APPENDIX B

REMEDIAL ACTION PLAN
ALEXANDER/BANNATYNE COMBINED SEWER DISTRICT
ADJACENT TO 830 LOGAN AVENUE,
WINNIPEG, MB

Manitoba
Conservation

Environmental Operations
Red River Region

123 Main Street, Suite 160
Winnipeg MB R3C 1A5
CANADA

April 18, 2005
XC S. Wiecek
D265-177-01

UMA Engineering Limited
1479 Buffalo Place
Winnipeg, MB R3T 1L7

Attention: Steve Wiecek, P.Eng., P.Geo.

Dear Mr. Wiecek:

Re: Remedial Action Plan for Alexander/Bannatyne Combined Sewer District, Adjacent to 830 Logan Ave, Winnipeg, Manitoba

This will acknowledge receipt of the Proposed Remedial Action Plan dated April 14, 2005 prepared by UMA Engineering Limited for the remediation of petroleum hydrocarbon impacted soil at the property described above.

The Remedial Action Plan proposes to remove approximately 10 to 20 m^3 of impacted soil adjacent to the property at 830 Logan Avenue and dispose of at the Brady Road Landfill. A closure report should be provided to this office upon completion of the work.

It is the position of Manitoba Conservation that the remediation of the impacted soil located adjacent to 830 Logan Avenue in Winnipeg, Manitoba be undertaken as proposed.

It should be noted that the position of Manitoba Conservation as stated in this letter is based on the information provided to this office by UMA Engineering Limited and relates only to the matters within the scope of the investigation conducted by UMA Engineering Limited. No additional site monitoring was performed by Manitoba Conservation.

Sincerely,

Dean Kasur, B.A., B.Sc.
Environment Officer

c File 20174

UMA | AECOM

UMA Engineering Ltd.
1479 Buffalo Place
Winnipeg, Manitoba R3T 1L7
T 204.284.0580 F 204.475.3646 www.uma.aecom.com

April 14, 2005

UMA Project No.: 41 01 D265 177 01 01

Mr. Randy Webber
Environmental Officer
Manitoba Conservation
Winnipeg Region
123 Main Street, Suite 160
Winnipeg, MB
R3C 1A5

Dear Sir:

Reference: Remedial Action Plan – Sewer Relief for the Alexander/Bannatyne Combined Sewer District City of Winnipeg, Water and Waste Department

UMA Engineering Ltd. has been retained by the City of Winnipeg, Water and Waste Department to provide Professional Engineering Services for the design and contract administration of sewer relief/separation works for the Alexander/Bannatyne Combined Sewer District. The following letter provides a brief overview of the background, project works and anticipated remedial measures that will be carried out during construction.

1.0 BACKGROUND

The Alexander/Bannatyne Combined Sewer District (CSD) is a 372 hectare catchment area that is bounded by Henry Avenue to the north, Elgin Avenue to the south, Beacon Street to the west and Sherman Street to the east.

The primary objective of the project is to upgrade the level of protection against basement flooding from summer rainstorms in the Alexander/Bannatyne CSD to current City design objectives. The preferred alternative for complete district relief is a balance of land drainage sewer separation and combined sewer relief.

Starting in the spring of 2005 the City of Winnipeg will initiate phased construction of the relief/separation works, beginning with the installation of new land drainage sewers, manholes and siphons.

During initial geotechnical investigations, possible subsurface contamination was identified southeast of the Logan Avenue-Tecumseh Street intersection (see Drawing No. LD-3120). UMA has subsequently completed environmental investigations in the vicinity of the new sewer alignment on Tecumseh Avenue to determine the nature, extent and subsequent impacts the contamination may have on the proposed relief/separation works.

2.0 SITE INVESTIGATIONS

On March 3, 2005, geotechnical investigations identified possible hydrocarbon impacts at one test hole (TH-05-05) location at the southeast corner of Logan Avenue and Tecumseh Street. Follow-up consultations with Manitoba Conservation indicated that a contaminated site file was maintained on the adjacent property located at 830 Logan Avenue. The file records indicated that a Phase II Environmental Site Assessment was conducted on the site in 1997 and identified hydrocarbon impacts in the northwest corner of the subject property.

As a result of this review, supplementary subsurface environmental investigations were completed by UMA on April 7, 2005 to determine the nature and magnitude of potential hydrocarbon impacts in the areas proposed for sewer relief/separation works. A copy of the summary letter report documenting this investigation is attached.

Supplementary investigations included a field test drilling program, soil vapour screening and laboratory soil testing to identify the extent and quantity of potential impacts within the road allowance. Soil vapour measurements were conducted throughout each test hole to a completion depth of 6.1 m.

2.1 Soil Quality

Soil samples selected for laboratory determination were based on visual observations, vapour screening results and the requirement to characterize soil that would be impacted at depth along the proposed sewer alignments. All samples submitted for laboratory determination were analyzed for petroleum hydrocarbon constituents, including volatile and extractable hydrocarbons.

Analytical testing identified elevated benzene concentrations in TH05-3A (3.0 m) that were above the applicable residential guidelines. Results were compared against the Canadian Council of the Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines (CEQG) and CCME Canada Wide Standards (CWS) for Petroleum Hydrocarbons (PHC) in Soil guidelines for residential land use (see attached). All other parameters in all four test holes were well below the applicable guidelines or below the method detection limit.

3.0 PROPOSED CONSTRUCTION WORKS

The proposed relief/separation works likely influenced by the hydrocarbon contamination includes approximately 10 m of 1200 mm diameter storm sewer along Tecumseh Street (average invert depth of 4.6m below grade);

Drawing No. LD-3120 illustrates a plan and cross sectional view of the proposed works at the southeast corner of Tecumseh Street and Logan Avenue. It is intended that the majority of the new sewer will be completed by trenchless (tunnel) construction methods due to localized soil conditions. Groundwater dewatering is not anticipated within the area of potential hydrocarbon impacts identified.

Construction of the sewer will involve excavation of vertical shafts on 10 to 12 m spacing along the proposed alignment to facilitate pipe installation and removal of soil potentially impacted with hydrocarbons.

3.1 Soil and Sediment Management

All hydrocarbon impacted soil removed as part of the construction works will be transported directly to the City of Winnipeg Brady Road Landfill located on the south perimeter of Winnipeg, Manitoba. No additional remedial excavation will be completed as part of this project.

A combination of field screening and analytical testing will be used to characterize the excavated soil scheduled for off-site disposal. Field samples will be collected directly from the excavated material and screened for hydrocarbon vapours using a photoionization detector. The samples will be analyzed for volatile and extractable hydrocarbons.

Based on the proposed construction works, an estimated 10-20 m^3 of potentially impacted soil will be excavated for off-site treatment/disposal.

3.2 *Air Quality Monitoring*

The air monitoring program has been designed to identify potential airborne risks to on-site workers. The information it provides will be used to modify work procedures and keep risks at an acceptable level. The air monitoring program will be conducted during the time period involving the excavation of potentially impacted soil.

The following indicator chemicals and action levels will be used to monitor activities around the site and ensure that there is no overexposure to workers.

Gases and Vapours

Elevated levels of soil vapours are anticipated within the tunnel excavation and possible entry shaft proposed for installation of the sewer pipe along Tecumseh Avenue. As part of the construction activities, the contractor will be required to conduct vapour monitoring in the excavation area. A photoionization detector (PID) will be on-site to monitor potential hydrocarbon vapours.

- Recommended Action Level: 10 PID units (sustained for 15 minutes)

Based on the existing analytical results and isolated nature of impacts within the road allowance and the method of excavation and construction activities, the chemical exposure hazards are expected to be low. Therefore, excavation will be initiated using Level D protection. Level D protection consists of the following equipment:

- Tyvek coveralls (or the equivalent);
- steel-toed work boots;
- hard hat, required when heavy equipment is being used; and
- ANSI-approved safety glasses (or equivalent).

Monitoring of the work area will be conducted to determine if field conditions warrant an upgrade in health and safety procedures. Levels of personnel protection equipment (PPE) will be adjusted upwards to Level C in the event that an action level is exceeded. Level C protection will consist of the following equipment, in addition to the equipment listed above for Level D:

- an air purifying respirator (NIOSH-approved); and
- organics, dust and pesticide respirator cartridges (MSA cartridges GMA-H, GMC-H, GMC-S, or equivalent).

All personnel who may be required to wear a respirator during any phase of the site activities shall require appropriate training in the use of air-purifying respirators and an appropriate medical examination. Each person assigned a respirator will be responsible for maintaining and inspecting the assigned respirator before and after use.

If you have any questions or concerns regarding this project or proposed remedial actions, please contact the undersigned at 284-0580 or by fax at 475-3646.

Yours truly,

UMA Engineering Ltd.

Steve Wiecek, P.Eng., P.Geo.
Senior Project Manager
Earth and Water

Attach.

cc: Andy Nagy, UMA

UMA | AECOM

UMA Engineering Ltd.
1479 Buffalo Place
Winnipeg, Manitoba R3T 1L7
T 204.284.0580 F 204.475.3646 www.uma.aecom.com

Date April 8, 2005 Project Number: D265 177 01 01

Mr. Andy Nagy
UMA Engineering Ltd
1479 Buffalo Place
Winnipeg, Manitoba R3T 1L7

Dear Mr. Nagy:

Re: Follow-up Investigations at Logan Avenue and Tecumseh Street for the Alexander/Bannatyne Combined Sewer Relief Project

UMA Engineering Ltd. was retained by the City of Winnipeg, Water and Waste Department to provide professional engineering services for the design and contract administration of the sewer relief works for the Alexander/Bannatyne Combined Sewer District. Initial subsurface investigations identified possible petroleum hydrocarbon impacted soils in the area of Tecumseh Street and Logan Avenue. The following letter provides an overview of additional test drilling that was completed to identify the area of impact and quantify the impacts present.

Background Information

The Alexander/Bannatyne Combined Sewer Relief consists of the construction of approximately 1000 m of storm relief sewers ranging in size from 300 mm to 1200 mm diameter. The project also includes the construction of several manholes and weirs and the construction of approximately 60 m of 375 mm combined sewer on McDermot Avenue.

Initial geotechnical investigations were undertaken on March 3, 2005 in the area bounded by Henry Avenue to the north, Elgin Avenue to the south, Beacon Street to the west and Sherman Street to the east. Test drilling identified possible hydrocarbon impacts at TH05-05 at the southeast corner of Logan Avenue and Tecumseh Street. Therefore, it was recommended that further investigation be conducted to identify the extent and quantity of impact.

Site Investigations

Consultations with Manitoba Conservation indicated that a file was maintained on the property utilized by Superior Brake & Cable located at 830 Logan Avenue which is immediately to the east of TH05-05. The file records indicated that a Phase II Environmental Site Assessment (ESA) was conducted by Pinchin Environmental at 830 Logan Avenue in 1997. The results of the Phase II ESA were obtained for review. The records indicate that a former pump island existed on the property. Pinchin Environmental conducted subsurface investigations by completing five test holes. Vapour measurements were collected along the length of the test hole and soil samples were submitted where the vapour analysis warranted. Four of the five test holes indicated vapour concentrations above 500 ppm. The soil analyses indicated hydrocarbon impacts were present at the northwest corner of the subject property.

As a result of this review, UMA Engineering Ltd. (UMA) conducted supplementary subsurface environmental investigations on April 7, 2005. A total of four additional test holes were drilled. Three test holes were drilled on the east side of Tecumseh Street. The fourth test hole was located on the west side of Tecumseh Street (see

Figure 01 for test hole locations). The subsurface investigations were undertaken to delineate the hydrocarbon plume extents and determine the magnitude of potential hydrocarbon impacts in the area.

Soil Quality Results

Vapor screening was conducted at 0.76 m intervals throughout the length of the test hole. Vapour analysis was conducted by allowing the soil sample to volatilize for approximately 20 minutes. The vapour readings were then obtained using a Gastech Model 1238 Organic Vapour analyzer. The results of the field screening are provided in Table 1. Soil samples were selected for laboratory analysis based on visual and olfactory observations as well as the organic vapour screening results.

One soil sample was collected from each test hole. Soil samples were collected using dedicated disposable nitrile gloves and were placed into clean laboratory supplied containers. The soil samples were then submitted to Enviro-Test Laboratories in Winnipeg, Manitoba immediately upon completion of drilling for analysis of benzene, toluene, ethylbenzene and xylene (BTEX) as well as the Canada Wide Standards (CWS) for Petroleum Hydrocarbon (PHC) fractions F1 to F4. All samples were submitted and analyzed within the required holding times. Copies of the laboratory analysis are provided in Appendix A.

A summary of the laboratory results is provided in Table 2. The laboratory results were compared to the Canadian Council of the Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines (CEQG) for fine-grained subsurface soil (depths greater than 1.5 m) utilizing the guidelines for residential land use with vapor inhalation for comparison of BTEX parameters. This guideline was chosen as residential housing is located adjacent to the site. The CCME Canada Wide Standards (CWS) for Petroleum Hydrocarbons (PHC) in Soil guidelines for fine-grained subsurface soil for residential land use with vapor inhalation were used for comparison of the F1 to F4 petroleum hydrocarbon fractions. The applicable guidelines are presented in Table 2.

Analytical testing revealed that elevated benzene concentrations were present at TH05-3A at a depth of 3.0 m at concentrations above the stringent Residential Guidelines. All other parameters in all four test holes were well below the applicable guidelines or were non detectable. Given the analytical results, it is recommended that some form of mitigation be put in place to isolate any piping from the impacted soil. This may include the use of hydrocarbon resistant piping, packing the trench with low permeability fill material or the use of the liner on the trench wall. In addition, any soils excavated during construction would have to be removed for treatment. Information provided by Manitoba Conservation states that at the reported concentrations, the material would be suitable for disposal at the Brady Road Waste Disposal Grounds.

If you have questions or require further information please contact the undersigned at 284-0580.

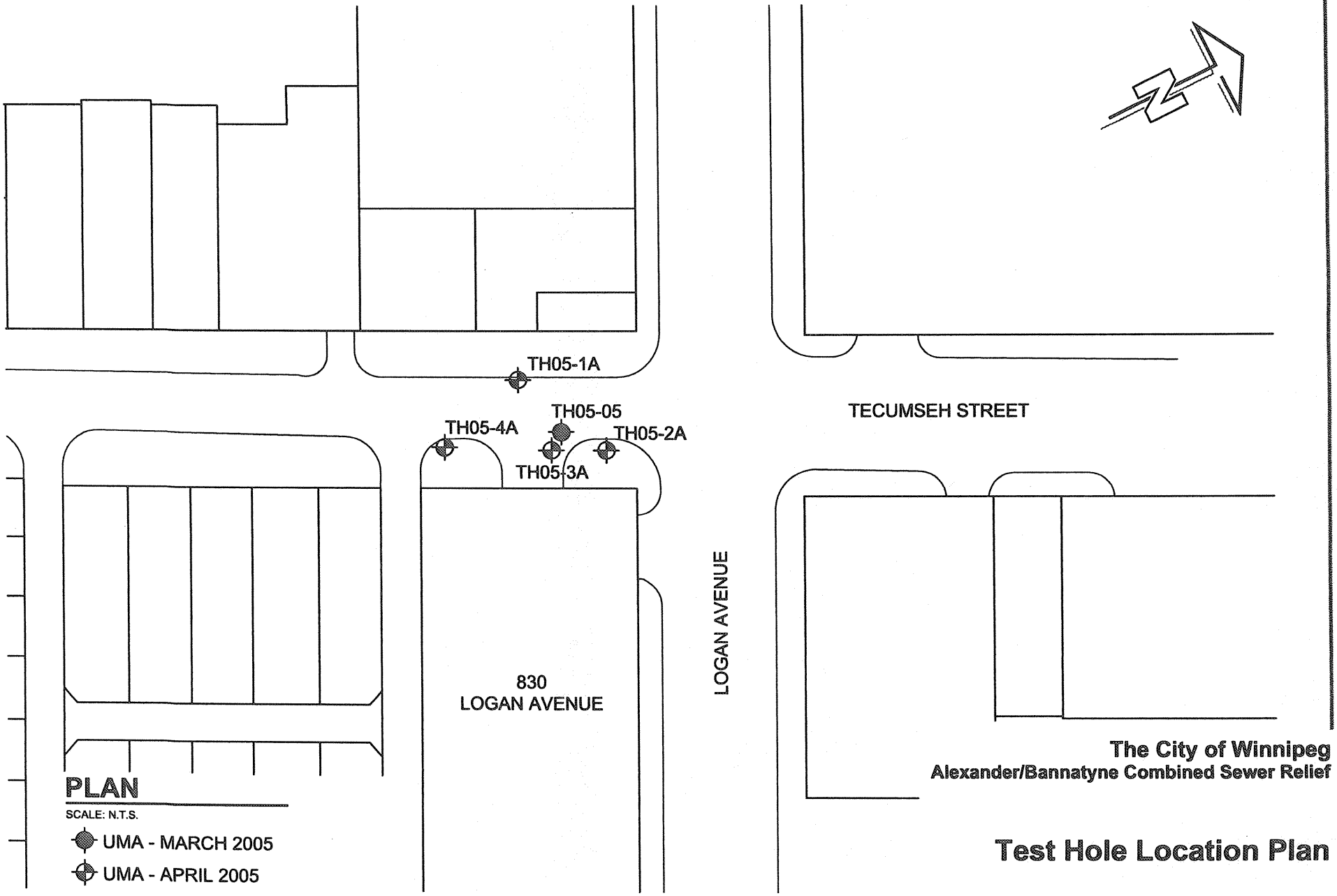
Sincerely,

UMA Engineering Ltd.

Larry Bielus, M.Sc, P.Eng
Manager
Earth & Environmental Division

LMP/lmp

UMA FILE NAME: D265-177-01_01-H-F001_RX.dwg Saved By: jviberg PLOT: 05/04/08 3:54:50 PM A SIZE 8.5" x 11" (215.9mm x 279.4mm)



The City of Winnipeg
Alexander/Bannatyne Combined Sewer Relief

Test Hole Location Plan

UMA | AECOM

Figure - 01

Table 1
Field Screening - Organic Vapour Results
Alexander/Bannatyne Combined Sewer Relief

Sample Identification	Depth Sampled (m)	Organic Vapour Reading (ppm)
TH05-1A	0.76	10
	1.54	10
	2.28	50
	3.00	25
	3.81	10
	4.57	10
	5.33	10
	6.09	10
TH05-2A	0.76	75
	1.54	100
	2.28	100
	3.00	50
	3.81	50
	4.57	25
	5.33	10
	6.09	10
TH05-3A	0.76	0
	1.54	50
	2.28	75
	3.00	300
	3.81	100
	4.57	80
	5.33	50
	6.09	25
TH05-4A	0.76	10
	1.54	25
	2.28	25
	3.00	50
	3.81	10
	4.57	10
	5.33	0
	6.09	0

Notes:
Vapour readings were obtained with a Gastech Model 1238 Vapour Analyzer

Table 2
Analytical Soil Results
Alexander/Bannatyne - Combined Sewer Relief

Sample Identification	Depth of Sample (m)	Parameter Tested							
		Benzene	Toluene	Ethylbenzene	Xylene	F1 (C6-C10)	F2 (C11-C16)	F3 (C16-C34)	F4 (C34-C50)
MDL		0.005	0.01	0.01	0.03	5	5	5	5
Fine Grained Soils < 1.5 m (Residential Land Use with Vapor Inhalation)									
CCME CEQG		0.21	1300	2600	320				
CCME PHC-CWS						940	520	NA	NA
TH05-1A	2.3	< 0.005	< 0.01	0.02	< 0.03	< 5	< 5	15	9
TH05-2A	2.1	0.064	0.07	0.16	0.28	20	18	10	< 5
TH05-3A	3.0	2.1	0.45	1.9	1.8	93	18	11	< 5
TH05-4A	3.0	< 0.005	< 0.01	< 0.01	< 0.03	< 5	< 5	23	< 5

Notes:

CCME CEQG - Canadian Council of the Ministers of the Environment - Canadian Environmental Quality Guidelines - December 2004 Update

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

PROJECT: Alexander Bannatyne Combined Sewer Relief	CLIENT: City of Winnipeg	TESTHOLE NO: TH05-1A
LOCATION: West side of Tecumseh, 12 m south of Logan Avenue		PROJECT NO.: D265 177 01 01
CONTRACTOR: Paddock Drilling Ltd.	METHOD: Acker MP5-T, 125 mm Solid Stem Auger	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊕ Vapour Reading ⊕ (ppm) 10 100 1000	COMMENTS	DEPTH (m)
0		CONCRETE					
		FILL (GRAVEL)					
		FILL (CLAY) - some sand, trace gravel - brown		1			
1		CLAY - brownish grey - firm, moist, intermediate plasticity - frozen to 1.5 m		2			1
2		CLAY - grey - firm becoming softer with depth, moist - intermediate to high plasticity - silt seam approximately 46 cm thick		3		Sample submitted for laboratory analysis of BTEX and F1 to F4 PHC's	2
3				4			3
4				5			4
5				6			5
6				7			6
		END OF TEST HOLE AT 6.1 METERS IN CLAY Notes: 1. No seepage or sloughing 2. Backfilled with bentonite and drill cuttings		8			
7							

ENVIRONMENTAL ... NDER BANNATYNE ENVIRONMENTAL.GPJ UMA.GDT 11/4/05

uma

LOGGED BY: Lee Peters	COMPLETION DEPTH: 6.10 m
REVIEWED BY: Steve Wiecek	COMPLETION DATE: 8/4/05
PROJECT ENGINEER: Andy Nagy	Page 1 of 1

PROJECT: Alexander Bannatyne Combined Sewer Relief | CLIENT: City of Winnipeg | TESTHOLE NO: TH05-2A

LOCATION: East side of Tecumseh, 6.5 m south of Logan Avenue (on Boulevard) | PROJECT NO.: D265 177 01 01

CONTRACTOR: Paddock Drilling Ltd. | METHOD: Acker MP5-T, 125 mm Solid Stem Auger | ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	Vapour Reading (ppm) 10 100 1000	COMMENTS	DEPTH (m)
0		TOPSOIL - black, trace organics					0
		FILL (CLAY) - silty - brown, dry - frozen to 0.76 m		9			
1		CLAY - trace sand, trace gravel - brownish grey - firm becoming softer with depth, moist					1
		- hydrocarbon odors at 1.5 m - hydrocarbon staining from 1.5 m to 3.0 m		10			
2		- trace sulphate inclusions from 2.1 m to 2.4 m		11		Sample submitted for laboratory analysis of BTEX and F1 to F4 PHCs	2
3		- grey below 3.0 m		12			3
		CLAY - brown clay - interbedded sand - low to medium plasticity - hydrocarbon staining throughout layer		13			
4				14			4
5				15			5
6		END OF TEST HOLE @ 6.1 METERS IN CLAY *Notes:* 1. No seepage or sloughing 2. Backfilled with bentonite and drill cuttings		16			6
7							

ENVIRONMENTAL ANDER BANNATYNE ENVIRONMENTAL.GPJ UMA.GDT 11/4/05

uma

LOGGED BY: Lee Peters | COMPLETION DEPTH: 6.10 m

REVIEWED BY: Steve Wiecek | COMPLETION DATE: 8/4/05

PROJECT ENGINEER: Andy Nagy

PROJECT: Alexander Bannatyne Combined Sewer Relief	CLIENT: City of Winnipeg	TESTHOLE NO: TH05-3A
LOCATION: East side of Tecumseh, center of driveway at 830 Logan Avenue		PROJECT NO.: D265 177 01 01
CONTRACTOR: Paddock Drilling Ltd.	METHOD: Acker MP5-T, 125 mm Solid Stem Auger	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	Vapour Reading (ppm) 10 100 1000	COMMENTS
0		CONCRETE				
		FILL (CLAY) - trace sand, some gravel - dry - significant water seepage at 0.15 m		17		
1		CLAY - brown - firm, moist, intermediate plasticity		18		
2		CLAY - brown - firm, becoming softer with depth, moist - hydrocarbon staining from 1.8 m to 3.0 m - trace sulphate inclusions at 2.1 m		19		
3		- grey below 3.0 m		20		Sample submitted for laboratory analysis of BTEX and F1 to F4 PHCs
4				21		
5				22		
6				23		
		END OF TEST HOLE @ 6.1 METERS IN CLAY		24		
7		Notes: 1. Significant seepage from gravel layer directly under the concrete 2. backfilled with bentonite and drill cuttings				

DEPTH (m) duplicate: 1, 2, 3, 4, 5, 6

uma	LOGGED BY: Lee Peters	COMPLETION DEPTH: 6.10 m
	REVIEWED BY: Steve Wiecek	COMPLETION DATE: 8/4/05
	PROJECT ENGINEER: Andy Nagy	Page 1 of 1

ENVIRONMENTAL ... NDER BANNATYNE ENVIRONMENTAL.GPJ UMA.GDT 11/4/05

PROJECT: Alexander Bannatyne Combined Sewer Relief	CLIENT: City of Winnipeg	TESTHOLE NO: TH05-4A
LOCATION: East side of Tecumseh, 20 m south of Logan Avenue (on Boulevard)		PROJECT NO.: D265 177 01 01
CONTRACTOR: Paddock Drilling Ltd.	METHOD: Acker MP5-T, 125 mm Solid Stem Auger	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	Vapour Reading (ppm) 10 100 1000	COMMENTS	DEPTH (m)
0		TOPSOIL - black, trace organics					0
		FILL (CLAY) - silty, brown, dry		25			
1		CLAY - trace sand - brownish grey - firm, moist, intermediate plasticity		26			1
		CLAY - brownish grey - firm, becoming softer with depth, moist - intermediate to high plasticity		27			
2		- trace sulphate inclusions at 2.1 m to 2.4 m					2
				28		Sample submitted for laboratory analysis of BTEX and F1 to F4 PHC's	
3				29			3
4				30			4
5				31			5
6		- grey below 5.8 m		32			6
		END OF TEST HOLE AT 6.1 METERS IN CLAY Notes: 1. No seepage or sloughing 2. Backfilled with bentonite and drill cuttings					
7							

LOGGED BY: Lee Peters		COMPLETION DEPTH: 6.10 m
REVIEWED BY: Steve Wiecek		COMPLETION DATE: 8/4/05
PROJECT ENGINEER: Andy Nagy		Page 1 of 1

ENVIRONMENTAL A...ADER BANNATYNE ENVIRONMENTAL.GPJ UMA.GDT 11/4/05

Appendix A

Laboratory Analyses

ANALYTICAL REPORT

UMA ENGINEERING
ATTN: LEE PETERS
1479 BUFFALO PLACE
WINNIPEG MB R3T 1L7

DATE: 08-APR-05 12:51 PM

Lab Work Order #: L257537 Sampled By: Lee Peters Date Received: 07-APR-05
Project P.O. #:
Project Reference:
Other Information:

Comments:

APPROVED BY:

GERRY VERA
Project Manager

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameter	Result	Guideline	Units	Extracted	Analyzed	By	Batch
L257537-1 D265-17701 TH05-2A 5-7							
Sample Date: 07-APR-05 08:00							
Matrix: Soil							
CCME BTEX + F1-F4							
CCME Total Hydrocarbons							
F1 (C6-C10)	21	5	mg/kg		08-APR-05		
F1-BTEX	20	5	mg/kg		08-APR-05		
F2 (C10-C16)	18	5	mg/kg		08-APR-05		
F3 (C16-C34)	10	5	mg/kg		08-APR-05		
F4 (C34-C50)	<5	5	mg/kg		08-APR-05		
Total Hydrocarbons (C6-C50)	49	5	mg/kg		08-APR-05		
Chromatogram to baseline at nC50	YES				08-APR-05		
CCME Total Extractable Hydrocarbons				07-APR-05	07-APR-05	DVH	R273838
Prep/Analysis Dates							
CCME BTEX							
Benzene	0.064	0.005	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
Toluene	0.07	0.01	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
Ethylbenzene	0.16	0.01	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
o-Xylene	0.07	0.01	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
Xylenes, m+p	0.21	0.02	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
Xylenes	0.28	0.03	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
% Moisture	22	0.1	%	08-APR-05	08-APR-05	TJJ	R274068
L257537-2 D265-17701 TH05-3A 10'							
Sample Date: 07-APR-05 08:00							
Matrix: Soil							
CCME BTEX + F1-F4							
CCME Total Hydrocarbons							
F1 (C6-C10)	99	5	mg/kg		08-APR-05		
F1-BTEX	93	5	mg/kg		08-APR-05		
F2 (C10-C16)	18	5	mg/kg		08-APR-05		
F3 (C16-C34)	11	5	mg/kg		08-APR-05		
F4 (C34-C50)	<5	5	mg/kg		08-APR-05		
Total Hydrocarbons (C6-C50)	130	5	mg/kg		08-APR-05		
Chromatogram to baseline at nC50	YES				08-APR-05		
CCME Total Extractable Hydrocarbons				07-APR-05	07-APR-05	DVH	R273838
Prep/Analysis Dates							
CCME BTEX							
Benzene	2.1	0.005	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
Toluene	0.45	0.01	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
Ethylbenzene	1.9	0.01	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
o-Xylene	0.07	0.01	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
Xylenes, m+p	1.7	0.02	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
Xylenes	1.8	0.03	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
% Moisture	27	0.1	%	08-APR-05	08-APR-05	TJJ	R274068
L257537-3 D265-17701 TH05-1A 7.5'							
Sample Date: 07-APR-05 08:00							
Matrix: Soil							
CCME BTEX + F1-F4							
CCME Total Hydrocarbons							
F1 (C6-C10)	<5	5	mg/kg		08-APR-05		
F1-BTEX	<5	5	mg/kg		08-APR-05		
F2 (C10-C16)	<5	5	mg/kg		08-APR-05		

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameter	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L257537-3 D265-17701 TH05-1A 7.5'								
Sample Date: 07-APR-05 08:00								
Matrix: Soil								
CCME BTEX + F1-F4								
CCME Total Hydrocarbons								
F3 (C16-C34)	15		5	mg/kg		08-APR-05		
F4 (C34-C50)	9		5	mg/kg		08-APR-05		
Total Hydrocarbons (C6-C50)	24		5	mg/kg		08-APR-05		
Chromatogram to baseline at nC50	YES					08-APR-05		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					07-APR-05	07-APR-05	DVH	R273838
CCME BTEX								
Benzene	<0.005		0.005	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
Toluene	<0.01		0.01	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
Ethylbenzene	0.02		0.01	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
o-Xylene	<0.01		0.01	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
Xylenes, m+p	<0.02		0.02	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
Xylenes	<0.03		0.03	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
% Moisture	23		0.1	%	08-APR-05	08-APR-05	TJJ	R274068
L257537-4 D265-17701 TH05-4A 10'								
Sample Date: 07-APR-05 08:00								
Matrix: Soil								
CCME BTEX + F1-F4								
CCME Total Hydrocarbons								
F1 (C6-C10)	<5		5	mg/kg		08-APR-05		
F1-BTEX	<5		5	mg/kg		08-APR-05		
F2 (C10-C16)	<5		5	mg/kg		08-APR-05		
F3 (C16-C34)	23		5	mg/kg		08-APR-05		
F4 (C34-C50)	<5		5	mg/kg		08-APR-05		
Total Hydrocarbons (C6-C50)	23		5	mg/kg		08-APR-05		
Chromatogram to baseline at nC50	YES					08-APR-05		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					07-APR-05	07-APR-05	DVH	R273838
CCME BTEX								
Benzene	<0.005		0.005	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
Toluene	<0.01		0.01	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
Ethylbenzene	<0.01		0.01	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
o-Xylene	<0.01		0.01	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
Xylenes, m+p	<0.02		0.02	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
Xylenes	<0.03		0.03	mg/kg	07-APR-05	07-APR-05	TJJ	R273785
% Moisture	27		0.1	%	08-APR-05	08-APR-05	TJJ	R274068

Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Methods Listed (if applicable):

ETL Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
ETL-BTX,TVH-CCME-WP	Soil	CCME BTEX		CCME CWS-PHC Dec-2000 - Pub# 1310
ETL-TEH-CCME-WP	Soil	CCME Total Extractable Hydrocarbons		CCME CWS-PHC Dec-2000 - Pub# 1310
ETL-TVH,TEH-CCME-WP	Soil	CCME Total Hydrocarbons		CCME CWS-PHC Dec-2000 - Pub# 1310

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

Hydrocarbon results are expressed on a dry weight basis.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PA H represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

"" Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

Chain of Custody numbers:

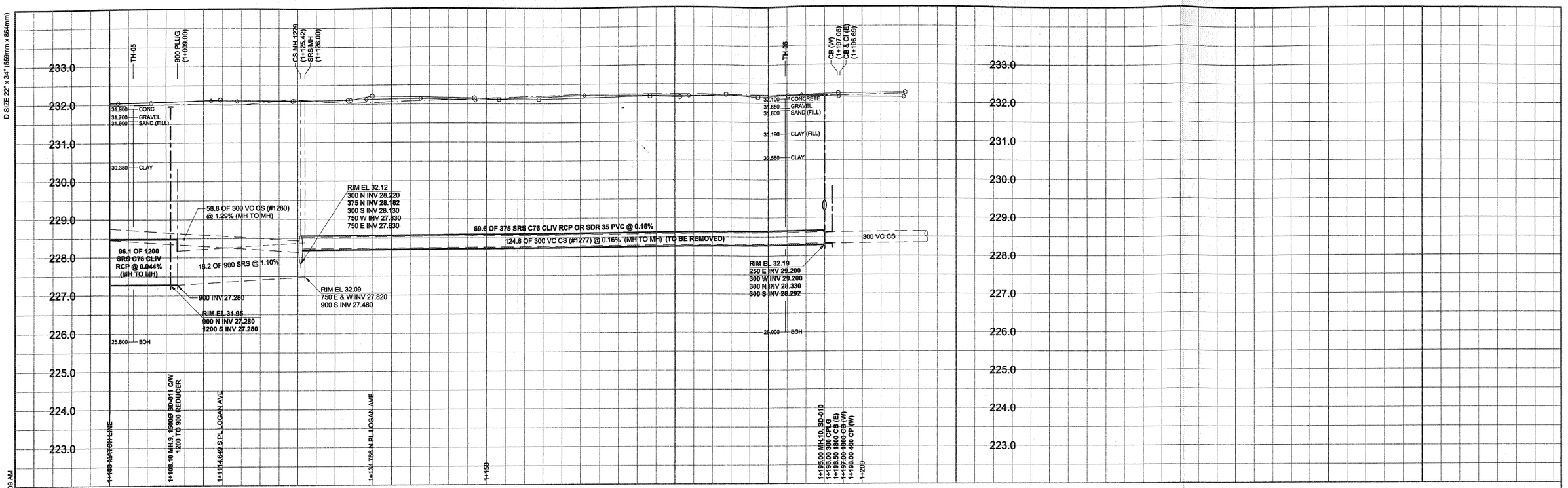
The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

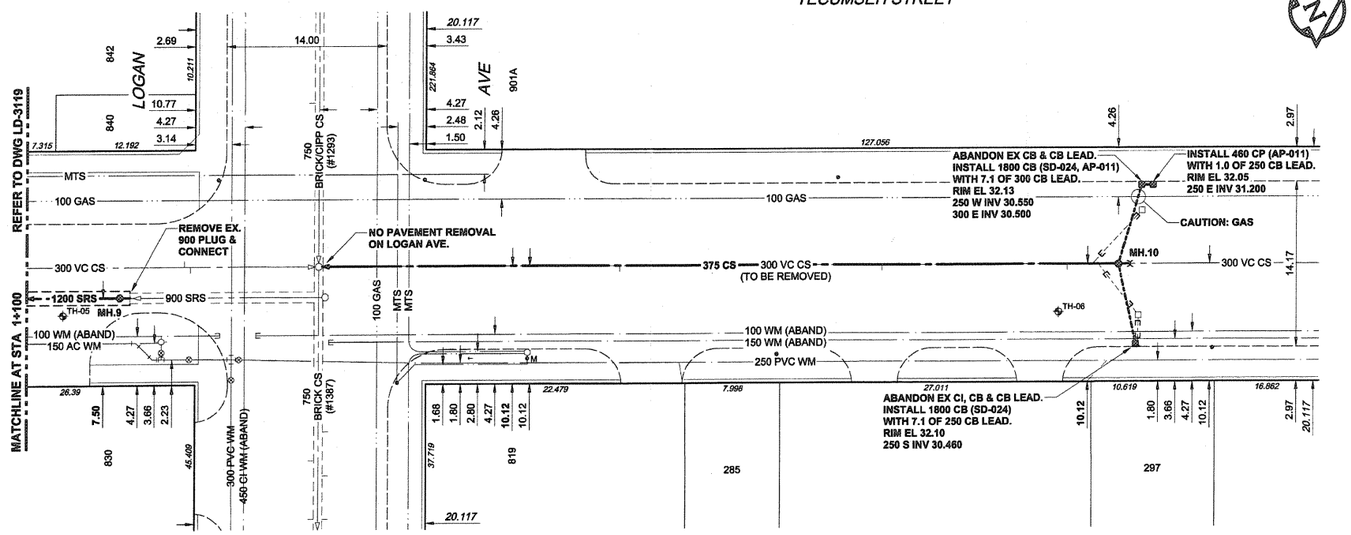
Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
WP	Enviro-Test Laboratories - Winnipeg, Manitoba, Canada		

GLOSSARY OF REPORT TERMS
Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds. The reported surrogate recovery value provides a measure of method efficiency. The Laboratory warning units are determined under column heading D.L.
mg/kg (units) - unit of concentration based on mass, parts per million
mg/L (units) - unit of concentration based on volume, parts per million
< - Less than
D.L. - Detection Limit
N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FELD BLANKS.
Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

Enviro-Test Laboratories has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, Enviro-Test Laboratories assumes no liability for the use or interpretation of the results.





SEWER SERVICE INFORMATION

ADDRESS	PL TIE (SHORT/LONG)	JUNCTION TIE	REMARKS
285 TECUMSEH			NO INFO
297 TECUMSEH			NO INFO

WATER SERVICE INFORMATION

ADDRESS	DISTANCE PROPERTY	SIZE (mm) & TYPE	SHORT & LONG MEASUREMENT	CORPORATION LOCATION	REMARKS
285 TECUMSEH (RESIDENTIAL)	4.27	19 COPPER	0.40 SSL HOUSE 22.25 NNL LOGAN	0.30 S OF SC	
297 TECUMSEH (RESIDENTIAL)	1.98	19 COPPER	3.20 SSL BLDG 57.52 NNL LOGAN	1.74 N OF SC	

CONSTRUCTION NOTES:

1. FOR DETAILED TEST HOLE INFORMATION, SEE SPECIFICATION.
2. THE LOCATION OF ALL SERVICES IS TO BE CONFIRMED IN THE FIELD.
3. INSTALL NEW SEWERS AND CATCHBASIN LEADS BY TRENCHLESS METHODS WHEREVER POSSIBLE.
4. RENEW/REHABILITATE CATCHBASINS & RENEW CATCHBASIN LEADS WHERE NOTED.
5. RENEW SEWER SERVICES TO PROPERTY LINE.

WARNING

IF POWER EQUIPMENT OR EXPLOSIVES ARE TO BE USED FOR EXCAVATION ON THIS PROJECT, THE CONTRACTOR MUST:
1) NOTIFY THE GAS COMPANY OF THE PROPOSED LOCATION OF EXCAVATION.
2) TAKE PRECAUTION TO AVOID DAMAGE TO GAS COMPANY INSTALLATIONS.
SEE PROVINCIAL REGULATION 140/92 FOR DETAILS

EXISTING	LEGEND - PLAN	NEW	EXISTING	LEGEND - PLAN	NEW	EXISTING	LEGEND - PROFILE	NEW
150 mm WM	WATERMAIN	150 mm WM		CURB STOP		150 mm WM	WATERMAIN	150 mm WM
	HYDRANT			REDUCER			HYDRANT	
	VALVE			COUPLING			VALVE	
300 mm LDS	LAND DRAINAGE SEWER	300 mm LDS		ANODE		300 mm LDS	LAND DRAINAGE SEWER	300 mm LDS
250 mm WWS	WASTE WATER SEWER	250 mm WWS		HYDRO		250 mm WWS	WASTE WATER SEWER	250 mm WWS
	MANHOLE			MTS			PAVEMENT CROWN	
	CATCH BASIN			GAS			N/W PROPERTY LINE	
	CURB INLET			TESTHOLE			S/E PROPERTY LINE	
	CULVERT			LAMP STANDARD			N/W GUTTER	
	PIPE ABANDONMENTS			TREE			S/E GUTTER	
	SURVEY BAR							

LOCATION APPROVED
UNDERGROUND STRUCTURES

SUPR. U/G STRUCTURES COMMITTEE — DATE

NOTE:
LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE. BUT NO GUARANTEE IS GIVEN THAT ALL EXISTING UTILITIES ARE SHOWN OR THAT THE GIVEN LOCATIONS ARE EXACT. CONFIRMATION OF EXISTENCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.

BM 36-009 ELEV 232.501m — Tbt. in W. wall of the City of Winnipeg Public Works Shops, S.E. Cor. of Pacific Ave. & Tecumseh St., 0.6m S. of N.W. Cor. of Bldg.

NO.	REVISIONS	YY/MM/DD	BY
0	ISSUED FOR CONSTRUCTION	05/05/26	ADL

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

APEGM Certificate of Authorization
UMA Engineering Ltd.
No. 256 Expiry: April 30, 2006

BID OPPORTUNITY NO. 137-2005

UMA | AECOM

DESIGNED BY	GEB/MM	CHECKED BY	
DRAWN BY	ADL	APPROVED BY	
HOR. SCALE	1:250	RELEASED FOR CONSTRUCTION	
VERT. SCALE	1:50		
DATE	05/05/27	DATE	May 22/06

PROFESSIONAL'S SEAL
PROVINCE OF MANITOBA
May 22, 2006
A. NAGY
REGISTERED PROFESSIONAL ENGINEER

CONSULTANT DRAWING NO. 06
D265-177-01-02

Winnipeg

THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT

ALEXANDER/BANNATYNE COMBINED SEWER RELIEF CONTRACT 1B

TECUMSEH STREET

85m NORTH OF ALEXANDER AVENUE
TO 40m SOUTH OF HENRY AVENUE

SHEET 06 OF 18
CITY DRAWING NUMBER
LD-3120
REV 0