# SUBSURFACE SITE ASSESSMENT
# THOMPSON PLAZA INC. CITICORP MANAGEMENT
# 50 SELKIRK AVENUE
# THOMPSON, MANITOBA

Submitted to:

**Marlowe Yeoman Limited**
610938 Howe Street
Vancouver, BC
V6Z 1N9

Attention: Mr. Cameron Olma

Submitted by:

**AMEC Earth & Environmental**
440 Dovercourt Drive
Winnipeg, Manitoba
R3Y 1N4

26 July 2011

AMEC Project No: WX16580

## EXECUTIVE SUMMARY

AMEC Earth & Environmental was retained by Mr. Cameron Olma of Marlowe-Yeoman Limited to conduct a Subsurface Site Assessment at the former ESSO and the former Texaco service stations located at 50 Selkirk in Thompson, Manitoba. AMEC prepared and submitted a project Scope of Work dated 14 April 2011, for the Site. Marlowe-Yeoman Limited approved the Scope of Work on 25 May 2011. The purpose of the Subsurface Site Assessment was to confirm the current environmental condition of the Site and attempt to delineate the extent of the known impacts.

The AMEC drilling program was conducted on 2 and 3 June 2011. The drilling program consisted of eighteen (18) test holes (TH11-1 through TH11-19, excluding TH11-3), three (3) of which were completed as groundwater monitoring wells (TH11-2, TH11-4 and TH11-6). The test holes were drilled to a maximum depth of 6.1 m with a continuous solid stem auger rig, supplied and operated by Maple Leaf of Winnipeg, Manitoba.

An abandoned underground waste oil tank was encountered at TH11-3 at a depth of 1.1 m. Subsequent assessment determined oil remained in the tank and that the bottom of the tank was at a depth of 2.1 m. Approximately 2,200 litres of waste oil was removed by a licensed disposal contractor. The test hole was backfilled with bentonite and concrete, and covered with a flush mount casing at the asphalt surface.

The soil profile encountered at the test hole locations generally consisted of an asphalt surface followed by granular fill to approximately 1.5 m below grade level. Underlying the granular fill was a medium plastic clay extending to the maximum termination depth of the test holes (6.1 m).

The maximum soil vapour concentration encountered during the test hole drilling program was 4500 $ppm_v$ in TH11-6 @ 3.1 m. TH11-6 was located immediately south of the restaurant. Elevated vapour concentrations were also observed in TH11-2 @ 3.1 m (4000 $ppm_v$), TH11-4 @ 2.3 m (1200 $ppm_v$) and TH11-11 @ 4.6 m (1250 $ppm_v$).

Petroleum hydrocarbons (PHCs) constituents in submitted soil samples were above the applicable guidelines in benzene for TH11-1 (3.22 ug/g), TH11-2 (14.9 ug/g), TH11-6 (21 ug/g), TH11-11(22.3 ug/g) and TH11-16 (3.75 ug/g). As well, a F3 concentration of 5040 ug/g was above the guidelines in TH11-5. All other soil samples submitted for laboratory analysis is below the guidelines.

Free phase product was present at TH11-2. All the remaining groundwater monitoring wells were dry at the time of monitoring (4 June 2011).

Based on the results from the investigation completed in 1995 and 2011, AMEC estimates approximately 500 $m^3$ of PHC impacted soil to be present at the former Esso Service Station.

Manitoba Conservations petroleum storage tank regulations states that all abandoned storage tanks must decommissioned and removed from Site. AMEC therefore recommends that this tank is removed.

## TABLE OF CONTENTS

## LIST OF APPENDICES

## 1.0 INTRODUCTION

AMEC Earth & Environmental was retained by Mr. Cameron Olma of Marlowe-Yeoman Limited to conduct a Subsurface Site Assessment at the former retail ESSO and the former Texaco service stations located at 50 Selkirk Avenue in Thompson, Manitoba (Site). AMEC prepared and submitted a project Scope of Work dated 14 April 2011, for the Site. Marlowe-Yeoman Limited approved the Scope of Work on 25 May 2011. The AMEC drilling program was conducted on 2 and 3 June 2011. The purpose of the Subsurface Site Assessment was to confirm the current environmental condition of the Site and attempt to delineate the extent of the known impacts.

A Site and Surrounding Land Use plan are presented as Figure 1 in Appendix A.

## 2.0 BACKGROUND

**Former Esso Site (Block 89)**
AMEC (then known as AGRA Earth & Environmental Limited) conducted a Phase I Environmental Site Assessment (ESA) at the subject property in September 1995. The historical information reviewed identified that the Site had been operated as a gasoline service station from about 1962 to the late 1980s. Underground storage tanks were reportedly present at the east side of the existing building with pump islands reportedly located to the east and southeast of the building. The tanks and pump islands were removed in the late 1980s or early 1990s. It was AMEC's understanding that sampling and testing of the soils surrounding the tanks were not conducted at the time they were removed.

AMEC conducted a preliminary subsurface investigation (Phase II ESA) at the Site in October 1995 and a supplementary subsurface investigation (Phase III ESA) in December 1995. Test hole drilling, soil sampling and laboratory analysis indicated subsurface petroleum hydrocarbon (PHC) impacts that exceeded the guideline criteria applicable at that time (Manitoba Environment Level II). The (PHC) impacts extended to a maximum depth of approximately 6 m from grade with the greatest area of impact being located around the former tank nest and pump islands. The (PHC) impacts were found at depths between 2.5 and 5 m from grade closest to the former tank nest and between 3.5 and 6 m below grade further from the tank nest.

West of the building, an area of "heavier" (less volatile) (PHC) impacts was identified. At this area, the total semi-volatile hydrocarbon concentrations substantially exceeded the guideline criteria applicable at that time (Manitoba Environment Level II). Backfill noted in this area suggested that a tank was likely present at this location at one time although this could not be confirmed through the information available. The laboratory results indicate the tank likely contained either heating oil, diesel fuel or possibly waste oil.

At the time of the previous assessment, the estimated volume of impacted soils that exceeded the applicable Manitoba Conservation (MC) criteria for a site with low sensitivity (Level III) was 1700 $m^3$.

**Former Texaco Site (Block 90)**
AMEC (then known as AGRA Earth & Environmental Limited) conducted a Phase I ESA at the subject property in September 1995. The historical information reviewed identified that the Site had been operated as a gasoline service station from about 1967 to the early 1990s. Underground storage tanks were reportedly present at the southwest side of the existing building with pump islands reportedly located to the west of the building. An underground waste oil tank was reportedly located south of the building. The tanks and pump islands were removed in 1991 and a remedial excavation of the tank nest area was completed by O'Connor Associates Environmental Inc. Confirmation of the removal of the waste oil tank could not be obtained although it was reportedly removed during the 1991 remedial excavation.

AMEC conducted a preliminary subsurface investigation (Phase II ESA) at the Site in October 1995. Test hole drilling, soil sampling and laboratory analysis indicated that concentrations of petroleum hydrocarbons in the subsurface soil were below the guideline criteria applicable at that time (Manitoba Environment Level II). Vapour concentrations noted during the Phase II ESA indicated residual (PHC) impacts may remain at the site in the area of TH-7.

## 3.0 SCOPE OF WORK

The purpose of the Subsurface Site Assessment is to confirm the current environmental condition of the Site and attempt to delineate the extent of the known impacts on-site.

Based on the review of the project file, the following scope of work for the Subsurface Site Assessment was undertaken:

- Completing a historical review of the Site of all previous reports.
- Conducting ground disturbance / utility locates at the Site including a private locator.
- Conducting a Phase II ESA consisted of the following:
    - Drilling fifteen (15) test holes at the former ESSO Site to establish existing levels of impacts in the area of the former USTs and pump island.
    - Completing eight (8) test holes as groundwater monitoring wells.
    - Drilling three (3) test holes at the former Texaco Site to reassess Site conditions.
    - Completing one (1) test hole as groundwater monitoring well.
    - Recovering continuous soils samples separated at 0.8 m intervals to 6.1 m, or until soil vapour screening suggests vertical delineation of impacts have been achieved.
    - Submitting a minimum of one soil sample from each test hole representing the highest soil vapour level for analysis for BTEX and F1 to F4 fractions and one sample below observed impacts for vertical delineation.
    - Submitting one (1) soil samples representative of the contaminant migration zone for grain size analysis.
- Conducting a groundwater monitoring program of the newly installed monitoring wells consisting of the following:
    - Measuring groundwater monitoring well vapour concentrations.
    - Determining the presence and thickness of Light Non-Aqueous Phase Liquids (LNAPL).

- Determining groundwater levels.
- Measuring of groundwater vapour concentrations.
- Hydraulic conductivity testing on a minimum of one (1) selected well representative of contaminant migration zone, and
- Collecting groundwater samples from each newly installed monitoring well for PHC analysis

- Preparing a report summarizing results of field and laboratory analysis, as well as any relevant conclusions and recommendations
- Preparing an updated remedial option plan which will include up to three detailed options including price.

Changes to the scope were due to the fact AMEC encountered an abandoned underground storage tank. On 2 June 2011, a test hole located approximately 3.0 m south and 1.0 m east of the southwest corner of the Robin's Donuts Drive-Through restaurant (former Texaco service station) was advanced to an approximate depth of 1.52 m below grade. Product, which appeared to be waste oil, was identified on the 125 mm solid stem auger upon removal from the subsurface. A tape measure indicated the maximum depth of the test-hole was 2.13 m below grade. It was inferred that a suspect waste oil tank had been punctured as the tape measure was covered with waste oil and the depth of the test-hole was 0.61 m below the maximum auger depth.

At this time, a septic truck provided by Red's Septic Service of Thompson, Manitoba was used to remove the waste oil from the tank at approximately 10:30 am on 3 June 2011. Although an exact value could not be provided, it was estimated that the waste oil tank contained in the order of 2,300 L) of waste oil. The initial test hole was partially backfilled with bentonite bags followed by soil cuttings, followed by hydrated bentonite, a steel monitoring well casing, and concrete.

## 4.0 INVESTIGATIVE METHODOLOGY

### 4.1 HAZARD ASSESSMENT AND SERVICE LOCATIONS

Prior to the start of the intrusive investigation, AMEC completed a site specific health and safety checklist to identify such items as hazard identification, project health and safety requirements, work site classification and decontamination procedures.

As part of the checklist, AMEC contacted the local service providers; Manitoba Telecommunications System (MTS), Manitoba Hydro, and the City of Thompson, to identify and mark their respective underground utility locations. A private locator was also contacted to identify and mark any private utility lines in the vicinity of the test holes.

### 4.2 SURROUNDING LAND USE

A survey of surrounding land uses was conducted as part of AMEC's Site visit. The purpose of the survey was to identify specific land uses (i.e. agricultural, residential, commercial or industrial) adjacent to the Site to establish the applicable soil and groundwater use criteria. The

surrounding land uses are shown on Figure 1 (Appendix A) and outlined in Table 1 (Appendix B).

### 4.3 DRILLING AND SAMPLING PROGRAM

The AMEC drilling program was conducted on 2 and 3 June 2011. The drilling program consisted of eighteen (18) test holes (TH11-1 through TH11-19, excluding TH11-3), three (3) of which were completed as groundwater monitoring wells (TH11-2, TH11-4 and TH11-6). The test holes were drilled to a maximum depth of 6.1 m below ground level (bgl) with solid stem auger rig, supplied and operated by Maple Leaf of Winnipeg, Manitoba. The test hole locations are shown on Figures 2 and 3 (Appendix A).

Grab samples were recovered directly from the solid stem augers at approximately 0.8 m depth intervals to the maximum depth of the test holes (6.1 m). Soil samples were also obtained in zones of visual impacts and/or at each stratigraphic change. Disturbed soils from the outside of the cuttings were removed to minimize potential cross contamination. The augers were cleaned between each hole.

Soil samples were classified according to the Modified Unified Soil Classification system and observed for visual evidence of PHC impacts. Soils samples were collected and split. One portion was placed in laboratory prepared glass jars (for possible laboratory analyses) and the other portion was placed in plastic bags (for field screening of combustible vapours). Soil samples were field screened for volatile PHC vapours using ambient temperature headspace (ATH) techniques and an RKI Eagle combustible vapour analyzer set in the no methane response mode. The ATH method involved half filling and sealing a 3.0 litre (L) plastic bag with soil and allowing the vapours to accumulate for approximately 20 minutes prior to analyzing the headspace. Accumulated vapours were measured in parts per million total combustible vapours ($ppm_v$). Vapours in excess of 600 $ppm_v$ were measured in percent lower explosive limit (% LEL). Soil samples were stored on ice in an insulated cooler while on site and during transport to the laboratory. The field protocols and QA/QC procedures utilized by AMEC were in accordance with standard industry protocols.

The following Table A summarizes the rationale for the test hole locations:

**Table A: Drilling Location Rationale**

| Test Holes/ Monitoring Wells | Rationale for Selection |
|---|---|
| TH11-1, TH11-2, TH11-4 through TH11-16, through TH19 | Investigate the Former Esso Site (Block 89) |
| TH11-3, TH11-17 through TH11-19 | Investigate the former Texaco Site (Block 90) |

## 4.4 MONITOR WELL INSTALLATION AND SAMPLING

As part of the Phase II ESA, three (3) test holes (TH11-2, TH11-5 and TH11-6) were completed as groundwater monitoring wells. The wells were installed in order to monitor subsurface vapour levels, establish the groundwater conditions at the Site and to allow for groundwater sampling. The monitoring wells were constructed with 50 mm diameter Schedule 40 PVC, number 10 slot well screen and 50 mm diameter Schedule 40 PVC solid riser pipe to the surface. Flush mount steel casings were installed over the wells for protection. The monitor well construction details are shown on the corresponding test hole logs in Appendix C.

All newly installed groundwater monitoring wells were monitored on 3 June 2011. AMEC notes that TH11-2 contained free phase product and two of the wells were dry (TH11-5 and TH11-6) therefore none of the wells were sampled.

## 4.5 LABORATORY ANALYSIS

Nineteen (19) soil samples were submitted for laboratory analysis at AMEC's laboratory in Edmonton, Alberta for chemical analysis. Samples were analyzed for benzene, toluene, ethylbenzene and xylenes (BTEX), and petroleum hydrocarbon (PHC) fractions F1-F4. The Canadian Association Laboratory Accreditation Inc. (CALA) has accredited AMEC's laboratory for testing including PHC parameters in accordance with the International Standard ISO/IEC 17025. The laboratory QA/QC is provided in Appendix D along with the certificates of analysis.

# 5.0 ASSESSMENT CRITERIA

## 5.1 GENERAL

Environmental assessment in Manitoba is based on the assessment criteria as produced by the Canadian Council of Ministers of the Environment (CCME). The following documents produced by CCME were selected as being applicable to the Site based on the contaminants of concern.

- CCME 1999 (updated 2009). Canadian Environmental Quality Guidelines (EQGs).
- CCME 2001 (revised 2008). Canada-Wide Standards (CWS) for Petroleum Hydrocarbons in Soil

Based on the above current CCME documents (and their precursors), AMEC conducted an evaluation of the applicable exposure pathways, land uses, key receptors and a visual evaluation of the predominant soil texture at the site. The sensitivity assessment was conducted in accordance with current CCME guidelines and did not include the modification or recalculation of the formulas used to derive the criteria values.

## 5.2 LAND USE

The CCME CWS 2008 has been developed for four generic land uses that have been adopted within these guidelines. A generic land use scenario is envisioned for each category based on the normal activities on these lands. The four land uses as defined by CCME are:

***Agricultural lands***: where the primary land use is growing crops or tending livestock. This also includes agricultural lands that provide habitat for resident and transitory wildlife and native flora. The portion of a farm that houses people is considered a residential land use.

***Residential/Parkland***: where the primary activity is residential or recreational activity. The ecologically-based approach assumes parkland is used as a buffer between areas of residency, but this does not include wild lands such as national or provincial parks.

***Commercial***: where the primary activity is commercial (*e.g.*, shopping mall) and there is free access to all members of the public, including children. The use may include, for example, commercial day-care centres. It does not include operations where food is grown.

***Industrial:*** where the primary activity involves the production, manufacture or construction of goods. Public access is restricted and children are not permitted continuous access or occupancy.

The Site is currently zoned for commercial land use and will likely be used as commercial property for the foreseeable future. As such, commercial would be the applicable land use category for the Site's assessment purposes.

### 5.3 GRAIN SIZE DESIGNATION

The CCME guidelines are prescribed for coarse-grained and fine-grained soils for PHC assessments. Fine-grained soils are defined as having a median grain size of less than or equal to 75 µm; coarse-grained soils have a median grain size of greater than 75 µm. Where both fine and coarse grained strata are present, the dominant soil particle size is determined by the stratum governing horizontal and vertical migration to a receptor.

Grain size analysis was not conducted as part of the Phase II ESA. A fine grained soil designation is based on visual assessment of soil samples collected and on AMEC's previous experience in the area of the Site.

### 5.4 APPLICABLE EXPOSURE PATHWAYS

CCME recognizes two soil horizons; surface soil (≤ 1.5 m depth) and subsoils (>1.5 m depth) for PHC assessment. Exposure pathways for PHCs are assessed individually for both horizons.

#### 5.4.1 HUMAN EXPOSURE PATHWAYS

Potential human exposure pathways include the soil ingestion, soil dermal contact, vapour inhalation, irrigation use and protection of potable groundwater pathways. The applicability of each of these potential exposure pathways are discussed in the following sections.

#### 5.4.1.1 *Soil Ingestion Pathway*

The soil ingestion pathway would not be considered applicable as the surface cover at the Site is asphalt. The areas of concern at the Site are covered with asphalt.

#### 5.4.1.2 *Dermal Contact Pathway*

The soil ingestion pathway would not be considered applicable as a portion of the surface cover at the Site is asphalt. The areas of concern at the Site are covered with asphalt.

#### 5.4.1.3 *Vapour Inhalation Pathway*

The vapour inhalation (indoor) pathway would be considered applicable to both the surface and subsoil horizons there is an occupied building on-Site.

#### 5.4.1.4 *Irrigation Use of Groundwater*

As there are no agricultural wells located within 500 m of the Site, the irrigation use of groundwater is not considered applicable to the Site.

#### 5.4.1.5 *Protection of Potable Groundwater*

##### 5.4.1.5.1 Manitoba Well Search

A water well survey was conducted by AMEC through Manitoba Water Stewardship to include an area within 500 m of the Site. No wells were identified within the search area.

##### 5.4.1.5.2 Livestock Watering

As there are no livestock wells located within 500 m of the Site, the livestock drinking water exposure pathway is not considered applicable to the Site.

##### 5.4.1.5.3 Potable Groundwater Pathway

The City of Thompson has a municipal water supply to the Site and surrounding properties. The water is from is drawn from the Burntwood River and is treated in a water treatment plant owned and operated by Vale Inco. There is one domestic well located within 500 m of the Site. The well is cased into limestone to a depth of 18 m.

CCME considers all water bearing units as a potential potable groundwater resource, however CCME defines a water bearing unit as having a hydraulic conductivity of greater than $10^{-4}$ cm/s. Furthermore, Manitoba Conservation recognizes the division between contaminated soil and groundwater that is not hydraulically connected to an underlying aquifer. A 5 m thickness of massive unfractured saturated fine-grained material, with a bulk hydraulic conductivity less than $10^{-5}$ cm/s is considered sufficient to ensure isolation of groundwater aquifers.

As the domestic well draw water from depths of 18.0 m below grade, groundwater at the Site is not considered a potential potable groundwater resource. As such, the protection of potable groundwater pathway is not considered to be applicable to the Site.

### 5.4.2 ECOLOGICAL EXPOSURE PATHWAYS

Potential ecological exposure pathways include the ecological soil contact and freshwater aquatic life pathways. The applicability of each of these potential exposure pathways are discussed in the following sections.

#### 5.4.2.1 *Ecological Soil Contact Pathway*

The ecological soil contact pathway would not be considered applicable to soils in the surface soil horizon as the surface is all paved. Ecological receptor exposure to soils in the subsoil horizon is not considered realistic.

#### 5.4.2.2 *Freshwater Aquatic Life Pathway*

CCME states that the freshwater aquatic life pathway may be excluded in cases where there is no surface water body within 10 m of a site classified as fine grained. The closest surface water body is Birch Tree Lake approximately 9.3 km southwest of the Site. As such, AMEC considers the freshwater aquatic life pathway not applicable to the Site.

### 5.4.3 MISCELLANEOUS CRITERIA

As commercial land use criteria are applicable to the Site, soil management limits as produced by CCME for PHCs are applicable to the assessment.

#### 5.4.3.1 *Management Limit*

The management limits for PHCs applies for all soils in the surface soil and subsoil horizon.

## 5.5 SUMMARY

Given the current and future commercial zoning of the Site, surrounding commercial land use, the fine grained nature of the soil and the applicable exposure pathways as outlined in the previous sections, AMEC determined assessment guidelines for each contaminant of concern. The most stringent of the applicable exposure pathway guideline values as produced by CCME was used for each contaminant for both the surface soil and subsoil horizons.

AMEC has chosen the following applicable risk guideline criteria for the Site:

Soil:

Above 1.5 m below grade:

- commercial values for fine grained surface soil in a non-potable situation as limited by the:

- inhalation of indoor air check (slab on grade) for benzene

Below 1.5 m below grade:

- commercial values for fine grained subsoil in a non-potable situation as limited by the:
  - inhalation of indoor air check (slab on grade) for benzene, toluene, ethylbenzene and xylenes; and
  - management limits for PHC fractions F1– F4.

A summary of the applicable assessment guidelines are included in Table 2 (Appendix B).

## 6.0 ASSESSMENT RESULTS

### 6.1 SITE AND AREA DESCRIPTION

The Site consists of a Chinese food restaurant, parking lot and Robins Donuts. located at 50 Selkirk Avenue in Thompson, Manitoba.

The surrounding property to the north, south, east, and west is commercial land use, and is shown on Figure 2 (Appendix A) and summarized in Table 1 (Appendix B).

### 6.2 SERVICE LOCATIONS

Utilities identified on-site included underground MTS lines, private electrical lines, and underground municipal sewer and water lines.

### 6.3 SOIL CONDITIONS

#### 6.3.1 REGIONAL AND LOCAL GEOLOGY

Based upon geological maps, the subsurface stratigraphy in the Thompson area normally consists of topsoil and fill materials underlain by up to 15 m of glaciolacustrine silt and clay. The clay can generally be described as being high plastic, brown to grey with zones of varved silt. Bedrock in this area of Manitoba is from the Precambrian period consisting of granite granodioite. The bedrock surface undulates significantly and the depth to bedrock can vary greatly over short distances. Discontinuous permafrost is known to be present within some areas of the City.

#### 6.3.2 STRATIGRAPHY

The soil profile encountered at the test hole locations generally consisted of an asphalt surface followed by granular fill to approximately 1.5 m below grade level (bgl). Underlying the granular fill was a medium plastic clay extending to the maximum termination depth of the test holes (6.1 m).

The soil profiles at the test hole locations are shown on the test hole logs included in Appendix C.

### 6.3.3 FIELD OBSERVATIONS

Soil vapour concentrations and field observations made during the field investigations on 2 and 3 June 2011 are summarized in Table 3 (Appendix B) and detailed on the test hole logs (Appendix C).

The maximum soil vapour concentration encountered during the test hole drilling program was 4500 $ppm_v$ in TH11-6 @3.1 m. TH11-6 was located immediately south of the restaurant. Elevated vapour concentrations were also observed in TH11-2 @ 3.1 m (4000 $ppm_v$), TH11-4 @ 2.3 m (1200 $ppm_v$) and TH11-11 @ 4.6 m (1250 $ppm_v$).

### 6.3.4 LABORATORY RESULTS

A total of nineteen (19) soil samples were submitted for laboratory analysis of PHCs. The results of the BTEX and PHC F1-F4 analyses conducted on the selected soil samples are shown on Figures 2 and 3 (Appendix A) and summarized in Table 4 (Appendix B). Copies of the detailed analytical reports are provided in Appendix D.

As Table 4 indicates, PHC constituents in submitted soil samples were above the applicable guidelines n benzene for TH11-1 (3.22 ug/g), TH11-2 (14.9 ug/g), TH11-6 (21 ug/g), TH11-11(22.3 ug/g) and TH11-16 (3.75ug/g). As well, F3 concentrations of 5040 ug/g were above the guidelines in TH11-5. All other soil samples submitted for laboratory analysis is below the guidelines.

## 6.4 GROUNDWATER CONDITIONS

### 6.4.1 SITE HYDROGEOLOGY

Free phase product was present at TH11-2. All the remaining groundwater monitoring wells were dry at the time of monitoring (4 June 2011).

## 7.0 SUMMARY

The AMEC drilling program was conducted on 2 and 3 June 2011. The drilling program consisted of eighteen (18) test holes (TH11-1 through TH11-19, excluding TH11-3), three (3) of which were completed as groundwater monitoring wells (TH11-2, TH11-4 and TH11-6). The test holes were drilled to a maximum depth of 6.1 m with a continuous solid stem auger rig, supplied and operated by Maple Leaf of Winnipeg, Manitoba.

An abandoned underground waste oil tank was encountered at TH11-3 at a depth of 1.1 m. Subsequent assessment determined oil remained in the tank and that the bottom of the tank was at a depth of 2.1 m. Approximately 2,200 litres of waste oil was removed by a licensed

disposal contractor. The test hole was backfilled with bentonite and concrete, and covered with a flush mount casing at the asphalt surface.

The soil profile encountered at the test hole locations generally consisted of an asphalt surface followed by granular fill to approximately 1.5 m below grade level. Underlying the granular fill was a medium plastic clay extending to the maximum termination depth of the test holes (6.1 m).

The maximum soil vapour concentration encountered during the test hole drilling program was 4500 $ppm_v$ in TH11-6 @ 3.1 m. TH11-6 was located immediately south of the restaurant. Elevated vapour concentrations were also observed in TH11-2 @ 3.1 m (4000 $ppm_v$), TH11-4 @ 2.3 m (1200 $ppm_v$) and TH11-11 @ 4.6 m (1250 $ppm_v$).

Petroleum hydrocarbons (PHCs) constituents in submitted soil samples were above the applicable guidelines in benzene for TH11-1 (3.22 ug/g), TH11-2 (14.9 ug/g), TH11-6 (21 ug/g), TH11-11(22.3 ug/g) and TH11-16 (3.75 ug/g). As well, a F3 concentration of 5040 ug/g was above the guidelines in TH11-5. All other soil samples submitted for laboratory analysis is below the guidelines.

Free phase product was present at TH11-2. All the remaining groundwater monitoring wells were dry at the time of monitoring (4 June 2011).

Based on the results from the investigation completed in 1995 and 2011, AMEC estimates approximately 500 $m^3$ of PHC impacted soil to be present at the former Esso Service Station.

Manitoba Conservations petroleum storage tank regulations states that all abandoned storage tanks must decommissioned and removed from Site. AMEC therefore recommends that this tank is removed.

## 8.0 CLOSURE

The American Society for Testing and Materials Standard of Practice notes that no environmental site assessment can wholly eliminate uncertainty regarding the potential for recognized environmental conditions in the connection with a property. Performance of a standardized environmental site assessment protocol is intended to reduce, but not eliminate, uncertainty regarding the potential for recognized environmental conditions in connection with the property, given reasonable limits of time and costs. The findings of this investigation are based on the interpretation of data from a limited number of boreholes and analytical results pertaining to specific samples. The evaluation and interpretations do not preclude the existence of chemical substances other than those identified herein, or the possibility that contamination levels can vary between the areas of the investigation.

This report has been prepared for the exclusive use of Marlowe-Yeoman Limited and their agent for specific application to the property identified in this report. The environmental assessment was conducted in accordance with generally accepted assessment practices. No other warranty, expressed or implied, is made. The general conditions of this report are specified in Appendix F.

We trust that this report meets your present requirements. Please contact our office if you have any questions or if we can be of further assistance.

This Report is also subject to the further General Conditions contained in Appendix F.
Respectively submitted,

AMEC Earth & Environmental,
**a division of AMEC Americas Limited**

Karen Timlick, B.Sc..
Environmental Scientist
Project Manager

Reviewed by:

for Mark Humbert, P.Eng.
Senior Environmental Scientist

## 9.0 REFERENCES

Canadian Council of Ministers of the Environment (CCME) 2009 Update. Canadian Environmental Quality Guidelines (EQG).

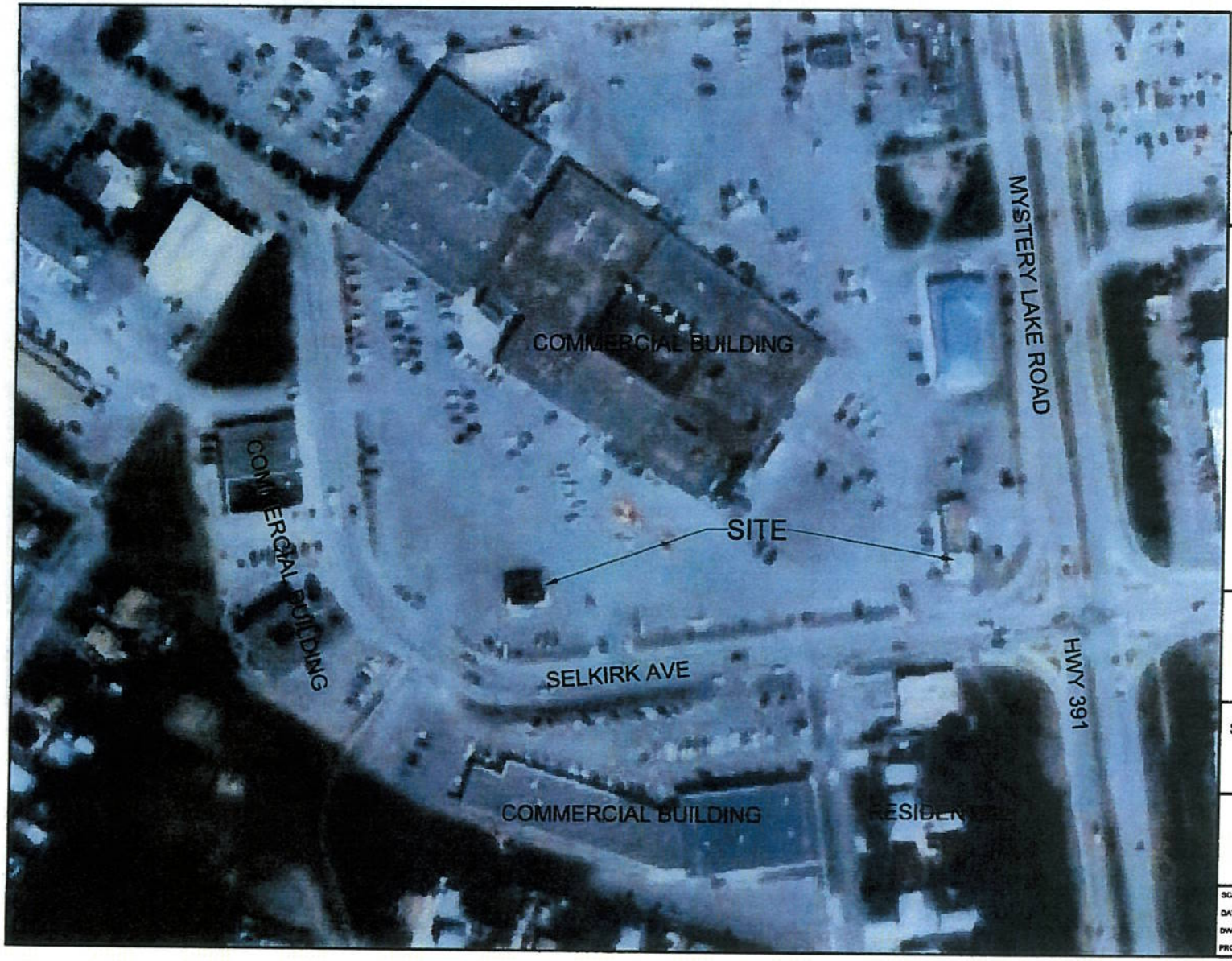
Canadian Council of Ministers of the Environment (CCME) 2001, Revised 2008. Canada-Wide Standards for Petroleum Hydrocarbons (CWS PHC) in soil

Manitoba Conservation Water Well Database Software (GWDrill), update 2003

Province of Manitoba Department of Natural Resources Water Resources Branch. Aquifer Maps of Southern Manitoba (Map 1 of 2) Bedrock Aquifers (1987)

# APPENDIX A

# FIGURES




amec

AMEC Earth & Environmental
440 DOVERCOURT DRIVE
WINNIPEG, MANITOBA
R3Y 1N4

CLIENT

MARLOWE-YEOMAN LIMITED

LEGENDS:

N

SUBSURFACE SITE ASSESSMENT
THOMPSON PLAZA
THOMPSON, MANITOBA

SITE AND SURROUNDING LAND USE

| | |
|---|---|
| SCALE: | NOT TO SCALE |
| DATE: | JULY 2011 |
| DWN BY: | MD |
| PROJECT NO: | WX16580 |

FIGURE 1


amec

AMEC Earth & Environmental
440 DOVERCOURT DRIVE
WINNIPEG, MANITOBA
R3Y 1N4

CLIENT

MARLOWE-YEOMAN LIMITED

LEGENDS:

- TEST HOLE
- MONITORING WELL
- PREVIOUSLY DRILLED TEST HOLE
- PREVIOUSLY DRILLED MONITORING WELL
- ABANDONED UST LOCATION

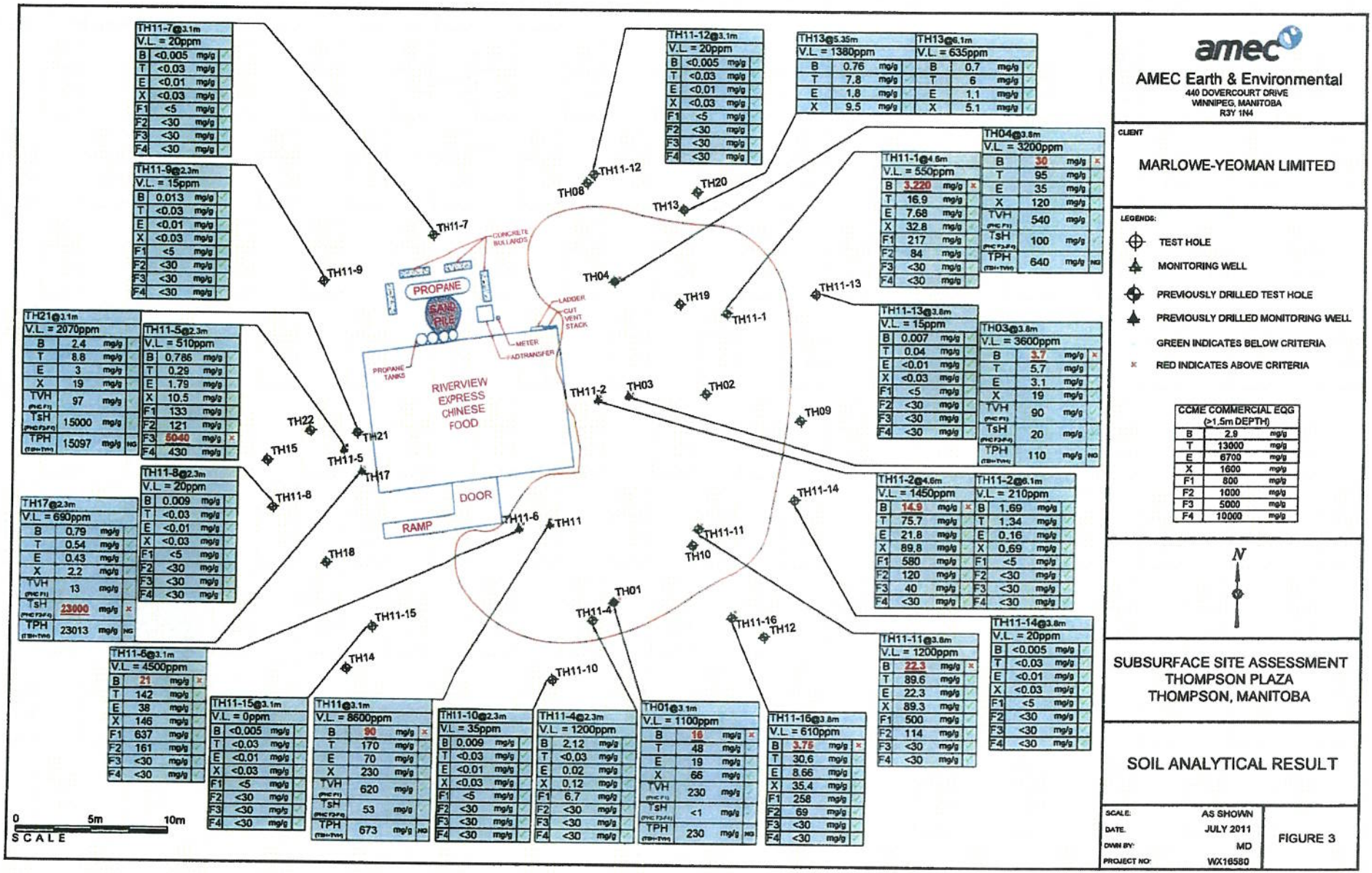
N

SUBSURFACE SITE ASSESSMENT
THOMPSON PLAZA
THOMPSON, MANITOBA

TEST HOLE LOCATION PLAN

| | |
|---|---|
| SCALE: | AS SHOWN |
| DATE: | JULY 2011 |
| DWN BY: | MD |
| PROJECT NO: | WX16580 |

FIGURE 2




amec

AMEC Earth & Environmental
440 DOVERCOURT DRIVE
WINNIPEG, MANITOBA
R3Y 1N4

CLIENT

MARLOWE-YEOMAN LIMITED

LEGENDS:

- TEST HOLE
- MONITORING WELL
- PREVIOUSLY DRILLED TEST HOLE
- PREVIOUSLY DRILLED MONITORING WELL
- GREEN INDICATES BELOW CRITERIA
- RED INDICATES ABOVE CRITERIA

CCME COMMERCIAL EQG (>1.5m DEPTH)

| | | |
|---|---|---|
| B | 2.9 | mg/g |
| T | 13000 | mg/g |
| E | 6700 | mg/g |
| X | 1600 | mg/g |
| F1 | 800 | mg/g |
| F2 | 1000 | mg/g |
| F3 | 5000 | mg/g |
| F4 | 10000 | mg/g |

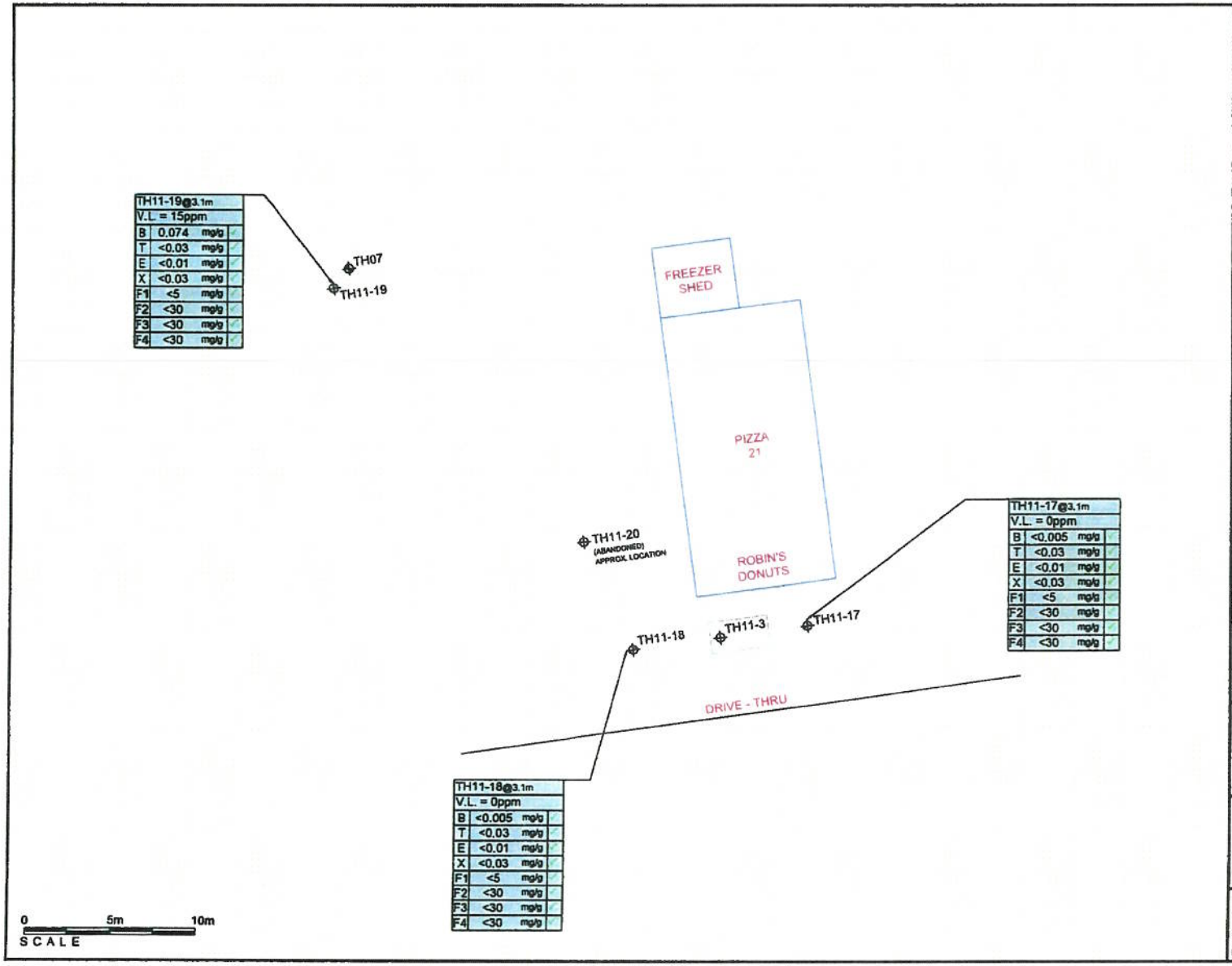
N

SUBSURFACE SITE ASSESSMENT
THOMPSON PLAZA
THOMPSON, MANITOBA

SOIL ANALYTICAL RESULT

| | |
|---|---|
| SCALE: | AS SHOWN |
| DATE: | JULY 2011 |
| DWN BY: | MD |
| PROJECT NO: | WX16580 |

FIGURE 3




amec
AMEC Earth & Environmental
440 DOVERCOURT DRIVE
WINNIPEG, MANITOBA
R3Y 1N4

CLIENT

MARLOWE-YEOMAN LIMITED

LEGENDS:

- TEST HOLE
- MONITORING WELL
- PREVIOUSLY DRILLED TEST HOLE
- ABANDONED UST LOCATION
- GREEN INDICATES BELOW CRITERIA
- RED INDICATES ABOVE CRITERIA

| CCME COMMERCIAL EQG (>1.5m DEPTH) | | |
|---|---|---|
| B | 2.9 | mg/g |
| T | 13000 | mg/g |
| E | 6700 | mg/g |
| X | 1600 | mg/g |
| F1 | 800 | mg/g |
| F2 | 1000 | mg/g |
| F3 | 5000 | mg/g |
| F4 | 10000 | mg/g |

N

SUBSURFACE SITE ASSESSMENT
THOMPSON PLAZA
THOMPSON, MANITOBA

SOIL ANALYTICAL RESULT

| | |
|---|---|
| SCALE: | AS SHOWN |
| DATE | JULY 2011 |
| DWN BY: | MD |
| PROJECT NO: | WX16580 |

FIGURE 4

# APPENDIX B

# TABLES

| TABLE 1: SITE AND SURROUNDING LAND USE | | |
|---|---|---|
| Direction | Land Use | Approx. Distance (m) |
| Site | Thompson Plaza | Site |
| North | Parking lot/Thompson Citi Plaza | adjacent |
| East | Mystery Lake Road | adjacent |
| South | Selkirk Avenue/Commercial strip | adjacent |
| West | Parking area/Selkirk Avenue/Commerical strip | adjacent |

| TABLE 2: ASSESSMENT CRITERIA | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Land Use | Exposure Pathway | Fine Grained Soil Guidelines (ug/g) (PHCs) | | | | | | | |
| | | Benzene | Toluene | Ethylbenzene | Xylenes | F1 | F2 | F3 | F4 |
| Commercial (> 1.5 m depth) | Inhalation of Indoor Air Check (Slab on Grade) | 2.9 | 13000 | 6700 | 1600 | 4600 | 23000 | NA | NA |
| | Management Limits | NG | NG | NG | NG | 800 | 1000 | 5000 | 10000 |

Notes:

- * Combined values for soil injestion and dermal contact for exposure pathway
- ** RES - residual PHC formation. Calculated value exceeds 30,000 mg/kg and solubility limit for PHC fraction.
- ug/g - concentration in micrograms per gram
- BOLD – selected guideline
- F1 - volatile petroleum hydrocarbons ($C_6 - C_{10}$); corrected for BTEX concentrations
- F2 - extractable petroleum hydrocarbons ($C_{10} - C_{16}$)
- F3 - extractable petroleum hydrocarbons ($C_{16} - C_{34}$)
- F4 - extractable petroleum hydrocarbons ($C_{34} - C_{50}$)
- NA - not applicable, calculated value exceeds 1,000,000 mg/kg
- NG - no guideline available
- CCME EQG Criteria – commercial land use criteria as outlined in the Canadian Council of the Ministers of the Environment (CCME) "Canadian Environmental Quality Guidelines", 1999 (updated 2009). The benzene concentration is based on one in one hundred thousand ($10^{-5}$) incremental risk of cancer.
- CCME CWS PHC Criteria - commercial land use criteria as outlined in the Canadian Council of the Ministers of the Environment (CCME) "Canada-Wide Standards for Hydrocarbons in Soil", 2001, revised 2008.

amec

| TABLE 3: FIELD OBSERVATIONS AND SOIL VAPOUR TESTING | | | | | |
|---|---|---|---|---|---|
| Test Hole | Test Hole Depth (m) | Staining Zone (m) | Soil Vapour Concentrations > 200 $ppm_v$ (m) | Max. Soil Vapour Concentration | |
| | | | | Level ($ppm_v$) | Depth (m) |
| TH11-1 | 6.1 | none | 4.6 | 550 | 4.6 |
| TH11-2 | 6.1 | none | 2.3 to 6.1 | 4000 | 3.1 |
| TH11-4 | 6.1 | none | 0.8 and 2.3 to 4.6 | 1200 | 2.3 |
| TH11-5 | 6.1 | none | 2.3 to 3.1 | 510 | 2.3 |
| TH11-6 | 6.1 | none | 0.8 and 2.3 to 3.8 | 4500 | 3.1 |
| TH11-7 | 4.6 | none | none | 35 | 0.8 |
| TH11-8 | 4.6 | none | none | 50 | 1.5 |
| TH11-9 | 4.6 | none | none | 60 | 0.8 |
| TH11-10 | 4.6 | none | none | 35 | 2.3 |
| TH11-11 | 6.1 | none | 2.3 to 6.1 | 1250 | 4.6 |
| TH11-12 | 4.6 | none | none | 35 | 1.5 |
| TH11-13 | 4.6 | none | none | 30 | 4.6 |
| TH11-14 | 6.1 | none | none | 40 | 2.3 |
| TH11-15 | 4.6 | none | none | 0 | All |
| TH11-16 | 6.1 | none | 2.3 and 3.8 to 4.6 | 610 | 3.8 |
| TH11-17 | 4.6 | none | none | 5 | 0.8 & 1.5 |
| TH11-18 | 4.6 | none | none | 15 | 0.8 |
| TH11-19 | 4.6 | none | none | 100 | 0.8 |

Notes:

- m - metres
- $ppm_v$ - parts per million total combustible vapour

amec

| TABLE 4: SOIL ANALYTICAL RESULTS - PHCs | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Hole | Depth (m) | Soil Vapour Concentration ($ppm_v$) | Benzene (µg/g) | Toluene (µg/g) | Ethyl benzene (µg/g) | Xylenes (µg/g) | F1 (µg/g) | F2 (µg/g) | F3 (µg/g) | F4 (µg/g) |
| TH11-1 | 4.6 | 550 | **3.220** | 16.9 | 7.68 | 32.8 | 217 | 84 | <30 | <30 |
| TH11-2 | 4.6 | 1450 | **14.9** | 75.7 | 21.8 | 89.8 | 580 | 120 | 40 | <30 |
| TH11-2 | 6.1 | 210 | 1.69 | 1.34 | 0.16 | 0.69 | <5.00 | <30 | <30 | <30 |
| TH11-4 | 2.3 | 1200 | 2.12 | <0.03 | 0.02 | 0.12 | 6.7 | <30 | <30 | <30 |
| TH11-5 | 2.3 | 510 | 0.786 | 0.29 | 1.79 | 10.5 | 133 | 121 | **5040** | 430 |
| TH11-6 | 3.1 | 4500 | **21** | 142 | 38 | 146 | 637 | 161 | <30 | <30 |
| TH11-7 | 3.1 | 20 | <0.005 | <0.03 | <0.01 | <0.03 | <5.00 | <30 | <30 | <30 |
| TH11-8 | 2.3 | 20 | 0.009 | <0.03 | <0.01 | <0.03 | <5.00 | <30 | <30 | <30 |
| TH11-9 | 2.3 | 15 | 0.013 | <0.03 | <0.01 | <0.03 | <5.00 | <30 | <30 | <30 |
| TH11-10 | 2.3 | 35 | 0.009 | <0.03 | <0.01 | <0.03 | <5.00 | <30 | <30 | <30 |
| TH11-11 | 3.8 | 1200 | **22.3** | 89.6 | 22.3 | 89.3 | 500 | 114 | <30 | <30 |
| TH11-12 | 3.1 | 20 | <0.005 | <0.03 | <0.01 | <0.03 | <5.00 | <30 | <30 | <30 |
| TH11-13 | 3.8 | 15 | 0.007 | 0.04 | <0.01 | <0.03 | <5.00 | <30 | <30 | <30 |
| TH11-14 | 3.8 | 20 | <0.005 | <0.03 | <0.01 | <0.03 | <5.00 | <30 | <30 | <30 |
| TH11-15 | 3.1 | 0 | <0.005 | <0.03 | <0.01 | <0.03 | <5.00 | <30 | <30 | <30 |
| TH11-16 | 3.8 | 610 | **3.75** | 30.6 | 8.66 | 35.4 | 258 | 69 | <30 | <30 |
| TH11-17 | 3.1 | 0 | <0.005 | <0.03 | <0.01 | <0.03 | <5.00 | <30 | <30 | <30 |
| TH11-18 | 3.1 | 0 | <0.005 | <0.03 | <0.01 | <0.03 | <5.00 | <30 | <30 | <30 |
| TH11-19 | 3.1 | 15 | 0.074 | <0.03 | <0.01 | <0.03 | <5.00 | <30 | <30 | <30 |
| **CCME Commercial EQG (>1.5m depth)** | | | **2.9** | **13000** | **6700** | **1600** | **NG** | **NG** | **NG** | **NG** |
| **CCME Commercial CWS PHC – fine grained soils (>1.5m depth below grade)** | | | | | | | **800** | **1000** | **5000** | **10000** |

Notes:

- $ppm_v$ – parts per million combustible vapour
- (µg/g) – micrograms per gram
- **BOLD** – exceeds the referenced guideline
- NG - No Guideline
- F1 – volatile petroleum hydrocarbons ($C_6$-$C_{10}$); correct for BTEX concentrations
- F2 – extractable petroleum hydrocarbons ($C_{10}$-$C_{16}$)
- F3 – extractable petroleum hydrocarbon ($C_{16}$-$C_{34}$)
- F4 – extractable petroleum hydrocarbons ($C_{34}$-$C_{50}$)
- < - less than the method detection limit
- CCME EQG Criteria – commercial land use criteria as outlined in the Canadian Council of the Ministers of the Environment (CCME) "Canadian Environmental Quality Guidelines", 1999 (updated 2009). The benzene concentration is based on one in one hundred thousand ($10^{-5}$) incremental risk of cancer.
- CCME CWS PHC Criteria - commercial land use criteria as outlined in the Canadian Council of the Ministers of the Environment (CCME) "Canada-Wide Standards for Hydrocarbons in Soil", 2001, revised 2008.
- See laboratory report for detection limits, testing protocols and QA/QC procedures. Laboratory analysis was performed by AMEC Laboratory in Edmonton.

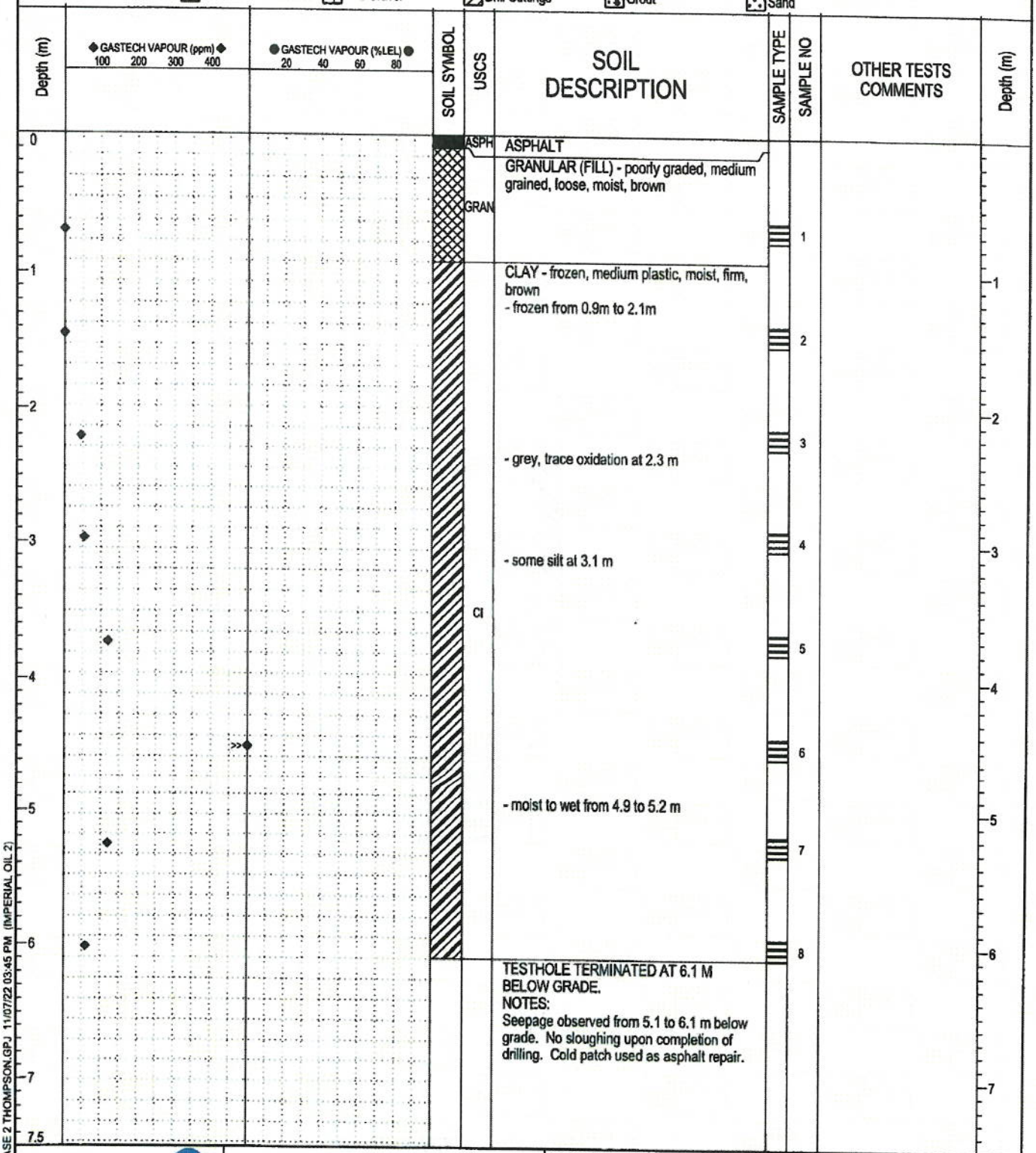
# APPENDIX C

# TEST HOLE LOGS

| | | |
|---|---|---|
| PROJECT: Phase II Thompson | DRILLED BY: Maple Leaf Drillers | TEST HOLE NO: TH11-1 |
| CLIENT: Thompson Plaza Inc. | DRILL RIG: CME 55 | PROJECT NO: WX16580 |
| LOCATION: Thompson, Manitoba | DRILL TYPE: 125 SSA | ELEVATION: |

SAMPLE TYPE: Shelby Tube; No Recovery; SPT Test (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Sand




| | | |
|---|---|---|
| amec | AMEC Earth and Environmental Winnipeg, Manitoba | LOGGED BY: AC |
| | | REVIEWED BY: KT |
| | | Fig. No: 1 |
| | | COMPLETION DEPTH: 6.1 m |
| | | COMPLETION DATE: June 2, 2011 |
| | | Page 1 of 1 |

16580-PHASE 2 THOMPSON.GPJ 11/07/22 03:45 PM (IMPERIAL OIL 2)

| | | |
|---|---|---|
| PROJECT: Phase II Thompson | DRILLED BY: Maple Leaf Drillers | TEST HOLE NO: TH11-10 |
| CLIENT: Thompson Plaza Inc. | DRILL RIG: CME 55 | PROJECT NO: WX16580 |
| LOCATION: Thompson, Manitoba | DRILL TYPE: 125 SSA | ELEVATION: |

SAMPLE TYPE: Shelby Tube; No Recovery; SPT Test (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Sand

| Depth (m) | ◆ GASTECH VAPOUR (ppm) ◆ 100 200 300 400 | ● GASTECH VAPOUR (%LEL) ● 20 40 60 80 | SOIL SYMBOL | USCS | SOIL DESCRIPTION | SAMPLE TYPE | SAMPLE NO | OTHER TESTS COMMENTS | Depth (m) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | ASPH | ASPHALT | | | | 0 |
| | | | | GRAN | GRANULAR (FILL) - poorly graded, medium grained, loose, moist, brown | | | | |
| 1 | | | | | CLAY - frozen, medium plastic, moist, firm, brown<br>- frozen from 0.61 to 3.1 m | | 1 | | 1 |
| | | | | | | | 2 | | |
| 2 | | | | | | | | | 2 |
| | | | | | | | 3 | | |
| | | | | | - grey at 2.3 m<br>- some silt at 2.4 m | | | | |
| 3 | | | | CI | | | 4 | | 3 |
| | | | | | | | | | |
| 4 | | | | | | | 5 | | 4 |
| | | | | | | | | | |
| | | | | | | | 6 | | |
| 5 | | | | | TESTHOLE TERMINATED AT 4.6 M BELOW GRADE.<br>NOTES:<br>No sloughing or seepage observed upon completion of drilling. Cold patch used as asphalt repair. | | | | 5 |
| 6 | | | | | | | | | 6 |
| 7 | | | | | | | | | 7 |
| 7.5 | | | | | | | | | |

amec

AMEC Earth and Environmental
Winnipeg, Manitoba

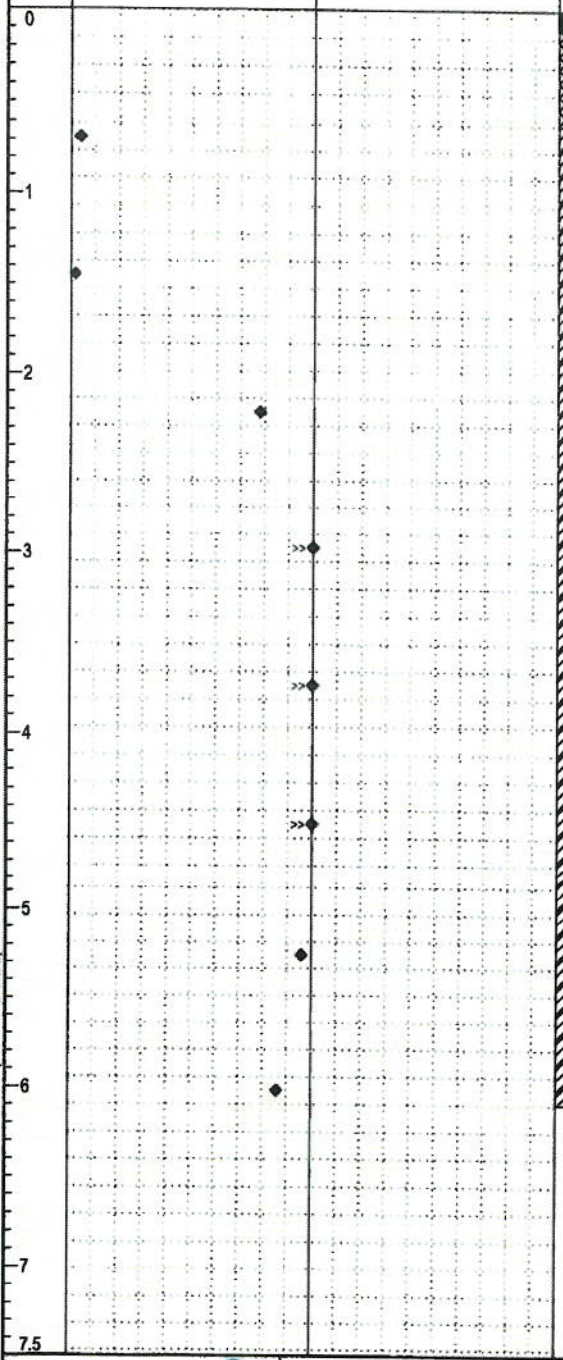
| | |
|---|---|
| LOGGED BY: AC | COMPLETION DEPTH: 4.6 m |
| REVIEWED BY: KT | COMPLETION DATE: June 2, 2011 |
| Fig. No: 10 | Page 1 of 1 |

16580-PHASE 2 THOMPSON.GPJ 11/07/22 03:45 PM (IMPERIAL OIL 2)

| | | |
|---|---|---|
| PROJECT: Phase II Thompson | DRILLED BY: Maple Leaf Drillers | TEST HOLE NO: TH11-11 |
| CLIENT: Thompson Plaza Inc. | DRILL RIG: CME 55 | PROJECT NO: WX16580 |
| LOCATION: Thompson, Manitoba | DRILL TYPE: 125 SSA | ELEVATION: |

SAMPLE TYPE: Shelby Tube; No Recovery; SPT Test (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Sand




| SOIL SYMBOL | USCS | SOIL DESCRIPTION | SAMPLE TYPE | SAMPLE NO | OTHER TESTS COMMENTS | Depth (m) |
|---|---|---|---|---|---|---|
| | ASPH | ASPHALT | | | | |
| | GRAN | GRANULAR (FILL) - poorly graded, medium grained, loose, moist, brown | | | | |
| | | CLAY - frozen, medium plastic, moist, firm, brown | | 1 | | |
| | | - frozen from 0.91 to 3.2 m | | 2 | | |
| | | | | 3 | | |
| | | - obvious odour, some silt at 3.1 m | | 4 | | |
| | CI | | | 5 | | |
| | | | | 6 | | |
| | | | | 7 | | |
| | | | | 8 | | |
| | | TESTHOLE TERMINATED AT 6.1 M BELOW GRADE. | | | | |

NOTES:
No sloughing or seepage observed upon completion of drilling. Cold patch used as asphalt repair.

16580-PHASE 2 THOMPSON.GPJ 11/07/22 03:45 PM (IMPERIAL OIL 2)

amec

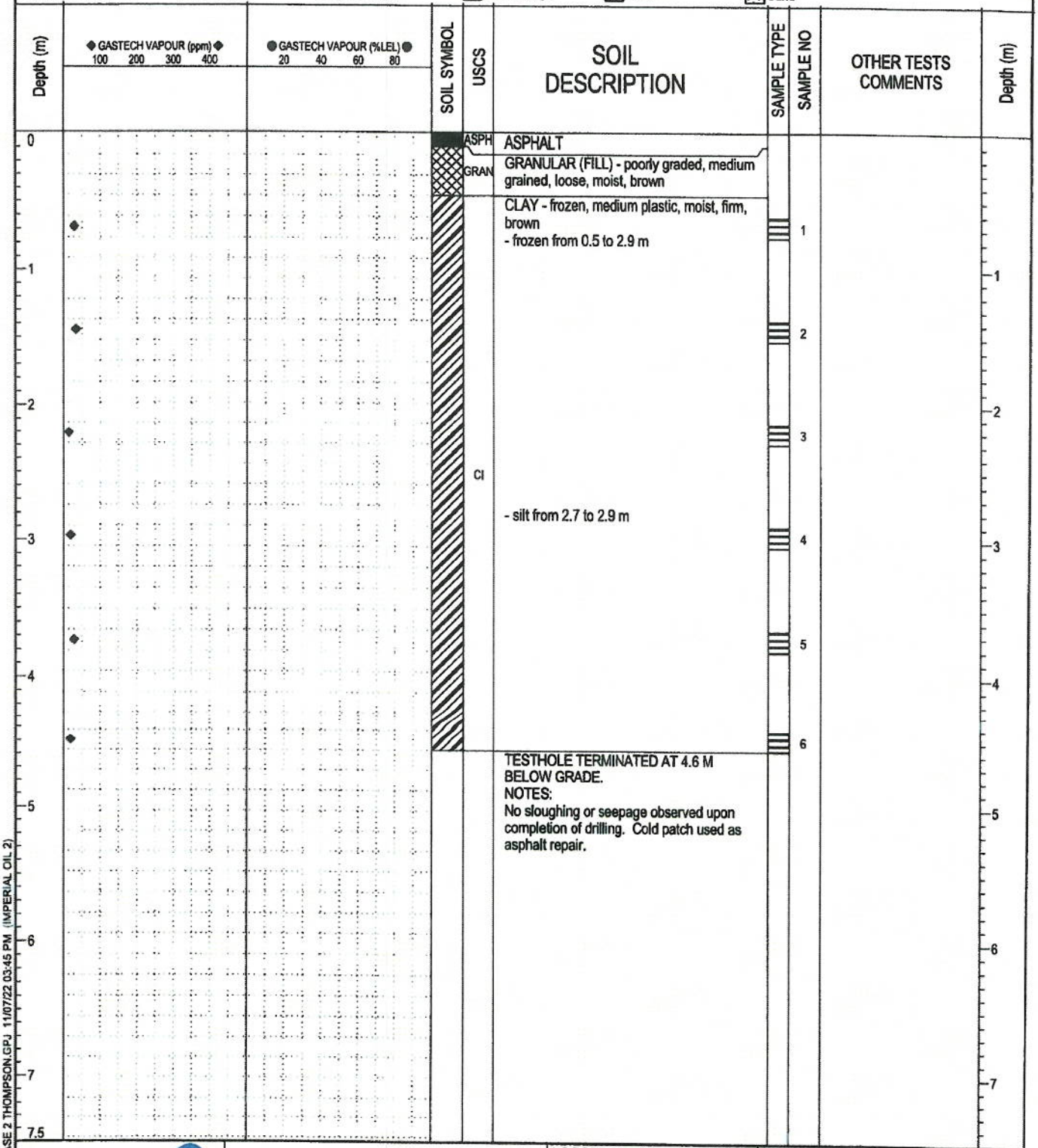
AMEC Earth and Environmental
Winnipeg, Manitoba

| | |
|---|---|
| LOGGED BY: AC | COMPLETION DEPTH: 6.1 m |
| REVIEWED BY: KT | COMPLETION DATE: June 2, 2011 |
| Fig. No: 11 | Page 1 of 1 |

| | | |
|---|---|---|
| PROJECT: Phase II Thompson | DRILLED BY: Maple Leaf Drillers | TEST HOLE NO: TH11-12 |
| CLIENT: Thompson Plaza Inc. | DRILL RIG: CME 55 | PROJECT NO: WX16580 |
| LOCATION: Thompson, Manitoba | DRILL TYPE: 125 SSA | ELEVATION: |

SAMPLE TYPE: Shelby Tube; No Recovery; SPT Test (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Sand



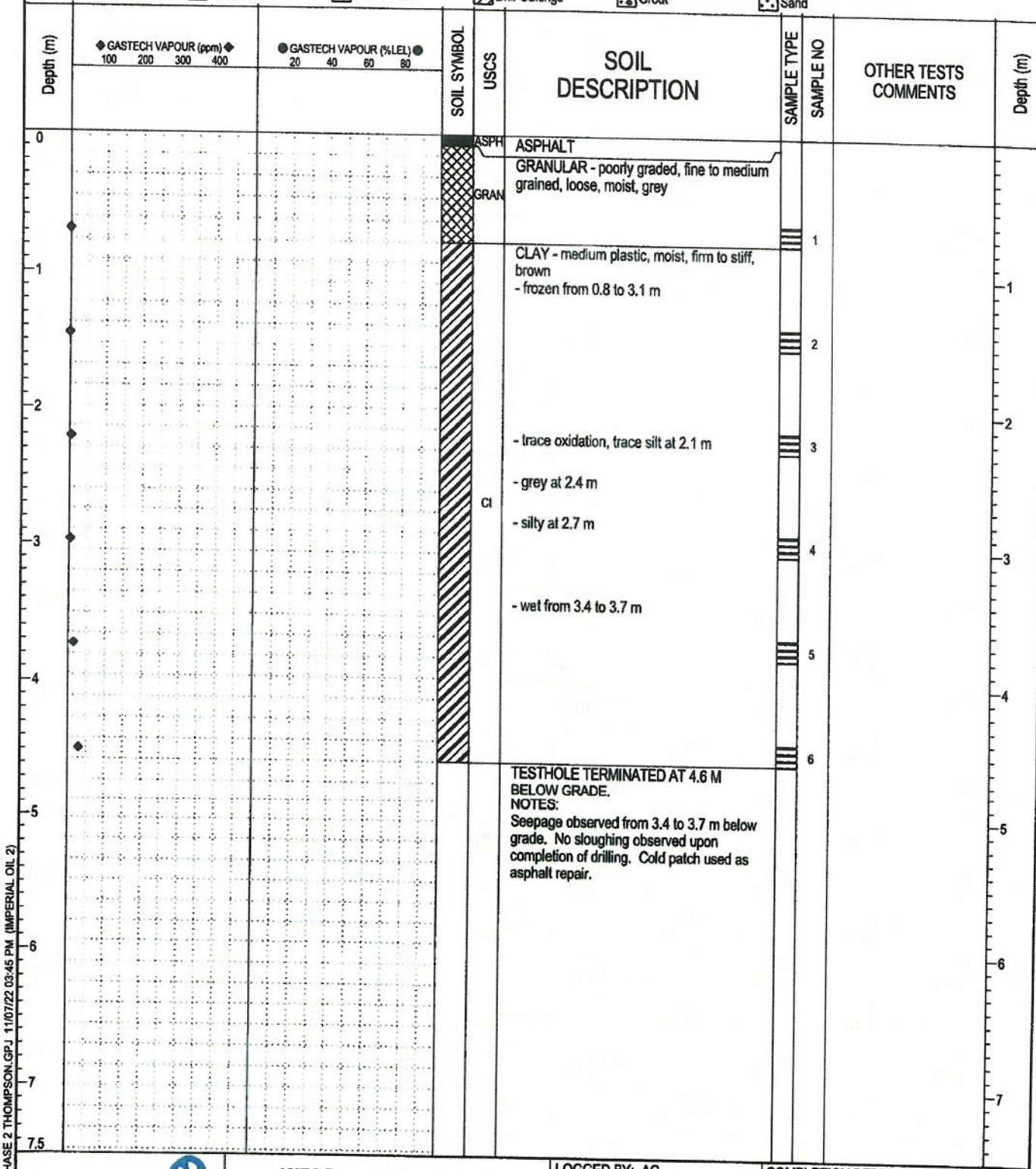

| | | | |
|---|---|---|---|
| amec | AMEC Earth and Environmental Winnipeg, Manitoba | LOGGED BY: AC | COMPLETION DEPTH: 4.6 m |
| | | REVIEWED BY: KT | COMPLETION DATE: June 2, 2011 |
| | | Fig. No: 12 | Page 1 of 1 |

16580-PHASE 2 THOMPSON.GPJ 11/07/22 03:45 PM (IMPERIAL OIL 2)

| | | |
|---|---|---|
| PROJECT: Phase II Thompson | DRILLED BY: Maple Leaf Drillers | TEST HOLE NO: TH11-13 |
| CLIENT: Thompson Plaza Inc. | DRILL RIG: CME 55 | PROJECT NO: WX16580 |
| LOCATION: Thompson, Manitoba | DRILL TYPE: 125 SSA | ELEVATION: |

SAMPLE TYPE: Shelby Tube; No Recovery; SPT Test (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Sand



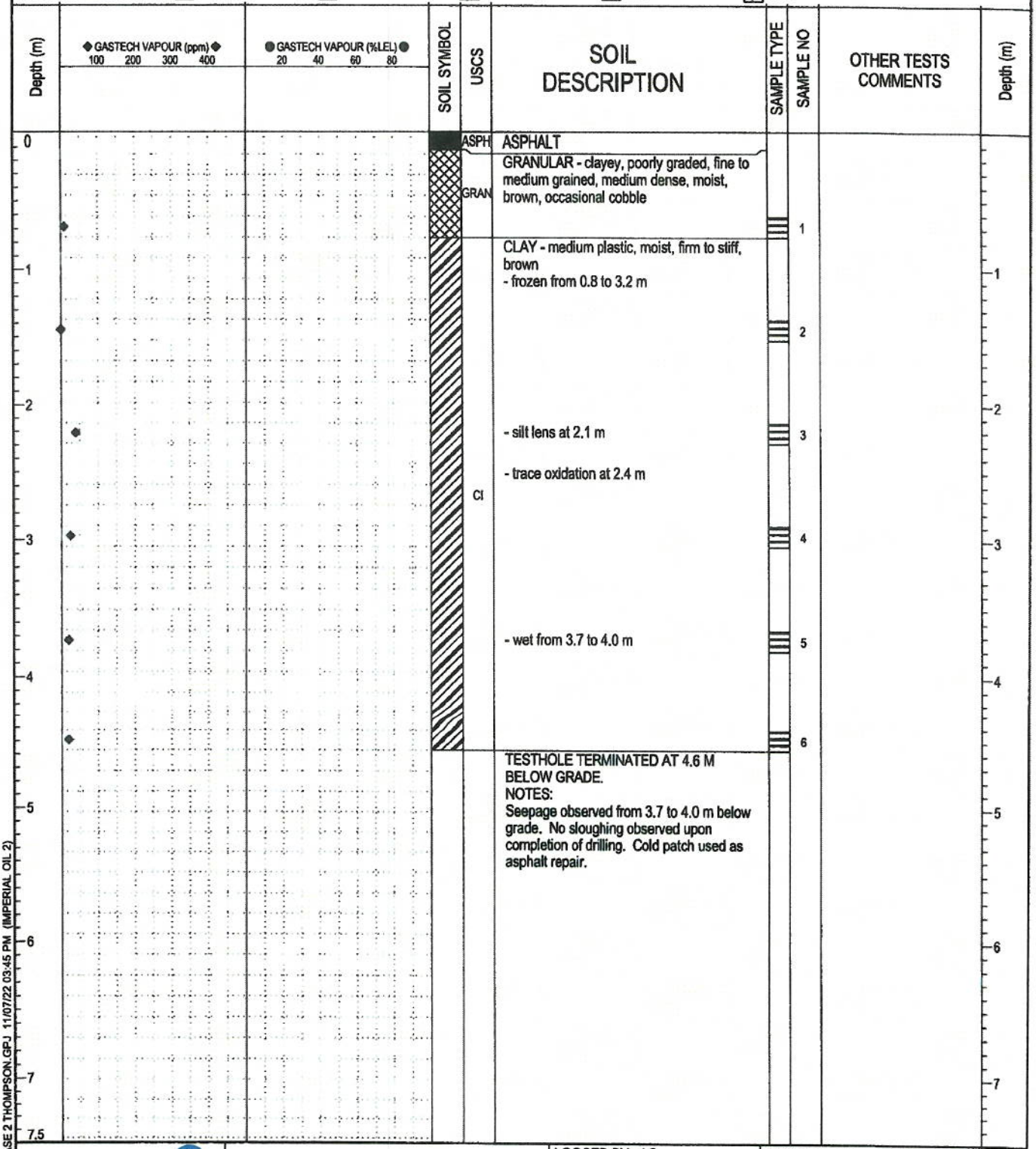

| | | |
|---|---|---|
| amec | AMEC Earth and Environmental Winnipeg, Manitoba | LOGGED BY: AC |
| | | REVIEWED BY: KT |
| | | Fig. No: 13 |
| | | COMPLETION DEPTH: 4.6 m |
| | | COMPLETION DATE: June 3, 2011 |
| | | Page 1 of 1 |

16580-PHASE 2 THOMPSON.GPJ 11/07/22 03:45 PM (IMPERIAL OIL 2)

| | | |
|---|---|---|
| PROJECT: Phase II Thompson | DRILLED BY: Maple Leaf Drillers | TEST HOLE NO: **TH11-14** |
| CLIENT: Thompson Plaza Inc. | DRILL RIG: CME 55 | PROJECT NO: WX16580 |
| LOCATION: Thompson, Manitoba | DRILL TYPE: 125 SSA | ELEVATION: |

SAMPLE TYPE: Shelby Tube; No Recovery; SPT Test (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Sand



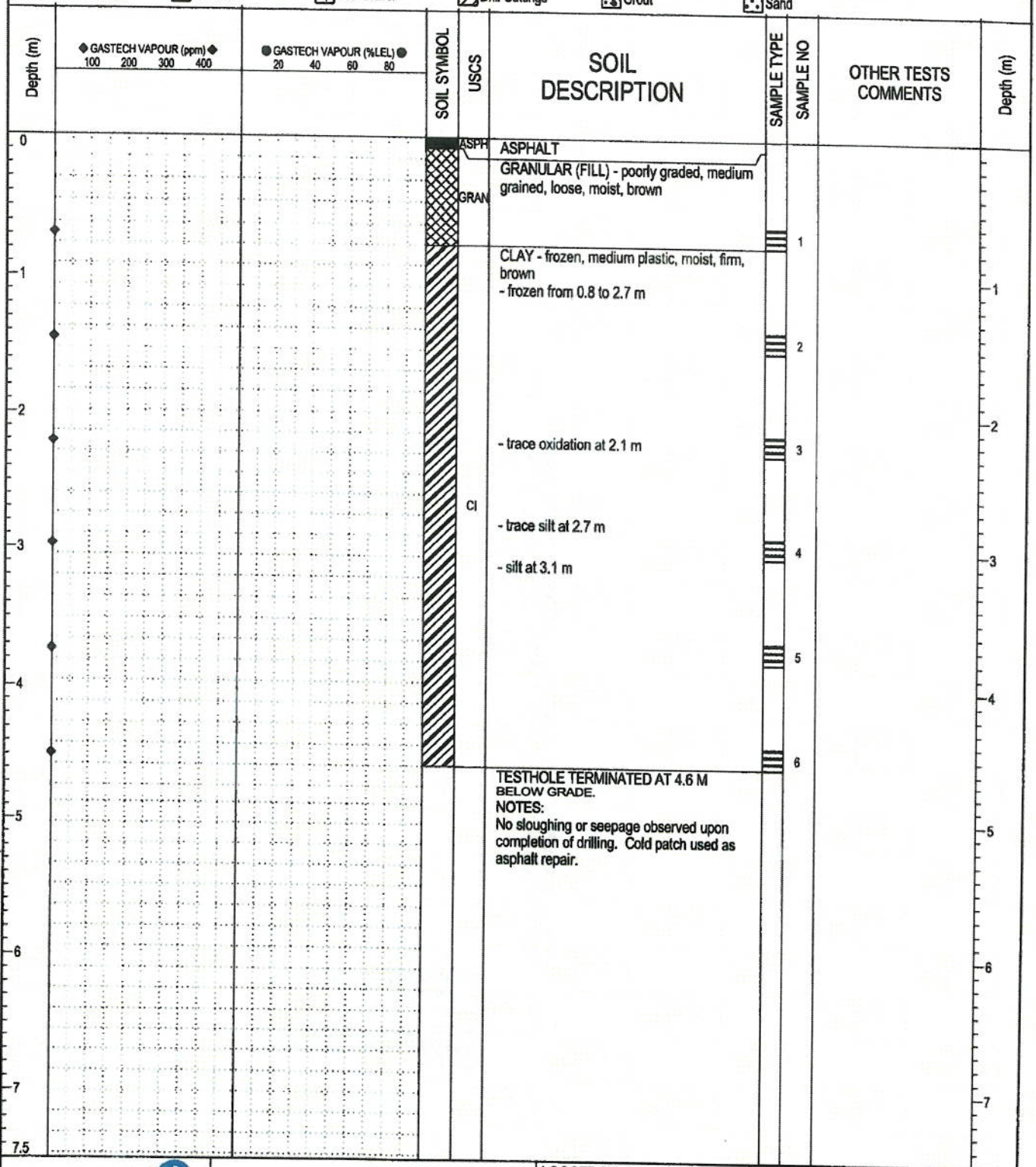

| | | |
|---|---|---|
| amec — AMEC Earth and Environmental, Winnipeg, Manitoba | LOGGED BY: AC | COMPLETION DEPTH: 4.6 m |
| | REVIEWED BY: KT | COMPLETION DATE: June 3, 2011 |
| | Fig. No: 14 | Page 1 of 1 |

16580-PHASE 2 THOMPSON.GPJ 11/07/22 03:45 PM (IMPERIAL OIL 2)

| | | |
|---|---|---|
| PROJECT: Phase II Thompson | DRILLED BY: Maple Leaf Drillers | TEST HOLE NO: TH11-15 |
| CLIENT: Thompson Plaza Inc. | DRILL RIG: CME 55 | PROJECT NO: WX16580 |
| LOCATION: Thompson, Manitoba | DRILL TYPE: 125 SSA | ELEVATION: |

SAMPLE TYPE: Shelby Tube; No Recovery; SPT Test (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Sand




| | | |
|---|---|---|
| amec | AMEC Earth and Environmental Winnipeg, Manitoba | LOGGED BY: AC |
| | | REVIEWED BY: KT |
| | | Fig. No: 15 |
| | | COMPLETION DEPTH: 4.6 m |
| | | COMPLETION DATE: June 3, 2011 |
| | | Page 1 of 1 |

16580-PHASE 2 THOMPSON.GPJ 11/07/22 03:45 PM (IMPERIAL OIL 2)

| | | |
|---|---|---|
| PROJECT: Phase II Thompson | DRILLED BY: Maple Leaf Drillers | TEST HOLE NO: TH11-16 |
| CLIENT: Thompson Plaza Inc. | DRILL RIG: CME 55 | PROJECT NO: WX16580 |
| LOCATION: Thompson, Manitoba | DRILL TYPE: 125 SSA | ELEVATION: |

SAMPLE TYPE: Shelby Tube; No Recovery; SPT Test (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Sand

| Depth (m) | GASTECH VAPOUR (ppm) 100 200 300 400 | GASTECH VAPOUR (%LEL) 20 40 60 80 | SOIL SYMBOL | USCS | SOIL DESCRIPTION | SAMPLE TYPE | SAMPLE NO | OTHER TESTS COMMENTS | Depth (m) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | ASPH | ASPHALT | | | | 0 |
| | | | | GRAN | GRANULAR (FILL) - poorly graded, medium grained, loose, moist, brown | | 1 | | |
| 1 | | | | | CLAY - frozen, medium plastic, moist, firm, brown<br>- frozen from 0.8 to 3.1 m | | 2 | | 1 |
| 2 | | | | | - trace silt, oxidation at 2.1 m | | 3 | | 2 |
| | | | | | - grey at 2.4 m | | | | |
| 3 | | | | | - silty at 2.7 m | | 4 | | 3 |
| | | | | CI | | | | | |
| 4 | | | | | - obvious odours from 3.8 to 4.6 m | | 5 | | 4 |
| | | | | | | | 6 | | |
| 5 | | | | | | | 7 | | 5 |
| 6 | | | | | TESTHOLE TERMINATED AT 6.1 M BELOW GRADE.<br>NOTES:<br>No sloughing or seepage observed upon completion of drilling. Cold patch used as asphalt repair. | | 8 | | 6 |
| 7 | | | | | | | | | 7 |
| 7.5 | | | | | | | | | |

16580-PHASE 2 THOMPSON.GPJ 11/07/22 03:45 PM (IMPERIAL OIL 2)

amec

AMEC Earth and Environmental
Winnipeg, Manitoba

| | |
|---|---|
| LOGGED BY: AC | COMPLETION DEPTH: 6.1 m |
| REVIEWED BY: KT | COMPLETION DATE: June 3, 2011 |
| Fig. No: 16 | Page 1 of 1 |

| | | |
|---|---|---|
| PROJECT: Phase II Thompson | DRILLED BY: Maple Leaf Drillers | TEST HOLE NO: TH11-17 |
| CLIENT: Thompson Plaza Inc. | DRILL RIG: CME 55 | PROJECT NO: WX16580 |
| LOCATION: Thompson, Manitoba | DRILL TYPE: 125 SSA | ELEVATION: |

SAMPLE TYPE: Shelby Tube; No Recovery; SPT Test (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Sand

| Depth (m) | GASTECH VAPOUR (ppm) 100 200 300 400 | GASTECH VAPOUR (%LEL) 20 40 60 80 | SOIL SYMBOL | USCS | SOIL DESCRIPTION | SAMPLE TYPE | SAMPLE NO | OTHER TESTS COMMENTS | Depth (m) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | ASPH | ASPHALT | | | | |
| | | | | GRAN | GRANULAR (FILL) - poorly graded, medium grained, loose, moist, brown | | | | |
| | | | | | | | 1 | | |
| 1 | | | | | CLAY - frozen, medium plastic, moist, firm, brown<br>- frozen from 0.8 to 2.9 m | | | | 1 |
| | | | | | - some silt at 1.5 m | | 2 | | |
| 2 | | | | | - trace silt inclusions at 2.1 m | | 3 | | 2 |
| | | | | CI | | | | | |
| 3 | | | | | | | 4 | | 3 |
| | | | | | | | | | |
| 4 | | | | | - wet from 3.8 to 4.6 m | | 5 | | 4 |
| | | | | | | | 6 | | |
| 5 | | | | | TESTHOLE TERMINATED AT 4.6 M BELOW GRADE.<br>NOTES:<br>Seepage observed from 3.8 to 4.6 m below grade. No sloughing observed upon completion of drilling. Cold patch used as asphalt repair. | | | | 5 |
| 6 | | | | | | | | | 6 |
| 7 | | | | | | | | | 7 |
| 7.5 | | | | | | | | | |

16580-PHASE 2 THOMPSON.GPJ 11/07/22 03:45 PM (IMPERIAL OIL 2)

amec

AMEC Earth and Environmental
Winnipeg, Manitoba

| | |
|---|---|
| LOGGED BY: AC | COMPLETION DEPTH: 4.6 m |
| REVIEWED BY: KT | COMPLETION DATE: June 3, 2011 |
| Fig. No: 17 | Page 1 of 1 |

| | | |
|---|---|---|
| PROJECT: Phase II Thompson | DRILLED BY: Maple Leaf Drillers | TEST HOLE NO: TH11-18 |
| CLIENT: Thompson Plaza Inc. | DRILL RIG: CME 55 | PROJECT NO: WX16580 |
| LOCATION: Thompson, Manitoba | DRILL TYPE: 125 SSA | ELEVATION: |

SAMPLE TYPE: Shelby Tube; No Recovery; SPT Test (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Sand

| Depth (m) | GASTECH VAPOUR (ppm) 100 200 300 400 | GASTECH VAPOUR (%LEL) 20 40 60 80 | SOIL SYMBOL | USCS | SOIL DESCRIPTION | SAMPLE TYPE | SAMPLE NO | OTHER TESTS COMMENTS | Depth (m) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | ASPH | ASPHALT | | | | 0 |
| | | | | GRAN | GRANULAR (FILL) - poorly graded, medium grained, loose, moist, brown | | | | |
| | | | | | CLAY - frozen, medium plastic, moist, firm, brown | | 1 | | |
| 1 | | | | | - frozen from 0.6 to 3.1 m | | | | 1 |
| | | | | | | | 2 | | |
| | | | | | - some silt at 1.7 m | | | | |
| 2 | | | | | | | | | 2 |
| | | | | | - trace silt, trace oxidation at 2.1 m | | 3 | | |
| | | | | CI | | | | | |
| 3 | | | | | | | 4 | | 3 |
| | | | | | - some silt at 3.1 m | | | | |
| | | | | | | | 5 | | |
| 4 | | | | | | | | | 4 |
| | | | | | | | 6 | | |
| | | | | | TESTHOLE TERMINATED AT 4.6 M BELOW GRADE. NOTES: No sloughing or seepage observed upon completion of drilling. Cold patch used as asphalt repair. | | | | |
| 5 | | | | | | | | | 5 |
| 6 | | | | | | | | | 6 |
| 7 | | | | | | | | | 7 |
| 7.5 | | | | | | | | | |

16580-PHASE 2 THOMPSON.GPJ 11/07/22 03:45 PM (IMPERIAL OIL 2)

amec

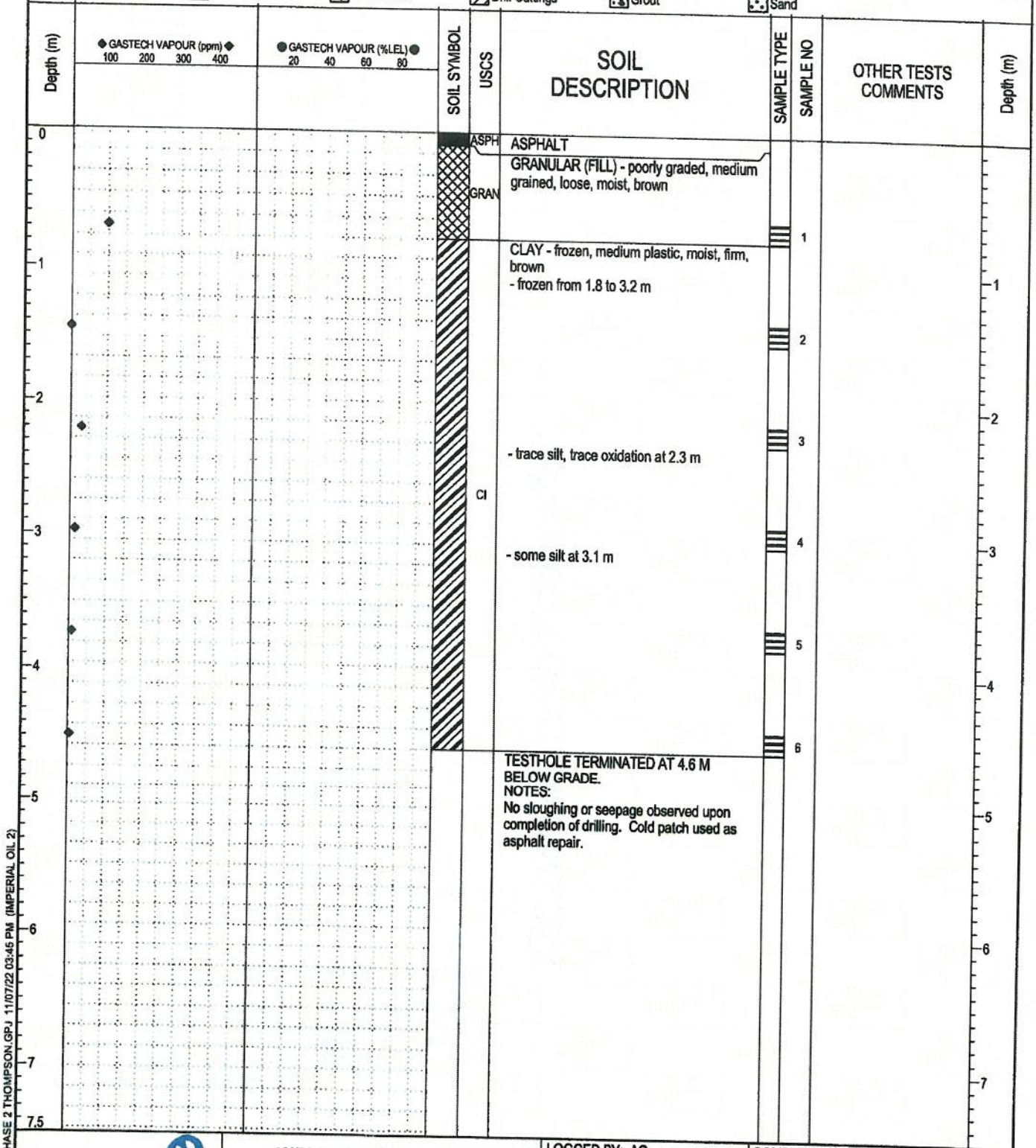
AMEC Earth and Environmental
Winnipeg, Manitoba

| | |
|---|---|
| LOGGED BY: AC | COMPLETION DEPTH: 4.6 m |
| REVIEWED BY: KT | COMPLETION DATE: June 3, 2011 |
| Fig. No: 18 | Page 1 of 1 |

| | | |
|---|---|---|
| PROJECT: Phase II Thompson | DRILLED BY: Maple Leaf Drillers | TEST HOLE NO: TH11-19 |
| CLIENT: Thompson Plaza Inc. | DRILL RIG: CME 55 | PROJECT NO: WX16580 |
| LOCATION: Thompson, Manitoba | DRILL TYPE: 125 SSA | ELEVATION: |

SAMPLE TYPE: Shelby Tube; No Recovery; SPT Test (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Sand



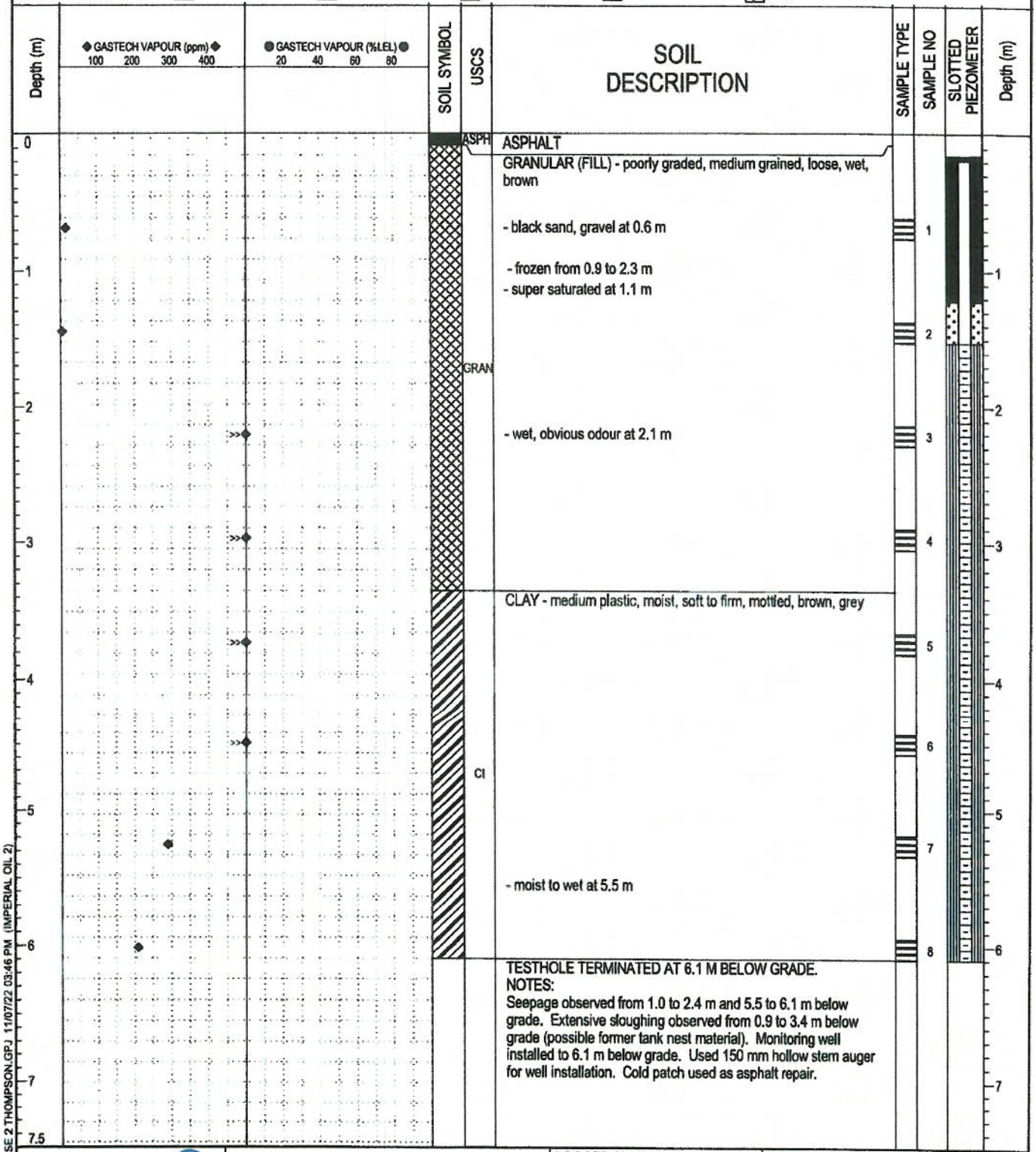

| | | |
|---|---|---|
| amec — AMEC Earth and Environmental Winnipeg, Manitoba | LOGGED BY: AC | COMPLETION DEPTH: 4.6 m |
| | REVIEWED BY: KT | COMPLETION DATE: June 3, 2011 |
| | Fig. No: 19 | Page 1 of 1 |

16580-PHASE 2 THOMPSON.GPJ 11/07/22 03:45 PM (IMPERIAL OIL 2)

| | | |
|---|---|---|
| PROJECT: Phase II Thompson | DRILLED BY: Maple Leaf Drillers | TEST HOLE NO: TH11-2 |
| CLIENT: Thompson Plaza Inc. | DRILL RIG: CME 55 | PROJECT NO: WX16580 |
| LOCATION: Thompson, Manitoba | DRILL TYPE: 125 SSA | ELEVATION: |

SAMPLE TYPE: Shelby Tube; No Recovery; SPT Test (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Sand



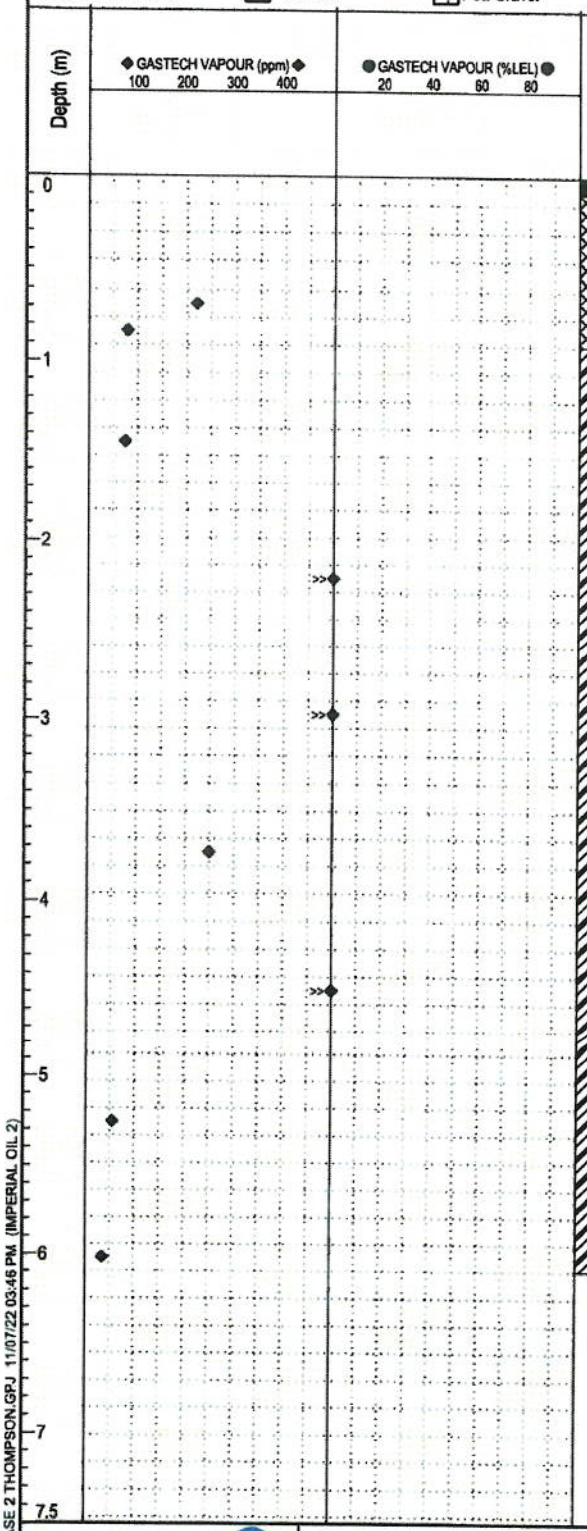

| | | |
|---|---|---|
| amec | AMEC Earth and Environmental Winnipeg, Manitoba | LOGGED BY: AC |
| | | REVIEWED BY: KT |
| | | Fig. No: 2 |
| | | COMPLETION DEPTH: 6.1 m |
| | | COMPLETION DATE: June 2, 2011 |
| | | Page 1 of 1 |

16580-PHASE 2 THOMPSON.GPJ 11/07/22 03:46 PM (IMPERIAL OIL 2)

| | | |
|---|---|---|
| PROJECT: Phase II Thompson | DRILLED BY: Maple Leaf Drillers | TEST HOLE NO: TH11-4 |
| CLIENT: Thompson Plaza Inc. | DRILL RIG: CME 55 | PROJECT NO: WX16580 |
| LOCATION: Thompson, Manitoba | DRILL TYPE: 125 SSA | ELEVATION: |

SAMPLE TYPE: Shelby Tube; No Recovery; SPT Test (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Sand




| Depth (m) | SOIL SYMBOL | USCS | SOIL DESCRIPTION | SAMPLE TYPE | SAMPLE NO | OTHER TESTS COMMENTS |
|---|---|---|---|---|---|---|
| 0 | | ASPH | ASPHALT | | | |
| | | GRAN | GRANULAR (FILL) - poorly graded, fine to medium grained, medium dense, damp, brown/grey, some clay<br>- frozen from 0.9 to 2.1 m<br>- moist from 2.1 to 6.1 m | | 1<br>2 | |
| 1 | | CI | CLAY - medium plastic, damp, firm to stiff, brown<br>- faint odour at 0.9m | | 3 | |
| 2 | | | - trace oxidation at 2.1 m | | 4 | |
| 3 | | | | | 5 | |
| 4 | | | | | 6 | |
| 5 | | | | | 7 | |
| 6 | | | | | 8 | |
| | | | TESTHOLE TERMINATED AT 6.1 M BELOW GRADE.<br>NOTES:<br>No sloughing or seepage observed upon completion of drilling. Cold patch used as asphalt repair. | | 9 | |
| 7 | | | | | | |

16580-PHASE 2 THOMPSON.GPJ 11/07/22 03:46 PM (IMPERIAL OIL 2)

amec

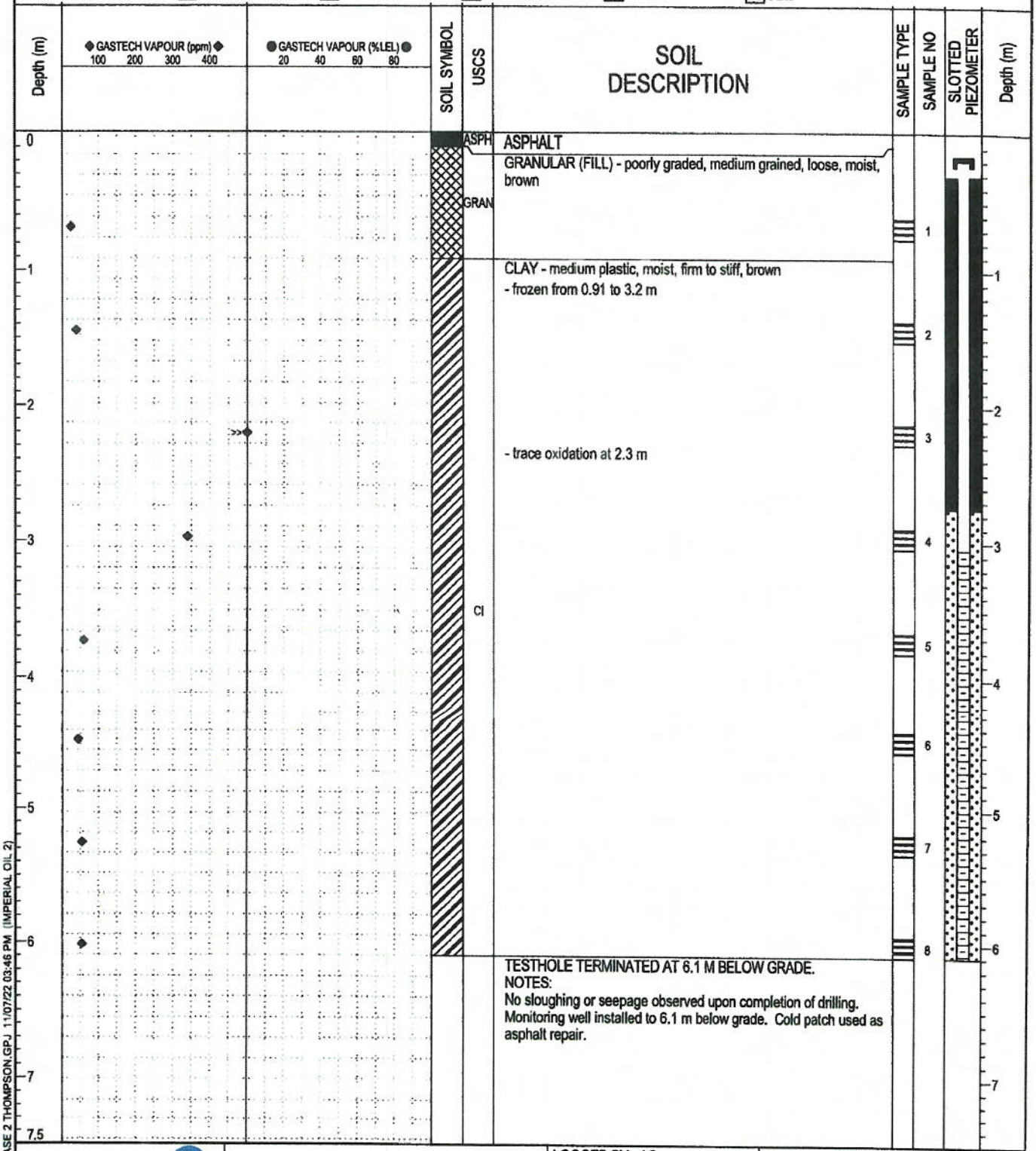
AMEC Earth and Environmental
Winnipeg, Manitoba

| | |
|---|---|
| LOGGED BY: AC | COMPLETION DEPTH: 6.1 m |
| REVIEWED BY: KT | COMPLETION DATE: June 2, 2011 |
| Fig. No: 4 | Page 1 of 1 |

| | | |
|---|---|---|
| PROJECT: Phase II Thompson | DRILLED BY: Maple Leaf Drillers | TEST HOLE NO: TH11-5 |
| CLIENT: Thompson Plaza Inc. | DRILL RIG: CME 55 | PROJECT NO: WX16580 |
| LOCATION: Thompson, Manitoba | DRILL TYPE: 125 SSA | ELEVATION: |

SAMPLE TYPE: Shelby Tube; No Recovery; SPT Test (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Sand



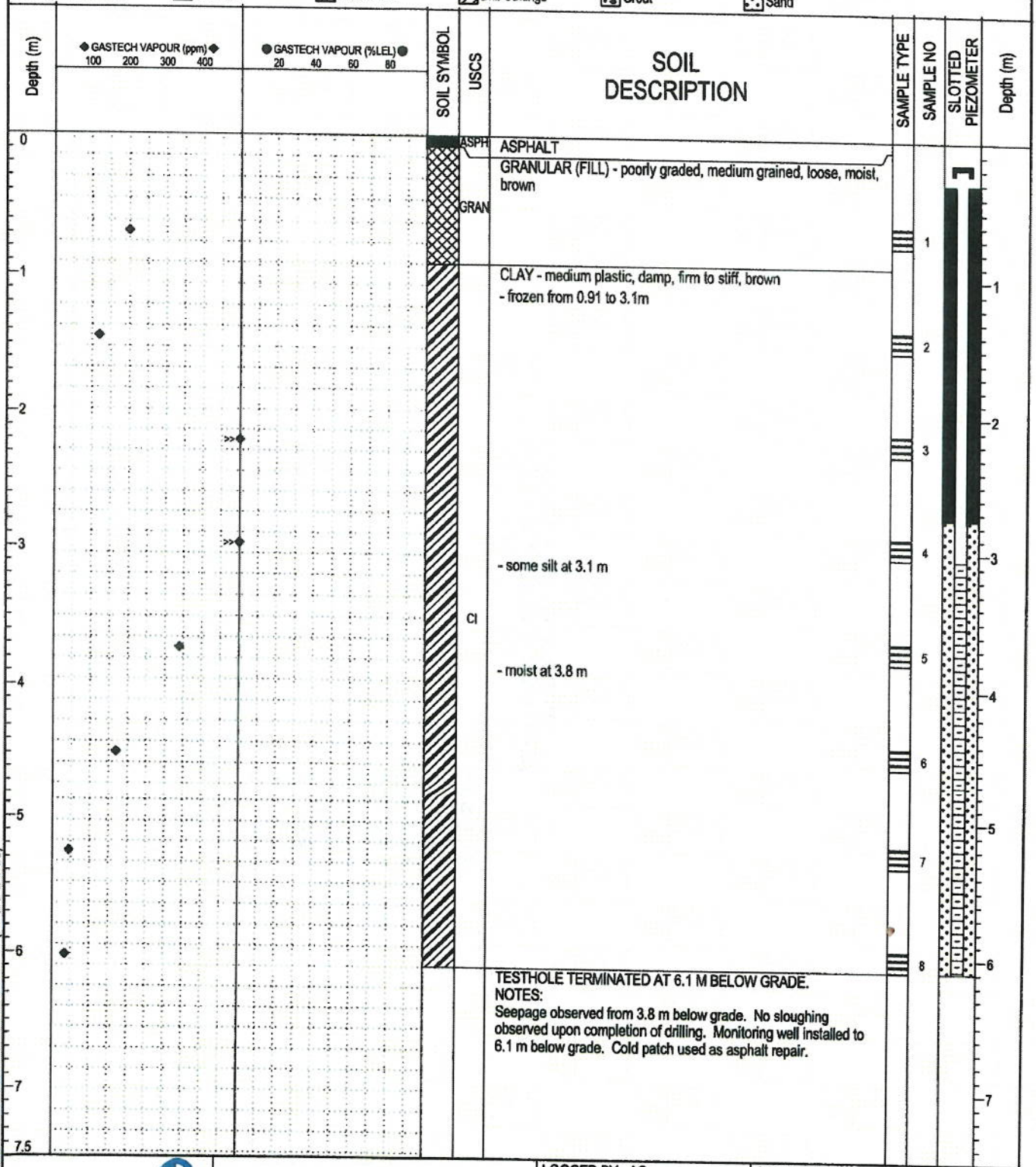

| | | | |
|---|---|---|---|
| amec | AMEC Earth and Environmental Winnipeg, Manitoba | LOGGED BY: AC | COMPLETION DEPTH: 6.1 m |
| | | REVIEWED BY: KT | COMPLETION DATE: June 2, 2011 |
| | | Fig. No: 5 | Page 1 of 1 |

16580-PHASE 2 THOMPSON.GPJ 11/07/22 03:46 PM (IMPERIAL CIL 2)

| | | |
|---|---|---|
| PROJECT: Phase II Thompson | DRILLED BY: Maple Leaf Drillers | TEST HOLE NO: TH11-6 |
| CLIENT: Thompson Plaza Inc. | DRILL RIG: CME 55 | PROJECT NO: WX16580 |
| LOCATION: Thompson, Manitoba | DRILL TYPE: 125 SSA | ELEVATION: |

SAMPLE TYPE: Shelby Tube; No Recovery; SPT Test (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Sand




| | | |
|---|---|---|
| amec | AMEC Earth and Environmental Winnipeg, Manitoba | LOGGED BY: AC |
| | | REVIEWED BY: KT |
| | | Fig. No: 6 |
| | | COMPLETION DEPTH: 6.1 m |
| | | COMPLETION DATE: June 2, 2011 |
| | | Page 1 of 1 |

16580-PHASE 2 THOMPSON.GPJ 11/07/22 03:46 PM (IMPERIAL OIL 2)

| | | |
|---|---|---|
| PROJECT: Phase II Thompson | DRILLED BY: Maple Leaf Drillers | TEST HOLE NO: TH11-7 |
| CLIENT: Thompson Plaza Inc. | DRILL RIG: CME 55 | PROJECT NO: WX16580 |
| LOCATION: Thompson, Manitoba | DRILL TYPE: 125 SSA | ELEVATION: |

SAMPLE TYPE: Shelby Tube; No Recovery; SPT Test (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Sand

| Depth (m) | GASTECH VAPOUR (ppm) 100 200 300 400 | GASTECH VAPOUR (%LEL) 20 40 60 80 | SOIL SYMBOL | USCS | SOIL DESCRIPTION | SAMPLE TYPE | SAMPLE NO | OTHER TESTS COMMENTS | Depth (m) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | ASPH | ASPHALT | | | | 0 |
| | | | | | GRANULAR (FILL) - poorly graded, medium grained, loose, moist, brown | | | | |
| | | | | GRAN | | | 1 | | |
| 1 | | | | | CLAY - medium plastic, firm to stiff, brown - frozen from 0.91 to 2.7 m | | | | 1 |
| | | | | | | | 2 | | |
| 2 | | | | | | | | | 2 |
| | | | | | | | 3 | | |
| | | | | CI | | | | | |
| 3 | | | | | | | 4 | | 3 |
| | | | | | - some silt at 3.2 m | | | | |
| | | | | | | | 5 | | |
| 4 | | | | | | | | | 4 |
| | | | | | | | 6 | | |
| | | | | | TESTHOLE TERMINATED AT 4.6 M BELOW GRADE. NOTES: No sloughing or seepage observed upon completion of drilling. Cold patch used as asphalt repair. | | | | |
| 5 | | | | | | | | | 5 |
| 6 | | | | | | | | | 6 |
| 7 | | | | | | | | | 7 |
| 7.5 | | | | | | | | | |

16580-PHASE 2 THOMPSON.GPJ 11/07/22 03:46 PM (IMPERIAL CIL 2)

amec

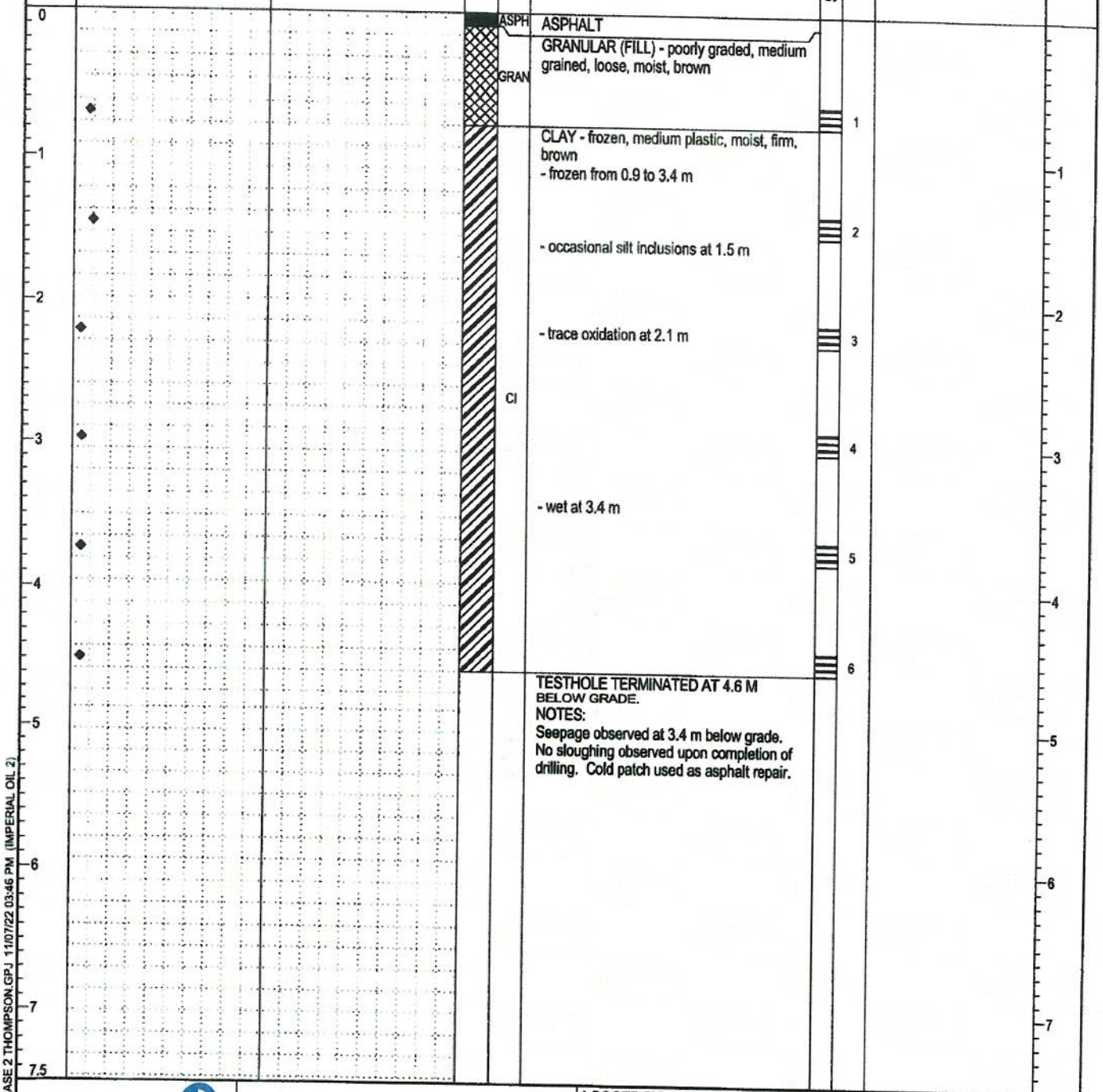
AMEC Earth and Environmental
Winnipeg, Manitoba

| | |
|---|---|
| LOGGED BY: AC | COMPLETION DEPTH: 4.6 m |
| REVIEWED BY: KT | COMPLETION DATE: June 2, 2011 |
| Fig. No: 7 | Page 1 of 1 |

| | | |
|---|---|---|
| PROJECT: Phase II Thompson | DRILLED BY: Maple Leaf Drillers | TEST HOLE NO: TH11-8 |
| CLIENT: Thompson Plaza Inc. | DRILL RIG: CME 55 | PROJECT NO: WX16580 |
| LOCATION: Thompson, Manitoba | DRILL TYPE: 125 SSA | ELEVATION: |

SAMPLE TYPE: Shelby Tube; No Recovery; SPT Test (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Sand




| | | | |
|---|---|---|---|
| amec | AMEC Earth and Environmental Winnipeg, Manitoba | LOGGED BY: AC | COMPLETION DEPTH: 4.6 m |
| | | REVIEWED BY: KT | COMPLETION DATE: June 2, 2011 |
| | | Fig. No: 8 | Page 1 of 1 |

16580-PHASE 2 THOMPSON.GPJ 11/07/22 03:46 PM (IMPERIAL OIL 2)

| | | |
|---|---|---|
| PROJECT: Phase II Thompson | DRILLED BY: Maple Leaf Drillers | TEST HOLE NO: TH11-9 |
| CLIENT: Thompson Plaza Inc. | DRILL RIG: CME 55 | PROJECT NO: WX16580 |
| LOCATION: Thompson, Manitoba | DRILL TYPE: 125 SSA | ELEVATION: |

SAMPLE TYPE: Shelby Tube; No Recovery; SPT Test (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Sand

| Depth (m) | GASTECH VAPOUR (ppm) 100 200 300 400 | GASTECH VAPOUR (%LEL) 20 40 60 80 | SOIL SYMBOL | USCS | SOIL DESCRIPTION | SAMPLE TYPE | SAMPLE NO | OTHER TESTS COMMENTS | Depth (m) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | ASPH | ASPHALT | | | | 0 |
| | | | | GRAN | GRANULAR (FILL) - poorly graded, medium grained, loose, moist, brown | | 1 | | |
| 1 | | | | | CLAY - frozen, medium plastic, moist, firm, brown<br>- frozen from 0.91 to 3.2 m | | 2 | | 1 |
| 2 | | | | | | | 3 | | 2 |
| | | | | | - grey at 2.4 m | | | | |
| | | | | CI | | | | | |
| 3 | | | | | - some silt at 2.9 m | | 4 | | 3 |
| | | | | | | | 5 | | |
| 4 | | | | | | | | | 4 |
| | | | | | | | 6 | | |
| 5 | | | | | TESTHOLE TERMINATED AT 4.6 M BELOW GRADE.<br>NOTES:<br>No sloughing or seepage observed upon completion of drilling. Cold patch used as asphalt repair. | | | | 5 |
| 6 | | | | | | | | | 6 |
| 7 | | | | | | | | | 7 |
| 7.5 | | | | | | | | | |

16580-PHASE 2 THOMPSON.GPJ 11/07/22 03:46 PM (IMPERIAL OIL 2)

amec

AMEC Earth and Environmental
Winnipeg, Manitoba

| | |
|---|---|
| LOGGED BY: AC | COMPLETION DEPTH: 4.6 m |
| REVIEWED BY: KT | COMPLETION DATE: June 2, 2011 |
| Fig. No: 9 | Page 1 of 1 |

# APPENDIX D

# LABORATORY RESULTS

5667 - 70 Street
Edmonton, Alberta
Canada T6B 3P6
Tel: (780) 436-2152
Fax: (780) 377-3600

**ANALYTICAL REPORT**

**AMEC Earth & Environmental**
**440 Dovercourt Drive**
**Winnipeg, MB R3Y 1N4**

**Date Received:** 2011/06/07
**Report Date:** 2011/06/15

# Soil Analysis

**Attention:** Timlick, Karen

**Project No.** WX16580

**File No.:** EC-61002

| Analyst | Date of Analysis (yyyy/m/d) | Analytical Parameter | Units | Reference Method | Lab #: Client ID: Sample Date: MDL | 11-6301 TH11-1@15' N/P | 11-6301-D TH11-1@15' Lab Duplicate | 11-6302 TH11-2@15' N/P | 11-6303 TH11-4@7.5' N/P | 11-6304 TH11-5@7.5' N/P |
|---|---|---|---|---|---|---|---|---|---|---|
| JL | 2011/06/07 | Benzene | µg/g (ppm) | EPA 8260B | 0.005 | 3.22 | 3.25 | 14.9 | 2.12 | 0.786 |
| JL | 2011/06/07 | Toluene | µg/g (ppm) | EPA 8260B | 0.03 | 16.9 | 20.5 | 75.7 | < 0.03 | 0.29 |
| JL | 2011/06/07 | Ethylbenzene | µg/g (ppm) | EPA 8260B | 0.01 | 7.68 | 7.68 | 21.8 | 0.02 | 1.79 |
| JL | 2011/06/07 | Total Xylenes | µg/g (ppm) | EPA 8260B | 0.03 | 32.8 | 32.4 | 89.8 | 0.12 | 10.5 |
| JL | 2011/06/07 | Surrogate Recovery | % | -- | 0.1 | 123 | 105 | 94.1 | 105 | 122 |
| JL | 2011/06/07 | VH (C6-C10) | µg/g (ppm) | CCME | 5.0 | 277 | 312 | 782 | 9.0 | 146 |
| PC | 2011/06/07 | F2 - EPH (C10-C16) | µg/g (ppm) | CCME | 30 | 84 | 91 | 120 | < 30 | 121 |
| PC | 2011/06/07 | F3 - EPH (C16-C34) | µg/g (ppm) | CCME | 30 | < 30 | < 30 | 40 | < 30 | 5040 |
| PC | 2011/06/07 | F4 - EPH (C34-C50) | µg/g (ppm) | CCME | 30 | < 30 | < 30 | < 30 | < 30 | 430 |
| PC | 2011/06/07 | Moisture | % | --- | 0.5 | 26.9 | 27.2 | 24.0 | 24.2 | 23.0 |
| PC | 2011/06/07 | F1 - VPH (C6-C10) | µg/g (ppm) | CCME | 5.00 | 217 | 249 | 580 | 6.70 | 133 |

All Analytical results pertain to samples analyzed as received.
CCME (EPH) - Canadian Council of Ministers of the Environment - Method for Canada Wide Standards for Petroleum Hydrocarbon in Soil, Tier 1 Method, Revision 5.0. The method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
Chromatography returned to baseline by C50.
EPA: U.S. Environmental Protection Agency. 1997. Test Methods of Evaluation of Solid Waste 3rd Ed through Update III. Office Solid Waste Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.
EPH: Extractable Petroleum Hydrocarbon - not corrected for PAH content.
Extraction and analysis limits for holding time were met.
MDL - Method Detection Limit
VH: Volatile Petroleum Hydrocarbon - Not corrected for BTEX content
VPH: Volatile Petroleum Hydrocarbons - Corrected for BTEX content.

Report reviewed by:

Jesse Dang, B.Sc.
Manager
Laboratory Services

Charlene Rollheiser
Director of QA/QC
Laboratory Services

** All samples will be disposed of after 30 days following analysis. Please contact the lab if you require additional sample storage time. (Samples deemed hazardous will be returned to the client at their own expense or disposal will be arranged.) **

5667 - 70 Street
Edmonton, Alberta
Canada T6B 3P6
Tel: (780) 436-2152
Fax: (780) 377-3600

**ANALYTICAL REPORT**

**AMEC Earth & Environmental**
**440 Dovercourt Drive**
**Winnipeg, MB R3Y 1N4**

**Date Received:** 2011/06/07
**Report Date:** 2011/06/15

# Soil Analysis

**Attention:** Timlick, Karen

**Project No.** WX16580 **File No.:** EC-61002

| Analyst | Date of Analysis (yyyy/m/d) | Analytical Parameter | Units | Reference Method | Lab #: Client ID: Sample Date: MDL | 11-6305 TH11-6@ 10' N/P | 11-6306 TH11-7@ 10' N/P | 11-6307 TH11-8@ 7.5' N/P | 11-6308 TH11-9@ 7.5' N/P | 11-6309 TH11-10@ 7.5' N/P |
|---|---|---|---|---|---|---|---|---|---|---|
| JL | 2011/06/07 | Benzene | µg/g (ppm) | EPA 8260B | 0.005 | 21.0 | < 0.005 | 0.009 | 0.013 | 0.009 |
| JL | 2011/06/07 | Toluene | µg/g (ppm) | EPA 8260B | 0.03 | 142 | < 0.03 | < 0.03 | < 0.03 | < 0.03 |
| JL | 2011/06/07 | Ethylbenzene | µg/g (ppm) | EPA 8260B | 0.01 | 38.0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| JL | 2011/06/07 | Total Xylenes | µg/g (ppm) | EPA 8260B | 0.03 | 146 | < 0.03 | < 0.03 | < 0.03 | < 0.03 |
| JL | 2011/06/07 | Surrogate Recovery | % | - | 0.1 | 114 | 104 | 106 | 112 | 119 |
| JL | 2011/06/07 | VH (C6-C10) | µg/g (ppm) | CCME | 5.0 | 985 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| PC | 2011/06/07 | F2 - EPH (C10-C16) | µg/g (ppm) | CCME | 30 | 161 | < 30 | < 30 | < 30 | < 30 |
| PC | 2011/06/07 | F3 - EPH (C16-C34) | µg/g (ppm) | CCME | 30 | < 30 | < 30 | < 30 | < 30 | < 30 |
| PC | 2011/06/07 | F4 - EPH (C34-C50) | µg/g (ppm) | CCME | 30 | < 30 | < 30 | < 30 | < 30 | < 30 |
| PC | 2011/06/07 | Moisture | % | - | 0.5 | 23.4 | 23.3 | 25.3 | 24.4 | 22.8 |
| PC | 2011/06/07 | F1 - VPH (C6-C10) | µg/g (ppm) | CCME | 5.00 | 637 | < 5.00 | < 5.00 | < 5.00 | < 5.00 |

All Analytical results pertain to samples analyzed as received.
CCME (EPH) - Canadian Council of Ministers of the Environment - Method for Canada Wide Standards for Petroleum Hydrocarbon in Soil, Tier 1 Method, Revision 5.0. The method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
Chromatography returned to baseline by C50.
EPA: U.S. Environmental Protection Agency. 1997. Test Methods of Evaluation of Solid Waste 3rd Ed through Update III. Office Solid Waste Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.
EPH: Extractable Petroleum Hydrocarbon - not corrected for PAH content.
Extraction and analysis limits for holding time were met.
MDL - Method Detection Limit
VH: Volatile Petroleum Hydrocarbon - Not corrected for BTEX content
VPH: Volatile Petroleum Hydrocarbons - Corrected for BTEX content.

Report reviewed by:

Jesse Dang, B.Sc.
Manager
Laboratory Services

Charlene Rollheiser
Director of QA/QC
Laboratory Services

** All samples will be disposed of after 30 days following analysis. Please contact the lab if you require additional sample storage time. (Samples deemed hazardous will be returned to the client at their own expense or disposal will be arranged.) **

5667 - 70 Street
Edmonton, Alberta
Canada T6B 3P6
Tel: (780) 436-2152
Fax: (780) 377-3600

**ANALYTICAL REPORT**

**AMEC Earth & Environmental**
**440 Dovercourt Drive**
**Winnipeg, MB R3Y 1N4**

**Date Received:** 2011/06/07
**Report Date:** 2011/06/15

# Soil Analysis

**Attention:** Timlick, Karen

**Project No.** WX16580

**File No.:** EC-61002

| Analyst | Date of Analysis (yyyy/m/d) | Analytical Parameter | Units | Reference Method | Lab #: Client ID: Sample Date: MDL | 11-6310 TH11-11@ 12.5' N/P | 11-6311 TH11-12@ 10' N/P | 11-6312 TH11-13@ 12.5' N/P | 11-6313 TH11-14@ 12.5' N/P | 11-6314 TH11-15@ 10' N/P |
|---|---|---|---|---|---|---|---|---|---|---|
| JL | 2011/06/07 | Benzene | µg/g (ppm) | EPA 8260B | 0.005 | 22.3 | < 0.005 | 0.007 | < 0.005 | < 0.005 |
| JL | 2011/06/07 | Toluene | µg/g (ppm) | EPA 8260B | 0.03 | 89.6 | < 0.03 | 0.04 | < 0.03 | < 0.03 |
| JL | 2011/06/07 | Ethylbenzene | µg/g (ppm) | EPA 8260B | 0.01 | 22.3 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| JL | 2011/06/07 | Total Xylenes | µg/g (ppm) | EPA 8260B | 0.03 | 89.3 | < 0.03 | < 0.03 | < 0.03 | < 0.03 |
| JL | 2011/06/07 | Surrogate Recovery | % | -- | 0.1 | 103 | 87.1 | 106 | 106 | 112 |
| JL | 2011/06/07 | VH (C6-C10) | µg/g (ppm) | CCME | 5.0 | 723 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| PC | 2011/06/07 | F2 - EPH (C10-C16) | µg/g (ppm) | CCME | 30 | 114 | < 30 | < 30 | < 30 | < 30 |
| PC | 2011/06/07 | F3 - EPH (C16-C34) | µg/g (ppm) | CCME | 30 | < 30 | < 30 | < 30 | < 30 | < 30 |
| PC | 2011/06/07 | F4 - EPH (C34-C50) | µg/g (ppm) | CCME | 30 | < 30 | < 30 | < 30 | < 30 | < 30 |
| PC | 2011/06/07 | Moisture | % | -- | 0.5 | 23.5 | 22.4 | 33.2 | 24.2 | 22.5 |
| PC | 2011/06/07 | F1 - VPH (C6-C10) | µg/g (ppm) | CCME | 5.00 | 500 | < 5.00 | < 5.00 | < 5.00 | < 5.00 |

All Analytical results pertain to samples analyzed as received.
CCME (EPH) - Canadian Council of Ministers of the Environment - Method for Canada Wide Standards for Petroleum Hydrocarbon in Soil, Tier 1 Method, Revision 5.0. The method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
Chromatography returned to baseline by C50.
EPA: U.S. Environmental Protection Agency. 1997. Test Methods of Evaluation of Solid Waste 3rd Ed through Update III. Office Solid Waste Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.
EPH: Extractable Petroleum Hydrocarbon - not corrected for PAH content.
Extraction and analysis limits for holding time were met.
MDL - Method Detection Limit
VH: Volatile Petroleum Hydrocarbon - Not corrected for BTEX content
VPH: Volatile Petroleum Hydrocarbons - Corrected for BTEX content.

Report reviewed by:

Jesse Dang, B.Sc.
Manager
Laboratory Services

Charlene Rollheiser
Director of QA/QC
Laboratory Services

** All samples will be disposed of after 30 days following analysis. Please contact the lab if you require additional sample storage time. (Samples deemed hazardous will be returned to the client at their own expense or disposal will be arranged.) **

5667 - 70 Street
Edmonton, Alberta
Canada T6B 3P6
Tel: (780) 436-2152
Fax: (780) 377-3600

**ANALYTICAL REPORT**

**AMEC Earth & Environmental**
**440 Dovercourt Drive**
**Winnipeg, MB R3Y 1N4**

**Date Received:** 2011/06/07
**Report Date:** 2011/06/15

# Soil Analysis

**Attention:** Timlick, Karen

**Project No.** WX16580 **File No.:** EC-61002

| Analyst | Date of Analysis (yyyy/m/d) | Analytical Parameter | Units | Reference Method | Lab #: Client ID: Sample Date: MDL | 11-6315 TH11-16@ 12.5' N/P | 11-6316 TH11-17@ 10' N/P | 11-6317 TH11-18@ 10' N/P | 11-6318 TH11-19@ 10' N/P | 11-6319 TH11-2@20' N/P |
|---|---|---|---|---|---|---|---|---|---|---|
| JL | 2011/06/07 | Benzene | µg/g (ppm) | EPA 8260B | 0.005 | 3.75 | < 0.005 | < 0.005 | 0.074 | 1.69 |
| JL | 2011/06/07 | Toluene | µg/g (ppm) | EPA 8260B | 0.03 | 30.6 | < 0.03 | < 0.03 | < 0.03 | 1.34 |
| JL | 2011/06/07 | Ethylbenzene | µg/g (ppm) | EPA 8260B | 0.01 | 8.66 | < 0.01 | < 0.01 | < 0.01 | 0.16 |
| JL | 2011/06/07 | Total Xylenes | µg/g (ppm) | EPA 8260B | 0.03 | 35.4 | < 0.03 | < 0.03 | < 0.03 | 0.69 |
| JL | 2011/06/07 | Surrogate Recovery | % | -- | 0.1 | 113 | 109 | 89.2 | 113 | 107 |
| JL | 2011/06/07 | VH (C6-C10) | µg/g (ppm) | CCME | 5.0 | 337 | < 5.0 | < 5.0 | < 5.0 | 8.4 |
| PC | 2011/06/07 | F2 - EPH (C10-C16) | µg/g (ppm) | CCME | 30 | 69 | < 30 | < 30 | < 30 | < 30 |
| PC | 2011/06/07 | F3 - EPH (C16-C34) | µg/g (ppm) | CCME | 30 | < 30 | < 30 | < 30 | < 30 | < 30 |
| PC | 2011/06/07 | F4 - EPH (C34-C50) | µg/g (ppm) | CCME | 30 | < 30 | < 30 | < 30 | < 30 | < 30 |
| PC | 2011/06/09 | Moisture | % | -- | 0.5 | 24.1 | 26.5 | 25.3 | 25.9 | 25.2 |
| PC | 2011/06/07 | F1 - VPH (C6-C10) | µg/g (ppm) | CCME | 5.00 | 258 | < 5.00 | < 5.00 | < 5.00 | < 5.00 |

All Analytical results pertain to samples analyzed as received.
CCME (EPH) - Canadian Council of Ministers of the Environment - Method for Canada Wide Standards for Petroleum Hydrocarbon in Soil, Tier 1 Method, Revision 5.0. The method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
Chromatography returned to baseline by C50.
EPA: U.S. Environmental Protection Agency. 1997. Test Methods of Evaluation of Solid Waste 3rd Ed through Update III. Office Solid Waste Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.
EPH: Extractable Petroleum Hydrocarbon - not corrected for PAH content.
Extraction and analysis limits for holding time were met.
MDL - Method Detection Limit
VH: Volatile Petroleum Hydrocarbon - Not corrected for BTEX content
VPH: Volatile Petroleum Hydrocarbons - Corrected for BTEX content.

Report reviewed by:

Jesse Dang, B.Sc.
Manager
Laboratory Services

Charlene Rollheiser
Director of QA/QC
Laboratory Services

** All samples will be disposed of after 30 days following analysis. Please contact the lab if you require additional sample storage time. (Samples deemed hazardous will be returned to the client at their own expense or disposal will be arranged.) **

5667 - 70 Street
Edmonton, Alberta
Canada T6B 3P6
Tel: (780) 436-2152
Fax: (780) 377-3600

**ANALYTICAL REPORT**

**AMEC Earth & Environmental**
**440 Dovercourt Drive**
**Winnipeg, MB R3Y 1N4**

**Report Date:** 2011/06/15

# Quality Control Standard

**Attention:** Timlick, Karen

**Project No.** WX16580

**File No.:** EC-61002

| Analyst | Date of Analysis (yyyy/m/d) | Analytical Parameter | Units | Reference Method | MDL | Analyzed Value | Advisory Range | Target Value | Reference No. |
|---|---|---|---|---|---|---|---|---|---|
| JL | 2011/06/07 | Benzene | % | EPA 8260B | 0.005 | 95.7 | 80-120 | 100.00 | Spike Recovery |
| JL | 2011/06/07 | Toluene | % | EPA 8260B | 0.03 | 96.6 | 80-120 | 100.00 | Spike Recovery |
| JL | 2011/06/07 | Ethylbenzene | % | EPA 8260B | 0.01 | 97.3 | 80-120 | 100.00 | Spike Recovery |
| JL | 2011/06/07 | Total Xylenes | % | EPA 8260B | 0.03 | 97.8 | 80-120 | 100.00 | Spike Recovery |
| JL | 2011/06/07 | VH (C6-C10) | % | CCME | 5.0 | 97.9 | 80-120 | 100.00 | Spike Recovery |
| PC | 2011/06/07 | F2 - EPH (C10-C16) | mg/Kg (ppm) | CCME | 30 | 1160 | 627 - 1187 | 907.00 | Spike Recovery |
| PC | 2011/06/07 | F3 - EPH (C16-C34) | mg/Kg (ppm) | CCME | 30 | 2890 | 1968 - 3158 | 2,563.00 | Spike Recovery |
| PC | 2011/06/07 | F4 - EPH (C34-C50) | mg/Kg (ppm) | CCME | 30 | 1440 | 1083 - 1821 | 1,452.00 | Spike Recovery |

All Analytical results pertain to samples analyzed as received.

CCME (EPH) - Canadian Council of Ministers of the Environment - Method for Canada Wide Standards for Petroleum Hydrocarbon in Soil, Tier 1 Method, Revision 5.0. The method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
Chromatography returned to baseline by C50.

EPA: U.S Environmental Protection Agency. 1997. Test Methods of Evaluation of Solid Waste 3rd Ed through Update III. Office Solid Waste Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

EPH: Extractable Petroleum Hydrocarbon - not corrected for PAH content.

Extraction and analysis limits for holding time were met.

MDL - Method Detection Limit

VH: Volatile Petroleum Hydrocarbon - Not corrected for BTEX content

VPH: Volatile Petroleum Hydrocarbons - Corrected for BTEX content.

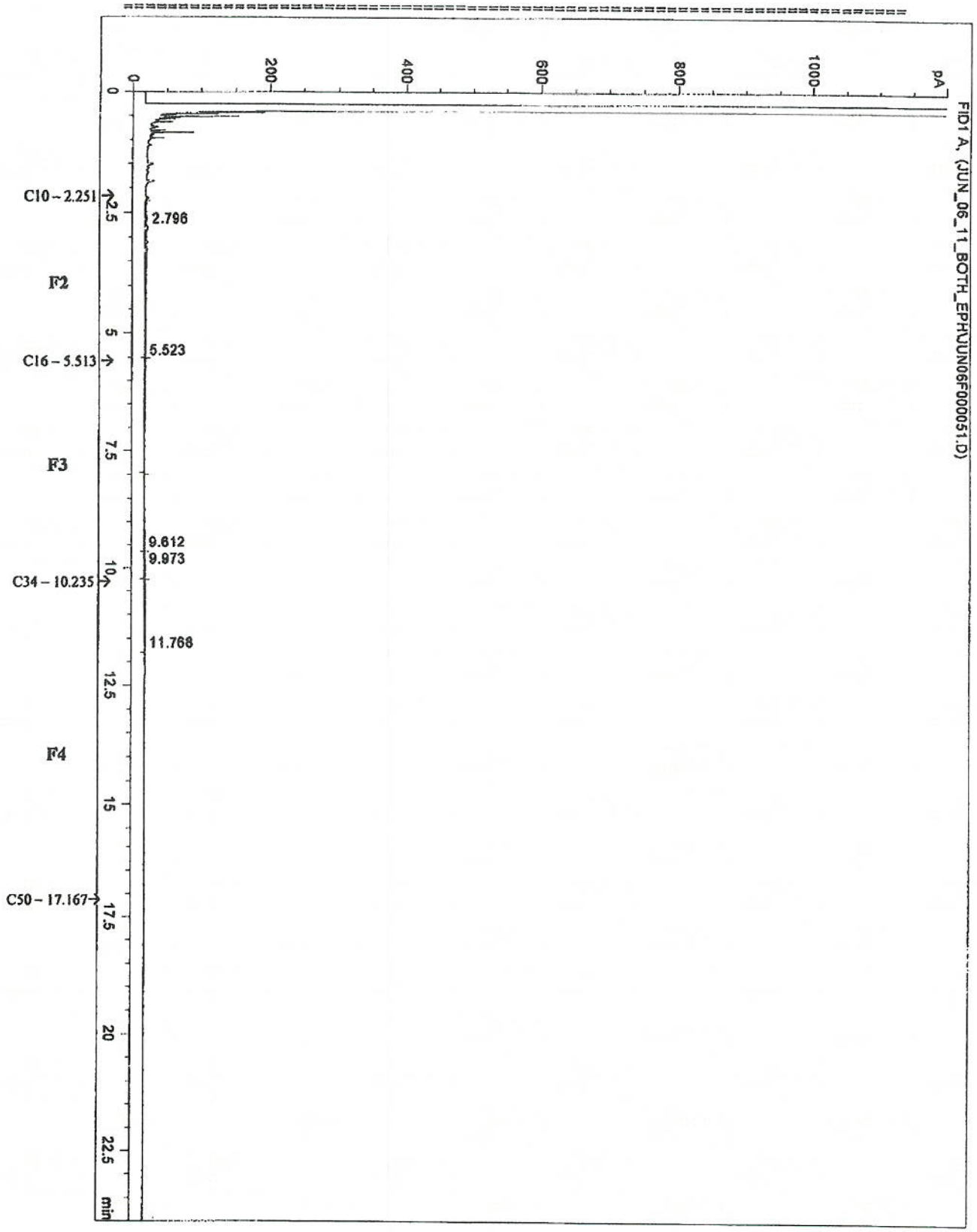
Report reviewed by:

Jesse Dang, B.Sc.
Manager
Laboratory Services

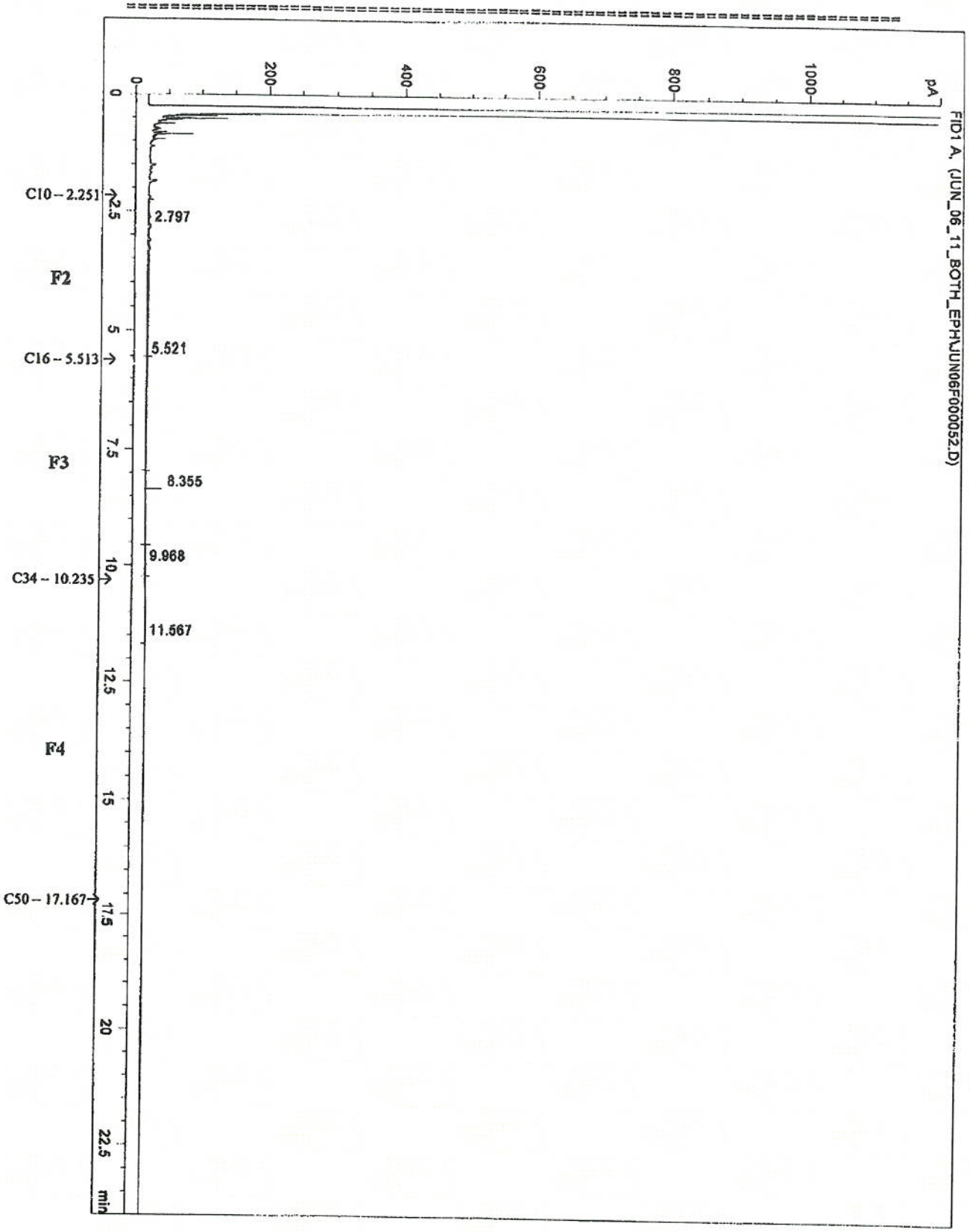
Charlene Rollheiser
Director of QA/QC
Laboratory Services

** All samples will be disposed of after 30 days following analysis. Please contact the lab if you require additional sample storage time. (Samples deemed hazardous will be returned to the client at their own expense or disposal will be arranged.) **

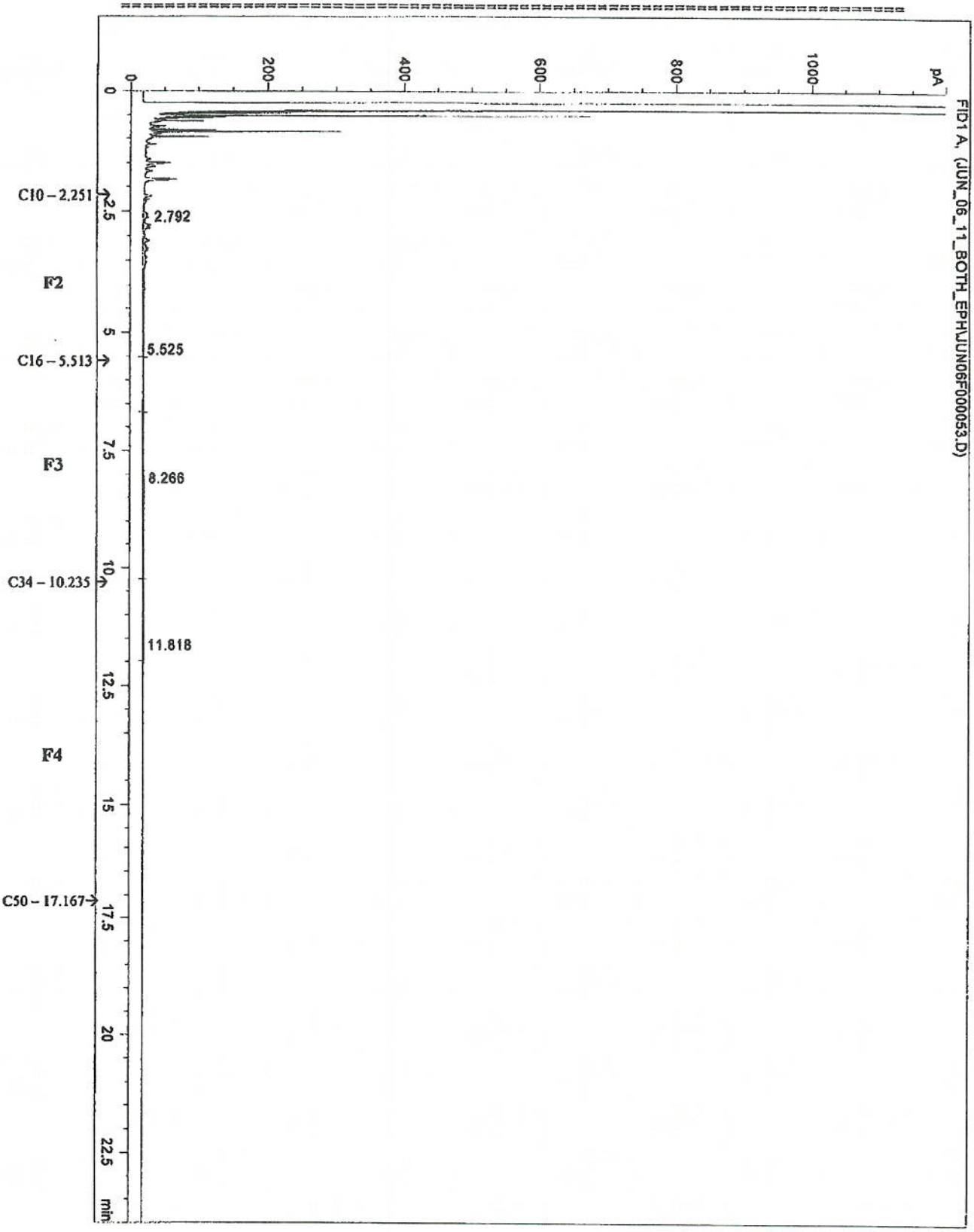
Data file : C:\CHEM32\1\DATA\JUN_06_11_BOTH_EPH\JUN06F000051.D
Sample Name: 6301 ephs



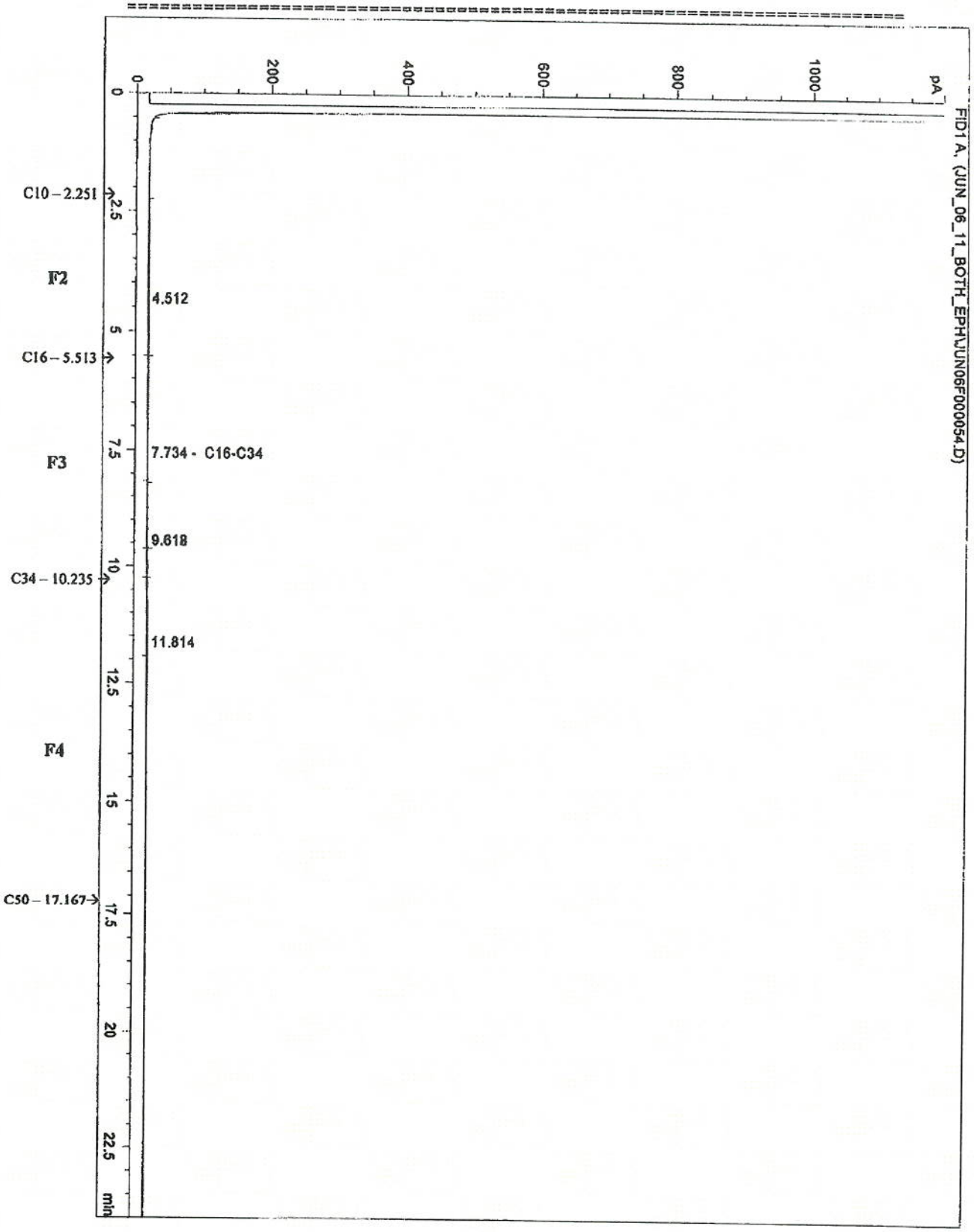
Data file : C:\CHEM32\1\DATA\JUN_06_11_BOTH_EPH\JUN06F000052.D
Sample Name: 6301-D ephs



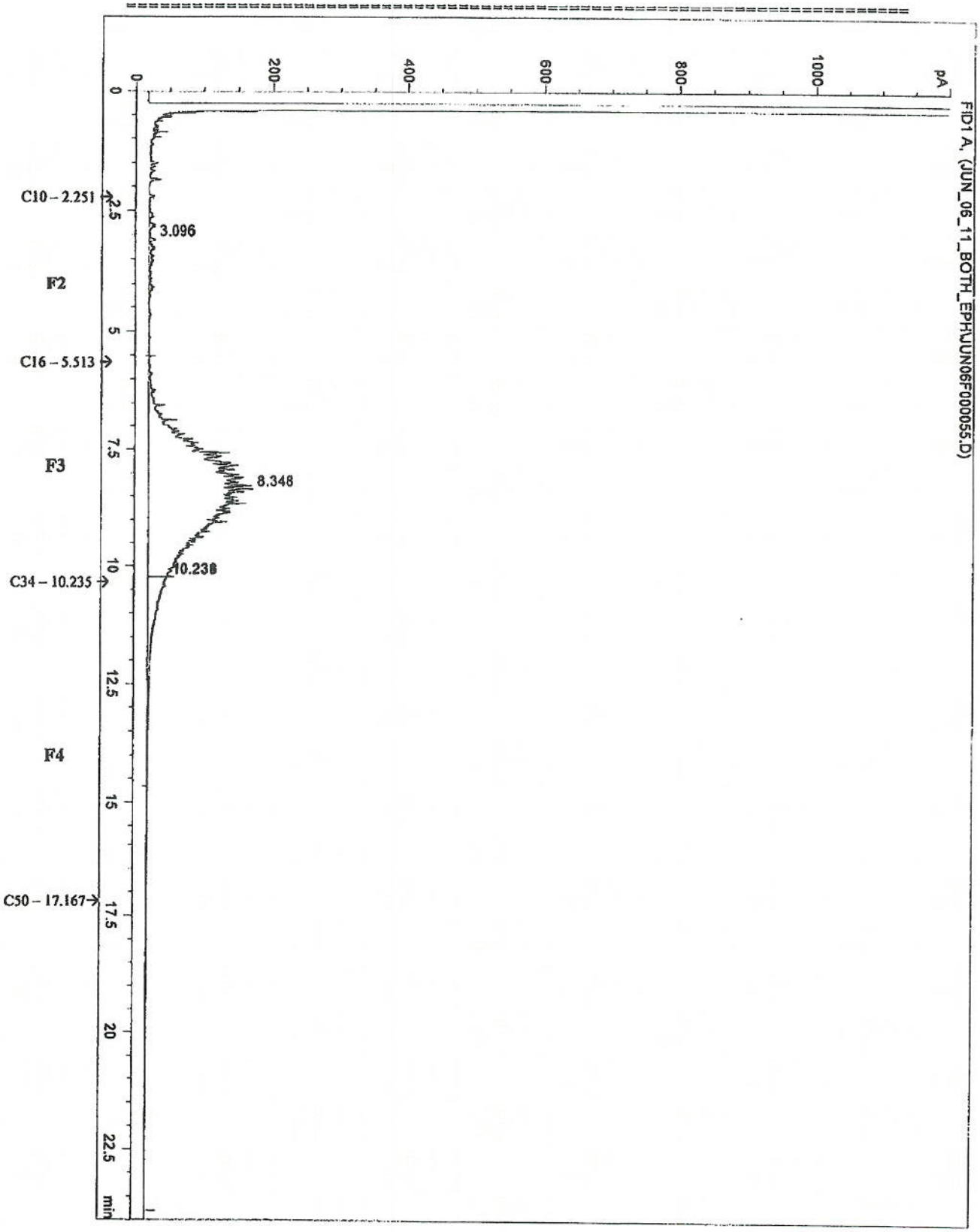
Data file : C:\CHEM32\1\DATA\JUN_06_11_BOTH_EPH\JUN06F000053.D
Sample Name: 6302 ephs



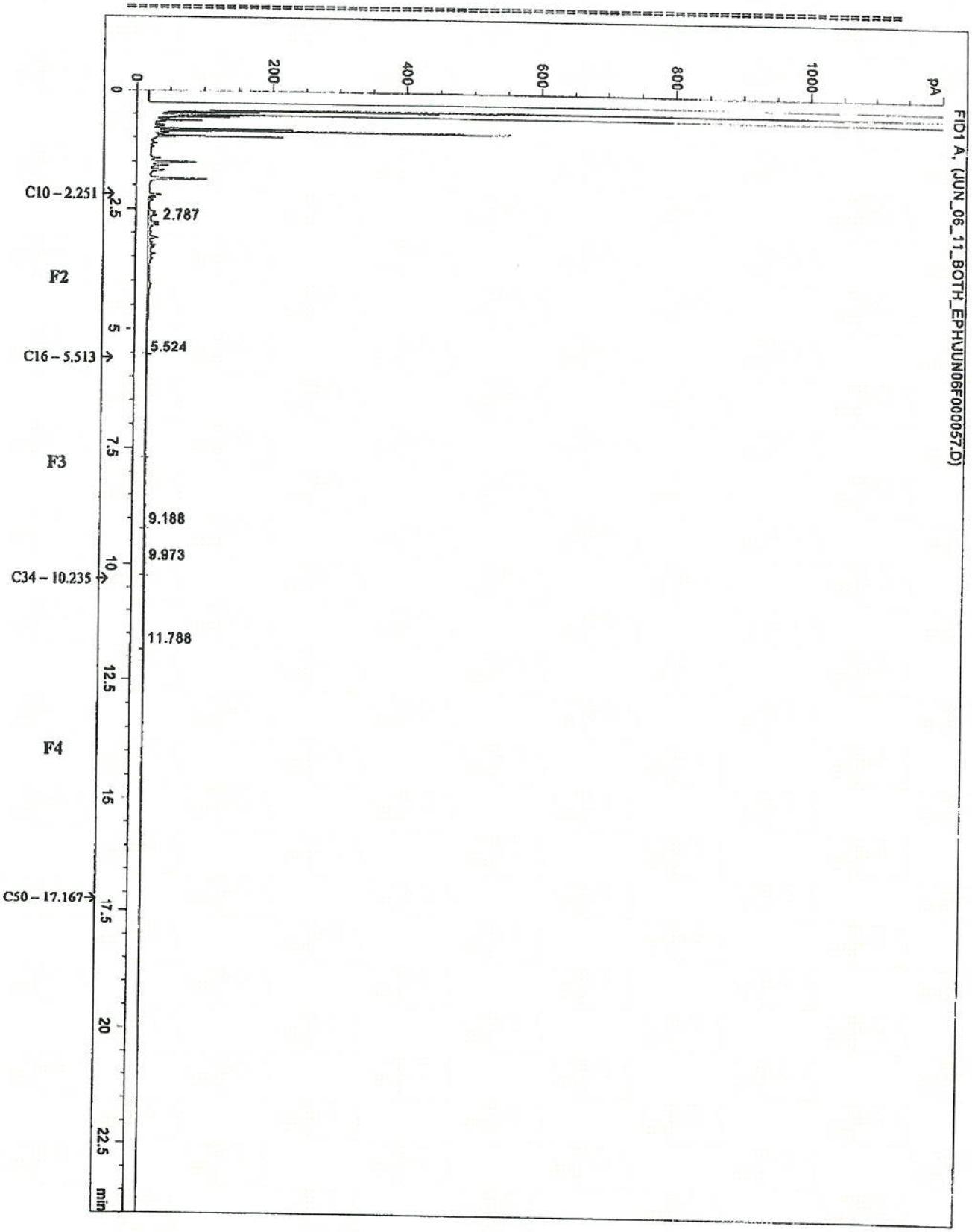
Data file : C:\CHEM32\1\DATA\JUN_06_11_BOTH_EPH\JUN06F000054.D
Sample Name: 6303 ephs



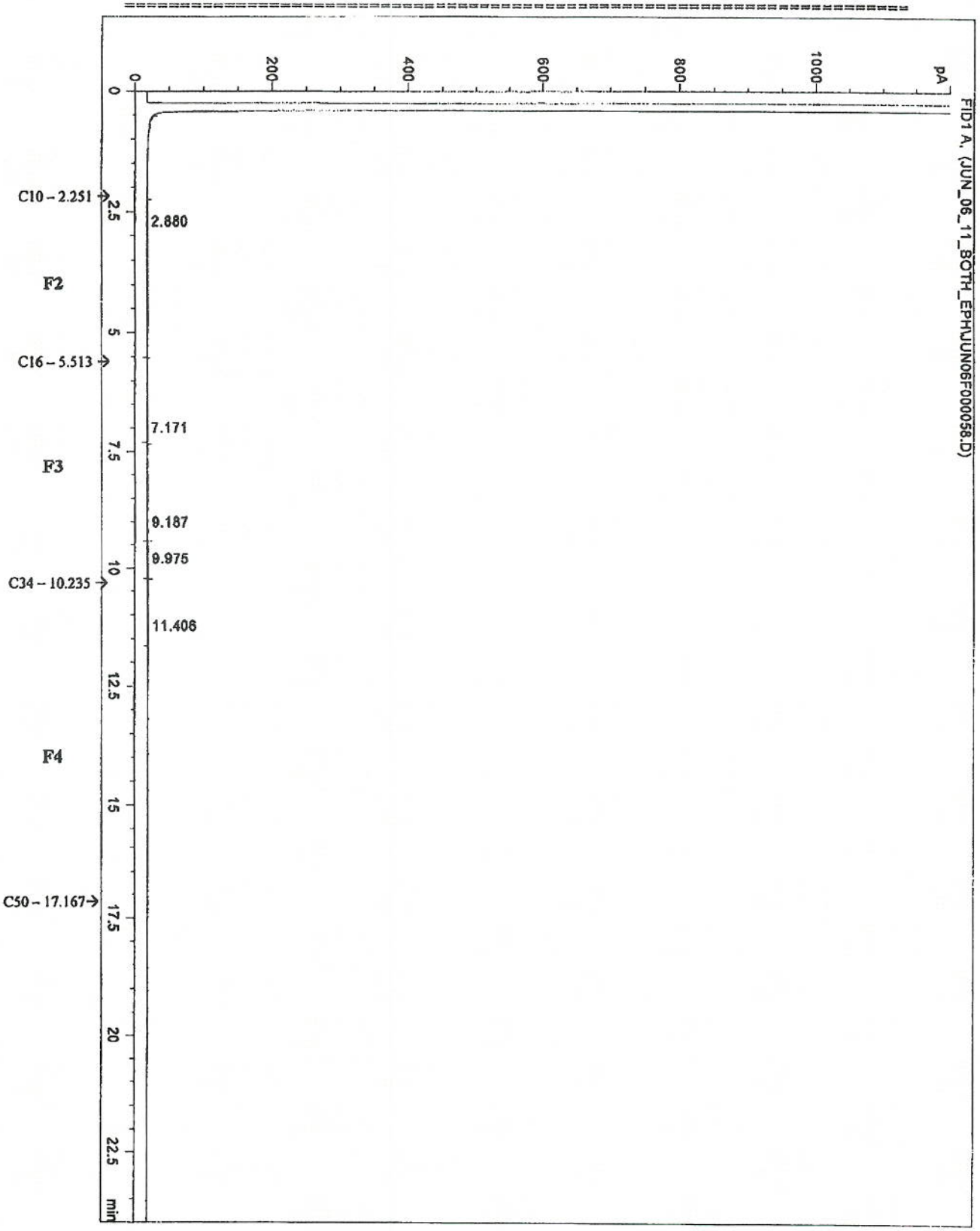
Data file : C:\CHEM32\1\DATA\JUN_06_11_BOTH_EPH\JUN06F000055.D
Sample Name: 6304 ephs



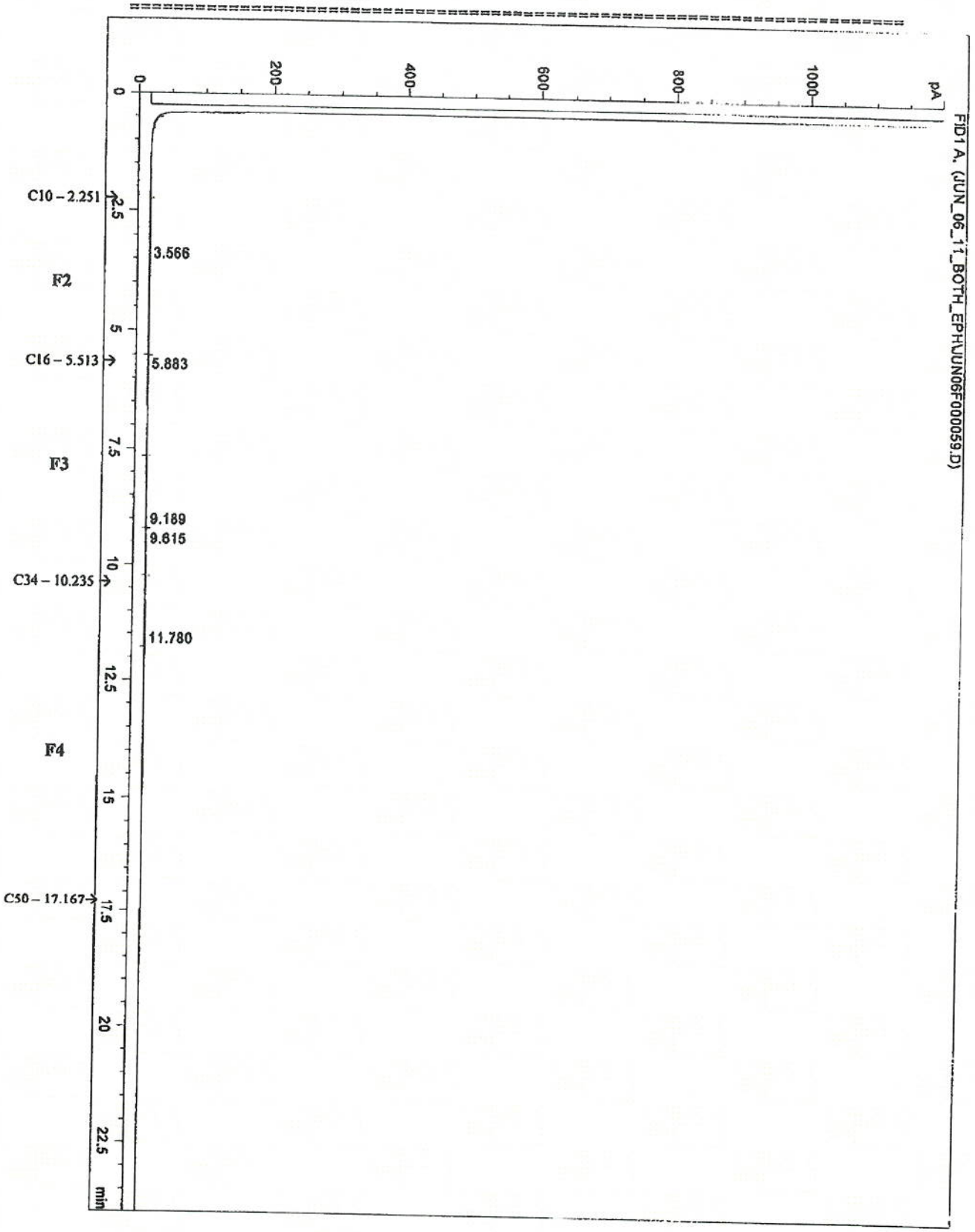
Data file : C:\CHEM32\1\DATA\JUN_06_11_BOTH_EPH\JUN06F000057.D
Sample Name: 6305 ephs



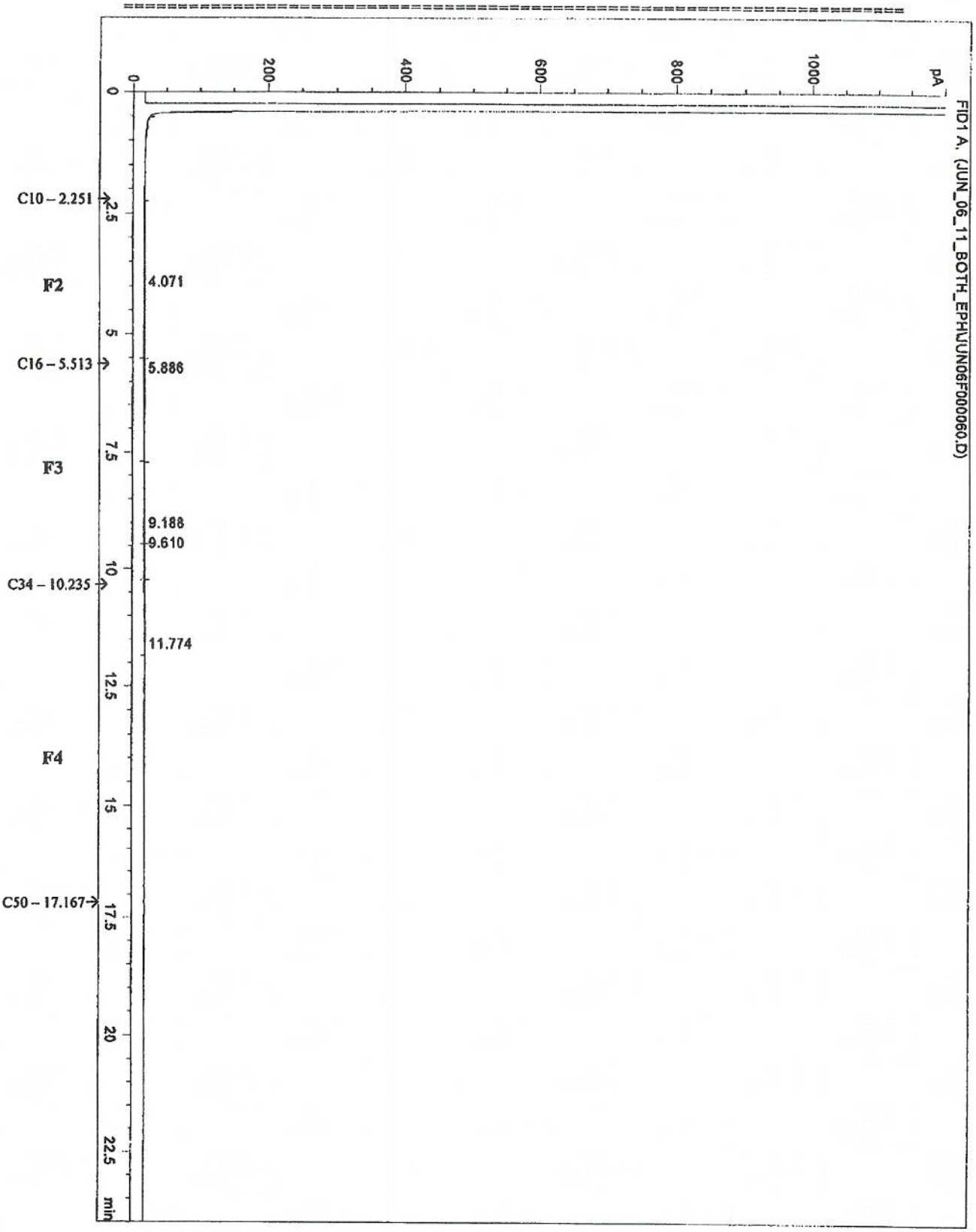
Data file : C:\CHEM32\1\DATA\JUN_06_11_BOTH_EPH\JUN06F000058.D
Sample Name: 6306 ephs



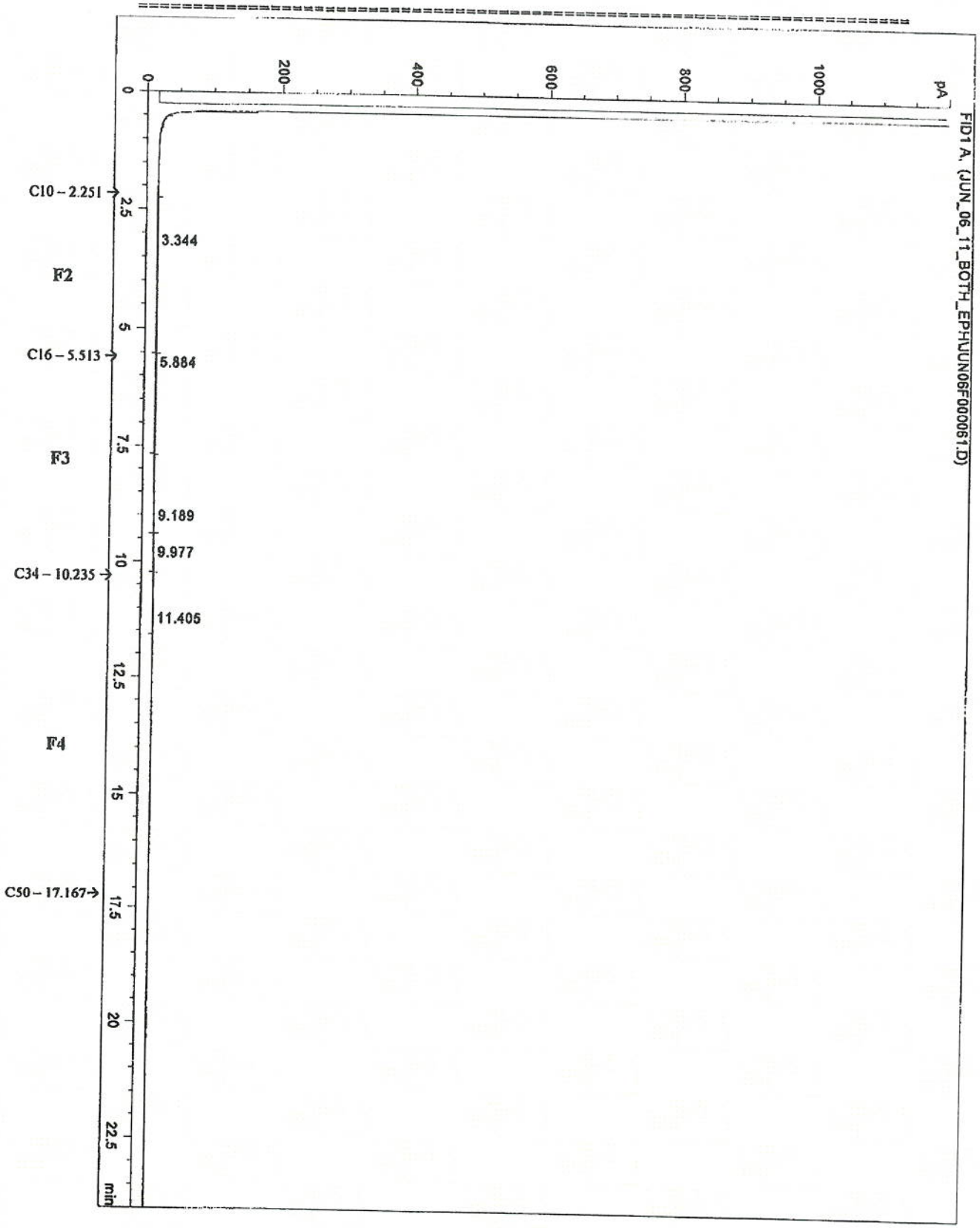
Data file : C:\CHEM32\1\DATA\JUN_06_11_BOTH_EPH\JUN06F000059.D
Sample Name: 6307 ephs



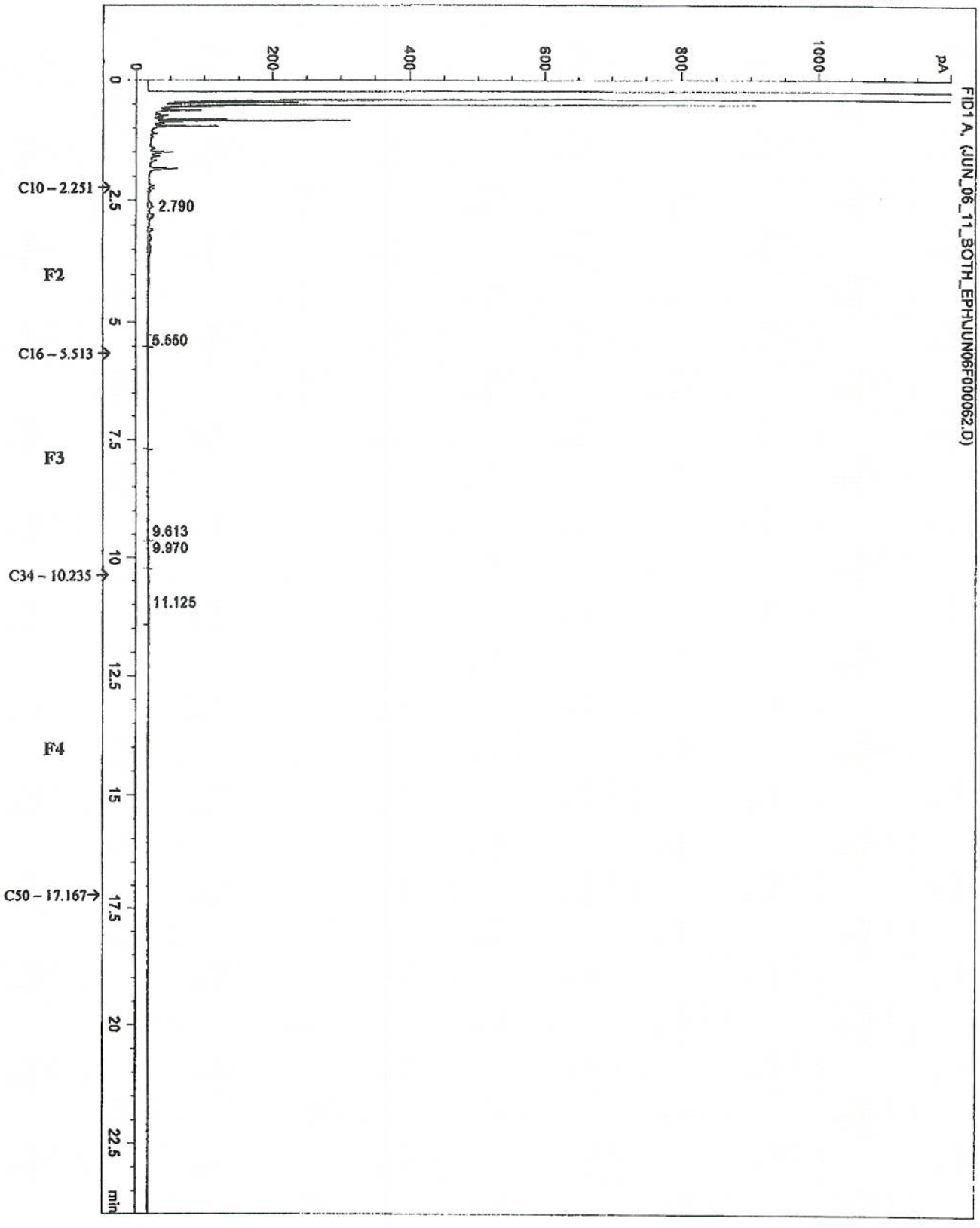
Data file : C:\CHEM32\1\DATA\JUN_06_11_BOTH_EPH\JUN06F000060.D
Sample Name: 6308 ephs



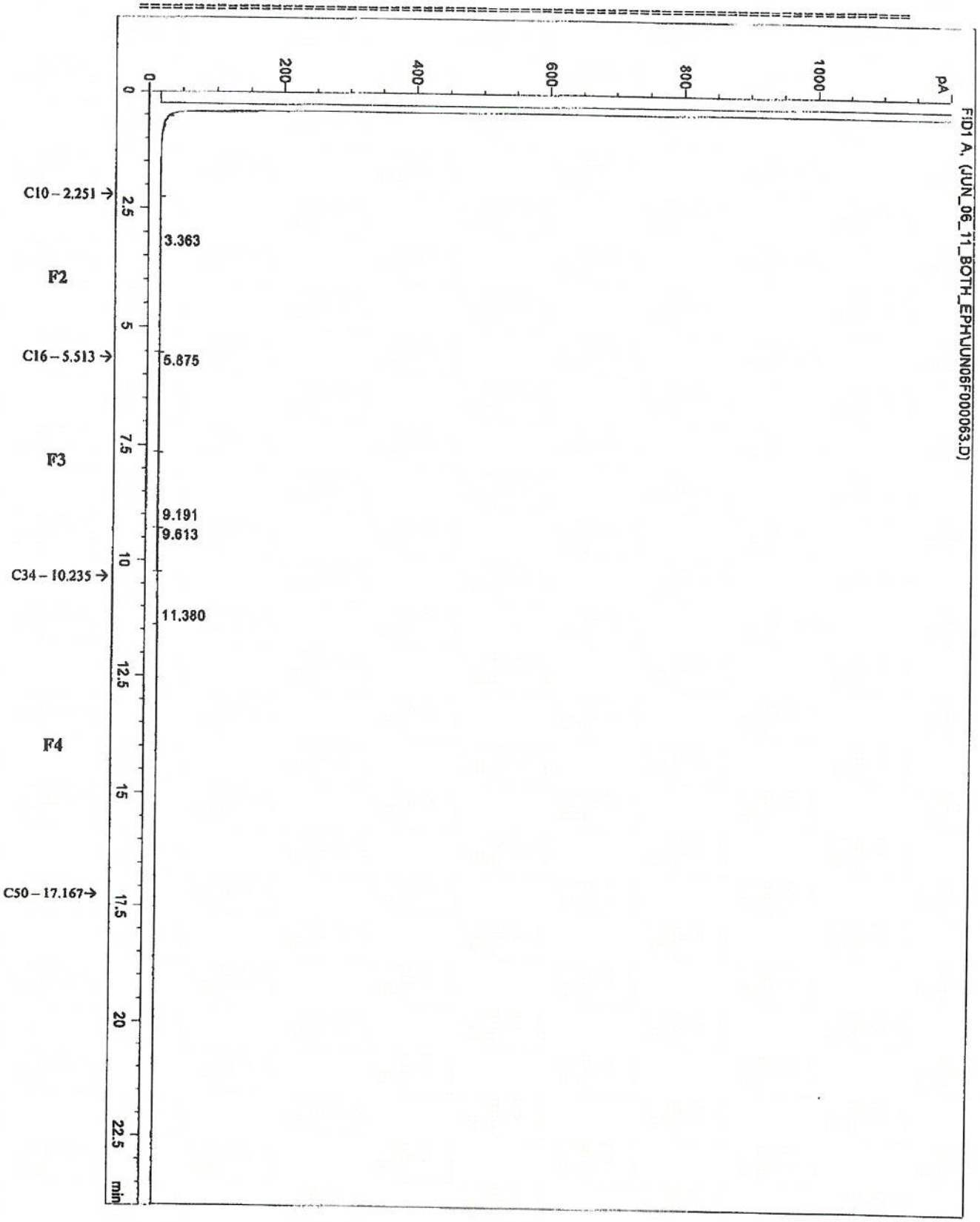
Data file : C:\CHEM32\1\DATA\JUN_06_11_BOTH_EPH\JUN06F000061.D
Sample Name: 6309 ephs



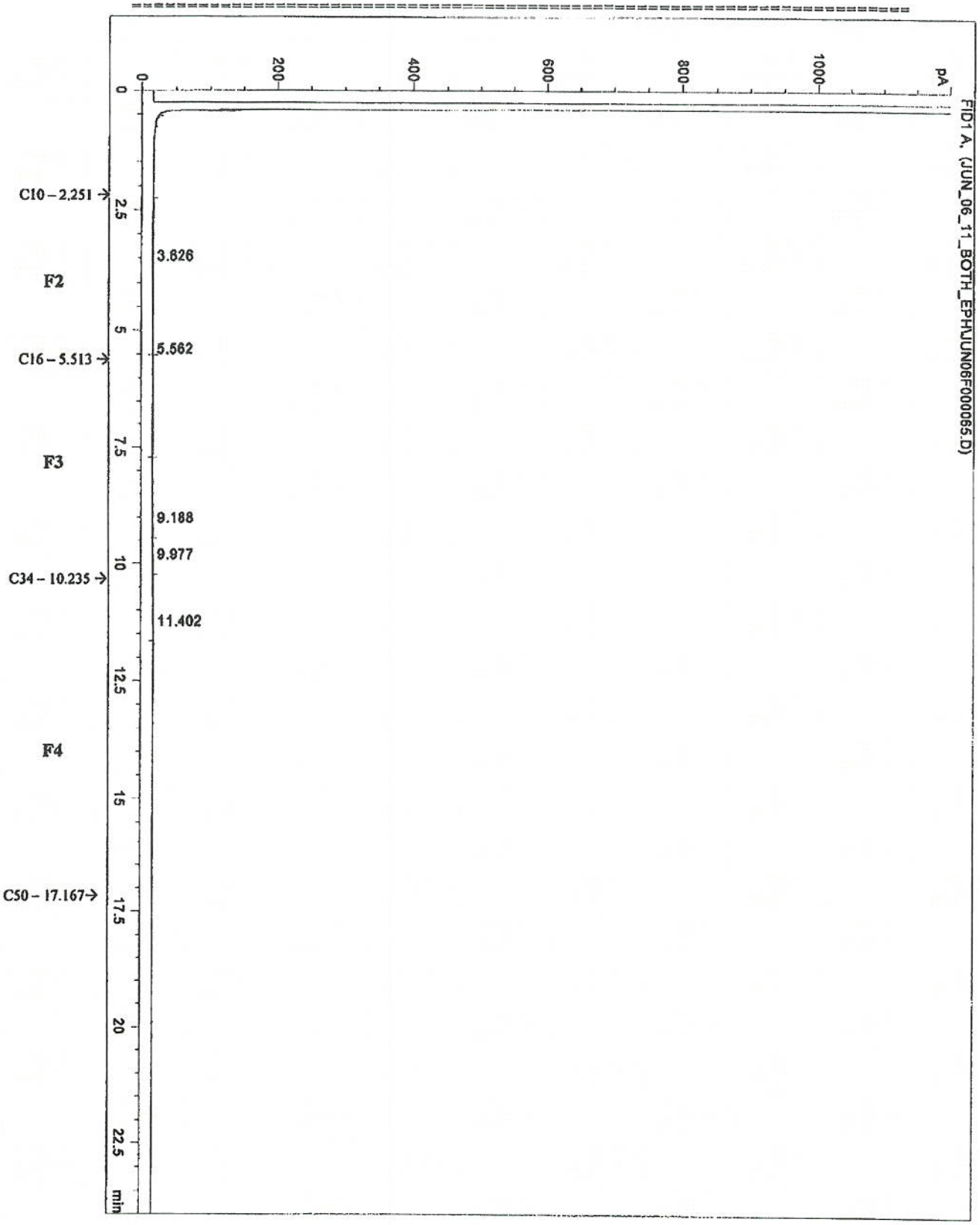
Data file : C:\CHEM32\1\DATA\JUN_06_11_BOTH_EPH\JUN06F000062.D
Sample Name: 6310 ephs



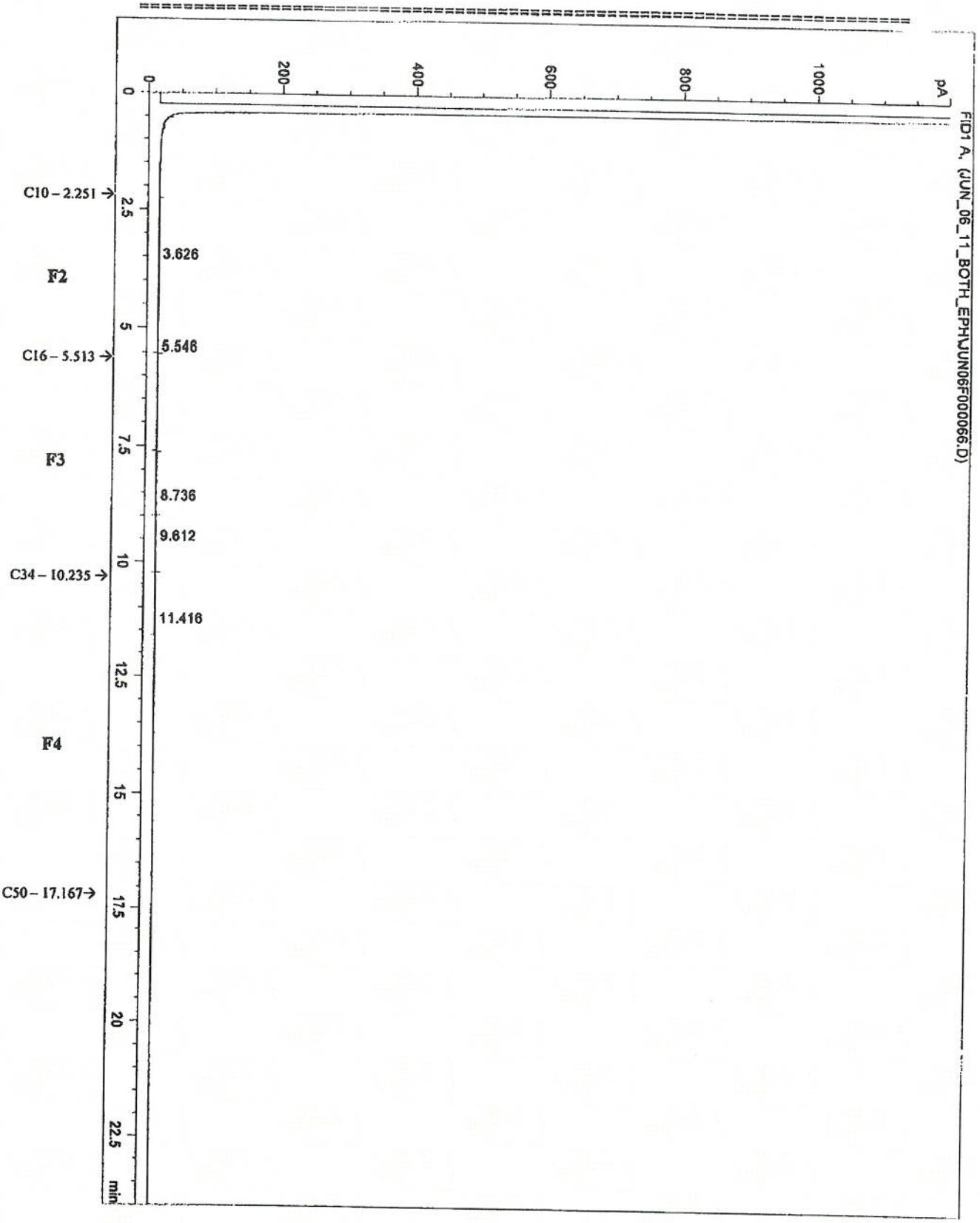
Data file : C:\CHEM32\1\DATA\JUN_06_11_BOTH_EPH\JUN06F000063.D
Sample Name: 6311 ephs



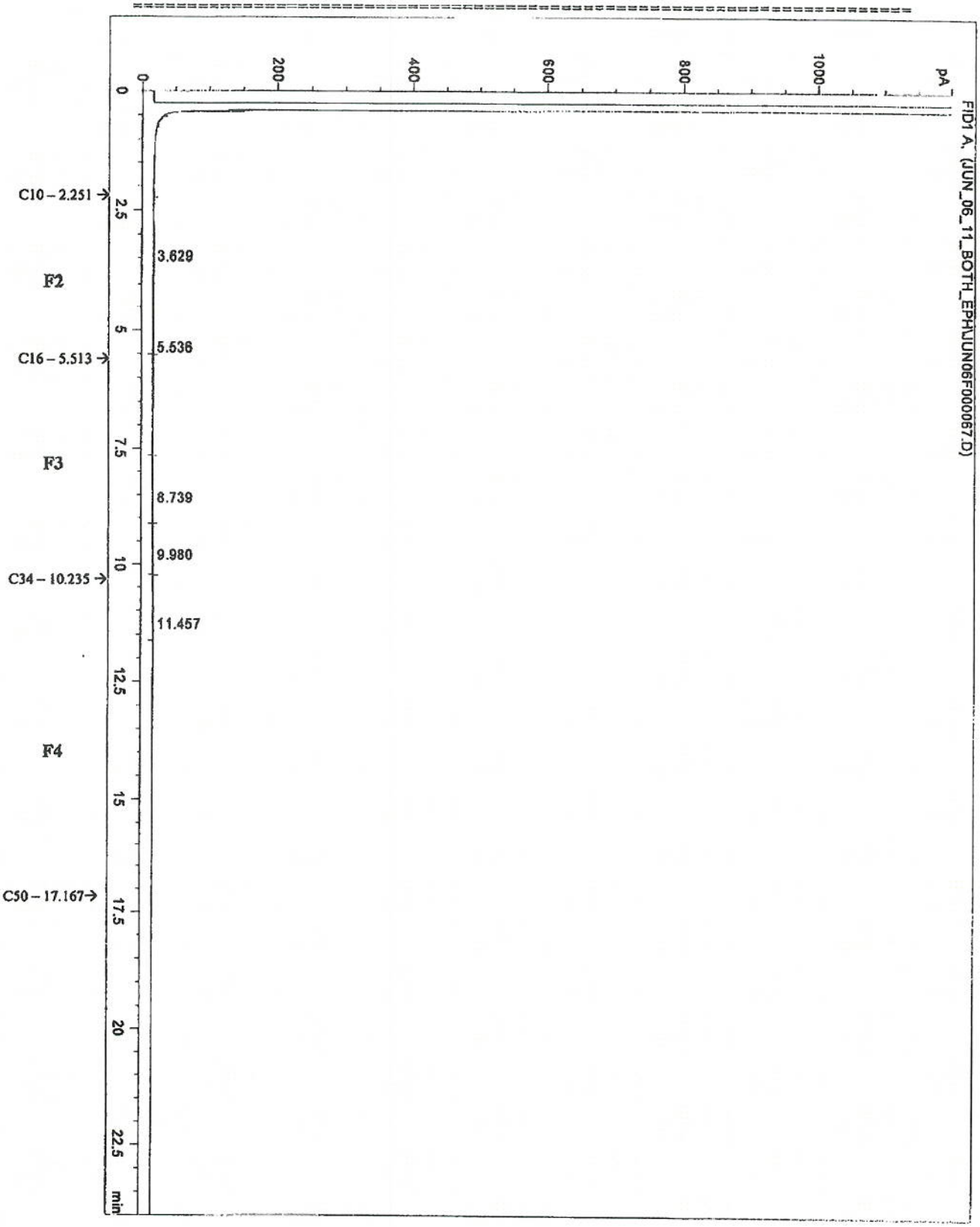
Data file : C:\CHEM32\1\DATA\JUN_06_11_BOTH_EPH\JUN06F000065.D
Sample Name: 6312 ephs



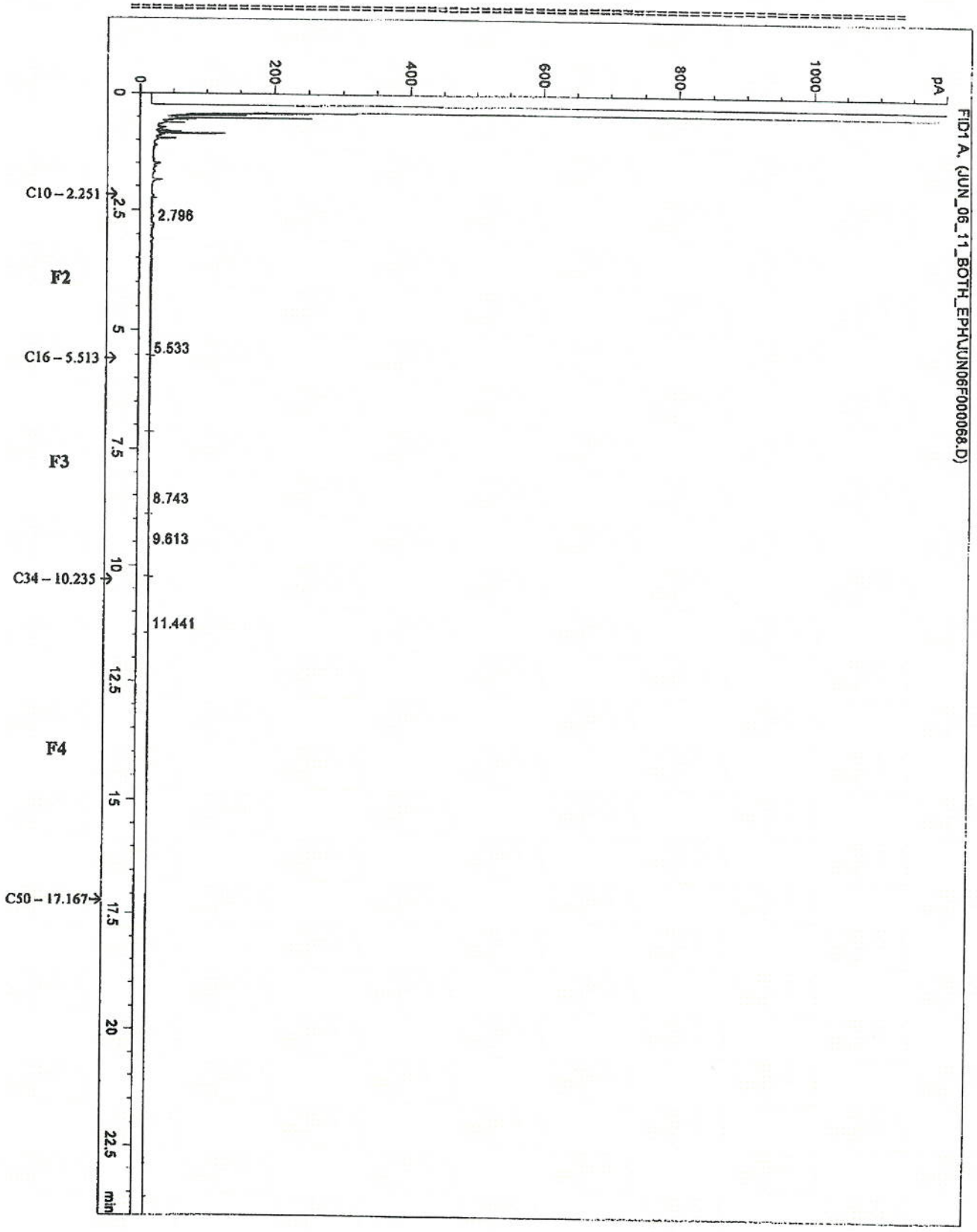
Data file : C:\CHEM32\1\DATA\JUN_06_11_BOTH_EPH\JUN06F000066.D
Sample Name: 6313 ephs



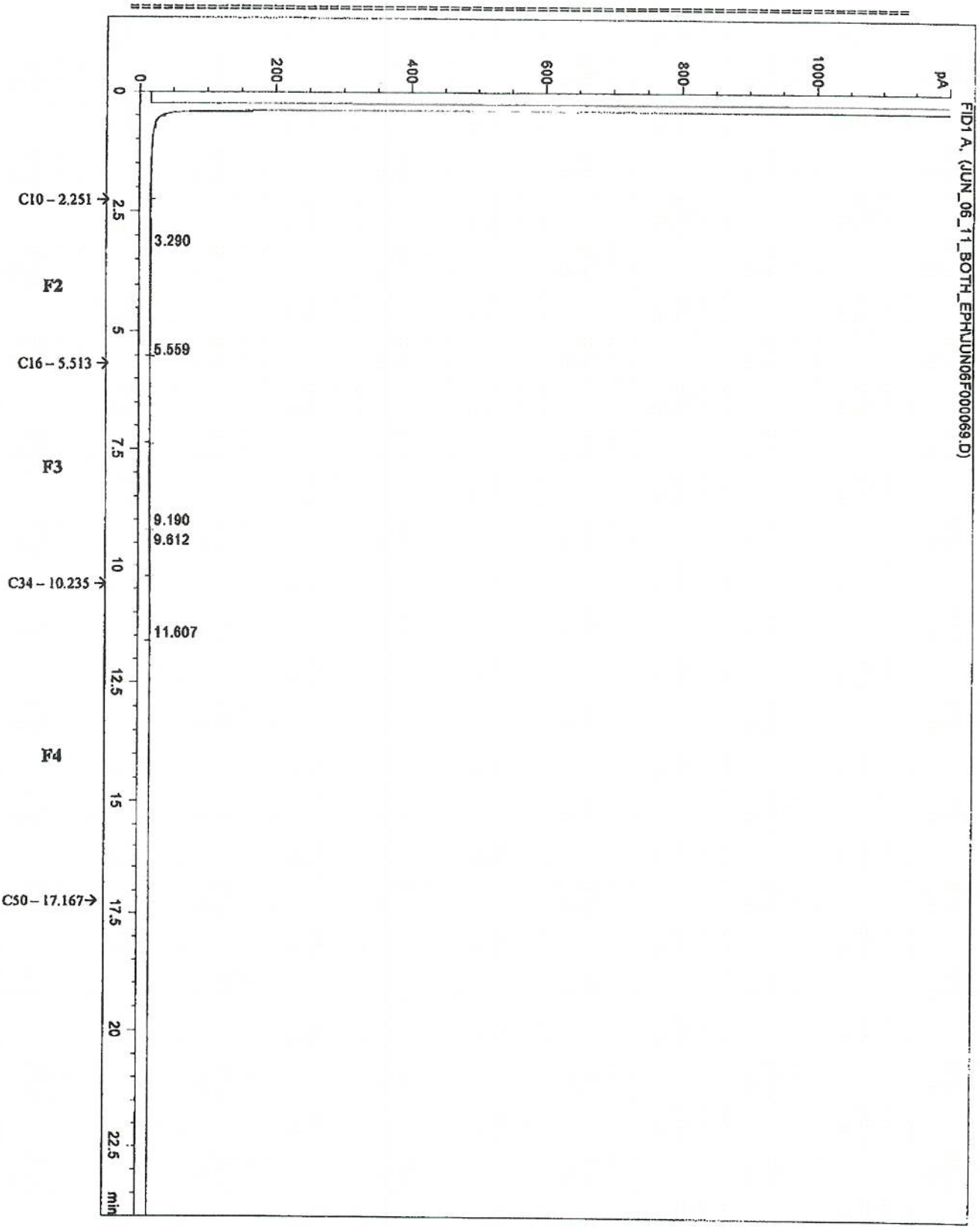
Data file : C:\CHEM32\1\DATA\JUN_06_11_BOTH_EPH\JUN06F000067.D
Sample Name: 6314 ephs



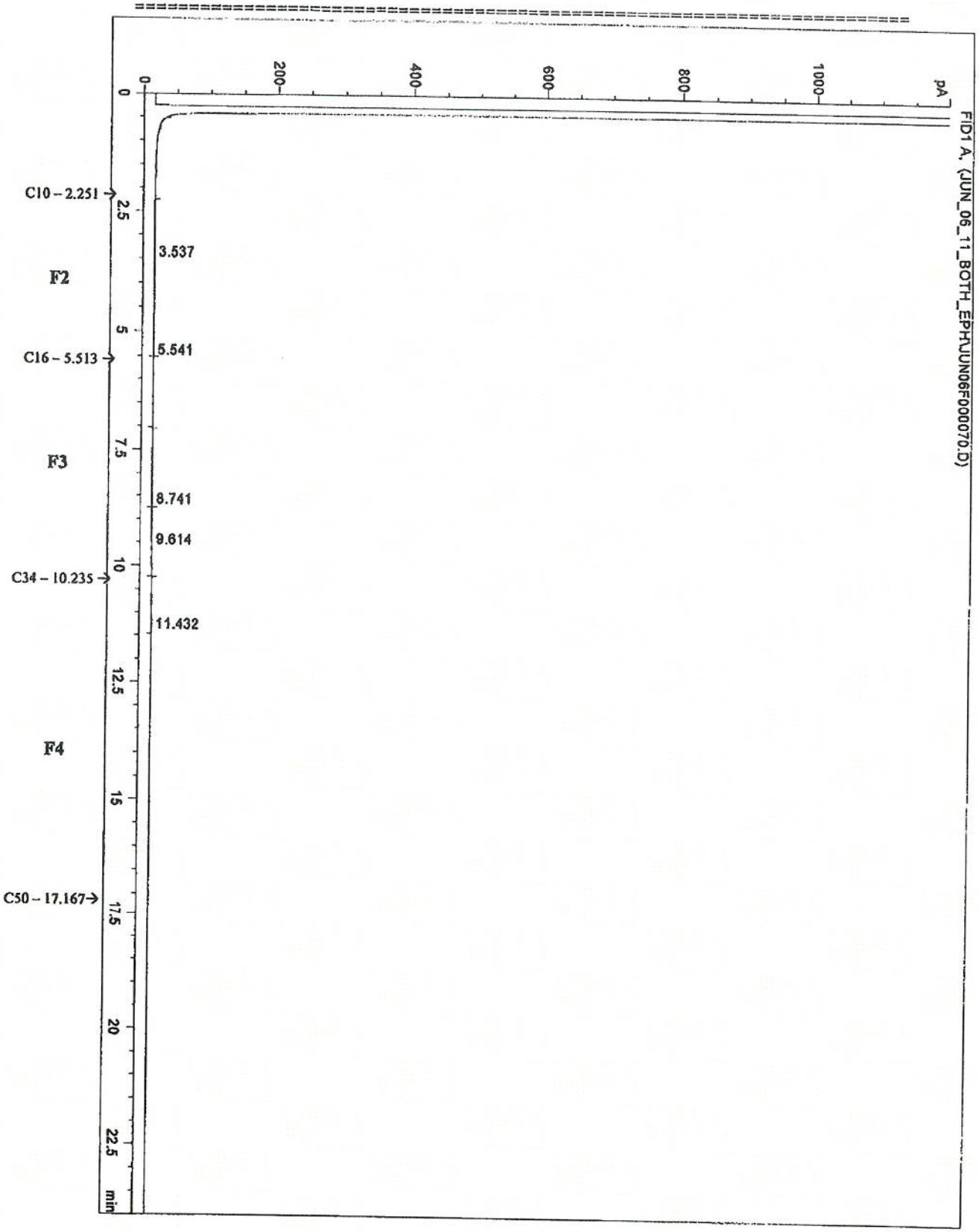
Data file : C:\CHEM32\1\DATA\JUN_06_11_BOTH_EPH\JUN06F000068.D
Sample Name: 6315 ephs



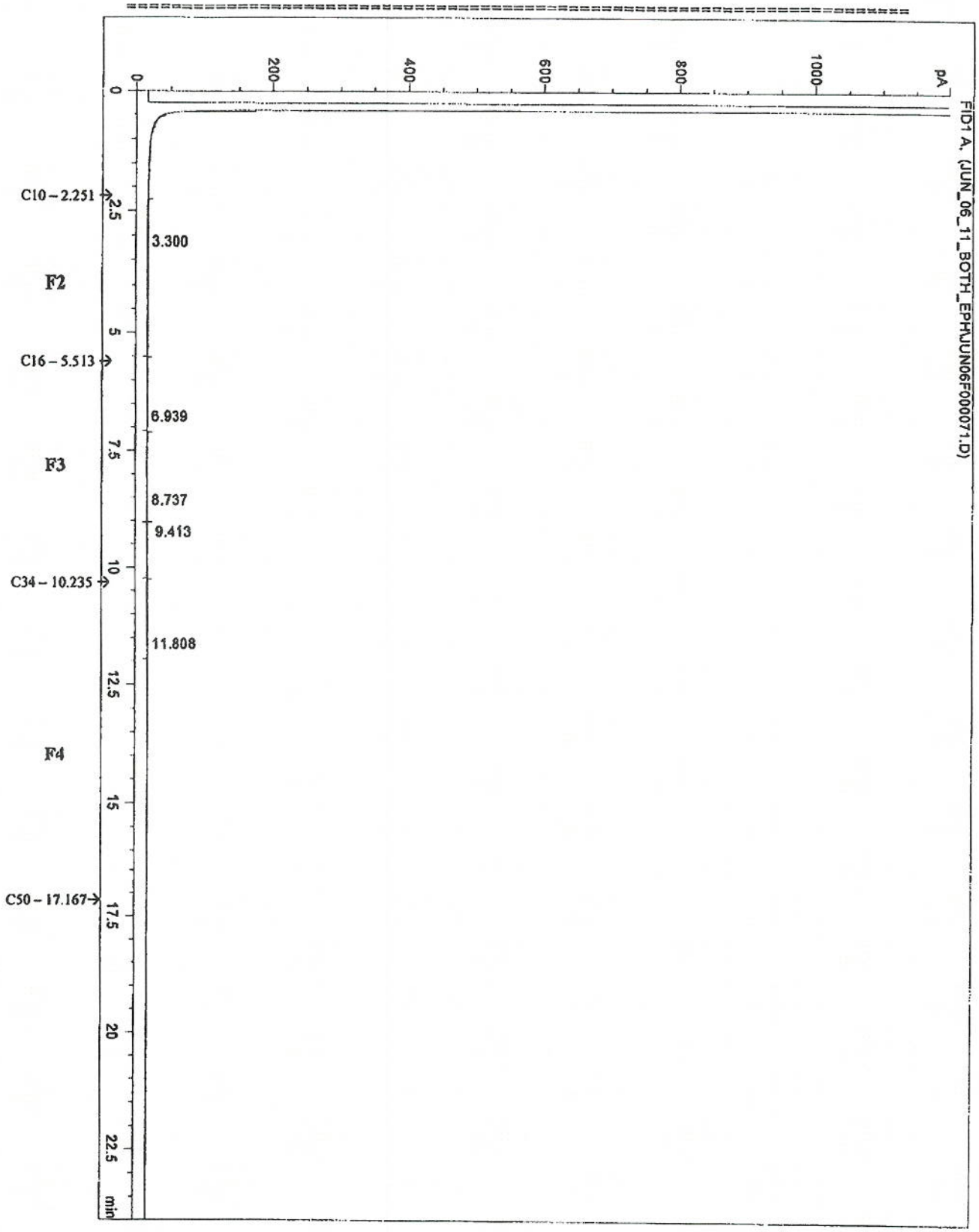
Data file : C:\CHEM32\1\DATA\JUN_06_11_BOTH_EPH\JUN06F000069.D
Sample Name: 6316 ephs



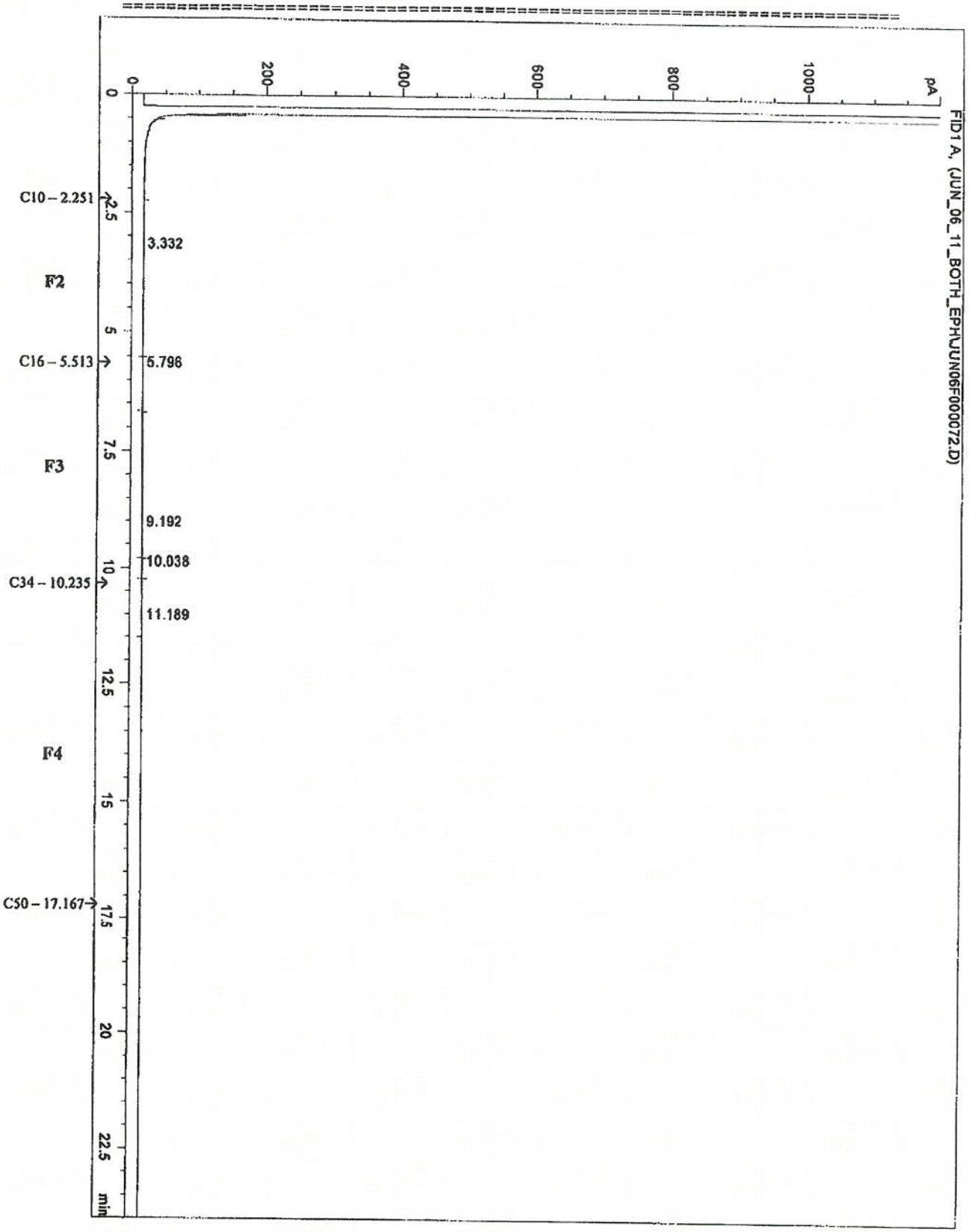
Data file : C:\CHEM32\1\DATA\JUN_06_11_BOTH_EPH\JUN06F000070.D
Sample Name: 6317 ephs



Data file : C:\CHEM32\1\DATA\JUN_06_11_BOTH_EPH\JUN06F000071.D
Sample Name: 6318 ephs



Data file : C:\CHEM32\1\DATA\JUN_06_11_BOTH_EPH\JUN06F000072.D
Sample Name: 6319 ephs



# APPENDIX E

# WATER WELL RECORDS

Manitoba Water Stewardship
Water Branch
WELL INFORMATION REPORT

Manitoba

2011 Jun 15

Well PID: 159960

LOCATION: 1-78-3W
UTMX:576251 UTMY:6176654 XY Accuracy:4 FAIR [350M-1KM] [WITHIN SECTION]
UTMZ:208 Z Accuracy:4 FAIR [5-10M]
Owner: JIM & CANDYCE MCINTOSH
Driller: Perimeter Drilling Ltd.
Well Name:
Date Completed: 2010 Jun 06
Well Use: PRODUCTION
WATER USE: Domestic
Well Status: ACTIVE Aquifer: GRANITE

REMARKS:
21 THOMPSON DRIVE

WELL LOG (Imperial units)

| From | To(ft.) | Log |
|---|---|---|
| 0.0 | 45 | TILL |
| 45.0 | 55 | SILTY CLAY |
| 55.0 | 61 | BLUE CLAY |
| 61.0 | 75 | LIMESTONE |
| 75.0 | 100 | LIMESTONE |
| 100.0 | 250 | BLUE AND RED GRANITE |
| 250.0 | 420 | BLUE GRANITE ONLY |

152109

WELL CONSTRUCTION

| From | To(ft) | Const.Method | Inside Dia.(in) | Outside Dia.(in) | Slot Size(in) | Type | Material |
|---|---|---|---|---|---|---|---|
| 0.0 | 60.0 | CASING | 5.0 | | | INSERT | PVC |
| 60.0 | 420.0 | OPEN HOLE | 4.8 | | | | |

Top of Casing: 2.0 ft above ground

PUMPING TEST
Date : 2010 Jun 07 Pumping 1.5 Imp. gallons/minute
Water level before test : 390.0 ft below ground
Water level at end of test :
Test duration:
Test Zone: from 60.0 ft to 420.0 ft

Manitoba Water Stewardship
Water Branch
WELL INFORMATION REPORT

Manitoba

2011 Jun 15

Well PID: 9287

LOCATION: 78-3W
Owner: INCO
Driller: International Water Supply
Well Name: TH #9
Date Completed: 1967 Jan 01
Well Use: TEST WELL
Well Status: UNKNOWN Aquifer: SAND AND GRAVEL

REMARKS:
BURNTWOOD AQUIFER SURVEY, S OF BURNWOOD RIVER, IN PARK, REPORT ON FILE 5.7.1,JULY/71, WELL SCREEN WILL NOT TAKE WATER

WELL LOG (Imperial units)

| From | To(ft.) | Log |
|---|---|---|
| 0.0 | 1 | TOPSOIL |
| 1.0 | 12 | CLAY |
| 12.0 | 29 | CLAY AND SAND |
| 29.0 | 43 | FINE SAND AND SILT |
| 43.0 | 47 | SAND; COARSER |
| 47.0 | 58 | FINE SAND AND CLAY, BEDROCK AT 58 FEET |

WELL CONSTRUCTION

| From | To(ft) | Const.Method | Inside Dia.(in) | Outside Dia.(in) | Slot Size(in) | Type | Material |
|---|---|---|---|---|---|---|---|
| 0.0 | 55.0 | casing | 2.0 | | | | |
| 55.0 | 58.0 | perforations | 2.0 | | | | |

Top of Casing: 2.4 ft below ground

# APPENDIX F

# STATEMENT OF GENERAL CONDITIONS

**AMEC Earth & Environmental, A Division of AMEC Americas Limited**
**STATEMENT OF GENERAL CONDITIONS - ENVIRONMENTAL SERVICES**

1. STANDARD OF CARE - In the performance of professional services, AMEC uses that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession practicing in the same or similar localities. No warranty, either express or implied, is made or intended by this Agreement or by furnishing oral or written reports of the findings. AMEC is to be liable only for damage proximately caused by the negligence of AMEC. The CLIENT recognizes that subsurface conditions may vary from those encountered at the location where borings, surveys or explorations are made by AMEC and that the data, interpretations and recommendation of AMEC are based solely on the information available to him. AMEC will not be responsible for the interpretation by others of the information developed.

2. SITE INFORMATION - The CLIENT has agreed to make available to AMEC all relevant information and documents under his control regarding past, present and proposed conditions of the site. The information shall include, but not be limited to, plot plans, topographic surveys, hydrologic data and previous soil and geologic data including borings, field or laboratory tests and written reports. The CLIENT shall immediately transmit to AMEC any new information that becomes available or any change in plans. The CLIENT also ensured uninterrupted site access for AMEC throughout performance of this Agreement.

AMEC agrees to include a review of all historical information obtained by the CLIENT or provided by the Client to assist in the investigation of the Site unless and except to the extent that such a review is limited or excluded from the scope of work to be performed by AMEC.

3. FULL DISCLOSURE - The CLIENT acknowledges that in order for AMEC to properly advise and assist the CLIENT in respect of the investigation of the Site, AMEC has relied upon full disclosure by the CLIENT of all matters pertinent to an investigation of the Site.

4. DELAYS AND INTERRUPTIONS - Should AMEC have been delayed or interrupted by others in the performance of its services or be required to perform additional services as a result of any delay or interruption caused by others, AMEC shall be equitably compensated by the CLIENT for all costs, charges and expenses which it may incur as a result of such delay or interruption and any such additional services to be performed and any and all consequences resulting from such delay or interruption.

5. USE OF WORK PRODUCT - AMEC agrees to provide to the CLIENT interim reports outlining the progress of the investigation of the Site on a periodic basis and a final comprehensive report upon the completion of the investigation of the Site.

6. COMPLETE REPORT - This document being a part of the Report is of a summary nature and is not intended to stand alone without reference to the instructions given to AMEC by the CLIENT, communications between AMEC and the CLIENT, and to any other reports, writings or documents prepared by AMEC for the CLIENT relative to the specific Site described herein, all of which constitute the Report. Wherever the word "Report" is used herein, it shall refer to any and all of the documents referred to herein.

In order to properly understand the suggestions, recommendations and opinions expressed herein, reference must be made to the whole of the Report. AMEC cannot be responsible for use by any part of portions of the report without reference to the whole report.

7. LIMITATIONS ON SCOPE OF INVESTIGATION AND WARRANTY DISCLAIMER
There is no warranty, expressed or implied, by AMEC that:
a) The investigation shall uncover all potential contaminants, including asbestos, on the Site; or
b) The Site will be entirely free of all Targeted Contaminants or other contaminants as a result of any cleanup work undertaken on the Site, since it is not possible, even with exhaustive sampling, testing and analysis, to document all potential contaminants on the Site.

Classification and identification of soils, rocks, geological units, contaminated materials and contaminant quantities have been based on commonly accepted practices in environmental consulting practice in this area.

The CLIENT acknowledges that:

a) The investigation findings are based solely on the information generated as a result of the specific scope of the investigation authorized by the CLIENT;

b) any assessment regarding the presence of contamination of the Site is based on the interpretation of conditions determined at specific sampling locations and depths and that conditions may vary between sampling locations;

c) there can be no assurance that isolated pockets of contaminants are not located on the Site;

d) any assessment is also dependent on and limited by the accuracy of the analytical data generated by the sample analyses;

e) any assessment is also limited by the scientific possibility of determining the presence of contaminants for which scientific analyses have been conducted; and

f) the analytical parameters selected are limited to those outlined in the CLIENT's authorized scope of investigation (in the absence of any evidence of potential contamination sources on the Site, which may warrant expanding the analytical parameters).

8. REMEDIATION COST ESTIMATES - Estimates of remediation costs can only be based on the specific information generated and the technical limitations of the investigation authorized by the CLIENT. Accordingly, estimated costs for remediation only represent the cost to clean up known contaminants that have been identified during the course of the investigation. As remediation of a Site is often an iterative exercise, estimated costs for remediation should only be interpreted to cover the first stage of any Site remediation until such time as verification samples indicate that the Site has been fully remediated and AMEC shall therefore not be liable for the accuracy of any estimates of remediation costs provided.

9. CONTROL OF WORK AND JOBSITE SAFETY - AMEC is only responsible for the activities of its employees on the jobsite. The presence of AMEC personnel on the Site shall not be construed in any way to relieve the CLIENT or any contractors on Site from their responsibilities for Site safety. The CLIENT undertakes to inform AMEC of all hazardous conditions, or possible hazardous conditions which are known to him. The CLIENT also recognizes that the activities of AMEC may uncover previously unknown hazardous materials and that such a discovery may result in the necessity to undertake emergency procedures to protect AMEC employees as well as the public at large and the environment in general. The CLIENT also acknowledges that in some cases the discovery of hazardous conditions and materials will require that certain regulatory bodies be informed and the CLIENT agrees that notification to such bodies by AMEC will not be a cause of action or dispute.

10. LIMITATION OF RESPONSIBILITY

Limitation of Liability - The CLIENT has agrees that, notwithstanding any other provision negotiated as part of AMEC's contract, the total liability of AMEC, its officers, directors and employees for liabilities, claims, judgments, demands and causes of action arising under or related to this Agreement, whether based in contract or tort, shall be limited to the total compensation actually paid to AMEC for the services hereunder or $50,000, whichever is less. All claims by the CLIENT shall be deemed relinquished unless filed within one (1) year after substantial completion of the services hereunder.

No Special or Consequential Damages - CLIENT and AMEC agree that to the fullest extent permitted by law that AMEC shall not be responsible for any consequential, incidental or indirect damages.

Indemnification - Because CLIENT owns and/or operates the site where work is being performed, CLIENT has and shall retain all responsibility and liability associated with the environmental conditions at the site. Unless specifically identified elsewhere, CLIENT'S responsibility and liability includes the handling and disposal of any samples or hazardous materials generated on the site as a result of AMEC's performance hereunder. To the fullest extent permitted by law, the CLIENT agrees to defend, indemnify and hold AMEC, its agents, subcontractors, and employees harmless from and against any and all claims, defense costs, including attorney's fees, damages, and other liabilities arising out of or in any way related to CONSULTANT's reports or recommendations concerning this Agreement, AMEC's presence on the project property, or the presence, release, or threatened release of asbestos, hazardous substances, or pollutants on or from the project property; provided that the CLIENT shall not indemnify AMEC against liability for damages to the extent caused by the negligence or intentional misconduct of AMEC, its agents, subcontractors, or employees.