date/Time Date/Time		20 (w/ M)	S CO	41 (S)	187 / K8/ 1		
Relinquished By (Si	gnature)		Date/Tin	ne		Received By (Signature) Je-		Date/Time		2(40)	3,6) 	S pt		
Field ID Number	Date Collected	Time Collected	San Media	Device	Location	/ Description	PID Reading	Field Comments	Preserv. Type	# of Cont.	9,	S AL	## / B	ko .	Lab ID Number	Sample Conditions @ Laboratory
103(3)	18/17/95	1130	SOIL	95			<u></u>		<u> </u>	5	X	11/	XX			
MW-102 (3)	08/17/95	1040	Joil	55						5	XX	14/2	$X \mid Y$	<u> </u>		
MW-105/3)	08/14/95	1350	SOIL	55						5	XX	X	$X \mid X$	x		
MW-101(3)	06/14/95	1020	501 L	35						5	XY	\ X .	X	1		5
METHANOL	BEANK								·	1	X				1 0 k	504
																E 37
						· · · · · · · · · · · · · · · · · · ·									X	1 rr
															3/2	3 84
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SPECIAL INSTRUC	CTIONS											analytical	report unle	in samples for 30 ess indicated other ther	days after issuing wise below:	

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LAFANI P.O. BCN LAFANI ZIP ZUP ZUP ZUP ZUP ZUP ZUP ZUP ZUP ZUP ZU	FORY DATE 8-18-75 ST YES NO	COC: ACHED	T IN REMARKS)	ER:	DEWIRN TO CLIENT	1 1 1	INV.TO:	ADDR:
1		tracking Number	6501903866		25 34050	140 4151		
1	*KEBECC	A J. KOEPK	Ephone 4:47795-3695	Service PedEx Printity Overing	gringht	ht Fedlax 2Day Consequence of a constitution of the consequence of th	TO:	
	mpany 73713 WES	OF PAUL	Popt/Floor Suite/Room	5 Packaging FedEx Letter	FedEx FedEx Box	FedEx Onler Packaging Packaging Operation State	ZEPTS	ATTN: ADDR:
Cv	toress PLWAUKE E ty Your Internal Billing Reference Information	State	5 30 f	Does this shipment contain dangerous good	No Yes dispersion	CA Cargo Aircraft Only	TechTAREPTS	
	3 TO SAMPLE	RECEIVING	5 Phone (318) 237-47	Payment Bill Sender to: Sender to the sender of the sender	Recipient Third Pa	rry Credit Card Cash/ Check	ر الحري الحري	
	Company SPL, Inc.	lombussado	Dept Floor Suite/Room	y.		ared Value Total Charges		٤ ٦. لا
1 /	Address printfed admessiver City	State _	For Saturday Delivery chec	Total Packages	er tran \$100 der purkaye vol. par an additionar title and timit of transitive consecutor for fortier	00 S	•	PROJ #
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SAMPLE BOTTLE REQUEST

SPL, Inc.
500 Ambassador Caffery Pkwy.
Scott, LA 70583-8544
Ph.: (318) 237-4775, Fax: 237-7080

- NUD TO:	1 1	
SHIP TO:	DATE: 2/9/AD1	
CLIENT: Scake Bouche	DATE.	
COMPANY: 12. Tural manufacture 12. A	REP:	
ADDRESS: <u>\$3913 What while kd</u>		
resummer Old.	REP. TELEPHONE:	
53.)7.2		—
PHONE:	PROJ CITY/STATE: Dia Charact	—
DATE NEEDED:		
par below	FEDEX: () PRIORITY — 1 DAY AM	
TRIP BLANK (X) YES () NO	(x) STANDARD — 1 DAY PM	
EQUIP/RINSATE BLANK () YES () NO	() ECONOMY - 2ND DAY PM UPS: () PRIORITY - 1 DAY AM	
FIELD BLANK () YES () NO	()	
D.I. WATER NEEDED () YES () NO	,	
SPECIAL COC:	SPL DELIVER: () OTHER:	
SPECIAL AB:	1 coster and education	
of peace the port all an	The state of the s	
TYPE CONTAINER AMT. LID TYP (SIZE, SHAPE)	E PRESERVATIVE TYPE SAMPLE (NAME) TEST	
Home with (250) 10 T/	e ACE GRO (HEO	$\overline{)}$
18 BRAINISEE IN T	HOL DIED CHE	رر (ر
dome main(iset) 10 TI	Is mee use's inte	
18121 20cker (12) I	1 - PAH (+	
500 ml dass 10 T	- HNU3 Pb. Co	
	T 4122 To Solute 1000	_
- IR BURRHAR (TEHEU) - T		7
· lea by mayol (OI Hzs) 7		
124 65 mil viax 57.425 7	- Med Tradition (NO):	
- 12 12 amps (DIHZU) 1	DIHEO) T HER TAGENSON (16	<u></u> ,
INSTRUCTIONS FOR SAMPLER: 500 ml (DIMES) T HE MADELLE (10	٠
to silva continues a	en up jour and many pe	<u> شام ده در من ا</u>
fell all Intitler		
QUESTIONS? CALL SPRING MENDOZA, KAR	REN LESTELLE OR RON BENJAMIN AT (318) 237-4775	
	·	
FILLED BY (1/2 () COURTS COURTS	B. FOOX	
ATECINE 2 4 CS 1110 EDELON	R: <u>FeΩχ</u> IT#: <u>1165052143</u> , 2 <u>134</u> , 2159, 2161	
AIE/IME: Y-7-95 12.20 FREIGH	DIZATION: 5150 + 5175 + 54 50 + 5	4.5
CHEST #: AUTHO	RIZATION: $54.50 + 51.75 + 54.50 + 56$ = 215.25	<u></u>
	(SPI) PAGE / OF /	
DECUECTED BY: VETO 5 15 DAG	(SPL) PAGE (OF !	<i>!</i>

SAMPLE BOTTLE REQUEST

SPL, Inc. 500 Ambassador Caffery Pkwy. Scott, LA 70583-8544

Ph.: (318) 237-4775, Fax: 237-7080

	SHIP TO:	,	,
	CLIENT: Becky Koephe	DATE:8/8/	95
	COMPANY: Datural Resource Technologies	REP:	1-1-1-10-10-10
	ADDRESS: 237/3 West Paul Rd.	co: <u>Datural</u>	Resource Tech
	Leubuke Ws.	REP. TELEPHONE:	
	53072	PROJECT:	
	PHONE:	PROJ CITY/STATE: Cit	go Project.
	DATE NEEDED: 8/10 PM		0
	- see helow	FEDEX: () PRIORIT	
X	TRIP BLANK (X) YES () NO	(X) STANDAF	
	EQUIP/RINSATE BLANK () YES () NO	() ECONOM	
	FIELD BLANK () YES () NO	UPS: () PRIORIT	
	D.I. WATER NEEDED () YES () NO	() STANDAF	RD - GROUND
	SPECIAL COC:	SPL DELIVER: ()	
	SPECIAL AB:	OTHER: / co	0
	y if possible put all	these in 1 co	our sauce
	TYPE CONTAINER AMT. LID TYPE	PRESERVATIVE	TYPE SAMPLE
	(SIZE, SHAPE)	(NAME)	TEST
	1-60 ml vial (previoled) 9 T		GRO (30
	lea-40ml vial 9 T	25 mls meat	TURGRO ASSITION
	Lea- 60ml plain 9 T		DRO SOIL
	402 soil iAR 9 T		VOC SOIL
	402 soil ian 9 T	<u> </u>	PAH
	fozsoil iAR 9 T		Pb, Cd.
	500 ml glass (DI HzO) 1/ch	est ### HNO3	Ph.Cd.
		/chest (HCl) riple	lank GRO/PUC
/	12 BR amber (DI H20) (ea/	/ · / · / · · /	blank DRO
	INSTRUCTIONS FOR SAMPLER:		
	Lab Las 18 HRS To add solu	ent to DRO vias	l after secui
		lah when sas	moles see
	of samples. Please notify	ALL SUPPLIES	7722
	Le shipped.	ESTELLE OR RON BENJAMIN	I AT (218) 227-4775
	Lea 60 me vial (DIHzo) //chee		nte VOC,
	ILBK Amber [ches	t HCL tripsea	h PAH
	FILLED BY: Juneth (until COURIER:	1 chest	
	DATE/TIME: 7-9-95 / 11'50 FREIGHT #:	114 5082 134	
	ALITHODIZAS	TION!	

SHIPPING	/RECEIVING	DEPT
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8/09/95	•	0705-0114-7	

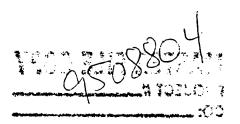
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Page 1

INTERING :	WGT SVC	GRS CHG NAME	COMPANY	REFERENCES		CITY	ST ZIP
103082107	27 SO	47.25 BECKY KOEPKE	NATURAL RESOURCE TECH	CITGO	CC	PEWAUKE	WI 53072
1165082116	14 50	33.75 BECKY KOEPKE	NATURAL RESOURCE TECH	O CITGO CC		PEWAUKE	WI 53072
	Ţ JE	Α					
1165082134	30 SO	51.75 BECKY KOEPHE	NATURAL RESOURCE TECH	IO CIITGO PROJECT	KM	PEWAUKE	WI 53072
1165082143	32 SO	54.50 BECKY KOEPKE	NATURAL RESOURCE TECH	CITGO PROJECT	CC	PEWAUKE	WI 53072
1165082152	32 S0	54.50 BECKY KOEPKE	NATURAL RESOURCE TECH	CITGO PROJECT	CC	PEWAUKE	WI 53072
1165082161	32 S0	54.50 BECKY KOEPKE	NATURAL RESOURCE TECH	CITGO PROJECT	CC	PEWAUKE_	WI 53072
	772						
			The state of the s		110		



INVOICE - 931768959 -







CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.#

#2642, TYPE WC

DATE: 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: SB-103 (3.5)

PROJECT NO: 1096

MATRIX: SOIL

DATE SAMPLED: 08/18/95 15:15:00

DATE RECEIVED: 08/19/95

ANALYTICAL PARAMETER	DATA RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/23/95 12:02:00	130	5	mg/Kg
Total Petroleum Hydrocarbons (DRO) WI LUST DRO # Analyzed by: AH Date: 08/28/95 11:46:00	120	14	mg/Kg
Sonication extraction METHOD 3550 *** Analyzed by: BD Date: 08/23/95 11:00:00	08/23/95		
Lead, Total Method 7420 *** Analyzed by: EH Date: 08/25/95 09:02:00	37	10	mg/Kg
Total Solids Method 2540G ** Analyzed by: DB Date: 08/29/95 16:00:00	81.3	0.1	Weight %

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CAG/John Troost, Laboratory Manager





CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: SB-103 (3.5)

PROJECT NO: 1096
MATRIX: SOIL

DATE SAMPLED: 08/18/95 15:15:00 DATE RECEIVED: 08/19/95

ANALYT	ICAL DATA		
PARAMETER	RESULTS	PQL*	UNITS
Dichlorodifluoromethane	ND	14.5	μg/Kg
Chloromethane	ND	4.0	μg/Kg
Vinyl chloride	ND	9.0	μg/Kg
Chloroethane	ND	26.0	μg/Kg
Trichlorofluoromethane	ND	5.0	μg/Kg
1,1-Dichloroethene	ND	6.5	μg/Kg
Methylene Chloride	B 10	4.0	μg/Kg
trans-1,2-Dichloroethene	ND	5.0	μg/Kg
1,1-Dichloroethane	ND	3.5	μg/Kg
2,2-Dichloropropane	ND	2.5	μg/Kg
cis-1,2-Dichloroethene	ND	0.5	μg/Kg
Chloroform	ND	2.5	μg/Kg
1,1,1-Trichloroethane	ND	1.5	μg/Kg
Carbon Tetrachloride	ND	6.0	μg/Kg
Benzene	170	10.0	μg/Kg
1,2-Dichloroethane	ND	1.5	μg/Kg
Trichloroethene	ND	6.0	μg/Kg
1,2-Dichloropropane	ND	2.0	μg/Kg
Bromodichloromethane	ND	5.0	μg/Kg
Toluene	64	10.0	μg/Kg
1,1,2-Trichloroethane	ND	1.0	μg/Kg
Tetrachloroethene	ND	1.5	μg/Kg
1,3-Dichloropropane	ND	1.5	μg/Kg
Dibromochloromethane	ND	4.5	μg/Kg
1,2-Dibromoethane	ND	4.0	μg/Kg
Chlorobenzene	ND	12.5	μg/Kg
Ethyl benzene	490	10.0	μg/Kg
M and P Xylene	1600	10.0	μg/Kg
0-Xylene	83	10.0	μg/Kg
Isopropylbenzene	110	10.0	μg/Kg
1,1,2,2-Tetrachloroethane	ND	1.5	μg/Kg
n-Propyl benzene	ND	0.5	μg/Kg
Bromobenzene	ND	1.5	μg/Kg
1,3,5-Trimethylbenzene	950	1.0	μg/Kg
2-Chlorotoluene	ND	0.5	μg/Kg
4-Chlorotoluene	ND	1.0	μg/Kg
tert-Butylbenzene	ND	3.0	μg/Kg
1,2,4-Trimethylbenzene	2200	2.5	μg/Kg

METHOD: Mod. 8021 (VOC) [SW 846] (continued on next page)



CITGO PETROLEUM CORPORATION

SAMPLE ID: SB-103 (3.5)

ANALYT	ICAL DATA (co	ntinued)	
PARAMETER	RESULTS	PQL*	UNITS
sec-Butylbenzene	430	1.0	μg/Kg
p-Isopropyltoluene	ND	0.5	μg/Kg
1,3-Dichlorobenzene	ND	16.0	μg/Kg
1,4-Dichlorobenzene	ND	12.0	μg/Kg
n-Butylbenzene	620	1.0	μg/Kg
1,2-Dichlorobenzene	ND	7.5	μg/Kg
1,2-Dibromo-3-chloropropane	ND	150	μg/Kg
1,2,4-Trichlorobenzene	ND	1.5	μg/Kg
Hexachlorobutadiene	ND	1.0	μg/Kg
Naphthalene	ИD	3.0	μg/Kg
1,2,3-Trichlorobenzene	ND	1.0	μg/Kg
Di-isopropyl ether	ND	5.0	μg/Kg
Methyl-t-butyl ether	ND	40.0	μg/Kg
SURROGATES	% REC	OVERY	
Fluorobenzene	11	4	

ANALYZED BY: PW DATE/TIME: 08/29/95 17:27:00

METHOD: Mod. 8021 (VOC) [SW 846]

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CAGXJohn Troost, Laboratory Manager



CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: SB-103 (3.5)

PROJECT NO: 1096
MATRIX: SOIL

DATE SAMPLED: 08/18/95 15:15:00

DATE RECEIVED: 08/19/95

ANALY	TICAL DATA		
PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	ND	0.06	μg/Kg
Acenaphthylene	ND	0.06	μg/Kg
Acenaphthene	ND	0.06	μg/Kg
Fluorene	ND	0.07	μg/Kg
Phenanthrene	ND	0.06	μg/Kg
Anthracene	ND	0.04	μg/Kg
Fluoranthene	ND	0.05	μg/Kg
Pyrene	ND	0.04	μg/Kg
Chrysene	ND	0.02	μg/Kg
Benzo (a) anthracene	ND	0.01	μg/Kg
Benzo (b) fluoranthene	ND	0.01	μg/Kg
Benzo (k) fluoranthene	ND	0.02	μg/Kg
Benzo (a) pyrene	ND	0.03	μg/Kg
Dibenzo (a,h) anthracene	ND	0.02	μg/Kg
Benzo (g,h,i) perylene	ND	0.03	μg/Kg
Indeno (1,2,3-cd) pyrene	ND	0.02	μg/Kg
1-Methylnaphthalene	ND	0.06	μg/Kg
2-Methylnaphthalene	ND	0.06	μg/Kg
SURROGATES		COVERY	
9,10-Diphenylanthracene	84		

ANALYZED BY: SJ DATE/TIME: 08/24/95 16:24:00 EXTRACTED BY: BD DATE/TIME: 08/23/95 11:00:00

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

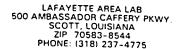
NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CAG/John Troost, Laboratory Manager





CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

DATE: 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: MW-112 (3.5)

PROJECT NO: 1096
MATRIX: SOIL

DATE SAMPLED: 08/18/95 16:10:00

DATE RECEIVED: 08/19/95

	ANALYTICAL	DATA		
PARAMETER		RESULTS	DETECTION LIMIT	UNITS
METHYL T-BUTYL ETHER		ND	8 P	μg/Kg
BENZENE		ND	1 P	μg/Kg
TOLUENE		ND	1 P	μg/Kg
ETHYLBENZENE		ND	1 P	μg/Kg
1,3,5 - TRIMETHYLBENZENE		2	1 P	μg/Kg
1,2,4 - TRIMETHYLBENZENE		8	1 P	μg/Kg
TOTAL XYLENE		ND	1 P	μg/Kg
Surrogate		% Recovery		
4-Bromofluorobenzene		98		
Method 8020				
Analyzed by: TB				
Date: 08/24/95				
Sonication extraction		08/23/95		
METHOD 3550 ***		• •		
Analyzed by: BD				
Date: 08/23/95 11:0	00:00			
Total Solids		98.3	0.1	Weight %
Method 2540G **		20.3	·	crgiic o
Analyzed by: DB				
Date: 08/29/95 16:0	0:00			

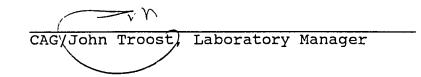
ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993



⁽P) - Practical Quantitation Limit



CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

09/01/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: MW-112 (3.5)

PROJECT NO: 1096 MATRIX: SOIL

DATE SAMPLED: 08/18/95 16:10:00

DATE RECEIVED: 08/19/95

ANALY	TICAL DATA		
PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	510	3.00	μg/Kg
Acenaphthylene	ND	3.00	μg/Kg
Acenaphthene	ND	3.00	μg/Kg
Fluorene	ND	3.50	μg/Kg
Phenanthrene	ND	3.00	μg/Kg
Anthracene	ND	2.00	μg/Kg
Fluoranthene	ND	2.50	μg/Kg
Pyrene	ND	2.00	μg/Kg
Chrysene	ND	1.00	μg/Kg
Benzo (a) anthracene	ND	0.50	μg/Kg
Benzo (b) fluoranthene	23	0.50	μg/Kg
Benzo (k) fluoranthene	9	1.00	μg/Kg
Benzo (a) pyrene	11	1.50	μg/Kg
Dibenzo (a,h) anthracene	ND	1.00	μg/Kg
Benzo (g,h,i) perylene	ND	1.50	μg/Kg
Indeno (1,2,3-cd) pyrene	ND	1.00	μg/Kg
1-Methylnaphthalene	580	3.00	μg/Kg
2-Methylnaphthalene	980	3.00	μg/Kg
SURROGATES	% REC	% RECOVERY	
9,10-Diphenylanthracene	+ DO		

DATE/TIME: 08/24/95 16:24:00 ANALYZED BY: SJ DATE/TIME: 08/23/95 11:00:00 EXTRACTED BY: BD

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS: + DO = Surrogate diluted out.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CAG/John Trogst, Laboratory Manager





CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER P.O.# #2642, TYPE WC

DATE: 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: SB-102 (3.5)

PROJECT NO: 1096

MATRIX: SOIL

DATE SAMPLED: 08/18/95 14:40:00

DATE RECEIVED: 08/19/95

ANALYTICA	L DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/23/95 12:02:00	24	5	mg/Kg
Total Petroleum Hydrocarbons (DRO) WI LUST DRO # Analyzed by: AH Date: 08/28/95 10:59:00	11	2.9	mg/Kg
Sonication extraction METHOD 3550 *** Analyzed by: BD Date: 08/23/95 11:00:00	08/23/95		
Lead, Total Method 7420 *** Analyzed by: EH Date: 08/25/95 09:02:00	23	10	mg/Kg
Total Solids Method 2540G ** Analyzed by: DB Date: 08/29/95 16:00:00	85.5	0.1	Weight %

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CAG/John Troost, Laboratory Manager



CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005

P.O.# #2642, TYPE WC

08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL STTE: MILWAUKEE, WI/9235 N 107 ST.

PROJECT NO: 1096
MATRIX: SOIL

SITE: MILWAUKEE, WI/9235 N 107 ST. SAMPLED BY: NATURAL RESOURCE TECH.

DATE SAMPLED: 08/18/95 14:40:00

SAMPLE ID: SB-102 (3.5)

ATTN: SCOTT BUCKNER

DATE RECEIVED: 08/19/95

ANALYTICAL DATA					
PARAMETER	RESULTS	PQL*	UNITS		
Dichlorodifluoromethane	ND	14.5	μg/Kg		
Chloromethane	ND	4.0	μg/Kg		
Vinyl chloride	ND	9.0	μg/Kg		
Chloroethane	ND	26.0	μg/Kg		
Trichlorofluoromethane	ND	5.0	μg/Kg		
1,1-Dichloroethene	ND	6.5	μg/Kg		
Methylene Chloride	B 8	4.0	μg/Kg		
trans-1,2-Dichloroethene	ND	5.0	μg/Kg		
1,1-Dichloroethane	ND	3.5	μg/Kg		
2,2-Dichloropropane	ND	2.5	μg/Kg		
cis-1,2-Dichloroethene	ND	0.5	μg/Kg		
Chloroform	ND	2.5	μ g/Kg		
1,1,1-Trichloroethane	ND	1.5	μg/Kg		
Carbon Tetrachloride	ND	6.0	μg/Kg		
Benzene	110	10.0	μg/Kg		
1,2-Dichloroethane	ND	1.5	μg/Kg		
Trichloroethene	ND	6.0	μg/Kg		
1,2-Dichloropropane	ND	2.0	μg/Kg		
Bromodichloromethane	ND	5.0	μg/Kg		
Toluene	ND	10.0	μg/Kg		
1,1,2-Trichloroethane	ND	1.0	μg/Kg		
Tetrachloroethene	ND	1.5	μg/Kg		
1,3-Dichloropropane	ND	1.5	μg/Kg		
Dibromochloromethane	ND	4.5	μg/Kg		
1,2-Dibromoethane	ND	4.0	μg/Kg		
Chlorobenzene	ND	12.5	μg/Kg		
Ethyl benzene	ND	10.0	μg/Kg		
M and P Xylene	ND	10.0	μg/Kg		
O-Xylene	ND	10.0	μg/Kg		
Isopropylbenzene	ND	10.0	μg/Kg		
1,1,2,2-Tetrachloroethane	ND	1.5	μg/Kg		
n-Propyl benzene	ND	0.5	μg/Kg		
Bromobenzene	ND	1.5	μg/Kg		
1,3,5-Trimethylbenzene	ND	1.0	μg/Kg		
2-Chlorotoluene	ND	0.5	μg/Kg		
4-Chlorotoluene	ND	1.0	μg/Kg		
tert-Butylbenzene	ND	3.0	μg/Kg		
1,2,4-Trimethylbenzene	ND	2.5	μg/Kg		

METHOD: Mod. 8021 (VOC) [SW 846] (continued on next page)



CITGO PETROLEUM CORPORATION

SAMPLE ID: SB-102 (3.5)

ANZ	ALYTICAL DATA	(continued	i)
PARAMETER	RESULTS	PQL:	UNITS
sec-Butylbenzene	N	D 1.0	μg/Kg
p-Isopropyltoluene	N	D 0.5	μg/Kg
1,3-Dichlorobenzene	N	D 16.0	μg/Kg
1,4-Dichlorobenzene	N	D 12.0	μ g/Kg
n-Butylbenzene	N	D 1.0	μg/Kg
1,2-Dichlorobenzene	N	D 7.5	μg/Kg
1,2-Dibromo-3-chloropropane	e Ni	D 150	μg/Kg
1,2,4-Trichlorobenzene	N	D 1.5	μ g/Kg
Hexachlorobutadiene	N	D 1.0	μg/Kg
Naphthalene	N	D 3.0	μg/Kg
1,2,3-Trichlorobenzene	N1	D 1.0	μg/Kg
Di-isopropyl ether	N	D 5.0	μg/Kg
Methyl-t-butyl ether	N	D 40.0	μg/Kg
SURROGATES	% :	RECOVERY	
Fluorobenzene		109	

ANALYZED BY: PW DATE/TIME: 08/29/95 17:27:00

METHOD: Mod. 8021 (VOC) [SW 846]

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993



CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL PROJECT NO: 1096 SITE: MILWAUKEE, WI/9235 N 107 ST. MATRIX: SOIL

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: SB-102 (3.5)

DATE SAMPLED: 08/18/95 14:40:00

DATE RECEIVED: 08/19/95

ANALY	TICAL DATA		
PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	110	0.60	μg/Kg
Acenaphthylene	ND	0.60	μg/Kg
Acenaphthene	ND	0.60	μg/Kg
Fluorene	34	0.70	μg/Kg
Phenanthrene	23	0.60	μg/Kg
Anthracene	1	0.40	μg/Kg
Fluoranthene	19	0.50	μg/Kg
Pyrene	ND	0.40	μg/Kg
Chrysene	ND	0.20	μg/Kg
Benzo (a) anthracene	ND	0.10	μg/Kg
Benzo (b) fluoranthene	5	0.10	μg/Kg
Benzo (k) fluoranthene	2	0.20	μg/Kg
Benzo (a) pyrene	2	0.30	μg/Kg
Dibenzo (a,h) anthracene	ND	0.20	μg/Kg
Benzo (g,h,i) perylene	ND	0.30	μg/Kg
Indeno (1,2,3-cd) pyrene	ND	0.20	μg/Kg
1-Methylnaphthalene	65	0.60	μg/Kg
2-Methylnaphthalene	65	0.60	μg/Kg
SURROGATES	% REC	COVERY	
9,10-Diphenylanthracene	56		

ANALYZED BY: SJ DATE/TIME: 08/24/95 16:24:00 EXTRACTED BY: BD DATE/TIME: 08/23/95 11:00:00

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993



CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

DATE: 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL PROJECT NO: 1096 SITE: MILWAUKEE, WI/9235 N 107 ST. MATRIX: SOIL

SAMPLED BY: NATURAL RESOURCE TECH. DATE

DATE SAMPLED: 08/18/95 11:15:00 DATE RECEIVED: 08/19/95

SAMPLE ID: MW-104 (3.5)

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/23/95 12:02:00	14	5	mg/Kg
Total Petroleum Hydrocarbons (DRO) WI LUST DRO # Analyzed by: AH Date: 08/26/95 08:01:00	6.3	2.9	mg/Kg
Sonication extraction METHOD 3550 *** Analyzed by: BD Date: 08/23/95 11:00:00	08/23/95		
Lead, Total Method 7420 *** Analyzed by: EH Date: 08/25/95 09:02:00	35	10	mg/Kg
Total Solids Method 2540G ** Analyzed by: DB Date: 08/29/95 16:00:00	86.3	0.1	Weight %

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993



CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL PROJECT NO: 1096
SITE: MILWAUKEE, WI/9235 N 107 ST. MATRIX: SOIL

SITE: MILWAUKEE, WI/9235 N 107 ST. MATRIX: SOIL
SAMPLED BY: NATURAL RESOURCE TECH. DATE SAMPLED: 08/18/95 11:15:00

SAMPLE ID: MW-104 (3.5) DATE RECEIVED: 08/19/95

ANALY	TICAL DATA		
PARAMETER	RESULTS	PQL*	UNITS
Dichlorodifluoromethane	ИD	14.5	μg/Kg
Chloromethane	ND	4.0	μg/Kg
Vinyl chloride	ND	9.0	μg/Kg
Chloroethane	ND	26.0	μg/Kg
Trichlorofluoromethane	ND	5.0	μg/Kg
1,1-Dichloroethene	ND	6.5	μg/Kg
Methylene Chloride	B 9	4.0	μg/Kg
trans-1,2-Dichloroethene	ND	5.0	μg/Kg
1,1-Dichloroethane	ND	3.5	μg/Kg
2,2-Dichloropropane	ND	2.5	μg/Kg
cis-1,2-Dichloroethene	ND	0.5	μg/Kg
Chloroform	ND	2.5	μg/Kg
1,1,1-Trichloroethane	ND	1.5	μg/Kg
Carbon Tetrachloride	ND	6.0	μg/Kg
Benzene	ND	10.0	μg/Kg
1,2-Dichloroethane	ND	1.5	μg/Kg
Trichloroethene	ND	6.0	μg/Kg
1,2-Dichloropropane	ND	2.0	μg/Kg
Bromodichloromethane	ND	5.0	μg/Kg
Toluene	ND	10.0	μg/Kg
1,1,2-Trichloroethane	ND	1.0	μg/Kg
Tetrachloroethene	ND	1.5	μg/Kg
1,3-Dichloropropane	ND	1.5	μg/Kg
Dibromochloromethane	ND	4.5	μg/Kg
1,2-Dibromoethane	ND	4.0	μg/Kg
Chlorobenzene	ND	12.5	μg/Kg
Ethyl benzene	ND	10.0	μg/Kg
M and P Xylene	ND	10.0	μg/Kg
O-Xylene	ND	10.0	μg/Kg
Isopropylbenzene	ND	10.0	μg/Kg
1,1,2,2-Tetrachloroethane	ND	1.5	μg/Kg
n-Propyl benzene	ND	0.5	μg/Kg
Bromobenzene	ND	1.5	μg/Kg
1,3,5-Trimethylbenzene	ND	1.0	μg/Kg
2-Chlorotoluene	ND	0.5	μg/Kg
4-Chlorotoluene	ND	1.0	μg/Kg
tert-Butylbenzene	ND	3.0	μg/Kg
1,2,4-Trimethylbenzene	ND	2.5	μg/Kg

METHOD: Mod. 8021 (VOC) [SW 846] (continued on next page)





CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-104 (3.5)

AN	ALYTICAL DATA (C	ontinued)	
PARAMETER	RESULTS	PQL*	UNITS
sec-Butylbenzene	ND	1.0	μg/Kg
p-Isopropyltoluene	ND	0.5	μg/Kg
1,3-Dichlorobenzene	ND	16.0	μg/Kg
1,4-Dichlorobenzene	ND	12.0	μg/Kg
n-Butylbenzene	ND	1.0	μg/Kg
1,2-Dichlorobenzene	ND	7.5	μg/Kg
1,2-Dibromo-3-chloropropan	e ND	150	μg/Kg
1,2,4-Trichlorobenzene	ND	1.5	μg/Kg
Hexachlorobutadiene	ND	1.0	μg/Kg
Naphthalene	ND	3.0	μg/Kg
1,2,3-Trichlorobenzene	ND	1.0	μg/Kg
Di-isopropyl ether	ND	5.0	μg/Kg
Methyl-t-butyl ether	ND	40.0	μg/Kg
SURROGATES	% RE	COVERY	
Fluorobenzene	1	.09	

ANALYZED BY: PW DATE/TIME: 08/29/95 17:27:00

METHOD: Mod. 8021 (VOC) [SW 846]

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993





CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL PROJECT NO: 1096

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

MATRIX: SOIL

DATE SAMPLED: 08/18/95 11:15:00

SAMPLED BY: NATURAL RESOURCE TECH.

DATE SAMPLED: 08/18/95

SAMPLE ID: MW-104 (3.5)

DATE RECEIVED: 08/19/95

ANALY:	TICAL DATA		
PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	ND	0.06	μg/Kg
Acenaphthylene	ND	0.06	μg/Kg
Acenaphthene	ND	0.06	μg/Kg
Fluorene	ND	0.07	μg/Kg
Phenanthrene	ND	0.06	μg/Kg
Anthracene	ND	0.04	μg/Kg
Fluoranthene	ND	0.05	μg/Kg
Pyrene	ND	0.04	μg/Kg
Chrysene	ND	0.02	μg/Kg
Benzo (a) anthracene	ND	0.01	μg/Kg
Benzo (b) fluoranthene	ND	0.01	μg/Kg
Benzo (k) fluoranthene	ND	0.02	μg/Kg
Benzo (a) pyrene	ND	0.03	μg/Kg
Dibenzo (a,h) anthracene	ND	0.02	μg/Kg
Benzo (g,h,i) perylene	ND	0.03	μg/Kg
Indeno (1,2,3-cd) pyrene	ND	0.02	μg/Kg
1-Methylnaphthalene	ND	0.06	μg/Kg
2-Methylnaphthalene	ND	0.06	μg/Kg
SURROGATES	% RE0	COVERY	
9,10-Diphenylanthracene	86		

ANALYZED BY: SJ DATE/TIME: 08/24/95 16:24:00 EXTRACTED BY: BD DATE/TIME: 08/23/95 11:00:00

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993



SPL BATCH QUALITY CONTROL REPORT ** Method 8020 ***

LAFAYETTE AREA LAB 500 AMBASSADOR CAFFERY PKWY SCOTT, LOUISIANA ZIP 70583-8544 PHONE: (318) 237-4775

PAGE

Matrix: Units:

Soil μg/Kg

Batch Id: HPBB950824101801

LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	Btan	k Spike	QC Limits(**)	
СОМРОИМОЅ	Blank Result <2>	Added <3>	Result <1>	Recovery %	(Mandatory) % Recovery Range	
ATBE	ND	50	48.8121	97.6	39 - 150	
BENZENE	ND	50	58.4050	117	39 - 150	
TOLUENE	ND	50	48.2588	96.5	46 - 140	
ETHYL_BENZENE	DN	50	48.5536	97.1	32 - 160	
1,3,5-тмв	ND	50	48.6548	97.3	32 - 160	
1,2,4-TMB	ND	50	49.8930	99.8	32 - 160	
XYLENE	ND	50	49.7405	99.5	32 - 160	
AND P XYLENE	ND I	50	50.7634	102	32 - 160	

MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix	Spike	Matrix Dupli	Spike cate	MS/MSD Relative %		imits(***) Advisory)
	<2>	<3>	Result <1>	Recovery <4>	Result	Recovery <5>	Difference	RPD Max.	Recovery Rang
-IT8E	ND	50	41.8043	83.6	48.6078	97.2	15.0	20	39 - 15
BENZENE	ND	50	44.3077	88.6	46.0409	92.1	3.87	20	39 - 15
TOLUENE	ND	50	44.5657	89.1	46.1086	92.2	3.42	20	46 - 14
ETHYL_BENZENE	ND	50	41.9588	83.9	43.3941	86.8	3.40	20	32 - 16
1,3,5-TMB	, ND	50	39.4697	78.9	41.8853	83.8	6.02	20	32 - 16
1,2,4-TMB	13.3583	50	43.3686	60.0	46.7033	66.7	10.6	20	32 - 16
O XYLENE	סא	50	41.8723	83.7	44.0112	88.0	5.01	20	32 - 16
M AND P XYLENE	ND	100	81.7776	81.8	84.4071	84.4	3.13	20	32 - 16

Analyst: TB

Sequence Date: 08/24/95

SPL ID of sample spiked: 9508896-01A

Sample File ID: \BH24415.ra

Method Blank File ID:

Blank Spike File ID: \BH24404.ra Matrix Spike File ID: \BH24429.ra

Matrix Spike Duplicate File ID: \BH24430.ra

* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

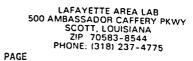
Relative Percent Difference = |(<4> - <5>)| / [(<4> + <5>) x 0.5] x 100

(**) = Source:

(***) = Source:

SAMPLES IN BATCH(SPL ID):

9508822-02A



** SPL BATCH QUALITY CONTROL REPORT ** EPA 8310

Matrix: Units:

Soil μg/Kg

Batch Id: HPLC950824162400

LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	Blani	Spike	QC Limits(**)				
COMPOUNDS	Blank Result	Added	Result	Recovery	(Mandatory)				
	<2>	<3>	<1>	×	% Recovery Range				
Naphthalene	ND	3.30	2.72	82.4	30 - 122				
Acenaphthylene	ND	3.30	2.94	89.1	30 - 126				
Acenaphthene	ND	3.30	2.81	85.2	30 - 124				
Fluorene	ND	3.30	3.15	95.5	30 - 142				
Phenanthrene	ND	3.30	2.85	86.4	30 - 155				
Anthracene	ND	3.30	1.98	60.0	30 - 126				
Fluoranthene	סא	3.30	2.62	79.4	30 - 123				
Pyrene	ND	3.30	2.80	84.8	30 - 140				
Chrysene	ND	3.30	2.81	85.2	30 - 199				
Benzo (a) anthracene	ND	3.30	2.83	85.8	30 - 135				
Benzo (b) fluoranthene	ND	3.30	2.70	81.8	30 - 150				
Benzo (k) fluoranthene	ND	3.30	2.70	81.8	30 - 159				
Benzo (a) pyrene	ND	3.30	2.47	74.8	30 - 128				
Dibenzo (a,h) anthracene	ND	3.30	2.64	80.0	30 - 110				
Benzo (g,h,i) perylene	ND	3.30	2.81	85.2	30 - 116				
Indeno (1,2,3-cd) pyrene	סא	. 3.30	2.59	78.5	30 - 116				
1-Methylnaphthalene	ND	3.30	2.81	85.2	30 - 130				
2-Methylnaphthalene	ND	3.30	3.15	95.5	30 - 130				

MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	1 ' 1 '		1		Spike	Matrix Spike Duplicate		MS/MSD Relative %	QC Limits(***)(Advisory)		
	<2>	<3>	Result <1>	Recovery <4>	Result	Recovery <5>	Difference		Recovery	Range		
NAPHTHALENE	3.5	3.30	4.91	42.7	4.11	18.5 *	79.1 *	30	30 -	122		
ACENAPHTHYLENE	ND	3.30	2.43	73.6	2.82	85.5	15.0	30	30 -	126		
ACENAPHTHENE	ND	3.30	2.94	89.1	2.56	77.6	13.8	30	30 -	124		
FLUORENE	ND	3.30	2.28	69.1	2.13	64.5	6.89	30	30 -	142		
PHENANTHRENE	ND	3.30	3.20	97.0	2.74	83.0	15.6	30	30 -	155		
ANTHRACENE	ND	3.30	2.12	64.2	2.03	61.5	4.30	30	30 -	126		
FLUORANTHENE	DN	3.30	2.80	84.8	2.15	65.2	26.1	30	30 -	123		
PYRENE	DN	3.30	3.20	97.0	3.12	94.5	2.61	30	30 -	140		
CHRYSENE	0.5	3.30	3.93	104	2.46	59.4	54.6 *	30	30 -	199		
BENZO (A) ANTHRACENE	ND	3.30	2.84	86.1	2.47	74.8	14.0	30	30 -	135		
BENZO (B) FLUORANTHENE	ND	3.30	3.84	116	3.63	110	5.31	30	30 -	150		
BENZO (K) FLUORANTHENE	ND	3.30	2.90	87.9	2.35	71.2	21.0	30	30 -	159		
BENZO (A) PYRENE	ND	3.30	2.45	74.2	2.81	85.2	13.8	30	30 -	128		
DIBENZO (A,H) ANTHRACENE	ND	3.30	2.76	83.6	2.30	69.7	18.1	30	30 -	130		
BENZO (G,H,I) PERYLENE	ND	3.30	3.22	97.6	2.45	74.2	27.2	30	30 -	130		
INDENO (1,2,3-CD) PYRENE	ND	3.30	2.40	72.7	2.10	63.6	13.4	30	30 -	116		



SPL BATCH QUALITY CONTROL REPORT ** EPA 8310

LAFAYETTE AREA LAB 500 AMBASSADOR CAFFERY PKWY SCOTT, LOUISIANA ZIP 70583-8544 PHONE: (318) 237-4775 PAGE

Batch Id: HPLC950824162400

Matrix: Units:

Soil μg/Kg

MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix Spike		Matrix Dupli	Spike cate	MS/MSD Relative %	Ī	.imits(***) (Advisory)
	<2>	<3>	Result <1>	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery Range
1-METHYLNAPHTHALENE 2-METHYLNAPHTHALENE	ND ND	3.30 3.30	3.86 4.20		3.24 3.80	1	17.5 9.92	30 30	30 - 130 30 - 130

Analyst: SJ

Sequence Date: 08/24/95

SPL ID of sample spiked: 9508814-05A

Sample File ID: 9508240120101

Method Blank File ID:

Blank Spike File ID: 9508250160101

Matrix Spike File ID: 9508250170101

Matrix Spike Duplicate File ID: 9508290030101

* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = |(<4> - <5>)| / [(<4> + <5>) x 0.5] x 100

(**) = Source: 8310 SW846 (***) = Source: 8310 SW846

SAMPLES IN BATCH(SPL ID):

9508814-04A 9508814-05A 9508822-01C 9508822-02B 9508822-03C 9508822-04C 9508804-01C 9508804-02C 9508804-03C 9508804-04C 9508814-01A 9508814-02A

9508814-03A



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Matrix: Units:

Soil μg/Kg

Batch Id: HP00950829172700

LABORATORY CONTROL SAMPLE

S P I K E C O M P O U N D S	Method Blank Result <2>	Spike Added <3>	Blank Result <1>	Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
I CHLOROD I FLUOROMETHANE	ND	15.0	10.1588	67.7	50 - 140
CHLOROMETHANE	ND	15.0	11.9650	79.8	50 - 140
INYL CHLORIDE	ND	15.0	14.1999	94.7	50 - 140
ROMOMETHANE	ND	15.0	14.0690	93.8	50 - 140
CHLOROETHANE	ND	15.0	13.8967	92.6	50 - 140
RICHLOROFLUOROMETHANE	ND	15.0	13.3424	88.9	50 - 140
1.1-DICHLOROETHENE	ND	15.0	14.0249	93.5	50 - 140
METHYLENE CHLORIDE	8.7282	15.0	14.3194	95.5	50 - 140
RANS-1,2-DICHLOROETHENE	ND	15.0	14.3523	95.7	50 - 140
1.1-DICHLOROETHANE	ND	15.0	15.6520	104	50 - 140
2,2-DICHLOROPROPANE	ND	15.0	15.6170	104	50 - 140
CIS-1,2-DICHLOROETHENE	ND	15.0	16.6364	111	50 - 140
CHLOROFORM	ND	15.0	16.1993	108	50 - 140
BROMOCHLOROMETHANE	ND	15.0	13.2430	88.3	50 - 140
1,1,1-TRICHLOROETHANE	ND	15.0	13.9952	93.3	50 - 140
1.1-DICHLOROPROPENE	ND	15.0	13.8919	92.6	50 - 140
CARBON TETRACHLORIDE	ND	15.0	14.2044	94.7	50 - 140
BENZENE	ND	15.0	14,7653	98.4	50 - 140
1,2-DICHLOROETHANE	ND	15.0	13.6859	91.2	50 - 140
TRICHLOROETHENE	ND	15.0	14.0374	93.6	50 - 140
1.2-DICHLOROPROPANE	ND	15.0	14.0022	93.3	50 - 140
BROMODICHLOROMETHANE	ND ND	15.0	14.1002	94.0	50 - 140
DIBROMOMETHANE	ND	15.0	10.5000	70.0	50 - 140
CIS-1,3-DICHLOROPROPENE	ND	15.0	13.8845	92.6	50 - 140
TOLUENE	ND	15.0	14.8498	99.0	50 - 140
TRANS-1,3-DICHLOROPROPENE	ND	15.0	13.6615	91.1	50 - 140
1,1,2-TRICHLOROETHANE	ND	15.0	14.2644	95.1	50 - 140
TETRACHLOROETHENE	ND	15.0	14.2262	94.8	50 - 140
1.3-DICHLOROPROPANE	ND	15.0	13.2212	88.1	50 - 140
DIBROMOCHLOROMETHANE	ND	15.0	14.6579	97.7	50 - 140
1.2-DIBROMOETHANE	ND	15.0	13.8998	92.7	50 - 140
CHLOROBENZENE	ND	15.0	14.0715	93.8	50 - 140
ETHYL BENZENE	ND	15.0	15.1737	101	50 - 140
1.1,1,2-TETRACHLOROETHANE	ND	15.0	14.0873	93.9	50 - 140
M AND P XYLENE	ND	30.0	29.0101	96.7	50 - 140
O-XYLENE	ND ND	15.0	14.8202	98.8	50 - 140
STYRENE	ND	15.0	14.1552	94.4	50 - 140
ISOPROPYLBENZENE	ND ND	15.0	13.4352	89.6	50 - 140
BROMOFORM	ND ND	15.0	15.4367	103	50 - 140
1,1,2,2-TETRACHLOROETHANE	ND	15.0	13.8460	92.3	50 - 140
1,2,3-TRICHLOROPROPANE	ND	15.0	16.4965	110	50 - 140
1,2,3-IKICHLOKOPKUPANE	ND	15.0	16.5424	110	50 - 140



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** SPL BATCH QUALITY CONTROL REPORT ** Method Mod. 8021 ***

Matrix: Units:

Soil μg/Kg

Batch Id: HP00950829172700

LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	Blank	Spike	QC Limits(**)
COMPOUNDS	Blank Result <2>	Added <3>	Result <1>	Recovery %	(Mandatory) % Recovery Range
BROMOBENZENE	ND	15.0	15.8126	105	50 - 140
1,3,5-TRIMETHYLBENZENE	ND	15.0	18.0975	121	50 - 140
2-CHLOROTOLUENE	ND	15.0	15.5191	103	50 - 140
4-CHLOROTOLUENE	ND	15.0	16.1557	108	50 - 140
TERT-BUTYLBENZENE	ND	15.0	16.3752	109	50 - 140
1,2,4-TRIMETHYLBENZENE	ND	15.0	13.5072	90.0	50 - 140
SEC-BUTYLBENZENE	ND	15.0	13.4839	89.9	50 - 140
P-ISOPROPYLTOLUENE	ND	15.0	13.4162	89.4	50 - 140
1,3-DICHLOROBENZENE	ND	15.0	13.5831	90.6	50 - 140
1,4-DICHLOROBENZENE	ND	15.0	12.7529	85.0	50 - 140
N-BUTYLBENZENE	ND -	15.0	14.2348	94.9	50 - 140
1,2-DICHLOROBENZENE	ND	15.0	14.5364	96.9	50 - 140
1,2-DIBROMO-3-CHLOROPROPAN	ND	15.0	20.1710	134	50 - 140
1,2,4-TRICHLOROBENZENE	ND	15.0	20.4816	137	50 - 140
HEXACHLOROBUTAD LENE	ND	15.0	17.6380	118	50 - 140
NAPHTHALENE	ND	15.0	20.1513	134	50 - 140
1,2,3-TRICHLOROBENZENE	ND	15.0	12.9749	86.5	50 - 140

MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix	Spike	Matrix Dupli	Spike	MS/MSD Relative %	QC Limits(***)(Advisory)				
	<2>	<3>	Result <1>	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery	Range		
VINYL CHLORIDE	ND	25.0	26.8906	108	22.0159	88.1	20.3	30	50 -	140		
CHLOROETHANE	ND	25.0	14.8107	59.2	22.7840	91.1	42.4 *	30	50 -	140		
METHYLENE CHLORIDE	8.7282	25.0	27.7291	76.0	30.8540	88.5	15.2	30	50 -	140		
1,1-DICHLOROETHANE	ND	25.0	18.1752	72.7	22.2111	88.8	19.9	30	50 -	140		
CHLOROFORM	סא	25.0	19.0732	76.3	25.7030	103	29.8	30	50 -	140		
1,1,1-TRICHLOROETHANE	DN	25.0	24.5692	98.3	29.4020	118	18.2	30	50 -	140		
CARBON TETRACHLORIDE	ND	25.0	28.9150	116	30.8402	123	5.86	30	50 -	140		
BENZENE	ND	25.0	27.6560	111	25.0683	100	10.4	30	50 -	140		
1.2-DICHLOROETHANE	ND	25.0	25.0978	100	22.7409	91.0	9.42	30	50 -	140		
TRICHLOROETHENE	ND	25.0	30.7148	123	31.6990	127	3.20	30	50 -	140		
BROMODICHLOROMETHANE	ND	25.0	27.4625	110	28.2521	113	2.69	30	50 -	140		
TOLUENE	ND	25.0	27.3918	110	25.3227	101	8.53	30	50 -	140		
1,1,2-TRICHLOROETHANE	ND	25.0	23.5156	94.1	21.8858	87.5	7.27	30	50 -	14		
TETRACHLOROETHENE	ND	25.0	29.9327	120	31.7590	127	5.67	30	50 -	14		
CHLOROBENZENE	ND	25.0	25.8011	103	25.4625	102	0.976	30	50 -	14		
ETHYL BENZENE	ND	25.0	25.4383	102	23.5165	94.1	8.06	30	50 -	14		
M AND P XYLENE	ND	50.0	49.000	98.0	48.6036	97.2	0.820	30	50 -	14		



Matrix: Units:

Soil

μg/Kg

SPL BATCH QUALITY CONTROL REPORT ** Method Mod. 8021 ***

LAFAYETTE AREA LAB 500 AMBASSADOR CAFFERY PKWY SCOTT, LOUISIANA ZIP 70583-8544 PHONE: (318) 237-4775

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MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results	Spike Added	Matrix	Matrix Spike Matrix Spike Duplicate		MS/MSD Relative %	QC Limits(***)(Advisory)						
	<2>	<3>	Result	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery	Range			
O-XYLENE	ND	25.0	25.0766	100	25.0744	100	0	30	50 -	140			
ISOPROPYLBENZENE	ND	25.0	24.2426	97.0	25.1598	101	4.04	30	50 -	140			
1,1,2,2-TETRACHLOROETHANE	DИ	25.0	20.6120	82.4	20.7195	82.9	0.605	30	50 -	140			
SEC-BUTYLBENZENE	ND	25.0	23.5101	94.0	25.4000	102	8.16	30	50 -	140			
P-ISOPROPYLTOLUENE	ND	25.0	20.4315	81.7	25.0284	100	20.1	30	50 -	140			
1,3-DICHLOROBENZENE	ND	25.0	22.3167	89.3	23.9584	95.8	7.02	30	50 -	140			
1,4-DICHLOROBENZENE	ND	25.0	19.2137	76.9	24.8694	99.5	25.6	30	50 -	140			
N-BUTYLBENZENE	ND	25.0	22.9546	91.8	22.2006	88.8	3.32	30	50 -	140			
1,2-DICHLOROBENZENE	ND	25.0	19.8557	79.4	22.5870	90.3	12.8	30	50 -	140			
NAPHTHALENE	ND	25.0	20.2	80.8	16.8222	67.3	18.2	30	50 -	140			

Analyst: PW

Sequence Date: 08/29/95

SPL ID of sample spiked: MBLANK

fample File ID: \EH29202.ra

ethod Blank File ID:

lank Spike File ID: \EH29204.ra Matrix Spike File ID: \EH29214.ra

Matrix Spike Duplicate File ID: \EH29204.ra

* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

Batch Id: HP00950829172700

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = |(<4> - <5>)| / [(<4> + <5>) x 0.5] x 100

(**) = Source: SPL Lafayette, 11/94

(***) = Source: SPL Lafayette, 11/94

SAMPLES IN BATCH(SPL ID):

9508822-01A 9508822-03A 9508822-04A 9508804-01A

9508804-02A 9508804-03A 9508804-04A 9508822-01A





Matrix: Soil

Reported on: 08/30/95

Analyzed on: 08/26/95

Analyst:

ΑH

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Diesel Range Organics WI LUST DRO #

SPL Sample ID Number	Blank Value mg/Kg	Amt Added mg/Kg	Matrix Spike Recovery %	Matrix Spike Duplicate Recovery %	Relative Percent Difference %	QC Limits Recovery	RPD Max.
BLANK_SPIKE	8.0	40	82.5	85.0	3.0	50 - 130	30

TPHD950821100000-9508D89

Samples in batch:

9508804-01B 9508804-02B 9

9508804-03B 9508804-04B

036

9508822-01B 9508822-03B 9508822-04B

COMMENTS:

METHOD BLANK CONTRIBUTION OF LESS THAN 5 TIMES OF THE DETECTION LIMIT. UNABLE TO REEXTRACT DUE TO NO MORE SAMPLE AVAILABLE.

SPL, Incorporated





Matrix: Soil

Reported on: 08/25/95

Analyzed on: 08/23/95

Analyst:

TR

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Gasoline Range Organics WI LUST GRO #

SPL Sample ID Number	Blank Value mg/Kg	Amt Added mg/Kg	Matrix Spike Recovery %	Matrix Spike Duplicate Recovery %	Relative Percent Difference %	QC Limits Recovery	RPD Max.
9508821-04A	ND	5.0	82.0	72.0	13	60 - 130	20

FIDB950823120200-9508B11

Samples in batch:

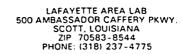
9508822-01A

9508822-02A

9508822-03A

COMMENTS:

SPL, Incorporated





Matrix: Soil

Reported on: 08/25/95

Analyzed on: 08/25/95

Analyst:

EΗ

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

> Lead, Total Method 7420 ***

SPL Sample ID Number	Blank Value mg/Kg	Amt Added mg/Kg	Matrix Spike Recovery	Matrix Spike Duplicate Recovery %	Relative Percent Difference %	QC Limits Recovery	RPD Max.
9508822-010	ND	100	100	90.0	10	80 - 120	20

3100950825090200-9508B24

Samples in batch:

9508822-03D 9508822-01D

9508822-04D

COMMENTS:

SPL, Incorporated

Mayofh Karen Grizzaffi, QC Officer





Matrix: Soil

Reported on: 08/30/95

Analyzed on: 08/29/95

Analyst:

DB

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

Total Solids
Method 2540G **

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration	Duplicate Sample %	RPD	RPD Max.
9508B41-18A	88.3	88.3	0	20

TSOL950829160000-9508E21

Samples in batch:

9508804-01D	9508804-02D	9508804-03D	9508804-04D
9508822-01D	9508822-02D	9508822-03D	9508822-040
9508B41-09A	9508B41-10A	9508B41-11A	9508B41-12A
9508B41-13A	9508B41-14A	9508B41-15A	9508B41-16A
9508B41-17A	9508B41-18A		

COMMENTS:

SPL, Incorporated

Mulu Magagh

Karen Grizzaffi, QC Officer





SAMPLE PROTOCOL NON-CONFORMANCE LOG

Prepared by: Lemeth Contant	· ` ` ` ·	Date_	8/15/55
Client: <u>Maturil Resonnce</u> Tec	G	Work Order	
Sample Types: Soil Wate	Sludge	Product	Air
SAMP	LES AFFECTED	•	
Client ID Fr	action #	ALL	
1 Didn't recrived moth	anol BLK		
3			
4	· · · · · · · · · · · · · · · · · · ·		
5			
NON-C	ONFORMANCE		
HEAD SPACE IN VOA UNPR	ESERVED	IMPROPE	RLYPRESERVED
IMPROPER CONTAINERS DAMA	GED CONTAIN	ERS NO	COC PRESENT
SAMPLE/COC I.D CONFLICT INCOM	APLETE COC		
OTHER:			
Submitted for Resolution to:		:	
Date:		Time:	
			
-			
Returned to Login: Date:			
ACTION: STOP ANALYSES COMPL			
nstructions:			





ENVIRONMENTAL LABORATORY

DATE

8/19/55

CLIENT CHEST: YES/NO SAMPLE LOGIN CHECKLIST

1) 2)	IS THE COC PROP	CUSTODY FORM PRESENT: PERLY COMPLETED: WHAT IS INCOMPLETE:		YES	NO
***************************************				·	
3) 4)	IS AIRBILL/PACK TO SHIPMENT:	CONTACTED ABOUT INCO ING LIST/BILL OF LADI	ING ATTACHED		
5)	ARE CUSTODY SEA	LS PRESENT ON THE PAC Y INTACT UPON RECEIPT	CKAGE:		
6)	DO THE LABELS M IF NO, HAS CLIE	TAGGED OR LABELED: ATCH THE COC: NT BEEN CONTACTED ABO NT DOCUMENTATION FROM	OUT IT: CLIENT IN REMA	ARKS)	
7)	DO ALL SHIPPING	DOCUMENTS AGREE: WHAT IS IN NONCONFOR			
			-		
8)	CONDITION/TEMPER	RATURE OF SHIPPING CO	NTAINER:	56-3	
	-	0K. 4C		2-ني	
9)	CONDITION OF SAM	•		- #9 - 3₩	
	ى	In't receive mether	nol BLK.		
10) REMAI	SAMPLE DISPOSAL: RKS/CONTACT/PHONE		RETURN TO	CLIENT	
		F	REIGHT		
		REPTS TO:			
R0J #	1096	ATTN:	ATTN:		
		ADDR:			
		CTY/ST			

J508822

CHAIN OF CUHUY RECORD

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I hereby certify that	I received, prop	erly handled	, and mai	ntained cu	stody of t	hese samples a	s noted be	low:						Analy	tical M	lethod	/ Num	bers		_		Lab Use On	ly
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SPECIAL INSTRUC	CTIONS														analytic	al report		indicated		ys after issu se below:	<u>.</u>	l _o	Ś

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Sender's Name BEKKY KOF Company DAMKA Ke	Source Techpept/Floor	FedEx Overhight Freight FodEx 2Day Freight from part Superior 150 provide Call for delivery schedule
Address 23713 W P. City Pewsuke	State W/21 53072	FedEx FedEx FedEx FedEx Form Declared value from 3000 Special Handling Does this shipment coptain dangerous goods! No Yes the shipment coptain dangerous goods!
Your Internal Billing Reference Information LAFA To Recipient's Name	Phone (31 s + 2 37 - 4775	Contain dangerous goods? Ory lee Ory
Company SOUTHERN PETROLEUM L Address print fed Ex address here) 500 APBASS		10: section 1 will be bled) tener Fed a accoupt no or Cerebi fine on the section 1 will be bled.
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		Release Signature Tour signature authorizes Federal Express to devent the stop ment without obtaining a signature and agrees to indemnify and hold harmless Federal Express from any resulting claims.
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CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.#

#2642, TYPE WC DATE: 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-110 (3.5)

PROJECT NO: 1096

MATRIX: SOIL

DATE SAMPLED: 08/23/95

DATE RECEIVED: 08/26/95

	ANALYTICAL	DATA		DEMEGRACAN	INTEG
PARAMETER			RESULTS	DETECTION LIMIT	UNITS
METHYL T-BUTYL ETHER			ND	8 P	μg/Kg
BENZENE			ND	1 P	μg/Kg
TOLUENE			ND	1 P	μg/Kg
ETHYLBENZENE			ND	1 P	μg/Kg
1,3,5 - TRIMETHYLBENZENE			ND	1 P	μg/Kg
1,2,4 - TRIMETHYLBENZENE			ND	1 P	μg/Kg
TOTAL XYLENE			ND	1 P	μg/Kg
Surrogate		%	Recovery		
4-Bromofluorobenzene Method 8020			98		
Analyzed by: TB Date: 08/29/95					
Sonication extraction METHOD 3550 ***			08/31/95		
Analyzed by: SW					
Date: 08/31/95 10:0	0:00				
Total Solids			80.0	0.1	Weight %
Method 2540G **					
Analyzed by: DB					
Date: 08/30/95 15:0	0:00				

ND - Not detected.

(P) - Practical Quantitation Limit

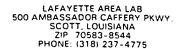
Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: DEPTH 2.5-4.5

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

Laboratory Manager





CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-110 (3.5)

PROJECT NO: 1096

MATRIX: SOIL

DATE SAMPLED: 08/23/95

DATE RECEIVED: 08/26/95

ANALY	TICAL DATA		
PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	ND	0.06	μg/Kg
Acenaphthylene	ND	0.06	μg/Kg
Acenaphthene	ND	0.06	μg/Kg
Fluorene	ND	0.07	μg/Kg
Phenanthrene	ND	0.06	μg/Kg
Anthracene	ND	0.04	μg/Kg
Fluoranthene	ND	0.05	μg/Kg
Pyrene	ND	0.04	μg/Kg
Chrysene	ND	0.02	μg/Kg
Benzo (a) anthracene	ND	0.001	μg/Kg
Benzo (b) fluoranthene	ND	0.01	μg/Kg
Benzo (k) fluoranthene	ND	0.02	μg/Kg
Benzo (a) pyrene	ND	0.03	μg/Kg
Dibenzo (a,h) anthracene	ND	0.02	μg/Kg
Benzo (g,h,i) perylene	ND	0.03	μg/Kg
Indeno (1,2,3-cd) pyrene	ND	0.02	μg/Kg
1-Methylnaphthalene	ND	0.06	μg/Kg
2-Methylnaphthalene	ND	0.06	μg/Kg
SURROGATES	-	COVERY	
9,10-Diphenylanthracene		84	

ANALYZED BY: SJ DATE/TIME: 08/31/95 20:30:03 EXTRACTED BY: SW DATE/TIME: 08/31/95 10:00:00

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS: DEPTH 2.5-4.5

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

P.O.#

#2642, TYPE WC



Certificate of Analysis No. L1-9508A65-02

CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

DATE: 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-111 (3.5)

PROJECT NO: 1096

MATRIX: SOIL

DATE SAMPLED: 08/24/95 DATE RECEIVED: 08/26/95

	ANALYTICAL	בייובת	1		
PARAMETER	ANABITICAL	DETE	RESULTS	DETECTION LIMIT	UNITS
METHYL T-BUTYL ETHER			ND	8 P	μg/Kg
BENZENE			ND	1 P	μg/Kg
TOLUENE			ND	1 P	μg/Kg
ETHYLBENZENE			ND	1 P	μg/Kg
1,3,5 - TRIMETHYLBENZENE			ND	1 P	μg/Kg
1,2,4 - TRIMETHYLBENZENE			ND	1 P	μg/Kg
TOTAL XYLENE			ND	1 P	μg/Kg
Surrogate		%	Recovery		
4-Bromofluorobenzene Method 8020 Analyzed by: TB			94		
Date: 08/29/95					
Sonication extraction METHOD 3550 *** Analyzed by: SW			08/31/95		
Date: 08/31/95 10:	00:00				
Total Solids			83.4	0.1	Weight S
Method 2540G **					
Analyzed by: DB					
Date: 08/30/95 15:	00:00				

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

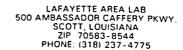
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: DEPTH 2.5-4.5

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

⁽P) - Practical Quantitation Limit





CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-111 (3.5)

PROJECT NO: 1096

MATRIX: SOIL

DATE SAMPLED: 08/24/95

DATE RECEIVED: 08/26/95

AN	ALYTICAL DATA		
PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	ND	0.06	μg/Kg
Acenaphthylene	ND	0.06	μg/Kg
Acenaphthene	ND	0.06	μg/Kg
Fluorene	ND	0.07	μg/Kg
Phenanthrene	ND	0.06	μg/Kg
Anthracene	ИD	0.04	μg/Kg
Fluoranthene	ND	0.05	μg/Kg
Pyrene	ND	0.04	μg/Kg
Chrysene	ND	0.02	μg/Kg
Benzo (a) anthracene	ND	0.001	μg/Kg
Benzo (b) fluoranthene	ND	0.01	μg/Kg
Benzo (k) fluoranthene	ND	0.02	μg/Kg
Benzo (a) pyrene	ND	0.03	μg/Kg
Dibenzo (a,h) anthracene	ND	0.02	μg/Kg
Benzo (g,h,i) perylene	ND	0.03	μg/Kg
Indeno (1,2,3-cd) pyrene	ND	0.02	μg/Kg
1-Methylnaphthalene	ND	0.06	μg/Kg
2-Methylnaphthalene	ND	0.06	μg/Kg
SURROGATES	% RE	COVERY	
9,10-Diphenylanthracene		80	

ANALYZED BY: SJ DATE/TIME: 08/31/95 20:30:03 EXTRACTED BY: SW DATE/TIME: 08/31/95 10:00:00

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS: DEPTH 2.5-4.5

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993



CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

DATE: 09/07/95

Weight %

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-106 (3.5)

PROJECT NO: 1096

MATRIX: SOIL

DATE SAMPLED: 08/25/95 DATE RECEIVED: 08/26/95

	ANALYTICAL	DATA		
PARAMETER		RESULTS	DETECTION	UNITS
			LIMIT	
METHYL T-BUTYL ETHER		ND	8 P	μg/Kg
BENZENE		ND	1 P	μg/Kg
TOLUENE		ND	1 P	μg/Kg
ETHYLBENZENE		ND	1 P	μg/Kg
1,3,5 - TRIMETHYLBENZENE		ND	1 P	μg/Kg
1,2,4 - TRIMETHYLBENZENE		ND	1 P	μg/Kg
TOTAL XYLENE		ND	1 P	μg/Kg
Surrogate		% Recovery		
4-Bromofluorobenzene		91		

Method 8020

Analyzed by: TB

Date: 08/29/95

Sonication extraction

METHOD 3550 ***

Analyzed by: SW Date: 08/31/95 10:00:00

, ,

Method 2540G **

Total Solids

Analyzed by: DB

Date: 08/30/95 15:00:00

ND - Not detected.

(P) - Practical Quantitation Limit

0.1

08/31/95

84.1

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

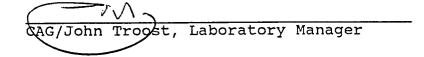
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: DEPTH 2.5-4.5

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060

LUST Analytical Guidance, Wisconsin DNR, 1993







CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL PROJECT NO: 1096
SITE: MILWAUKEE, WI/9235 N 107 ST. MATRIX: SOIL

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-106 (3.5)

DATE SAMPLED: 08/25/95 DATE RECEIVED: 08/26/95

ANALY	TICAL DATA		
PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	ND	0.06	μg/Kg
Acenaphthylene	ND	0.06	μg/Kg
Acenaphthene	ND	0.06	μg/Kg
Fluorene	ND	0.07	μg/Kg
Phenanthrene	ND	0.06	μg/Kg
Anthracene	ND	0.04	μg/Kg
Fluoranthene	ND	0.05	μg/Kg
Pyrene	ND	0.04	μg/Kg
Chrysene	ND	0.02	μg/Kg
Benzo (a) anthracene	ND	0.001	μg/Kg
Benzo (b) fluoranthene	ND	0.01	μg/Kg
Benzo (k) fluoranthene	ND	0.02	μg/Kg
Benzo (a) pyrene	ND	0.03	μg/Kg
Dibenzo (a,h) anthracene	ND	0.02	μg/Kg
Benzo (g,h,i) perylene	ND	0.03	μg/Kg
Indeno (1,2,3-cd) pyrene	ND	0.02	μg/Kg
1-Methylnaphthalene	ND	0.06	μg/Kg
2-Methylnaphthalene	ND	0.06	μg/Kg
SURROGATES	% RE	COVERY	
9,10-Diphenylanthracene		81	

ANALYZED BY: SJ DATE/TIME: 08/31/95 20:30:03 EXTRACTED BY: SW DATE/TIME: 08/31/95 10:00:00

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS: DEPTH 2.5-4.5

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993



CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.#

#2642, TYPE WC DATE: 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-107 (3.5)

PROJECT NO: 1096

MATRIX: SOIL

DATE SAMPLED: 08/25/95

DATE RECEIVED: 08/26/95

2224	ANALYTICAL	DATA RESULTS	DETECTION	UNITS
PARAMETER		RESULTS	LIMIT	UNITS
METHYL T-BUTYL ETHER		ND	8 P	μg/Kg
BENZENE		ND	1 P	μg/Kg
TOLUENE		ND	1 P	μg/Kg
ETHYLBENZENE		ND ND	1 P 1 P	μg/Kg
1,3,5 - TRIMETHYLBENZENE 1,2,4 - TRIMETHYLBENZENE		ND	1 P	μg/Kg μg/Kg
TOTAL XYLENE		ND	1 P	μg/Kg
Surrogate		% Recovery		
4-Bromofluorobenzene Method 8020 Analyzed by: TB Date: 08/29/95		96		
Sonication extraction		08/31/95		
METHOD 3550 ***		00/31/33		
Analyzed by: SW				
Date: 08/31/95 10:	00:00			
Total Solids		84.8	0.1	Weight %
Method 2540G **				
Analyzed by: DB Date: 08/30/95 15:	00:00			

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed. ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: DEPTH 2.5-4.5

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

⁽P) - Practical Quantitation Limit





CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-107 (3.5)

PROJECT NO: 1096

MATRIX: SOIL

DATE SAMPLED: 08/25/95

DATE RECEIVED: 08/26/95

ANALY	TICAL DATA		
PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	ND	0.06	μg/Kg
Acenaphthylene	ND	0.06	μg/Kg
Acenaphthene	ND	0.06	μg/Kg
Fluorene	ND	0.07	μg/Kg
Phenanthrene	ND	0.06	μg/Kg
Anthracene	ND	0.04	μg/Kg
Fluoranthene	ND	0.05	μg/Kg
Pyrene	ND	0.04	μg/Kg
Chrysene	ND	0.02	μg/Kg
Benzo (a) anthracene	ND	0.001	μg/Kg
Benzo (b) fluoranthene	ND	0.01	μg/Kg
Benzo (k) fluoranthene	ND	0.02	μg/Kg
Benzo (a) pyrene	ND	0.03	μg/Kg
Dibenzo (a,h) anthracene	ND	0.02	μg/Kg
Benzo (g,h,i) perylene	ND	0.03	μg/Kg
Indeno (1,2,3-cd) pyrene	ND	0.02	μg/Kg
1-Methylnaphthalene	ND	0.06	μg/Kg
2-Methylnaphthalene	ND	0.06	μg/Kg
SURROGATES	% RE	COVERY	
9,10-Diphenylanthracene		80	

ANALYZED BY: SJ DATE/TIME: 08/31/95 20:30:03 EXTRACTED BY: SW DATE/TIME: 08/31/95 10:00:00

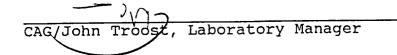
METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

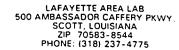
NOTES: * - Practical Quantitation Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS: DEPTH 2.5-4.5







CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

#2642, TYPE WC DATE: 09/07/95

P.O.#

Weight %

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-108 (3.5)

PROJECT NO: 1096

MATRIX: SOIL

DATE SAMPLED: 08/25/95 DATE RECEIVED: 08/26/95

PARAMETER	ANALYTICAL	DATA	RESULTS	DETI LIMI	ECTION	UNITS
METHYL T-BUTYL ETHER			ND		P	μg/Kg
BENZENE			ND	1	P	μg/Kg
TOLUENE			ND	1	P	μg/Kg
ETHYLBENZENE			ND	1	P	μg/Kg
1,3,5 - TRIMETHYLBENZENE			ND	1	P	μg/Kg
1,2,4 - TRIMETHYLBENZENE			ND	1	P	μg/Kg
TOTAL XYLENE			ND	1	P	μg/Kg
		0. 1	0			

Surrogate % Recovery 4-Bromofluorobenzene 93

Method 8020

Analyzed by: TB

Date: 08/29/95

Sonication extraction 08/31/95

METHOD 3550 ***
Analyzed by: SW

Date: 08/31/95 10:00:00

- -- ,

Total Solids
Method 2540G **

Analyzed by: DB

Date: 08/30/95 15:00:00

ND - Not detected.

(P) - Practical Quantitation Limit

86.5

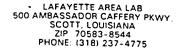
0.1

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: DEPTH 2.5-4.5

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993





CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-108 (3.5)

PROJECT NO: 1096

MATRIX: SOIL

DATE SAMPLED: 08/25/95

DATE RECEIVED: 08/26/95

	ANALYTICAL DATA		
PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	ND	0.06	μg/Kg
Acenaphthylene	ND	0.06	μg/Kg
Acenaphthene	ND	0.06	μg/Kg
Fluorene	ND	0.07	μg/Kg
Phenanthrene	ND	0.06	μg/Kg
Anthracene	ND	0.04	μg/Kg
Fluoranthene	ND	0.05	μg/Kg
Pyrene	ND	0.04	μg/Kg
Chrysene	ND	0.02	μg/Kg
Benzo (a) anthracene	ND	0.001	μg/Kg
Benzo (b) fluoranthene	ND	0.01	μg/Kg
Benzo (k) fluoranthene	ND	0.02	μg/Kg
Benzo (a) pyrene	ND	0.03	μg/Kg
Dibenzo (a,h) anthracene	ND	0.02	μg/Kg
Benzo (g,h,i) perylene	ND	0.03	μg/Kg
Indeno (1,2,3-cd) pyrene	ND	0.02	μg/Kg
1-Methylnaphthalene	ND	0.06	μg/Kg
2-Methylnaphthalene	ND	0.06	μg/Kg
SURROGATES	% 1	RECOVERY	
9,10-Diphenylanthracene		80	

ANALYZED BY: SJ DATE/TIME: 08/31/95 20:30:03 EXTRACTED BY: SW DATE/TIME: 08/31/95 10:00:00

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS: DEPTH 2.5-4.5





CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.#

#2642, TYPE WC DATE: 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

Date: 08/30/95 15:00:00

SAMPLE ID: MW-109 (3.5)

PROJECT NO: 1096

MATRIX: SOIL

DATE SAMPLED: 08/25/95 DATE RECEIVED: 08/26/95

	ANALYTICAL DZ	አ ጥ አ		
PARAMETER	ANADITICAD DA	RESULTS	DETECTION LIMIT	UNITS
METHYL T-BUTYL ETHER BENZENE TOLUENE ETHYLBENZENE 1,3,5 - TRIMETHYLBENZENE 1,2,4 - TRIMETHYLBENZENE TOTAL XYLENE		ND ND ND ND ND ND	8 P 1 P 1 P 1 P 1 P 1 P	μg/Kg μg/Kg μg/Kg μg/Kg μg/Kg μg/Kg
Surrogate 4-Bromofluorobenzene Method 8020 Analyzed by: TB Date: 08/29/95		% Recovery 83		
Sonication extraction METHOD 3550 *** Analyzed by: SW Date: 08/31/95 10:0	0:00	08/31/95		
Total Solids Method 2540G ** Analyzed by: DB		85.7	0.1	Weight %

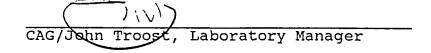
ND - Not detected.

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: DEPTH 2.5-4.5







CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-109 (3.5)

PROJECT NO: 1096
MATRIX: SOIL

DATE SAMPLED: 08/25/95 DATE RECEIVED: 08/26/95

ANALY	TICAL DATA		
PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	ND	6.00	μg/Kg
Acenaphthylene	ND	6.00	μg/Kg
Acenaphthene	ND	6.00	μg/Kg
Fluorene	ND	7.00	μg/Kg
Phenanthrene	250	6.00	μg/Kg
Anthracene	23	4.00	μg/Kg
Fluoranthene	760	5.00	μg/Kg
Pyrene	690	4.00	μg/Kg
Chrysene	560	2.00	μg/Kg
Benzo (a) anthracene	330	0.100	μg/Kg
Benzo (b) fluoranthene	290	1.00	μg/Kg
Benzo (k) fluoranthene	120	2.00	μg/Kg
Benzo (a) pyrene	230	3.00	μg/Kg
Dibenzo (a,h) anthracene	ND	2.00	μg/Kg
Benzo (g,h,i) perylene	57	3.00	μg/Kg
Indeno (1,2,3-cd) pyrene	ND	2.00	μg/Kg
1-Methylnaphthalene	ND	6.00	μg/Kg
2-Methylnaphthalene	ND	6.00	μg/Kg
SURROGATES	% RE	COVERY	
9,10-Diphenylanthracene		77	

ANALYZED BY: SJ DATE/TIME: 08/31/95 20:30:03 EXTRACTED BY: SW DATE/TIME: 08/31/95 10:00:00

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS: DEPTH 2.5-4.5



4508HCa)

CHAIN OF CUS RECORD

Sample Collectors(s)/Signature(s)				·		- 			·				
	y Samples are Being Submitted To: 5, P.L. Scott, LA												
REBECCA T. KOEPKE		mber/Addendum Number Attached: YES NO											
Site Name: LITGO PETRO	Stelm							<u>-</u>					
Site Address: 107th 54.	If sample(s) were received on ice and there was ice remaining, you may seport the												
Site Address: 107th S.s. Milwaukee	TU	temperature as "received on ice". If all of the ice was melted, the temperature of the melt may be substituted for a temperature blank.											
I hereby certify that I received, properly handled, and main	nained custody of i	ļ	Analytical Method / Numbers Lab Use Only										
Belinquished By Signature Date/Tim	e	Received By (Signature		ir Bill #	Date/Time			Analytica	I Nietho	d / NumL	ers	10/00	Lab Use Only
Test- frantita 19:		FED EX 6	4941	184990	19:0		1	$\overline{}$		13	1/25/	4/4/2/	
Relinquished By (Signature) Date/Fine	e	Received By (Signature	Date/l'ime		1.	3/	>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\						
Relinquished By (Signature) Date/Time	:	Received By (Signature			Date/Time	····	· '	U/\	ĭ/\		ZZ	(4)	
	. 1	Sist Ma	8-26-95	- 0545	ک ا	1/7	X	/%/	\$\\ \$\\\				
Time Collected Collected Media		/ Description	PID Reading	Field Comments	Preserv. Type	# of Cont.	3	TT	2/		72/		Sample Conditions
1W-110/35) 08/23/95 SOIL	ss De	PTH 2.5.4.5			ICE	2	V	ΧÍ	1 -	/ /		Lab ID Number	@ Laboratory
W-111/3.5\ 08/24/95 Soil		MH 2.5-4.5			ICE	7		$\frac{1}{x}$	- -	╀─┼			ļ.,——
NG-106(3.5) 8/25/15	1 10					 	1	$\left(\cdot \right)$				CV2	7.5
1W-107(3.5)	1,0	11 15				<u>Z</u>	X					M	pelly.
nw-108(3.5)	11					<u>と</u> こ		<u> </u>	-	╂─┼		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	2860
1W109-3.5 V	1	11 15				2		<u> </u>	╂		_ _		13/2
	aike Pie				_	7	× ;	` -	 			a ser exemple of	66800
MW-101 1		-/01				4			1		2/1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	D804 3
104 loy	1 1	1-104				7		- -		2 3	2 1	(a)	- Coll
nw-102	1 1	-102				.7.			-		2)		(cp),
1W-105	1 1'	1-103				2		- 			2)	/	- Both
1W-105	Insu				_	5				2 3	2 1		- thy
MW-ZZ V V SECIAL INSTRUCTIONS NEED RE		ノーゼナ			1	专					2 1		(2 3).
ECIAL INSTRUCTIONS NEED RE	SILLST	5 RY	7 - 4	-95	4	<u>'T</u>				2/3			1/2
All Methods WISCON	ISIN .	A) PRA	FSER	VEN W/ HA	rL			analyti	cal report	unless indic	iles for 30 da aled otherwis	ys after issuing e below;	
		B) PRO	SER	UED W/ HO	tric 1	400l		-"	:tum	_ Oiyer			

APPENDIX E

MONITORING WELL INFORMATION FORM,
MONITORING WELLS AND PIEZOMETERS SOIL BORING LOGS,
WELL DEVELOPMENT FORMS, CONSTRUCTION FORMS, AND
ABANDONMENT FORMS

State of Wi	iscons
State of Williams	isconsiii t of Natural Resource

PAGE 1 OF Z

GROUNDWATER MONITORING WELL INFORMATION
Chapter 144, Wis. Stats.
Form 4400-89

Rev. 1-90

Facility Name		e RIVY		 em	.	acili	ty ID Number	Date /	0/2	5/95	Completed B			Firm)	SOEP	KE	=	/	NATURAL		ESOUR	
	DNR Well ID				1		Date Established	Well C	asing	Elevat Top of Well Casing	ions Ground	Refer		Screen Length	Well Depth	团	¥	×	Type of Well (Aban-	Enf. Stds Apply	Gradient U, S, D or N
	Number	Well Location	N	S	E	W	Established	Diam.	Туре	Well Casing	Surface	(4)	(7)	Lengur	Depair	Ē	0			 		_
MW-101		1821.4 2026.0	ľ	H	/	- (08/16/95	Z	Ρ	733.23	730.66	/		10	15.96		V			-	У	D
PZ-101		1825.Z	V		/	- 0	18/18/95	Z	Φ	733.40	730.96	/		5	z 7, 3	1			·	ļ	У	D
MW-10Z		1822.4	V			7,	8/17/95	Z	ρ	731.14	731.60	/		6	9.41		√				У	Д
PZ-10Z		1872.7	V		7	-	08/18/95	Z	ρ	731.21	731.60	/		5	z3.96	1					Y	D
MW-103		1911.9 1825.8	1		/	- 2	08/17/95	z	ρ	732.44	732.78	/		6	9.45		1				У	5
mw-104		1960.4	1		J	H	08/18/95	Z	ρ	735.06	732.71	/		10	15.91		1			_	Y	u
mw-105		1956.1	/	-	J		08/16/95	Z	ρ	729.88	73038	/		10	13.05	;	V			_	У	5
MM-106		1860.1	1	1	1	H	08/25/95	Z,	P	735.50	732.79	1		10	16.50		1				Y	NA
mw-107		1891.3	1,	4	1	H	08 25 95	Z	P	736.31	733.30	/		10	16.42	,	V				Y	NA
mw-108		1851.7	-	4	/		08/25/95	Z	ρ	739.82	736.90	1		10	15.77	7	V	/			Ä	NA
MW-109		2088.6 1013.8	-	4		,	08/25/95	Z	ρ	737.14	734.28	V		10	15.78	3	V	1			У	NA
MW-110		2130.9	+	1	1	1	08/22/95	Z	ρ	736.97	734.48	V		10	15.6	7	V	/			У	NA
							Remarks: 100) 5	RIES	, ഗുളപ്പട്ട	PIEZOM	ETE	LS In	JSTALL	ED B	<u> </u>	e.	[]	SS Use:			
Local Gr (prefe	id System cared)	□ Ce	orthe	:mı	ina	te	MW-1 T		> Fr	8-WM 1987		et.							File Maint. Com	pleted:		

Facility Name CITGO MILWAUKEE BULK TERM. Facility ID Number Date 10/25/95 Completed By (Name and Firm) REBECLA J. KOEPKE / NATURAL RESOURCE TECH																							
Cirdo i	DNR						T		Casing		lions	Reference		<u> </u>	OEPKE	<u> </u>							
Well Name	Well ID Number	Well Location	И	s	E	w	Date Established	Diam.	T	Top of	C	1	1 6:	Screen Length	Well Depth	PEZ	₹	LYS LYS			Enf. Stds Apply	Gradient U, S, D or N	
mw-111		2140.Z 1563.0	V		V		18/24/95	Z	P	734.00				10	15.12		1				/	NA	
MW-112		1988.4 1742.3	1		/	7	08/17/95	Z	ρ	732.62	733.09	/		10	13.40						1	и	
MW-1					<u> </u>	- 0	01/30/87	Z	ρ	101.25	99.65		1	10.4	16.9		/	-		1	V	D	
mw-z						- c	128/87	Z	Ρ	102.10	99.70		/	10.4	21.7		/			/		u	
mw-3						- 0	1/30/87	Z	P	102.55	100.45		/	10.4	15.4		/			/		NA	
mw-4						-0	1/29/87	2	Ρ	102.20	100.4		/	10.4	15.4		/			\checkmark		NA	
MW-5					-	c	01/28/87	Z	Ρ	103.80	100.82		V	10.4	15.4		/			/		NA	
mw-6						0	1/30/87	z	P	103,25	101.7		√	10.4	15.4		/			/	**	NA	
mw-7					-	0	128/87	Z	Ρ	103.80	101.90		V	104	14.3		/			/		NA	
Mw-8					$\frac{1}{1}$	0	1/29/87	2	ρ	105.25	102.75		\checkmark	10.4	20.4		/			/		NA	
					$\frac{1}{1}$																		
Location Coordinates Are: Remarks:											Ŧ	PSS Use:											
Local Grid System State Plane Coordinate (prefernxl) Northern Central						 - -											File Maint. Completed:						

State of Wisconsin SOIL BORING LOG INFORMATION Route To: ☐ Solid Waste ☐ Haz. Waste Department of Natural Resources Form 4400-122 Rev. 5-92 Underground Tanks ☐ Emergency Response ☐ Wastewater ☐ Water Resources ☐ Superfund Other: Page 1 of 1 I III ty/Project Name License/Permit/Monitoring Number **Boring Number** ਹਰਿ Bulk Terminal/Site Investigation (1096) MW-101 Boring Drilled By (Firm name and name of crew chief) Date Drilling Started Date Drilling Completed **Drilling Method** Midwest Engineering Services 08/16/95 4-1/4" (ID) HSA 08/16/95 Final Static Water Level **Surface Elevation** DNR Facility Well No. WI Unique Well No. Common Well Name Borehole Diameter MW-101 727.55 Feet MSL 730.71 Feet MSL 8 inches Feet N Boring Location Local Grid Location (if applicable) Lat State Plane 1821.4 feet ⊠ N 2026.0 feet ⊠ E Feet E Long ' SE 1/4 of Ne 1/4 of Section 6, T8N, R21 $\Box s$ \square N County **DNR County Code** Civil Town/City/ or Village Milwaukee City of Milwaukee Sample Soil Properties ڪ س Depth in Feet Compressive **Blow Counts** Soil/Rock Description Recovered RGD/ Comments Length Att. Plasticity Index And Geologic Origin For Moisture Content and Type Strength Well Diagram PID/FID Graphic Number Each Major Unit Liquid Limit nscs 200 SILTY GRAVEL, med., ang., (FILL) 2 MW-101 2'-4' CLAY, yellowish brown (IOYR 5/4), 5% silt, 13 Ø 447 (3) tr. subrnd. crs. sand, firm, med. plast., moist, 4 tr. organics, no odor, (FILL) 6 7'-9' CLAY, brown (7.5YR 5/3), tr-5% MW-101 laminations of greenish gray (5GY 6/1) silt 27 8 21 26 CL (8) w/organics, tr. subrnd f. gravel, hard, sl. moist, med. plast., no odor - 10 12 12'-14' CLAY, gray-dk. gray (2.5Y 5-4/1), 5% CL MW-101 silt,tr. f. subang. gravel, med-high plast., 38 8 (13) hard, dry-sl. moist 14 EOB @ 14' 16 18 20

Natural Resource Technology This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Firm

hereby certify that the information on this form is true and correct to the best of my knowledge.

22

hature

D of Mahiral Pacaureae	id Waste Haz. Waste		MONITORING WELL CONSTRUCTION Form 4400-113A Rev. 4-90
Env. Response	Local Grid Location of	ound Tanks Other 🗆	Well Name
itgo Bulk Terminal	1821.4 ft. 7		MW-101
lity Ecense, Permit or Monitoring Number	Grid Origin Location		Wis Unique Well Number DNR Well Number
· ·	Lat	Long. or	
W (11/ 11 11/ m · · · · · · · · · · · · · · · · · ·		·	Date Well Installed
Piezometer 12	St. Plane		등 1 년 1 년 년 년 년 년 년 년 년 년 년 년 년 년 년 년 년
	Section Location of Was	ite/source E.	Well Installed By: (Person's Name and Firm)
ft.	SE 1/4 of [VE 1/4 of Se	c. <u>6</u> ,T. <u>8</u> N, R. <u>21</u> . W.	
Is Well A Point of Enforcement Std. Application?	Location of Well Relativ u Upgradient	ve to Waste/Source s ☐ Sidegradient	
■ Yes □ No	d Downgradient	_	MIDWEST ENGINEERING
	t. MSL	1. Cap and lock	
B. Well casing, top elevation _ 733.23 f	1	2. Protective cov	• •
- •	- 15	b. Length:	'"
C. Land surface elevation _ 730 .60 f	t. MSL	c. Material:	_5.0 ft.
D. Surface seal, bottom_Z29.Z ft. MSL or	1.0 ft.	C. Maletian	Steel ■ 04 Other □
12. USCS classification of soil near screen:		d. Additional	
GP □ GM □ GC □ GW □ SW □ S	SP III	113	protection?
SM SC ML MH CL			
Bedrock 🗆		3. Surface seal:	Bentonite 30
13. Sieve analysis attached? Yes	io 🖁		Concrete □ 01
14. Drilling method used: Rotary	1 1883	4 Material barry	een well casing and protective pipe:
Hollow Stem Auger	i ma	4. Waterial betw	
Other 🛘			Bentonite 3 0
			Armular space seal
15. Drilling fluid used: Water 02 Air 0	0 1 9 9 Vo		Cther 3 3
Drilling Mud 🗆 03 None 🔳	99	12.0	
		CCC	
Drilling additives used?	<i>v</i> ⊗		al mud weight Bentonite slurry 31
			ntonite Bentonite-cement grout \(\sigma \) 50
Describe NR		1000	Ft volume added for any of the above led: Tremie 0 1
17. Source of water (attach analysis):		f. How instal	.
NA			
		6. Bentonite seal	
E. Bentonite seal, top ft. MSL or	fr 🔛	XXX	
E. Bentantie seat, up		6. L1/4 III.	
F. Fine sand, top ft. MSL or	ft.	7 Fine sand mai	terial: Manufacturer, product name & mesh size
	/ / 💹		- · · · · · · · · · · · · · · · · · · ·
G. Filter pack, top _ 727 7 ft. MSL or	- i. ft.	b. Volume ad	ided ft ³
	\ \ \	1774 /	aterial: Manufacturer, product name and mesh size
H. Screen joint, top _727.2 ft. MSL or	35 ft.	1 #30	RED FLINT SAND
• •		b. Volume ac	
I. Well bottom _717.2 ft. MSL or 1	36 ft、 🎏	9. Well casing:	Flush threaded PVC schedule 40 23
	[]		Flush threaded PVC schedule 80 24
J. Filter pack, bottom _ 716 7 ft. MSL or _ 1	4 D ft.		Other 🛘 💮
		10. Screen materi	
K. Borehole, bottom _ 716.7 ft. MSL or _ 1	40 ft.	a. Screen typ	
			Continuous slot 0 1
L. Borehole, diameter 87 in.			Other □
		b. Manufactur	. \
M. O.D. well casing 2 in.		c. Slot size:	0. 010in.
· · · · · · · · · · · · · · · · · · ·		d. Slotted len	
.D. well casing 19 in.		\	rial (below filter pack): None 1 14
~ ~ ~ · · · · · · · · · · · · · · · · ·			Other
I hereby certify that the information on this	form is true and c	orrect to the best of my	
Signature	Eirm	_	
Stochemieland	NATU	ESOURCE	TECHNOLOGY, INC.

Please complete both sides of this form and feturn to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be seen

Route to: Solid Waste Haz Waste Wastewater

Env. Respo	orise & Repair 🗖	Underground Tanks (Other 🗆	
Facility/Project Name	County N	ame	Well Name	101
CITO BULK TERMINA	K1096 MI	LWAUKEE	MU	J-/01
Facility License, Permit or Monitoring Number	County Co	ode Wis. Unique Well	Number - DNR We	il Number
1. Can this well be purged dry?	¥ Yes □ N		Before Development	After Development
1. can and went to parged any.	= = 1,	11. Depth to Wate		That Bevelopment
2. Well development method		(from top of	<u>a _ </u>	DRYft.
surged with bailer and bailed	□ 41	well casing)		
surged with bailer and pumped	61		ł	
surged with block and bailed	□ 42	Date	b (8 / 2 4 / 9 5	08,24,95
surged with block and pumped	□ 62		m m d d y y	$\frac{3}{m}\frac{3}{m}\frac{1}{d}\frac{1}{d}\frac{1}{y}\frac{3}{y}$
surged with block, bailed and pumped	7 0		r a.m.	□ a.m.
compressed air	□ 20	Time	c ; p.m.	a.m.
bailed only	□ 10			
pumped only	5 1	12. Sediment in we	ell inches	inches
pumped slowly	□ 50	bottom		
Other		13. Water clarity	Clear 🔲 10	Clear 20
			Turbid 1 15	Turbid 2 2 5
3. Time spent developing well	<u>30</u> min.		(Describe)	(Describe)
	15.96ft		TAN + TURBS	
4. Depth of well (from top of well casisng)	_13.76ft			ļ
2 T 11 P				
5. Inside diameter of well	m			
. Volume of water in filter pack and well				
casing	2.4 gal.			
		Fill in if drilling fly	uids were used and well is a	t colid wasta facilism
7. Volume of water removed from well	gal.	The min dinning in	aids were aser and well is a	t soud waste facility:
The state of which followed Boll well		14 Total suspende	d mg/l	mg/l
3. Volume of water added (if any)	DO_gal.	solids		
9. Source of water added N	Α	15. COD	mg/l	mg/l
10. Analysis performed on water added?	□Yes □ N	o		
(If yes, attach results)				
16. Additional comments on development:				
Well developed by: Person's Name and Firm		II harabu carrifu th	at the above information is t	Tip and compat to the best
real developed by. Person's Name and Pum		of my knowledge.	at the goode Hilotiliadoli 12 (THE AND CONTEST IN THE DEST
			- 11	\bigcirc $$
Name: STEPHANIE VAIS DYKE S	HELL REITE	Signature: Sc	Sunada	vyre .
CI THATE ONE PIPE IS	1		- 4 1/	
=im: NATURAL RESPONDE	TECH.	Print Initials:	<u>v 7 c</u>	
THE POST OF		-		- T
		Firm: <u>UA</u>	TURAL RESOURCE	= IECHNOLOGY

SOIL BORING LOG INFORMATION State of Wisconsin Route To: ☐ Solid Waste ☐ Haz. Waste Department of Natural Resources Form 4400-122 Rev. 5-92 ☐ Emergency Response ☐ Underground Tanks ☐ Water Resources ■ Wastewater ☐ Superfund Other: Page 1 of 2 Boring Number License/Permit/Monitoring Number Mity/Project Name Lillo Bulk Terminal/Site Investigation (1096) PZ-101 Boring Drilled By (Firm name and name of crew chief) Date Drilling Started **Date Drilling Completed Drilling Method** 4-1/4" (ID) HSA Midwest Engineering Services 08/17/95 08/18/95 Final Static Water Level **Surface Elevation Borehole Diameter** DNR Facility Well No. WI Unique Well No. Common Well Name 730.96 Feet MSL 14 and 8 inches 728.08 Feet MSL PZ-101 Local Grid Location (if applicable) **Boring Location** Feet N Lat 1825.2 feet ⊠ N 2023.4 feet ⊠ E State Plane Feet E Long $\Box s$ SE 1/4 of NE 1/4 of Section 6, T8N, R21 DNR County Code | Civil Town/City/ or Village County Milwaukee City of Milwaukee Soil Properties Sample Compressive Strength ڪَ ي in Feet Blow Counts Soil/Rock Description RGD/ Comments Recovered **Plasticity** Length Att. And Geologic Origin For Moisture Content and Type PID/FID Diagram Graphic Number Depth i Each Major Unit Liquid Limit Index SSS ¥ell GP BLIND DRILL TO 15' W/8" (ID) HSA . 2 REFERENCE SOIL BORING LOG FOR MW-101 SET 10" PERMANENT CASING TO 15' W/ BENTONITE/CEMENT GROUT CONTINUE DRILLING THROUGH CASING W/ 4-1/4" (ID) HSA 10 CL 12 14 Ø 22' SAND 16 blew in augers to 17'-19' SAND, It brownish gray (2.5Y 6/2), prly approx. PZ-101 graded, 5-10% sllt , pred f., few med, 18 21 SP 22 15', blew (18) subrnd-rnd., compact, few lamin., clay as sand out above, wet, no odor and contin 20 ued 22 22'-24' SILTY SAND, gray (2.5Y 5/1), prly SM graded, <5% clay, f., compact, wet, no odor P7-101 (25)the information on this form is true and correct to the best of my knowledge. hereby certify that

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

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Natural Resource Technology

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State of Wisconsin Department of Natural Resources Route to: Solid Waste □ Haz. Was Env. Response & Repair □ Under	Z
Facility/Project Name Local Grid Location of 1825.2 ft.	of Well Name
Lity License, Permit or Monitoring Number Grid Origin Location	Wis. Unique Well Number DNR Well Number
Type of Well Water Table Observation Well 11 St. Plane	
Di la	
Section Location of W	
It. I continue of Well Dale	Sec. (a, T. 8 N, R.21 W. Well Installed By: (Person's Name and Firm)
Is Well A Point of Enforcement Std. Application? u ☐ Upgradient d ■ Downgradient	s Sidegradient
A. Protective pipe, top elevation ft. MSL	1. Cap and lock? Yes \(\sigma\) No
B. Well casing, top elevation _ Z33.40 ft. MSL	2. Protective cover pipe:
	a Inside diameter:
C. Land surface elevation	b. Length:
D. Surface seal, bottom_726.0 ft. MSL or _5.0 ft.	c. Material: Steel 0 4
12. USCS classification of soil near screen:	d. Additional protection? ☐ Yes ■ No
GP □ GM □ GC □ GW □ SW □ SP ■ SM ■ SC □ ML□ MH□ CL □ CH □	If yes, describe:
Beirock	3. Surface seal: Bentonite 3 0
13. Sieve analysis attached?	Concrete 01
14. Drilling method used: Rotary 50	Other 4. Material between well casing and protective pipe:
Hollow Stem Auger # 41	Bentonite 3 0
Other 🗆 🚃	Annular space seal
	Other □
15. Drilling fluid used: Water 0 0 2 Air 0 0 1	5. Annular space seal: a. Granular Bentonite # 33
Drilling Mud □ 03 None ■ 99	bLbs/gal mud weight Bentonite-sand shurry \[\Bar{\cup} \] 3 5
Drilling additives used?	cLbs/gal mud weight Bentonite slurry [] 3 1
	d % Bentonite Bentonite-cement grout \(\square 50 \)
DescribeNA	eFt 3 volume added for any of the above
17. Source of water (attach analysis):	f. How installed: Tremie □ 01 Tremie pumped □ 02
NA	3
	6. Bentonite seal: a. Bentonite granules 3 3
E. Bentonite seal, top ft. MSL or ft.	b. □1/4 in. □3/8 in. □1/2 in. Bentonite pellets □ 32
	si mi
F. Fine sand, top	7. Fine sand material: Manufacturer, product name & mesh size
G. Filter pack, top _ 71 2 0 ft. MSL or _ 19 0 ft.	b. Volume added ft ³
	b. Volume addedft ³ 8. Filter pack material: Manufacturer, product name and mesh size
H. Screen joint, top _711 O ft. MSL or _ZOO ft.	2 #30 Red Flint Sand
	b. Volume added ft ³
I. Well bottom _ 7 0 6 0 ft. MSL or _ 25 0 ft.	9. Well casing: Flush threaded PVC schedule 40 ■ 23
1 Files - 2 / 2 / 5 / 6 / 7 / 7 / 7 / 7 / 7 / 7 / 7 / 7 / 7	Flush threaded PVC schedule 80 🛘 24
J. Filter pack, bottom _705.Q ft. MSL or _260 ft.	10 Screen material: PVC
K. Borehole, bottom _ 105.0 ft. MSL or _ 260 ft.	10.00.00
222,2	a. Screen type: Factory cut ■ 11 Continuous slot □ 01
L. Borehole, diameter _8.2 in.	Continuous slot
•	b. Manufacturer
M. O.D. well casing 2.1 in.	c. Slot size: 0. 01 Q in.
D multi-raine 1.0	d. Slotted length: 10.0 ft.
D. well casingiin.	11. Backfill material (below filter pack): None 14
hereby certify that the information on this form is true and	correct to the best of my knowledge
Signature Firm .	
St. olan is the O bo NATI	DEAL RESOURCE TECHNIAL DOWN THIS

Please complete both sides of this form and course to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than \$10,000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent

Route to: Solid Waste Haz. Waste Wastewater Env. Response & Repair Underground Tanks Other L							
Facility/Project Name / County Name	Well Name						
	whee 12-101						
	Wis. Unique Well Number DNR Well Number						
41	. A						
1. Can this well be purged dry?	Before Development After Development						
	11. Depth to Water						
2. Well development method	(from top of a 5.28 ft ft.						
surged with bailer and bailed 4 1	well casing)						
surged with bailer and pumped 6 1	1 - 10 -1						
surged with block and bailed	Date $\frac{08}{m m} \frac{24}{d} \frac{45}{y} \frac{08}{m m} \frac{24}{d} \frac{95}{y}$						
surged with block and pumped							
surged with block, bailed and pumped 70	Time c. 1:40 p.m. : p.m.						
compressed air 20 bailed only 10	c: p.m: p.m.						
bailed only	12. Sediment in well inches inches						
pumped slowly 50	bottom inches inches						
Other	13. Water clarity Clear 10 Clear 20						
	Turbid 15 Turbid 25						
3. Time spent developing well 2 1 0 min.	(Describe) (Describe)						
	TAN+ CLOUDY						
4. Depth of well (from top of well casising) $\underline{27}$. $\underline{3}$ ft.	at first						
3	.THENS CLEAR						
. Volume of water in filter pack and well							
casing							
7. Volume of water removed from well $g = \frac{g}{2} = \frac{1}{2}$. gal.	Fill in if drilling fluids were used and well is at solid waste facility:						
7. Volume of water removed from well gal.	14. Total suspended mg/l mg/l						
3. Volume of water added (if any)O .O gal.	14. Total suspended mg/l mg/l solids						
	33323						
9. Source of water added NA	15. COD mg/l mg/l						
	,						
10. Analysis performed on water added?							
(If yes, attach results)							
16. Additional comments on development:							
特							
t)							
Well developed by: Person's Name and Firm	I hereby certify that the above information is true and correct to the best						
on so-cloped by. Telson's traine and Pulli	of my knowledge.						
,							
Name: STEPHANIE VANDVILE STEELY BEITTEN	Signature: Stephanie Van Dyle						
The state of the s	Print Tairiala C A V						
Firm: NATURAL RESOURCE TECH.	Print Initials: S H V						
	Firm: NATURAL RESOURCE TECHNOLOGY						

	of Wis tment			□ Em	To: lid Waste ergency Respon stewater perfund	se 🔀] Haz. V [Under] Water] Other:	ground Resou					OIL BO				RMATION Rev. 5–92
	y/Proj	ect Na	me		pertund ————————				mit/Mon	nitoring) Numbe	er .	Boring	Numb	er	 	Page 1 of 1
Boring		By (i	irm na	nvestigation-1096 me and name of crew ices	chief)		Date 08/17		Starte	d	Date D 08/17/		MW-10.		Drilling I 4-1/4"		
DNR F	acility	Well No	o. WI	Unique Well No.	Common Well Na	me		Static 5 Feet	Water I	_evei	Surfac 731.65				Borehol		eter
State			f Secti	on 6, T8N, R 21	Feet N Feet E		Lat Long				Local	Grid Lo			plicable 0.3 feet)	
Count Milwau	-					DNR C	County		Civil To		ty/ or \	/illage					
Sar	nple					l		<u> </u>					Soil	Prope	erties		
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	And Ge	ock Description ologic Origin For h Major Unit			SOSA	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid	Plasticity Index	P 200	RQD/ Comments
			1 2 4 1 6 1 10 11 12 11 16 11 18 11 20	Blind drill to 10' REFERENCE SOIL E	ORING LOG FOR S	SB-104		GP GP CL (FILL)									

This form is authorized by Chapters 144.147 and \$2, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 182.08, Wis. Stats.

Natural Resource Technology

hereby certify hat the information on this form is true and correct to the best of my knowledge.

	id Waste Haz. Waste		MONITORING WELL CONSTRUCTION Form 4400-113A Rev. 4-90
Eliv. Response	& Repair Underground	Tanks & Other L	Well Name
Fility/Project Name 100 BULK TERMINAL	1822.4 ft. S.	1869.3 ft. E.	MW-10Z
l'Illity License, Permit or Monitoring Number	Grid Origin Location Lat Lo	ng. or	Wis: Unique Well Number DNR Well Number
Type of Well Water Table Observation Well 11	St. Plane ft.	N ft. E.	Date Well Installed $\frac{0.8}{m}$ / $\frac{17}{4}$ / $\frac{9.5}{v}$
Piezometer 12	Section Location of Waste/S	ource	
Distance Well Is From Waste/Source Boundary ft.	SE 1/4 of NE 1/4 of Sec. 6	2, T. <u>8</u> N, R. <u>21</u> . W.	Weil Installed By: (Person's Name and Firm)
Is Well A Point of Enforcement Std. Application?	Tocation of Meti Ketative to	Waste/Source ☐ Sidegradient	
■ Yes □ No	1 —	☐ Not Known	MIDWEST ENGINEERING
	ft. MSL	1. Cap and lock?	
B. Well casing, top elevation _ Z3 L .L4	ft. MSL	a. Inside diam	<u> </u>
C. Land surface elevation _231.	ft. MSL	b. Length:	_1.0ft.
D. Surface seal, bottom_739.6 ft. MSL or	1.0 ft.	c. Material:	Steel ■ 04
12. USCS classification of soil near screen:		d. Additional	•
GP □ GM □ GC □ GW □ SW □ SM □ SC □ ML □ MH □ CL ■	SP CH	If yes, desc	Bentonite 3 0
Bedrock □		3. Surface seal:	Concrete 0 1
13. Sieve analysis attached? Yes	1 1883 189		Other D
14. Drilling method used: Rotary Hollow Stem Auger		4. Material betw	een well casing and protective pipe: Bentonite 30
Other 🗆			Annular space seal 🔲 🧱
15. Drilling fluid used: Water 02 Air 0	.,		Other 3 Granular Bentonite 3 3
Drilling Mud 103 None	1 100 20	5. Annular space	e seal: a. Granular Bentonite 333 gal mud weight Bentonite-sand shurry 35
Drilling additives used? Yes		cLbs/{	gal mud weight Bentonite slurry 🛛 3 1
MacDrilling additives used? Yes	No ₩ ₩		Intonite Bentonite-cement grout 50 Ft 3 volume added for any of the above
Describe NA		c. How insta	·
17. Source of water (attach analysis):			Tremie pumped 🔲 02
<u>NA</u>		(December 1	Gravity ■ 08 a. Bentonite granules □ 33
E. Bentonite seal, top ft. MSL or	ft	6. Bentonite sea	a. Bentonite granules 33 . 38 in. 31/2 in. Bentonite pellets 32
			Other 🛚 💆
F. Fine sand, top ft. MSL or	·- ^{ft.}	c	nterial: Manufacturer, product name & mesh size
G. Filter pack, top _ 128 6 ft. MSL or _	_3.0 ft.	b. Volume a	ddedft ³
H. Screen joint, top _728.1 ft. MSL or	35 ft -		naterial: Manufacturer, product name and mesh size Red Flint Sand
•		b. Volume a	dtledft ³
I. Well bottom _722.1 ft. MSL or	-9.5 ft.	9. Well casing:	Flush threaded PVC schedule 40 23 Flush threaded PVC schedule 80 24
J. Filter pack, bottom 7216ft. MSL or	100 ft.	<u> </u>	Other 🗆 🥶
K. Borehole, bottom _ 721 6 ft. MSL or _	100 ft.	10. Screen mater a. Screen ty	pe: Factory cut ■ 11
L. Borehole, diameter _ 8.2 in.			Continuous slot 0 1 Other
M. O.D. well casing $21 ilde{1}$ in.		b. Manufacti c. Slot size:	0. Q <u>/ Q</u> in.
· · ·		d Slotted le	ength: 10.0 ft. erial (below filter pack): None 14
L.D. well casing 1.9 in.		11. Dackim man	Other
I hereby certify that the information on th	is form is true and cor	rect to the best of my	knowledge.
Signature	Firm	_	_

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Form 4400-113B Rev. 4-90 Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐ Env. Response & Repair ☐ Underground Tanks ☐ Other ☐

	=	rground Lanks Ut	1	
· · · ·	County Name	i	Well Name	. 1
CITGO BULK TREMINAL 1096	Milwa	uhee	1 MW-12	
Facility License, Permit or Monitoring Number	•	Wis. Unique Well N	umber † DNR We	il Number
	7.1			
1. Can this well be purged dry?	□ No	11. Depth to Water	Before Development	After Development
2. Well development method		(from top of	$\frac{2.63}{6}$ ft.	DRY. ft.
surged with bailer and bailed	1	well casing)	<u></u>	
surged with bailer and pumped 6				
surged with block and bailed 4	2	Date	$b \underbrace{C8}_{m \ m} / \underbrace{25}_{d \ d} / \underbrace{95}_{y \ y}$	08,25,95
surged with block and pumped 6	2		m m d d y y	m m d d y y
surged with block, bailed and pumped 7	0		a.m.	a.m.
compressed air 2	0	Time	c. 10:10 p.m.	: p.m.
bailed only				
pumped only 5		12. Sediment in well bottom	inches	inches
pumped slowly 5	0		a	a –
Other 🛚 🖳	<u>.</u>	13. Water clarity	Clear ☐ 10 Turbid ■ 15	Clear 20
3. Time spent developing well	~ .		(Describe)	Turbid 25 (Describe)
2. This spent developing went2	<u>C</u> min.		TAN + TURBO	(Describe)
4. Depth of well (from top of well casisng)	41 fc		75,101,101,000	
4. Departor wen (from top of wen casting)	=			
5. Inside diameter of well	<u>9</u> _in_			
6. Volume of water in filter pack and well			:1	
casing	. 7 gal.			
5 5	. Ogal.	Fill in if drilling fluid	is were used and well is a	t solid waste facility:
7. Volume of water removed from well	gal.			_
8. Volume of water added (if any)). <u>O</u> gal.	14. Total suspended solids	mg/l	mg/l
5. Volume of water abded (it ally)	. <u>o</u> gai.	301103		
9. Source of water added NA		15. COD	mg/l	mg/l
	•			
10. Analysis performed on water added? NA	□ No	•		
(If yes, attach results)				
	·			
16. Additional comments on development:				
•				
e				
Well developed by: Person's Name and Firm	·	If hereby certify that	the above information is:	rue and correct to the best
developed by. Telson's Ivalie and Phili		of my knowledge.	are needed intollination is t	the min collect in the pest
,			71	- 60
Name: STEPHANIE NAM DUKE SHALL	BRITTON	Signature: 50	Veinarg	a tyle
	, ., -	Print Initials: S	A-V	\bigcirc
Firm: NATURAL RESSURCE TECH		Print Initials: S	<u> </u>	
- Augustinia		Firm: NATU	RAL RESOURCE	TENHAIO, OC V
		Line MALO	KHL NESOUKCE	ICTURE A

SOIL BORING LOG INFORMATION State of Wisconsin Route To: ☐ Solid Waste ☐ Haz. Waste Department of Natural Resources Form 4400-122 Rev. 5-92 ☐ Emergency Response Underground Tanks ☐ Water Resources □ Wastewater ☐ Superfund Other: Page 1 of 2 Boring Number Mity/Project Name License/Permit/Monitoring Number ਹਰਿਸ਼ ਹੈ Bulk Terminal/Site Investigation (1096) PZ-102 Boring Drilled By (Firm name and name of crew chief) Date Drilling Started Date Drilling Completed **Drilling Method** Midwest Engineering Services 08/17/95 08/18/95 4-1/4" (ID) HSA Final Static Water Level DNR Facility Well No. WI Unique Well No. Common Well Name Surface Elevation **Borehole Diameter** PZ-102 728.49 Feet MSL 731.60 Feet MSL 12 and 8 inches Feet N Local Grid Location (if applicable) **Boring Location** Lat 1820.6 feet 🛛 N 1872.7 feet 🛛 E State Plane Feet E Long SE 1/4 of NE 1/4 of Section 6, T8N, R 21 $\Box s$ County **DNR County Code** Civil Town/City/ or Village Milwaukee City of Milwaukee Sample Soil Properties Compressive Strength ڪ ھ Depth in Fee Counts Soil/Rock Description Recovered RGD/ Comments Length Att. Plasticity Index And Geologic Origin For and Type Moisture Content Well Diagram PID/FID Graphic Log Each Major Unit Liquid Limit P 200 **NSCS** ASPH BLIND DRILL TO 17' GP REFERENCE SOIL BORING LOG FOR SB-104 2 SET PERMANENT 10" PVC CASING FROM 0'-15' CONTINUE DRILLING THROUGH CASING WITH 4-1/4" (ID) HSA 4 6 8 CL 10 12 SP 16 18 20 22 22'-24' SILTY SAND gray (2.5Y 5/1), prly SM graded, f.-med., trc clay, compact, wet, no odor. hereby certify that the information on this form is true and correct to the best of my knowledge. Firm ature Natural Resource Technology

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Page 2 of 2

	l Waste□ Haz, Waste□	I Wastewater□ and Tanks ☑ Other □	MONITORING WELL CONSTRUCT Form 4400-113A Rev.	TION 4-90
Project Name	ocal Grid Location of W	/ell 1872.7 ft. ■ E.	Well Name PZ-10Z	
Littly License, Permit or Monitoring Number	Grid Origin Location	<u> </u>	Wis Unique Well Number DNR Well Nu	mber
	at	Long or		
	St. Plane		Date Well Installed 08/18/95	
	Section Location of Wast		m m d d y y Well Installed By: (Person's Name and Firm	m)
ft.	SE 1/4 of NE 1/4 of Sec Location of Well Relative	. 6 T. 8 N. R.21 W.		,
Is Well A Point of Enforcement Std. Application?	u 🔲 Upgradient	s Sidegradient	50 - File -	_
☐ Yes ☐ No	d 🛘 Downgradient		MIDWEST ENGINEERIN	
A. Protective pipe, top elevation ft	. MSL	1. Cap and lock? 2. Protective cov		No
B. Well casing, top elevation _731.21 ft	. MSL	a. Inside diam		_ in.
C. Land surface elevation _731.6 ft	. MSL	b. Length:	 _	_ft
D. Surface seal, bottom_7.26.6 ft. MSL or _5	O ft.	c. Material:	Steel ■ Other □	0 4 2000
12. USCS classification of soil near screen:		d. Additional		
	PU	X \	ribe:	
SM ■ SC □ ML□ MH□ CL □ C	H 🗆	3. Surface seal:	Bentonite	3 0
13. Sieve analysis attached? Yes N			Concrete □	01
14. Drilling method used: Rotary ☐ 5	n 👹	4. Material berw	een well casing and protective pipe:	<u> </u>
Hollow Stem Auger # 4	1		Bentonite 🗆	3 0
Other 🗆 🚆	1 1 2 1 2 9 6		Annular space seal	<u> </u>
15. Drilling fluid used: Water □ 02 Air □ 0	,,		Other D	3 3
Drilling Mud 103 None 19	9 8	5. Amular space bLbs/g cLbs/g d% Be: e f. How instal	e seal: 2. Gramular Bentonite gal mud weight Bentonite-sand slurry	35
		6Lbs/g	gal mud weight Bentonite slurry	3 1
U. brilling additives used?	6	d% Be	ntonite Bentonite-cement grout	50
Describe NA	🐰	ē	_Ft 3 volume added for any of the above	
17. Source of water (attach analysis):		f. How instal	lled: Tremie 🛘 Tremie pumped 🗎	01 02
NA			Gravity	03
		6. Bentonite sea	d: a. Bentonite granules	3 3
E. Bentonite seal, top ft. MSL or	\ 123	b. □1/4 in.	□3/8 in. □ 1/2 in. Bentonite pellets □	3 2
F. Fine sand, top 7136 ft. MSL or 1	20 %	7 Fine sand ma	terial: Manufacturer, product name & mesh	
7. Falle Sailed, top	ō: / 📓	7. Fine sand ma	eriai. Manufacturer, product hame & mesn	51ZE <u>∰</u>
G. Filter pack, top	BO ft.	o. Totaliou		
711/-5 Vet 7			aterial: Manufacturer, product name and mes	h size
H. Screen joint, top7116 ft. MSL orZ		a_#30 b. Volume 3	Red Flint Sand	<u></u>
I. Well bottom _ 706.6 ft. MSL or _ Z	50 ft、 1	9. Well casing:		23
	/ [[Flush threaded PVC schedule 80	24
J. Filter pack, bottom _705 & ft. MSL or _2	60 ft.		Other 🗆	
K. Borehole, bottom _ 705.6 ft. MSL or _ 2	60 ft.	10. Screen mater a. Screen ty		11
A. Borenole, bottom		2 Scienty	Continuous slot	01
L. Borehole, diameter 8.2 in.		—	Other 🗆	
		b. Manufactu		
M. O.D. well casing 2.1 in.		c. Slot size: d. Slotted le		10 in. . <u>3</u> ft.
D. well casing [9 in.		\	rial (below filter pack): None	14
	· · · · · · · · · · · · · · · · · · ·		Other 🗆	660000
I hereby certify that the information on this		orrect to the best of my	knowledge.	
Signature	Firm		_	

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State of Wisconsin Department of Natural Resources

MONITORING WELL DEVELOPMENT Form 4400-113B Rev. 4-90

Route to: Solid Waste Haz. Waste Wastewater Env. Response & Repair Underground Tanks Other —						
•		IWeil Name				
	ilwanker	1.3	-102			
Facility License, Permit or Monitoring Number County C		, ,	ll Number			
Facility Electise, 1 clinic of Mediabiling Manager	************************************					
	·					
1. Can this well be purged dry?	- I		After Development			
	11. Depth to Water (from top of	a2.90 ft				
2. Well development method	well casing)	a R.	ft.			
surged with bailer and bailed 4 1	Word Germany					
surged with bailer and pumped 61	Data	10.00.05	08.76.00			
surged with block and bailed	Date	b 1 28 195 m m d d y y				
surged with block and pumped		•	ł			
surged with block, bailed and pumped 70	Time	c. 12:00 = 2.m.	a.m. : p.m.			
compressed air	Thire	C pa				
bailed only 10	12. Sediment in wel	1 inches	inches			
	bottom					
pumped slowly	13. Water clarity	Clear 🛮 10	Clear 20			
Ouer	,	Turbid # 15	Turbid 25			
3. Time spent developing well 6 Omin.		(Describe)	(Describe)			
		Trin + Claudy				
4. Depth of well (from top of well casisng) 23.96 ft.		<u> </u>				
4. Deput of well (from up of well out the						
\equiv inside diameter of well $= 1.9$ in.						
5. Volume of water in filter pack and well		<u> </u>	l			
casing <u>6</u> . 9 gal						
7. Volume of water removed from well Sal	Fill in if drilling flu	ids were used and well is	at solid waste facility:			
7. Volume of water removed from well						
8. Vojume of water added (if any) O . O gal.	14. Total suspended solids	img/l	mg/l			
8. Volume of water added (if any) gal.	sonas					
9. Source of water added NA	15. COD	mg/	l mg/l			
7. Somee of water ander	-					
10. Analysis performed on water added? NA Yes 🗆	No .					
(If yes, attach results)						
15. Additional comments on development:						
4						
Well developed by: Person's Name and Firm	of my knowledge.	at the above information is	true and correct to the best			
,		1)	C h =			
- Compression of State of State of Live	Signature: St	Veinarge	a-+1710			
Tame: STEPHANIE VANDINE / STELLY EXC.	143	- A \/	\bigcirc			
=:	Print Initials:	<u> </u>				
Firm:		WAL RESOURCE				
	Firm: NAT	TURAL MESOURCE	= FCHNOLDGY			

SOIL BORING LOG INFORMATION Route To: State of Wisconsin Form 4400-122 ☐ Solid Waste ☐ Haz. Waste Rev. 5-92 Department of Natural Resources ☐ Emergency Response ☐Underground Tanks □ Wastewater ☐ Water Resources Other: ☐ Superfund Page 1 of 1 **Boring Number** License/Permit/Monitoring Number y/Project Name MW-103 Citgo Bulk Terminal/Site Investigation-1096 Date Drilling Completed Drilling Method Boring Drilled By (Firm name and name of crew chief) Date Drilling Started 4-1/4" (ID) HSA 08/17/95 08/17/95 Midwest Engineering Services Borehole Diameter Surface Elevation Final Static Water Level Common Well Name WI Unique Well No. DNR Facility Well No. 732.80 Feet MSL 8 inches 729.94 Feet MSL MW-103 Local Grid Location (if applicable) Feet N **Boring Location** Lat 1911.9 feet ⊠ N 1825.8 feet ⊠ E State Plane Long Feet E $\Box s$ SE 1/4 of NE 1/4 of Section 6, T8N, R 21 Civil Town/City/ or Village DNR County Code County City of Milwaukee Milwaukee Soil Properties Sample Compressive Strength Depth in Feet ය ⊆ි Soil/Rock Description Blow Counts ROD/ Comments Plasticity Index Recovered Moisture Content Length Att. And Geologic Origin For PID/FID and Type Graphic Diagram Liquid Limit 200 Each Major Unit nscs Kell ASPH Blind drill to 10' GP REFERENCE SOIL BORING LOG FOR SB-105 CL E08 @ 10" SP Soil Boring SB-105 was drilled adjacent to MW-103 and was sampled to 14'. Corresponding lithology is shown in the adjacent USCS & Graphic Log columns. 18 20 22 reby certify that the information on this form is true and correct to the best of my knowledge. Firm ature Natural Resource Technology

This form is authorized by Chapters 144 47 and 162, Wis Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

	: to: Solid Waste Response & Repair			r D	MONITORING WELL CON Form 4400-113A	NSTRUCTION Rev. 4-9
y/Project Name	Local Gr	rid Location of We	41	N.	ell Name	
	. 1 1011	.9_fr. □N.	1825.8	ft. Tw	mw-103)
Facility License, Permit or Monitoring Num	iber Grid Ori	gin Location L		or V	/is_Unique Well Number DNR	. Well Numbe
Type of Well Water Table Observation We	Il # 11 St. Plane		t. N	IL. E.	Page Well Installed OB/17	
Distance Well Is From Waste/Source Bound	SE1/4	of NE 1/4 of Sec.	<u>6</u> , t. <u>8</u> n, r.	<u>ZI 8</u> ₩. V	Vell Installed By: (Person's Nam	ne and Firm)
Is Well A Point of Enforcement Std. Applie	ation? u 🗆 [to Waste/Source s II Sidegradien n II Not Known		MIDWEST ENGIN	JEERIN C
	Z.44 ft. MSL-		1. Ca	ip and lock?		Yes 🗆 No
	2.44 ft. MSL -	71	<u> </u>	otective cover Inside diamete		ir
5 .	2.B ft. MSL			Length:		1.0 m
			C.	Material:		Steel 🖺 0
D. Surface seal, bottom_731.8 ft. M				Additional pr		Other 🛚 💆 !Yes 🚆 No
12. USCS classification of soil near scree GP ☐ GM ☐ GC ☐ GW ☐	n:	The state of the s	13		be:	
GP GM GC GW GSM SM SC GM ML MH GMH GBeetrook G	CT CH		3. Su	urface seal:	Ben	tonite 3
13. Sieve analysis attached? Yes	■ No				•	Other 🔲 🚿
	otary 50		4. M	laterial betwee	n well casing and protective pipe	<u>-</u> ,
Hollow Stem A	uger 📕 41					ntonite 🛘 3
	Other 🗆 💴				Annular spac	_
			-			Other 🔲 🚆
13. 2.2.	Air 01		5. A	mular space s	eal: a. Granular Ben	
Drilling Mud 🔲 03	None # 99		b	Lbs/gal	mud weight Bentonite-sand	sturry D 3
16. Drilling additives used?	■ No	ft	5. A b c d e f.	% Bent	l mud weight Bentonite : onite Bentonite-cement	tgrout 🛛 5
Describe NA			e. <i>–</i>		t volume added for any of the a	above Tremie 🔲 0
17. Source of water (attach analysis):			f.	How installe	d: Tremie pu	
NA						ravity I 0
1111		٦ ⊠	6. B	entonite seal:	a. Bentonite gr	anules 🔲 3
E. Bentonite seal, top ft. N	ISL or	\ MI	m / -		□3/8 in. □1/2 in. Bentonite	pellets 📙 3
F. Fine sand, top ft. N	ISL or	ft			rial: Manufacturer, product nan	
G. Filter pack, top _729.8ft. M	ISL or3.0	ft.	ky / b	. Volume add		
	1SL or3.5			#30	terial: Manufacturer, product nar Red Flint Sand	ne and mesh
I. Well bottom	1SL or _ 9.5	fr.		. Volume acti Well casing:	Flush threaded PVC schedu	
J. Filter pack, bottom _723.8 ft. M	1SL or _ 10.0	ſ.			64.4	ole 80 🔲 2
				Screen materia	_	ory cut 📘 1
K. Borehole, bottom _722.8 ft. N	ASL or _ 10.0	ır	,	. Screen type		us slot 🔲 (
L. Borehole, diameter 8.2 in	L.		b		NORTHERN AIR	
M. O.D. well casing _2.l ir	L.		\ d		_	70°C 0°010
I.D. well casing _1.9 _ ir	t.		11.	Backfill mater	ial (below filter pack):	None Other
I nereby certify that the informati	on on this form	n is true and c	orrect to the b	est of my	knowledge.	
Signature	<u> </u>	i i m n				TNC
Please complete both sides of this form a	-Jyree	DAID at	ion licted at the to	n of this form	TECHNOLOGY. as required by chs. 144, 147 and	1 160. Wis. 50
Please complete both sides of this form a and ch. NR 141, Wis. Ad. Code. In account 55000 for each day of violation. In account to the state of the	ordance with ch. 14	7. Wis Stats., failu	re to file this form	n may result in	a forfeiture of not less than \$10 a forfeiture of not more than \$1 where the completed form shou	0,000 for each

· • · · · · · · · · · · · · ·

Route to: Solid Waste Haz. Waste Wastewater CEnv. Response & Repair Underground Tanks Other CENTRAL						
Facility/Project Name	County Name		Well Name	· · · · · · · · · · · · · · · · · · ·		
CITGO BULK TERMINAL 1096	Milwa	11/100	MW-	/ <u>0</u> 3		
Facility License, Permit or Monitoring Number	County Code	Wis Unique Well N	ımber DNR We	Il Number		
	41					
1. Can this well be purged dry?	Yes 🛮 No		Before Development	After Development		
		11. Depth to Water	0 !! 6	O - : /		
2. Well development method		(from top of	2	DRYft.		
surged with bailer and bailed	41	well casing)				
surged with bailer and pumped	6 1		سه سه ۵۰	000000		
surged with block and bailed	42	Date	POR 135125	08,25,95		
surged with block and pumped	62			• • •		
surged with block, bailed and pumped	70	-	c : p.m.	: p.m.		
compressed air	20	Time	c : p.m.	:□ p.m.		
bailed only	10	12. Sediment in well	inches	inches		
pumped only pumped slowly	51	bottom	niches	menes		
pumped slowly Other	5 0	13. Water clarity	Clear 🔲 10	Clear □ 20		
<u></u>	100000	15. Water clarity	Turbid 15	Turbid 25		
3. Time spent developing well	<u>30</u> min.		(Describe)	(Describe)		
	•		TANS + TURAS	JAN + TURBIO		
4. Depth of well (from top of well casising)	<u>9.45</u> ft					
nside diameter of well	. <u>9</u> _ in.					
5. Volume of water in filter pack and well	u 0					
casing						
		Fill in if drilling fluid	is were used and well is a	t solid waste facility:		
7. Volume of water removed from well	<u>○</u> , <u>○</u> gal.		_	_		
S. Volume of water added (if any)	<u>O</u> .O gal.	14. Total suspended solids	mg/l	mg/l		
	<u> ga.</u>	3024				
9. Source of water added NA		15. COD	mg/l	mg/l		
						
	Yes 🛮 No					
(If yes, attach results)						
15. Additional comments on development:						
10. Additional confinents on development						
••						
			•			
Well developed by: Person's Name and Firm			the above information is	true and correct to the best		
		of my knowledge.	· · · · · · · · · · · · · · · · · · ·			
1		Signature: ST	ologie in Ma	ho		
MATURAL RESSURE TE	U. BRITTEN	Signature: OC	phanie Vo	~ Lyce		
		Print Initials: S	$A \checkmark$	U		
MIM: NATURAL RESOURCE TE	CH					
		Firm: NATT	MAL RESOURCE	E /ECHNOLOGY		

SOIL BORING LOG INFORMATION State of Wisconsin Route To: ☐ Solid Waste ☐ Haz. Waste Department of Natural Resources Form 4400-122 Rev. 5-92 ☐ Emergency Response ☑ Underground Tanks ☐ Wastewater ☐ Water Resources Other: ☐ Superfund Page 1 of 1 .y/Project Name License/Permit/Monitoring Number Boring Number Citgo Bulk Terminal/Site Investigation (1096) MW-104 Date Drilling Completed Boring Drilled By (Firm name and name of crew chief) Date Drilling Started **Drilling Method** 08/18/95 4-1/4" (ID) HSA Midwest Engineering Services 08/18/95 WI Unique Well No. Final Static Water Level Surface Elevation Borehole Diameter DNR Facility Well No. Common Well Name MW-104 730.14 Feet MSL 732.71 Feet MSL 8 inches **Boring Location** Feet N Local Grid Location (if applicable) Lat 1960.4 feet ⊠ N 1989.7 feet ⊠ E State Plane Feet F Long SE 1/4 of NE 1/4 of Section 6, T8N, R21 $\Box s$ DNR County Code | Civil Town/City/ or Village County City of Milwaukee Milwaukee Soil Properties Sample ڪَ ري Fee Compressive Strength Blow Counts Soil/Rock Description RQD/ Comments Length Att. Recovered Plasticity Index And Geologic Origin For Moisture Content and Type .⊆ Diagram PID/FID Each Major Unit Depth Liquid Limit 200 uscs Well ASPH ASPHALT W/ GRAVEL SUBGRADE - 2 2.5'-4.5' SILTY CLAY, dk grysh brown (10YR 4/2), 5-10% subang. f. gravel, low plast., firm-hard, sl. moist, no odor (FILL) W-IO 18 <1 15 (3.5)4 6 7.5'-9.5' CLAY, brown (IOYR 5/3) w/ occass. 8 4W-104 vf. lamin. silt, 5% f. subang. gravel, med. 18 <1 22 (7.5)plast., moist, no odor 10 CL 12 12.5'-14.5' As above MW-104 19 26 <1 (13.5)-14 EOB @ 14.5° - 16 18 20 22 hereby certify that the information on this form is true and correct to the best of my knowledge.

This form is authorized by Chapters 4.147 and 162, is. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Natural Resource Technology

	d Waste Haz. Waste		MONITORING WELL CONSTRUCTION Form 4400-113A Rev. 4-90
Env. Response	& Repair Undergroun Local Grid Location of We		Well Name
Project Name DO BULK PETROLEUM TERMINA	1940.4 ft = N	1989.7 ft. Tw	MW-104
Facility License, Permit or Monitoring Number	Grid Origin Location Lat I		Wis: Unique Well Number DNR Well Number
			Date Well Installed
_	St. Plane f Section Location of Waste,		Se / 4 8 / 9 5
	Section Location of Waste	C T C Y P 7/ EE	Well Installed By: (Person's Name and Firm)
ft.	SE1/4 of $VE1/4$ of Sec.	6 T. 8 N. R. 21 W.	
Is Well A Point of Enforcement Std. Application?	Location of Well Kelative	to Waste/Source s	
■ Yes □ No		n 🗆 Not Known	MIDWEST ENGINEERING
	L MSL	1. Cap and lock	Yes 🗆 No
Carronal at the contract of the carron		2. Protective co	
B. Well casing, top elevation _ 73_5 .06 f	L MSL	a. Inside diam	
	t MSL	b. Length:	_ <u>1</u> . <u>0</u> ft
		c. Material:	Steel 🔳 04
D. Surface seal, bottom_ 731.7 ft MSL or	1.2 ft.		Other 🛚 🤐
12. USCS classification of soil near screen:	A STATE OF THE PARTY OF THE PAR	d. Additional	protection?
GP II GM II GC II GW II SW II S	SP 🗆 XII	If yes, desc	mibe:
SM SC ML MH CL	CH 🗆 NII		Bentonite 📰 30
Bedrock □		3. Surface seal:	Concrete 📮 01
13. Sieve analysis attached? Yes	√ 0		Other 🗆 💮
14. Drilling method used: Rotary	50	4. Material betw	een well casing and protective pipe:
Hollow Stem Auger	41		Bentonite 🗖 30
Other 🗆			Annular space seal 🔲 👑
			Other 🗆 🚉
15. Orilling fluid used: Water 0 0 2 Air 0	01	5. Armular space	e seal: a. Granular Bentonite 🛣 33
Drilling Mud 🗆 03 None 🔳	99	bLbs/	gal mud weight Bentonite-sand shurry [1] 35
 	01 99	cLbs/	gal mud weight Bentonite slurry 🔲 3 1
16. Unilling additives used? Yes	No SS	d% Be	ntonite Bentonite-cement grout 🛘 50
N10		е	_Ft 3 volume added for any of the above
Describe NA		f. How insta	lled: Tremie □ 01
17. Source of water (attach analysis):			Tremie pumped
NA			Gravity 📕 08
		6. Bentonite se:	
E. Bentonite seal, top ft. MSL or	m		. \$\Quad 3/8 \text{ in. } \$\Quad 1/2 \text{ in. Bentonite pellets } \$\Quad 3.2\$
•		7. Fine sand m:	Other 🛚 💆
F. Fine sand, top ft. MSL or	:- ir/	7. Fine sand ma	aterial: Manufacturer, product name & mesh size
72076 751 55	30 ft.	b. Volume a	okled ft ³
G. Filter pack, top 7297 ft. MSL or	-5:- "\\		naterial: Manufacturer, product name and mesh size
H. Screen joint, top _ 7292 ft. MSL or _	_3.5 ft.	a #30	Red Flint Sand
•		b. Volume	
I. Well bottom _ 719.2 ft. MSL or _ 1	135 元	9. Well casing	
.			Flush threaded PVC schedule 80 24
J. Filter pack, bottom	77.5 年 / 注	<u> </u>	Other 🗆 💮
		10. Screen mate	nai: FYC
K. Borehole, bottom	14.3 6	a. Screen ty	<u> </u>
			Continuous slot 01
L. Borehole, diameter _8_2 in.	\@		Other 🗆 💹
			WE NORTHERN AIRE
M. O.D. well casing 2.1 in.		c. Slot size	
•		d. Slotted l	
		11. Backfill man	erial (below filter pack): None 1 4 Cther 1
I hereby certify that the information on th	is form is true and co	orrect to the best of my	
Signature	Firm		

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by cits. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than \$10,000 for each 35000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each 35000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each 35000 f

MONITORING WELL DEVELOPMENT Form 4400-113B Rev. 4-90

Env. Response & Repair ☐ Under Facility/Project Name County Name							
		Well Name					
CITGO BULK TERMINAL 1096 MILLUA	UKEE	Mul-/04 Imber ** DNR Well Number					
Facility License, Permit or Monitoring Number County Code	Wis: Umque Well Nu	imber ** DNR We	ll Number				
1. Can this well be purged dry?	11. Depth to Water	Before Development	After Development				
2. Well development method surged with bailer and bailed 4 1	(from top of well casing)	<u>3.10</u> ft.	DRYfic				
surged with bailer and pumped 6 1 surged with block and bailed 4 2 surged with block and pumped 6 2	Date	b <u>C8</u> 124195	08124195 mm d d y y				
surged with block, bailed and pumped	Time	c: p.m.	a.m. p.m.				
bailed only	12. Sediment in well bottom	inches	inches				
Other 🗆 💆	13. Water clarity	Clear ☐ 10 Turbid ☐ 15	Clear 20 Turbid 25				
3. Time spent developing well3 min. 4. Depth of well (from top of well casising)1 5.91 %		(Describe) BY ZSN T TUKBID	(Describe) BROWN				
4. Depth of well (from top of well casising)		100-1111					
o. Volume of water in filter pack and well							
casing 8 gal. 7. Volume of water removed from well 5. C gal.	Fill in if drilling flui	ds were used and well is a	at solid waste facility:				
7. Volume of water removed from well	14. Total suspended solids	mg/l	mg/l				
9. Source of water added NA	15. COD	mg/l	mg/l				
10. Analysis performed on water added? NA Yes No (If yes, attach results)			İ				
16. Additional comments on development:							
Well developed by: Person's Name and Firm	of my knowledge.		true and correct to the best				
Name: STEPHANIE VAN WILE SHELLY BRITTON	.	ephanie/b	- Cype				
irm: NATURAL RESOURCE TECH	Print Initials: 5		CE TECHNOLOGY I				

State Depart				Resources	□ Eme	d Waste rgency Respon tewater	se 🔀] Water	ground Resou	l Tanks rces				OIL BO rm 440				RMATION Rev. 5–92			
ِ آنـــا	y/Proje	act Na	me.		Sup	erfund 		Other:		mit/Mon	itoring	Numbe	er l	Boring	Numbe	er		Page 1 of 1			
Citgo I	Bulk Te	rminal,	/Site I	nvestigation (MW-105	5		4-11-4				
	Drilled st Engil			ime and name o ices	f crew o	:hief)		08/16		Starte	1	Date D 08/16/	_	Complet		Drilling I 4-1/4"					
DNR F	acility	Well No	o. WI	Unique Well No.	•	Common Well Na MW-105	ame	1	Static 8 Feet	Water L MSL	evel	Surfac 730.38			- 1	Boreholi 8 inches		eter			
	Locat	ion				Feet N		Lat						cation t 🖾 N		pilcable 1.2 feet					
State SE 1/4		1/4 0	f Sect	ion 6, T8N, R21		Feet E		Long	•			7501		□s	2,10,						
County							DNR 1	County	Code	Civil To			Village								
Sam														-T	Prope	erties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet		And Geo	ck Description logic Origin For n Major Unit	•		nscs	Graphic Log	Well Diagram	P10/F10	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments			
- e			-	CLAYEY SI	LI black	w/ abundant or	ganics		OL (FILL			*									
MW-105 (3)	18	12	2	olive yellow	2'-4' CLAY, mottled strng brown (7.5YR 5/6 olive yellow (3.5Y 6/6) & drk grayish brown (10YR 4/2), soft, 5% gravel, v. mst, no odor (FILL)				CL (FILL			614									
MW-105 (8)	21	22	6 8 0 1 8 0	& yellowish lamin. gree mottling, tro	7'-9' CLAY, laminated pinkish gray (7.5YR 6 5 yellowish brown (10YR 5/6) w/ occas. vf. lamin. greenish gray (10G 6/1) silt, trc bik mottling, trc f. subang gravel, hard, moist, - v. moist) no odor (Lacustrine)							83									
MW-105	22	14	12	trc-5% (de sand, subar brown (10Y sl. moist-d	12'-14' CLAY, brown IOYR 5-4/3), med. plas trc-5% (decrease w/ depth) f. gravel, crs. sand, subang-subrnd, firm-hard, trc yellowin brown (IOYR 5/8) mottling, trc black mottlin sl. moist-dry, no odor				c-5% (decrease w/ depth) f. grav and, subang-subrnd, firm-hard, trc own (10YR 5/8) mottling, trc black . moist-dry, no odor	ase w/ depth) f. gravel, crs. subrnd, firm-hard, trc yellowish /8) mottling, trc black mottling,	sh				13						
			16 18 20																		
-	eby ce	rtify ti	hat the	e information or	n this 🏍	n is true and o	correct	to the	best	 of my ki	nowied	l dge.	<u> </u>				<u></u>				
a	ture	Tu	lu	eca 1	(4	eye		Firm	Na	tural Re	sourc	e Techr									
45.55	\$10 po	-	than 9	by Chapters 44 \$5,000 for each on. Each day o	h violati	on. Fined not l	ess tha	an \$10 (or more	e than 9	5100 O	or impris	onea i	not less	tnan	JU day:	ss 3,				

State of Wisconsin Department of Natural Resources Route to: So Env. Response	lid Waste Haz. Waste	. Wastewaler □	MONITORING WELL CONSTR Form 4400-113A	UCTION Rev. 4-90
	& Repair Undergrou	ind lanks ■ Other [] ——	Well Name	
Project Name ROLV TERMINAL	1956.1 ft. IS		MW-105	
		ZIOI.Z	Wis Unique Well Number DNR Well	DX6
License, Permit or Monitoring Number	Grid Origin Location	_		: ivumbe
		Long or		
Type of Well Water Table Observation Well # 11	St. Plane	ft. N, ft. E.	Date Well Installed O8/16/9	5
Piezometer 12	Section Location of Was	re/Source		
Distance Well Is From Waste/Source Boundary	CEAN COLCUMN SE	c. 6 T. 8 N. R.21 W.	Weil Installed By: (Person's Name and	l Firm)
ft.	SE 1/4 OF IVE 1/4 OF SE	c. <u>6</u> 1. <u>6</u> 1. K. S. U. W.	4	
Is Well A Point of Enforcement Std. Application?	Location of Well Relativ	s Sidegradient		
	d Downgradient	-	MIDWEST ENGINEE	ERINC
■ Yes □ No		1. Cap and lock	2 Yes	□ No
A. Protective pipe, top elevation _ 729.88	ft. MSL	2. Protective co		<u> </u>
B. Well casing, top elevation _729.88	ft. MSL ———	→ He> /		•
B. Well casing, top elevation	.]}	a Inside diam	reter:	m
C. Land surface elevation _ 730.4	ft. MSL	b. Length:		_1.0ft
	المنصوب المساهدة	c. Material:	Steel	■ 04
D. Surface seal, bottom_729.4 ft MSL or _	<u> </u>		Other	
12. USCS classification of soil near screen:	The second	d. Additional	protection?	■ No
GP GM GC GW SW G	SP 🗆	If yes, des	cribe:	_
SM SC ML MH CL	CH 🗆	[1] / /	Bentonite	3 (
Bedrock □		3. Surface seal:	Concrete	I 0
13. Sieve analysis attached? Yes	No 🔛		Other	
	50	4 Margiel berry	veen well casing and protective pipe:	— 22
14. Drilling method used: Rotary	30 8	4. Maieriai betv	Bentonite	: 🗆 3 (
Hollow Stem Auger	41			
Other 🗆			Annular space seal	
_			Other	
15. Drilling fluid used: Water 02 Air 0	01 👹	5. Amular space	ce seal: a. Granular Bentonite	
Drilling Mud 🔲 03 None 📕	99	h Lbs/	gal mud weight Bentonite-sand slurry	7 🔲 3 3
1 11 1	No 50 41 01 99	c Lbs/	gal mud weight Bentonite slurry	□ 3
	No 🔯	d % B	entonite Bentonite-cement grout	t 🗆 5
			Ft 3 volume added for any of the above	
Describe NA	🛗	i. How insta		
17. Source of water (attach analysis):	1 👹	[110 w 115 c	Tremie pumped	□ o:
		\text{\tin}\text{\tetx{\text{\tetx{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\ti}\}\text{\text{\text{\text{\text{\text{\text{\text{\tex{\tex	Gravity	
N A			•	
		6. Bentonite se		_
E. Bentonite seal, top ft. MSL or _	ft 🐰		n. □3/8 in. □ 1/2 in. Bentonite pellets	
		7. Fine sand m	Other	
F. Fine sand, top ft. MSL or	ír/	7. Fine sand m	aterial: Manufacturer, product name & n	
		段/ / 2		
G. Filter pack, top _727.5 ft. MSL or _	30 ft. \\	b. Volume:	added ft ³	
o posta top		8. Filter pack i	material: Manufacturer, product name and	d mesh s
H. Screen joint, top _7269 ft. MSL or _	35 ft 🖊 🖊		Red Flint Sand	🙎
h. Screen joint top		b. Volume		
I. Well bottom _7169 ft. MSL or _	135 ft.	9. Well casing		2
I. Well bottom	75.5 (6)		Flush threaded PVC schedule 80	
71/11 - 200		富火		
J. Filter pack, bottom _7164 ft. MSL or _	.Ta'n	P	erial: PYC	· 🗖 👸 _
7.1.4		10. Screen mate		
K. Borehole, bottom _716.4 ft. MSL or _	.14.0 ft.	a. Screen t		
			Continuous slo	
L. Borehole, diameter 82 in.	\E			x 🛛 🚆
		b. Manufac	OUTHERN AIRE	4
M. O.D. well casing _ 2 1 _ in.		c. Slot size		0.070
m. O.D. wen casing ii.		d. Slotted	length:	70.0
— p1' 1 C ·		11. Backfill ma	terial (below filter pack): Non	e 🔳 1
D. well casing				≠ 🗆 🖔
	Nie fame is assessed	correct to the best of m	v knowledge	
I nereby certify that the information on t	Inis form is true and	COLLECT TO THE DEST OF HE	, 	

Stephanie Value VR NATURAL RESOURCE TECHNOLOGY - TNC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. World Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

MONITORING WELL DEVELOPMENT Form 4400-113B Rev. 4-90

Env. Response & Repair Underground Tanks Other U									
Facility/Project Name County	Name	Well Name							
CITTOR RIVER TERMINAL INSID	h Wanker	MW-105							
Facility License, Permit or Monitoring Number County	Code Wis: Umque Well Nu	mber DNR Wei	l Number						
1. Can this well be purged dry?	No 11. Depth to Water	Before Development							
2. Well development method surged with bailer and bailed	(from top of well casing) Date Time 12. Sediment in well bottom 13. Water clarity n. Fill in if drilling fluid sal. 14. Total suspended	a3.05ft. b \(\frac{3}{3} \) \(\frac{3}{4} \) \(\frac{9}{5} \) m m \(\frac{1}{4} \) \(\frac{1}{4} \) y y c inches Clear \(\prec{1}{10} \) 15 (Describe) \(\frac{7}{10} \) \(\frac{1}{15} \) (Describe) \(\frac{7}{10} \) \(\frac{1}{15} \) (Describe) \(\frac{1}{10} \) \(\frac{1}{15} \) (Describe) \(\frac{7}{10} \) \(\frac{1}{15} \) (Describe) \(\frac{1}{10} \) \(\frac{1}{15} \) (Describe) DE/24/95 m m d d y y a.m. a.m. p.m. inches Clear 20 Turbid 25 (Describe) TAN t solid waste facility: mg/l							
V			·						
Weil developed by: Person's Name and Firm	I hereby certify that of my knowledge.	the above information is	true and correct to the best						
Tame: STEPHHYUE DAN DIKE / SHEZLY E	Signature: State Print Initials: S Firm: NATO	phanie Vo AV WEAL RESOURCE	E TECHNOLOGY						

SOIL BORING LOG INFORMATION State of Wisconsin Route To: ☐ Haz. Waste ☐ Solid Waste Department of Natural Resources Form 4400-122 Rev. 5-92 ☐ Underground Tanks ☐ Emergency Response ☐ Water Resources □ Wastewater ☐ Superfund ₩0ther: Page 1 of 1 Boring Number License/Permit/Monitoring Number MW-106 Date Drilling Started Date Drilling Completed Drilling Method Boring Drilled By (Firm name and name of crew chief) 08/25/95 08/25/95 4-1/4" (ID) HSA Midwest Engineering Services Surface Elevation Borehole Diameter DNR Facility Well No. Common Well Name Final Static Water Level WI Unique Well No. 732.79 Feet MSL 8 inches MW-106 729.69 Feet MSL Local Grid Location (if applicable) **Boring Location** Feet N Lat 1860.1 feet 🖾 **N** 1589.5 feet ⊠ E State Plane Long Feet E $\Box s$ \square N SE 1/4 of NW 1/4 of Section 6, T8N, R21 **DNR County Code** Civil Town/City/ or Village County City of Milwaukee Milwaukee Soil Properties Sample Compressive Strength Feet ى ي Blow Counts Soil/Rock Description RGD/ Comments Plasticity Index Length Att. Recovered Moisture Content And Geologic Origin For and Type Depth in PID/FID Graphic Diagram Liquid 200 Each Major Unit nscs Log ž Ô GRAVEL, crs., angular GP - 2 CLAY brown (IOYR 5/1), trc sand & slit, f., 4W-106 similar to MW-107, silt content decreases w/ 11 24 (3.5)CL 6 8 MW-106 35 24 (8.5) SAND red brown to brown, vf., wet, trc clay, v. slight hydrocarbon odor, occasional ang. - 10 gravels SP 12 MW-106 24 SILT, gray (10YR 4/4), clean, prly sorted silt, (13.5)-14 ML wet, compact, firm E08 @ 14.5° - 16 18 20

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

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Natural Resource Technology

hereby certify that the information on this form is true and correct to the best of my knowledge.

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ture

	Vaste Haz. Waste Repair Underground		MONITORING WELL CONST Form 4400-113A	TRUCTION Rev. 4-90
Litt. Reopeille es :	cal Grid Location of Well	-	Well Name	
	1860-1 fr. 75	1589.5 ft. W	MW-106	
Facility License, Permit or Monitoring Number Gri	d Origin Location	mg or	Wis: Unique Well Number DNR W	ell Number
Type of Well Water Table Observation Well # 11 St.	Plane ft.	N ft. E.	Date Well Installed OR 8/25/ mm ddd/	9,5 <u>,</u>
Distance Well Is From Waste/Source Boundary	tion Location of Waste/S	e.T. S. N. R. 21 . W.	Weil Installed By: (Person's Name a	
Is Well A Point of Enforcement Std. Application? u	cation of well Kelative to Upgradient s	Waste/Source ☐ Sidegradient ☐ Not Known NA	MIDWEST ENGINE	ERING
	ASL MSL	1. Cap and lock	? Y	es 🛮 No
NOT SURJEYED		2. Protective cov		
B. Well casing, top elevation _ Z35.50 ft. N	1111	a. Inside diam	eter:	in.
C. Land surface elevation _ 732.8 ft. M	ASL _	b. Length:		_5Ωt ట ≣ 04
D. Surface seal, bottom_731.8 ft. MSL or _1.5	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	c. Material:	Oth	
12. USCS classification of soil near screen:		d. Additional If yes, desc	•	<i>⇔</i> ≡ 1,0
GP □ GM □ GC □ GW □ SW □ SP SM □ SC □ ML ■ MH □ CL ■ CH		3. Surface seal:	Benton	
Bedrock []			Concre	ente 🔲 01 er 🗆 🎆
13. Sieve analysis attached?		4 Marerial berry	reen well casing and protective pipe:	- L
14. Drilling method used: Rotary 50 Hollow Stem Auger 41		4.1111111111111111111111111111111111111	Benton	ite 🔲 30
Other 🗆 ==			Annular space se	
				er 🗆 😇 ite 📕 33
15. Drilling fluid used: Water 02 Air 01		5. Armular spac	e seal: a. Granular Benton	_
Drilling Mud 🔲 0 3 None 📕 9 9	'	bLbs/	gal mud weight Bentonite-sand shr	ny 🗆 35
Type addition made Type Type		5. Amular space bLbs// cLbs// d % Be e f. How insta	gal mud weight Bentonite slur	ry 🗆 31
16. Drilling additives used? Yes No		₫% Be	mtonite Bentonite-cement gro	
Describe NA		e	Ft volume added for any of the abo	
17. Source of water (attach analysis):		f. How insta	цеа: Tremie pump	
			••	ity = 08
NA NA		6. Bentonite se:	al: a. Bentonite granu	les 🔲 33
E. Bentonite seal, top ft. MSL or	· · · · · · · · · · · · · · · · · · ·	~	. 3/8 in. 1/2 in. Bentonite pell Other	ets 🛮 32
F. Fine sand, top ft. MSL or	ft.	XX /	aterial: Manufacturer, product name of	
G. Filter pack, top _ 729.8 ft. MSL or _ 3	So it	b. Volume a	oddedft ³ naterial: Manufacturer, product name	
H. Screen joint, top _729.3 ft. MSL or 3	3.5 ft.	<u> </u>	Red Flint Sand	
I. Well bottom	35 (b. Volume 9. Well casing	: Flush threaded PVC schedule	
I. Filter pack, bottom _718.3 ft. MSL or _14	15 11			80 U 24
		10. Screen mate	_	
K. Borehole, bottom 718 3 ft. MSL or 11	1.3 it	a. Screen i	Continuous	slot 🗖 01
L. Borehole, diameter _8.2 in.		b. Manufact	DURTHERN AIRE	ther 🗆 💹
M. O.D. well casing 2.1 _ in.		c. Slot size d. Slotted l	:: ength;	0. <u>Q L Q</u> in. <u>L o</u> . <u>d</u> ft.
.D. well casing _1.9 _ in.			0	fone ■ 14 ther □ □□
I hereby certify that the information on this	form is true and co-	rrect to the best of my	knowledge.	
Signature	NATURA	RESOURCE T	FCHNOLOGY. TNC	
Please complete both sides of this form and return to the	DND office	a listed at the top of this for	m as required by $chs. 144, 147$ and 16	d). Wis. Stats
and ch. NR 141, Wis. Ad. Code. In accordance with c	in.144, Wis Stats., failure h. 147, Wis, Stats., failure	e to file this form may result		00 for each

MONITORING WELL DEVELOPMENT Form 4400-113B Rev. 4-90

			ste □ Wastewater □ rground Tanks □ Oth	er II	
				Well Name	
Facility/Project Name	,	nty Name	سسس من		
CITED BULK TERMINAL Facility License, Permit or Monitoring Number		11111111111111111111111111111111111111	ひここ Wis: Unique Well No	1 MW-1010	eil Number
and the second of the second o	1	41			arranner ———
1. Can this well be purged dry?	☐ Yes I	 ■ No		Refore Development	After Development
1. Can this wen be purged thy:	<u>.</u> 100	= 140	11. Depth to Water	Before Development	Atter Development
2. Well development method surged with bailer and bailed surged with bailer and pumped	□ 41 □ 61		(from top of well casing)	2.3.81 ft.	
surged with block and bailed surged with block and pumped	☐ 42 ☐ 62		Date	b.O.K.1.281.97	$\frac{08}{mm} \frac{28}{d} \frac{95}{y}$
surged with block, bailed and pumped compressed air	☐ 70 Ⅲ 20		Time	c i : 50 = p.m.	: p.m.
bailed only	10		12. Sediment in well	• •	
pumped only	□ 51 □ 60 □ 60 □ 60 □ 60 □ 60 □ 60 □ 60 □ 60		bottom	inches	inches
pumped slowly Other	□ 50 □ <u>□</u>		13. Water clarity	Clear □ 10 Turbid ■ 15	Clear 20 Turbid 25
3. Time spent developing well	r	min.		(Describe) THO TURBO	(Describe)
4. Depth of well (from top of well casisng)	_16.5	ft			
Inside diameter of well	_1.9_	in.		••	
J. Volume of water in filter pack and well					
easing	8.7	gal.			
7. Volume of water removed from well	_}\$5	gal.	Fill in if drilling fluid	is were used and well is a	1
3. Volume of water added (if any)	0.0	gal.	14. Total suspended solids	mg/l	mg/l
9. Source of water addedNA			15. COD	mg/l	mg/l
10. Analysis performed on water added? NA (If yes, attach results)	☐ Yes	□ No			
16. Additional comments on development:				' 12 2	
Weil developed by: Person's Name and Firm			I hereby certify that of my knowledge.	the above information is t	rue and correct to the best
Name: STEPHANIE UND DIKE IS	HAW B	Signature: St	phanie Va	wyho	
HIM: NATURAL RESOURCE	тсн		Print Initials: S		
			Firm: NA	TURAL KESOU	IRCE TECHNOLOG

State of Wisconsin Route To: SOIL BORING LOG INFORMATION ☐ Solid Waste Department of Natural Resources ☐ Haz. Waste Form 4400-122 Rev. 5-92 ☐ Emergency Response ☐ Underground Tanks □ Wastewater ☐ Water Resources ☐ Superfund ⊠Óther: Page 1 of 1 ty/Project Name

Use Bulk Terminal/Site Investigation (1096) License/Permit/Monitoring Number Boring Number MW-107 Boring Drilled By (Firm name and name of crew chief) Date Drilling Started Date Drilling Completed **Drilling Method** Midwest Engineering Services 08/25/95 08/25/95 4-1/4" (ID) HSA Final Static Water Level DNR Facility Well No. WI Unique Well No. Common Well Name Surface Elevation Borehole Diameter MW-107 730.95 Feet MSL 733.30 Feet MSL 8 inches **Boring Location** Feet N Local Grid Location (if applicable) Lat State Plane 1891.3 feet 🛛 N 1413.7 feet 🛛 E Feet E Long SE 1/4 of NE 1/4 of Section 6, T8N, R21 $\Box s$ Civil Town/City/ or Village County **DNR County Code** Milwaukee City of Milwaukee Sample Soil Properties ശ ട് Depth in Fee Compressive **Blow Counts** Soil/Rock Description Recovered RQD/ Comments Length Att. And Geologic Origin For Strength Moisture Content **Plasticity** and Type Graphic Log PID/FID Diagram Each Major Unit Liquid Limit Index nscs Kell 0 GRAVEL, crs., ang., (FILL) 0 GP (Cuttings) SILTY CLAY red brown (10YR 5/4), 2 dry-moist, sl. sticky, trc vf. sand, occas. MW-107 gray mottling 24 10 (3.5)4 CLAY, occas. gravel, v. hard, stiff, firm, compact, fissured, (TILL) CL 6 8 4W-107 24 SILTY SAND red brown (IOYR 5/4), wet, vf., 22 (8.5)compact, no odor, below 9' thin clay lamin. 10 SM 12 4W-107 24 19 (13.5)EOB @ 14.5' 20 22 I hereby certify that the information on this form is true and correct to the best of my knowledge.

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

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Project Name	State of Wisconsin Department of Natural Resources Route to: Solidary Response	d Waste Haz. Waste	Wastewater [MONITORING WELL CONSTRUCTION Form 4400-113A Rev. 4-90
		& Repair L Underground	Tanks Li Other D.	Well Name
Comparison Com	THE TOCCTION	1901 3 # EN	1413.7 化青色	mw-107
Type of Well Water Table Observation Well 1	PO BOLK JEBWINAL			Wis Unique Well Number DNR Well Number
Type of Well Water Table Observation Well 1	Lacinty Diccinc, I dille of more and	_	OT	•
Type of Well Water Table Observation Well Sp. Plane Sp. Plane Disconnect Disconnect Plane Disconnect D			~ <u>-</u>	
Distance Well form Waste/Source Boundary N h f.				08/25/95
SE_1/4 of Sec. S. T. S. N. E. W.	Piezometer 12	Section Location of Waste/	Source	
Step A Point of Enforcement Sul. Application	Distance Well Is From Waste/Source Boundary	SE 1/4 of NE 1/4 of Sec.	<u>6</u> , T. <u>8</u> N, R. <u>21 🖥</u> ₩.	Well libration by. (I describ Haire and I min)
Well A Point of Enforcement Stut. Application? u U Upgradient 1 N Markfroom N MINUSEST ENGINEER N N N N N N N N N		I ACRUON OF WELL KEIMINE	13 77 23 LL 30 LL C	
A Protective pipe, top elevation	Is Well A Point of Enforcement Std. Application?	n 🖂 Upgradient - S	; ☐ Sidegradient	MINITEST ENGINEERING
A. Protective pice, top elevation	■ Yes □ No	d Downgradient r	1 ■ Not Known Nr	
B. Well casing, top elevation	A Protective pipe top elevation	t. MSL		
C. Land surface elevation	77/41/	MSI -		
C. Land surface seal bottom	B. Well casing, top elevation 13.2.3.1	. 11-		
D. Surface seal. bottom 7.2.2.3 ft. MSL or 1.0 ft. 12. USCS classification of soil new screen: 12. USCS classification of soil new screen: 13. Secretary 14. 15. 1	2 Land number alouation 732 3	t. MSL	1	
12 USCS classification of soil new street: GP			c. Material:	
12 USCS classification of soil near street: GP	D. Surface seal, bottom_732_3 ft. MSL or			
SM		A Committee of the Comm	d. Additional	l protection?
Serious Scale Mile Mile CL Ch Ch Ch Ch Ch Cher C	CP II GMII GCII GWII SWII	SP 🗆	If yes, des	cribe:
Betrock 13. Sieve analysis attached?		CH 🗆 NII	Surface seeds	Bentonite 📕 30
Carring 0 8			3. Surface seal:	Concrete 0 0 1
NR 08 Gravity 08 08 Gravity 08 08 E. Bentonite seal. top	13 Sieve analysis attached? Yes	No S		Other 🛛 🥮
NR 08 Gravity 08 08 Gravity 08 08 E. Bentonite seal. top		50	4. Material bety	ween well casing and protective pipe:
NR 08 Gravity 08 08 Gravity 08 08 E. Bentonite seal. top		4.		
Carring 0 8				Armular space seal
Carring 0 8	Uner Li			
Carring 0 8	Wass 5 02 Air 5	0.1		
Carring 0 8	10. 0.1111	01	5. Armular space	CE 253T: T. CIMIMIM DATE: T. —
NR 08 Gravity 08 08 Gravity 08 08 E. Bentonite seal. top	Drilling Mud [] 03 None	99	bLbs/	gal mud weight benionite-sand sturry
Carring 0 8		., 📓	cLbs/	gal mud weight Bentonite slurry 1 51
NR 08 Gravity 08 08 Gravity 08 08 E. Bentonite seal. top	16. Utiling additives used? Li Tes	No	₩ d% B	
NR 08 Gravity 08 08 Gravity 08 08 E. Bentonite seal. top	0.10	l 🔛	e	
Carring 0 8	Describe		£ How inst	alled:
F. Fine sand, top ft. MSL or 7. Fine sand material: Manufacturer, product name & mesh size a b. Volume added ft. 8. Filter pack material: Manufacturer, product name and mesh size a #30 Red flint Sand b. Volume added ft. 9. Well casing: Flush threaded PVC schedule 40 23 Flush threaded PVC schedule 80 24 I. Filter pack, bottom 718 8 ft. MSL or 145 ft. Continuous slot 0 1 L. Borehole, diameter 82 in. M. O.D. well casing 2 1 in. D. well casing 1.9 in. 11. Backfill material (below filter pack): None 14 Other 15 12. Other 15 None 14 Other 15 None 14 Other 15 13. Screen sype: None 14 Other 15 14. Slotted length: None 14 Other 15 15. Backfill material (below filter pack): None 14 Other 15 16. Well casing 1.9 in.	17. Source of water (attach analysis):			
F. Fine sand, top ft. MSL or 7. Fine sand material: Manufacturer, product name & mesh size a b. Volume added ft. 8. Filter pack material: Manufacturer, product name and mesh size a #30 Red flint Sand b. Volume added ft. 9. Well casing: Flush threaded PVC schedule 40 23 Flush threaded PVC schedule 80 24 I. Filter pack, bottom 718 8 ft. MSL or 145 ft. Continuous slot 0 1 L. Borehole, diameter 82 in. M. O.D. well casing 2 1 in. D. well casing 1.9 in. 11. Backfill material (below filter pack): None 14 Other 15 12. Other 15 None 14 Other 15 None 14 Other 15 13. Screen sype: None 14 Other 15 14. Slotted length: None 14 Other 15 15. Backfill material (below filter pack): None 14 Other 15 16. Well casing 1.9 in.	NA			• - •
F. Fine sand, top ft. MSL or 7. Fine sand material: Manufacturer, product name & mesh size a b. Volume added ft. 8. Filter pack material: Manufacturer, product name and mesh size a #30 Red flint Sand b. Volume added ft. 9. Well casing: Flush threaded PVC schedule 40 23 Flush threaded PVC schedule 80 24 I. Filter pack, bottom 718 8 ft. MSL or 145 ft. Continuous slot 0 1 L. Borehole, diameter 82 in. M. O.D. well casing 2 1 in. D. well casing 1.9 in. 11. Backfill material (below filter pack): None 14 Other 15 12. Other 15 None 14 Other 15 None 14 Other 15 13. Screen sype: None 14 Other 15 14. Slotted length: None 14 Other 15 15. Backfill material (below filter pack): None 14 Other 15 16. Well casing 1.9 in.			6. Bentonite se	
Cother Cother F. Fine sand, top ft. MSL or ft.	F. Recognition and the fit MSL or	ft		n. 3/8 in. 1/2 in. Bentonite pellets 32
G. Filter pack, top 230.3 ft. MSL or 30 ft. H. Screen joint, top 729.8 ft. MSL or 35 ft. I. Well bottom 719.8 ft. MSL or 135 ft. J. Filter pack, bottom 718.8 ft. MSL or 145 ft. K. Borehole, bottom 718.8 ft. MSL or 145 ft. D. well casing 2.1 in. D. well casing 1.9 in.	E. Bentonite seat, top			Other 🛚 💆
G. Filter pack, top 230.3 ft. MSL or 30 ft. H. Screen joint, top 729.8 ft. MSL or 35 ft. I. Well bottom 719.8 ft. MSL or 135 ft. J. Filter pack, bottom 718.8 ft. MSL or 145 ft. K. Borehole, bottom 718.8 ft. MSL or 145 ft. D. well casing 2.1 in. D. well casing 1.9 in.	E Elevent to ft MSI or	ft、	7. Fine sand n	naterial: Manufacturer, product name & mesh size
G. Filter pack, top	F. Fine sand, top	·- ··· \ \	₩ / / a	
H. Screen joint, top 729 & ft. MSL or 35 ft. I. Weil bottom 719 & ft. MSL or 135 ft. J. Filter pack, bottom 718 & ft. MSL or 145 ft. L. Borehole, diameter 8.2 in. D. well casing 1.9 in. 8. Filter pack material: Manufacturer, product name and mean size at the standard product name and name	700 a f MSI or	30 ft.	117	•
H. Screen joint, top	G. Futer pack, top Z D D . D ILL MIDE OF _	¹¹		
b. Volume added ft 3 I. Weil bottom719 8 ft. MSL or135 ft. J. Filter pack, bottom718 8 ft. MSL or145 ft. K. Borehole, bottom718 8 ft. MSL or145 ft. L. Borehole, diameter82 in. M. O.D. well casing21 in. D. well casing19 in. b. Volume addedft 3 9. Well casing: Flush threaded PVC schedule 40	77 Q Q = Met	35 ft.	#30	Red flint Sond
I. Well bottom 7198 ft. MSL or 135 ft. 9. Well casing: Flush threaded PVC schedule 40 23 I. Filter pack, bottom 7188 ft. MSL or 145 ft. Other 10. Screen material: 24 K. Borehole, bottom 718.8 ft. MSL or 145 ft. 10. Screen material: 25 L. Borehole, diameter 82 in. Other 10 D. well casing 19 in. 11. Backfill material (below filter pack): None 114 D. well casing 19 in. 11. Backfill material (below filter pack): None 114 Other 10 11. Backfill material (below filter pack): None 114 Other 10 II. Backfill material (below filter pack): None 114 Other 10 II. Backfill material (below filter pack): None 114	H. Screen joint, top	-=	Nolume	added fr3
I. Well bottom If 1 8 it MoD of 1 2 4 I. Filter pack, bottom I. Filter pack, bottom II. Screen material: II. Screen type: II. Screen type: II. Borehole, diameter II. Borehole, diameter III. Borehole, diameter II	7100530	136 6		
J. Filter pack, bottom 7188 ft. MSL or 145 ft. K. Borehole, bottom 7188 ft. MSL or 145 ft. L. Borehole, diameter 82 in. M. O.D. well casing 21 in. D. well casing 1.9 in. Other 0 10. Screen material: PVC a. Screen type: Factory cut 11 Continuous slot 0 01 Other 0 Continuous slot 0 01 C. Slot size: 0.010 in. d. Slotted length: 10.0 ft. 11. Backfill material (below filter pack): None 14 Other 0	I. Well bottom	ころに …/ [護	事 ::	
I. Filter pack, solition	— . A A			
K. Borehole, bottom _718.8 ft. MSL or _145 ft. L. Borehole, diameter _8.2 in. M. O.D. well casing _21_ in. D. well casing _1.9_ in. 10. Screen type: Factory cut = 11 Continuous slot 01	J. Filter pack, bottom 7188 ft. MSL or _	177.2 117.12	三	0/1
L. Borehole, diameter 8 2 in. M. O.D. well casing 2 1 in. D. well casing 1.9 in. D. well casing 1.9 in. Other 0.010 in. d. Slotted length: 10.0 ft. 11. Backfill material (below filter pack): None 14. Other 0.010 in.			///	
L. Borehole, diameter 8 2 in. M. O.D. well casing 2 1 in. D. well casing 1.9 in. D. well casing 1.9 in. Other 0.010 in. d. Slotted length: 10.0 ft. 11. Backfill material (below filter pack): None 14. Other 0.010 in.	K. Borehole, bottom _718.8 ft. MSL or _	アゴコ に 一	a. Screen	,
L. Borehole, diameter 8.2 m. b. Manufacturer NORTHERN AIRE c. Slot size: 0.010in. d. Slotted length: 10.0ft. D. well casing 1.9 in. 11. Backfill material (below filter pack): None 14. Other Other				· · · · · · · · · · · · · · · · · ·
M. O.D. well casing 2.1 in. b. Manufacturer 10012(1120) F122 c. Slot size: d. Slotted length: 10.0 ft. 11. Backfill material (below filter pack): None ■ 14 Other □	L. Borehole, diameter 8 2 in.			
M. O.D. well casing _2 1 in. d Slotted length: 10.0 ft. D. well casing _1.9 in. 11. Backfill material (below filter pack): None ■ 14 Other □				
D. well casing 1.9 in. 11. Backfill material (below filter pack): Other Other	M OD well casing 2 1 in			
D. well casing _ 1 . 9 _ in Other □	Inc. O.D. woo owning =		\ d Slotted	
	D real casing 1 Q in		11. Backfill ma	
I have by configuration the information on this form is true and correct to the best of my knowledge.	D. well cashing _ L . J _ lin.			Other 🗆 💆
	I have be earlier that the information on t	his form is true and o	orrect to the best of m	ny knowledge.

Signature

NATURAL RESOURCE TECHNOLOGY, INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., Please complete both sides of this form and ch. NR 141. Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$10,000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation.

Firm

Signature

Route to: Solid Waste | Haz. Waste | Wastewater | Env. Response & Repair Underground Tanks Other # -Well Name County Name Facility/Project Name MW-107 MILWAUKER TERMINAL 10960 BULK 4760 DNR Well Number County Code Wis. Unique Well Number Facility License, Permit or Monitoring Number After Development Before Development ☐ Yes ■ No 1. Can this well be purged dry? 11. Depth to Water (from top of 2. Well development method well casing) surged with bailer and bailed 41 61 surged with bailer and pumped Date 42 surged with block and bailed surged with block and pumped 62 2:15 a.m. surged with block, bailed and pumped 70 □ p.m. Time 20 compressed air 10 bailed only 12. Sediment in well . __ inches . __ inches pumped only 51 bottom pumped slowly 50 Clear 20 13. Water clarity Clear □ 10 Other Turbid 📜 15 Turbid X 25 (Describe) 60 min. (Describe) 3. Time spent developing well BROWN 420,00/ 7022.5 16 .42 fc 4. Depth of well (from top of well casisng) **≡**nside diameter of well Volume of water in filter pack and well 8 9 gal. casing Fill in if drilling fluids were used and well is at solid waste facility: 90. gal. 7. Volume of water removed from well 14. Total suspended D.Ogal. solids 3. Volume of water added (if any) 15. COD mg/l 9. Source of water added □ No 10. Analysis performed on water added? ☐ Yes ALA (If yes, attach results) 15. Additional comments on development: I hereby certify that the above information is true and correct to the best of my knowledge. Weil developed by: Person's Name and Firm Signature: STEPHANIE VAN DIJKE / SHETLY ZRITTEN Print Initials: NATURAL PEREVELE TECH

Firm:

ATURAL RESOURCE

IECHNOLOGY

SOIL BORING LOG INFORMATION Route To: State of Wisconsin ☐ Haz. Waste ☐ Solid Waste Rev. 5-92 Form 4400-122 Department of Natural Resources ☐ Emergency Response ☐ Underground Tanks ■ Wastewater ☐ Water Resources Other: ☐ Superfund Page 1 of 1 License/Permit/Monitoring Number **Boring Number** ty/Project Name MW-108 Citgo Bulk Terminal/Site Investigation (1096) Boring Drilled By (Firm name and name of crew chief) Date Drilling Completed **Drilling Method** Date Drilling Started 4-1/4" (ID) HSA 08/25/95 08/25/95 Midwest Engineering Services Surface Elevation **Borehole Diameter** Common Well Name Final Static Water Level DNR Facility Well No. WI Unique Well No. 736.90 Feet MSL 8 inches 733.42 Feet MSL MW-108 Local Grid Location (if applicable) Feet N **Boring Location** Lat 1851.7 feet ⊠ N 1071.3 feet ⊠ E State Plane Feet E Long $\Box s$ SE 1/4 of NE 1/4 of Section 6, T8N, R21 Civil Town/City/ or Village **DNR County Code** County City of Milwaukee 41 Milwaukee Soil Properties Sample Compressive Strength æ <u>≘</u> Soil/Rock Description Blow Counts RGD/ Comments Plasticity Index Recovered Length Att. Moisture Content And Geologic Origin For Well Diagram and Type .⊆ PID/FID Graphic Depth i Liquid Limit Each Major Unit **USCS** GRAVEL, crs., ang., (FILL) O SILTY CLAY, red brown (10YR 4/4), trc sand & 2 gravel, f., dry-moist , firm, occas. gray mott. 4W-108 5 20 (3.5) SAND, red brown (10YR 4/4), vf., moist, loose SP 6 saturated @ about 5.5'-6' Cuttings suggest CLAYEY SAND, lots of CLAY -8 saturated about 5.5'-6' Must 4W-108 72 have (8.5)caught rock SC - 10 - 12 CLAYEY SAND/CLAY, brown - red brown (IOYR MW-108 4/4), vf. sand & clay, loose-compact, wet, no 24 49 (13.5)odor EOB @ 14.5° 16 18 20 22 eby certify that the information on this form is true and correct to the best of my knowledge. Natural Resource Technology

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

State of Wisconsin Department of Natural Resources East Personne	I Waste □ Haz. Waste □ V & Repair □ Underground T	Wastewaler C	MONITORING WELL CONSTRUC Form 4400-113A Rev	CTION 7. 4-90
/Project Name	ocal Grid Location of Well		Well Name	
TOO BULK TERMINAL	1851.7 ft 08.	1071.3 ft. TW	mw-108	
raculity License, Permit or Monitoring Number	Grid Origin Location	ıg or		umber
· ·	St. Plane ft. N		Date Well Installed O8/25/95	-
Distance Well Is From Waste/Source Boundary	Section Location of Waste/So SE 1/4 of NE 1/4 of Sec. 6	_T. <u>8</u> N, R. <u>21 . W.</u>	Well Installed By: (Person's Name and Fi	
NA ft. Is Well A Point of Enforcement Std. Application? Yes IN		Waste/Source ☐ Sidegradient ■ Not Known NA	MIDWEST ENGINEER	 <u>e</u> nc
	MSL	1. Cap and lock	? 📕 Yes 🗆] %
NOT SURVEYED		2. Protective co	• •	
B. Well casing, top elevation739.82 ft	. Wist	a. Inside diam		in.
C. Land surface elevation _ 736.9 ft	.MSL	b. Length:	_ ユ Steel T	.Qft. ■ 04
D. Surface seal, bottom_ 735.9 ft. MSL or _ J	O ft.	c. Material:	Other D	
12. USCS classification of soil near screen:		d Additional	protection?	
1	iP 🔳	If yes, desc	•	-
SM SC ML MH CL			Bentonite	30
Bedrock 🗆	60 11 01 99	3. Surface seal:	Concrete C	I 0 I
13. Sieve analysis attached? Yes 13.	6 S	\	Other E	
14. Drilling method used: Rotary D	50 👹 🧱	4. Material betw	veen well casing and protective pipe:	
Hollow Stem Auger			Bentonite □	-
Other 🗆 .			Annular space seal	
15 Brilling fluid used: Water 102 Air	o, 📓 🛣		Other C e seal: a, Granular Bentonite	
15. Drilling fluid used: Water 0 0 2 Air Drilling Mud 0 0 3 None	99	5. Armular space	gal mud weight Bentonite-sand shurry	
Driming Fride [] U 3 Note []		bLos/	gal mud weight Bentonite slurry	_ 31
io. Drilling additives used?	ا ه	d % Be	entonite Bentonite-cement grout	
		d:	Ft 3 volume added for any of the above	
Describe NA		f. How insta	alled: T re nie [J 01
17. Source of water (attach analysis):		- 8	Tremie pumped	
NR			Gravity	• •
		6. Bentonite se		
E. Bentonite seal, top ft. MSL or	· – · – ft~ 💢 🖁	b. □1/4 in	L. □3/8 in. □1/2 in. Bentonite pellets □	
F. Fine sand, top ft. MSL or	ft.	c	aterial: Manufacturer, product name & mes	
	3 0 ft.		added ft ³	<u> </u>
G. Filter pack, top 7339 ft. MSL or	-4.12 **/ 一里面	b. Volume a	naterial: Manufacturer, product name and m	nesh siz
H. Screen joint, top	3.5 ft		Red Flim Sand	2
I. Well bottom _ 723 4 ft. MSL or _]	3.5 1.	9. Well casing	: Flush threaded PVC schedule 40	
J. Filter pack, bottom _ 722 4 ft. MSL or _	45 1		Flush threaded PVC schedule 80 Other	
K. Borehole, bottom _722 4 ft. MSL or		10. Screen mate	_	
K. Borehole, bottom			Continuous slot	a o :
L. Borehole, diameter <u>8.2</u> in.	\chi_		other NORTHERN AIRE	
M. O.D. well casing 2 1 in.		c. Slot size d. Slotted		70 · 0 :
D. well casingL.9 _ in.		11. Backfill ma	terial (below filter pack): None Other	9000
I hereby certify that the information on th	is form is true and corn	rect to the best of m	y knowledge.	
Signature	11777) () () -		

Signature

NATURAL RESOURCE TECHNOLOGY, INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each \$2000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each \$2000 for each day of violation.

MONITORING WELL DEVELOPMENT Form 4400-113B Rev. 4-90

	/aste ∐ Haz. Waste Repair □ Undergr	ound Tanks ☐ Othe	- I	
Facility/Project Name	County Name	· · · · · · · · · · · · · · · · · · ·	Well Name	
	Milwauk	ei	MW-108	
CITED BULK TURMINAL 1096 Facility License, Permit or Monitoring Number	County Code	Wis. Umque Well Nu	mber DNR Wel	l Number
1. Can this well be purged dry?		1. Depth to Water	Before Development	•
surged with bailer and pumped surged with block and bailed surged with block and pumped surged with block, bailed and pumped compressed air bailed only pumped only pumped slowly Other	50 □		a3.4 ft. b O 2 29 9 5 m m d d y y c. 12:20 p.m. inches Clear □ 10 Turbid ■ 15 (Describe)	
Inside diameter of well 5. Volume of water in filter pack and well	5.27ft. .9_in. 8.5gal.		TURAS	
	gal. ○ . O gal.	_	ds were used and well is a	
9. Source of water added NA		15. COD	mg/l	mg/l
10. Analysis performed on water added? NA (If yes, attach results)	Yes 🛚 No			1
Weil developed by: Person's Name and Firm		I hereby certify tha	t the above information is	true and correct to the best
- Hame: STEPHHANE NANDINE SHE Firm: NATURAL REFERENCE TO	,	Print initials.	iphanie) A V WAL RESOURCE	a Dyte TECHNOLOGY

State d Departi				Res	sources S	te To: Solid Wast Emergency Nastewate	y Respons er	se [] Haz. W] Underg] Water	ground Resour					IL BO m 440			F	MATION lev. 5-92
 -	10-1-	-4 11				Superfund			Other:		nit/Moni	torino	Numbe	r I	Boring	Numbe	r		Page 1 of 1
i ■ It y Citgo B	i/Proje Bulk Tei	ct Nai rminal/	ne 'Site	Inv	estigation-1096				Licens						MW-109)			
Boring Midwes					e and name of cre	ew chief)			Date 1 08/25		Started		08/25/	_	Complet		Orilling M 1-1/4"		A
DNR F	acility i	tell No). J	II U	nique Well No.	Commo	on Well Na	ime	1	Static 3 Feet	Water L MSL	evel	Surfac 734.28				Borehole Binches		ter
Boring State	Plane		,1_			Fee Fee			Lat Long						cation t⊠N □s		olicable 8 feet (1) ⊠e Jw	
County	,	1/4 01	f Sec	tion	6, TBN, R21			DNR	County	Code	Civil To	wn/Cl Milwa	ty/ or \	Village					
Milwauk								71							Soil	Prope	rties		
Sam	2 (<u>E</u>	S	Feet		Soil	/Rock De:	scription						ļ	ve					
Number and Type	Length Att. Recovered	Blow Counts	Depth in Fe		And	Geologic (Each Majo	Origin For			nscs		Well	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RGD/ Comments
			E	1	GRAVEL, crs., ar	ng., (FILL)			-	GP (FILL)	200								
			-2		CLAY, drk. red stiff, moist, fissi				v										
MM-108	24	14	E		strength	ged, non p	iastic, iiigi	., .,											
(3.5)			<u> </u> 4							CL					į				
			<u> </u> 6												1				
			Ē														İ		
MM-108	24	19	₽®	·															
(8.5)			ŧ.		SILTY SAND. gr compact, wet, f	ay brown irm, no odd	(2.5Y 6/1), or	, v. fin	е,								1		
			F	0															
			E	2						SM									
MW-108	24	20	F								1//								
(13.5)	24	20	Ę١	4						-	12./2								
			F.	6	EOB @ 14.5														
			E'	۱						ļ									
			E	8															
			E																
			E	20															
			E	22															
			E																
	eby ce	rtify 1	- that	the	information on th	is form is	true and	correc	t to the	e best	of my k	nowle	dge.						
·	ature 9			-	<u> </u>	tch			Firm				ce Tech	nology	•				
This	form is	autho	rize	<u> </u>	. 44444	7 and 162	Wis. Sta	ts. Co	mpletio	n of th	is repo	rt is n	nandato	ry. Pe	nalties:	Forfe	eit not le	ess	
				***	Chapters 144.14 5,000 for each vi . Each day of co		INDA DOL	IDEC II	ווא חבי	or mea	e wan	<i>_</i>	O1 11111211	JU110			,		

State of Wisconsin _ Route to: Sol	id Waste Haz. Waste	Wastewater []	MONITORING WELL CONSTRUCTION Form 4400-113A Rev. 4-90
Department of Natural Resources Env. Response	& Repair Underground	Tanks U Other	Well Name
Project Name	Local Grid Location of Well	1013.8 ft. W	MW-109
60 BULK TERMINAL	2088.6 ft. 05.	1017.0 ". D.M.	Wis Unique Well Number DNR Well Number
Facility License, Permit or Monitoring Number	Grid Origin Location		T. D. Cilique - Cars
	Lat Lo	ong or	Date Weil Installed 0.0 + 7.5 + 0.6
Type of Well Water Table Observation Well 11	St. Planeft.	N ft. E.	00145145
Piezometer 12	C I seeing of Wortel	Source	Weil Installed By: (Person's Name and Firm)
Distance Well Is From Waste/Source Boundary	SE 1/4 of NE 1/4 of Sec.	6. Т. S. N. R.ZI	Well installed by. (Ferson's Ivalite and Film)
NA ft.	Location of Weil Relative to	Waste/Source	
Is Well A Point of Enforcement Std. Application?	u Upgradient s	☐ Sidegradient	MIDWEST ENGINEERING
Yes No		■ Not Known NA	
	ft. MSL	1. Cap and lock	
A. Protective pipe, top elevation		2. Protective co	
B. Well casing, top elevation	ft. MSL	a. Inside diam	
761.0	11 1	b. Length:	_\(\frac{7}{2}\).\(\frac{6}{6}\) ft
C. Land surface elevation _23.4.3	ft. MSL	c. Material:	Steel 📰 04
D. Surface seal, bottom_ 733.3 ft MSL or _	1 0 ft.		Other 🗆 🔠
		d. Additional	protection?
12. USCS classification of soil near screen:		If yes, des	-
GP GM GC GW SW G		H \	Bentonite 3 0
		3. Surface seal:	Concrete 0 1
Bedrock 🗆			Other 🛚 🤍
15. Steve manysis attention — 1-	I No 1 5 0 1 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	5. Annular spa b	ween well casing and protective pipe:
14. Drilling method used: Rotary	150	4. Material bet	Bentonite 30
Hollow Stem Auger	41		Annular space seal
Other C			
		—	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
15. Orilling fluid used: Water 02 Air 0] 01	5. Amular spa	ce seal:
Drilling Mud 🔲 03 None 🛘	1 99 ∰	₩ bLbs	/gai mud weight Delibilitie-said start /
		cLbs	/gal mud weight Bentonite slurry
'i.o. Drilling additives used?	II No S	d% B	entonite Bentonite-cement grout 50
	1 🔛	e	Ft 3 volume added for any of the above
Describe NA		f. How inst	alled: Tremie 0 1
17. Source of water (attach analysis):		₩	Tremie pumped 🔲 02
NA	i 🚟		Gravity I 08
Nn		6. Bentonite s	eal: a. Bentonite granules [33
	. 🔛	/ h []1/4 i	n. 3/8 in. 1/2 in. Bentonite pellets 32
E. Bentonite seal, top ft. MSL or			Other 🛚 🚉
	. 📉	7. Fine sand r	naterial: Manufacturer, product name & mesh size
F. Fine sand, top ft. MSL or	:- it.		
·	it.	b. Volume	3
G. Filter pack, top _731 3 ft. MSL or	3:5 m/	b. Volume	material: Manufacturer, product name and mesh size
	→ 1 111	8. Filter pack	Red Flint Sand
H. Screen joint, top _730.8 ft. MSL or	2:= "	1 1 2	
•		b. Volume	
I. Well bottom	_135 年	9. Well casin	Flush threaded PVC schedule 80 2 4
	> □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □		Piusn interdent PVC schedule av II
I. Filter pack, bottom _719 8 ft. MSL or	145 ft. 1	<u> </u>	Other 🗆
		10. Screen ma	
K. Borehole, bottom _719.8 ft. MSL or	145 ft.	a. Screen	type: Factory cut 📕 il
K. Borenole, bottom			Continuous slot 0 1
			Other 🛘 💮
L. Borehole, diameter 8.2 in.		b. Manufa	COURT NORTHERN AIRE
		c. Slot si	ze: 0. <u>010 u</u>
M. O.D. well casing 2.1 in.		d Slotted	
_		11. Backfill n	naterial (below filter pack): None 📕 1
I.D. well casing -1.9 in.			Other 🗆
I cereby certify that the information on	this form in two and o	correct to the best of r	ny knowledge.
I norshy certify that the information on	uns form is true and t		

Signature

NADPAL RESOURCE TECHNOLOGY, TNC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats...

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Please co

Signature

MONITORING WELL DEVELOPMENT Form 4400-113B Rev. 4-90

Route to: Soli Env. Response	lid Was e & Re	ste 🔲 Haz. Was pair 🔲 Under	round Tanks ☐ Othe	a I	
Facility/Project Name		County Name	ikee	Well Name NW-109	
Cittal Buck TFRMINAL 10 Facility License, Permit or Monitoring Number	1760	County Code	Wis: Unique Well Nu	mber DNR Wel	II Number
1. Can this well be purged dry?	□ Yes	■ No	11. Depth to Water		After Development
surged with bailer and pumped surged with block and bailed surged with block and pumped surged with block, bailed and pumped compressed air bailed only pumped only pumped slowly Other		1 2 2 0 0 0 1 0 	(from top of well casing) Date Time 12. Sediment in well bottom 13. Water clarity	2 _ 4. 4. 4. 6. ft. b	a.m. : p.m.
10	7 165	9 _ in. 2 . 7 gal. 2 gal. 2 gal.		ds were used and well is a	
9. Source of water added NA	,		15. COD	mg/l	mg/l
10. Analysis performed on water added? (If yes, attach results) 15. Additional comments on development:	□ Ye	≥ □ No			
.1			II hereby certify tha	r the above information is	true and correct to the best
Weil developed by: Person's Name and Firm Varne: STEPHANIE DAY DYKE /S Firm: NAMA RESSURCE TE		LY BRITT	of my knowledge. Signature: 50 Print Initials: 5	phanie Vo AV	E TECHNOLOGY

_					stewater perfund		Water Other:										Page 1 of
—ty/Project Name Citgo Bulk Terminal/Site Investigation (1096) Boring Drilled By (Firm name and name of crew chief) Midwest Engineering Services				License/Permit/Monitoring Number					भ	Boring Number MW-110							
				Date Drilling Started 08/22/95				Date D 08/22		Completed Drilling N			lethod (ID) HSA				
DNR Facility Well No. WI Unique Well No. Common Well MW-110				Common Well No MW-110				Final Static Water Level 732.10 Feet MSL				ation MSL	1.	Borehole Dlameter 8 inches			
Boring State SE 1/4	Plane		f Sect	ion 6, T8N, R21	Feet N Feet E		Lat Long	•					cation t 🖾 N 🗆 S		pilcable 1.1 feet		
County	7					DNR (County	Code	Civil To			Village	······				
Sam	ple					<u></u>		<u> </u>					Soil	Prope	rties		
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	And Ge	ock Description ologic Origin Fol h Major Unit	•		nscs	Graphic Log	Well Diagram	PID/FID	Compressive	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
GRAVEL, crs., ang., (FILL)				(FILL)	.)			000									
MW-110 (3.5)	23	7	_2 	2.5'-4' <u>CLAY</u> , browi gravel, firm-soft, m			CL										
(3.5)		-	- 4 6 6	4'-13.5' <u>SAND</u> , It ye graded, 10% silt, f.,			SP							The state of the s			
MW-110 (8.5)	18	25	8	SILTY SAND													
			10					SM									
MW-110 (13.5) 23	23	27	E 14	SAND, trc silt				SP	1//								
			E 16	E0B @ 14.5'						:							
			E - 18 														
			20														
			- 22 - 22 														
	by ce	rtify th	nat the	e information on this fo	orm is true and o	correct	to the	best	of my kr	owled	ige.					·	

This form is authorized by Chapters 144.147 and \$2. Wis. Stats. Completion of this report is mandatory. Penalties: Fortest not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

	Waste ☐ Haz. Waste ☐		MONITORING WELL CONST Form 4400-113A	RUCI Rev.	
Env. Response	k Repair Undergroun		Well Name		
	2130.9 ft. S.	1331.1 ft. E.	MW-110		
GO BULK TERMINAL	Grid Origin Location		Wis Unique Well Number DNR W.	TEXI	
I acmity Electron 1 children in the land of the land o	•			:II IYU	moer
	at1				
Type of Well Water Table Observation Well # 11	St. Plane	t. N ft. E.	Date Well Installed O8/22/9	15	
Piezometer 🔲 12	Section Location of Waste	/Source	लाल वर्व	y v	
Distance Well Is From Waste/Source Boundary	SEIM OF NE IM OF SOC	6 T. 8 N. R. 21 0 ₩.	Well Installed By: (Person's Name at	nd Firm	m)
NA ft.	3E 1/4 of 1/4 of 3ec.	W(S			
Is Well A Point of Enforcement Std. Application?	Location of Well Relative 1 Upgradient	s Sidegradient			_
■ Yes □ No		n Mot Known NA	MIDWEST ENGINE	-12-11	<u>بار</u> ح
		1. Cap and lock	? E Ye	S 🗆	No
JOT SUK VEYED	. MSL	2. Protective co		_	• •
B. Well casing, top elevation _ 736.97 ft	. MSL ————	a. Inside diam			_ in.
• •	11		ce.		_
C. Land surface elevation _ 734.5 ft	MSL	b. Length:	n:		∂ tr
127 C c 201		c. Material:	Stee		0.4
D. Surface seal, bottom_ 733.5 ft. MSL or _1			Othe	_	200
12. USCS classification of soil near screen:	- Principal	d. Additional	protection?	5	No.
	P III	If yes, desc	cribe:	_	
SM SC ML MH CL M	H 🗆 K		Bentonii	e I	30
Bedrock []		3. Surface seal:	Concret	æ 🛘	01
13. Sieve analysis attached? Yes	6 S		Othe	T 🗆	
	in 🔛	4 Material berry	veen well casing and protective pipe:	. –	
	,		Bentoni	ie 🗆	3 0
Hollow Stem Auger			Annular space sea		000000
Other Li	 ₩		· · · · · · · · · · · · · · · · · · ·		<u> </u>
	🐰			=	<u> </u>
15. Drilling fluid used: Water 02 Air 0		5. Armular space			33
Drilling Mud 🔲 03 None 🔳	60 10 11 99 40	bLbs/(gal mud weight Bentonite-sand slum	.у <u>Ц</u>	3 5
		cLbs/g	gal mud weight Bentonite slurr	y 🗆	3 i
16. Drilling additives used? Yes	6	₩ d% Be	mtonite Bentonite-cement gro	ut 🗆	50
	1 🔛	.	_Ft ³ volume added for any of the abov	e	
Describe NA		f. How insta	ilei: Treni	ic 🔲	01
17. Source of water (attach analysis):			Tremie pumpe	i □	02
NA			Gravit	у 🔳	0.3
		6. Bentonite se:	al: a. Bentonite granule	es 🗖	33
5 MSI	<u>.</u>		. □3/8 in. □1/2 in. Bentonite pelle	_	32
E. Bentonite seal, top ft. MSL or	in the miles				*****
	ft.	7. Fine sand ma	aterial: Manufacturer, product name &		<u> </u>
F. Fine sand, top ft. MSL or	ft.	//. Fine sand ma	alerrai: Manufacturer, product name &	mean	
	7 / 問		rided ft ³		<u> </u>
G. Filter pack, top	.なら m/ /型	b. Volume a			
_	~ \		naterial: Manufacturer, product name a	nd mes	sh size
H. Screen joint, top _ 731 Q ft. MSL or	·3.5 年———周	图 / 1 #30	Red Flint Sand		<u>- 86</u>
•		b. Volume a	addedft ³		
I. Well bottom 7210 ft. MSL or 1	35 ft、 渥	9. Well casing	: Flush threaded PVC schedule 4	0	23
			Flush threaded PVC schedule 8	0 🗖	24
J. Filter pack, bottom _7_20_0 ft. MSL or _1	45 ft_ \{\bar{\}}		Othe	= 0	200
1. Piller pack, solitoniceg. ta ma_ or		10. Screen mate	044		
K. Borehole, bottom _ 720 . Oft. MSL or _ 1	45 %	2. Screen ty			11
K. Borehole, bottom _ 120 . Oft. MSL or _ 1	· · · · · · ·	1. Scienty	Continuous sl		
•					
L. Borehole, diameter _ 8.2 in.	•			er 🗆	
		•	THE NORTHERN AIRE	0.0	10:-
M. O.D. well casing $2 \cdot 1$ in.		c. Slot size			10 in.
•		d. Slotted le			. Q ft.
D. well casing 19 in.		 Backfill mat 		ne I	1000000000
- 				× 0	
I nereby certify that the information on th	s form is true and c	orrect to the best of my	knowledge.		
Signature	Firm				

Signature

NATURAL RESOURCE TECHNOLOGY, INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$55000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each

MONITORING WELL DEVELOPMENT Form 4400-113B Rev. 4-90

NATURAL RESOURCE TECHNOLOGY

	olid Waste 🗌 Haz. Was			
<u> </u>	County Name		Well Name	
Facility/Project Name	Milwice	60.	mw-110	
Citas Bulk Torminal 1096 Facility License, Permit or Monitoring Number	County Code	Wis: Unique Well N		Il Number
Facility License, Permit or Monitoring Number	4	14 D. Cilique (ich.)		
	- 1 34			
1. Can this well be purged dry?	☐ Yes ■ No		Before Development	After Development
		11. Depth to Water	<u>a3.51ft</u>	
2. Well development method		(from top of	aft_	ft.
surged with bailer and bailed	□ 41	well casing)		
surged with bailer and pumped	□ 61			~ ~
surged with block and bailed	☐ 42	Date	bOX129195	$\frac{08}{m} \frac{29}{d} \frac{95}{y}$
surged with block and pumped	_ □ 62		mm ddyy	mm ddyy
surged with block, bailed and pumped	□ 70		O 2 Man.	☐ a.m.
compressed air	= 20	Time	c 2: 30 = p.m.	:
bailed only	□ 10			
, pumped only	□ 51	12. Sediment in well	inches	inches
pumped slowly	☐ 50	bottom		
Other	n 🕷	13. Water clarity	Clear □ 10	Clear 20
Otte		,	Turbic 👅 15	Turbid 2 5
3. Time spent developing well	1 0 0 min.		(Describe)	(Describe)
3. Time spent developing wen			TANT TIRKS	TAN
4. Depth of well (from top of well casisng)	_15.61ft			
Inside diameter of well	1 . 9 in.		<u></u>	
Volume of water in filter pack and well	c2 11			
casing	<u></u>			
	7.	Fill in if drilling flui	ids were used and well is a	at solid waste facility:
7. Volume of water removed from well	gal.		_	
•	٠,	14. Total suspended	mg/l	mg/l
3. Volume of water added (if any)	<u>O</u> . <u>O</u> gal.	solids		
9. Source of water added NA		15. COD	mg/l	mg/l
10. Analysis performed on water added? NA (If yes, attach results)	□ Yes □ No			
16. Additional comments on development:				
•				
•				
				true and correct to the best
Weil developed by: Person's Name and Firm		of my knowledge.	It we above information is	true and correct to the best
and a company of	-le un 21 —	Signature:	Meimad que	a Dyle
- Hame: STEPHANNE Nobal DYICE	13/E/LY 12/17/0	حد ال	`	()
	•	Print Initials:	<u>V A C</u>	•
Firm: NATURAL RESOURCE	15-17	1	_	

Firm:

SOIL BORING LOG INFORMATION State of Wisconsin Route To: ☐ Haz. Waste ☐ Solid Waste Rev. 5-92 Department of Natural Resources Form 4400-122 ☐ Emergency Response Underground Tanks ☐ Water Resources ☐ Wastewater ₩Qther: ☐ Superfund Page 1 of 1 Boring Number License/Permit/Monitoring Number y/Project Name MW-111 Citgo Bulk Terminal/Site Investigation (1096) Date Drilling Completed **Drilling Method** Date Drilling Started Boring Drilled By (Firm name and name of crew chief) 08/24/95 4-1/4" (ID) HSA 08/24/95 Midwest Engineering Services Borehole Diameter Common Well Name Final Static Water Level Surface Elevation DNR Facility Well No. WI Unique Well No. 733.48 Feet MSL 8 inches 730.30 Feet MSL MW-111 Local Grid Location (if applicable) Feet N **Boring Location** Lat 2160.2 feet ⊠ N 1563.0 feet ⊠ E State Plane Long ' Feet E $\Box s$ SE 1/4 of NE 1/4 of Section 6, T8N, R21 **DNR County Code** Civil Town/City/ or Village County City of Milwaukee Milwaukee Soil Properties Sample Compressive Strength in Feet ے ی Soil/Rock Description Blow Counts RGD/ Comments Plasticity Index Recovered Length Att. Moisture Content And Geologic Origin For Diagram and Type PID/FID Graphic Depth i Liquid Limit P 200 Each Major Unit nscs Log Ke 0 GP (FILL) O Blind drill to 14' REFERENCE SOIL BORING LOG FOR SB-106. 2 SM E0B @ 14' 20 the information on this form is true and prrect to the best of my knowledge. eby certify that Firm Natural Resource Technology This form is authorized by Chapters 44.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less

This form is authorized by Chapters 44.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Description of Manager Description	id Waste Haz. Waste	` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` `	MONITORING WELL CONSTRUCTION Form 4400-113A Rev. 4-90
Env. Response	& Repair Underground		
Project Name TGO BULK TERMINAL	Local Grid Location of Well 2160.2 ft. S	1563.0 ft. Tw	Well Name MW-III
racility License, Permit or Monitoring Number	Grid Origin Location		Wis Unique Well Number DNR Well Number
	LatLor	ng or	
Type of Weil Water Table Observation Well ■ 11	St. Plane ft. 1		Date Well Installed 08/24/95
Piezometer	Section Location of Waste/So	ource _ F	m m d d d y v Well Installed By: (Person's Name and Firm)
NA ft.	SE 1/4 of NE 1/4 of Sec. (6	_T. <u>8</u> N, R. <u>21 </u>	Well libration by. (I cison's Ivalie and Firm)
Is Well A Point of Enforcement Std. Application?	Location of Well Relative to u Dupgradient s	Waste/Source ☐ Sidegradient	
■ Yes □ No		■ Not Known NA	MIDWEST ENGINEERING
	t. MSL	1. Cap and lock?	
NOT SURVEYED B. Well casing, top elevation _ 736.00 f	t. MSL	2. Protective cov	• •
	·	a. Inside diame	~5'-"
	L MSL	b. Length:	
D. Surface seal, bottom 732.5 ft. MSL or	1Oft. (高麗)		Other []
12. USCS classification of soil near screen:		d. Additional	protection?
GP GM GC GW SW GS SW GS SM SC GML MH GCL SW GS		If yes, desc	· · · · · · · · · · · · · · · · · · ·
SM SC D MLD MHD CL Sectrock D		3. Surface seal:	Bentonite 🕱 30
13. Sieve analysis attached? Yes	, I		Concrete □ 01
14. Drilling method used: Rotary	1 1883 1883	4. Material betw	een well casing and protective pipe:
Hollow Stem Auger	41		Bentonite □ 30
Other 🗆			Armular space seal 🔲 👑
15. Drilling fluid used: Water 0 0 2 Air 0	., 🕍 🕷		Other 🗆 💮
Drilling Mud 1 03 None	99	5. Amular space	
		bLbs/g	al mud weight Bentonite-sand slurry 35 al mud weight Bentonite slurry 31
16. Drilling additives used?	50 41 01 99	d. % Ber	ntonite Bentonite-cement grout \Box 50
Describe NA		ė	Ft 3 volume added for any of the above
Describe N4 17. Source of water (attach analysis):	I	f. How instal	
			Tremie pumped 02
NA	 -	6. Bentonite sea	Gravity II 08
E. Bentonite seal, top ft. MSL or	01 99 %6	0. Bentonite sea	□3/8 in. □1/2 in. Bentonite pellets □ 32
2. Sellolate 1944 to 1 = 1 = 1.2	· — · — · · · · · · · · · · · · · · · ·	, , ,	Other 🗆 💮
F. Fine sand, top ft. MSL or	· ft.	7. Fine sand ma	terial: Manufacturer, product name & mesh size
70.55.461	30 "	<i>t</i> /	
G. Filter pack. top _ 730.5 ft. MSL or	·5:5 m/ / / / / / / / / / / / / / / / / / /	b. Volume ad	
H. Screen joint, top _730 Q ft. MSL or	35 1	1 #30	aterial: Manufacturer, product name and mesh size
I. Well bottom _ 720 0 ft. MSL or _ 1	35 ft	b. Volume ac 9. Well casing:	itledft ³ Flush threaded PVC schedule 40 2 2 3
1. Well bottom). Well cashig.	Flush threaded PVC schedule 80 \(\sigma 24\)
J. Filter pack, bottom _7195 ft. MSL or _1	40 tr		Other 🗆 💮
K. Borehole, bottom _719.5 ft. MSL or _1	40 m.	10. Screen mater a. Screen typ	
K. Solehole, Solioni —		a sciently,	Continuous slot 🔲 0 i
L. Borehole, diameter _ 8 2 in.		<u> </u>	Other 🔲 💮
		b. Manufactu	
M. O.D. well casing 211 in.		c. Slot size:	0. <u>0 / 0</u> in.
. well casing 19 in.		\	ngth: <u>/ ₫ . D</u> ft. rial (below filter pack): None ■ 1.4
. well casing 1.9 in.			Other 🗆 💮
I hereby certify that the information on thi	s form is true and corre	ect to the best of my	knowledge.

Signature

NATURAL RESOURCE TECHNOLOGY, INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than \$10,000 for each state of the control of the co

MONITORING WELL DEVELOPMENT Form 4400-113B Rev. 4-90

Route to: Solid Waste ☐ Env. Response & Repair [Haz. Was	te 🔲 Wastewater 🛭 ground Tanks 🗎 Oth	er 🖫	
-	ty Name		Well Name	
1 401116//11030011	Kilwai	و و مل	MW-11	1
Facility License, Permit or Monitoring Number Coun	ity Code	Wis Unique Well M		Number
1. Can this well be purged dry?	■ No	11. Depth to Water	Before Development	
2. Well development method surged with bailer and bailed	ft	(from top of well casing) Date Time 12. Sediment in well bottom 13. Water clarity	a	08/25/95 mm ddyy
5. Volume of water in filter pack and well casing		Fill in if drilling flui	ids were used and well is	at solid waste facility:
7. Volume of water removed from well S. Volume of water added (if any)		14. Total suspended soiids	mg/l	mg/l
9. Source of water added NA		15. COD	mg/	mg/l
10. Analysis performed on water added? NA Pes (If yes, attach results) 16. Additional comments on development:	N ₀		<u> </u>	1
Weil developed by: Person's Name and Firm	 	I hereby certify the	it the above information is	true and correct to the best
Name: STPHHINE VAN DIKE SHOW B.	<u>RITTON</u>	Signature: S	_	ion The

SOIL BORING LOG INFORMATION Route To: State of Wisconsin ☐ Solid Waste ☐ Haz. Waste Rev. 5-92 Form 4400-122 Department of Natural Resources ☐ Emergency Response ☐ Underground Tanks ☐ Water Resources ☐ Wastewater ☐ Superfund ₩ Other: Page 1 of 1 License/Permit/Monitoring Number **Boring Number** y/Project Name MW-112 Citgo Bulk Terminal/Site Investigation (1096) Date Drilling Completed **Drilling Method** Boring Drilled By (Firm name and name of crew chief) Date Drilling Started 4-1/4" (ID) HSA 08/17/95 08/17/95 Midwest Engineering Services Final Static Water Level Surface Elevation **Borehole Diameter** WI Unique Well No. Common Well Name DNR Facility Well No. 729.04 Feet MSL 733.09 Feet MSL 8 inches MW-112 Feet N Local Grid Location (if applicable) **Boring Location** Lat 1988.4 feet ⊠ N 1742.3 feet ⊠ E State Plane Feet E Long $\square s$ SE 1/4 of NE 1/4 of Section 6, T8N, R 21 Civil Town/City/ or Village DNR County Code County City of Milwaukee Milwaukee Soil Properties Sample Compressive Strength Feet ය 🗦 Soil/Rock Description Blow Counts RQD/ Comments Length Att. Recovered Moisture Content And Geologic Origin For Plasticity Diagram and Type Depth in PID/FID Graphic Liquid Limit Each Major Unit 200 uscs Mell ASPH ASPHALT W/ GRAVEL SUBGRADE (FILL) GP (FILL 2 2.5'-4.5' SILTY CLAY, pale brown (10YR 6/3), med. plast., firm, trc f. gravel, moist, no odor, **MW112** CL (FILL) ΩA 49 15 (FILL) (3.5)6 6.5'-8.5' SAND, It brownish gray (2.5Y 6/2), prly graded, 5% silt, f., subrnd, compact, wet, no odor 8 SB105 61 23 10 (8.5)10 SP 12 SB105 97 18 34 (13.5)- 14 E08 @ 14.5° 16 18 20 22 eby certify that the information on this form is true and correct to the best of my knowledge. Firm Natural Resource Technology

This form is authorized by Chapters 144.147 and 122, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Description of National Paragraphs	id Waste 🛘 Haz. Waste 🗖		MONITORING WELL CON Form 4400-113A	
Env. Response	& Repair Undergroun			Rev. 4-90
THY/Project Name THY/Project Name TERMINAL	Local Grid Location of Wo		Well Name MW-11Z	
Lacility License, Permit or Monitoring Number	Grid Origin Location		Wis, Unique Well Number DNR	Well Number
Type of Well Water Table Observation Well 11	Lat St. Plane		Date Well Installed	 195
Piezometer 12 Distance Well Is From Waste/Source Boundary	Section Location of Waste		Weil Installed By: (Person's Nam	e and Firm)
ft.	Location of Well Relative	to Waste/Source		
Is Well A Point of Enforcement Std. Application? ■ Yes □ No	u U pgradient d Downgradient	s 🔲 Sidegradient	MIDWEST ENGIN	EERING
A. Protective pipe, top elevation _ 732.62		1. Cap and lock?		Yes 🗆 No
B. Well casing, top elevation232.62	t MSL	2. Protective cor a. Inside diam	• •	in.
C. Land surface elevation _ Z32.1	t. MSL	b. Length: c. Material:	e	fr_
D. Surface seal, bottom_732.1 ft. MSL or	L.O ft.			iteel 📕 04 Ather 🗆 🚉
12. USCS classification of soil near screen: GP GM GC GW SW SM SC ML MH CL	SP ■	1 1 1 1	protection?	Yes 📕 No
Bedrock []		3. Surface seal:	Bento Conv	onite 30
13. Sieve analysis attached?	√ 0		0	ther 🗆 🚆
14. Drilling method used: Rotary Hollow Stem Auger	50	4. Material betw	een well casing and protective pipe:	onite 🛘 30
Other 🗆			Annular space	
15. Drilling fluid used: Water □ 02 Air □	01			Ather □ mite ■ 33
Drilling Mud 🔲 0 3 None 🔳	99	5. Annular space	a. Granular Benic al mud weight Beniconite-sand si	
	,	cLbs/g	al mud weight Bentonite sh	шпу 🛛 31
Describe NA			ntoniteBentonite-cement g _Ft ³ volume added for any of the ab	
Describe NH 17. Source of water (attach analysis):		£. How instal	lled: Tre Tremie pum	emie 🛮 01
NA			•	ped □ 02
E. Bentonite seal, top ft. MSL or	No 50 41 99 No 6t-	6. Bentonite sea	l: 2. Bentonite gran □3/8 in. □1/2 in. Bentonite pe	_
	"	c	•	ther 🛘 👑
F. Fine sand, top ft. MSL or	ft.	c	terial: Manufacturer, product name	: 1.3990
G. Filter pack, top	3.0 ft.	b. Volume ac		
H. Screen joint, top _729.6 ft. MSL or	35 ft.		aterial: Manufacturer, product name Red Flint Sand titled fr ³	and mesh size
I. Well bottom _719.6 ft. MSL or _1	35 ft.	9. Well casing:	Flush threaded PVC schedule	
J. Filter pack, bottom _718,6 ft. MSL or _1	45 1			:80 □ 24 ther □
K. Borehole, bottom _7186 ft. MSL or _]	4.5 ft.	10. Screen mater 1. Screen ty	pe: Factor	
L. Borehole, diameter <u>8.2</u> in.				Other 🗆 💆
M. O.D. well casing _2.1 _ in.		b. Manufactu c. Slot size: d. Slotted le	mer <u>NORTHERN AIRE</u>	0. Q <u>1 0</u> în.
D. well casing _1.9 _ in.		\	rial (below filter pack):	None # 14
I hereby certify that the information on thi	s form is true and co	rrect to the best of my		LI 22
Signature	Firm	€		
Saphanie But	e NATURAL	KESOURCE TECH	INCLOSSY, INC.	·
Please complete both sides of this form and return to and ch. NR 141, Wis. Ad. Code. In accordance with \$5000 for each day of violation. In accordance with	i ch.144, Wis Stats., failure ch. 147, Wis. Stats., failur	e to file this form may result is e to file this form may result i	n a torteiture of not less than \$10, no in a forfeiture of not more than \$10,0	or more than 000 for each
and the state of t	to Cartinamia	ماليماسيا سالت بسيعات البياب	أفالتناطل للشميء فالمعالستان بالمحادمين مساطية م	L

		iste 🔲 Wastewater 🖸 rground Tanks 👅 Ott		
Facility/Project Name	County Name		Weil Name	
CITED RULY TED MINES	Milway	Roc	MW-112	
CITCO BUIL TER MINAL. Facility License, Permit or Monitoring Number	County Code	Wis: Unique Well N	umber DNR We	il Number
1. Can this well be purged dry?	lYes II No	11. Depth to Water	Before Development	After Development
2. Well development method surged with bailer and bailed surged with block and pumped surged with block and pumped surged with block and pumped surged with block, bailed and pumped compressed air bailed only pumped only pumped slowly Other	61 1 42 1 62 1 70 1 20 1 10 1 51 1 50 1 <u>60</u> min.	(from top of well casing) Date Time 12. Sediment in well bottom 13. Water clarity	c: p.m.	08,28,95 m m d d y y
·	<u>19</u> in.		9	
7. Volume of water removed from well	_6 . 7 gal. 75 gal0.0 gal.	Fill in if drilling fluid 14. Total suspended solids	is were used and well is a	1
9. Source of water added NA	·	15. COD	mg/l	mg/l
10. Analysis performed on water added? NA (If yes, attach results)	lYes DNo			
Well developed by: Person's Name and Firm		I harajus samifis de sa	the shave in the	
		of my knowledge.	mie above miormation is b	rue and correct to the best
rum: BANGRAL RESCURCE	TECH TECH	Signature: Signature:		- She
		Firm: NATU	RAL RESOURCE	TECHNIC MY

APPENDIX F GROUNDWATER ANALYTICAL REPORTS

Received 3:10 pm (C3T)

LAFAYETTE AREA LAB

SOO AMBASSADOR CAFFERY PKWY

SCOTT, LOUISIANA

PHONE: (318) 237-4775

PHONE: (318) 237-4776

FAX TRANSMISSION

MEMO FROM: JOHN TROOST

COMPANY: SPL, INC - SCOTT, LA (LAFAYETTE AREA)

FAX #: (318) 237-7080

PHONE #: (318) 237-4775

NUMBER OF PAGES TO FOLLOW: 12

DATE: 09/06/95

COMPANY: CITGO

FAX #: 708-437-3578 44- 523- 900/

REFERENCE: LAB# 95-08-C04

CITGO MILWAUKEE TERMINAL

MILWAUKEE, WI/9235 N 107 ST.

COMMENTS: RESULTS ATTACHED FOR THIS WORK ORDER -

PAH'S THAT ARE EXPECTED 9/7....

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LAFAYETTE AREA LAB 500 AMBASSADOR CAFFERY PKWY. SCOTT, LOUISIANA ZIP 70583-8544 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508C04-01

CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC DATE: 09/06/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST. SAMPLED BY: NATURAL PROJECT TROUBLES

PROJECT NO: 1096

SAMPLED BY: NATURAL RESOURCE TECH. SAMPLE ID: MW-109

Date: 08/31/95

MATRIX: WATER
DATE SAMPLED: 08/28/95

09 DATE RECEIVED: 08/30/95

	ANALYTICAL	DATA	A			
PARAMETER			RESULTS	DET	ECTION	UNITS
MINIST M. MARKET				LIM	IT	
METHYL T-BUTYL ETHER			ND	8	P	μg/L
BENZENE			ND	ı	P	μg/L
TOLUENE			ND		P	μg/L
ETHYLBENZENE			ND	ī	P	μg/L
1,3,5 - TRIMETHYLBENZENE			ND	1	_	
1,2,4 - TRIMETHYLBENZENE			ND	1	P	μg/L
TOTAL XYLENE			ND	ī	-	μg/L
	•			_	•	μg/L
Surrogate		%	Recovery			
4-Bromofluorobenzene		•	96			
Method 8020			96			
Analyzed by: TB						

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

⁽P) - Practical Quantitation Limit

2318 237 7080

LAFAYETTE AREA LAB 500 AMBASSADOR CAFFERY PKWY. SCOTT, LOUISIANA 21P 70583-8544 PHONE: (318) 237-4775



Certificate of Analysis No. L1-9508C04-02

CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC DATE: 09/06/95

PROJECT NO: 1096

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST. SAMPLED BY: NATURAL RESOURCE TECH. SAMPLE ID: MW-111

MATRIX: WATER DATE SAMPLED: 08/28/95 DATE RECEIVED: 08/30/95

PARAMETER	ANALYTICAL	DATA RESULTS	DETECTION LIMIT	UNITS
METHYL T-BUTYL ETHER BENZENE TOLUENE ETHYLBENZENE 1,3,5 - TRIMETHYLBENZENE 1,2,4 - TRIMETHYLBENZENE TOTAL XYLENE		ND ND ND ND ND ND	8 P 1 P 1 P 1 P 1 P 1 P	μg/L μg/L μg/L μg/L μg/L
Surrogate 4-Bromofluorobenzene Method 8020 Analyzed by: TB Date: 08/31/95		% Recovery 99		

ND - Not detected.

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed. ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993



LAFAYETTE AREA LAB 500 AMBASSADOR CAFFERY PKWY SCOTT, LOUISIANA ZIP 70583-6544 PHONE: 13181 237-4775

Certificate of Analysis No. L1-9508C04-03

CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

DATE: 09/06/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST.

PROJECT NO: 1096

MATRIX: WATER

SAMPLED BY: NATURAL RESOURCE TECH.

DATE SAMPLED: 08/28/95 DATE RECEIVED: 08/30/95

SAMPLE ID: PZ-102

ANALYTICAL I	DATA		
	RESULTS	DETECTION	UNITS
CARBONS (GRO) 5 11:04:00	ND	LIMIT 0.1	mg/L
CARBONS (DRO) 5 02:23:00	0.2	0.1	mg/L
5 08:35:00	ND	0.001	mg/L
	CARBONS (GRO) 5 11:04:00 CARBONS (DRO)	CARBONS (GRO) ND 5 11:04:00 CARBONS (DRO) 0.2 5 02:23:00 ND	RESULTS DETECTION LIMIT O.1 5 11:04:00 CARBONS (DRO) 0.2 0.1 5 02:23:00 ND 0.001

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed. ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #99993060 # LUST Analytical Guidance, Wisconsin DNR, 1993



LAFAYETTE AREA LAB 500 AMBASSADOR CAFFERY PKWY. SCOTT, LOUISIANA ZIP 70583-8544 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508C04-03

CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 09/06/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST. SAMPLED BY: NATURAL RESOURCE TECH. SAMPLE ID: PZ-102

PROJECT NO: 1096

MATRIX: WATER

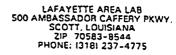
DATE SAMPLED: 08/28/95

DATE RECEIVED: 08/30/95

ANALYTICAL DATA					
PARAMETER	RESULTS	PQL*	UNITS		
Dichlorodifluoromethane	ND	2.9	μg/L		
Chloromethane	ND	0.8	μg/L		
Vinyl chloride	ND	1.8	μg/L		
Chloroethane	ND	5.2	μg/L		
Trichlorofluoromethane	ND	1.0	μg/L		
l,l-Dichloroethene	ND	1.3	μg/L		
Methylene Chloride	ND	0.8	μg/L		
trans-1,2-Dichloroethene	ND	1.0	μg/L		
1,1-Dichloroethane	ND	0.7	$\mu g/L$		
2,2-Dichloropropane	ND	0.5	μg/L		
cis-1,2-Dichloroethene	ND	0.1	μg/L		
Chloroform	ND	0.5	μg/L		
1,1,1-Trichloroethane	ND	0.3	μg/L		
Carbon Tetrachloride	ND	1.2	μg/L		
Benzene	ND	2.0	μg/L		
1,2-Dichloroethane	ND	0.3	μg/L		
Trichloroethene	ND	1.2	μg/L		
1,2-Dichloropropane	ND	0.4	μg/L		
Bromodichloromethane	ND	1.0	μg/L		
Toluene	ND	2.0	μg/L		
1,1,2-Trichloroethane	MD	0.2	μg/L		
Tetrachloroethene	ND	0.3	μg/L		
1,3-Dichloropropane	ND	0.3	μg/L		
Dibromochloromethane	ND	0.9	μg/L		
1,2-Dibromoethane	ND	0.8	μg/L		
Chlorobenzene	ND	2.5	μg/L		
Ethyl benzene	ND	2.0	μg/L		
M and P Xylene	ND	2.0	μg/L		
O-Xylene	ND	2.0	μg/L		
Isopropylbenzene	ND	2.0	μg/L		
1,1,2,2-Tetrachloroethane	ND	0.3	μg/L		
n-Propyl benzene	ND	0.1	μg/L		
Bromobenzene	ND	0.3	μg/L		
1,3,5-Trimethylbenzene	ND	0.2	μg/L		
2-Chlorotoluene	ND	0.1	μg/L		
4-Chlorotoluene	ND	0.2	μg/L		
tert-Butylbenzene	ND	0.6	μg/L		
1,2,4-Trimethylbenzene	ND	0.5	μg/L		

METHOD: Mod. 8021 (VOC) [SW 846] (continued on next page)







CITGO PETROLEUM CORPORATION

SAMPLE ID: PZ-102

104

	ANALYTICAL D	ATA (con	tinued)	
PARAMETER	REST	JLTS	PQL*	UNITS
sec-Butylbenzene		ND	0.2	μg/L
p-Isopropyltoluene		ND	0.1	μg/L
1,3-Dichlorobenzene		ND	3.2	μg/L
1,4-Dichlorobenzene		ND	2.4	μg/L
n-Butylbenzene		ND	0.2	μg/L
1,2-Dichlorobenzene		ND	1.5	μg/L
1,2-Dibromo-3-chloroprop	pane	ND	30	μg/L
1,2,4-Trichlorobenzene		ND	0.3	μ g/L
Hexachlorobutadiene		ND	0.2	μg/L
Naphthalene		ND	0.6	μg/L
1,2,3-Trichlorobenzene		ND	0.2	μg/L
Di-isopropyl ether		ND	1.0	μg/L
Methyl-t-butyl ether		ND	8.0	μg/L
SURROGATES		% RECO	VERY	

ANALYZED BY: PW DATE/TIME: 08/30/95 15:14:00

METHOD: Mod. 8021 (VOC) [SW 846]

Fluorobenzene

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993



LAFAYETTE AREA LAB 500 AMBASSADOR CAFFERY PKWY SCOTT, LOUISIANA ZIP 70583-8544 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508C04-04

CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC DATE: 09/06/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST.

PROJECT NO: 1096

SAMPLED BY: NATURAL RESOURCE TECH. SAMPLE ID: MW-112

MATRIX: WATER DATE SAMPLED: 08/28/95 DATE RECEIVED: 08/30/95

ANALYTICAL DATA PARAMETER RESULTS DETECTION UNITS LIMIT TOTAL PETROLEUM HYDROCARBONS (GRO) ND 0.1 mg/L WI LUST GRO # Analyzed by: TB Date: 08/30/95 11:04:00 TOTAL PETROLEUM HYDROCARBONS (DRO) ND0.1 mg/L WI LUST DRO # Analyzed by: AH Date: 09/02/95 03:10:00 Lead, Total ND 0.001 mg/L Method 239.2 * Analyzed by: EH Date: 09/05/95 08:35:00

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed. ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

> Troost Laboratory Manager



SAMPLE ID: MW-112

LAFAYETTE AREA LAB 500 AMBASSADOR CAFFERY PKWY, SCOTT, LOUISIANA ZIP 70583-8544 PHONE: I318) 237-4775

Certificate of Analysis No. L1-9508C04-04

CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 09/06/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST. SAMPLED BY: NATURAL RESOURCE TECH.

PROJECT NO: 1096

MATRIX: WATER

DATE SAMPLED: 08/28/95

DATE RECEIVED: 08/30/95

ANALYTICAL DATA PARAMETER RESULTS POL* UNITS Dichlorodifluoromethane ND 2.9 μg/L Chloromethane ND 0.8 μg/L Vinyl chloride ND 1.8 μg/L Chloroethane ND 5.2 μq/L Trichlorofluoromethane · ND 1.0 $\mu q/L$ 1,1-Dichloroethene ND 1.3 μg/L Methylene Chloride ND 0.8 μg/L trans-1,2-Dichloroethene ND 1.0 μg/L 1,1-Dichloroethane ND 0.7 μg/L 2,2-Dichloropropane ND 0.5 μg/L cis-1,2-Dichloroethene ND 0.1 μg/L Chloroform ND 0.5 μg/L 1,1,1-Trichloroethane ND 0.3 μg/L Carbon Tetrachloride ND 1.2 μg/L Benzene ND 2.0 μg/L 1,2-Dichloroethane ND 0.3 μg/L Trichloroethene ND 1.2 μg/L 1,2-Dichloropropane ND 0.4 μg/L Bromodichloromethane ND 1.0 μg/L Toluene ND 2.0 μg/L 1,1,2-Trichloroethane ND 0.2 μg/L Tetrachloroethene ND 0.3 μg/L 1,3-Dichloropropane ND 0.3 μg/L Dibromochloromethane ND 0.9 μg/L 1,2-Dibromoethane ND 0.8 μg/L Chlorobenzene ND 2.5 μg/L Ethyl benzene ND 2.0 μg/L M and P Xylene ND 2.0 μg/L O-Xylene ND 2.0 μg/L Isopropylbenzene ND 2.0 μg/L 1,1,2,2-Tetrachloroethane ND 0.3 μg/L n-Propyl benzene ND 0.1 μg/L Bromobenzene ND 0.3 μg/L 1,3,5-Trimethylbenzene ND 0.2 μg/L 2-Chlorotoluene ND 0.1 μg/L 4-Chlorotoluene ND 0.2 μg/L tert-Butylbenzene ND 0.6 μg/L 1,2,4-Trimethylbenzene ND 0.5 μg/L

METHOD: Mod. 8021 (VOC) [SW 846] (continued on next page)





CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-112

ANAI	LYTICAL DATA (cor	tinued)	
PARAMETER	RESULTS	PQL*	UNITS
sec-Butylbenzene	ND	0.2	μg/L
p-Isopropyltoluene	ND	0.1	μg/L
1,3-Dichlorobenzene	ND	3.2	μg/L
1,4-Dichlorobenzene	ND	2.4	μg/L
n-Butylbenzene	ND	0.2	μg/L
1,2-Dichlorobenzene	ND	1.5	μg/L
1,2-Dibromo-3-chloropropane	ND	30	μg/L
1,2,4-Trichlorobenzene	ND	0.3	μg/L
Hexachlorobutadiene	ND	0.2	μg/L
Naphthalene	ND	0.6	μg/L
1,2,3-Trichlorobenzene	ND	0.2	μg/L
Di-isopropyl ether	ND	1.0	μg/L
Methyl-t-butyl ether	ND	8.0	μg/L
SURROGATES	% RECC	VERY	
Fluorobenzene	104	:	

ANALYZED BY: PW DATE/TIME: 08/30/95 15:14:00

METHOD: Mod. 8021 (VOC) [SW 846]

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

LAFAYETTE AREA LAB 500 AMBASSADOR CAFFERY PKWY. SCOTT, LOUISIANA PHONE: (318) 237-4775



. 09/06/95

Certificate of Analysis No. L1-9508C04-05

SOUTHERN PET LAB

CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

DATE: 09/06/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST. SAMPLED BY: NATURAL RESOURCE TECH. PROJECT NO: 1096 MATRIX: WATER

DATE SAMPLED: 08/29/95 DATE RECEIVED: 08/30/95

SAMPLE ID: MW-106

ANALYTICAL DATA RESULTS DETECTION PARAMETER UNITS LIMIT ND 8 P μg/L METHYL T-BUTYL ETHER 1 P BENZENE NDμg/L TOLUENE ND 1 P μg/L 1 P ND ETHYLBENZENE μg/L ND 1 P 1,3,5 - TRIMETHYLBENZENE μg/L 1,2,4 - TRIMETHYLBENZENE ND 1 P μg/L TOTAL XYLENE ND 1 P μg/L

% Recovery Surrogate 4-Bromofluorobenzene

Method 8020 Analyzed by: TB

Date: 08/31/95

ND - Not detected.

(P) - Practical Quantitation Limit

96

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993





CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.#

#2642, TYPE WC

DATE: 09/06/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

Date: 08/31/95

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: MW-107

PROJECT NO: 1096

MATRIX: WATER

DATE SAMPLED: 08/29/95

DATE RECEIVED: 08/30/95

ANALYTICAL	DATA		
	RESULTS	DETECTION	UNITS
		LIMIT	
	ND	8 P	μg/I
	ND	1 P	μg/I
	ND	1 P	μg/I
	ND	1 P	μg/I
	ND	1 P	μg/1
	ND	1 P	μg/I
	ND	1 P	μg/1
	% Recovery		
	95		
	ANALYTICAL	ND ND ND ND ND ND	RESULTS DETECTION LIMIT ND 8 P ND 1 P ND 1 P ND 1 P ND 1 P ND 1 P ND 1 P ND 1 P ND 1 P ND 1 P ND 1 P

ND - Not detected.

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

P.O.#



. 09/06/95

LAFAYETTE AREA LAB 500 AMBASSADOR CAFFERY PKWY SCOTT, LOUISIANA ZIP 70583-8544 PHONE: 13181 237-4775

Certificate of Analysis No. L1-9508C04-07

SOUTHERN PET LAB

CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

#2642, TYPE WC DATE: 09/06/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: MW-108

PROJECT NO: 1096

MATRIX: WATER DATE SAMPLED: 08/29/95

DATE RECEIVED: 08/30/95

	ANALYTICAL	DATA		
PARAMETER		RESULTS	DETECTION LIMIT	UNITS
METHYL T-BUTYL ETHER		ND	8 P	μg/L
BENZENE		ND	1 P	μg/L
TOLUENE		ND	1 P	μg/L
ETHYLBENZENE		ND	1 P	μg/L
1,3,5 - TRIMETHYLBENZENE		ND	1 P	μg/L
1,2,4 - TRIMETHYLBENZENE		ND	1 P	μg/L
TOTAL XYLENE		ND	1 P	μg/L
Surrogate		% Recovery		
4-Bromofluorobenzene		96		

4-Bromofluorobenzene Method 8020

Analyzed by: TB

Date: 08/31/95

ND - Not detected.

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

OUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993





CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC DATE: 09/06/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST. SAMPLED BY: NATURAL RESOURCE TECH. SAMPLE ID: MW-110

PROJECT NO: 1096

MATRIX: WATER

DATE SAMPLED: 08/29/95

DATE RECEIVED: 08/30/95

	ANALYTICAL	DATA			
PARAMETER		RESULTS	DET	ECTION	UNITS
			LIM	IT	
METHYL T-BUTYL ETHER		ND	8	P	μg/L
BENZENE		ND	1	P	μg/L
TOLUENE		ND	1		μg/L
ETHYLBENZENE		ND	ı		μg/L
1,3,5 - TRIMETHYLBENZENE		ND	ī	P	μg/L
1,2,4 - TRIMETHYLBENZENE		ND	1	P	μg/L
TOTAL XYLENE		ND	1	-	μg/L
Surrogate		% Recovery			

4-Bromofluorobenzene Method 8020

obenzene 100

Analyzed by: TB
Date: 08/31/95

ND - Not detected.

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993



LAFAYETTE AREA LAB 500 AMBASSADOR CAFFERY PKWY SCOTT, LOUISIANA ZIP 70583-8544 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508C04-11

CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

DATE: 09/06/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST.

PROJECT NO: 1096 MATRIX: WATER

DATE SAMPLED: 08/29/95 DATE RECEIVED: 08/30/95

SAMPLED BY: NATURAL RESOURCE TECH. SAMPLE ID: MW-DD

ANALYTICAL DATA PARAMETER RESULTS DETECTION UNITS METHYL T-BUTYL ETHER LIMIT ND BENZENE 8 P μ g/L ND 1 P TOLUENE $\mu g/L$ ND ETHYLBENZENE 1 P μg/L 1,3,5 - TRIMETHYLBENZENE ND l P μg/L ND 1,2,4 - TRIMETHYLBENZENE 1 P μg/L TOTAL XYLENE ND 1 P μg/L ND 1 P μg/L Surrogate % Recovery 4-Bromofluorobenzene

96

Method 8020 Analyzed by: TB

Date: 08/31/95

ND - Not detected.

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed. ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. was performed in accordance with EPA guidelines. SPL Cert. #999993060 This analysis LUST Analytical Guidance, Wisconsin DNR, 1993

FAX TRANSMISSION

MEMO FROM: JOHN TROOST

COMPANY: SPL, INC - SCOTT, LA (LAFAYETTE AREA)

FAX #: (318) 237-7080

PHONE #: (318) 237-4775

NUMBER OF PAGES TO FOLLOW:

DATE: 09/07/95

MEMO TO: TIM MUELLER

COMPANY: NATIONAL RESOURCE TECHNOLOGY

FAX #: 414-523-9001

REFERENCE: LAB# 95-08-C04

CITGO MILWAUKEE TERMINAL

1096

MILWAUKEE, WI/9235 N 107 ST.

COMMENTS: REMAINING PAH'S TO COMPLETE THIS WORK ORDER.

OUR APOLOGIES FOR DELAY...

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CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: MW-109

PROJECT NO: 1096 MATRIX: WATER DATE SAMPLED: 08/28/95 DATE RECEIVED: 08/30/95

737	ANALYTICAL DATA		
PARAMETER	RESULTS	MDL*	TDT-m-
Naphthalene	ND	0.100	UNITS
Acenaphthylene	ND	0.020	μg/L
Acenaphthene	ND		μg/L
Fluorene		0.020	μg/L
Phenanthrene	ND	0.020	μg/L
Anthracene	ND	0.020	μg/L
Fluoranthene	, ND	0.010	μg/L
Pyrene	ND	0.010	μg/L
Chrysene	ND	0.010	μg/L
Benzo (a) anthracene	ND	0.007	μg/L
	ND	0.002	μg/L
	ND	0.003	μg/L
Benzo (k) fluoranthene	ND	0.002	μg/L
Benzo (a) pyrene	ND	0.008	μg/L
Dibenzo (a,h) anthracene	ND	0.006	μg/L
Benzo (g,h,i) perylene	רוזא	0.010	μg/L
Indeno (1,2,3-cd) pyrene	ND	0.006	
1-Methylnaphthalene	ND	0.100	μg/L /T
2-Methylnaphthalene	ND	0.100	μg/L
-	ND	0.100	μg/L
SURROGATES	9- TO	ECOVERY	
9,10-Diphenylanthracene	5 K		
		76	

ANALYZED BY: SJ DATE/TIME: 09/06/95 21:23:00 EXTRACTED BY: SN DATE/TIME: 09/01/95 15:00:00 METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

NOTES:

* - Method Detection Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST. SAMPLED BY: NATURAL RESOURCE TECH. SAMPLE ID: MW-111

PROJECT NO: 1096 MATRIX: WATER DATE SAMPLED: 08/28/95 DATE RECEIVED: 08/30/95

PARAMETER	ANALYTICAL DATA RESULTS	MOT +	
Naphthalene		MDL*	UNITS
Acenaphthylene	ND	0.100	μg/L
Acenaphthene	ND	0.020	μg/L
Fluorene	ND	0.020	μg/L
	ИD	0.020	μg/L
Phenanthrene	ND	0.020	μg/L
Anthracene	ND	0.010	μg/L
Fluoranthene	ND	0.010	μg/L
Pyrene	ND	0.010	μg/L
Chrysene	ND	0.007	μg/L
Benzo (a) anthracene	ND	0.002	μg/L
Benzo (b) fluoranthene	ND	0.003	
Benzo (k) fluoranthene	ND	0.002	μg/L
Benzo (a) pyrene	ND		μg/L
Dibenzo (a,h) anthracene		0.008	μg/L
Benzo (g,h,i) perylene		0.006	μ g/L
Indeno (1,2,3-cd) pyrene	ND	0.010	μg/L
1-Methrinanhtheles		0.006	μg/L
1-Methylnaphthalene	ND	0.100	μg/L
2-Methylnaphthalene	ND	0.100	μg/L
SURROGATES	नव ४	COVERY	
9,10-Diphenylanthracene		53	

ANALYZED BY: SJ DATE/TIME: 09/01/95 13:30:05 EXTRACTED BY: SN DATE/TIME: 08/31/95 17:00:00 METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

NOTES: * - Method Detection Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST. SAMPLED BY: NATURAL RESOURCE TECH. SAMPLE ID: PZ-102

PROJECT NO: 1096 MATRIX: WATER DATE SAMPLED: 08/28/95 DATE RECEIVED: 08/30/95

PARAMETER	ANALYTICAL DATA		
Naphthalene	RESULTS	MDL.*	UNITS
	ND	0.100	μg/L
Acenaphthylene	ND	0.020	μg/L
Acenaphthene	ND	0.020	μg/L
Fluorene	ND	0.020	μg/L
Phenanthrene	ND	0.020	μg/L
Anthracene	ND	0.010	μg/L
Fluoranthene	ND	0.010	μg/L
Pyrene	ND	0.010	μg/L μg/L
Chrysene	ND	0.007	
Benzo (a) anthracene	ND	0.002	μg/L
Benzo (b) fluoranthene	ND		μg/L
Benzo (k) fluoranthene	ND	0.003	μg/L
Benzo (a) pyrene		0.002	μg/L
Dibenzo (a,h) anthracene	ND	0.008	μg/L
Penzo (a h i) marriagene		0.006	μg/L
Benzo (g,h,i) perylene	ND	0.010	μg/L
Indeno (1,2,3-cd) pyrene	ND	0.006	μg/L
l-Methylnaphthalene	ND	0.100	μg/L
2-Methylnaphthalene	ND	0.100	μg/L
SURROGATES	% RE	COVERY	
9,10-Diphenylanthracene		92	

ANALYZED BY: SJ DATE/TIME: 09/06/95 21:23:00 EXTRACTED BY: SN DATE/TIME: 09/01/95 15:00:00 METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

* - Method Detection Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST. SAMPLED BY: NATURAL RESOURCE TECH. SAMPLE ID: MW-112

PROJECT NO: 1096
MATRIX: WATER
DATE SAMPLED: 08/28/95
DATE RECEIVED: 08/30/95

	ANALYTICAL DATA		
PARAMETER	RESULTS	$\mathtt{MDL}\star$	UNITS
Naphthalene	ND	0.100	μg/L
Acenaphthylene	ND	0.020	μg/L
Acenaphthene	ND	0.020	μg/L
Fluorene	ND	0.020	
Phenanthrene	ND	0.020	μg/L
Anthracene	ND	0.010	μg/L
Fluoranthene	ND	0.010	μg/L
Pyrene	ND		μg/L
Chrysene	ND	0.010	μg/L
Benzo (a) anthracene		0.007	μg/L
Benzo (b) fluoranthene	ND	0.002	μg/L
Benzo (k) fluoranthene	ND	0.003	μα/Γ
Benzo (a) pyrene	ND	0.002	μg/L
Dibenzo (a,h) anthracene	ND	0.008	μg/L
Benzo (g,h,i) perylene		0.006	μg/L
Indone (1.2.2 and)	ND	0.010	μg/L
Indeno (1,2,3-cd) pyrene		0.006	μg/L
1-Methylnaphthalene	ND	0.100	μg/L
2-Methylnaphthalene	ND	0.100	μg/L
SURROGATES	9. DT	COVERY	
9,10-Diphenylanthracene	2A &	85	

ANALYZED BY: SJ EXTRACTED BY: SN

DATE/TIME: 09/06/95 21:23:00 DATE/TIME: 09/01/95 15:00:00

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

NOTES: * - Method Detection Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST. SAMPLED BY: NATURAL RESOURCE TECH. SAMPLE ID: MW-106

PROJECT NO: 1096 MATRIX: WATER DATE SAMPLED: 08/29/95 DATE RECEIVED: 08/30/95

ANALYTICAL DATA		
PARAMETER RESULTS	MDL*	UNITS
Naphthalene ND 0	.100 μg/L	01(11)
Acananhebulana	.020 μg/L	
	- rai -	
שווים יים	r3/ 	
* Dhonouthus-	r-51 -	
Ant because	.020 μg/L	
Fluorenthana	$\mu g/L$	
Dyrana	.010 μ g/L	
Chrysone	.010 μ g/L	
Ponzo (a) anthony	.007 μg/L	
Benzo (a) anthracene ND 0	$\mu g/L$	
Benzo (b) fluoranthene ND 0	.003 μg/L	
Benzo (k) fluoranthene ND 0	.002 µg/L	
Benzo (a) pyrene ND 0	.008 μg/L	
Dibenzo (a,h) anthracene ND 0	.006 µg/L	
Benzo (g,h,i) perylene ND 0	010 μg/L	
Indone /1 2 2 -4)	F-3/ —	
1-Methyrl nanhthalana	F-31 -	
2-Methylmanhthalana		
1 ND U.	μ g/L	
SURROGATES % RECOVE	1	
0 10 Dinhamalanthan	KI	
71 - Jiphenylanthracene		

ANALYZED BY: SJ DATE/TIME: 09/06/95 21:23:00 EXTRACTED BY: SN DATE/TIME: 09/01/95 15:00:00 METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

* - Method Detection Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST. SAMPLED BY: NATURAL RESOURCE TECH. SAMPLE ID: MW-107

PROJECT NO: 1096

MATRIX: WATER

DATE SAMPLED: 08/29/95

DATE RECEIVED: 08/30/95

	ANALYTICAL DATA		
PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	ND	0.100	μg/L
Acenaphthylene	ND	0.020	μg/L
Acenaphthene	ND	0.020	μg/L
Fluorene	ND	0.020	μg/L
Phenanthrene	ND	0.020	μg/L
Anthracene	ND	0.010	μg/L
Fluoranthene	ND		μg/L
Pyrene	ND	0.010	μg/L
Chrysene	ND	0.007	μg/L
Benzo (a) anthracene	ND	0.002	μ g/ L
Benzo (b) fluoranthene	ND	0.003	μg/L
Benzo (k) fluoranthene	ND	0.002	μg/L
Benzo (a) pyrene	ND	0.008	μg/L
Dibenzo (a,h) anthracene	ND	0.006	μg/L
Benzo (g,h,i) perylene	ND	0.010	μg/L
Indeno (1,2,3-cd) pyrene	ND	0.006	μg/L
<pre>1-Methylnaphthalene</pre>	ND	0.100	μg/L
2-Methylnaphthalene	ND	0.100	μg/L
SURROGATES	% R	ECOVERY	
Biphenyl		0	
Decafluorobiphenyl		Ō	
Coronene		Ō	
9,10-Diphenylanthracene		58	

ANALYZED BY: SJ DATE/TIME: 09/06/95 21:23:00 EXTRACTED BY: SN DATE/TIME: 09/01/95 15:00:00

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

NOTES: * - Method Detection Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST. SAMPLED BY: NATURAL RESOURCE TECH. SAMPLE ID: MW-108

PROJECT NO: 1096
MATRIX: WATER
DATE SAMPLED: 08/29/95
DATE RECEIVED: 08/30/95

	ANALYTICAL DATA		
PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	ND	0.100	μg/L
Acenaphthylene	ND	0.020	μg/L
Acenaphthene	ND	0.020	μg/L
Fluorene	ND	0.020	μg/L
Phenanthrene	ИD	0.020	μg/L
Anthracene	ND	0.010	μg/L
Fluoranthene	ND	0.010	μg/L μg/L
Pyrene	ND	0.010	μg/L μg/L
Chrysene	ND	0.007	μg/L
Benzo (a) anthracene	ND	0.002	μg/L
Benzo (b) fluoranthene	ND	0.002	μg/L
Benzo (k) fluoranthene	ND	0.002	μg/L μg/L
Benzo (a) pyrene	ND	0.002	
Dibenzo (a,h) anthracene		0.006	μg/L
Benzo (g,h,i) perylene	ND		μg/L
Indeno (1,2,3-cd) pyrene		0.010	μg/L
1-Methylnaphthalene		0.006	μg/L
2-Methylnaphthalene	ND	0.100	μg/L
5comy maphiculatene	ND	0.100	μg/L
SURROGATES	% R	ECOVERY	
9,10-Diphenylanthracene		36,	

ANALYZED BY: SJ DATE/TIME: 09/01/95 13:30:05 EXTRACTED BY: SN DATE/TIME: 08/31/95 17:00:00

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

NOTES: * - Method Detection Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

SAMPLE ID: MW-110

PROJECT NO: 1096

MATRIX: WATER

DATE SAMPLED: 08/29/95

DATE RECEIVED: 08/30/95

	ANALYTICAL DATA		
PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	ND	0.100	μg/L
Acenaphthylene	ND	0.020	μg/L
Acenaphthene	ND	0.020	μg/L
Fluorene	ND	0.020	μg/L
Phenanthrene	1	0.020	μg/L
Anthracene	0.08	0.010	μg/L
Fluoranthene	ND	0.010	μg/L
Pyrene	ND	0.010	μg/L
Chrysene	0.03	0.007	μg/L
Benzo (a) anthracene	0.03		μg/L
Benzo (b) fluoranthene	ND	0.003	μg/L
Benzo (k) fluoranthene	ND	0.002	μg/L
Benzo (a) pyrene	ND	0.008	μg/L
Dibenzo (a,h) anthracene		0.006	μg/L
Benzo (g,h,i) perylene	ND	0.010	μg/L
Indeno (1,2,3-cd) pyrene		0.006	μg/L
1-Methylnaphthalene	ND	0.100	μg/L
2-Methylnaphthalene	ND	0.100	μg/L
	<u>.</u>		<u> </u>
SURROGATES	% RE	COVERY	
9,10-Diphenylanthracene		42	

ANALYZED BY: SJ DATE/TIME: 09/01/95 13:30:05 EXTRACTED BY: SN DATE/TIME: 08/31/95 17:00:00 METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

NOTES: * - Method Detection Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CITGO PETROLEUM CORPORATION

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECH.

2316 TERMINAL DRIVE

SAMPLE ID: MW-DD

VU/ VI/ VU

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 09/07/95

PROJECT NO: 1096

MATRIX: WATER
DATE SAMPLED: 08/29/95

DATE RECEIVED: 08/30/95

ANAL	YTICAL DATA		
PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	ND	0.100	μg/L
Acenaphthylene	ND	0.020	μg/L
Acenaphthene	ND	0.020	μg/L
Fluorene	ND	0.020	μg/L
Phenanthrene	ND	0.020	μg/L
Anthracene	ND	0.010	μg/L
Fluoranthene	ND	0.010	$\mu g/L$
Pyrene	ND	0.010	μg/L
Chrysene	ND	0.007	μ g/L
Benzo (a) anthracene	ND	0.002	μg/L
Benzo (b) fluoranthene	ND	0.003	μg/L
Benzo (k) fluoranthene	ND	0.002	μg/L
Benzo (a) pyrene	ND	0.008	μg/L
Dibenzo (a,h) anthracene	ND	0.006	μ g/L
Benzo (g,h,i) perylene	ND	0.010	μg/L
Indeno (1,2,3-cd) pyrene	ND	0.006	μg/L
l-Methylnaphthalene	ND	0.100	μ g/L
2-Methylnaphthalene	ND	0.100	μg/L
SURROGATES	% RE	COVERY	
9,10-Diphenylanthracene		39	

ANALYZED BY: SJ DATE/TIME: 09/01/95 13:30:05 EXTRACTED BY: SN DATE/TIME: 08/31/95 17:00:00

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

NOTES: * - Method Detection Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993





****SUMMARY REPORT****

09/07/95

Company: Site:

CITGO PETROLEUM CORPORATION MILWAUKEE, WI/9235 N 107 ST.

Project No:

1096

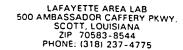
Project:

CITGO MILWAUKEE TERMINAL

ANALYTICAL DATA
NOTE: ND - Not Detected

SPL ID MATRIX	CLIENT ID DATE SAMPLED	BENZENE	TOLUENE	ETHYLBENZ.	XYLENE	TPH-IR	TPH-GC MDL	LEAD MDL	MTBE
9508A65-07 WATER	PZ-101 08/25/95						0.5 0.1mg/L	ND 0.001mg/L	
9508A65-08 WATER	MW-101 08/25/95						0.5 0.1mg/L	ND 0.001mg/L	
9508A65-09 WATER	MW-104 08/25/95						0.6 0.1mg/L	ND 0.001mg/L	
9508A65-10	MW-102 08/25/95						0.4 0.1mg/L	ND 0.001mg/L	
JJUM65-11 WATER	MW-103 08/25/95						0.6 0.1mg/L	ND 0.001mg/L	
9508A65-12 WATER	MW-105 08/25/95				***************************************		0.4 0.1mg/L	ND 0.001mg/L	
9508A65-13 WATER	MW-ZZ 08/25/95						0.6 0.1mg/L	ND 0.001mg/L	

TPH-GC - WI LUST DRO # LEAD - Method 239.2 *





CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.#

#2642, TYPE WC

DATE: 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: PZ-101

PROJECT NO: 1096

MATRIX: WATER

DATE SAMPLED: 08/25/95

DATE RECEIVED: 08/26/95

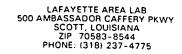
ANALYTICAL D	ATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/31/95 08:14:01	0.2	0.1	mg/L
TOTAL PETROLEUM HYDROCARBONS (DRO) WI LUST DRO # Analyzed by: AH Date: 08/31/95 02:25:00	0.5	0.1	mg/L
Lead, Total Method 239.2 * Analyzed by: CB Date: 08/30/95 15:15:00	ND	0.001	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993





CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: PZ-101

PROJECT NO: 1096

MATRIX: WATER

DATE SAMPLED: 08/25/95 DATE RECEIVED: 08/26/95

ANALYTICAL DATA								
PARAMETER	RESULTS	PQL*	UNITS					
Dichlorodifluoromethane	ND	2.9	μg/L					
Chloromethane	ND	0.8	μg/L					
Vinyl chloride	ND	1.8	μg/L					
Chloroethane	ND	5.2	μg/L					
Trichlorofluoromethane	ND	1.0	μg/L					
1,1-Dichloroethene	ND	1.3	μg/L					
Methylene Chloride	ND	0.8	μg/L					
trans-1,2-Dichloroethene	ND	1.0	μ g/L					
1,1-Dichloroethane	46	1.0	μ g/L					
2,2-Dichloropropane	ND	0.5	μ g/L					
cis-1,2-Dichloroethene	ND	0.1	μg/L					
Chloroform	ND	0.5	μg/L					
1,1,1-Trichloroethane	15	0.3	μg/L					
Carbon Tetrachloride	ND	1.2	μg/L					
Benzene	55	2.0	μ g/L					
1,2-Dichloroethane	ND	0.3	μ g/L					
Trichloroethene	ND	1.2	μg/L					
1,2-Dichloropropane	ND	0.4	μg/L					
Bromodichloromethane	ИD	1.0	μ g/L					
Toluene	ND	2.0	μg/L					
1,1,2-Trichloroethane	ND	0.2	μ g/L					
Tetrachloroethene	ND	0.3	μ g/L					
1,3-Dichloropropane	ND	0.3	μ g/L					
Dibromochloromethane	ND	0.9	μg/L					
1,2-Dibromoethane	ND	0.8	μ g/L					
Chlorobenzene	ND	2.5	μg/L					
Ethyl benzene	ND	2.0	μ g/L					
M and P Xylene	ND	2.0	μg/L					
O-Xylene	ND	2.0	μg/L					
Isopropylbenzene	ND	2.0	μg/L					
1,1,2,2-Tetrachloroethane	ND	0.3	μg/L					
n-Propyl benzene	ND	0.1	μg/L					
Bromobenzene	ND	0.3	μg/L					
1,3,5-Trimethylbenzene	ND	0.2	μg/L					
2-Chlorotoluene	ND	0.1	μg/L					
4-Chlorotoluene	ND	0.2	μg/L					
tert-Butylbenzene	ND	0.6	μg/L					
1,2,4-Trimethylbenzene	ND	0.5	μg/L					
1,2,4-II IMethy IDenzene	1.5		r- 51 —					

METHOD: Mod. 8021 (VOC) [SW 846] (continued on next page)



CITGO PETROLEUM CORPORATION

SAMPLE ID: PZ-101

ANALYTICAL DATA (continued)				
PARAMETER	RESULTS	PQL*	UNITS	
sec-Butylbenzene	ND	0.2	$\mu exttt{g/L}$	
p-Isopropyltoluene	ND	0.1	$\mu t g/L$	
1,3-Dichlorobenzene	ND	3.2	μ g/L	
1,4-Dichlorobenzene	ND	2.4	$\mu exttt{g/L}$	
n-Butylbenzene	ND	0.2	$\mu exttt{g/L}$	
1,2-Dichlorobenzene	ND	1.5	μg/L	
1,2-Dibromo-3-chloropropane	ND	30	μg/L	
1,2,4-Trichlorobenzene	ND	0.3	μg/L	
Hexachlorobutadiene	ND	0.2	$\mu extsf{g/L}$	
Naphthalene	ND	0.6	μ g/L	
1,2,3-Trichlorobenzene	ND	0.2	μ g/L	
Di-isopropyl ether	430	1.0	μ g/L	
Methyl-t-butyl ether	ND	8.0	μg/L	
SURROGATES	% RECO	OVERY		
Fluorobenzene	106	5		

ANALYZED BY: PW DATE/TIME: 08/30/95 15:14:00

METHOD: Mod. 8021 (VOC) [SW 846]

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993



CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: PZ-101

PROJECT NO: 1096

MATRIX: WATER

DATE SAMPLED: 08/25/95 DATE RECEIVED: 08/26/95

	ANALYTICAL DATA		
PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	ND	0.100	μ g/L
Acenaphthylene	ND	0.020	μ g/L
Acenaphthene	ND	0.020	μ g/L
Fluorene	ND	0.020	μ g/L
Phenanthrene	ND	0.020	μ g/L
Anthracene	ND	0.010	μ g/L
Fluoranthene	ND	0.010	μg/L
Pyrene	ND	0.010	$\mu g/L$
Chrysene	ND	0.007	μ g/L
Benzo (a) anthracene	ND	0.002	μ g/L
Benzo (b) fluoranthene	ND	0.003	μ g/L
Benzo (k) fluoranthene	ND	0.002	μ g/L
Benzo (a) pyrene	ND	0.008	μ g/L
Dibenzo (a,h) anthracene	ND	0.006	μ g/L
Benzo (g,h,i) perylene	ND	0.010	μ g/L
Indeno (1,2,3-cd) pyrene	ND	0.006	μ g/L
1-Methylnaphthalene	ND	0.100	μ g/L
2-Methylnaphthalene	ND	0.100	μg/L
SURROGATES	% RE	COVERY	
9,10-Diphenylanthracene		36	

ANALYZED BY: SJ DATE/TIME: 09/02/95 12:30:00 EXTRACTED BY: SN DATE/TIME: 08/29/95 08:00:00

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

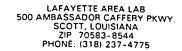
NOTES: * - Method Detection Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993





CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

#2642, TYPE WC

DATE: 09/07/95

P.O.#

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-101

MATRIX: WATER DATE SAMPLED: 08/25/95

DATE RECEIVED: 08/26/95

PROJECT NO: 1096

ANALYTICAL DATA			
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/31/95 08:14:01	ND	0.1	mg/L
TOTAL PETROLEUM HYDROCARBONS (DRO) WI LUST DRO # Analyzed by: AH Date: 08/31/95 03:12:00	0.5	0.1	mg/L
Lead, Total Method 239.2 * Analyzed by: CB Date: 08/30/95 15:15:00	ND	0.001	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

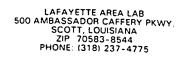
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: +Low surrogate recovery. Unable to reextract due to

no more sample available.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

Laboratory Manager





CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST.

PROJECT NO: 1096
MATRIX: WATER

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

DATE SAMPLED: 08/25/95 DATE RECEIVED: 08/26/95

SAMPLE ID: MW-101

ANALYTICAL DATA				
PARAMETER	RESULTS	PQL*	UNITS	
Dichlorodifluoromethane	ND	2.9	μ g/L	
Chloromethane	ND	0.8	μ g/L	
Vinyl chloride	ND	1.8	μ g/L	
Chloroethane	ND	5.2	μ g/L	
Trichlorofluoromethane	ND	1.0	μg/L	
1,1-Dichloroethene	ND	1.3	μg/L	
Methylene Chloride	ND	0.8	μ g/L	
trans-1,2-Dichloroethene	ND	1.0	μ g/L	
1,1-Dichloroethane	1	0.7	μ g/L	
2,2-Dichloropropane	ND	0.5	μ g/L	
cis-1,2-Dichloroethene	ND	0.1	μ g/L	
Chloroform	ND	0.5	μg/L	
1,1,1-Trichloroethane	3	0.3	μg/L	
Carbon Tetrachloride	ND	1.2	μ g/L	
Benzene	ND	2.0	μ g/L	
1,2-Dichloroethane	ND	0.3	μg/L	
Trichloroethene	ND	1.2	μg/L	
1,2-Dichloropropane	ND	0.4	μg/L	
Bromodichloromethane	ND	1.0	μg/L	
Toluene	ND	2.0	μ g/L	
1,1,2-Trichloroethane	ND	0.2	μg/L	
Tetrachloroethene	ND	0.3	μg/L	
1,3-Dichloropropane	ND	0.3	μg/L	
Dibromochloromethane	ND	0.9	μg/L	
1,2-Dibromoethane	ND	0.8	μg/L	
Chlorobenzene	ND	2.5	μg/L	
Ethyl benzene	ND	2.0	μg/L	
M and P Xylene	ND	2.0	$\mu g/L$	
O-Xylene	ND	2.0	μg/L	
Isopropylbenzene	ND	2.0	μg/L	
1,1,2,2-Tetrachloroethane	ИD	0.3	μg/L	
n-Propyl benzene	ND	0.1	μg/L	
Bromobenzene	ND	0.3	μg/L	
1,3,5-Trimethylbenzene	ND	0.2	μg/L	
2-Chlorotoluene	ND	0.1	μg/L	
4-Chlorotoluene	ND	0.2	μg/L	
tert-Butylbenzene	ND	0.6	μg/L	
1,2,4-Trimethylbenzene	ND	0.5	μg/L	
1/2/1 11 1moonj 1wone			, ,,	

METHOD: Mod. 8021 (VOC) [SW 846] (continued on next page)



CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-101

ANAI	ANALYTICAL DATA (continued)			
PARAMETER	RESULTS	PQL*	UNITS	
sec-Butylbenzene	ND	0.2	μ g/L	
p-Isopropyltoluene	ND	0.1	μg/L	
1,3-Dichlorobenzene	ND	3.2	μ g/L	
1,4-Dichlorobenzene	ND	2.4	μ g/L	
n-Butylbenzene	ND	0.2	μ g/L	
1,2-Dichlorobenzene	ND	1.5	μ g/L	
1,2-Dibromo-3-chloropropane	ND	30	μ g/L	
1,2,4-Trichlorobenzene	ND	0.3	μ g/L	
Hexachlorobutadiene	ND	0.2	μg/L	
Naphthalene	ND	0.6	μg/L	
1,2,3-Trichlorobenzene	ND	0.2	μ g/L	
Di-isopropyl ether	ND	1.0	μ g/L	
Methyl-t-butyl ether	30	8.0	μ g/L	
	0. 2200			
SURROGATES	% RECC			
Fluorobenzene	104			

ANALYZED BY: PW DATE/TIME: 08/30/95 15:14:00

METHOD: Mod. 8021 (VOC) [SW 846]

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS: +Low surrogate recovery. Unable to reextract due to

no more sample available.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993





CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-101

PROJECT NO: 1096

MATRIX: WATER

DATE SAMPLED: 08/25/95
DATE RECEIVED: 08/26/95

ANALY	TICAL DATA		
PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	ND	0.100	μ g/L
Acenaphthylene	ND	0.020	μ g/L
Acenaphthene	ND	0.020	μ g/L
Fluorene	ND	0.020	μ g/L
Phenanthrene	ND	0.020	μ g/L
Anthracene	ND	0.010	μ g/L
Fluoranthene	ND	0.010	$\mu g/L$
Pyrene	ND	0.010	μg/L
Chrysene	ND	0.007	$\mu g/L$
Benzo (a) anthracene	ND	0.002	μg/L
Benzo (b) fluoranthene	ND	0.003	μ g/L
Benzo (k) fluoranthene	ND	0.002	μ g/L
Benzo (a) pyrene	ND	0.008	μ g/L
Dibenzo (a,h) anthracene	ND	0.006	μ g/L
Benzo (g,h,i) perylene	ND	0.010	μg/L
Indeno (1,2,3-cd) pyrene	ND	0.006	μg/L
1-Methylnaphthalene	ND	0.100	μg/L
2-Methylnaphthalene	ND	0.100	μ g/L
SURROGATES	% RE	COVERY	
9,10-Diphenylanthracene		45	

ANALYZED BY: SJ DATE/TIME: 09/02/95 12:30:00 EXTRACTED BY: SN DATE/TIME: 08/29/95 08:00:00

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

NOTES: * - Method Detection Limit ND

ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993



CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

DATE: 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-104

PROJECT NO: 1096
MATRIX: WATER

DATE SAMPLED: 08/25/95

DATE RECEIVED: 08/26/95

ANALYTICAL DA	ATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/31/95 08:14:01	ND	0.1	mg/L
TOTAL PETROLEUM HYDROCARBONS (DRO) WI LUST DRO # Analyzed by: AH Date: 08/31/95 04:00:00	0.6	0.1	mg/L
Lead, Total Method 239.2 * Analyzed by: CB Date: 08/30/95 15:15:00	ND	0.001	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993





CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL PROJECT NO: 1096
SITE: MILWAUKEE, WI/9235 N 107 ST. MATRIX: WATER

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-104

DATE SAMPLED: 08/25/95
DATE RECEIVED: 08/26/95

ANALY	TICAL DATA		
PARAMETER	RESULTS	PQL*	UNITS
Dichlorodifluoromethane	ND	2.9	μg/L
Chloromethane	ND	0.8	μ g/L
Vinyl chloride	ND	1.8	μ g/L
Chloroethane	ND	5.2	μ g/L
Trichlorofluoromethane	ND	1.0	μ g/L
1,1-Dichloroethene	ND	1.3	μ g/L
Methylene Chloride	ND	0.8	μ g/L
trans-1,2-Dichloroethene	ND	1.0	μ g/L
1,1-Dichloroethane	ND	0.7	μg/L
2,2-Dichloropropane	ND	0.5	μ g/L
cis-1,2-Dichloroethene	ND	0.1	μ g/L
Chloroform	ND	0.5	μ g/L
1,1,1-Trichloroethane	ND	0.3	μg/L
Carbon Tetrachloride	ND	1.2	μ g/L
Benzene	ND	2.0	μ g/L
1,2-Dichloroethane	ND	0.3	μg/L
Trichloroethene	ND	1.2	μg/L
1,2-Dichloropropane	ND	0.4	μ g/L
Bromodichloromethane	ND	1.0	μ g/L
Toluene	ND	2.0	μ g/L
1,1,2-Trichloroethane	ND	0.2	μ g/L
Tetrachloroethene	ND	0.3	μ g/L
1,3-Dichloropropane	ND	0.3	μ g/L
Dibromochloromethane	ND	0.9	μg/L
1,2-Dibromoethane	ND	0.8	μ g/L
Chlorobenzene	ND	2.5	μ g/L
Ethyl benzene	ND	2.0	μg/L
M and P Xylene	ND	2.0	μg/L
O-Xylene	ND	2.0	μg/L
Isopropylbenzene	ND	2.0	μ g/L
1,1,2,2-Tetrachloroethane	ND	0.3	μ g/L
n-Propyl benzene	ND	0.1	μg/L
Bromobenzene	ND	0.3	μ g/L
1,3,5-Trimethylbenzene	ND	0.2	μ g/L
2-Chlorotoluene	ND	0.1	μ g/L
4-Chlorotoluene	ND	0.2	μg/L
tert-Butylbenzene	ND	0.6	μg/L
1,2,4-Trimethylbenzene	ND	0.5	μg/L

METHOD: Mod. 8021 (VOC) [SW 846] (continued on next page)



CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-104

ANALYTIC	ANALYTICAL DATA (continued)			
PARAMETER	RESULTS	PQL*	UNITS	
sec-Butylbenzene	ND	0.2	μg/L	
p-Isopropyltoluene	ND	0.1	μg/L	
1,3-Dichlorobenzene	ND	3.2	μg/L	
1,4-Dichlorobenzene	ND	2.4	μg/L	
n-Butylbenzene	ND	0.2	μg/L	
1,2-Dichlorobenzene	ND	1.5	μ g/L	
1,2-Dibromo-3-chloropropane	ND	30	μ g/L	
1,2,4-Trichlorobenzene	ND	0.3	μg/L	
Hexachlorobutadiene	ND	0.2	μg/L	
Naphthalene	ND	0.6	μ g/L	
1,2,3-Trichlorobenzene	ND	0.2	μ g/L	
Di-isopropyl ether	ND	1.0	μ g/L	
Methyl-t-butyl ether	ND	8.0	μg/L	
SURROGATES	% RECOV	/ERY		
Fluorobenzene	103			

ANALYZED BY: PW DATE/TIME: 08/30/95 15:14:00

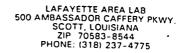
METHOD: Mod. 8021 (VOC) [SW 846]

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993





CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-104

PROJECT NO: 1096 MATRIX: WATER

DATE SAMPLED: 08/25/95

DATE RECEIVED: 08/26/95

ANALY	TICAL DATA		
PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	ND	0.100	μ g/L
Acenaphthylene	ND	0.020	μ g/L
Acenaphthene	ND	0.020	μ g/L
Fluorene	ND	0.020	μ g/L
Phenanthrene	ND	0.020	μ g/L
Anthracene	ND	0.010	μg/L
Fluoranthene	ND	0.010	μ g/L
Pyrene	ND	0.010	μ g/L
Chrysene	ND	0.007	μ g/L
Benzo (a) anthracene	ND	0.002	μ g/L
Benzo (b) fluoranthene	ND	0.003	μ g/L
Benzo (k) fluoranthene	ND	0.002	μ g/L
Benzo (a) pyrene	ND	0.008	μ g/L
Dibenzo (a,h) anthracene	ND	0.006	μ g/L
Benzo (g,h,i) perylene	ND	0.010	μ g/L
Indeno (1,2,3-cd) pyrene	ND	0.006	μ g/L
1-Methylnaphthalene	ND	0.100	μg/L
2-Methylnaphthalene	ND	0.100	μg/L
SURROGATES	% RE	COVERY	
9,10-Diphenylanthracene		49	

DATE/TIME: 09/05/95 21:05:00 ANALYZED BY: SJ DATE/TIME: 08/29/95 08:00:00 EXTRACTED BY: SN

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

ND - Not Detected * - Method Detection Limit

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

Laboratory Manager





CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

SAMPLE ID: MW-102

P.O.# #2642, TYPE WC

DATE: 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST. SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

PROJECT NO: 1096

MATRIX: WATER

DATE SAMPLED: 08/25/95

DATE RECEIVED: 08/26/95

			
ANALYTICAL DA	ATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/31/95 08:14:01	ND	0.1	mg/L
TOTAL PETROLEUM HYDROCARBONS (DRO) WI LUST DRO # Analyzed by: AH Date: 08/31/95 04:48:00	0.4	0.1	mg/L
Lead, Total Method 239.2 * Analyzed by: CB Date: 08/30/95 15:15:00	ND	0.001	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993





CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-102

PROJECT NO: 1096

MATRIX: WATER

DATE SAMPLED: 08/25/95 DATE RECEIVED: 08/26/95

ANALYTICAL DATA					
PARAMETER	RESULTS	PQL*	UNITS		
Dichlorodifluoromethane	ND	2.9	μg/L		
Chloromethane	ND	0.8	μg/L		
Vinyl chloride	ND	1.8	μg/L		
Chloroethane	ND	5.2	μg/L		
Trichlorofluoromethane	ND	1.0	μg/L		
1,1-Dichloroethene	ND	1.3	μg/L		
Methylene Chloride	ND	0.8	μg/L		
trans-1,2-Dichloroethene	ND	1.0	μg/L		
1,1-Dichloroethane	ND	0.7	μg/L		
2,2-Dichloropropane	ND	0.5	μg/L		
cis-1,2-Dichloroethene	ND	0.1	μg/L		
Chloroform	ND	0.5	μg/L		
1,1,1-Trichloroethane	ND	0.3	μg/L		
Carbon Tetrachloride	ND	1.2	μg/L		
Benzene	ND	2.0	μg/L		
1,2-Dichloroethane	ND	0.3	μg/L		
Trichloroethene	ND	1.2	μg/L		
1,2-Dichloropropane	ND	0.4	μg/L		
Bromodichloromethane	ND	1.0	μg/L		
Toluene	ND	2.0	μg/L		
1,1,2-Trichloroethane	ND	0.2	μg/L		
Tetrachloroethene	ND	0.3	μg/L		
1,3-Dichloropropane	ND	0.3	μg/L		
Dibromochloromethane	ND	0.9	μg/L		
1,2-Dibromoethane	ND	0.8	μg/L		
Chlorobenzene	ND	2.5	μg/L		
Ethyl benzene	ND	2.0	μg/L		
M and P Xylene	ND	2.0	μg/L		
O-Xylene	ND	2.0	μg/L		
Isopropylbenzene	ND	2.0	μg/L		
1,1,2,2-Tetrachloroethane	ND	0.3	μg/L		
n-Propyl benzene	ND	0.1	μg/L		
Bromobenzene	ND	0.3	μg/L		
1,3,5-Trimethylbenzene	ND	0.2	μg/L		
2-Chlorotoluene	ND	0.1	μg/L		
4-Chlorotoluene	ND	0.2	μg/L		
tert-Butylbenzene	ND	0.6	μg/L		
1,2,4-Trimethylbenzene	ND	0.5	μg/L		

METHOD: Mod. 8021 (VOC) [SW 846] (continued on next page)



CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-102

ANALYTICAL DATA (continued)			
PARAMETER	RESULTS	PQL*	UNITS
sec-Butylbenzene	ND	0.2	μg/L
p-Isopropyltoluene	ND	0.1	μg/L
1,3-Dichlorobenzene	ND	3.2	μg/L
1,4-Dichlorobenzene	ND	2.4	μg/L
n-Butylbenzene	ND	0.2	μg/L
1,2-Dichlorobenzene	ND	1.5	μg/L
1,2-Dibromo-3-chloropropa	ne ND	30	μg/L
1,2,4-Trichlorobenzene	ND	0.3	μg/L
Hexachlorobutadiene	ND	0.2	μg/L
Naphthalene	ND	0.6	$\mu g/L$
1,2,3-Trichlorobenzene	ND	0.2	$\mu g/L$
Di-isopropyl ether	ND	1.0	μ g/L
Methyl-t-butyl ether	130	8.0	μg/L
SURROGATES	% REC	COVERY	
Fluorobenzene	10)5	

ANALYZED BY: PW DATE/TIME: 08/30/95 15:14:00

METHOD: Mod. 8021 (VOC) [SW 846]

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993





CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-102

PROJECT NO: 1096

MATRIX: WATER

DATE SAMPLED: 08/25/95

DATE RECEIVED: 08/26/95

ANALY	TICAL DATA		
PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	ND	0.100	μ g/L
Acenaphthylene	ND	0.020	μ g/L
Acenaphthene	ND	0.020	μ g/L
Fluorene	ND	0.020	μ g/L
Phenanthrene	ND	0.020	μ g/L
Anthracene	ND	0.010	μg/L
Fluoranthene	ND	0.010	μ g/L
Pyrene	ND	0.010	μ g/L
Chrysene	ND	0.007	μ g/L
Benzo (a) anthracene	ND	0.002	μ g/L
Benzo (b) fluoranthene	ND	0.003	μ g/L
Benzo (k) fluoranthene	ND	0.002	μ g/L
Benzo (a) pyrene	ND	0.008	μ g/L
Dibenzo (a,h) anthracene	ND	0.006	μ g/L
Benzo (g,h,i) perylene	ND	0.010	μ g/L
Indeno (1,2,3-cd) pyrene	ND	0.006	μ g/L
1-Methylnaphthalene	ND	0.100	μ g/L
2-Methylnaphthalene	ND	0.100	μ g/L
SURROGATES	% RE	COVERY	
9,10-Diphenylanthracene		44	

ANALYZED BY: SJ DATE/TIME: 09/05/95 21:05:00 EXTRACTED BY: SN DATE/TIME: 08/29/95 08:00:00

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

NOTES: * - Method Detection Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993





CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

#2642, TYPE WC DATE: 09/07/95

P.O.#

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST.

MATRIX: WATER

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

DATE SAMPLED: 08/25/95 DATE RECEIVED: 08/26/95

PROJECT NO: 1096

SAMPLE ID: MW-103

ANALYTICAL D	ATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/31/95 08:14:01	ND	0.1	mg/L
TOTAL PETROLEUM HYDROCARBONS (DRO) WI LUST DRO # Analyzed by: AH Date: 08/31/95 05:35:00	0.6	0.1	mg/L
Lead, Total Method 239.2 * Analyzed by: CB Date: 08/30/95 15:15:00	ND	0.001	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993





CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST. SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

PROJECT NO: 1096
MATRIX: WATER
DATE SAMPLED: 08/25/95

SAMPLE BY: NATURAL RESOURCE TECHNOLOGY SAMPLE ID: MW-103

DATE RECEIVED: 08/26/95

ANALYTICAL DATA					
PARAMETER	RESULTS	PQL*	UNITS		
Dichlorodifluoromethane	ND	2.9	μ g/L		
Chloromethane	ND	0.8	μ g/L		
Vinyl chloride	ND	1.8	μ g/L		
Chloroethane	ND	5.2	μ g/L		
Trichlorofluoromethane	ND	1.0	μ g/L		
1,1-Dichloroethene	ND	1.3	μ g/L		
Methylene Chloride	ND	0.8	μ g/L		
trans-1,2-Dichloroethene	ND	1.0	μ g/L		
1,1-Dichloroethane	ND	0.7	μ g/L		
2,2-Dichloropropane	ND	0.5	μ g/L		
cis-1,2-Dichloroethene	ND	0.1	μg/L		
Chloroform	ND	0.5	μ g/L		
1,1,1-Trichloroethane	ND	0.3	μ g/L		
Carbon Tetrachloride	ND	1.2	μ g/L		
Benzene	ND	2.0	μ g/L		
1,2-Dichloroethane	ND	0.3	μ g/L		
Trichloroethene	ИD	1.2	μ g/L		
1,2-Dichloropropane	ND	0.4	μg/L		
Bromodichloromethane	ND	1.0	μ g/L		
Toluene	ND	2.0	μ g/L		
1,1,2-Trichloroethane	ND	0.2	μ g/L		
Tetrachloroethene	ND	0.3	μ g/L		
1,3-Dichloropropane	ND	0.3	μ g/L		
Dibromochloromethane	ND	0.9	μ g/L		
1,2-Dibromoethane	ND	0.8	μ g/L		
Chlorobenzene	ND	2.5	μ g/L		
Ethyl benzene	ND	2.0	μ g/L		
M and P Xylene	ND	2.0	μ g/L		
O-Xylene	ND	2.0	μ g/L		
Isopropylbenzene	ND	2.0	μ g/L		
1,1,2,2-Tetrachloroethane	ND	0.3	μ g/L		
n-Propyl benzene	ND	0.1	μ g/L		
Bromobenzene	ND	0.3	μ g/L		
1,3,5-Trimethylbenzene	ИD	0.2	μg/L		
2-Chlorotoluene	ND	0.1	μ g/L		
4-Chlorotoluene	ND	0.2	μ g/L		
tert-Butylbenzene	ND	0.6	μ g/L		
1,2,4-Trimethylbenzene	ND	0.5	μg/L		

METHOD: Mod. 8021 (VOC) [SW 846] (continued on next page)





CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-103

ANALYTICAL DATA (continued)				
PARAMETER	RESULTS	PQL*	UNITS	
sec-Butylbenzene	ND	0.2	μ g/L	
p-Isopropyltoluene	ND	0.1	μ g/L	
1,3-Dichlorobenzene	ND	3.2	μ g/L	
1,4-Dichlorobenzene	ND	2.4	μ g/L	
n-Butylbenzene	ND	0.2	μ g/L	
1,2-Dichlorobenzene	ND	1.5	μ g/L	
1,2-Dibromo-3-chloropropane	ND	30	μ g/L	
1,2,4-Trichlorobenzene	ND	0.3	μ g/L	
Hexachlorobutadiene	ND	0.2	μ g/L	
Naphthalene	ND	0.6	μ g/L	
1,2,3-Trichlorobenzene	ND	0.2	μ g/L	
Di-isopropyl ether	ND	1.0	·µg/L	
Methyl-t-butyl ether	140	8.0	μg/L	
SURROGATES	% RECO			
Fluorobenzene	105	;		

ANALYZED BY: PW DATE/TIME: 08/30/95 15:14:00

METHOD: Mod. 8021 (VOC) [SW 846]

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993



CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-103

PROJECT NO: 1096

MATRIX: WATER

DATE SAMPLED: 08/25/95

DATE RECEIVED: 08/26/95

A	NALYTICAL DATA		
PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	ND	0.100	μ g/L
Acenaphthylene	ND	0.020	μ g/L
Acenaphthene	ND	0.020	μg/L
Fluorene	ND	0.020	μg/L
Phenanthrene	ND	0.020	μg/L
Anthracene	ND	0.010	$\mu \mathtt{g}/\mathtt{L}$
Fluoranthene	ND	0.010	μg/L
Pyrene	ND	0.010	μg/L
Chrysene	ND	0.007	μg/L
Benzo (a) anthracene	ND	0.002	μg/L
Benzo (b) fluoranthene	ND	0.003	μg/L
Benzo (k) fluoranthene	ND	0.002	μ g/L
Benzo (a) pyrene	ND	0.008	μ g/L
Dibenzo (a,h) anthracene	ND	0.006	μ g/L
Benzo (g,h,i) perylene	ND	0.010	μ g/L
Indeno (1,2,3-cd) pyrene	ND	0.006	μ g/L
1-Methylnaphthalene	ND	0.100	μ g/L
2-Methylnaphthalene	ND	0.100	μg/L
SURROGATES	% RE	COVERY	
9,10-Diphenylanthracene		32	

ANALYZED BY: SJ DATE/TIME: 09/05/95 21:05:00 EXTRACTED BY: SN DATE/TIME: 08/29/95 08:00:00

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

NOTES: * - Method Detection Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993





CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

DATE: 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-105

PROJECT NO: 1096
MATRIX: WATER

DATE SAMPLED: 08/25/95

DATE RECEIVED: 08/26/95

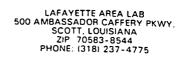
ANALYTICAL DA	TA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/31/95 08:14:01	ND	0.1	mg/L
TOTAL PETROLEUM HYDROCARBONS (DRO) WI LUST DRO # Analyzed by: AH Date: 08/31/95 06:23:00	0.4	0.1	mg/L
Lead, Total Method 239.2 * Analyzed by: CB Date: 08/30/95 15:15:00	ND	0.001	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993





CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

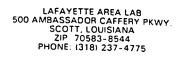
SAMPLE ID: MW-105

PROJECT NO: 1096
MATRIX: WATER

DATE SAMPLED: 08/25/95 DATE RECEIVED: 08/26/95

ANALYI	ICAL DATA		
PARAMETER	RESULTS	PQL*	UNITS
Dichlorodifluoromethane	ND	2.9	$\mu extsf{g}/ extsf{L}$
Chloromethane	ND	0.8	$\mu { t g}/{ t L}$
Vinyl chloride	ND	1.8	μ g/L
Chloroethane	ND	5.2	μg/L
Trichlorofluoromethane	ND	1.0	μg/L
1,1-Dichloroethene	ND	1.3	$\mu exttt{g/L}$
Methylene Chloride	ND	0.8	μ g/L
trans-1,2-Dichloroethene	ND	1.0	$\mu \mathtt{g}/\mathtt{L}$
1,1-Dichloroethane	ND	0.7	$\mu extsf{g}/ extsf{L}$
2,2-Dichloropropane	ND	0.5	μ g/L
cis-1,2-Dichloroethene	ND	0.1	μ g/L
Chloroform	ND	0.5	μ g/L
1,1,1-Trichloroethane	ND	0.3	$\mu g/L$
Carbon Tetrachloride	ND	1.2	$\mu g/L$
Benzene	ND	2.0	μg/L
1,2-Dichloroethane	ND	0.3	μg/L
Trichloroethene	ND	1.2	μg/L
1,2-Dichloropropane	ND	0.4	$\mu g/L$
Bromodichloromethane	ND	1.0	$\mu g/L$
Toluene	ND	2.0	μg/L
1,1,2-Trichloroethane	ND	0.2	$\mu g/L$
Tetrachloroethene	ND	0.3	μg/L
1,3-Dichloropropane	ND	0.3	μg/L
Dibromochloromethane	ND	0.9	μg/L
1,2-Dibromoethane	ND	0.8	μg/L
Chlorobenzene	ND	2.5	μg/L
Ethyl benzene	ND	2.0	μg/L
M and P Xylene	ND	2.0	μg/L
0-Xylene	ND	2.0	μg/L
Isopropylbenzene	ND	2.0	μg/L
1,1,2,2-Tetrachloroethane	ND	0.3	μg/L
n-Propyl benzene	ND	0.1	μg/L
Bromobenzene	ND	0.3	μg/L
1,3,5-Trimethylbenzene	ND	0.2	μg/L
2-Chlorotoluene	ND	0.1	μg/L
4-Chlorotoluene	ND	0.2	μg/L
tert-Butylbenzene	ND	0.6	μg/L
1,2,4-Trimethylbenzene	ND	0.5	μg/L

METHOD: Mod. 8021 (VOC) [SW 846] (continued on next page)





CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-105

ANALYTICAL DATA (continued)				
PARAMETER	RESULTS	PQL*	UNITS	
sec-Butylbenzene	ND	0.2	$\mu extsf{g/L}$	
p-Isopropyltoluene	ND	0.1	$\mu extsf{g/L}$	
1,3-Dichlorobenzene	ND	3.2	μ g/L	
1,4-Dichlorobenzene	ND	2.4	μ g/L	
n-Butylbenzene	ND	0.2	μ g/L	
1,2-Dichlorobenzene	ND	1.5	μ g/L	
1,2-Dibromo-3-chloropropane	ND	30	μ g/L	
1,2,4-Trichlorobenzene	ND	0.3	μg/L	
Hexachlorobutadiene	ND	0.2	μg/L	
Naphthalene	ND	0.6	μ g/L	
1,2,3-Trichlorobenzene	ND	0.2	μ g/L	
Di-isopropyl ether	ND	1.0	μg/L	
Methyl-t-butyl ether	ND	8.0	μg/L	
SURROGATES	% RECOV	ERY		
Fluorobenzene	105			

ANALYZED BY: PW DATE/TIME: 08/30/95 15:14:00

METHOD: Mod. 8021 (VOC) [SW 846]

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993





CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER P.O.# #2642, TYPE WC 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-105

PROJECT NO: 1096

MATRIX: WATER

DATE SAMPLED: 08/25/95 DATE RECEIVED: 08/26/95

PARAMETER	ANALYTICAL DATA		
Naphthalene	RESULTS	MDL*	UNITS
	ИD	0.100	μg/L
Acenaphthylene	ND	0.020	μ g/L
Acenaphthene	ND	0.020	μg/L
Fluorene	ND	0.020	μg/L
Phenanthrene	ND	0.020	μg/L
Anthracene	ND	0.010	μg/L
Fluoranthene	ND	0.010	μg/L
Pyrene	ND	0.010	μg/L
Chrysene	ND	0.007	μg/L
Benzo (a) anthracene	ND	0.002	μg/L
Benzo (b) fluoranthene	ND	0.003	μg/L
Benzo (k) fluoranthene	ND	0.002	μg/L
Benzo (a) pyrene	ND	0.008	μg/L
Dibenzo (a,h) anthracene	ND	0.006	μg/L
Benzo (g,h,i) perylene	ND	0.010	μg/L
Indeno (1,2,3-cd) pyrene	ND	0.006	μg/L
1-Methylnaphthalene	ND	0.100	. = ,
2-Methylnaphthalene	ND		μg/L
	ND	0.100	μg/L
SURROGATES	% R1	ECOVERY	
9,10-Diphenylanthracene	% KI	49	

ANALYZED BY: SJ DATE/TIME: 09/05/95 21:05:00 EXTRACTED BY: SN DATE/TIME: 08/29/95 08:00:00 METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

NOTES: * - Method Detection Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993





CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC

DATE: 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL

SITE: MILWAUKEE, WI/9235 N 107 ST.

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-ZZ

PROJECT NO: 1096

MATRIX: WATER

DATE SAMPLED: 08/25/95 DATE RECEIVED: 08/26/95

ANALYTICAL DAT	ra		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/31/95 08:14:01	ND	0.1	mg/L
TOTAL PETROLEUM HYDROCARBONS (DRO) WI LUST DRO # Analyzed by: AH Date: 08/31/95 09:34:00	0.6	0.1	mg/L
Lead, Total Method 239.2 * Analyzed by: CB Date: 08/30/95 15:15:00	ND	0.001	mg/L

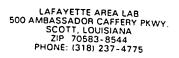
ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993





CITGO PETROLEUM CORPORATION 2316 TERMINAL DRIVE ARLINGTON HGTS, IL 60005 ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL
SITE: MILWAUKEE, WI/9235 N 107 ST.
SAMPLED BY: NATURAL RESOURCE TECHNOLOGY
SAMPLE ID: MW-ZZ
D

MATRIX: WATER
DATE SAMPLED: 08/25/95
DATE RECEIVED: 08/26/95

PROJECT NO: 1096

ANALYTICAL DATA					
•	PARAMETER	RESULTS	PQL*	UNITS	
	Dichlorodifluoromethane	ND	2.9	μg/L	
	Chloromethane	ND	0.8	μ g/L	
	Vinyl chloride	ND	1.8	μ g/L	
	Chloroethane	ND	5.2	μ g/L	
	Trichlorofluoromethane	ND	1.0	μ g/L	
	1,1-Dichloroethene	ND	1.3	μ g/L	
	Methylene Chloride	ND	0.8	μ g/L	
	trans-1,2-Dichloroethene	ND	1.0	μ g/L	
	1,1-Dichloroethane	ND	0.7	μg/L	
	2,2-Dichloropropane	ND	0.5	μg/L	
	cis-1,2-Dichloroethene	ND	0.1	μ g/L	
	Chloroform	ND	0.5	μg/L	
	1,1,1-Trichloroethane	ND	0.3	μg/L	
	Carbon Tetrachloride	ND	1.2	μg/L	
	Benzene	ND	2.0	μg/L	
	1,2-Dichloroethane	ND	0.3	μ g/L	
	Trichloroethene	ND	1.2	μg/L	
	1,2-Dichloropropane	ND	0.4	μ g/L	
	Bromodichloromethane	ND	1.0	μg/L	
	Toluene	ND	2.0	μ g/L	
	1,1,2-Trichloroethane	ND	0.2	μ g/L	
	Tetrachloroethene	ND	0.3	μ g/L	
	1,3-Dichloropropane	ND	0.3	μ g/L	
	Dibromochloromethane	ND	0.9	μ g/L	
	1,2-Dibromoethane	ND	0.8	μ g/L	
	Chlorobenzene	ND	2.5	μ g/L	
	Ethyl benzene	ND	2.0	μ g/L	
	M and P Xylene	ND	2.0	μg/L	
	O-Xylene	ND	2.0	μ g/L	
	Isopropylbenzene	ND	2.0	μg/L	
	1,1,2,2-Tetrachloroethane	ND	0.3	μ g/L	
	n-Propyl benzene	ND	0.1	μ g/L	
	Bromobenzene	ND	0.3	μg/L	
	1,3,5-Trimethylbenzene	ND	0.2	μg/L	
	2-Chlorotoluene	ND	0.1	μg/L	
	4-Chlorotoluene	ND	0.2	μg/L	
	tert-Butylbenzene	ND	0.6	μ g/L	
	1,2,4-Trimethylbenzene	ND	0.5	μg/L	

METHOD: Mod. 8021 (VOC) [SW 846] (continued on next page)



CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-ZZ

ANALYT	ICAL DATA (con	tinued)	
PARAMETER	RESULTS	PQL*	UNITS
sec-Butylbenzene	ND	0.2	μ g/L
p-Isopropyltoluene	ND	0.1	μ g/L
1,3-Dichlorobenzene	ND	3.2	μ g/L
1,4-Dichlorobenzene	ИD	2.4	μg/L
n-Butylbenzene	ИD	0.2	$\mu { t g}/{ t L}$
1,2-Dichlorobenzene	ND	1.5	μg/L
1,2-Dibromo-3-chloropropane	ND	30	μ g/L
1,2,4-Trichlorobenzene	ND	0.3	μ g/L
Hexachlorobutadiene	ND	0.2	μ g/L
Naphthalene	ND	0.6	μ g/L
1,2,3-Trichlorobenzene	ND	0.2	μ g/L
Di-isopropyl ether	130	1.0	μ g/L
Methyl-t-butyl ether	ND	8.0	μg/L
SURROGATES	% RECO	VERY	
Fluorobenzene	104		

ANALYZED BY: PW DATE/TIME: 08/30/95 15:14:00

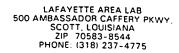
METHOD: Mod. 8021 (VOC) [SW 846]

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993





CITGO PETROLEUM CORPORATION

2316 TERMINAL DRIVE

ARLINGTON HGTS, IL 60005

ATTN: SCOTT BUCKNER

P.O.# #2642, TYPE WC 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL PROJECT NO: 1096
SITE: MILWAUKEE, WI/9235 N 107 ST. MATRIX: WATER

SAMPLED BY: NATURAL RESOURCE TECHNOLOGY

SAMPLE ID: MW-ZZ

DATE SAMPLED: 08/25/95
DATE RECEIVED: 08/26/95

ANALYT	ICAL DATA		
PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	ND	0.100	μ g/L
Acenaphthylene	ND	0.020	μ g/L
Acenaphthene	ND	0.020	μ g/L
Fluorene	ND	0.020	μ g/L
Phenanthrene	ND	0.020	μ g/L
Anthracene	ND	0.010	μ g/L
Fluoranthene	ND	0.010	μ g/L
Pyrene	ND	0.010	μ g/L
Chrysene	ND	0.007	μ g/L
Benzo (a) anthracene	ND	0.002	μ g/L
Benzo (b) fluoranthene	ND	0.003	μ g/L
Benzo (k) fluoranthene	ND	0.002	μ g/L
Benzo (a) pyrene	ND	0.008	μg/L
Dibenzo (a,h) anthracene	ND	0.006	μ g/L
Benzo (g,h,i) perylene	ND	0.010	μ g/L
Indeno (1,2,3-cd) pyrene	ND	0.006	μ g/L
1-Methylnaphthalene	ND	0.100	μ g/L
2-Methylnaphthalene	ND	0.100	μg/L
SURROGATES	% RE	COVERY	
9,10-Diphenylanthracene	1.	.05	

ANALYZED BY: SJ DATE/TIME: 09/02/95 12:30:00 EXTRACTED BY: SN DATE/TIME: 08/29/95 08:00:00

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

NOTES: * - Method Detection Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993



** SPL BATCH QUALITY CONTROL REPORT **

Method 8020 ***

LAFAYETTE AREA LAB 500 AMBASSADOR CAFFERY PKWY SCOTT, LOUISIANA ZIP 70583-8544 PHONE: (318) 237-4775

PAGE

Matrix: Units: Soil µg/Kg Batch Id: HPBB950829105101

LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	8lanl	Spike	QC Limits(**)		
COMPOUNDS	Blank Result <2>	Added <3>	Result <1>	Recovery %	(Mandatory) % Recovery Range		
MTBE	ND	50	46.4370	92.9	39 - 150		
BENZENE	ND	50	42.7684	85.5	39 - 150		
TOLUENE	ND	50	41.8303	83.7	46 - 140		
ETHYL_BENZENE	ND	50	41.6147	83.2	32 - 160		
1,3,5-TMB	ND	50	48.3183	96.6	32 - 160		
1,2,4-TMB	ND	50	54.2387	108	32 - 160		
O XYLENE	ND	50	41.5324	83.1	32 - 160		
M AND P XYLENE	ОИ	100	82.1518	82.2	32 - 160		

MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix	Spike	Matrix Dupli	Spike cate	MS/MSD Relative %		imits(***) Advisory)	
	<2>	<3>	Result	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery	Range
ITBE	ND	50	37.4161	74.8	36.9955	74.0	1.08	20	39 -	150
BENZENE .	ND	50	48.6637	97.3	46.0362	92.1	5.49	20	39 -	150
TOLUENE	DИ	50	41.5248	83.0	44.1433	88.3	6.19	20	46 -	140
ETHYL BENZENE	l nd	50	41.4517	82.9	42.9659	85.9	3.55	20	32 -	160
1,3,5-TMB	4.3850	50	47.4846	86.2	47.9543	87.1	1.04	20	32 -	160
1,2,4-TMB	9.9281	50	44.1259	68.4	50.5154	81.2	17.1	20	32 -	160
XYLENE	ND	50	40.4609	80.9	41.9814	84.0	3.76	20	32 -	16
M AND P XYLENE	3.0978	100	83.6186	80.5	83.7013	80.6	0.124	20	32 -	16

Analyst: TB

Sequence Date: 08/29/95

SPL ID of sample spiked: 9508803-18A

Sample File ID: \BH29207.ra

Method Blank File ID:

Blank Spike File ID: \BH29204B.r Matrix Spike File ID: \BH29226.ra

Matrix Spike Duplicate File ID: \BH29227.ra

* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100

(**) = Source:

(***) = Source:

SAMPLES IN BATCH(SPL ID):

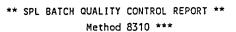
9508A65-06A 9508A65-01A 9508A65-02A 9508A65-03A

9508A65-04A 9508A65-05A

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PAGE



Matrix: Units:

Soil μg/Kg

Batch Id: HPLC950831203003

LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	Blank	Spike	QC Limits(**)
COMPOUNDS	Blank Result	Added	Result	Recovery	(Mandatory)
	<2>	<3>	<1>	*	% Recovery Range
Naphthalene	ND	1650.00	1368	82.9	30 - 122
Acenaphthylene	ND	1650.00	1588	96.2	30 - 126
Acenaphthene	ND	1650.00	1545	93.6	30 - 124
Fluorene	ND	1650.00	1401	84.9	30 - 142
Phenanthrene	סא	1650.00	1503	91.1	30 - 155
Anthracene	ND	1650.00	1611	97.6	30 - 126
Fluoranthene	ND	1650.00	1479	89.6	30 - 123
Pyrene	ND	1650.00	1565	94.8	30 - 140
Chrysene	ND	1650.00	1497	90.7	30 - 199
Benzo (a) anthracene	ND	1650.000	1519	92.1	30 - 135
Benzo (b) fluoranthene	ND	1650.00	1599	96.9	30 - 150
Benzo (k) fluoranthene	ND	1650.00	1569	95.1	30 - 159
Benzo (a) pyrene	ND	1650.00	1790	108	30 - 128
Dibenzo (a,h) anthracene	ND	1650.00	1458	88.4	30 - 110
Benzo (g,h,i) perylene	ND	1650.00	1601	97.0	30 - 116
Indeno (1,2,3-cd) pyrene	ND	1650.00	1384	83.9	30 - 116
-Methylnaphthalene	ND	1650.00	1351	81.9	30 - 130
2-Methylnaphthalene	ND	1650.00	1426	86.4	30 - 130
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MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix	Matrix Spike		Matrix SpikeDuplicate			imits(***) Advisory)	
	<2> <	<3>	Result <1>	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery	Range
laph tha lene	ND	1650.00	1342	81.3	1376	83.4	2.55	30	30 -	122
Acenaphthylene	ND	1650.00	1489	90.2	1574	95.4	5.60	30	30 -	126
Acenaphthene	ND	1650.00	1478	89.6	1473	89.3	0.335	30	30 -	124
luorene	ОМ	1650.00	1379	83.6	1366	82.8	0.962	30	30 -	142
Phenanthrene	ND	1650.00	1428	86.5	1426	86.4	0.116	30	30 -	155
Anthracene	ND	1650.00	1496	90.7	1504	91.2	0.550	30	30 -	126
Fluoranthene	ND	1650.00	1391	84.3	1391	84.3	0	30	30 -	123
yrene	ND	1650.00	1488	90.2	1204	73.0	21.1	30	30 -	140
Chrysene	ND	1650.00	1425	86.4	1408	85.3	1.28	30	30 -	199
Benzo (a) anthracene	ND	1650.000	1443	87.5	1424	86.3	1.38	30	30 -	135
Benzo (b) fluoranthene	ND	1650.00	1506	91.3	1489	90.2	1.21	30	30 -	150
Benzo (k) fluoranthene	ND	1650.00	1480	89.7	1468	89.0	0.783	30	30 -	159
Benzo (a) pyrene	DN	1650.00	1711	104	1668	101	2.93	30	30 -	128
Dibenzo (a,h) anthracene	DN	1650.00	1343	81.4	1314	79.6	2.24	30	30 -	130
Benzo (g,h,i) perylene	- סא	1650.00	1525	92.4	1479	89.6	3.08	30	30 -	130
ndeno (1,2,3-cd) pyrene	ND	1650.00	1222	74.1	1200	72.7	1.91	30	30 -	116

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SPL BATCH QUALITY CONTROL REPORT ** Method 8310 ***

LAFAYETTE AREA LAB 500 AMBASSADOR CAFFERY PKWY SCOTT, LOUISIANA ZIP 70583-8544 PHONE: (318) 237-4775

PAGE

Matrix: Units:

Soil μg/Kg Batch Id: HPLC950831203003

MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix	Spike	Matrix Dupli	Spike	MS/MSD Relative %		imits(***) (Advisory)
	<2>	<3>	Result	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery Range
1-Methylnaphthalene 2-Methylnaphthalene	ND ND	1650.00 1650.00	1297 1364	78.6 82.7	1286 1351	ŀ	0.895 0.972	30 30	30 - 130 30 - 130

Analyst: SJ

Sequence Date: 08/31/95

SPL ID of sample spiked: 9508C24-03B

Sample File ID: 9509040050101

Method Blank File ID:

Blank Spike File ID: 9508310150101

Matrix Spike File ID: 9509040030101

Matrix Spike Duplicate File ID: 9509040040101

* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

 $% Recovery = {(<1> - <2>) / <3> } x 100$

LCS % Recovery = (<1> / <3>) x 100

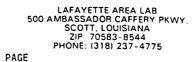
Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100

(**) = Source: 8310 SW846 (***) = Source: 8310 SW846

SAMPLES IN BATCH(SPL ID):

9508A65-05B 9508A65-06B 9508A65-01B 9508A65-02B

9508A65-03B 9508A65-04B



** SPL BATCH QUALITY CONTROL REPORT ** Method 8310 ***

Matrix: Units:

Water μg/L

Batch Id: HPLC950902123000

LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	Blank	Spike	QC Limits(**)
COMPOUNDS	Blank Result	Added <3>	Result <1>	Recovery %	(Mandatory) % Recovery Range
Naphthalene	ND	0.100	0.085	85.0	30 - 122
Acenaphthylene	ND	0.100	0.046	46.0	30 - 126
Acenaphthene	ND	0.100	0.066	66.0	30 - 124
Fluorene	ND	0.100	0.065	65.0	30 - 142
Phenanthrene	ND	0.100	0.067	67.0	30 - 155
Anthracene	ND	0.100	0.063	63.0	30 - 126
Fluoranthene	ND	0.100	0.062	62.0	30 - 123
Pyrene	ND	0.100	0.073	73.0	30 - 140
Chrysene	ND	0.100	0.065	65.0	30 - 199
Benzo (a) anthracene	ND	0.100	0.065	65.0	30 - 135
Benzo (b) fluoranthene	ND	0.100	0.068	68.0	30 - 150
Benzo (k) fluoranthene	ND	0.100	0.066	66.0	30 - 159
Benzo (a) pyrene	ND	0.100	0.074	74.0	30 - 128
Dibenzo (a,h) anthracene	ND	0.100	0.061	61.0	30 - 130
Benzo (g,h,i) perylene	ND	0.100	0.065	65.0	30 - 130
Indeno (1,2,3-cd) pyrene	ND	0.100	0.056	56.0	30 - 130
-Methylnaphthalene	ND	0.100	0.065	65.0	30 - 130
-Methylnaphthalene	ND	0.100	0.068	68.0	30 - 130

MATRIX SPIKES

S	Sample Results	Spike Added	Matrix	Spike	Matrix Dupli	Spike cate	MS/MSD Relative %		imits(***) Advisory)	
·			Result	Recovery	i	Recovery <5>	Difference	RPD Max.	Recovery	Pange
	<2>	<3>	<1>	<4>	<1>	(5)		Max.	Recovery	Kange
NAPHTHALENE	ND	0.100	0.060	60.0	0.053	53.0	12.4	30	30 -	122
ACENAPHTHYLENE	ОМ	0.100	0.062	62.0	0.061	61.0	1.63	30	30 -	126
ACENAPHTHENE	ND	0.100	0.050	50.0	0.051	51.0	1.98	30	30 -	124
FLUORENE	ND	0.100	0.055	55.0	0.038	38.0	36.6 *	30	30 -	142
PHENANTHRENE	ND	0.100	0.051	51.0	0.065	65.0	24.1	30	30 -	155
ANTHRACENE	ND	0.100	0.046	46.0	0.059	59.0	24.8	30	30 -	126
FLUORANTHENE	ND	0.100	0.048	48.0	0.062	62.0	25.5	30	30 -	123
PYRENE	ND	0.100	0.053	53.0	0.066	66.0	21.8	30	30 -	140
CHRYSENE	ND	0.100	0.051	51.0	0.066	66.0	25.6	30	30 -	199
BENZO (A) ANTHRACENE	ND	0.100	0.051	51.0	0.065	65.0	24.1	30	30 -	139
BENZO (B) FLUORANTHENE	ND	0.100	0.054	54.0	0.066	66.0	20.0	30	30 -	150
BENZO (K) FLUORANTHENE	ND	0.100	0.052	52.0	0.065	65.0	22.2	30	30 -	159
BENZO (A) PYRENE	ND	0.100	0.058	58.0	0.065	65.0	11.4	30	30 -	128
DIBENZO (A,H) ANTHRACENE	ND	0.100	0.047	47.0	0.061	61.0	25.9	30	30 -	110
BENZO (G,H,I) PERYLENE	ND	0.100	0.051	51.0	0.065	65.0	24.1	30	30 -	116
■NDENO (1,2,3-CD) PYRENE	ND	0.100	0.042	42.0	0.060	60.0	35.3 *	30	30 -	110



SPL BATCH QUALITY CONTROL REPORT ** Method 8310 ***

LAFAYETTE AREA LAB 500 AMBASSADOR CAFFERY PKWY. SCOTT, LOUISIANA ZIP 70583-8544 PHONE. (318) 237-4775

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Matrix: Units:

Water μg/L

Batch Id: HPLC950902123000

MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix Spike		Matrix Spike Duplicate				QC Limits(***) (Advisory)		
20111331133	<2>	<3>	Result	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery Range		
1-METHYLNAPHTHALENE 2-METHYLNAPHTHALENE	ND ND	0.100 0.100	0.047 0.051		0.048 0.050		2.11 1.98	30 30	30 - 130 30 - 130		

Analyst: SJ

Sequence Date: 09/02/95

SPL ID of sample spiked: MBLK Sample File ID: 9509010070101

Method Blank File ID:

Blank Spike File ID: 9509010100101

Matrix Spike File ID: 9509010080101

Matrix Spike Duplicate File ID: 9509010090101

* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = |(<4> - <5>)| / [(<4> + <5>) x 0.5] x 100

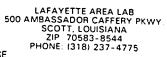
(**) = Source: 8310 SW846 (***) = Source: 8310 SW846

SAMPLES IN BATCH(SPL ID):

9508A45-01C 9508A45-02C 9508A45-03C 9508A45-04C

9508A45-05C 9508A65-08C 9508A65-07C 9508A65-13C 9508A43-01C 9508A43-02C 9508A43-03C 9508A43-04C

9508A43-05C



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** SPL BATCH QUALITY CONTROL REPORT ** Method 8310 ***

Matrix: Units:

Water μg/L

Batch Id: HPLC950905210500

LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	Blank	Spike	QC Limits(**)				
сомроиноѕ	Blank Result	Added	Result	Recovery	(Mandatory)				
	<2>	<3>	<1>	x x	% Recovery Range				
NAPHTHALENE	ND	0.100	0.100	100	30 - 122				
ACENAPHTHYLENE	ND	0.100	0.113	113	30 - 126				
ACENAPHTHENE	ND	0.100	0.087	87.0	30 - 124				
FLUORENE	ND	0.100	0.064	64.0	30 - 142				
PHENANTHRENE	ND	0.100	0.094	94.0	30 - 155				
ANTHRACENE	ND	0.100	0.085	85.0	30 - 126				
FLUORANTHENE	ND	0.100	0.070	70.0	30 - 123				
PYRENE	ND	0.100	0.101	101	30 - 140				
CHRYSENE	ND	0.100	0.096	96.0	30 - 199				
BENZO (A) ANTHRACENE	ND	0.100	0.092	92.0	30 - 135				
BENZO (6) FLUORANTHENE	ND	0.100	0.089	89.0	30 - 150				
BENZO (K) FLUORANTHENE	ND	0.100	0.090	90.0	30 - 159				
BENZO (A) PYRENE	ND	0.100	0.096	96.0	30 - 128				
DIBENZO (A,H) ANTHRACENE	ND	0.100	0.088	88.0	30 - 130				
BENZO (G,H,I) PERYLENE	ND	0.100	0.096	96.0	30 - 130				
NDENO (1,2,3-CD) PYRENE	ND	0.100	0.084	84.0	30 - 130				
-METHYLNAPHTHALENE	ND	0.100	0.089	89.0	30 - 130				
-METHYLNAPHTHALENE	ND	0.100	0.094	94.0	30 - 130				

MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix	Spike	Matrix Dupli	Matrix SpikeDuplicate			imits(***) Advisory)	
	<2>	<3>	Result <1>	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery	Range
IAPHTHALENE	ND	0.100	0.060	60.0	0.073	73.0	19.5	30	30 -	122
CENAPHTHYLENE	ND	0.100	0.075	75.0	0.069	69.0	8.33	30	30 -	126
CENAPHTHENE	ND	0.100	0.055	55.0	0.069	69.0	22.6	30	30 -	124
LUORENE	ND	0.100	0.043	43.0	0.048	48.0	11.0	30	30 -	142
HENANTHRENE	ND	0.100	0.058	58.0	0.073	73.0	22.9	30	30 -	155
NTHRACENE	ND	0.100	0.051	51.0	0.065	65.0	24.1	30	30 -	126
LUORANTHENE	ND	0.100	0.054	54.0	0.054	54.0	0	30	30 -	123
YRENE	ND	0.100	0.065	65.0	0.076	76.0	15.6	30	30 -	140
HRYSENE	ND	0.100	0.062	62.0	0.073	73.0	16.3	30	30 -	199
ENZO (A) ANTHRACENE	DN	0.100	0.059	59.0	0.070	70.0	17.1	30	30 -	135
ENZO (B) FLUORANTHENE	DN	0.100	0.058	58.0	0.074	74.0	24.2	30	30 -	150
ENZO (K) FLUORANTHENE	DN	0.100	0.058	58.0	0.071	71.0	20.2	30	30 -	159
ENZO (A) PYRENE	ND	0.100	0.065	65.0	0.076	76.0	15.6	30	30 -	128
IBENZO (A,H) ANTHRACENE	ND	0.100	0.055	55.0	0.066	66.0	18.2	30	30 -	110
ENZO (G,H,I) PERYLENE	סא	0.100	0.062	62.0	0.074	74.0	17.6	30	30 -	116
NDENO (1,2,3-CD) PYRENE	ם א	0.100	0.049	49.0	0.060	60.0	20.2	30	30 -	116



SPL BATCH QUALITY CONTROL REPORT ** Method 8310 ***

LAFAYETTE AREA LAB 500 AMBASSADOR CAFFERY PKWY. SCOTT, LOUISIANA ZIP 70583-8544 PHONE: (318) 237-4775

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Matrix: Units:

Water μg/L

Batch Id: HPLC950905210500

MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix	Spike	Matrix Spike Duplicate		MS/MSD Relative %	QC Limits(***) (Advisory)		
	<2>	<3>	Result <1>	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery Range	
1-METHYLNAPHTHALENE 2-METHYLNAPHTHALENE	ND ND	0.100 0.100	0.052 0.057	i I	0.065 0.071	65.0 71.0	22.2 21.9	30 30		

Analyst: SJ

Sequence Date: 09/05/95

SPL ID of sample spiked: BLK Sample File ID: 9509050130201

Method Blank File ID:

Blank Spike File ID: 9509050100201

Matrix Spike File ID: 9509050110201

Matrix Spike Duplicate File ID: 9509050060301

* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

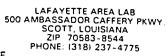
LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = |(<4> - <5>)| / [(<4> + <5>) x 0.5] x 100

(**) = Source: 8310 SW846 (***) = Source: 8310 SW846

SAMPLES IN BATCH(SPL ID):

9508A65-09C 9508A65-10C 9508A65-11C 9508A65-12C



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** SPL BATCH QUALITY CONTROL REPORT ** Method Mod. 8021 ***

Matrix: Units:

Water μg/L

Batch Id: HP00950830151400

LABORATORY CONTROL SAMPLE

SPIKE	Method Spike		Blank	Spike	QC Limits(**)		
COMPOUNDS	Blank Result	Added	Result	Recovery	(Mandatory)		
	<2>	<3>	<1>	*	% Recovery Range		
DICHLORODIFLUOROMETHANE	ND	25.0	26.1840	105	50 - 140		
CHLOROMETHANE	ND	25.0	21.6794	86.7	50 - 140		
VINYL CHLORIDE	ND	25.0	20.5320	82.1	50 - 140		
BROMOMETHANE	ND	25.0	28.6995	115	50 - 140		
CHLOROETHANE	סא	25.0	26.7342	107	50 - 140		
TRICHLOROFLUOROMETHANE	ND	25.0	26.3348	105	50 - 140		
1,1-DICHLOROETHENE	ND	25.0	24.8164	99.3	50 - 140		
METHYLENE CHLORIDE	3.2256	25.0	23.9321	95.7	50 - 140		
TRANS-1,2-DICHLOROETHENE	ND	25.0	27.8029	111	50 - 140		
1,1-DICHLOROETHANE	ND	25.0	28.4910	114	50 - 140		
2,2-DICHLOROPROPANE	ND	25.0	25.9416	104	50 - 140		
CIS-1,2-DICHLOROETHENE	DN	25.0	21.4063	85.6	50 - 140		
CHLOROFORM	ND	25.0	24.6378	98.6	50 - 140		
BROMOCHLOROMETHANE	ND	25.0	26.9981	108	50 - 140		
1,1,1-TRICHLOROETHANE	ND	25.0	25.5518	102	50 - 140		
1,1-DICHLOROPROPENE	ND	25.0	25.4419	102	50 - 140		
ARBON TETRACHLORIDE	ND	25.0	25.7742	103	50 - 140		
BENZENE	ND	25.0	23.5152	94.1	50 - 140		
1,2-DICHLOROETHANE	ND	25.0	25.0990	100	50 - 140		
TRICHLOROETHENE	ND	25.0	22.7991	91.2	50 - 140		
1,2-DICHLOROPROPANE	ND	25.0	24.2517	97.0	50 - 140		
BROMODICHLOROMETHANE	ND	25.0	26.0986	104	50 - 140		
DIBROMOMETHANE	ND	25	27,4817	110	50 - 140		
CIS-1,3-DICHLOROPROPENE	ND	25.0	24.7273	98.9	50 - 140		
TOLUENE	ND	25.0	23.2886	93.2	50 - 140		
TRANS-1,3-DICHLOROPROPENE	ND	25.0	25.3771	102	50 - 140		
1,1,2-TRICHLOROETHANE	ND	25.0	24.6771	98.7	50 - 140		
TETRACHLOROETHENE	ND	25.0	24.2288	96.9	50 - 140		
1.3-DICHLOROPROPANE	ND	25.0	26.8351	107	50 - 140		
DIBROMOCHLOROMETHANE	ND	25.0	28.0794	112	50 - 140		
1,2-DIBROMOETHANE	ND ND	25.0	33.5819	134	50 - 140		
CHLOROBENZENE	ND	25.0	14.5377	58.2	50 - 140		
ETHYL BENZENE	ND	25.0	22.3985	89.6	50 - 140		
1,1,1,2-TETRACHLOROETHANE	ND	25.0	22.564	90.3	50 - 140		
M AND P XYLENE	ND ND	50.0	47.1082	94.2	50 - 140		
	1	25.0	24.1894	96.8	50 - 140		
O-XYLENE	ND	1	25.4552	102	50 - 140		
STYRENE	ND	25.0 25.0	25.4923	102	50 - 140		
ISOPROPYLBENZENE	ND ND		22.9575	91.8	50 - 140		
BROMOFORM	ND	25.0 25.0	25.8268	103	50 - 140		
1,1,2,2-TETRACHLOROETHANE	ND ND	1	26.0491	104	50 - 140		
1,2,3-TRICHLOROPROPANE	ND	25.0			50 - 140		
1-PROPYL BENZENE	ND	25.0	24.4031	97.6	JU - 140		





** SPL BATCH QUALITY CONTROL REPORT **

Method Mod. 8021 ***

Matrix: Units: Water μg/L Batch Id: HP00950830151400

LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	Blank	Spike	QC Limits(**)			
COMPOUNDS	Blank Result	Added	Result	Recovery	(Mandatory)			
	<2>	<3>	<1>	z	% Recovery Range			
BROMOBENZENE	ND	25.0	29.9129	120	50 - 140			
1,3,5-TRIMETHYLBENZENE	ND	25.0	18.6835	74.7	50 - 140			
2-CHLOROTOLUENE	ND	25.0	28.7790	115	50 - 140			
4-CHLOROTOLUENE	ND	25.0	33.4298	134	50 - 140			
TERT-BUTYLBENZENE	DM	25.0	20.3257	81.3	50 - 140			
1,2,4-TRIMETHYLBENZENE	DM	25.0	23.3630	93.5	50 - 140			
SEC-BUTYLBENZENE	ND	25.0	23.3161	93.3	50 - 140			
P-ISOPROPYLTOLUENE	ND	25.0	22.6430	90.6	50 - 140			
1,3-DICHLOROBENZENE	ND	25.0	22.5027	90.0	50 - 140			
1,4-DICHLOROBENZENE	ND	25.0	23.2425	93.0	50 - 140			
N-BUTYLBENZENE	ND.	25.0	20.6493	82.6	50 - 140			
1,2-DICHLOROBENZENE	ND	25.0	24.8405	99.4	50 - 140			
1,2-DIBROMO-3-CHLOROPROPAN	ND	25	28.4156	114	50 - 140			
1,2,4-TRICHLOROBENZENE	ND	25.0	24.3000	97.2	50 - 140			
HEXACHLOROBUTAD I ENE	ND	25.0	24.8000	99.2	50 - 140			
IAPHTHALENE	ND	25.0	24.6000	98.4	50 - 140			
,2,3-TRICHLOROBENZENE	ND	25.0	24.3000	97.2	50 - 140			
I-ISOPROPYL ETHER	DN	25.0	24.0045	96.0	50 - 140			
METHYL-T-BUTYL ETHER	ND	25.0	32.7796	131	50 - 140			

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Spike Results Added		Matrix Spike		Matrix Spike		MS/MSD Relative %	QC Limits(***) (Advisory)		
	<2>	<3>	Result <1>	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery	Range
VINYL CHLORIDE	ND	25.0	22.8774	91.5	23.2826	93.1	1.73	30	50 -	140
CHLOROETHANE	ОИ	25.0	25.3091	101	27.5037	110	8.53	30	50 -	140
METHYLENE CHLORIDE	3.2256	25.0	25.3194	88.4	24.6764	85.8	2.99	30	50 -	140
1,1-DICHLOROETHANE	DN	25.0	21.7799	87.1	21.5044	86.0	1.27	30	50 -	140
CHLOROFORM	ND	25.0	23.1033	92.4	23.4565	93.8	1.50	30	50 -	140
1,1,1-TRICHLOROETHANE	ND	25.0	21.9759	87.9	21.8824	87.5	0.456	30	50 -	140
CARBON TETRACHLORIDE	ND	25.0	20.7463	83.0	20.4811	81.9	1.33	30	50 -	140
BENZENE	ND	25.0	22.6443	90.6	23.2782	93.1	2.72	30	50 -	140
1,2-DICHLOROETHANE	ND	25.0	23.8334	95.3	23.2488	93.0	2.44	30	50 -	140
TRICHLOROETHENE	ND	25.0	21.0718	84.3	19.6666	78.7	6.87	30	50 -	140
BROMODICHLOROMETHANE	ND	25.0	19.5835	78.3	18.9835	75.9	3.11	30	50 -	140
TOLUENE	ND	25.0	22.7989	91.2	22.9802	91.9	0.765	30	50 -	140
1,1,2-TRICHLOROETHANE	ND	25.0	23.7975	95.2	24.0071	96.0	0.837	30	50 -	140
TETRACHLOROETHENE	ND	25.0	23.2178	92.9	23.4818	93.9	1.07	30	50 -	140
HLOROBENZENE	ND	25.0	24.5309	98.1	25.3393	101	2.91	30	50 -	140



SPL BATCH QUALITY CONTROL REPORT ** Method Mod. 8021 ***

LAFAYETTE AREA LAB 500 AMBASSADOR CAFFERY PKWY. SCOTT, LOUISIANA ZIP 70583-8544 PHONE: (318) 237-4775

PAGE

Matrix: Units:

Water μg/L

Batch Id: HP00950830151400

MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative %	QC Limits(***) (Advisory)		
	<2>	<3>	Result <1>	Recovery <4>	Result	Recovery <5>	Difference	RPD Max.	Recovery	Range
ETHYL BENZENE	ND	25.0	22.2225	88.9	23.7045	94.8	6.42	30	50 -	140
M AND P XYLENE	DN	50.0	46.7081	93.4	46.2217	92.4	1.08	30	50 -	140
O-XYLENE	ND	25.0	23.4333	93.7	24.6352	98.5	4.99	30	50 -	140
ISOPROPYLBENZENE	ND	25.0	25.4072	102	27.2965	109	6.64	30	50 -	140
1,1,2,2-TETRACHLOROETHANE	ND	25.0	29.5070	118	23.8985	95.6	21.0	30	50 -	140
SEC-BUTYLBENZENE	סא	25.0	24.1239	96.5	26.0417	104	7.48	30	50 -	140
P-ISOPROPYLTOLUENE	DN	25.0	23.3667	93.5	25.1803	101	7.71	30	50 -	140
1,3-DICHLOROBENZENE	ND	25.0	20.2280	80.9	19.7089	78.8	2.63	30	50 -	140
1,4-DICHLOROBENZENE	ND	25.0	20.3291	81.3	20.8923	83.6	2.79	30	50 -	140
N-BUTYLBENZENE	ND	25.0	21.4868	85.9	22.0857	88.3	2.76	30	50 -	140
1,2-DICHLOROBENZENE	DN	25.0	22.4629	89.9	23.1550	92.6	2.96	30	50 -	140
NAPHTHALENE	ND	25.0	22.7201	90.9	25.0732	100	9.53	30	50 -	140
	, ,		ŧ	1 1		ı				

Analyst: PW

quence Date: 08/30/95

L ID of sample spiked: BLANK Sample File ID: \EH30302.ra

Method Blank File ID:

Blank Spike File ID: \EH30316.ra Matrix Spike File ID: \EH30320.ra

Matrix Spike Duplicate File ID: \EH30321.ra

* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit % Recovery = [(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100

(**) = Source: SPL Lafayette, 11/94 (***) = Source: SPL Lafayette, 11/94

SAMPLES IN BATCH(SPL ID):

9508A65-12A 9508A65-13A 9508C04-03A 9508C04-04A

9508A65-07A 9508A65-08A 9508A65-09A 9508A65-10A

9508A65-11A





Matrix: Water

Reported on: 09/01/95

Analyzed on: 08/30/95

Analyst:

AH

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Diesel Range Organics WI LUST DRO #

SPL Sample ID Number	Blank Value mg/L	Amt Added mg/L	Matrix Spike Recovery %	Matrix Spike Duplicate Recovery %	Relative Percent Difference %	QC Limits Recovery	RPD Max.
BLANK_SPIKE	0.1	1.0	100	100	0	50 - 130	30

TPHD950829110000-9509032

Samples in batch:

9508A65-07B

9508A65-08B

9508A65-09B 9508A65-10B

9508A65-11B

9508A65-12B

9508A65-13B

COMMENTS:

BLANK CONTRIBUTION OF LESS THAN 5 TIMES OF THE DETECTION LIMIT. UNABLE TO REEXTRACT DUE TO NO MORE SAMPLES AVAILABLE.

SPL, Incorporated





Matrix: Water

Reported on: 09/07/95

Analyzed on: 08/31/95

Analyst:

TB

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Gasoline Range Organics WI LUST GRO #

SPL Sample ID Number	Blank Value mg/L	Amt Added mg/L	Matrix Spike Recovery	Matrix Spike Duplicate Recovery %	Relative Percent Difference %	OC Limits Recovery	RPD Max.
9508A30-01A	ND	5.0	96.0	104	8.0	70 - 130	20

FIDA950831081401-9509212

Samples in batch:

9508A65-07A 9508A65-08A

9508A65-09A

9508A65-10A

9508A65-11A

9508A65-12A

9508A65-13A

COMMENTS:

SPL, Incorporated





Matrix: Soil

Reported on: 08/31/95

Analyzed on: 08/30/95

Analyst:

DB

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

Total Solids Method 2540G **

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration	Duplicate Sample %	RPD	RPD Max.
9508B95-05A	90.4	87.9	2.8	20

TSOL950830150000-9508E56

Samples in batch:

9508A65-01B	9508A65-02B	9508A65-03B	9508A65-04B
9508A65-05B	9508A65-06B	9508B94-01A	9508B94-02A
9508894-03A	9508B94-04A	9508B94-05A	9508B94-06A
9508B94-07A	9508B95-01A	9508B95-02A	9508B95-03A
9508895-04A	9508B95-05A	9508C05-03A	

COMMENTS:

SPL, Incorporated have Original





Matrix: Water

Reported on: 08/31/95

Analyzed on: 08/30/95

Analyst:

CB

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Lead, Total Method 239.2 *

SPL Sample ID Number	Blank Value mg/L	Amt Added mg/L	Matrix Spike Recovery	Matrix Spike Duplicate Recovery %	Relative Percent Difference %	QC Limits Recovery	RPD Max.
9508A65-07D	ND	80	90.4	93.1	2.9	75 - 125	20

5100950830151500-9508E60

Samples in batch:

 9507A73-01C
 9508A65-07D
 9508A65-08D
 9508A65-09D

 9508A65-10D
 9508A65-11D
 9508A65-12D
 9508A65-13D

 9508A72-01C
 9508B48-01C
 9508B91-01C

COMMENTS:

SPL, Incorporated



SPL CHEST #

ENVIRONMENTAL LABORATORY

DATE 0-1000

	ENVIRONMENTAL BADONATORT	DATE 0-26	5-75
CLIENT CHEST: YES/NO	SAMPLE LOGIN CHECKLIST		
1) IS A CHAIN-OF CUSTO	DY FORM PRESENT:	YES	NO
2) IS THE COC PROPERLY	COMPLETED:		

3) 4)	HAS CLIENT BEEN CONTACTED ABOUT INCOMPLETE COC: IS AIRBILL/PACKING LIST/BILL OF LADING ATTACHED	
-,	TO SHIPMENT: IF YES, ID# 6494484290 - Fed - X	
5)	ARE CUSTODY SEALS PRESENT ON THE PACKAGE: IF YES, ARE THEY INTACT UPON RECEIPT:	
	ARE ALL SAMPLES TAGGED OR LABELED: DO THE LABELS MATCH THE COC: IF NO, HAS CLIENT BEEN CONTACTED ABOUT IT: (PLACE SUBSEQUENT DOCUMENTATION FROM CLIENT IN REN	MARKS)
7)	DO ALL SHIPPING DOCUMENTS AGREE: IF NO, DESCRIBE WHAT IS IN NONCONFORMITY:	
	CONDITION/TEMPERATURE OF SHIPPING CONTAINER:	88-5 F5-5 3w
9) (REIGHT
LO) S REMARI	SAMPLE DISPOSAL: SPL RETURN TO KS/CONTACT/PHONE/DATE:	CLIENT

CO.: Natural Resource	Tech REPTS TO:	INV.TO:	
≕ ROJ #:	ATTN:	ATTN:	
PROJ LOC.: WI	ADDR:	ADDR:	
SPL REP .: Sech	CTY/ST	CTY/ST	

9508HLaS

CHAIN OF CUHILLY RECORD

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Sample Collectors(s)/S					,	~ / I			SOURCE TECHNOLOG AUKEE, WISCONSIN	, INC.	.	Laboratory	Samples	are Bein	Submit	ed To:	<u>S,</u>	PL	<u>., 56</u>	H, L.K
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Site Name:				γ.	SLEU		Send Recort To: Project Manager:	im N	MUELLER Project	Numbe	r: l	076			Temp	erature o	of tempe	rature b	olank	
Site Address:			_				Natural Resource Tec 23713 W. Paul Road	hnology	ECCY KOEP!	nber:					received	on ice a	ind there	e was ic	e remaining, you may	
			au ko	re	w.	T	Pewaukee, WI 53077 Telephone (414) 523	2			-		melt may						·	•
I hereby certify that I	received,	prope	erly handled	, and ma	intained c	ustody of the	hese samples as noted be	low:	.,					Analytic	l Metho	d / Num	bers			Lab Use Only
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Field ID Number	Date Collected		Time Collected		nple Device	Location	/ Description	PID Reading	Field Comments	•	serv. /pe	# of Cont.	0	t/	/.	4 (3/~	Lab ID Number	Conditions @ Laboratory
MW-110/35)	08/23	195		Soil	55	DE	PTH 2.5.4.5			10	E	2	X >	4						
NW-111/3.5	08/24	95		Soil	55	DE	0TH 2.5-4.5			10	E	Z	X	<						5.
MC-106(3.5)	8/25	hs		1		10	(1 1)			1		Z	x \						6/2	C4140
MW-107(3.5)						1	. 11 15					ک	× .						V	300C> J
MW-108(3-5)						11), 11					2	X	<						1, Oly
MW109-3.5	$\sqrt{}$			V	V	10	11 10					2	X>	<						٥٥٩٠٠
P2-101	8/25/	45		GW	Bailer	Pie	2 . 101					7		1	1	2	2			1801
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MW-105					Ш	MI	v-105					7		\\	1	۷	2	`\		(0
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MW-ZZ SPECIAL INSTRUCT	TIONS	N	EEL	R	Esl	174	5 BY	9-4	1-95			_			oratory shi				ys after issuing e below:	
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APPENDIX G MICROBIAL AND NUTRIENT ANALYTICAL REPORTS

Facsimile Cover Sheet

Technologies, Inc.

NOTICE: This facsimile is intended only for the addressee shown below and may contain confidential or privileged information. If the recipient of this material is not the intended recipient or if you have received this transmission in error, please notify us immediately by telephone and return the original material to BioRenewal Technologies at the below address via U.S. Postal Service. Thank you for your cooperation.

Tim Mueller/Rebecca Koepke

Natural Resource Technology, Inc. Company:

414/523-9000 Phone:

414/523-9001 Fax:

From: M. Lynn Haugh

Company: BioRenewal Technologies, Inc.

608/276-8980 Phone: 608/273-6989 Fax:

Date: September 27, 1995

Pages (incl cover page):

MASTER FILE COPY

PROJECT #___ 1096 CO:

If there is a problem with this transmission, please call (608) 276-8980

Comments:

re: BioRenewal Job Code ABF

Dear Tim/Becky::

Here are the results from our comparative enumeration assays and nutrient analyses for the 3 soil samples you sent us in connection with the Citgo Terminal site located in Milwaukee, WI (project number 1096, task 4). These samples were received by BioRenewal Technologies, Inc. on 8/18 & 8/19/95. I will enclose the invoice and chain of custody for this job with the mailed confirmation copy.

The analytical results requested are presented in the following sections:

- Site suitability for passive bioremediation in relation to suggested guidelines
- Microbial data summary
- Nutrient conditions
- Soil physical conditions.

These samples were processed by BioRenewal using weathered gasoline or diesel fuel (separately) as the sole carbon source for enumerating the "degrader" populations. Samples were received on ice and cold.

Please give me a call if you wish to further discuss these results or have other questions. Thank you for retaining BioRenewal for the project. We look forward to working again with you in the future.

Sincerely

ynn Haugh

Microbial Services Manager

Enclosures:

Analytical results

Invoice

Chain of custody

Bio-Analytical Summary Report

9/18/95 Job Code: ABF

Site Information

Site Name Location Citgo Terminal

Milwaukee, WI

weathered gas or diesel

Contaminant Consultant Proj. Contact

Natural Resource Technology

Proj. Contact Rebecca Koepke Project Ref ID 1096 (Task 4) Number samples

Sample Type

3 soil

Date received

18-Aug & 19-Aug-95

Date of this Report

18-Sep-95

BioRenewal Job Code

ABF

Section I - Summary of Bioremediation Data

Nutrient/physical factors are as suggested by Wisconsin DNR guidelines for site characterization requirements for natural biodegradation. Microbial factors are shown according to bio-engineering norms.

	Soil micro	bial	Soil moist.					
	populat	tions:	content:	%		% TON of		
	Exceeds nor	m for:	% of field	Air-filled		organic		
	Passive	Active	capacity	pore space	pH	matter	C:N	C:P
Suggested	>1E+06	>1E+03	25-85%	>10%	5.5-8.5	>1.5%	<40	<120
guideline								
Note Ref.	1	2	3	4	5	6	7	8
MW-102 (3)	×	✓ .	×	✓	×	✓	✓	×
MW-104 (3.5)	×	✓	✓	✓	×	✓	✓	×
SB-102 (3.5)	*	✓	*	✓	×	✓	✓	x

The nutrient/physical paprameters summarized above, in the case of unsaturated zone soils, reflect suggested minimum Wis Dept of Nat Res "site characterization requirements for natural biodegradation projects" as presented on pp 10-11 in Interim Guidance for Natural Biodegradation as a Remedial Action Option Dated February 8, 1993. BioRenewal stress that these "suggested guidelines" are only intended to provide a working frame of reference for evaluation. Each site is unique and requires professional judgement in order to select an appropriate remedial design. We provide this information in recognition that our clients need to work within the guidelines suggested by the state. Further, we hope this will facilitate continued evolution of a working framework for evaluating sites as to the potential for bioremediation whether through site augmentation or natural attenuation.

Notes: Check indicates that sample meets guideline. Blank indicates no detect or data not available for that sample.

- x indicates sample does not meet guideline.
- 1) Microbial population levels in soils generally accepted as potentially adequate to support passive biodegradation. These levels are based on bio-engineering norms and not WDNR guidelines.
- 2) Microbial population levels in soils generally accepted as minimum to serve as an "inoculum" for implementing active bioremedial strategies.
- 3) See page 10, WDNR as referenced above. The suggested optimum range is 50-80% (P. 6).
- 4) See page 8 and 10, WDNR. WDNR suggests a minimum air-filled porosity in soil of 10% is necessary for adequate ozygen diffusion in the soil gas to support biodegradation.
- 5) See pages 7 and 11, WDNR.
- 6) See pages 9 and 11, WDNR. Total Organic Nitrogen (calculated from TKN values minus ammonium nitrogen values) divided by organic matter.
- 7) See pages 9 and 11, WDNR.
- 8) See pages 9 and 11, WDNR.

Bio-Analytical Summary Report

9/18/95 Job Code: ABF

ean Lo +04 1.78E+(+05 1.55E+(+03 6.61E+(04 2.06E+04 05 1.78E+05			1.00E+03	1.00E+04			Range 1.00E+07	1.00E+08	1.00E+09
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	E+04 1.26E+(E+04 1.17E+(E+04 5.87E+(E+04 5.54E+(E+02 1.14E+(E+00 1.05E+(E+04 1.26E+04 1.51E+04 E+04 1.17E+04 1.38E+04 E+04 5.87E+04 7.36E+04 E+04 5.54E+04 6.95E+04 E+02 1.14E+02 3.86E+02 E+00 1.05E+00 3.82E+01	Mean Low High E+04 1.26E+04 1.51E+04 E+04 1.17E+04 1.38E+04 E+04 5.87E+04 7.36E+04 E+04 5.54E+04 6.95E+04 E+02 1.14E+02 3.86E+02 E+00 1.05E+00 3.82E+01	Mean Low High E+04 1.26E+04 1.51E+04 E+04 1.17E+04 1.38E+04 E+04 5.87E+04 7.36E+04 E+04 5.54E+04 6.95E+04 E+02 1.14E+02 3.86E+02 E+00 1.05E+00 3.82E+01	Mean Low High E+04 1.26E+04 1.51E+04 E+04 1.17E+04 1.38E+04 E+04 5.87E+04 7.36E+04 E+04 5.54E+04 6.95E+04 E+02 1.14E+02 3.86E+02	Mean Low High E+04 1.26E+04 1.51E+04 E+04 1.17E+04 1.38E+04 E+04 5.87E+04 7.36E+04 E+04 5.54E+04 6.95E+04 E+02 1.14E+02 3.86E+02 E+00 1.05E+00 3.82E+01	Mean Low High E+04 1.26E+04 1.51E+04 E+04 1.17E+04 1.38E+04 E+04 5.87E+04 7.36E+04 E+04 5.54E+04 6.95E+04 E+02 1.14E+02 3.86E+02 E+00 1.05E+00 3.82E+01	Mean Low High E+04 1.26E+04 1.51E+04 E+04 1.17E+04 1.38E+04 E+04 5.87E+04 7.36E+04 E+04 5.54E+04 6.95E+04 E+02 1.14E+02 3.86E+02 E+00 1.05E+00 3.82E+01	Mean Low High E+04 1.26E+04 1.51E+04 E+04 1.17E+04 1.38E+04 E+04 5.87E+04 7.36E+04 E+04 5.54E+04 6.95E+04 E+02 1.14E+02 3.86E+02 E+00 1.05E+00 3.82E+01	E+04 1.26E+04 1.51E+04 E+04 1.17E+04 1.38E+04 E+04 5.87E+04 7.36E+04 E+04 5.54E+04 6.95E+04 E+02 1.14E+02 3.86E+02 E+00 1.05E+00 3.82E+01

Inoculum levels = Degrader populations between 1.0E+03 and 1.0E+06 are amenable to site augmentation but generally are insufficient to attain adequate biotransformation without increased populations.

Active degradation levels = Degrader populations greater than 1.0E+06 are generally of sufficient magnitude to support measurable biotransformation. Additional site augmentation may still be required to attain desireable rates of transformation.

Assay conditions		% Carbon	Incubation	Growth	Degrees of Freedom**		
	Carbon source	(v/v)	Temperature	Conditions	Totals	Degraders	
MW-102 (3)	diesel	1.0	22	Aerobic	9	9	
MW-102 (3)	weathered gas	1.0	22	Aerobic	9	9	
MW-104 (3.5)	diesel	1.0	22	Aerobic	9	4	
MW-104 (3.5)	weathered gas	1.0	22	Aerobic	9	4	
SB-102 (3.5)	diesel	1.0	22	Aerobic	9	4	
SB-102 (3.5)	weathered gas	1.0	22	Aerobic	9	4	

cfu/gm (DSW) = colony forming units per gm of dry soil weight

Degrees of freedom is number of replicates minus one. This parameter is used in calculation of 95% confidence intervals.

9/18/95 Job Code: ABF

Section III - Nutrient Conditions All units in mg/kg or ppm itrogen Log ppm 1 10 100 1000 10000 NH4-N **TKN** MW-102 (3) 234 2.5 MW-104 (3.5) 96 3.0 176 3.5 SB-102 (3.5) **M TKN** NH4-N Available Phosphorus and Potassium Log ppm Avail Avail 100 1000 10 Р K MW-102 (3) <1 105 <1 65 MW-104 (3.5) 70 SB-102 (3.5) 1 M Available P Available K **Organic Matter and Related Analyses** C:P Guideline Published Threshholds* C:N 40 120 Wis Dept. Natural Resources Below: 6 30 Cation Exc Nat'l Academy of Sciences Below: SO4-S NO3-N **Calculated Ratios** Mg Ca Capacity % Organic TOC** C:N C:P Meq/100g pН ppm ppm Matter ppm ppm 8.6 NR NR 7 NR NR NR MW-102 (3) 0.4% 1,560 >1,560 NR NR NR 8.8 NR NR 0.3% 13 >1,170 MW-104 (3.5) 1,170 NR NR 8.7 NR NR 7 NR 1,170 SB-102 (3.5) 0.3% 1,170

Note To determine C:N and C:P ratios, phosphorus is expressed as available phosphorus, total organic carbon (TOC) is calculated from percent organic carbon and total organic nitrogen is calculated as total Kjeldahl nitrogen (TKN) minus ammonium nitrogen.

^{*} Sources: Natural Biodegradation as a Remedial Action Option - Interim Guidance, Wisconsin Dept of Nat Res. (1993) and In-situ Bioremediation: When Does it Work?, B. Rittman, Ed., National Academy of Sciences, 1993 p 117.

^{**} Estimated total organic carbon (expressed in ppm) calculated from % organic matter - See Methods.

n/a = Not applicable

9/18/95 Job Code: ABF

Particle size													
i ai ticle Size						Perce	nt Gr	avel -	Sand -	Silt - C	Clay		100
	Gravel Fraction	Sand	Silt	Clay	0% 10%						-	80% 90%	
MW-102 (3)	NR	NR	NR	NR		-							
MW-104 (3.5)	NR	NR	NR	NR		-							
SB-102 (3.5)	NR	NR	NR	NR		- -							
					-	- -							
						_							
					-				······				
n/a=not applica NR=not request					9	- 6 Grave	I % %	∞ San	d	% Silt		% Clay	
	ted	Ire Condi CEA % Moisture	tions Core % Moisture	% Water Holding Capacity	Moisture as % Wate Holding Capacity	# v · · · · · · · · · · · · · · · · · ·	10.0		20.0%		0%	% Clay	50.0%
NR=not request	and Moistu % Air-filled	CEA %	Core %	Water Holding	Moisture as % Wate Holding	· · · · · · · · · · · · · · · · · · ·					0%		50.0%
NR=not request	and Moistu % Air-filled pore space	CEA % Moisture	Core % Moisture	Water Holding Capacity	Moisture as % Wate Holding Capacity	· · · · · · · · · · · · · · · · · · ·					0%		50.0%
NR=not request	*Air-filled pore space 22.9%	CEA % Moisture 16.7%	Core % Moisture 15.2%	Water Holding Capacity 16.5%	Moisture as % Wate Holding Capacity 91.8%	· · · · · · · · · · · · · · · · · · ·					0%		50.0%
NR=not request oil Oxygen MW-102 (3) MW-104 (3.5)	% Air-filled pore space 22.9% 31.4%	CEA % Moisture 16.7% 13.8%	Core % Moisture 15.2% 14.5%	Water Holding Capacity 16.5% 18.2%	Moisture as % Wate Holding Capacity 91.8%	· · · · · · · · · · · · · · · · · · ·					0%		50.0%
NR=not request oil Oxygen MW-102 (3) MW-104 (3.5)	% Air-filled pore space 22.9% 31.4%	CEA % Moisture 16.7% 13.8%	Core % Moisture 15.2% 14.5%	Water Holding Capacity 16.5% 18.2%	Moisture as % Wate Holding Capacity 91.8%	· · · · · · · · · · · · · · · · · · ·					0%		50.0%

CHAIN OF CUSTODY RECORD

Sample Collectors	(s)/Signature(s)	T. K	O TPI	KE		(lu)	NAT	URAL RES	SOURCE TECHNOLOG AUXEE, WISCONSIN	GY, INC.	Laborator					d To:		B.T/ Attached: YES_	NO
Site Name:	CITGO 9235 MILWA	JE N. 1	RN 107	1	3T	Matural Re 23713 W. Pewaukee,	source Tech Paul Road WI 53072	nology, Inc	VELLER Project	et Number: /	096-	If san	nple(s) v	vere rec	Temper ceived o	n ice an ice". If	d there w	ire blank as ico remaining, you in Ace was melted, the ten	ay report the
I hereby certify the Religious Age of the Religious Age of Religious Age of Religious Age of the Religious Age of	Signature)	perly handled	Date/Vir	ne / P.		,	(Signature)	301 ml	9038\$5 -	Date/Time Date/Time	10:10 5 2H1	7		1	1 /2	Numb	2,5,07	, (O) a,	Lab Use Only Sizuples on I co in good enditing.
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SPECIAL INSTR	UCTIONS	<u> </u>			<u></u>				1			L	<u> </u>	analyti	ical repor		dicated oth	30 days after issuing erwise below:	

CHAIN OF CUSTODY RECORD

					>															
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7,00			_/	IM	ju	1009	1	 				mber/Ac	ldendum	Numl	ber			Atta	ched: YES	NO _
Site Name:						Send Repo	ort To: 11	n M	WECLER Project E. BELLY KOEP Task Nur	Number: 1	094	,,	-1-7->				temperatur		naining, you ma	
Site Address:	Z35_	N. 1	1071	# <u>></u>	TREET	23713 V	/. Paul Road	nnology, In-	" BELICY FOEP	nber:		tempe	ature as	"recei	ved on	ice". If	all of the	ice was	melted, the temp	
	11cwau		U	NI		Pewauke	e, WI 53072	!	(414) 523-9001			melt n	nay be s	ubstitu	ted for	a temper	ature hy	k! NO		
I hereby certify that	I received, prop	perly handle	d, and mai	intained c	ustody of t	hese sample	s as noted be	low:					Anal	rtical	Method	Multer	er _k S)	<u> </u>		Lab Use Only
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PT 1 - ORIGINAL-WHITE PT 2 - LABORATORY COPY-YELLOW PT 3 - NRT FIELD COPY-PINK

CALCULATED PARAMETER (TON, CON, CON)

COPY-PINK

COP

Facsimile Cover Sheet

Technologies, Inc.

NOTICE: <u>This facsimile is intended only for the addressee shown below and may contain confidential or privileged information</u>. If the recipient of this material is not the intended recipient or if you have received this transmission in error, please notify us immediately by telephone and return the original material to BioRenewal Technologies at the below address via U.S. Postal Service. Thank you for your cooperation.

To: Tim Mueller/Rebecca Koepke

Company: Natural Resource Technology, Inc.

Phone: 414/523-9000 Fax: 414/523-9001

From: M. Lynn Haugh

Company: BioRenewal Technologies, Inc.

Phone: 608/276-8980 Fax: 608/273-6989

Date: September 27, 1995

Pages (incl cover page): 4

MASTER FILE COPY

PROJECT # 1096 CO: ______ da ta

If there is a problem with this transmission, please call (608) 276-8980

Comments:

re: BioRenewal Job Code ABO

Dear Tim/Becky::

Here are the results from our comparative enumeration assays and nutrient analyses for the 3 groundwater samples you sent us in connection with the Citgo Terminal site located in Milwaukee, WI (project number 1096, task 4). These samples were received by BioRenewal Technologies, Inc. on 8/30/95. I will enclose the invoice and chain of custody for this job with the mailed confirmation copy.

The analytical results requested are presented in the following sections:

- Site suitability for passive bioremediation in relation to suggested guidelines
- Microbial data summary
- Nutrient conditions

These samples were processed by BioRenewal using weathered gasoline or diesel fuel (separately) as the sole carbon source for enumerating the "degrader" populations. Samples were received on ice and cold.

Please give me a call if you wish to further discuss these results or have other questions. Thank you for retaining BioRenewal for the project. We look forward to working again with you in the future.

Sincerely,

M. Lynn Haugh

Microbial Services Manager

Enclosures:

Analytical results

Invoice

Chain of custody

Bio-Analytical Summary Report

9/27/95 Job Code: ABO

Site Information

Site Name Location

Citgo Terminal

Milwaukee, WI

Contaminant Consultant

weathered gas or diesel Natural Resource Technology

Proj. Contact Rebecca Koepke

Project Ref ID 1096 (Task 4)

Number samples

Sample Type

Date received

30-Aug-95

groundwater

Date of this Report

26-Sep-95

BioRenewal Job Code

ABO

Section I - Summary of Bioremediation Data

Nutrient/physical factors are as suggested by Wisconsin DNR guidelines for site characterization requirements for natural biodegradation. Microbial factors are shown according to bio-engineering norms.

	Soil micro	oil microbial Soil moist.						
	popula	tions:	content:	-				
	Exceeds not	m for:	% of field	Air-filled		organic		
	Passive	Active	capacity	pore space	pН	matter	C:N	C:P
Suggested guideline	>1E+06	>1E+03	25-85%	>10%	5.5-8.5	>1.5%	<40	<120
Note Ref.	1	2	3	4	5	6	7	8
MW-102	Guidel	nes not valid for	groundwater at th	nis time.				
MW-103	Guidel	nes not valid for	groundwater at th	nis time.				
MW-104	Guidel	nes not valid for	groundwater at th	nis time.				
								· · · · · · · · · · · · · · · · · · ·

The nutrient/physical paprameters summarized above, in the case of unsaturated zone soils, reflect suggested minimum Wis Dept of Nat Res "site characterization requirements for natural biodegradation projects" as presented on pp 10-11 in Interim Guidance for Natural Biodegradation as a Remedial Action Option Dated February 8, 1993. BioRenewal stress that these "suggested guidelines" are only intended to provide a working frame of reference for evaluation. Each site is unique and requires professional judgement in order to select an appropriate remedial design. We provide this information in recognition that our clients need to work within the guidelines suggested by the state. Further, we hope this will facilitate continued evolution of a working framework for evaluating sites as to the potential for bioremediation whether through site augmentation or natural attenuation.

Notes: Check indicates that sample meets guideline. Blank indicates no detect or data not available for that sample.

- x indicates sample does not meet guideline.
- 1) Microbial population levels in soils generally accepted as potentially adequate to support passive biodegradation. These levels are based on bio-engineering norms and not WDNR guidelines.
- 2) Microbial population levels in soils generally accepted as minimum to serve as an "inoculum" for implementing active bioremedial strategies.
- 3) See page 10, WDNR as referenced above. The suggested optimum range is 50-80% (P. 6).
- 4) See page 8 and 10, WDNR. WDNR suggests a minimum air-filled porosity in soil of 10% is necessary for adequate ozygen diffusion in the soil gas to support biodegradation.
- 5) See pages 7 and 11, WDNR.
- 6) See pages 9 and 11, WDNR. Total Organic Nitrogen (calculated from TKN values minus ammonium nitrogen values) divided by organic matter.
- 7) See pages 9 and 11, WDNR.
- 8) See pages 9 and 11, WDNR.

Bio-Analytical Summary Report

9/27/95

l'echnologies, Inc.										J	ob Cod	de: ABO			
Section II - Mi Froundwater	crobial D	ata Sumn	nary cont	inued	All va	ues in cf	u/ml								
amples ـــٰــ					Low and High indicate 95% Confidence Range										
Total populations	\$														
	Mean	Low	High	1.00E+01	1.00E+02	1.00E+03	1.00E+04	1.00E+05	1.00E+06	1.00E+07	1.00E+	+08 1.00E+0			
MW-102	1.61E+06	1.50E+06	1.72E+06		la E	ilip			I						
MW-103	8.92E+05	8.01E+05	9.89E+05								11.7				
MW-104	1.24E+06	1.15E+06	1.34E+06												
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Groundwater							· 								
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Samples Degrader populat	iono				Low a	ind High	indicate	95% Co	nfidence	Range					
Degrader popular	.10115														
	Mean	Low	High	1.00E+01	1.00E+02	1.00E+03	1.00E+04	1.00E+05	1.00E+06	1.00E+07	1.00E+	08 1.00E+09			
MW-102	1.23E+06	1.13E+06	1.33E+06					: :	I						
MW-102	1.15E+06	1.06E+06	1.26E+06						1		* * * * * * * * * * * * * * * * * * * *				
MW-103	2.44E+05	2.32E+05	2.59E+05					l							
MW-103	1.93E+05	1.79E+05	2.08E+05						,		• • • • • • • • • • • • • • • • • • • •				
 1W-104	2.03E+05	1.89E+05	2.16E+05		1.			Ī							
₩1W-104	2.00E+05	1.86E+05	2.17E+05												
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					14		• • • • • • • • • • • • • • • • • • • •				:				
Marginal inoculum				<i>'\\\\\</i>					1.1						
Inoculum levels						<i>\\\\\\</i>									
Active degradation	levels		-			. 177			20000						
Marginal inoculum = De cell mass to attain meas	grader populati surable biotrans	ions below 1.01 sformation rate	E+03 are indic s.	ative of sev	vere limitation		ly require m		,			•			
Inoculum levels = Degra biotransformation withou			E+03 and 1.0E	E+06 are an	nenable to s	ite augmen	tation but g	enerally are	insufficien	t to attain a	dequate				
Active degradation level augmentation may still be	ls = Degrader poe required to a	opulations gre ttain desireable	ater than 1.0E e rates of trans	:+06 are ge sformation.	nerally of su	ifficient mag	gnitude to s	upport mea	surable bio	transformat	ion. Add	litional site			
Assay conditons			% Carbon		Incuba	ition		Growth		Denree	s of Fre	edom**			
	rbon source		(v/v)		Temper			Conditions	2	-		Joomdom			

Assay conditons		% Carbon	Incubation	Growth	Degrees of Freedom [™]			
	Carbon source	(v/v)	Temperature	Conditions	Totals	Degraders		
MW-102	diesel	1.0	22	Aerobic	9	4		
MW-102	weathered gas	1.0	22	Aerobic	9	4		
MW-103	diesel	1.0	22	Aerobic	9	9		
MW-103	weathered gas	1.0	22	Aerobic	9	9		
MW-104	diesel	1.0	22	Aerobic	9	9		
MW-104	weathered gas	1.0	22	Aerobic	9	9		

cfu/ml = colony forming units per ml of groundwater

Degrees of freedom is number of replicates minus one. This parameter is used in calculation of 95% confidence intervals.

9/27/95 Job Code: ABO

— litrogen	All units in mo	J/kg or ppn	1			Log ppr	n			
	TKN	NH4-N	0.1	1.0		10.0	100.0	100	0.00	10000.
MW-102	1.0	<0.5					111			
MW-103	14.0	<0.5				IIIIIII.		···	*	
MW-104	4.0	<0.5						<u>- </u>		

			_				111		••• = • • • • • • • • • • • • • • • • •	
			- · · ·							·
<u></u>										
					-	// TKN	□ NH4-N			•
Available l	Phosphorus a		ssium			Log ppn				
	Avail P	Avail K	0.1	1.	0	1	0.0	100.0		1000
MW-102	0.2	6.0					· · · · · · · · · · · · · · · · · · ·			
MW-103	0.2	4.0				L				
MW-104	0.1	3.5			*******	. <u></u>	-			
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			·							
					₩ Δ:	vailable P	Available	V		
Organic Ma	atter and Rela	ted Ana	iyses				Available	N.		
Guideline Pu	blished Threshh		***************************************	C:N		1				
	tural Resources		Below:	40	C:P 120					
	y of Sciences	*************	Below:			•	Cotion Fun			
	% Organic	****************	Calculated R		Mg	.i Ca	Cation Exc Capacity		204.0	1100 11
	Matter	TOC**	C:N	C:P	ppm	ppm	Meg/100g	рН	SO4-S ppm	NO3-N
	NR	NR	NR	NR	NR	NR	NR	7.5	NR	ppm 1.0
MW-102		NR	NR	NR	NR	NR	NR	7.5	NR	<0.5
	NR			NR	NR	NR	NR	7.8	NR	<0.5
MW-102 MW-103 MW-104		NR	NR	1417						٠٠.٥
MW-103	NR		NR_	INIX						
MW-103	NR		NK NK	INIX						
MW-103	NR		NK	NK						

n/a = Not applicable

Note To determine C:N and C:P ratios, phosphorus is expressed as available phosphorus, total organic carbon (TOC) is calculated from percent organic carbon and total organic nitrogen is calculated as total Kjeldahl nitrogen (TKN) minus ammonium nitrogen.

^{*} Sources: Natural Biodegradation as a Remedial Action Option - Interim Guidance, Wisconsin Dept of Nat Res. (1993) and In-situ Bioremediation: When Does it Work?, B. Rittman, Ed., National Academy of Sciences, 1993 p 117.

^{**} Estimated total organic carbon (expressed in ppm) calculated from % organic matter - See Methods.

CHAIN OF CUSTODY RECORD

Sample Collectors(s) Stephenice Shelly Brit	/Signature(s) ton/C	Shell	Liph	aire	d. A	. Ojko	NAT		SOURCE TECHNOLO AUKEE, WISCONSIN									RENEWAL TE	-
Site Name:	tgc.)			Send Report Project Ma Natural Re 23713 W. Pewaukee,	esource Tech Paul Road WI 53072	hnology, In 2	e/Becky Kee c. Task 1 (414) 523-9001	OKC ect Number: 1 Number: 4	C416	Temperature of temperature blank					olank e remaining, you ma	ay report the	
I hereby certify that	I received, pro	perly handié	d, and ma	intained c	ustody of t	hese samples	as noted be	low:					Analyt	ical Met	hod / Nur	nbers			Lab Use Only
Relinquished By (Si	gnature) 1.V cL	she		1195	-	Received By	EX 1	ns- 01	7,03811	Date/Tim	e	sis.							
Relinquished By (Sig	gnature) (ر ــــــــــــــــــــــــــــــــــــ	Date/Tit	me 95-		Received By Received By	(Signatute	s Uur		Date/Tim	c	13hpany							
Relinquished By (Si	gnature)	·	Date/Tir	me	2	Received By	(Signature	1/		Date/Tim	e	1 1 1 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 1						
Field ID Number	Date Collected	Time Collected	Sar Media	Device	Location	/ Description		PID Reading	Field Comments	Preserv. Type	# of Cont.	11.W						Lab ID Number	Sample Conditions @ Laboratory
MM-105	હ્યિક				ABO	ΣØΙ				None	3								
MW-103					ABO	\$2					3							1.44	
mw-104	1		<u> </u>		ABO	\$5				1	3								
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<u></u>				<u> </u>	<u> </u>			<u> </u>					<u> </u>						
CEA'S 4	TIONS . 2/ g.75	+ dies	el a	legr zi	<i>fers</i>	56021	stely 	/ \	std. ntv. p.	mel	is Ti	n 7/	1/95	alytical re	shall retain port unless Othe	indicated o		ys after issuing e below:	

APPENDIX H MONITORING WELL ABANDONMENT FORMS

abandonment work shall be performed in accordance with transition. Code, whichever is applicable. Also, see instructions of	e provisions of back.	T Chapters NR 111	, NH 112 OF NH 141, WIS.
(I) GENERAL INFORMATION	(2) FACILITY		
Well/Drillhole/Borehole County	Original We	ell Owner (If Known)	0
Location MW-1 Milwaukee	1 Citac	> Petrolei	m Corporation
Ø r	Present Wel	ll Owner	
SE 1/4 of NW 1/4 of Sec. 6 : T. 8 N. R. 21 W	asak	SOVE	
(If applicable)	Street or Ro	oute	
Gov't Lot Grid Number	2316	Terminal [)r,
Grid Location	City, State,	Zip Code	
ft. N. S., ft. E. W.	Arlingt	on Heights I No. and/or Name (II A	, IL 60065
Civil Town Name	Facility Well	I No. and/or Name (II A	poucable) WI Unique Well No.
Street Address of Well	Reason For A	Abandonment	
9235 N. 107th St.	Boreno	ole no lon	ger in use
City, Village	Date of Aban	ndonment	9
Milwau Kee, WI		10/9/95	
WELL/DRILLHOLE/BOREHOLE INFORMATION	البرازات المساور والمسا		
(3) Original Well/Drillhole/Borehole Construction Completed On	(4) Depth to Wa		
(Date) 01/30/87		-	Yes No Not Applicable
(54)	Liner(s) Remo	L1	Yes No Not Applicable
Monitoring Well Construction Report Available?	Screen Remov		Yes 📈 Not Applicable
☐ Water Well Yes ☐ No	Casing Left is	12 N	Ys 🗌 No
Drillhole	If No, Explai	n	
Borehole			
— 2000		Cut Off Below Surface?	X Ya No
Construction Type:	_	Material Rise to Surface?	
Drilled Driven (Sandpoint) Dug		Settle After 24 Hours?	Ya 🔀 No
Other (Specify)	If Yes, Was	s Hole Retopped?	☐ Y¤ ☐ №
	5) Required Meth	hod of Placing Sealing V	faterial
Formation Type:	Conductor	Pipe-Gravity	Conductor Pipe Pumped
☐ Unconsolidated Formation ☐ Bedrock	Dump Bail	• • =	Other (Explain)
Total Well Depth (ft.) 16.9 Casing Diameter (ins.)	5) Sealing Mater		For moniming wells and
(From groundsurface)	☐ Neat Ceme		monitoring well boreholes only
(From groundatace)	Sand-Cem	ent (Concrete) Grout	
Casing Depth (fL)	Concrete		Bentonite Pellets
Casing Deput (12)	Clay-Sand	Slurry	Granulæ Bentonite
Was Well Annular Space Grouter? Yes No 🛭 Unknow=	Bentonite-	Sand Slurry	Bentonite - Cement Grout
If Yes, To What Depth? Feet	Chipped Be	entonite I	
		No. Yards,	
(7) Sealing Material Used	From (FL) To	(FL) Sacks Sealant or Volume	Mix Ruio or Mud Weight
3/8" CHIPPED BENTONITE	Surface 16	,.9	
18 CHITTED DENOTORITE			
(8) Comments:			
[]] Jame of Person or Firm Doing Sealing Work		FOR DNR OR CO	ANTIX AREA ON LA
NORTH SHORE	Date Receiv	ed/inspected	District County
ignature of Person-Doing Work Date Signed			
10/9/95	Reviewer/In		
Section Route Telephone Number			
(/ ()	Follow-up N	Yecessary	
City, State, Zip Code	9-10-10-10-10-10-10-10-10-10-10-10-10-10-		* 1

abandonment work shall be performed in accordance with the nin. Code, whichever is applicable. Also, see instructions of	ne provisions of Chapters NR 111, NR 112 or NR 141, Wis. n back.
(I) GENERAL INFORMATION	(2) FACILITY NAME
Well/Drillhole/Borehole County	Original Well Owner (If Known)
Location NW-2 Milwavkee	Citao Petroleum Corporation
· · · · · · · · · · · · · · · · · · ·	Present Well Owner
SE 1/4 of NW 1/4 of Sec. 6 : T. 8 N. R. 21 H	asabove
OF 1/4 of (4/2) 1/4 or or or or or or or or or or or or or	Street or Route
(If applicable)	2316 Terminal Dr.
Gov't Lot Grid Number	Ciry, State, Zip Code
Grid Location	1 . · · · · · · · · · · · · · · · · · ·
ft. N. S.,ft. E. W.	Ar lington Meights, 12 60065 Facility Well No. and/or Name (II Applicable) Wil Unique Well No.
Civil Town Name	Parinty Well 110. and of Maine (if Applicable) Wit cinque Well 110.
Street Address of Well .	Reason For Abandonment
9235 N. 107th St.	Bore hole no longer in use
City, Village	Date of Abandonment
Milwau Kee, WI	10/9/95
WELL/DRILLHOLE/BOREHOLE INFORMATION	
(3) Original Well/Drillhole/Borehole Construction Completed On	(4) Depth to Water (Feet) <5'
(3) Original WeinDilmioled Dotellois Consultation Company	Pump & Piping Removed? Yes No Not Applicable
(Date) 01 28 87	Liner(s) Removed? Yes No Not Applicable
	Screen Removed? Yes No Not Applicable
Monitoring Well Construction Report Available?	1
☐ Water Well Yes ☐ No	· — — — — — — — — — — — — — — — — — — —
Drillhole	If No, Explain
Borehole	57 V. (7)
	Was Casing Cut Off Below Surface? X Yes No
Construction Type:	Did Sealing Material Rise to Surface? X Yes No
Drilled Driven (Sandpoint) Dug	Did Material Settle After 24 Hours? YES No
	If Yes, Was Hole Retopped? Yes No
Other (Specify)	(5) Required Method of Placing Sealing Staterial
	I'' '
Formation Type:	Conductor Pipe Gravity Conductor Pipe Pumped
M Olicolpolicated Lothington	Dump Bailer Other (Explain)
Total Well Depth (ft.) 21.7 Casing Diameter (ins.)	(6) Sealing Materials For monitoring wells and
(From groundsurface)	Neat Cement Grout monitoring well boreholes only
(Hom groundarine)	Sand-Cement (Concrete) Grout
a : D 4/6)	Concrete ! Bentonite Pellets
Casing Depth (ft.)	Clay-Sand Slurry Granulæ Bentonite
Was Well Annular Space Grouted? Yes No Vinknown	Bentonite-Sand Slurry Bentonite - Cement Grout
	Chipped Bentonite
If Yes, To What Depth? Feet	
(7) Sealing Material Listed	From (Ft.) To (Ft.) Sacks Sealant Mix Ratio or Mud Weight
(7) Sealing Material Used	or Volume
	Surface 71 7
CHIPPED BENTONITE	Surface ZI.7
OTTO BOILTING	
·	
(8) Comments:	
	(10) FOR DNR OR COUNTY USE ON LY
Hame of Person or Firm Doing Sealing Work	
NORTH SHORE	Date Recover/Inspected District County
Signed of Person Pring Work Date Signed	
10/9/95	Reviewer/Inspector
Street or Route Telephone Number	
(V ()	Follow-up Necessary
City, State, Zip Code	

All abandonment work shall be performed in accordance with to dmin. Code, whichever is applicable. Also, see instructions of	on back.
(I) GENERAL INFORMATION	(2) FACILITY NAME
Well/Drillhole/Borchole County	Original Well Owner (If Known)
Location MW-3 Milwaukee	1 Citao Petroleum Corporation
⊠ r	
SE 1/4 of NW 1/4 of Sec. 6 ; T. 8 NR 21 1 W	1 as above
(If applicable)	Street or Route
Gov't Lot Grid Number	2316 Terminal Dr.
Grid Location	City, State, Zip Code
ft. N. S., T. It. E. W.	Facility Well No. and/or Name (II Applicable) WI Unique Well No.
Claff Iomit Haute	
5	Reason For Abandonment
Street Address of Well	! _
9235 N. 107th St.	Borehole no Longer in USP Date of Abandonment
Ciry, Village	
Milwau Kee, WI	10/9/95
WELL/DRILLHOLE/BOREHOLE INFORMATION	
(3) Original Well/Drillhole/Borehole Construction Completed On	(4) Depth to Water (Feet) 1.85
(Date) 01/30/87	Pump & Piping Removed? Yes No S Not Applicable
	Liner(s) Removed? Yes No Not Applicable
Monitoring Well Construction Report Available?	Screen Removed? Yes No Not Applicable
☐ Water Well	Casing Left in Place? X Y S No
Drillhole	If No, Explain
Borehole	
boternie	Was Casing Cut Off Below Surface? ∑ Y ⊆ No
Commencial Transport	Did Sealing Material Rise to Surface? X Yes No
Construction Type: Drilled Driven (Sandpoint) Dug	Did Material Settle After 24 Hours? YES No
M Sime U Mileti (Saidponii)	If Yes, Was Hole Recopped? Yes No
Other (Specify)	
	(5) Required Method of Placing Sealing Vizterial
Formation Type:	Conductor Pipe-Gravity Conductor Pipe-Pumped
☐ Unconsolidated Formation ☐ Bedrock	Dump Bailer Other (Explain)
Total Well Depth (ft.) 15.4 Casing Diameter (ins.)	(6) Sealing Materials For monitoring wells and
(From groundsurface)	Neat Cement Grout monitoring well boreholes only
(110111 Broadmarting)	Sand-Cement (Concrete) Grout
Casing Depth (ft.)	Concrete Bentonite Pellets
Casing Deput (IL)	Clay-Sand Slurry Granule Bentonite
Was Well Annular Space Grouted? Yes No Vinknown	Bentonite-Sand Slurry Bentonite - Cement Grout
· · · · · · · · · · · · · · · · · · ·	☐ Chipped Bentonite
If Yes, To What Depth?	
(7) Sealing Material Used	From (FL) To (FL) Sacks Sealant Mix Raco or Mud Weight
Scanig Hamila Coos	or Volume
3/ 1 0	Surface I & L
3/8" CHIPPED BENTONITE	Surface 15.4
(8) Comments:	
Name of Person or Firm Doing Sealing Work	(10) FOR DNR OR COUNTY USE ONLY
North Share	Date Received/Inspected
Signature of Person-Doing Work Date Signed	
	Reviewer/Inspector
Server or Route Telephone Number	Follow-up Necessary
2: Control (1-0-do-	
City, State, Zip Code	A CONTROL OF THE PROPERTY OF T

All abandonment work shall be performed in accordance with the Admin. Code, whichever is applicable. Also, see instructions on	provisions back.	of Chapter	s NR 111, NF	R 112 or NR 141, Wis.
A CONTRACTOR OF THE PROPERTY O	2) FACILIT	Y NAME		
(1) GENERAL INFORMATION		Vell Owner (.	if Known)	
Well/Drillhole/Borehole Location MW-4 MILWAUKEE	CITC	o PE	TROLEUM	(DEPORATION)
SE 1/4 of NW 1/4 of Sec. 6; T. 8 N; R. ZI W		ell Owner ABOU	E	
(If applicable)	Street or i	Route	_	$\overline{}$
Gov't Lot Grid Number	231L	<u>ا م</u>	ERMINAL	PUE
Grid Location	_ ^ ·	te, Zip Code		
ft. N. S.,ft. E. W.	ARLI	26702	HEIGH	
Civil Town Name	Facility W	ell No. and/o	or Name (It Appi	icabie) WI Unique Well No.
Street Address of Well	Reason Fe	or Abandonn	nent	
9Z35 N. 107TH STREET	WELL	NIA	LONGER	IN USE
Ciry, Village		bandonment		
MILWAUKEE WI			×17-19	95
WELL/DRILLHOLE/BOREHOLE INFORMATION	20 December 1	Water (Feet)		
(5) Original Well-Driminold-Dolonois College	•			es No Not Applicable
(Date) 01 29 87		Piping Remo		
		Removed?		es Not Applicable
Monitoring Well Construction Report Available?	Screen Re			es No Not Applicable
☐ Water Well Yes ☐ No	_	eft in Place?	T Y	es [] 1/o
Drillhole	If No, Ex	plain		
Borehole				
Bolesbie			eiow Surface?	Yes No
Construction Type:			Rise to Surface?	Yes 🗌 No
■ Drilled □ Driven (Sandpoint) □ Dug	Did Mate	rial Settle Ai	ter 24 Hours?	Yes 🖪 No
Other (Specify)	If Yes,	Was Hole Re	ecopped?	☐ Y≈ ☐ №
Odder (operary)	(S. Pequired	Method of P	lacing Sealing M	aterial
Formation Type:	, ,			
Unconsolidated Formation Bedrock	_	uctor Pipe G		onductor Pipe-Pumped
Oneoneone i ominioni		Bailer		Other (Explain)
Total Well Depth (ft.) 15.4 Casing Diameter (ins.)	(6) Sealing N			For monitoring wells and
(From groundsurface)	. —	Cement Gro		monitoring well boreholes only
	· =	-	ncrese) Grout	
Casing Depth (ft.)	☐ Conc		i	Bentonite Pellets
		Sand Slurry		Granular Bentonite
Was Well Annular Space Groutzei? Yes No Unknown		onice-Sand Sl		Bentonite - Cement Grout
If Yes, To What Depth?	Chip	ped Bentoniu	'	
			No. Yards.	A D A A A A A A A A A A A A A A A A A A
(7) Sealing Material Used	From (FL)	To (Ft.)	Sacks Sealant or Volume	Mix Ratio or Mud Weight
			or volume	
3/2" CHIPPED BENTON ITE	Surface	15.4	ļ	1
3/8 CHIPPED DEVIDIOLIC	-			
	 			
				1
200				
(8) Comments:				
	(10)	FO	R DNR OR C	OUNTY USE ONLY
(9) Name of Person or Firm Doing Sealing Work		Received/Ins		District/County
MIDWEST ENGINEERING	4 1	يالاوس ويسيد		
Signature of Person Doing Work Date Signed	Pen	ewer/Inspect	or.	
und /				
Street or Route Telephone Number		Nf		
()	- rolk	ow-up Neces	oar y	
City, State, Zip Code				

DNR/COUNTY

All abandonment work shall be performed in accordance with the same of the sam	the provisions of Chapters NH 111, NH 112 of NH 141, Wis. on back.				
(I) GENERAL INFORMATION	(2) FACILITY NAME				
Well/Drillhole/Borehole County	Original Well Owner (If Known)				
Location MW-5 Milwaukee	1 Citao Petroleum Corporation				
——————————————————————————————————————	Present Well Owner				
SE 1/4 of NW 1/4 of Sec. 6 ; T. 8 N. R. 21 1 W	100001				
(If applicable)	Street or Route				
Gov't Lot Grid Mumber	2316 Terminal Dr.				
Grid Location	City, State, Zip Code				
ft. N. S.,ft. E. W.	Arlington Heights, IL 60065 Facility Well No. and/or Name (It Applicable) WI Unique Well No.				
Civil Town Name	Parity went to and traine in Applicancy Willingto went to				
A1/ 11	Reason For Abandonment				
Street Address of Well	,				
9235 N. 107th St. City, Village	Borehale no longer in use Date of Abandonment				
Milway Kee, WI	1019195				
WELL/DRILLHOLE/BOREHOLE INFORMATION					
(3) Original Well/Drillhole/Borehole Construction Completed On	(4) Depth to Water (Feet) 69				
$\sim 1-\sim 1$	Pump & Piping Removed? Yes No X Not Applicable				
(Date) 01 28 8 +	Liner(s) Removed? Yes No Not Applicable				
Monitoring Well Construction Report Available?	Screen Removed? Yes No Not Applicable				
☐ Water Well Yes ☐ No	Casing Left in Place? X Yes \(\bigcap\) No				
Drillhole	If No, Explain				
Borehole					
	Was Casing Cut Off Below Surface? ☐ Yo ☐ No				
Construction Type:	Did Sealing Material Rise to Surface? X Yes No				
☑ Drilled ☐ Driven (Sandpoint) ☐ Dug	Did Material Settle After 24 Hours? YE No				
Other (Specify)	If Yes, Was Hole Retopped? YE No				
	(5) Required Method of Placing Sealing Valerial				
Formation Type:	Conductor Pipe - Gravity Conductor Pipe - Pumped				
Unconsolidated Formation Bechock	Dump Bailer Other (Explin) (6) Sealing Materials For monitoring wells and				
Total Well Depth (ft.) 15.4 Casing Diameter (ins.)					
(From groundsurface)	Neat Cement Grout monitoring well boreholes only				
	Sand-Cement (Concrete) Grout				
Casing Depth (ft.)	Concrete Bentonia Pellets				
	Clay-Sand Slurry Granular Bentonite				
Was Well Annular Space Grouted? Yes No 🔀 Unknown	Bentonite-Sand Slurry Bentonite - Cement Grout				
If Yes, To What Depth? Feet	☐ Chipped Bentonite				
(7) Saeling Material Used	From (Ft.) To (Ft.) Sacks Sealant Mix Raco or Mud Weight				
(1) Sealing Material Used	From (FL) To (FL) Sacks Sealant Mix Raco or Mud Weight or Volume				
21 11	Surface 15 4				
3/8" CHIPPED BENTONITE	Surface 15.4				
•					
(8) Comments:					
(v) Comments.					
Name of Person or Firm Doing Sealing Work	(10) FOR DNR OR COUNTY USE ONLY				
NORTH SHORE	Date Received/Inspected				
Signature of Person-Doing Work Date Signed					
10/9/95	Reviewer/Inspector				
Street or Route' Telephone Number					
(/ ()	Follow-up Necessary				
City, State, Zip Code					

WELL/DRILLHOLE/BOREHOLE ABANDONMENT Form 3300-5W 11-89

State of Wisconsin Department of Natural Resources

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141. Wis. Admin. Code, whichever is applicable. Also, see instructions on back. FACILITY NAME GENERAL INFORMATION Original Well Owner (It Known) County Well/Drillhole/Borehole PETROLEUM DRPORATION) Location MILLIAUKEE MW- C Present Well Owner Ξ As Aboue SE 1/4 of NW 1/4 of Sec. Street or Route (If applicable) 2316 Grid Number IERMINAL Gov't Lot City, State, Zip Code Grid Location ARLINGTON ft. | E. | W. HEIGHTS ft. | N. | | Facility Weil No. and/or Name (It Applicable) Civil Town Name OF CITY MILLHAUKEE Street Address of Well Reason For Abandonment ST. WELL NOLONGER 9235 NORTH City, Village Date of Abandonment WI MILWAUKEE WELL/DRILLHOLE/BOREHOLE INFORMATION (3) Original Well/Drillhole/Borehole Construction Completed On Depth to Water (Feet) Yes No Not Applicable Pump & Piping Removed? 01/30/ (Date) Liner(s) Removed? Yes Not Applicable Yes No Not Applicable Screen Removed? Construction Report Available? Monitoring Well Casing Left in Place? Yes 1 No Yes □ No Water Well If No, Explain Drillhole Borehole Was Casing Cut Off Below Surface? ■ Yes □ No Did Sealing Material Rise to Surface? Yes | No Construction Type: ☐ Dug Did Material Settle After 24 Hours? Yes No Drilled Driven (Sandpoint) If Yes, Was Hole Recopped? Yes | No Other (Specify) (5) Required Method of Placing Sealing Material Formation Type: Gonductor Pipe-Gravity Conductor Pipe-Pumped ☐ Beckrock Unconsolidated Formation Dumo Bailer Other (Explain) Total Well Depth (ft.) 15.4 Casing Diameter (ins.) Sealing Materials For monitoring wells and monitoring well boreholes only Neat Cement Grout (From groundsurface) Sand-Cement (Concrete) Grout Concrete Bentonite Pellets Casing Depth (ft.) Clay-Sand Slurry Granular Bentonite Bentonite - Cement Grout ☐ Yes ☐ No I Unknown Bentonite-Sand Slurry Was Well Annular Space Grouted? Chipped Bentonite If Yes, To What Depth? No. Yards, Sacks Sealant or Volume <u>0</u> Mix Ratio or Mud Weight Sealing Material Used From (Ft.) To (FL) Surface 15.4 CHIPPED BENTONITE Comments: (10) FOR DNR OR COUNTY USE ONLY (9) Name of Person or Firm Doing Sealing Work Date Received/Inspected District/County ENGINEERING MINWEST Signature of Person Doong Work Date Signed Reviewer/Inspector Telephone Number) Follow-up Necessary City, State, Zip Code

DNR/COUNTY

abandonment work shall be performed in accordance with the	ne provisions of Chapters NR 111, NR 112 of NR 141, Wis. n back.				
(I) GENERAL INFORMATION	(2) FACILITY NAME				
Well/Drillhole/Borehole County Milwaukee	Original Well Owner (If Known) Citao Petroleum Corporation				
SE 1/4 of NW 1/4 of Sec. 6: T. 8 N. R. 21 H	Present Well Owner 95 9000				
(If applicable)	Street or Route				
Gov't Lot Grid Number	2316 Terminal Dr.				
Grid Location	City, State, Zip Code				
ft. N. S., ft. E. W.	Arlington Heights, 1L 60065 Facility Well No. and/or Name (Il Applicable) Will Unique Well No.				
Street Address of Well	Reason For Abandonment				
9235 N. 107th St.	Borehdenolonger in use				
City, Village	Date of Abandonment 10/9/95				
milwan Kee, WI	1079795				
WELL/DRILLHOLE/BOREHOLE INFORMATION	(4) Depth to Water (Feet) 3.81				
(3) Original Well/Drillhole/Borehole Construction Completed On (Date) 01/28/87	Pump & Piping Removed? ☐ Yes ☐ No ☒ Not Applicable				
(Date) 01 28 8 1	Liner(s) Removed? ☐ Yes ☐ No ☒ Not Applicable				
Monitoring Well Construction Report Available?	Screen Removed? Yes No Not Applicable				
☐ Water Well	Casing Left in Place? Yes No				
☐ Drillhole	If No, Explain				
☐ Borehole	Was Casing Cut Off Below Surface? X YE No				
<u>.</u> .	Did Sealing Material Rise to Surface? X Yes No				
Construction Type:	Did Material Settle After 24 Hours? Yes No				
☐ Drilled ☐ Driven (Sandpoint) ☐ Dug ☐ Other (Specify) ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	If Yes, Was Hole Retopped? Yes No (5) Required Method of Placing Sealing Material				
Odici (Specia)					
Formation Type:	Conductor Pipe Gravity Conductor Pipe Pumped				
☐ Unconsolidated Formation ☐ Bedrock	Dump Bailer Other (Explex) (6) Sealing Materials For monitoring wells and				
Total Well Depth (ft.) 14.3 Casing Diameter (ins.)					
(From groundsurface)	Neat Cement Grout monitoring well boreholes only				
,	Sand-Cement (Concrete) Grout				
Casing Depth (ft.)	Concrete Bentonia Pellets Clay-Sand Slurry Granula Bentonite				
Was Well Annular Space Grouted? Yes No 🔀 Unknown					
	Chipped Bentonite				
If Yes, To What Depth? Feet	No. Yards,				
(7) Sealing Material Used	From (FL) To (FL) Sacks Sealant Mix Race or Mud Weight or Volume				
3/8" CHIPPED BENTONITE	Surface 14. 3				
(8) Comments:					
► Hame of Person or Firm Doing Sealing Work	(10) FOR DNR OR COUNTY USE ON LY				
NORTH SHORE	Date Received/Inspected. District County				
Date Signed					
10/19/19/19/19/19/19/19/19/19/19/19/19/19/	Reviewer/Inspector				
Street or Roule Telephone Number	Follow-up: Necessary				
	3004				
City, State, Zip Code	MANAGEMENT AND THE PROPERTY OF				

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis.—Admin. Code, whichever is applicable. Also, see instructions on back.

_i) GENERAL INFORMATION		(2) FACILIT	TY NAME					
Well/Drillhole/Borehole County		Onginal Well Owner (If Known)						
Location MW-8 Mile	wavkee	Cito	10 Pe	<u>troleor</u>	n Corporation			
	○ 2\ ⊠ ː		Yell Owner	_				
SE 1/4 of NW 1/4 of Sec. 6 ; T.	8 N. R. 21 W	08	<u>2001</u>	<u>e</u>				
(If applicable)	0.137	Street or Route						
Gov't Lot	Grid Number	2316 Terminal Dr. City, State, Zip Code						
Grid Location ft. N. S.,	ft. E. W.		-		. 1L 60065			
ft. N. S., Civil Town Name	<u></u>	Расшту У	Veil No. and	Teights or Name (II Appl	ucaoie) WI Unique Well No.			
GIVE TOWN France		,						
Street Address of Well	Street Address of Well				Reason For Abandonment			
9235 N. 107th St.	N. 107th St. Borehole no longerinuse Date of Abandonment							
City, Village					0			
Milwaukee, WI		9/21	195					
WELL/DRILLHOLE/BOREHOLE INFO	RMATION	(m. D. al. a.	W(C)					
(3) Original Well/Drillhole/Borehole Construction	on Completed On	J	Water (Feet)		[] No 57 No. Applicable			
(Date) 01 Z9 87	<u> </u>	•	Piping Remo					
		Screen R	Removed?		S No Not Applicable S No Not Applicable			
	ction Report Available?		eft in Place?	ш	es No Not Applicable			
<u> </u>	Yes U No	If No. Ex		[X] -	~ П 10			
Drillhole		21.0, 2.						
Borehole		Was Casing Cut Off Below Surface? ☐ Yes ☐ No						
Construction Type:		Did Sealing Material Rise to Surface? X Yes No						
Drilled Driven (Sandpoi	nt) Dug	Did Mate	rial Settle Af	ter 24 Hours?	Yes 🛛 No			
Other (Specify)		If Yes, Was Hole Recopped?						
		(5) Required Method of Placing Sealing Material						
Formation Type:		1	uctor Pip e-Gr		onductor Pipe-Pumped			
☐ Unconsolidated Formation ☐	Unconsolidated Formation Bedrock			Dumo Bailer Other (Explain)				
Total Well Depth (ft.) 20.4 Casing Diameter (ins.)		(6) Sealing Materials For monitoring wells and						
(From groundsurface)		Next Cement Grout monitoring well boreholes only						
			Sand-Cement (Concrete) Grout					
Casing Depth (ft.)		Conc		i i	Bentonite Pellets			
pareq		Clay-Sand Slurry Granular Bentonite						
Was Well Annular Space Grouted?	Yes No Unknown	Bentonite-Sand Slurry Bentonite - Cement Grout Chipped Bentonite						
If Yes, To What Depth?	Fæt	M cumb	bed Delimitie	No. Yards.				
(7) Sealing Material Used		From (Ft.)	To (FL)	Sacks Sealant	Mix Ratio or Mud Weight			
				or Volume				
CHIPPED BENTONITE	•	Surface	20.4					
Chin Co Delo (Cicit)	<u> </u>	-						
			<u> </u>	<u></u>				
(8) Comments:								
	.1-	V(40)8	EUB	NR OP C	OUNTY USE ONLY			
_	Traine of 1 cason of Third Board 5 cases							
Midwest Engineering Signature of Person Doing Work Date	Signed	I						
Signature of reison bonig work		Revi	ewer/Inspecto	r.				
Street or Route Tele	phone Number	1	_					
, ()	Follo	w-up Necess	ary				
City, State, Zip Code								
		1		-				