Hamilton Transit

BUS MAINTENANCE & STORAGE FACILITY

Appendix F

Physical Environment

Part 3

January 3, 2020

Prepared for

Hamilton

Prepared by

IBI GROUP

Appendix C

AERIAL PHOTOGRAPHS

LEGEND

SITE

PHASE I STUDY AREA

NOTES

1. BASE MAP - NATIONAL AIR PHOTO LIBRARY PHOTO NUMBERS RA13_078 AND RA13_080 TAKEN ON 9-MAY-1927.

0 100 200 m

1927 AIR PHOTO

PHASE I ENVIRONMENTAL SITE ASSESSMENT
FUTURE HSR STORAGE & MAINTENANCE FACILITY
For: City of Hamilton

DATE: FEBRUARY 2017	SCALE: AS SHOWN
PROJECT: 161-17781-00	REF. NO.: 161-17781-00-FC1-1927AP

WSP

FIGURE C1

LEGEND

SITE

PHASE I STUDY AREA

NOTES

1. BASE MAP - NATIONAL AIR PHOTO LIBRARY PHOTO NUMBER A4871_017 TAKEN ON 3-NOV-1934.

0 100 200 m

1934 AIR PHOTO

PHASE I ENVIRONMENTAL SITE ASSESSMENT
FUTURE HSR STORAGE & MAINTENANCE FACILITY
For: City of Hamilton

DATE: FEBRUARY 2017	SCALE: AS SHOWN
PROJECT: 161-17781-00	REF. NO.: 161-17781-00-FC2-1934AP

WSP

FIGURE C2

LEGEND

SITE

PHASE I STUDY AREA

NOTES

1. BASE MAP - NATIONAL AIR PHOTO LIBRARY PHOTO NUMBER A12511_115 TAKEN ON 7-JUN-1950.

0 100 200 m

1950 AIR PHOTO

PHASE I ENVIRONMENTAL SITE ASSESSMENT
FUTURE HSR STORAGE & MAINTENANCE FACILITY
For: City of Hamilton

DATE: FEBRUARY 2017	SCALE: AS SHOWN
PROJECT: 161-17781-00	REF. NO.: 161-17781-00-FC3-1950AP

WSP

FIGURE C3

LEGEND

SITE

PHASE I STUDY AREA

NOTES

1. BASE MAP - NATIONAL AIR PHOTO LIBRARY PHOTO NUMBER A16448_028 TAKEN ON 24-APR-1959.

0 100 200 m

1959 AIR PHOTO

PHASE I ENVIRONMENTAL SITE ASSESSMENT
FUTURE HSR STORAGE & MAINTENANCE FACILITY
For: City of Hamilton

DATE: FEBRUARY 2017	SCALE: AS SHOWN
PROJECT: 161-17781-00	REF. NO.: 161-17781-00-FC4-1959AP

WSP

FIGURE C4

LEGEND

SITE

PHASE I STUDY AREA

NOTES

1. BASE MAP - NATIONAL AIR PHOTO LIBRARY PHOTO NUMBER VRR2666_402 TAKEN ON 15-APR-1966.

0 100 200 m

1966 AIR PHOTO

PHASE I ENVIRONMENTAL SITE ASSESSMENT
FUTURE HSR STORAGE & MAINTENANCE FACILITY
For: City of Hamilton

DATE: FEBRUARY 2017	SCALE: AS SHOWN
PROJECT: 161-17781-00	REF. NO.: 161-17781-00-FC5-1966AP

WSP

FIGURE C5

LEGEND

SITE

PHASE I STUDY AREA

NOTES

1. BASE MAP - NATIONAL AIR PHOTO LIBRARY PHOTO NUMBER A23294_139 TAKEN ON 11-JUN-1973.

0 100 200 m

1973 AIR PHOTO

PHASE I ENVIRONMENTAL SITE ASSESSMENT
FUTURE HSR STORAGE & MAINTENANCE FACILITY
For: City of Hamilton

DATE: FEBRUARY 2017	SCALE: AS SHOWN
PROJECT: 161-17781-00	REF. NO.: 161-17781-00-FC6-1973AP

WSP

FIGURE C6

LEGEND

SITE

PHASE I STUDY AREA

NOTES

1. BASE MAP - NATIONAL AIR PHOTO LIBRARY PHOTO NUMBER A27598_100 TAKEN ON 2-JUL-1990.

0 100 200 m

1990 AIR PHOTO

PHASE I ENVIRONMENTAL SITE ASSESSMENT
FUTURE HSR STORAGE & MAINTENANCE FACILITY
For: City of Hamilton

DATE: FEBRUARY 2017	SCALE: AS SHOWN
PROJECT: 161-17781-00	REF. NO.: 161-17781-00-FC7-1990AP

WSP

FIGURE C7

Appendix D

INFORMATION REQUEST RESPONSES

Ministry of the Environment and Climate Change

Freedom of Information and Protection of Privacy Office

12th Floor
40 St. Clair Avenue West
Toronto ON M4V 1M2
Tel: (416) 314-4075
Fax: (416) 314-4285

Ministère de l'Environnement et de l'Action en matière de changement climatique

Bureau de l'accès à l'information et de la protection de la vie privée

12e étage
40, avenue St. Clair ouest
Toronto ON M4V 1M2
Tél. : (416) 314-4075
Téléc.: (416) 314-4285

Ontario

January 19, 2017

Rachel Bryan
WSP Canada Inc.
4 Hughson Street South, Suite 300
Hamilton, ON L8N 3Z1

Dear Rachel Bryan:

RE: *Freedom of Information and Protection of Privacy Act* Request
Our File #: A-2017-00120, Your Reference #: 2 Hillyard

This letter is in response to your request made pursuant to the *Freedom of Information and Protection of Privacy Act* relating to 2 Hillyard St, Hamilton.

After a thorough search of the Ministry's Hamilton District Office, Investigations and Enforcement Branch, Environmental Approvals Branch, Environmental Monitoring and Reporting Branch, Sector Compliance Branch and Safe Drinking Water Branch, records were located in response to your request. It is my decision to provide full access to the attached information. Please note that records or portions of records not found to be responsive to the request have been removed or marked N/R.

In accordance with Section 57 of the *Freedom of Information and Protection of Privacy Act*, detailed below are our charges:

• Search Time 1 hour @ $30/hour	$30.00
• Copying 10 pages @ $0.20/page	$2.00
• Delivery	3.00
• **Total**	**$ 35.00**
• Deposit Received	- 30.00
• **BALANCE WAIVED (NOT REQUIRED)**	**$5.00**

You may request a review of my decision by contacting the Information and Privacy Commissioner/Ontario, 2 Bloor Street East, Suite 1400, Toronto, ON M4W 1A8 (800-387-0073 or 416-326-3333). Please note that there is a $25.00 fee and you only have 30 days from receipt of this letter to request a review.

If you have any questions regarding this matter, please contact Mark Wilson at mark.b.wilson@ontario.ca.

Yours truly,

M. Wilson

For Christopher Mastropietro
FOI Manager (A)

Attachments

Generator Details

Registration/Notification Number

ON4574853

Legal Company Name

Primary Name:	Duke Electric Ltd	Division Name:	NA

Company Operating Name

Primary Name:	Duke Electric Ltd	Division Name:	NA

Mailing Address

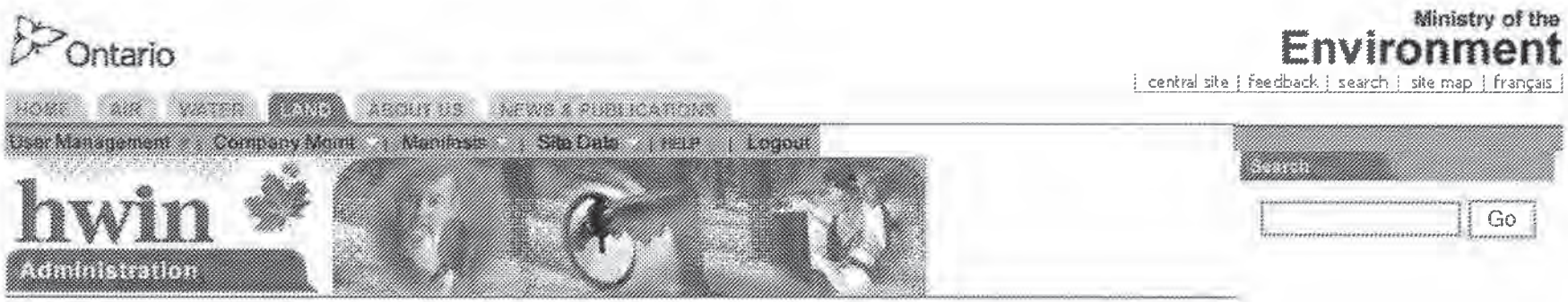
Division Building:	NA	Post Box Number:	NA
Address Line 1:	986 Barton Street East	Address Line 2:	NA
Town/City:	Hamilton	Postal Code / Zip Code:	L8L 3C7
County: (if inside Ontario)	HAMILTON-WENTWORTH R. M.	Province/State (If inside Canada/US)	ONTARIO
County: (if outside Ontario)	NA	Province / State (If outside Canada / US)	NA
Country:	Canada		

Site Location

This should be the street address of the site that is being registered. You are required to register each site that generates hazardous waste separately

Division Building:	NA	Post Box Number:	NA
Address Line 1:	2 Hillyard Street		
Address Line 2:	NA		
Town/City:	Hamilton	Postal Code / Zip Code:	L8L 7W7
County: (if inside Ontario)	HAMILTON-WENTWORTH R. M.	Province / State (If inside Canada / US)	ONTARIO
County: (if outside Ontario)	NA	Province / State (If outside Canada / US)	NA
Country:	Canada		

Company Official



Company Name: **Duke Electric Ltd**
Company Number: **ON4574853 (Generator)**

Active Waste Classes

Active Waste Class Listing

Add New Waste Class Inactive waste classes

Active Off-site Waste Classes

Waste Class	View Details	Hazardous Waste Number (per waste stream)	Reg. 347 Schedules	Disposal Method	Part 2B required	Part 2B complete	Physical State	Off-Site	Status	UnRegister Waste Class
243 - D	View details	N/A					Solid	Off-Site	Active	☐

Unregister Selected Classes

Back

Ministry of the Environment / Ministère de l'Environnement
Ontario

FAX MESSAGE
To: Company NIAGARA PAINT
Name ANAN SOMNERAIN
Fax # Clair Avenue West 416-
Suite 100
Toronto, Ontario
Toronto (Ontario)
From: MOE PSW Waste Management Branch
Name MRS. KEKESI
Tel # 323-5171 Fax # 323-5021
# of Pages 5 Date 900822
Subject GENERATOR REG. ACKNOWLEDGEMENT

July 20, 1987

Niagara Paint & Chemical Co. Ltd.
PO Box 402/Station B
Hamilton, Ont.
L8L 7W4

Attn: Mr. G. O'Reilly
President

Dear Mr. O'Reilly:

RE: Acknowledgement of Subject Waste Registration

As prescribed by Section 15(4) of Ontario Regulation 309, this letter acknowledges receipt of your Generator Registration Report(s) dated **May 7, 1986 and further correspondence as outlined in Schedule "B"** for the following site:

2 Hillyard St.
Hamilton, Ont.

The Generator Registration Number assigned to your company at this site is:

ON0259700

Please note that this Generator Registration Number must be used only in conjunction with the site for which it was issued.

This acknowledgement letter supersedes the previous acknowledgement letter dated May 20, 1986 for this site.

Please ensure that the company name shown on this letter is complete and accurate. This would be the corporate name or, if a partnership or proprietorship, the name of the principal(s). If you intend to carry on business under a separate name or style, this should also be entered. If there is a discrepancy, it is your responsibility to re-register providing us with your complete and accurate company name.

A list of the waste stream(s) covered by this acknowledgement is attached to this letter as Schedule "A".

For off-site disposal of subject wastes, the waste number(s) describing the waste stream(s) in Schedule "A"

.../2

International Year of Shelter for the Homeless

and the Generator Registration Number must be entered on manifest forms for each waste transaction after you have received this generator registration document. A copy of an example manifest form is attached for your information.

For on-site disposal of subject wastes covered by this acknowledgement, including on-site incineration, landfilling and discharges to sanitary sewers, every generator shall retain records for a period of at least two years. These records shall include the generator registration number, waste name(s), waste number(s), quantity and disposition of the waste(s).

For off-site disposal of any registerable solid wastes shown in Schedule "A" (waste classes ending in the letter "N"), manifesting is not required at this time. These wastes can be disposed of at most approved municipal landfilling sites.

The selection of accurate waste classes is the responsibility of each waste generator. This acknowledgement must not be considered as a confirmation of the accuracy of information submitted by you. Based on the information you have provided, the waste class(es) that has (have) been selected appear(s) to be correct. If, due to new information or re-assessment of information submitted, you feel your waste is inappropriately classified, you should apply for a revision to your registration using the Generator Registration Report, Form 2. Should the waste class(es) that you have selected be deemed incorrect by the Ministry, or improper waste disposal occurs at any time, you may be subject to legal action as provided by the Environmental Protection Act and Regulation 309.

Your Generator Registration Report has now been forwarded to the District Office of this Ministry that is closest to your generating site. The District Office will be conducting a post-registration audit and may be contacting you for additional information or may be conducting site visits.

It is important to note that under Section 15(4) of Ontario Regulation 309, a new Generator Registration Report must be submitted to the Ministry within fifteen (15) days for any of the following reasons:

1. If the name, address or telephone number of your company or waste generating site changes.

2. If the description, the waste class or physical or chemical characteristics of your registered wastes change(s).

3. If you generate a hazardous or liquid industrial waste that has not been registered with the Ministry.

If the quantity of registered wastes or your carrier or receiver changes, automatic re-registration is not required. However, in order to update our file, we may periodically request additional information when we observe or suspect a significant change as compared to the most recent information submitted by you for registration purposes.

Should you have any questions concerning generator registration or manifesting requirements, please contact the Waste Management Branch Reviewer identified below at 323-5202.

Yours truly,

S E Radcliffe

Director
Regulation 309, R.R.O., 1980
Environmental Protection Act

Waste Management Branch Reviewer: _____
Michelle Conran

EAS/gwm

Enclosure

LE 03 07

.../4

SCHEDULE "A"

This attached Schedule forms part of the acknowledgement of generator registration for the facility and site identified by Generator Registration Number ON0269700, dated at Toronto, this 20th day of July, 1987.

	Waste Stream	Waste Class
1.	Floor sweepings (paint residue)	145N
2.	Wash solvents from paint manufacturing	211H

Waste Management Branch Reviewer: _____
Michelle Conran

8/16.9

.../5

Pages 7 to / à 11

are not relevant

sont non pertinentes

Ontario

Ministry of the Environment **Ministère de l'Environnement**

CERTIFICATE OF APPROVAL
AIR
NUMBER 4057-4JCG8N

Welco Castings (1993) Inc.
563 Kenilworth Avenue North
Hamilton, Ontario
L8H 4T8

Site Location: 2 Hillyard Street
Hamilton City, Regional Municipality Of Hamilton-Wentworth

You have applied in accordance with Section 9 of the Environmental Protection Act for approval of:

a baghouse dust collector located downstream of a twin cyclone system, serving the lead smelting operation, used to control emissions from the following:

- one (1) natural gas fired lead scrap melting furnace, pot type, having a maximum heat input of 2.1 gigajoules per hour and a maximum processing capacity of 1700 kilograms per hour;
- nine (9) natural gas fired lead melting furnaces, pot type, having a total heat input of 5.5 gigajoules per hour and a total maximum processing capacity of 1135 kilograms per hour;
- one (1)extruder;
- one (1) electric heated bake oven; and
- one (1) natural gas fired baking oven, having a total heat input of 0.16 gigajoules per hour.

The baghouse is equipped with polyester filter material having a filtering area of 356 square metres and a pulse jet cleaning system, discharging into the atmosphere at a maximum volumetric flow rate of

9.45 actual cubic metres per second
through a stack, having an exit diameter of
0.74 metre, extending 6.1 metres
above the roof and 12.2 metre;

all in accordance with an application for
Certificate of Approval (Air), submitted
by Vladimir Uzelac & Associates
Engineering of Toronto on behalf of
Welco Castings (1993) Inc. signed by
Vladimir Uzelac dated March 4,2000
including all supporting information
prepared by Vladimir Uzelac.

For the purpose of this Certificate of Approval and the terms and conditions specified below, the following definitions apply:

DEFINITIONS

1. For the purpose of this Certificate of Approval:

(1) "Act" means the Environmental Protection Act;

(2) "Certificate" means this Certificate of Approval, issued in accordance with Section 9 of the Act;

(3) "Company" means Welco Castings (1993) Inc.;

(4) "Equipment" means the baghouse dust collector, described in the Company's application, this Certificate and in the supporting documentation referred to herein, to the extent approved by this Certificate;

(5) "Manual" means a document or a set of documents that provide written instructions to staff of the Company;

(6) "Ministry" means the Ontario Ministry of the Environment; and

(7) "Publication NPC-205" means Publication NPC-205, Sound Level Limits for Stationary Sources in Class 1 & 2 Areas (Urban), October, 1995.

You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

OPERATION AND MAINTENANCE

2. The Company shall ensure that the Equipment is properly operated and maintained at all times. The Company shall:

(1) prepare, not later than three (3) months after the date of this Certificate, and update, as necessary, a Manual outlining the operating procedures and a maintenance program for the Equipment, including:

(a) routine operating and maintenance procedures in accordance with good engineering practices and as recommended by the Equipment suppliers;

(b) emergency procedures;

(c) the frequency of inspection and replacement of the filter material in the Equipment;and

(d) procedures for any record keeping activities relating to operation and maintenance of the Equipment;

(2) implement the recommendations of the operating and maintenance Manual; and

(3) retain, for a minimum of two (2) years from the date of their creation, all records on the maintenance, repair and inspection of the Equipment, and make these records available for review by staff of the Ministry upon request.

3. The Company shall ensure that the noise emissions from the exhaust fan associated with the fume hood control system, comply with the limits set in Publication NPC-205.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition No. 1 is included to define the special terms that are used throughout the Certificate.

2. Condition No. 2 is included on the Certificate to emphasize that the Equipment must be maintained and operated according to a procedure that will result in compliance with the Act, the regulations and this Certificate.

In addition, the Company is required to keep records and provide information to staff of the Ministry so that compliance with the Act, the regulations and this Certificate can be verified.

3. Condition No. 3 is included to provide the minimum performance requirement considered necessary to prevent an adverse effect resulting from the operation of the exhaust fan associated with the fume hood control system;

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as

amended, you may by written Notice served upon me, the Environmental Appeal Board and in accordance with Section 47 of the Environmental Bill of Rights, S.O. 1993, Chapter 28, the Environmental Commissioner, within 15 days after receipt of this Notice, require a hearing by the Board. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Appeal Board
2300 Yonge St., 12th Floor
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

The Environmental Commissioner
1075 Bay Street, 6th Floor
Suite 605
Toronto, Ontario
M5S 2B1

AND

The Director
Section 9, *Environmental Protection Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Appeal Board's requirements for an appeal can be obtained directly from the Board at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

This instrument is subject to Section 38 of the Environmental Bill of Rights, that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek leave to appeal within 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry at www.ene.gov.on.ca , you can determine when the leave to appeal period ends.

The above noted works are approved under Section 9 of the Environmental Protection Act.

DATED AT TORONTO this 30th day of May, 2000

Steve Klose, P.Eng.
Director
Section 9, *Environmental Protection Act*

AK/
c: District Manager, MOE Hamilton - District
Vladimir Uzelac, P.Eng., Vladimir Uzelac & Associates Engineering

Ministry of the Environment and Climate Change

Freedom of Information and Protection of Privacy Office

12th Floor
40 St. Clair Avenue West
Toronto ON M4V 1M2
Tel: (416) 314-4075
Fax: (416) 314-4285

Ministère de l'Environnement et de l'Action en matière de changement climatique

Bureau de l'accès à l'information et de la protection de la vie privée

12e étage
40, avenue St. Clair ouest
Toronto ON M4V 1M2
Tél. : (416) 314-4075
Téléc.: (416) 314-4285

Ontario

RECEIVED
JAN 19 2017

January 13, 2017

Rachel Bryan
WSP Canada Inc.
4 Hughson Street South, Suite 300
Hamilton, ON L8N 3Z1

Dear Rachel Bryan:

RE: ***Freedom of Information and Protection of Privacy Act* Request**
Our File # A-2016-07767, Your Reference 80 Brant St

This letter is in response to your request made pursuant to the *Freedom of Information and Protection of Privacy Act* relating to 80 Brant St, Hamilton.

After a thorough search through the files of the Ministry's Hamilton District Office, West Central Regional Office, Investigations and Enforcement Branch, Environmental Approvals Branch, Environmental Monitoring and Reporting Branch, Sector Compliance Branch and Safe Drinking Water Branch, no records were located responsive to your request. To provide you with this response and in accordance with Section 57 of the *Freedom of Information and Protection of Privacy Act*, the fee owed is $30.00 for 1 hour of search time @ $30.00 per hour. **We have applied the $30.00 for this request from your initial payment. This file is now closed.**

You may request a review of my decision by contacting the Information and Privacy Commissioner/Ontario, 2 Bloor Street East, Suite 1400, Toronto, ON M4W 1A8 (800-387-0073 or 416-326-3333). Please note that there is a $25.00 fee and you only have 30 days from receipt of this letter to request a review.

If you have any questions regarding this matter, please contact Alejandro Gonzalez at alejandro.gonzales@ontario.ca.

Yours truly,

Alejandro

for Christopher Mastropietro
FOI Manager (A)

Appendix E

OPTA ENVIROSCAN REPORT AND 1911 FIPs

opta
INFORMATION INTELLIGENCE

enviroscan

An SCM Company

175 Commerce Valley Drive W
Markham, Ontario L3T 7Z3

T: 905-882-6300
W: www.optaintel.ca

Report Completed By:

Catherine

Site Address:

2 Hillyard St Hamilton ON

Project No:

20161213053

Opta Order ID:

31748

Requested by:

Eleanor Goolab

Eris

Date Completed:

12/20/2016 7:09:31 AM

Project Name: Future HSR Storage Maintenance Facility

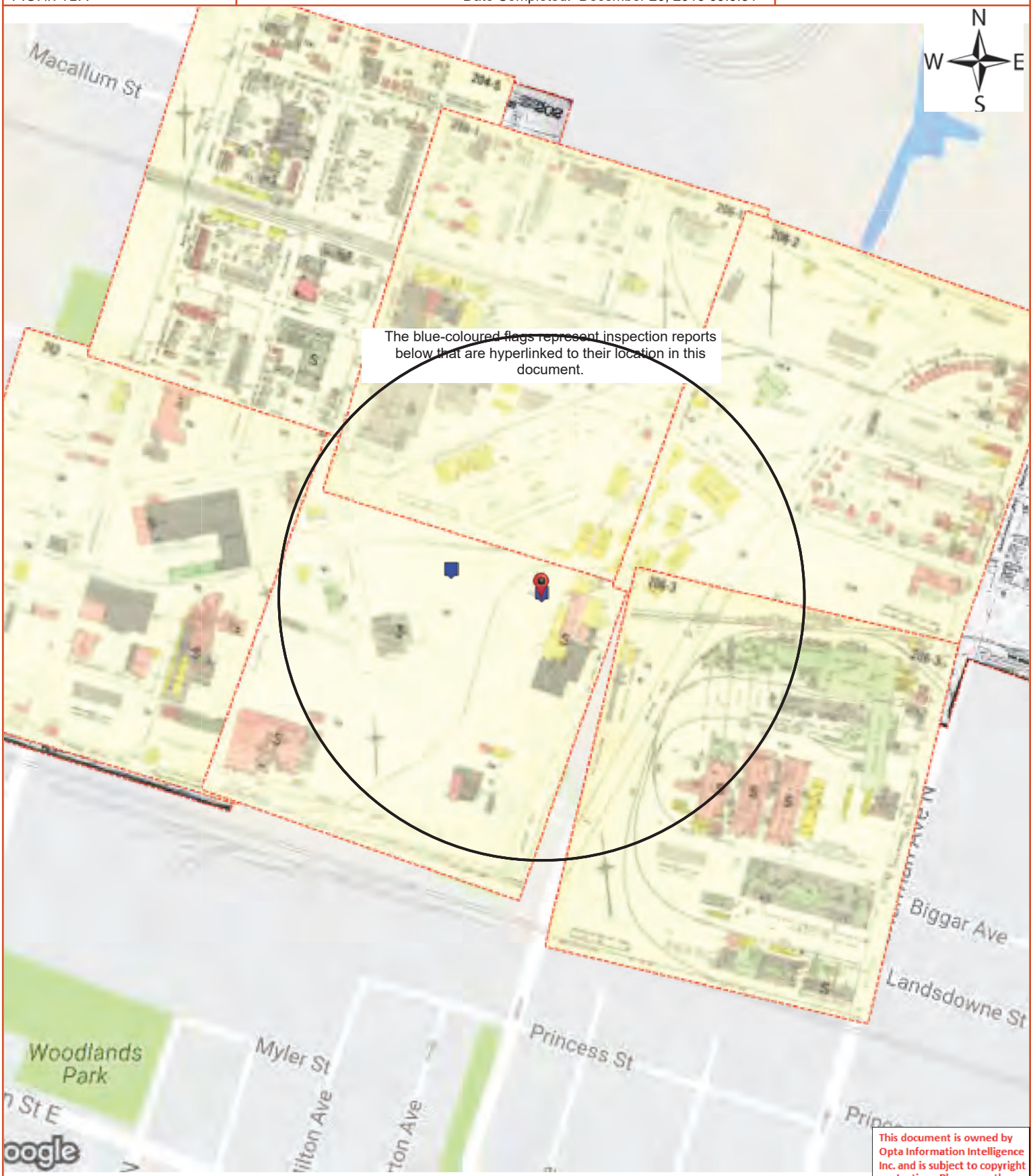
Project #: 20161213053
P.O. #: TBA

ENVIROSCAN Report

Search Area: 2 Hillyard St Hamilton ON

Requested by:
Eleanor Goolab
Date Completed: December 20, 2016 09:9:31

enviroscan
OPTA INFORMATION INTELLIGENCE



Opta Historical Environmental Services Enviroscan™ Terms and Conditions

Report

The documents (hereinafter referred to as the "Documents") to be released as part of the report (hereinafter referred to as the "Report") to be delivered to the purchaser as set out above are documents in Opta's records relating to the described property (hereinafter referred to as the "Property"). Opta makes no representations or warranties respecting the Documents whatsoever, including, without limitation, with respect to the completeness, accuracy or usefulness of the Documents, and does not represent or warrant that these are the only plans and reports prepared in association with the Property or in Opta's possession at the time of Report delivery to the purchaser. The Documents are current as of the date(s) indicated on them. Interpretation of the Documents, if any, is by inference based upon the information which is apparent and obvious on the face of the Documents only. Opta does not represent, warrant or guarantee that interpretations other than those referred to do not exist from other sources. The Report will be prepared for use by the purchaser of the services as shown above hereof only.

Disclaimer

Opta disclaims responsibility for any losses or damages of any kind whatsoever, whether consequential or other, however caused, incurred or suffered, arising directly or indirectly as a result of the services (which services include, but are not limited to, the preparation of the Report provided hereunder), including but not limited to, any losses or damages arising directly or indirectly from any breach of contract, fundamental or otherwise, from reliance on Opta Reports or from any tortious acts or omissions of Opta's agents, employees or representatives.

Entire Agreement

The parties hereto acknowledge and agree to be bound by the terms and conditions hereof. The request form constitutes the entire agreement between the parties pertaining to the subject matter hereof and supersedes all prior and contemporaneous agreements, negotiations and discussions, whether oral or written, and there are no representations or warranties, or other agreements between the parties in connection with the subject matter hereof except as specifically set forth herein. No supplement, modification, waiver, or termination of the request shall be binding, unless confirmed in writing by the parties hereto.

Governing Document

In the event of any conflicts or inconsistencies between the provisions hereof and the Reports, the rights and obligations of the parties shall be deemed to be governed by the request form, which shall be the paramount document.

Law

This agreement shall be governed by and construed in accordance with the laws of the Province of Ontario and the laws of Canada applicable therein.

ENVIROSCAN Report

Report Index

Project Name: Future HSR Storage Maintenance Facility

Project #: 20161213053
P.O. #: TBA

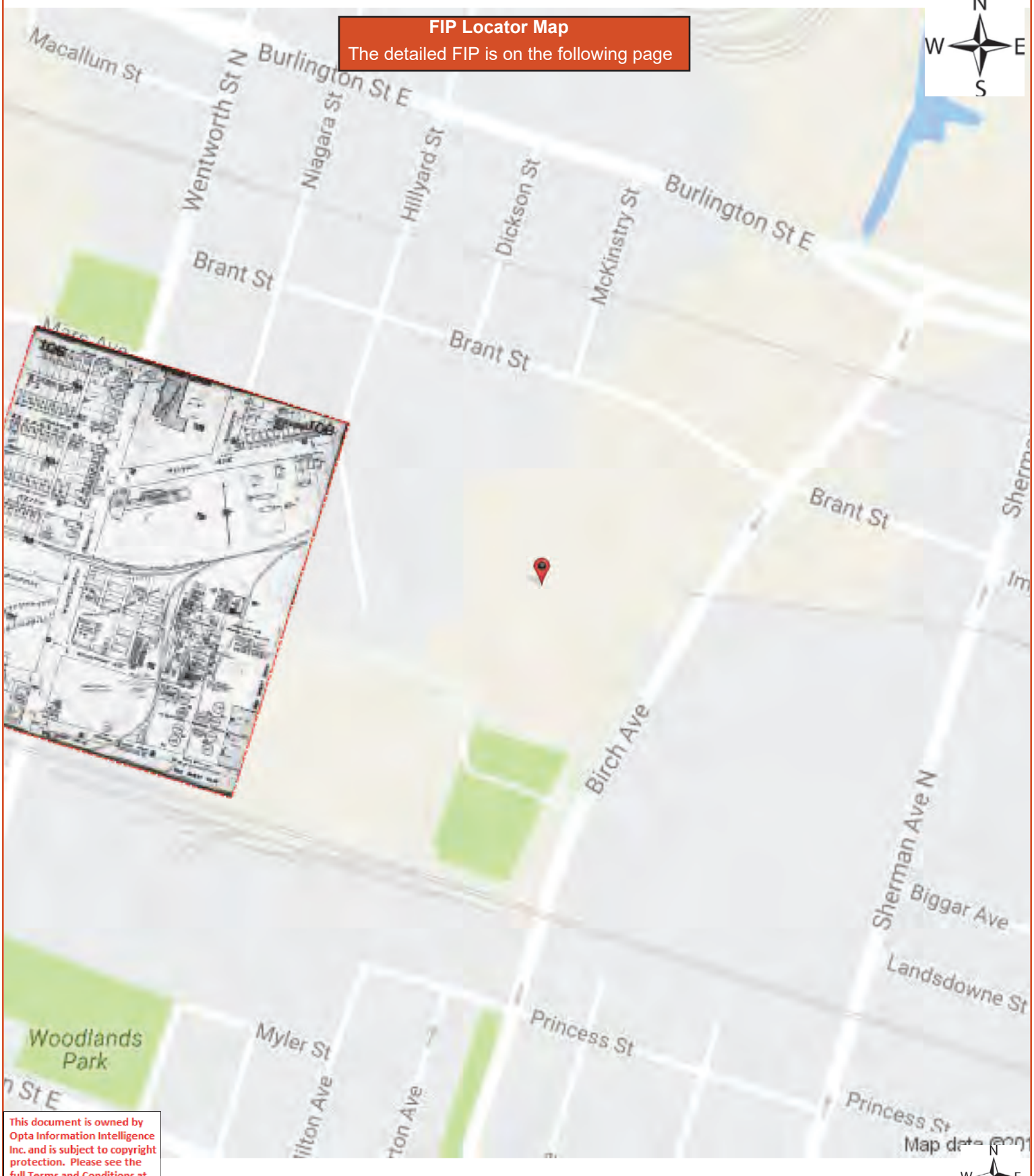
ENVIROSCAN Report

1916 Volume: Hamilton 2 Firemap: 108
Hamilton Vol. 2 Plan: 825 (1898)
Sheet: 108 (1916)

Requested by:
Eleanor Goolab
Date Completed: December 20, 2016 07:09:31

enviroscan
OPTA INFORMATION INTELLIGENCE

FIP Locator Map
The detailed FIP is on the following page

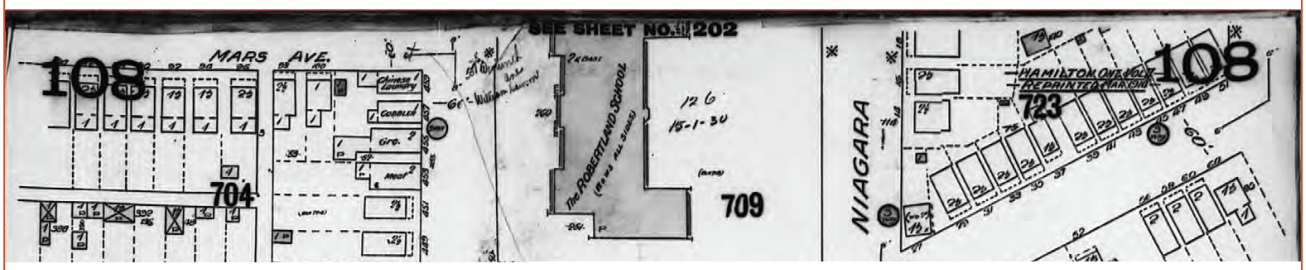


HEIRS Report

1916 Volume: Hamilton 2 Firemap: 108
Hamilton Vol. 2 Plan: 825 (1898)
Sheet: 108 (1916)

Requested by:
Eleanor Goolab
Date Completed: December 20, 2016 07:09:31

OPTA INFORMATION INTELLIGENCE



Project Name: Future HSR Storage Maintenance Facility

Project #: 20161213053
P.O. #: TBA

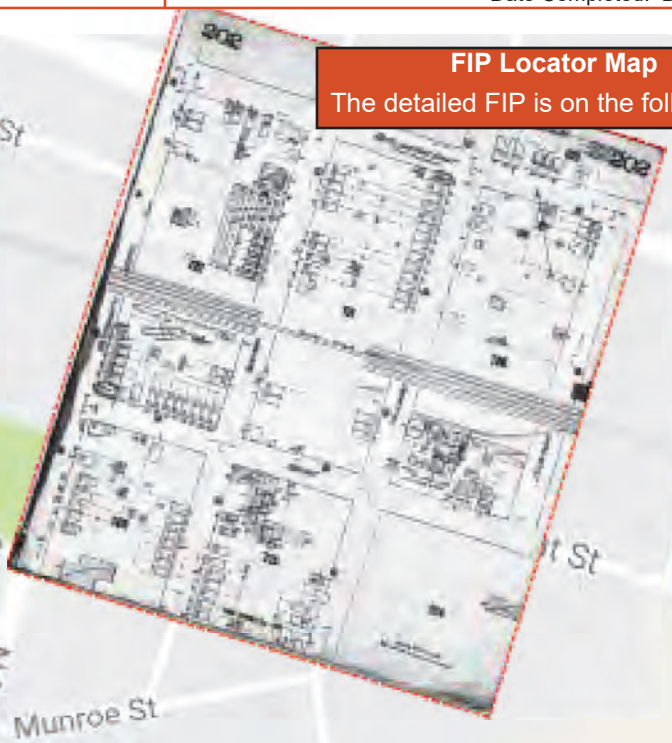
ENVIROSCAN Report

1916 Volume: Hamilton 2 Firemap: 202
Hamilton Vol. 2 Plan: 825 (1898)
Sheet: 202 (1916)

Requested by:
Eleanor Goolab
Date Completed: December 20, 2016 07:09:31

enviroscan
OPTA INFORMATION INTELLIGENCE

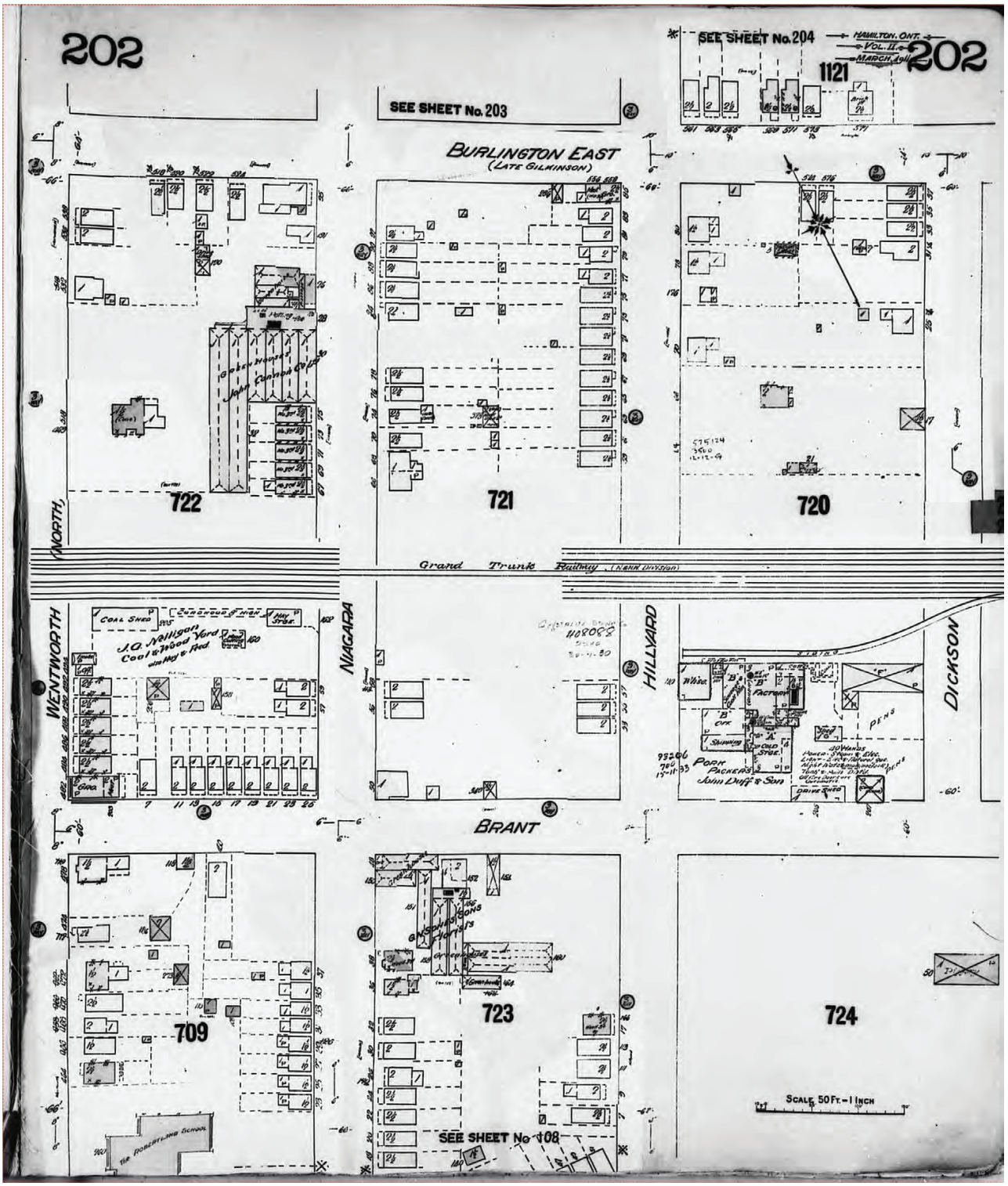
FIP Locator Map
The detailed FIP is on the following page



HEIRS Report

1916 Volume: Hamilton 2 Firemap: 202
Hamilton Vol. 2 Plan: 825 (1898)
Sheet: 202 (1916)

Requested by:
Eleanor Goolab
Date Completed: December 20, 2016 07:09:31



Project Name: Future HSR Storage Maintenance Facility

Project #: 20161213053
P.O. #: TBA

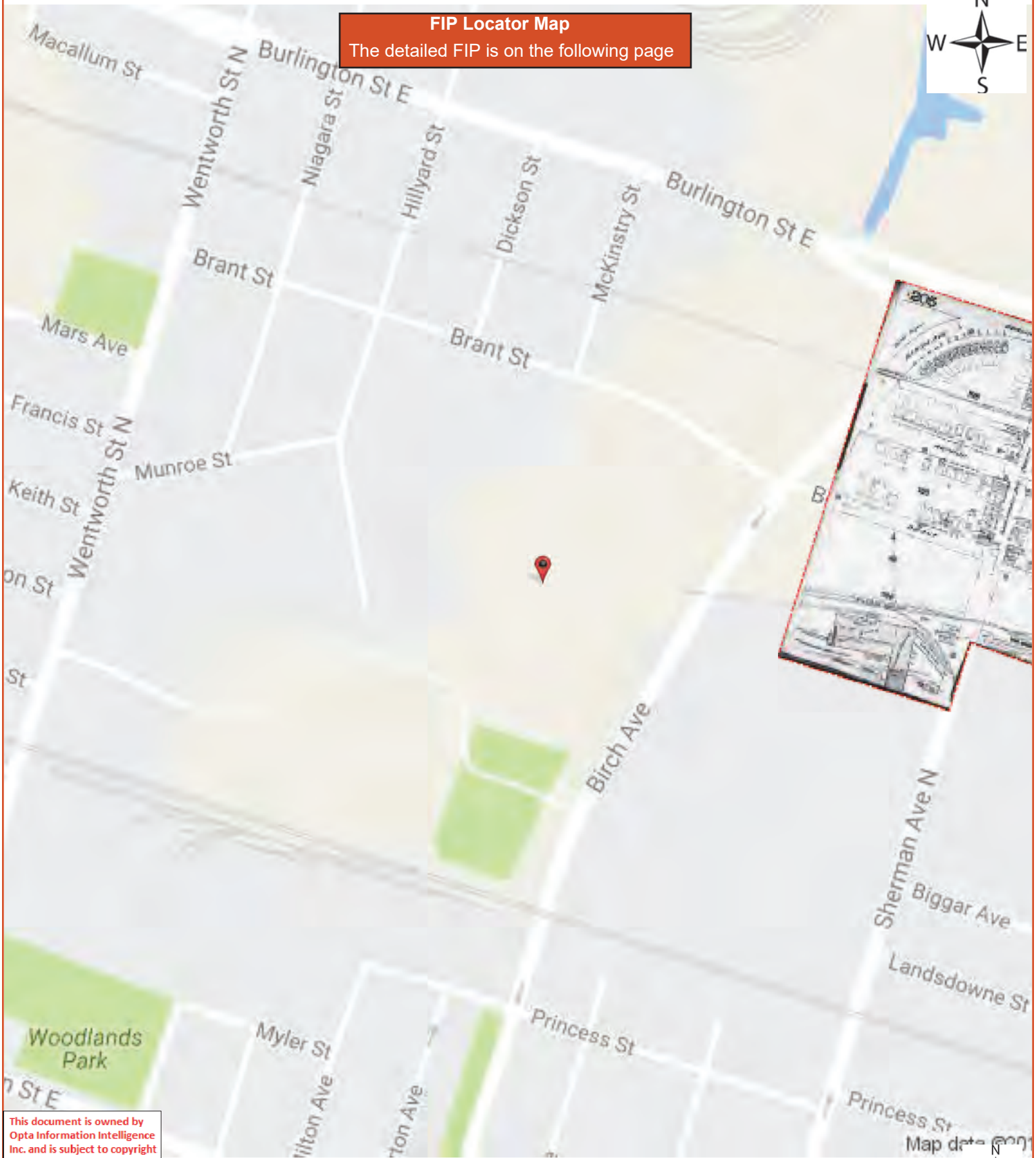
ENVIROSCAN Report

1916 Volume: Hamilton 2 Firemap: 205
Hamilton Vol. 2 Plan: 825 (1898)
Sheet: 205 (1916)

Requested by:
Eleanor Goolab
Date Completed: December 20, 2016 07:09:31

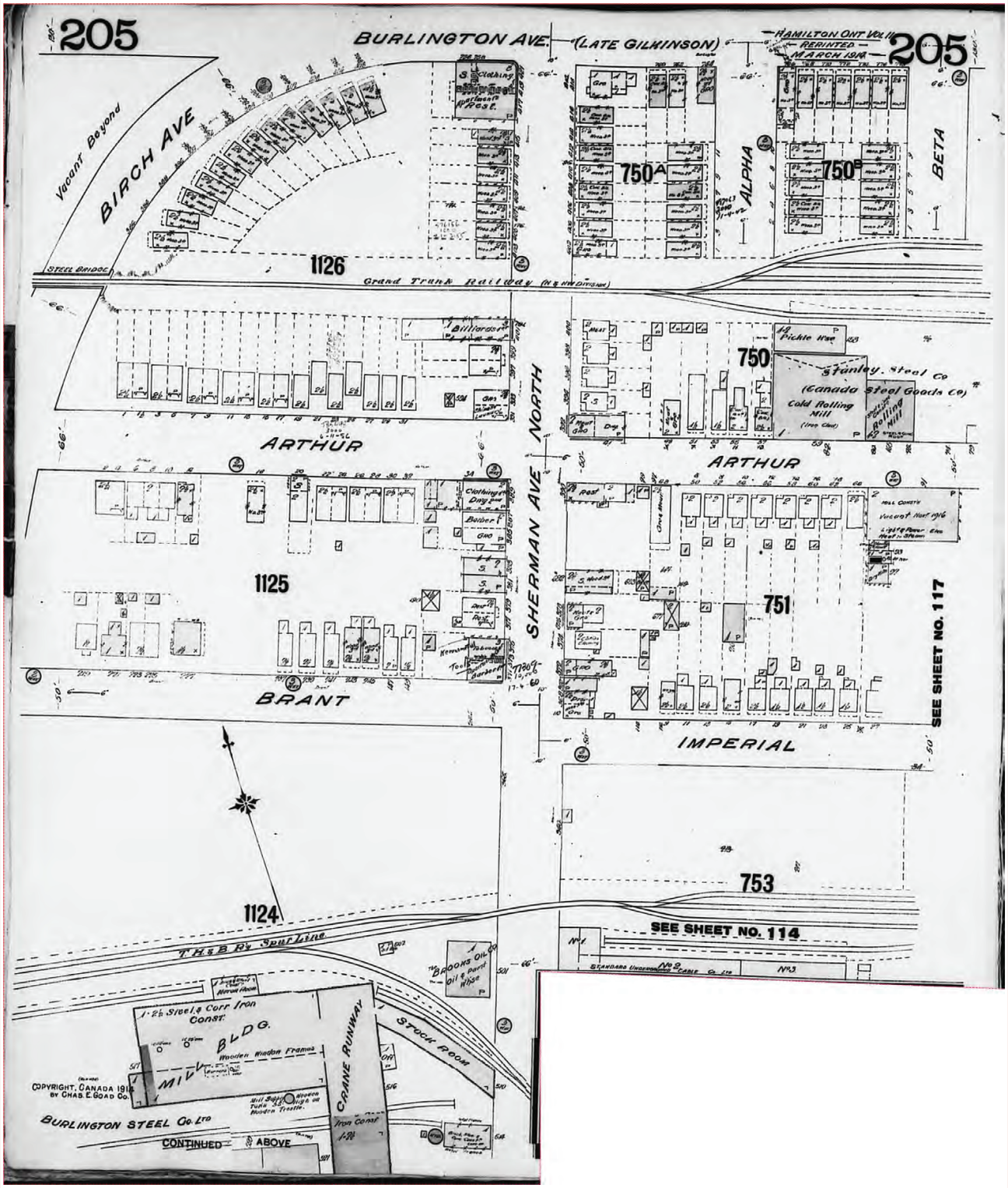
enviroscan
OPTA INFORMATION INTELLIGENCE

FIP Locator Map
The detailed FIP is on the following page



HEIRS Report

1916 Volume: Hamilton 2 Firemap: 205
Hamilton Vol. 2 Plan: 825 (1898)
Sheet: 205 (1916)



Project Name: Future HSR Storage Maintenance Facility

Project #: 20161213053
P.O. #: TBA

ENVIROSCAN Report

1962 Volume: Hamilton 2 Firemap: 203
Hamilton Volume 2 Plan: 848 (1962)
Sheet: 203 (1962)

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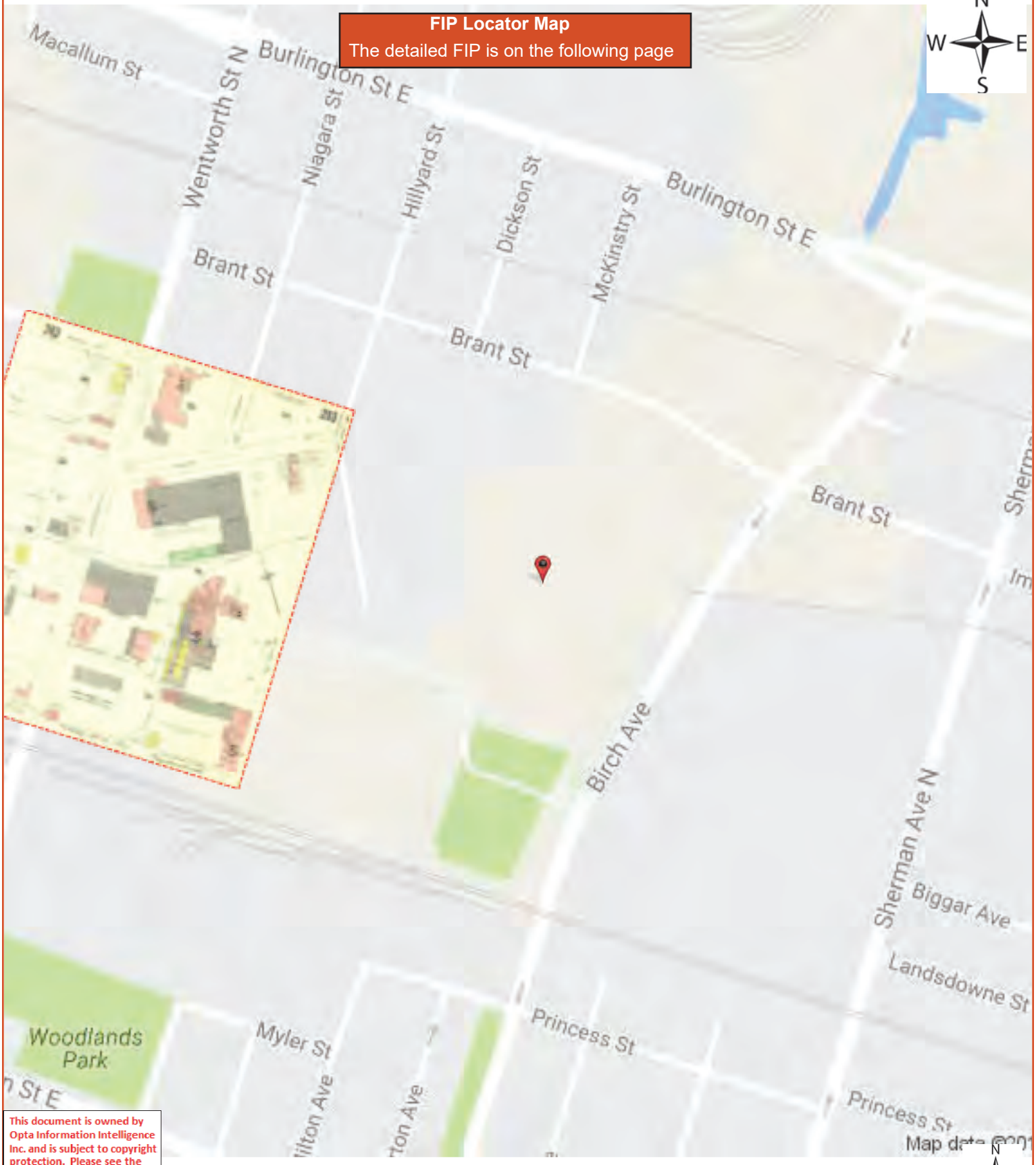

HEIRS Report

1962 Volume: Hamilton 2 Firemap: 203
Hamilton Volume 2 Plan: 848 (1962)
Sheet: 203 (1962)

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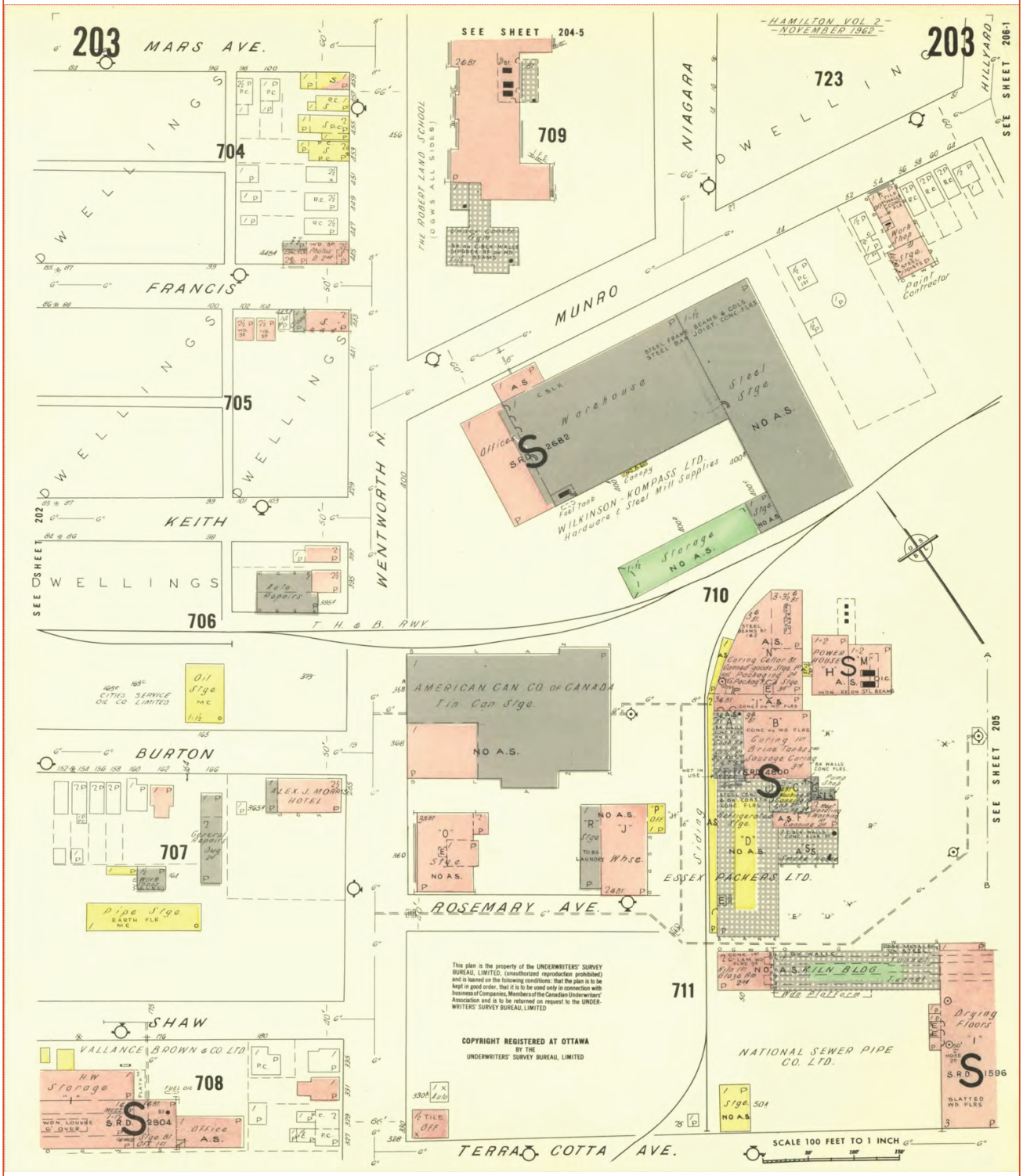

Project Name: Future HSR Storage Maintenance Facility

Project #: 20161213053
P.O. #: TBA

ENVIROSCAN Report

1962 Volume: Hamilton 2 Firemap: 205
Hamilton Volume 2 Plan: 848 (1962)
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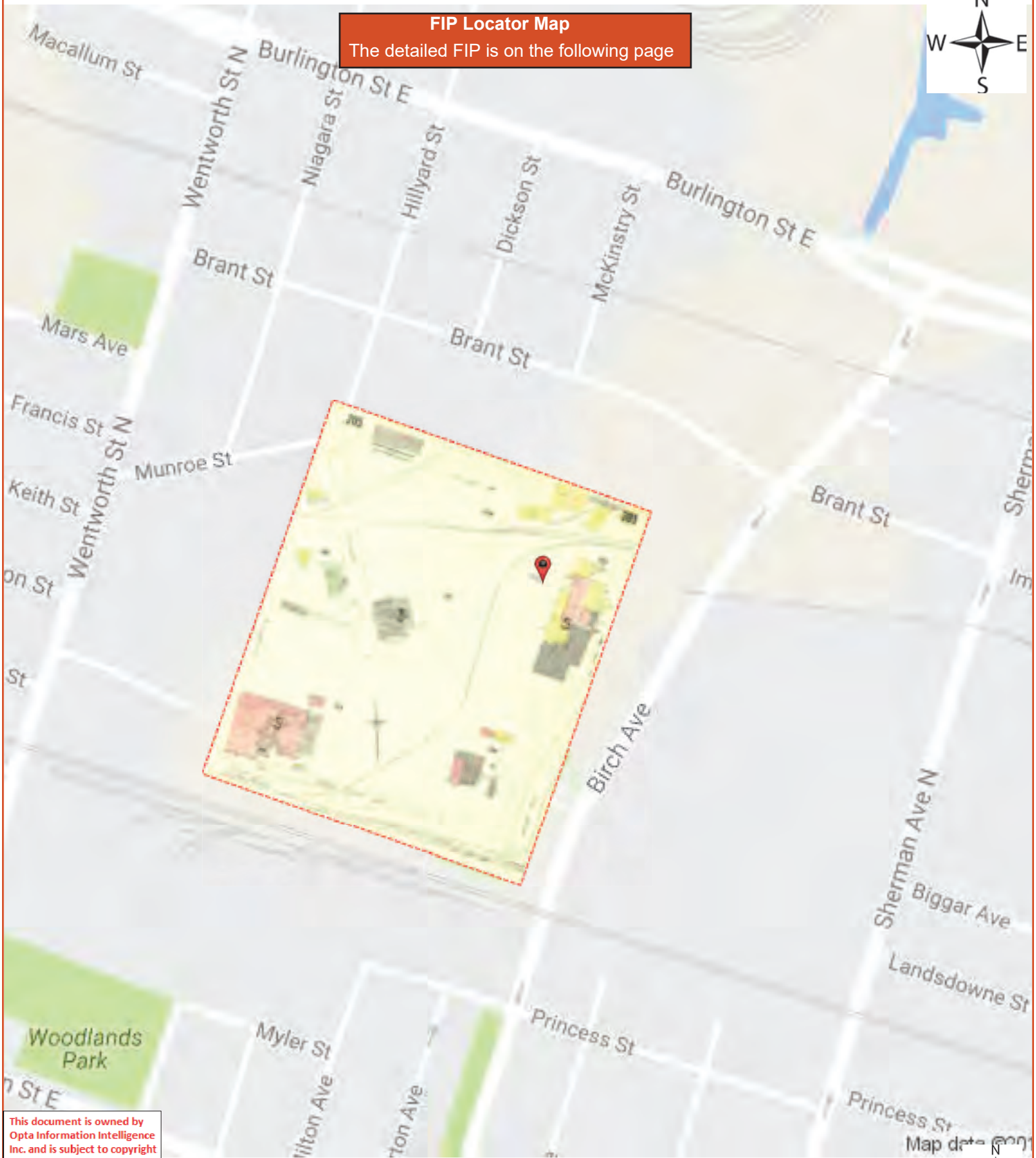

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1962 Volume: Hamilton 2 Firemap: 205
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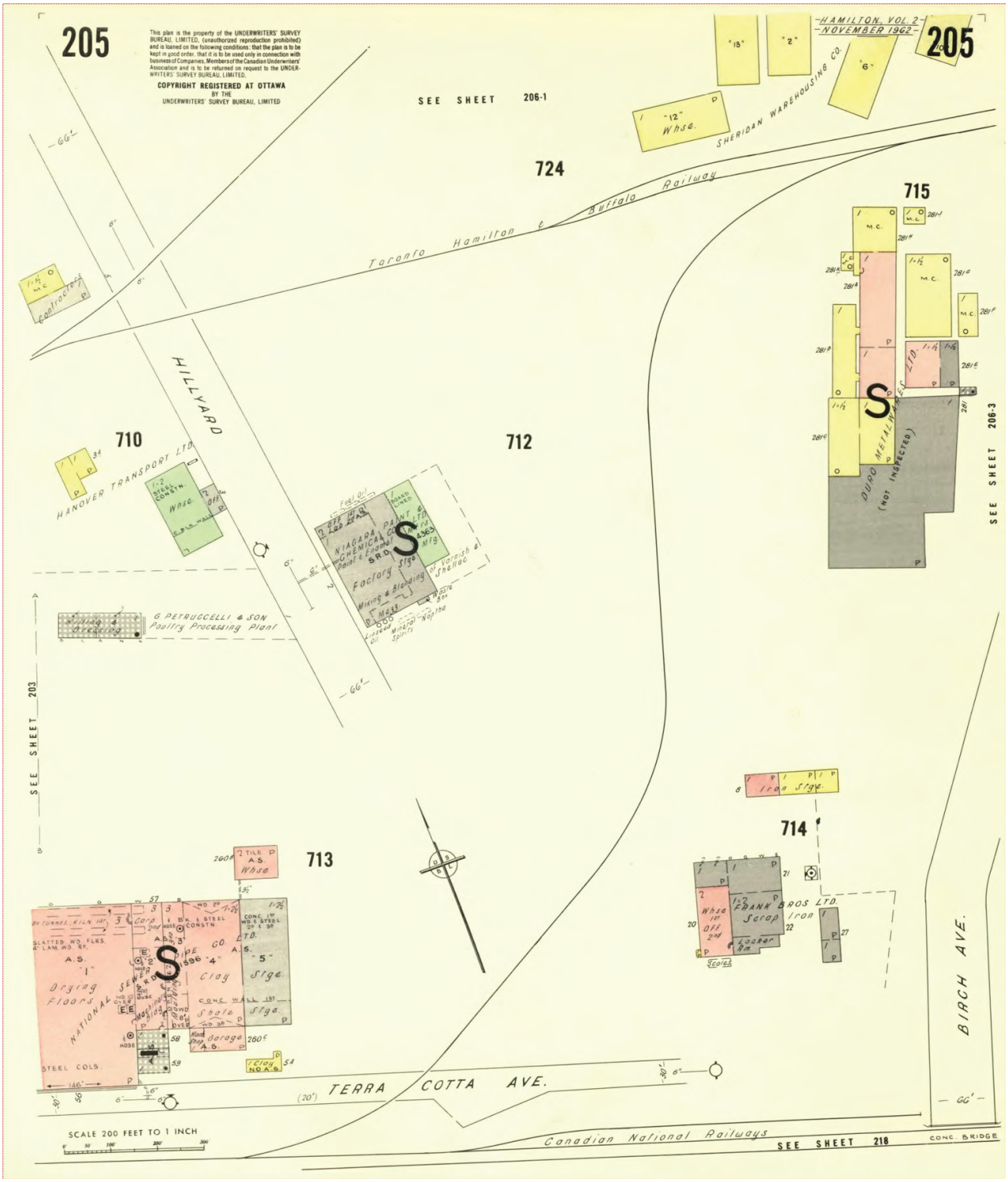

Project Name: Future HSR Storage Maintenance Facility

Project #: 20161213053
P.O. #: TBA

ENVIROSCAN Report

1962 Volume: Hamilton 2 Firemap: 204-5
Hamilton Volume 2 Plan: 848 (1962)
Sheet: 204-5 (1962)

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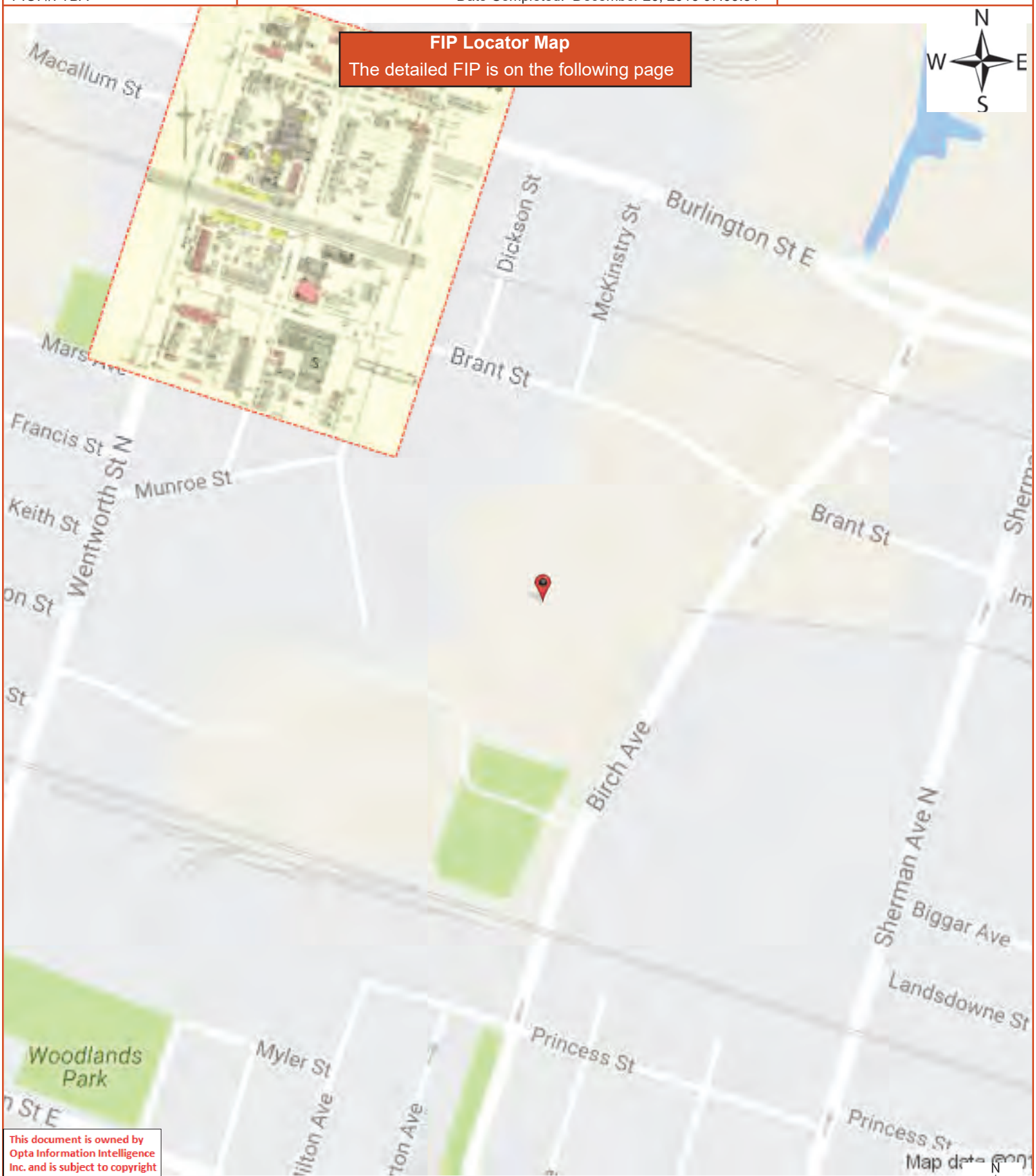

HEIRS Report

1962 Volume: Hamilton 2 Firemap: 204-5
Hamilton Volume 2 Plan: 848 (1962)
Sheet: 204-5 (1962)

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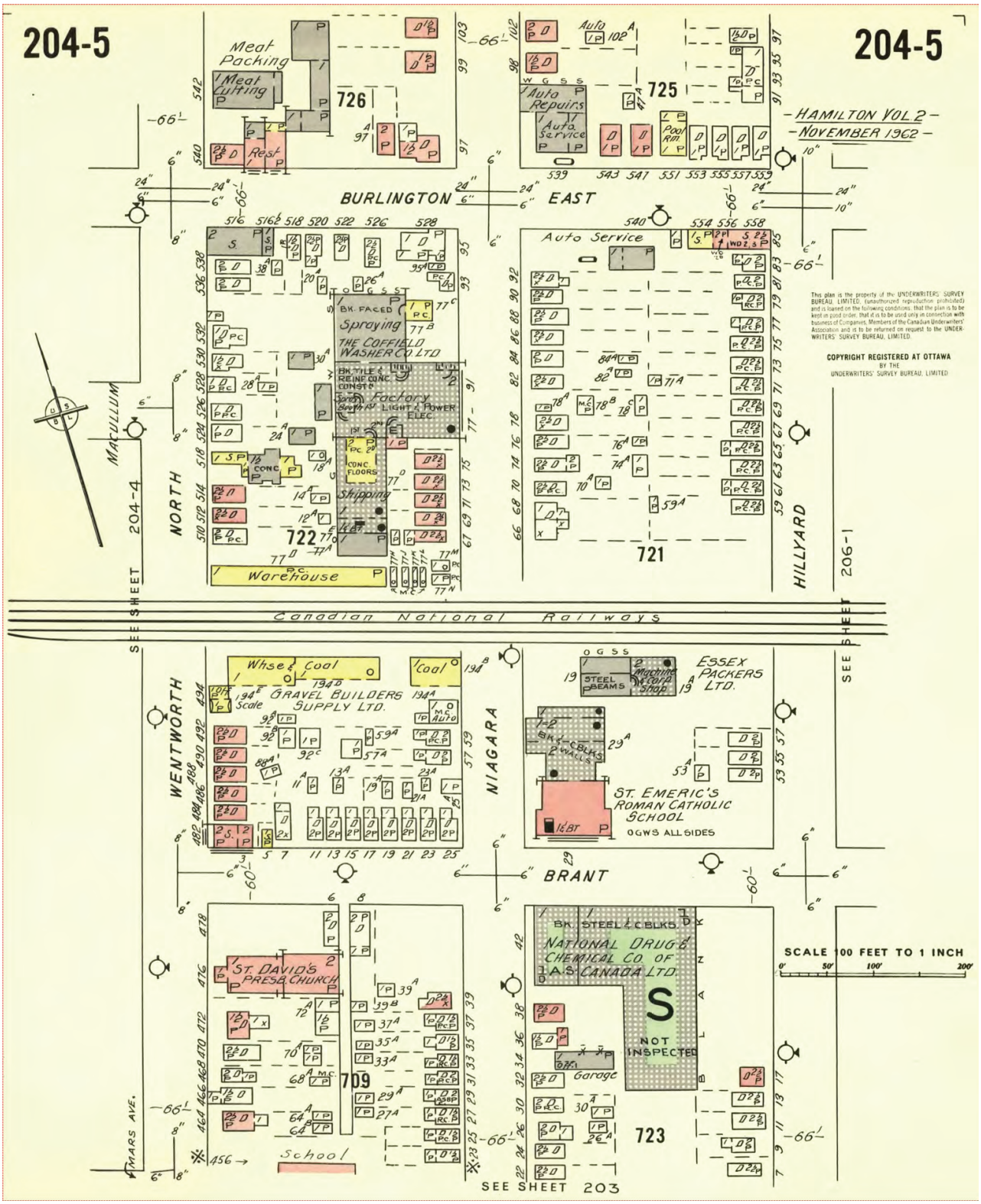

Project Name: Future HSR Storage Maintenance Facility

Project #: 20161213053
P.O. #: TBA

ENVIROSCAN Report

1962 Volume: Hamilton 2 Firemap: 206-1
Hamilton Volume 2 Plan: 848 (1962)
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1962 Volume: Hamilton 2 Firemap: 206-1
Hamilton Volume 2 Plan: 848 (1962)
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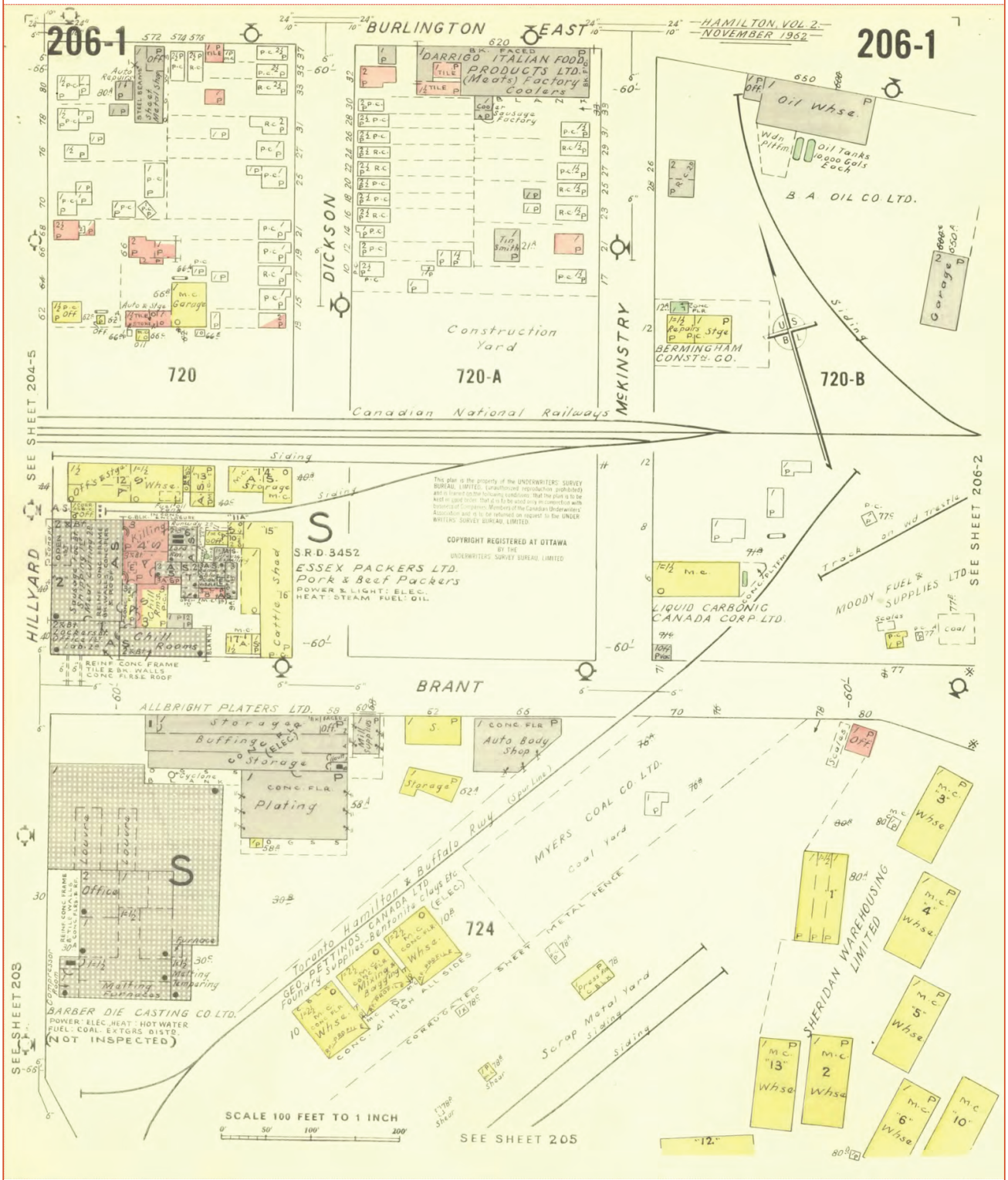

Project Name: Future HSR Storage Maintenance Facility

Project #: 20161213053
P.O. #: TBA

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1962 Volume: Hamilton 2 Firemap: 206-2
Hamilton Volume 2 Plan: 848 (1962)
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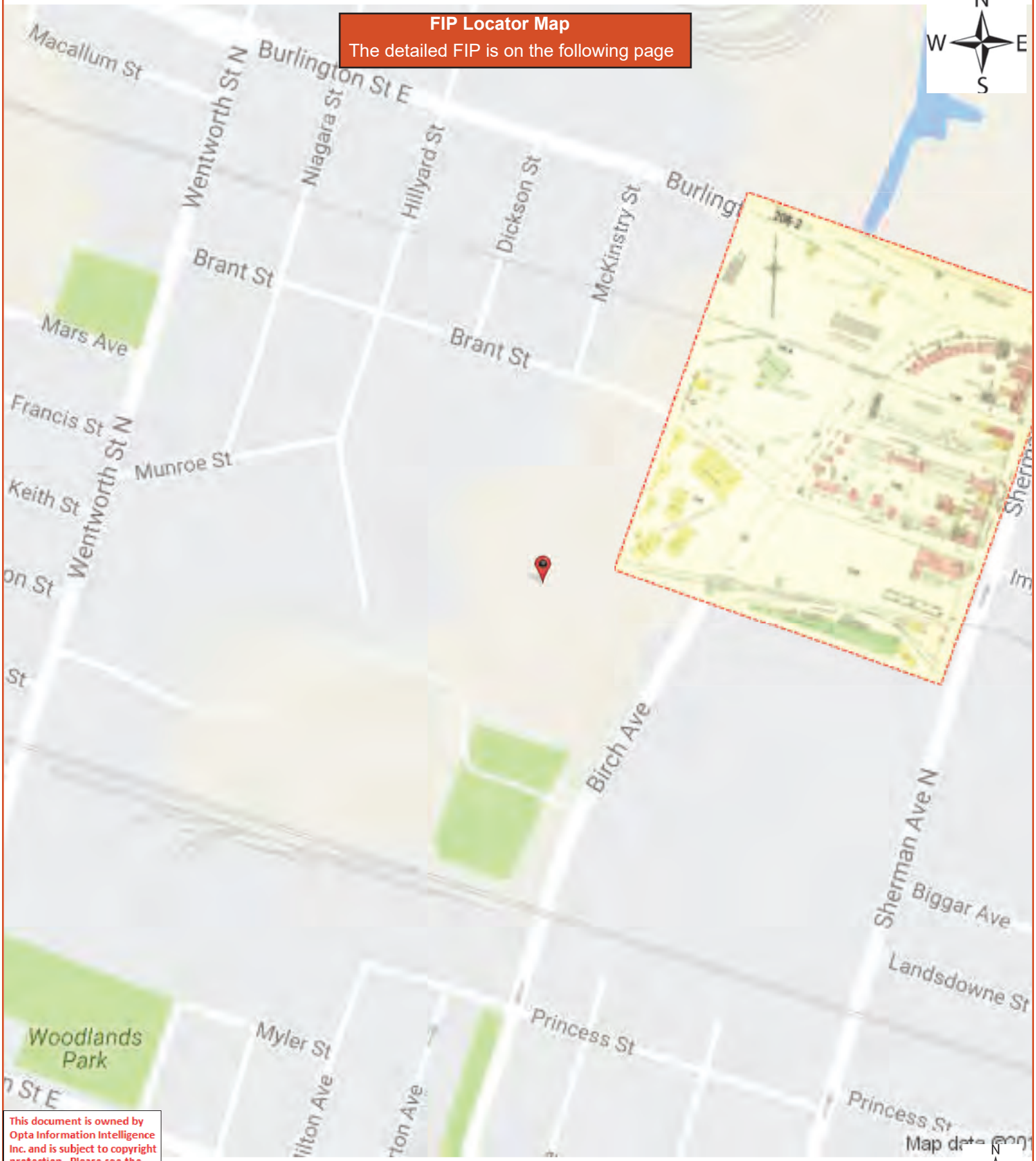

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1962 Volume: Hamilton 2 Firemap: 206-2
Hamilton Volume 2 Plan: 848 (1962)
Sheet: 206-2 (1962)

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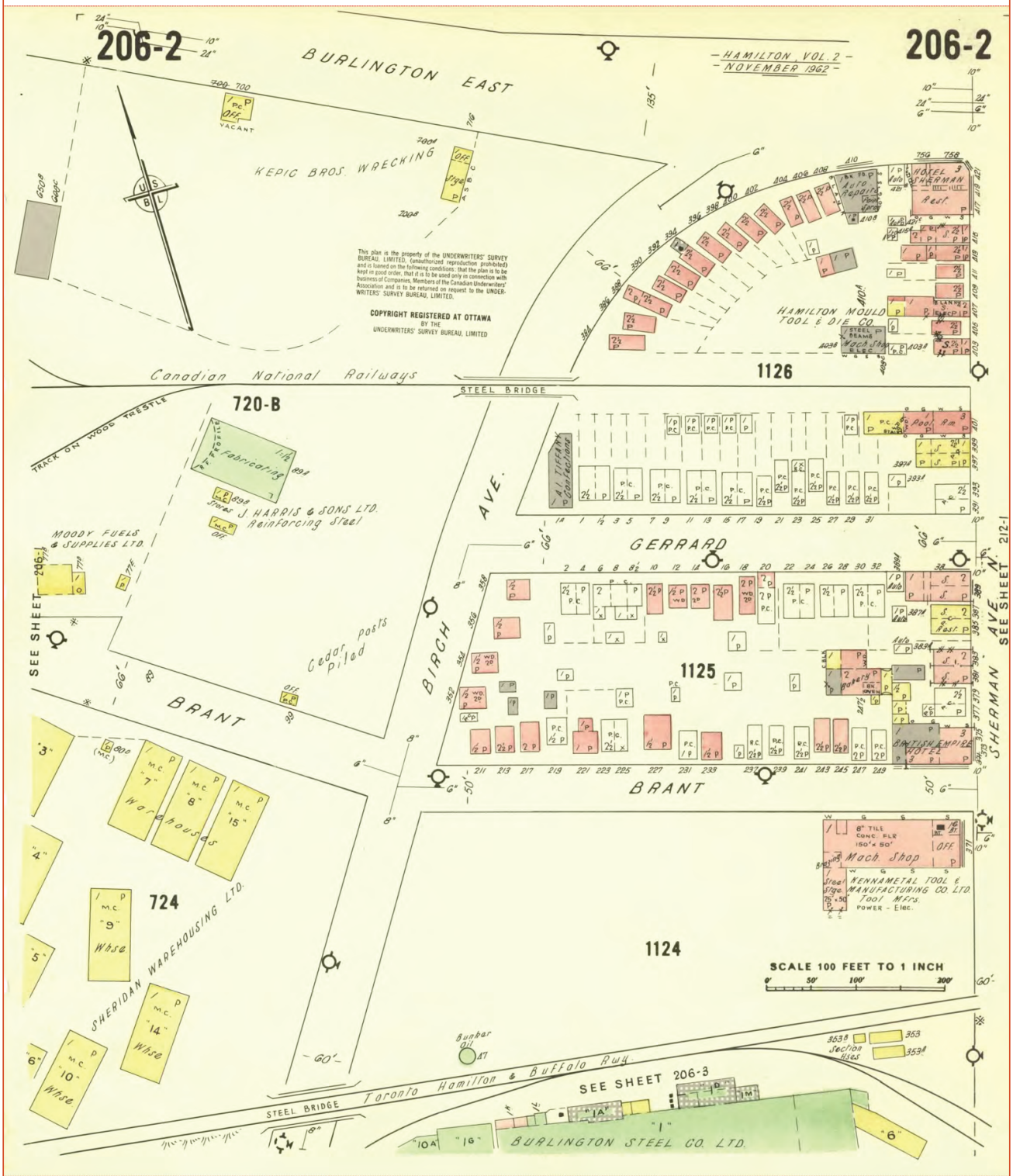

Project Name: Future HSR Storage Maintenance Facility

Project #: 20161213053
P.O. #: TBA

ENVIROSCAN Report

1962 Volume: Hamilton 2 Firemap: 206-3
Hamilton Volume 2 Plan: 848 (1962)
Sheet: 206-3 (1962)

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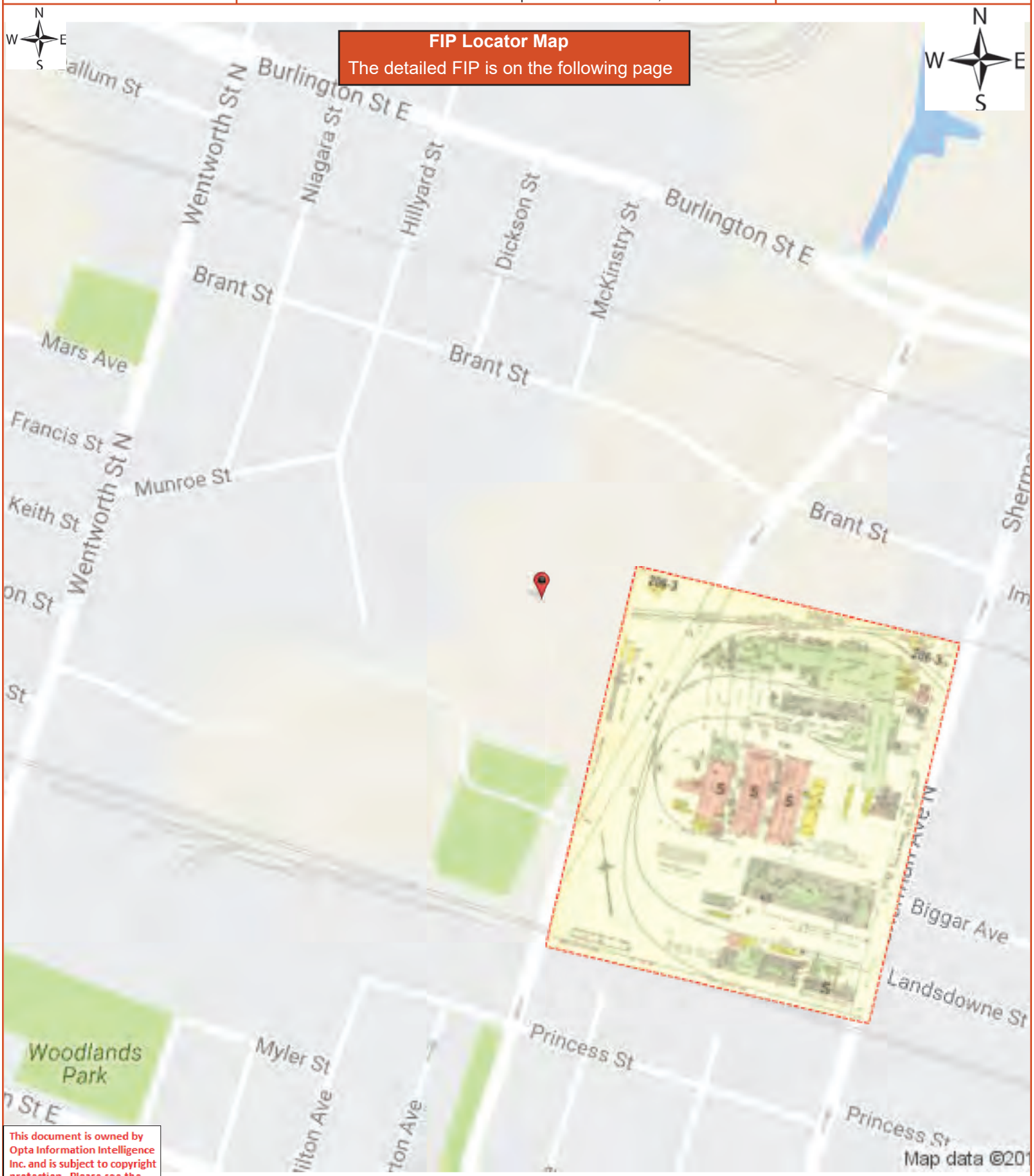

HEIRS Report

1962 Volume: Hamilton 2 Firemap: 206-3
Hamilton Volume 2 Plan: 848 (1962)
Sheet: 206-3 (1962)

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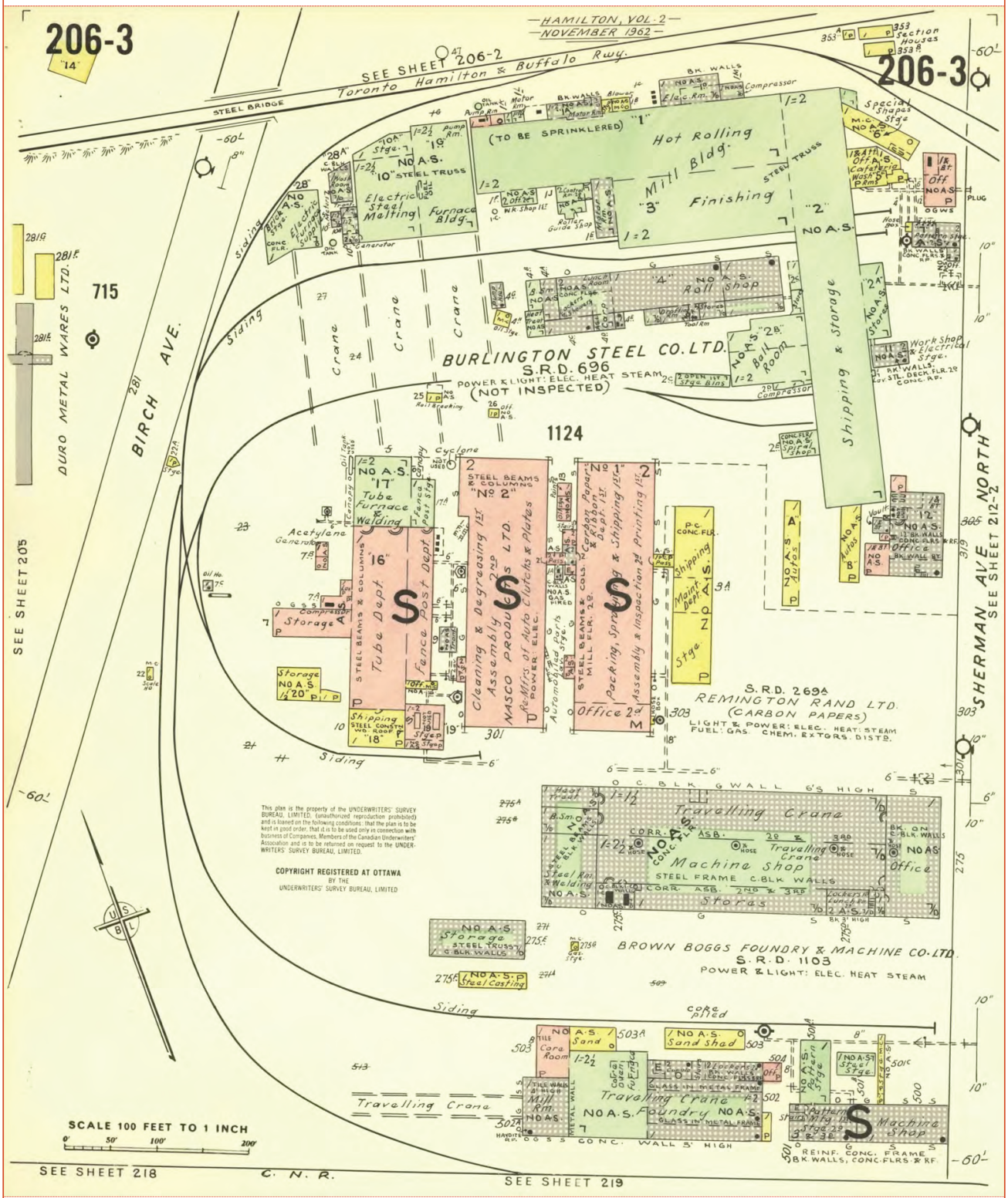

ENVIROSCAN Report

Inspection Report - 1989 NIAGARA PAINT AND CHEMICAL CO 2 HILLYARD ST HAMILTON ON L8L 6B1 Reference No: 10601352

Requested by: Eleanor Goolab

Date Completed: December 20, 2016 07:09:31

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OPTA INFORMATION INTELLIGENCE

AIS Ref No.: 10601352

1989

CONFIDENTIAL

LOSS CONTROL ENGINEERING DEPARTMENT

Ontario

INSURED:	Niagara Paint & Chemical Co. Ltd. Attention: Mr. A. Watson	27 October 2008
	2 Hillyard Street Hamilton, Ontario	File No. SR04363 Reference 060135
MAILING ADDRESS:	P.O. Box 402, Station "B" Hamilton, Ontario L8L 7W4	
CONTACT:	Mr. A. Watson, Mr. Sam Restivo Mr. Anan Somnarain, Plant Manager	

SURVEY-FIRE AND EXTENDED COVERAGE INSURANCE

The survey of the above property on December 4, 1989 was made on behalf of participating insurance companies. The information gathered on this survey is used by these insurers to aid in deciding whether to underwrite the risk, and if so, at what cost.

The following comments were developed from this survey, and are based on conditions, practices observed, other pertinent data supplied by management personnel at the risk, and information secured at the time of survey.

Please note that the following recommendations have been made with the intention of pointing out those areas in which remedial action could have the beneficial effect of making your premises safer.

RECOMMENDATIONS IN CAPITAL LETTERS ARE OF PARTICULAR IMPORTANCE, AND THEIR EARLY IMPLEMENTATION IS ENCOURAGED.

Thank you for your co-operation during this visit, and please do not hesitate to get in touch with us if we can be of any further assistance.

Representative: Walter Haraschuk

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ENVIROSCAN Report

Inspection Report - 1989 NIAGARA PAINT AND CHEMICAL CO 2 HILLYARD ST HAMILTON ON L8L 6B1 Reference No: 10601352

Requested by: Eleanor Goolab
Date Completed: December 20, 2016 07:09:31

1989

IAO reports, prepared in compliance with commonly accepted risk control standards existing at the time services are rendered, are developed from an inspection of the premises and/or from data supplied by or on behalf of the Purchaser. IAO does not purport to list all hazards. While changes and modifications referred to in the reports are designed to upgrade protection and loss prevention of the premises, IAO assumes no responsibility for management and control of these activities. IAO will not be responsible to the Purchaser for any loss or damages, whether consequential or other, however caused, incurred or suffered, as a result of the service being provided.

REMARKS:

1. This is the first survey of the premises since 1986.

2. Recommendation 86-1 has been carried out. A dyke has been constructed around the two alkyd resin tanks.

3. All flammable and combustible drums have been removed from the rear raw materials storage warehouse and an outdoor sprinklered rack is now used for on side storage of drums.

4. A new underground tank farm has been built at the north side of the yard. The old tanks have been removed.

5. A detached compressor shed (of combustible construction) has been built in the front yard.

RECOMMENDATIONS:

84-1 (Revised 1989) The storage of Class I flammable liquids in 22.7 L (5 gallon) containers in the finished goods storage area is inadequately protected by the present sprinkler system in your building.

The sprinkler system should be redesigned in accordance with NFPA 30, (in accordance with provisions for "In-rack" sprinklers beneath the storage racks in a finished goods warehouse) in order to protect this storage arrangement as outlined above.

A recognized sprinkler contractor should be engaged to do this work and all proposals and plans should be submitted to the IAO for approval prior to the installation. IAO engineering officials may be contacted for further details

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Inspection Report - 1989 NIAGARA PAINT AND CHEMICAL CO 2 HILLYARD ST HAMILTON ON L8L 6B1 Reference No: 10601352

of specifications regarding the required protection.

89-1 Sprinkler protection should be extended inside the 2.1m x 3m (7' x 10') wood frame extention at the southeast of the main building.

89-2 Arrangements should be made to have the booster fire pump water flow tested during the summer months to ascertain the rated performance of this pump.

WITHDRAWN RECOMMENDATIONS:

75-5 (Revised 1985)

(a) Emergency venting extending outdoors should be provided for the three 27,300 L (6,000 gallon) alkyd resin storage tanks in the East Warehouse. It is understood that the flash points of the resins are approximately 4.4C. (40F.). This emergency venting is required in addition to the existing small vent pipes which terminate outside.

An estimated emergency ventilation capacity of 2,102,100 L (462,000 gallons) of air per hour should be provided

AIS Ref No.: 10601352

1989

INSURERS' ADVISORY ORGANIZATION
Ontario

CONFIDENTIAL

INSPECTION REPORT

File No. 04363
Reference: 060135

Sheet 205 Block 712

NAME OF RISK: Niagara Paint & Chemical Co. Ltd.
Attention: Mr. A. Watson

LOCATION: 2 Hillyard Street
Hamilton, Ontario

SURVEYED BY: Walter Haraschuk

SURVEY DATE: December 4, 1989

IAO reports, prepared in compliance with commonly accepted risk control standards existing at the time services are rendered, are developed from an inspection of the premises and/or from data supplied by or on behalf of the Purchaser. IAO does not purport to list all hazards. While changes and modifications referred to in the reports are designed to upgrade protection and loss prevention of the premises, IAO assumes no responsibility for management and control of these activities. IAO will not be responsible to the Purchaser for any loss or damages, whether consequential or other, however caused, incurred or suffered, as a result of the service being provided.

GENERAL COMMENTS

OCCUPANCY: Manufacture of paints, enamels and blending of varnish and shellac (no cooking of varnish) with retail and wholesale outlet. Mainly industrial and highway marking paints are manufactured.

Grading of risk in class: Average

CONSTRUCTION

FIRE DIVISIONS: Fire Division: See Multiple Fire Section Sheets.

HAZARDS

COMMON HAZARD:

Heating: Office and laboratory are heated by a roof mounted natural gas furnace/air-conditioning unit.

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Detached warehouse is heated by ceiling suspended natural gas fired unit heaters.

Manufacturing areas are heated by natural gas-fired furnaces located in the open and roof mounted natural gas-fired air make-up units. Fire dampers have been installed in the ductwork. The fire booster pump room is heated by an electric heater. Chimneys and flues standard.

Air-Conditioning: Central 10% Air Conditioned.

Electrical: Circuit breakers used. Wiring installed and updated in last 30 years. Transformers PCB filled: Yes

SPECIAL HAZARDS: Unsafe

Naphtha, Mineral Spirits, Xylol and Toluol are dispensed in the mixing area from the underground bulk storage tanks. Pumping equipment is located outdoors and is suitable for the location. The dispensing nozzles are equipped with safety shut-off valves with fusible links.

Generally, the mixing and blending operation appears to be safe. Equipment is grounded and electrical equipment is Class I, Group D, Division 1.

A laboratory on the second floor above the office is well arranged. Electrical equipment is Class I, Group D, Division 1. A number of 4.6 L (1 gallon) metal containers (screw type tops) are used for storing various flammable liquids (solvents) and are safely arranged on metal shelves in a well ventilated room. Sample metal strips are spray painted in a small sprinklered spray booth equipped with suitable electrical equipment and ventilation. Samples are baked in three small vented electric ovens. A computer is used in the laboratory for quality control and pigment information.

RADIOACTIVE MATERIAL: None

HIGH PILING: Unsafe

Unsafe. See "Process Description"

3(f) Hazardous Materials: Safe and unsafe.

1. Approximately fifty 204.8 L (45 gallon) drums of various flammable liquids and solvents (e.g. Butyl Cellusolve ISOL 2429, 2020, Varsol, Butyl Acetate, Methyl Hydrate, Isopropyl Alcohol, Methyl 150 Butyl Ketone, Methyl Ethyl Ketone, etc.) with flash points ranging from -6C. (21F.) to 43.4C. (110F.) are stored on steel racks beneath a sprinklered canopy at the south end of the detached Warehouse Building and on a second detached rack, south of the warehouse building.

2. One 204.8 L (45 gallon) drum of Nitrocellulose in 30% Isopropyl Alcohol said to be brought in occasionally, but used entirely for special products (no explosion hazard provided - a minimum of 15% Alcohol content).

3. The following materials are stored in underground tanks:

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N
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- 25,003 L (5,500 gallons) of Naphtha (F.P. 10C. to 26.7C. (50F. to 80F.)).

- 25,003 L (5,500 gallons) of varsol (F.P. 40C. (104F.)).

- 27,300 L (6000 gallons) of Xylol (F.P. 28.9C. (84F.)).

- 35,004.2 L (7,700 gallons) of Toluol (F.P. 4.4C. (40F.)).

- 15,911 L (3,500 gallons) of "Solvesso 100".

- 15,911 L (3,500 gallons) of isopropyl alcohol.

- 15,911 L (3,500 gallons) Reclaimed Solvent.

4. Large quantities of in-process paints which contain varying amounts of low flash point solvents in open vats (227.5 L to 2275 L (50 gallons to 500 gallons)).

5. One hundred 4.6 L (1 gallon) closed metal containers (ordinary cans) of low flash point flammable liquids and solvents stored in laboratory on metal shelves.

6. Approximately 45,500 L (10,000 gallons) of finished paint in sealed metal containers ranging from 1.1 L (1 quart) to 22.7 L (5 gallon) stored in the 1948 and 1955 warehouse areas (unsafe). See "Process Description".

7. One hundred 204.8 L (45 gallon) drums of paint stored outdoors awaiting shipment.

8. 13,650 L (3000 gallon) underground tank of Gasoline.

9. 13,650 L (3000 gallon) tanks of Fuel Oil.

4(a)(i) Areas Unsprinklered: 1.2m x 4.9m (4' x 16') unsprinklered canopy at entrance, unsprinklered, fire-resistive 0.9m x 3.7m (3' x 12') electrical room (sprinklers not required).

HOUSEKEEPING: Safe

HAZARDOUS MATERIAL: Safe and unsafe

EXPOSURES:

North	Protection Required: N	Protection Provided: N
	None	
South	Protection Required: N	Protection Provided: N
	None	
East	Protection Required: N	Protection Provided: N

< SR04363 / 060135 / 10601352 >

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Inspection Report - 1989 NIAGARA PAINT AND CHEMICAL CO 2 HILLYARD ST HAMILTON ON L8L 6B1 Reference No: 10601352

Moderate

West Protection Required: N Protection Provided: N

Light

ACTIVITY: Busy 8 Hrs/Day 5 Days/Wk

Number of Production Workers: 9

SMOKING RESTRICTED: Yes

ELECTRONIC DATA PROCESSING: Yes - See attached D.P.O.S.

PROCESS DESCRIPTION: 1970 Detached 21.4m x 29.9m (70' x 98') Warehouse: This is a Raw Material Warehouse (of all metal construction) with the interior walls and ceilings insulated with fibreglass in a thin plastic vinyl sheathing. Bagged pigments are stored up to 3.7m (12') high, various fillers, wax, empty cans, water base paints, etc.

Three 27,300 L (6,000 gallon) vertical tanks of alkyd resin (having a Toluol Solvent (F.P. 4.4C. (40F.)) are kept in this building. Resin is transferred by pump to the Manufacturing/Mixing Buildings. These tanks do not have adequate emergency venting but are dyked.

Alkyd resin is manufactured by other plants and delivered by tanker truck to the building.

There is outdoor raw materials in 204.8 L (45 gallon) drums, alkyd resins, drying oils and various additives are stored on one sprinklered double row rack, four drums high (on side). These are Class IC to IIIB flammable and combustible liquids having flash points from 26.7C. (80F.) to over 93.4C. (200F.).

Lower flash point solvent items in 204.8 L (45 gallon) drums are also stored outside the south wall of the warehouse on a rack four drums high (on side). Sprinklers have been provided under the canopy over this rack.

NOTE: There are electric lift trucks in use which are suitable for the occupancy.

1960/1965 Manufacturing/Mixing Building: This building (of all metal construction with fibreglass interior insulation walls and ceilings in a thin plastic vinyl sheathing), is used for manufacturing paint, blending varnish and shellac and filling various containers of solvents for resale.

Mixing is done in vats 227.5 L (50 gallons) to 2,275 L (500 gallons) in capacity. The vats have covers and ducted ventilation by two fans to the outdoors. Electrical equipment is Class I, Group D, Division I and mixing machinery is grounded. Bulk solvents (Naphtha, Mineral Spirits, Xylol, isopropyl alcohol, "Solvesso 100" and Toluol) are stored in underground tanks outside the building. The tank pumps are located at ground level. Switches for the pumps are located near the dispensing area and have pilot lamps.

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The solvent dispensing lines have fusible link equipped nozzles that can shut-off automatically in the event of fire. Two 13,650 L (3,000 gallon) resin tanks (mineral spirit solvent) are kept in the manufacturing area.

Pigments are ground in four ball mills. Occasionally, small batches of special paints are mixed using Nitrocellulose in 30% Isopropyl Alcohol. When this operation is carried out, the entire 204.8 L (45 gallon) drum of Nitrocellulose is used. Approximately 15% of the paint manufactured is water-based type.

NOTE: Paint is mainly industrial paint for traffic marking purposes (lining of highways).

1948/1955 Finished Goods Warehouse: This concrete block/wood joist building is attached to the Manufacturing Building by a 20.3cm (8") concrete block party wall with a fire door which would likely be of little value. The 1948/1955 areas of the building have two 11,355 L (3,000 gallon) dyked tanks of resin.

The 1955 Warehouse Section, 7m x 28.1m (23' x 92') (separated by a 20.3cm (8") concrete block wall with several openings) is used for storage of one 1.2m (4') wide rack of miscellaneous storage including 22.8 L (5 gallon) cans of paint and several skids of 4.6 L (1 gallon) cans of Alcohol, Xylene, Shellac and Mineral Spirits.

The 1948 Warehouse Section, 18.9m x 29.6m (62' x 97') is used for storage of finished goods on a single rack and several double racks separated by a 0.3m (1') space. Stock is stored up to 3.7m (12') high and consists of Class I and II flammables and combustibles (in 22.7 L (5 gallon) sealed containers, as well as Class III combustible paints or Latex Paints of various sizes). The floor level tier of the rack has 1.5m (5') high storage of 22.7 L (5 gallon) containers of flammables with the top tier mainly used for storage of laboratory 4.5 L (1 gallon) samples of flammable paint.

The required ceiling sprinkler discharge density for 1.5m (5') high storage of Class I flammables is 16.30 mm/min (0.40 U.S. g.p.m./sq. ft.) over 279 sq. m (3,000 sq. ft.) and for 3.7m (12') of Class II flammables and combustibles is 12.23 mm/min (0.30 U.S. g.p.m./sq. ft.) over 279 sq. m (3,000 sq. ft.). Class III combustible liquids require a ceiling sprinkler density of 10.19 mm/min (0.25 U.S. g.p.m./sq. ft.) over 278.7 sq. m (3,000 sq. ft.), this is available. However, "in-rack" sprinkler protection is also required (Recommendation made).

A small Quality Control Laboratory is located on the second floor of the office area. A small amount of spray painting of sample metal strips is carried out in a small sprinklered spray booth. One hundred ordinary metal 4.6 L (1 gallon) (with screw on type tops) cans of various low flash point solvents are stored in a separate, well ventilated room. Sample painted strips are baked in five small electric ovens. Electrical equipment in the laboratory is suitable for occupancy.

The area below the laboratory is used for offices and for a retail/ wolesale outlet.

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MAINTENANCE WELDING: No

PROTECTION

SPRINKLER PROTECTION:

(i) 99% Area Sprinklered 100% Wet

Sprinkler Installation Date: 100%: 1976

Yes

Yes

No

All sprinklers are 1976, 14mm (17/32"), 141C. (286F.) with 13mm (1/2") pipe thread. The sprinkler system was installed in 1960, 1962, 1965 and 1970 and updated in 1976.

Protection Against Freezing: The 125mm (5") sprinkler feed main between the 1965 and 1970 buildings is insulated and electrically traced. The electric power is supervised and connected to the Hamilton central station of ADT Security Systems. Also, five areas subject to freezing are protected by standard cold weather (anti-freeze) systems.

Sprinkler Protection Required: - In the 1948 building there are seven racks from 1m to 2.4m
(3.5' to 8') wide and from 9.2m to 18.4m (30' to 60') long that require "in-rack" sprinkler protection.

- The 1955 building has a 1.2m x 18.4m (4' x 60') rack that requires "in-rack" sprinklers.

Alarms: Underwriters' Laboratories of Canada listed full central station supervisory service and local alarms

Consist of the Underwriters' Laboratories of Canada listed full supervisory service of ADT Security Systems connected to their Hamilton central station and includes supervision of the fire pump power supplies and "pump running" condition as well as local inside electric bell and outside water motor gong (Grading = 20%).

Primary Water Supplies: Municipal - Fair

Secondary Water Supplies: Provided - None Required - No

ADDITIONAL SPRINKLER PROTECTION DETAILS:

(a) Overall Grading: Fair

ENVIROSCAN Report

Inspection Report - 1989 NIAGARA PAINT AND CHEMICAL CO 2 HILLYARD ST HAMILTON ON L8L 6B1 Reference No: 10601352

Requested by:
Eleanor Goolab
Date Completed: December 20, 2016 07:09:31

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Yes

Fire Department Pumper Connection: Yes

(b) Other

1948/1955 Warehouse: Ordinary hazard pipe sizes with 7.3 sq. m (78 sq. ft.) to 7.8 sq. m (84 sq. ft.) spacing per sprinkler. (This provides an average density of 16.3 mm/min (0.40 U.S. g.p.m./sq. ft.) over 279 sq. m (3,000 sq. ft.)).

1960/1965 Manufacturing and 1970 Warehouse: Extra hazard pipe sizing and 7.4 sq. m (80 sq. ft.) pipe sizing. (This provides an average density of 12.23 mm/min (0.30 U.S. g.p.m./sq. ft.) over 372 sq. m (4,000 sq. ft.) for the 1960/1965 manufacturing area and an average density of 16.3 mm/min (0.40 U.S. g.p.m./sq. ft.) over 279 sq. m (3,000 sq. ft.) for the 1970 warehouse).

NOTE: All sprinklers are 14mm (17/32"), 141C. (286F.) with 12mm (1/2") thread of about 1976 issue.

OTHER PROTECTION:

Extinguishers: Standard

Standpipe and Hose: None

Watchman Service: None

Special Equipment: Non-Standard

Outside

The solvent wash tank in the manufacturing area is protected by a non-standard installation comprising three 2.3 kg (5 lb.) Underwriters' Laboratories labelled dry chemical extinguishing units hung above the wash tank. The units are activated by fusible links only and are not considered to be a standard installation.

OUTSIDE PROTECTION:

Public Hydrants: Non-Standard

There is only one public fire hydrant within 152.5m (500'), located within 15.3m (50') from the building. There is also a private fire hydrant located approximately 12.2m (40') south of the building (separated by a wired fence).

Private Hydrants: None

Public Fire Department: Paid Distance to Fire Hall 0.8 km (1/2 mile)

Private Fire Department: No

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Accessibility: To Property: Fair

Into Building: Good

To property is only fair due to the street being dead ended and there being a railway spur crossing on the dead end street. Also, the plant is fenced.

EXTENDED COVERAGE

WINDSTORM - No

LIGHTNING (FEATURES) - No

LIGHTNING (GROUNDED) - Yes

EXPLOSION - Yes

Skidded or Shelved Yes

Floors: Drained Yes

Inherent in the mixing of paints using volatile solvents.

RIOT, VANDALISM, MALICIOUS ACTS

Access Restricted: Yes

Access to premises is restricted by a burglar alarm system connected to the Hamilton central station of ADT. Yards are fenced.

Guard Supervised: No Yards Lit

Remote from Populated Areas: Yes

IMPACT HAZARDS:

BUSINESS INTERRUPTION

6(d) Raw materials are 15% foreign and 85% domestic. Vital machinery custom built and of foreign origin, would likely take up to 1 year to replace. The quality Control Laboratory is vital to operations in order to maintain control over product. Loss of the laboratory would mean making other arrangements for quality control however, plant could continue to manufacture regular products.

Seasonal: No

< SR04363 / 060135 / 10601352 >

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Operational: 8 Hrs/Day 5 Days/Wk.

Interdependency: No

Raw Materials: Domestic

Stock On Hand: 1 month

Stock Replacement Time: 1 week to 1 month

Computer Programming: No

Single Train Production: No

Vital Machinery Custom Made: No

Replacement Time: Up to 3 months

Replacement Time: No

Private Power Generation: No

Alternate Power Generation: No

ADDITIONAL BUSINESS INTERRUPTION DETAILS:

No

UNDESIRABLE FEATURES

PROMINENT:

None.

OTHER:

- Inherent weakness in water supply due to there being only one electric powered booster fire pump.
- Accessibility is limited due to dead end street with railway spur crossing. Also is limited due to wire fences.
- Hydrant protection is only fair due to only one public fire hydrant within 152.5m (500').
- Three 27,300 L (6,000 gallon) Alkyd Resin tanks located indoors without adequate emergency venting (Recommendation 75-5 is being held in "Withdrawn Recommendations").
- "In-rack" sprinklers are required in the finished goods warehouse.

REPORT DETAILS

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ENVIROSCAN Report

Inspection Report - 1989 NIAGARA PAINT AND CHEMICAL CO 2 HILLYARD ST HAMILTON ON L8L 6B1 Reference No: 10601352

Requested by:
Eleanor Goolab
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MANAGEMENT - LOSS PREVENTION PROGRAMMES

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DATA PROCESSING REPORT

Map Checked: Yes Corr.: No

Sh. 105 Bl. 712

SPECIAL RISKS

Name of Risk: Niagara Paint & Chemical Company Limited

Location: 2 Hillyard Street, Hamilton, Ontario

Surveyed by: Walter Haraschuk Date: December 4, 1989

DATA PROCESSING OPERATIONS SURVEY

Portable and Miniature Computers

NAME OF USER: Niagara Paint & Chemical Company Limited

EQUIPMENT: Digital PDP 11/23, Applied Color Systems Incorporated colour sensor, two printers and four VDT's. Also a NEC Astra with five terminals and three printers.

EQUIPMENT USED FOR: The Digital computer is used for technical analysis of colour, paint formulation, laboratory quality control and production reports. The Astra Computer is used for accounting procedures, inventory control, sales orders, and invoicing.

Effect on Insured and replacement time: Should not be severe - information can be processed on other similar equipment provided data is not lost.

EQUIPMENT OWNED BY USER

APPROXIMATE VALUE: Not applicable.

RECORDS/TAPES STORED: One copy of all records is stored inside the EDP room,

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one copy is stored inside the pump room and one copy is stored off premises.

GENERAL: The Digital computer equipment is located on the second floor room adjacent to the laboratory in a fairly well shut-off sprinklered laboratory room. Interior walls and ceiling are plasterboard. The room is on an outside

wall with ordinary glass in wood frame facing the parking lot. Equipment can be readily shutdown by pull-out on accessible plug. All wiring is exposed. There is separate air-conditioning located on the roof. Good care and cleanliness.An adequate, suitable fire extinguisher is provided.

The Astra Computer is located on the first floor of the 1948 warehouse in the separate sprinkler room.

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MULTIPLE FIRE SECTION [1] SHEET:

LOCATION / BUILDING NO.1 & 2

PERCENT SPRINKLERED:99% A.S.

OCCUPANCY: Offices, laboratory, finished goods storage and manufacturing of paints

OPINION OF RISK:

BUILT IN: 1948

Additions: 1955, 1960 and 1965

Repair: Good

HEIGHT: 1 & 2 Sto.(s) = 3.4m to 5.8m (11' to 19')

Basement: None

WALLS: Construction: 55% concrete block; 30% steel frame metal clad; 15% wood frame.

Type of Walls: Independent, Bearing, Non-bearing

FLOORS: 88% concrete on grade; 12% wood joist

ROOF: 61% wood joist; 39% metal on steel

AREA:

Grade:	1,362.5 sq. m (14,666 sq. ft.)
Total:	1,747.1 sq. m (18,806 sq. ft.)
Separation Walls:	20.3cm (8") concrete block wall separates manufacturing area from storage area. This includes also a fire door.

VERTICAL OPENINGS: Partially shut-off

Elevators: None

INTERIOR FINISH - Walls: Mainly open except non-combustible in offices.

INTERIOR FINISH - Ceilings: Mainly open except non-combustible in offices

EXTERIOR FINISH - Walls:

EXTERIOR FINISH - Ceilings:

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COMBUSTIBLE CONCEALED SPACES: None

NON-COMBUSTABLE CONCEALED SPACES:

SPRINKLER PROTECTION:

ADDITIONAL CONSTRUCTION DETAILS

SMOKE AND HEAT VENTING: Three electrically powered roof mounted

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MULTIPLE FIRE SECTION [2] SHEET:

LOCATION / BUILDING NO.A (Letter denotes one fire division area).

PERCENT SPRINKLERED:100% A.S.

OCCUPANCY:

OPINION OF RISK:

BUILT IN: 1970

Additions:

Repair:

HEIGHT:

Basement:

WALLS: Construction:

Type of Walls:

FLOORS:

ROOF:

AREA:

Grade: 637.3 sq. m (6,860 sq. ft.)

Total: 637.3 sq. m (6,860 sq. ft.)

Separation Walls:

VERTICAL OPENINGS:

Elevators:

INTERIOR FINISH - Walls:

INTERIOR FINISH - Ceilings:

EXTERIOR FINISH - Walls:

EXTERIOR FINISH - Ceilings:

COMBUSTIBLE CONCEALED SPACES:

NON-COMBUSTABLE CONCEALED SPACES:

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SPRINKLER PROTECTION: 69 (EF) x 81 (RF) x 90 (AT) = 50

ADDITIONAL CONSTRUCTION DETAILS

fans are installed above mixing areas in the paint manufacturing

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MULTIPLE FIRE SECTION [3] SHEET:

LOCATION / BUILDING NO.

PERCENT SPRINKLERED:0% A.S.

OCCUPANCY: Warehouse of pigments and bulk tanks of resin (toluol solvent)

OPINION OF RISK:

BUILT IN: 1988

Additions:

Repair: Good

HEIGHT:

Basement: None

WALLS: Construction: Steel frame metal clad

Type of Walls: Independent, Non-bearing

FLOORS:

ROOF:

AREA:

Grade: 21.7 sq. m (234 sq. ft.)

Total: 21.7 sq. m (234 sq. ft.)

Separation Walls: None

VERTICAL OPENINGS: None

Elevators: None

INTERIOR FINISH - Walls: Open

INTERIOR FINISH - Ceilings: Open

EXTERIOR FINISH - Walls:

EXTERIOR FINISH - Ceilings:

COMBUSTIBLE CONCEALED SPACES: None

NON-COMBUSTABLE CONCEALED SPACES:

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SPRINKLER PROTECTION: 100 100

ADDITIONAL CONSTRUCTION DETAILS

area. Two floor fans take suction from ducts from surface of the mixing vats. There is also ordinary glass and metal and wooden sash windows at the perimeter walls.

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COPE (Construction, Occupancy, Protection, Exposure) REPORT

Risk: NIAGARA PAINT & CHEMICAL CO LTD
2 HILLYARD ST
(BLDGS 1 & 2)
HAMILTON,ONTARIO
L8L 7W4

Reference No. 10601352 / Building No. 01 PAINT MFG/FINISHED GOODS

(Surveyed By W HARASCHUK on 04-DEC-89)

Please note that the information contained in this report was gathered during a physical inspection of the risk by an IAO Loss Control Representative.

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------ CODING ------

Industry Code:	287	- Chemicals - Low to moderate hazard (N.O.C.)
Construction Code:	4	- Masonry
Risk Classification:	AS	- Automatic Sprinklers
Protection Code:	6	- Sprinklered, Fully Protected, Gr 1-2
Combustibility	H5	

------ CONSTRUCTION ------

WALLS - MASONRY:
55% CB WALLS 200mm Thick C-2 Type: W-1

NON COMBUSTIBLE WALLS:
30% S.F.M.C. WALLS

WALLS - COMBUSTIBLE:
15% WOOD FRAME WALLS C-2

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MASONRY and FIRE RESISTIVE FLOOR and ROOFS:
44% CONC FLOOR Hours: 2.00 Listed? U Type: D-1

NON-COMBUSTIBLE FLOORS and ROOFS:
17% METAL ON STEEL ROOF C-4

FLOORS & ROOFS - COMBUSTIBLE:
39% WD FLOOR AND ROOF C-2

------ SECONDARY CONSTRUCTION ------

HEIGHT:
Number of Storeys: 1&
Basements: N

Combustible Storeys Without Grade Access: 0

VERTICAL OPENINGS:
1ST-2ND OPEN Comb.: H5 Const.: 4
Type: Open (V-4) 0 Hrs-Walls/ 0 Hrs-Doors

AREA:

Grade: 1363 m2 Total: 1747 m2 Effective: 1747 m2

L1, L2 Area 0%

ROOF SURFACE:
100 % APPROVED

BUILDING CONDITION:
GOOD Type C-.

Year Built: 1948/5 Air Conditioning: 11%

Basement: NIL

Elevators: NIL

COMMON HAZARDS: 7211A2 - HOT AIR GAS FIRED
7211C1 - UNIT HEATER GAS FIRED

------ PROTECTION ------

MUNICIPAL PROTECTION:
Distance from Hydrants: NON STANDA Congested Area: NO
Distance to Fire Hall: STANDARD (Accessibility: FAIR
FUS Protection Class: 04
Revised Class: 06
IAO Protection Class: 06

INTERNAL PROTECTION:
MANUAL FIRE FIGHTING EQUIPMENT: Portable Fire Extinguishers
Standpipe and Hose

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STANDARD AUTOMATIC SPRINKLERS:
EF: 69 X RF: 81/100 X AT: 90/100 = Final 50

AUTOMATIC SPRINKLER ALARMS:
ADT CENTRAL STATION

------ EXPOSURE ------

NONE NOTED:
------ OCCUPANCY - NIAGARA PAINT & CHEMICAL CO LTD ------

Industry Code: 287 - Chemicals - Low to moderate hazard (N.O.C.)

Occupancy: 6014E - PAINT MFG

Location: 1 Area: 1728 m2 100.0% of Total

Combustibility Code: H5 - Rapid/Flash Burning
Susceptibility Code: S5 - Extreme Loss

Special Hazard: 7303C1B - SPRAY PAINTING IN LAB
7308D1 - LAB OVENS

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COPE (Construction, Occupancy, Protection, Exposure) REPORT

Risk: NIAGARA PAINT & CHEMICAL CO LTD
2 HILLYARD ST
HAMILTON,ONTARIO
L8L 7W4

Reference No. 10601352 / Building No. 02 PAINT & RAW MATERIALS

(Surveyed By W. HARASCHUK on 11 SEP 86)

Please note that the information contained in this report was gathered during a physical inspection of the risk by an IAO Loss Control Representative.

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------ CODING ------

Industry Code:	287	- Chemicals - Low to moderate hazard (N.O.C.)
Construction Code:	3	- Masonry
Risk Classification:	AS	- Automatic Sprinklers
Protection Code:	6	- Sprinklered, Fully Protected, Gr 1-2
Combustibility	H5	

------ CONSTRUCTION ------

NON COMBUSTIBLE WALLS:
100% SFMC WALLS

MASONRY and FIRE RESISTIVE FLOOR and ROOFS:
50% CONC GRADE FLOOR Hours: 2.00 Listed? U Type: D-1

NON-COMBUSTIBLE FLOORS and ROOFS:
50% METAL ON STEEL ROOF C-4

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------ SECONDARY CONSTRUCTION ------

HEIGHT:
Number of Storeys: 1
Basements: N

Combustible Storeys Without Grade Access: 0

VERTICAL OPENINGS:
N/A Comb.: H5 Const.: 3
Type: *** Unknown Message Code *** '30.'E'

AREA:

Grade: 637 m2 Total: 637 m2 Effective: 637 m2

L1, L2 Area 0%

ROOF SURFACE:
100 % APPROVED

BUILDING CONDITION:
GOOD Type C-.

Year Built: 1970 Air Conditioning: NIL

Basement: NIL

Elevators: NIL

COMMON HAZARDS: 7211C1 - UNIT HEATER GAS FIRED

------ PROTECTION ------

MUNICIPAL PROTECTION:
Distance from Hydrants: NON STANDA Congested Area: NO
Distance to Fire Hall: STANDARD Accessibility: GOOD
FUS Protection Class: 04
Revised Class: 05
IAO Protection Class: 05

INTERNAL PROTECTION:
MANUAL FIRE FIGHTING EQUIPMENT: Portable Fire Extinguishers
Standpipe and Hose

STANDARD AUTOMATIC SPRINKLERS:
EF: 78 X RF: 81/100 X AT: 100/100 = Final 63

AUTOMATIC SPRINKLER ALARMS:
ADT CENTRAL STATION

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------ EXPOSURE ------

NONE NOTED:

------ OCCUPANCY - NIAGARA PAINT & CHEMICAL CO LTD ------

Industry Code: 287 - Chemicals - Low to moderate hazard (N.O.C.)

Occupancy: 5414C - PAINT RAW MATERIALS STGE

Location: 2 Area: 637 m2 100.0% of Total

Combustibility Code: H5 - Rapid/Flash Burning
Susceptibility Code: S5 - Extreme Loss

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Risk: NIAGARA PAINT & CHEMICAL CO LTD
2 HILLYARD ST
HAMILTON,ONTARIO
L8L 7W4

Reference No. 10601352 / Building No. 03 RESIN & RAW MATERIALS

(Surveyed By W HARASCHUK on 04-DEC-89)

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------ CODING ------

Industry Code: 287 - Chemicals - Low to moderate hazard (N.O.C.)
Construction Code: 3 - Masonry
Risk Classification: AS - Automatic Sprinklers
Protection Code: 6 - Sprinklered, Fully Protected, Gr 1-2
Combustibility H5

------ CONSTRUCTION ------

NON COMBUSTIBLE WALLS:
100% SFMC WALLS

MASONRY and FIRE RESISTIVE FLOOR and ROOFS:
50% CONC GRADE FLOOR Hours: 2.00 Listed? U Type: D-1

NON-COMBUSTIBLE FLOORS and ROOFS:
50% METAL ON STEEL ROOF C-4

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------ SECONDARY CONSTRUCTION ------

HEIGHT:
Number of Storeys: 1
Basements: N

Combustible Storeys Without Grade Access: 0

VERTICAL OPENINGS:
N/A Comb.: H5 Const.: 3
Type: *** Unknown Message Code *** '30.'E'

AREA:

Grade: 637 m2 Total: 637 m2 Effective: 637 m2

L1, L2 Area 0%

ROOF SURFACE:
100 % APPROVED

BUILDING CONDITION:
GOOD Type C-.

Year Built: 1970 Air Conditioning: NIL

Basement: NIL

Elevators: NIL

COMMON HAZARDS: 7211C1 - UNIT HEATER GAS FIRED

------ PROTECTION ------

MUNICIPAL PROTECTION:
Distance from Hydrants: NON STANDA Congested Area: NO
Distance to Fire Hall: STANDARD (Accessibility: FAIR
FUS Protection Class: 04
Revised Class: 06
IAO Protection Class: 06

INTERNAL PROTECTION:
MANUAL FIRE FIGHTING EQUIPMENT: Portable Fire Extinguishers
Standpipe and Hose

STANDARD AUTOMATIC SPRINKLERS:
EF: 100 X RF: 100/100 X AT: 100/100 = Final 100

AUTOMATIC SPRINKLER ALARMS:
ADT CENTRAL STATION

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------ EXPOSURE ------

NONE NOTED:

------ OCCUPANCY - NIAGARA PAINT & CHEMICAL CO LTD ------

Industry Code: 287 - Chemicals - Low to moderate hazard (N.O.C.)

Occupancy: 5414C - PAINT RAW MATERIALS STGE

Location: 2 Area: 637 m2 100.0% of Total

Combustibility Code: H5 - Rapid/Flash Burning
Susceptibility Code: S5 - Extreme Loss

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N W E S

AIS Ref No.: 10601352

INSURERS' ADVISORY ORGANIZATION 2008-Nov-04
CONFIDENTIAL - FOR USE OF MEMBERS ONLY 14:25 [Tue]
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COPE (Construction, Occupancy, Protection, Exposure) REPORT

Risk: NIAGARA PAINT & CHEMICAL LTD
2 HILLYARD STREET
HAMILTON, ONTARIO
?

Reference No. 10601352 / Building No. 04 COMPRESSOR SHED

(Surveyed By W HARASCHUK on 04-DEC-89)

Please note that the information contained in this report was gathered during a physical inspection of the risk by an IAO Loss Control Representative.

If you wish to obtain building or contents rates for this risk, please refer to the Rate Card in the list of products available for this risk. Please call the IAO Help Desk or your local IAO Representative for help in obtaining a rate for this risk, or do it yourself by going to www.iao.ca and using the New X-rate to generate a new rate yourself.

IAO reports, prepared in compliance with commonly accepted risk control standards existing at the time services are rendered, are developed from an inspection of the premises and/or from data supplied by or on behalf of the Purchaser. IAO does not purport to list all hazards. While changes and modifications referred to in the reports are designed to upgrade protection and loss prevention of the premises, IAO assumes no responsibility for management and control of these activities. IAO will not be responsible to the Purchaser for any loss or damages, whether consequential or other, however caused, incurred or suffered, as a result of the service being provided.

------ CODING ------

Industry Code:	287	- Chemicals - Low to moderate hazard (N.O.C.)
Construction Code:	6	- Masonry
Risk Classification:	AS	- Automatic Sprinklers
Protection Code:	1	- Sprinklered, Fully Protected, Gr 1-2
Combustibility	L2	

------ CONSTRUCTION ------

WALLS - COMBUSTIBLE:
100% M.C.W.F. WALLS C-2

MASONRY and FIRE RESISTIVE FLOOR and ROOFS:
50% GRADE FLOOR CONCRETE Hours: 0.00 Listed? . Type: D-1

FLOORS & ROOFS - COMBUSTIBLE:
50% METAL/WOOD JOIST ROOF C-2

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ENVIROSCAN Report

COPE Report - 1990 NIAGARA PAINT AND CHEMICAL CO 2 HILLYARD ST HAMILTON ON L8L 6B1 Reference No: 10601352

Requested by: Eleanor Goolab
Date Completed: December 20, 2016 07:09:31

OPTA INFORMATION INTELLIGENCE

AIS Ref No.: 10601352

1990

------ SECONDARY CONSTRUCTION ------

HEIGHT:
Number of Storeys: 1
Basements: N

Combustible Storeys Without Grade Access: 0

AREA:

Grade: 22 m2 Total: 22 m2 Effective: 22 m2

L1, L2 Area 0%

ROOF SURFACE:
100 % APPROVED

BUILDING CONDITION:
GOOD Type C-.

Year Built: 1988 Air Conditioning: NIL

Basement: NIL

Elevators: NIL

COMMON HAZARDS: 721 - NO HEAT

------ PROTECTION ------

MUNICIPAL PROTECTION:
Distance from Hydrants: NON-STANDA Congested Area: NO
Distance to Fire Hall: STANDARD (Accessibility: FAIR
FUS Protection Class: 02
Revised Class: 04
IAO Protection Class: 04

INTERNAL PROTECTION:
MANUAL FIRE FIGHTING EQUIPMENT: Portable Fire Extinguishers
Standpipe and Hose

------ EXPOSURE ------

NONE NOTED:

------ OCCUPANCY - NIAGARA PAINT & CHEMICAL CO LTD ------

Industry Code: 287 - Chemicals - Low to moderate hazard (N.O.C.)

Occupancy: 5451A - AIR COMPRESSOR SHED

Location: 2 Area: 22 m2 100.0% of Total

Combustibility Code: L2 - Limited Combustibility
Susceptibility Code: S2 - Slight Damage

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Inspection Report - 1993 Niagara Paint Chamical CO LTD 2 Hillyard St Hamilton ON L8L8J9

INSURERS' ADVISORY ORGANIZATION
Ontario

CONFIDENTIAL

INSPECTION REPORT

File No. **SR04363**
Reference: 060135

Sheet 205 Block

NAME OF RISK: Niagara Paint & Chemical Co. Ltd.

LOCATION: 2 Hillyard Street
Hamilton, Ontario

SURVEYED BY: Reg Guay

SURVEY DATE: January 5, 1993

GENERAL COMMENTS

OCCUPANCY: Manufacture of paints, enamels and blending of varnish and shellac (no cooking of varnish) with retail and wholesale outlet. Mainly industrial and highway marking paints are manufactured.

CONSTRUCTION

FIRE DIVISIONS: Fire Division: See Multiple Fire Section Sheets.

HAZARDS

COMMON HAZARDS:

Heating: Safe.

Office and laboratory are heated by roof mounted natural gas-furnace/air-conditioning unit.

The detached warehouse is heated by ceiling suspended natural gas-fired unit heaters.

Manufacturing areas are heated by natural gas-fired furnaces located in the open and roof mounted natural gas-fired air make-up units. Fire dampers have been installed in the duct work. The fire booster pump room is heated by an electric heater.

Chimneys and Flues: Standard

Air-Conditioning: Central. 10% Air-Conditioned.

Electrical: Safe.

The electrical system consist of "BX" wiring and rigid conduit encased wiring with circuit breaker (75%) and fuses (25% - Lighting only).

The electrical equipment throughout the vicinity of paint manufacturing and/or processing is of the explosion proof type designed for Class I, Group D, Division I.

SPECIAL HAZARDS: Unsafe

Naphtha, Mineral Spirits, Xylol and Toluol are dispensed in the mixing area from the underground bulk storage tanks. Pumping equipment is located outdoors and is suitable for the location. The dispensing nozzles are equipped with safety shut-off valves with fusible links.

Generally, the mixing and blending operation appears to be safe. Equipment is grounded and electrical equipment is designed for Class I, Group D, Division I locations.

A laboratory on the second floor above the office is well arranged. Electrical equipment is designed for Class I, Group D, Division 1 locations. A number of 4.6 L (1 gallon) metal containers (screw type tops) are used for storing various flammable liquids (solvents) and are safely arranged on metal shelves in a well ventilated room. This room is also designed with explosion venting. Sample metal strips are spray painted in a small sprinklered spray booth equipped with suitable electrical equipment and ventilation. Samples are baked in three small vented electric ovens. A computer is used in the laboratory for quality control and pigment information.

RADIOACTIVE MATERIALS: None

HOUSEKEEPING: Safe

HAZARDOUS MATERIAL: Safe and unsafe.

(1) Approximately 150 - 204.75 L (45 IMP gal) drums of various flammable liquids and solvents (e.g. Butly Cellusolde ISOO 2429, 2020 Varsol, Butly Acetate Methyl Hydrate, Isopropyl, Alcohol, Methyl 150 Butly, ketone, Methyl Ethyl Ketone etc.) with flash points ranging from -6.116 Deg C (21 Deg F) to 43.368 Deg C (110 Deg F) are stored on steel rack beneath a sprinkler canopy at the south end of the detached warehouse building and on a second detached rack, south of the warehouse building.

(2) One 204.75 L (45 IMP gal) drum of Nitro Cellose in 30% Isopropyl Alcohol said to be brought in occasionally, but used entirely for special products
(No explosion hazard provided - a minimum 15% alcohol content).

(3) The following materials are stored in underground tanks

- 25025 L (5500 IMP gal) of Napsa (flash point 10 Deg C to 26.7 Deg C (50 Deg F to 80 Deg F).

- 12353.25 L (2715 IMP gal) of Varsol (flash point 40.032 Deg C (104 Deg F).

- 27300 L (6000 IMP gal) of Zylol (flash point 28.912 Deg C (84 Deg F).

- 10483.2 L (2304 IMP gal) of Toluol (flash point 4.448 Deg C (40 Deg F).

- 15925 L (3500 IMP gal) of Solvesso "100".

- 15925 L (3500 IMP gal) of Isopropyl Alcohol.

- 15925 L (3500 IMP gal) of reclaimed Solvents.

(4) Large quantities of inprocess paints which contain varying amounts of low flash point solvents in open vats 227.5 L to 2275 L (50 gal to 500 gal).

(5) 100 - 4.55 L (1 IMP gal) closed metal containers (ordinary cans) of low flash point flammable liquids and solvents stored in laboratory metal shelves.

(6) Approximately 36400 L (8000 IMP gal) of finished paint in sealed metal containers ranging from 1.1 L to 22.75 L (1 qrt to 5 IMP gal) stored in the 1948 and 1955 warehouse areas (unsafe). "See Process Description".

EXPOSURES:

North: Protection Required: N Protection Provided: N

None

South: Protection Required: N Protection Provided: N

None

East: Protection Required: Y Protection Provided: Y

Moderate with fair protection by ordinary glass in steel frame windows and steel frame wall facing a blank steel frame wall located 6.1 m (20').

West: Protection Required: N Protection Provided: N

Light

ACTIVITY: Busy 8 Hrs/Day 5 Days/Wk

Number of Production Workers: 16

SMOKING RESTRICTED: Yes, smoking is not permitted inside the building.

ELECTRONIC DATA PROCESSING: Yes, additional information is available on request.

PROCESS DESCRIPTION: 1970 Detached 21.4m x 29.9m (70' x 98') Warehouse: This is a Raw Material Warehouse (of all metal construction) with the interior walls and ceilings insulated with fibreglass in a thin plastic vinyl sheathing. Bagged pigments are stored up to 3.7m (12') high, various fillers, wax, empty cans, water base paints, etc.

Three 27,300 L (6,000 gallon) vertical tanks of alkyd resin (having a Toluol Solvent (F.P. 4.4C. (40F.)) are kept in this building. Resin is transferred by pump to the Manufacturing/Mixing Buildings. These tanks do not have adequate emergency venting but are dyke.

Alkyd resin is manufactured by other plants and delivered by tanker truck to the building.

There is outdoor raw materials in 204.8 L (45 gallon) drums, alkyd resins, drying oils and various additives are stored on one sprinklered double row rack, four drums high (on side). These are Class IC to IIIB flammable and combustible liquids having flash points from 26.7C. (80F.) to over 93.4C. (200F.).

Lower flash point solvent items in 204.8 L (45 gallon) drums are also stored outside the south wall of the warehouse on a rack four drums high (on side). Sprinklers have been provided under the canopy over this rack.

NOTE: There are electric lift trucks in use which are suitable for the occupancy.

1960/1965 Manufacturing/Mixing Building: This building (of all metal construction with fibreglass interior insulation walls and ceilings in a thin plastic vinyl sheathing), is used for manufacturing paint, blending varnish and shellac and filling various containers of solvents for resale.

Mixing is done in vats 227.5 L (50 gallons) to 2,275 L (500 gallons) in capacity. The vats have covers and duct ventilation by two fans to the outdoors. Electrical equipment is Class I, Group D, Division I and mixing machinery is grounded. Bulk solvents (Naphtha, Mineral Spirits, Xylol, isopropyl alcohol, "Solvesso 100" and Toluol) are stored in underground tanks outside the building. The tank pumps are located at ground level. Switches for the pumps are located near the dispensing area and have pilot lamps.

The solvent dispensing lines have fusible link equipped nozzles that can shut-off automatically in the event of fire. Two 13,650 L (3,000 gallon) resin tanks (mineral spirit solvent) are kept in the manufacturing area.

Pigments are ground in four ball mills. Occasionally, small batches of special paints are mixed using Nitrocellulose in 30% Isopropyl Alcohol. When this operation is carried out, the entire 204.8 L (45 gallon) drum of Nitrocellulose is used. Approximately 15% of the paint manufactured is water-based type.

NOTE: Paint is mainly industrial paint for traffic marking purposes (lining of highways).

1948/1955 Finished Goods Warehouse: This concrete block/wood joist building is attached to the Manufacturing Building by a 20.3cm (8") concrete block party wall with a fire door which would likely be of little value. The 1948/1955 areas of the building have two 11,355 L (3,000 gallon) dyke tanks of resin.

The 1955 Warehouse Section, 7m x 28.1m (23' x 92') (separated by a 20.3cm (8") concrete block wall with several openings) is used for storage of one 1.2m (4') wide rack of miscellaneous storage including 22.8 L (5 gallon) cans of paint and several skids of 4.6 L (1 gallon) cans of Alcohol, Xylene, Shellac and Mineral Spirits.

The 1948 Warehouse Section, 18.9m x 29.6m (62' x 97') is used for storage of finished goods on a single rack and several double racks separated by a 0.3m (1') space. Stock is stored up to 3.7m (12') high and consists of Class I and II flammables and combustibles (in 22.7 L (5 gallon) sealed containers, as well as Class III combustible paints or Latex Paints of various sizes). The floor level tier of the rack has 1.5m (5') high storage of 22.7 L (5 gallon) containers of flammables with the top tier mainly used for storage of laboratory 4.5 L (1 gallon) samples of flammable paint.

The required ceiling sprinkler discharge density for 1.5m (5') high storage of Class I flammables is 16.30 mm/min (0.40 U.S. g.p.m./sq. ft.) over 279 sq. m (3,000 sq. ft.) and for 3.7m (12') of Class II flammables and combustibles is 12.23 mm/min (0.30 U.S. g.p.m./sq. ft.) over 279 sq. m (3,000 sq. ft.). Class III combustible liquids require a ceiling sprinkler density of 10.19 mm/min (0.25 U.S. g.p.m./sq. ft.) over 278.7 sq. m (3,000 sq. ft.), this is available. However, "in-rack" sprinkler protection is also required (Recommendation made).

A small Quality Control Laboratory is located on the second floor of the office area. A small amount of spray painting of sample metal strips is carried out in a small sprinklered spray booth. One hundred ordinary metal 4.6 L (1 gallon) (with screw on type tops) cans of various low flash point solvents are stored in a separate, well ventilated room. Sample painted strips are baked in five small electric ovens. Electrical equipment in the laboratory is suitable for occupancy.

The area below the laboratory is used for offices and for a retail/ wholesale outlet.

PROTECTION

SPRINKLER PROTECTION:

OVERALL GRADING: See Multiple Fire Section Sheet

Area Sprinklered (excluding concealed spaces): 99% 100 Wet

Sprinkler Installation Date: All sprinklers are 1976, 14mm (17/32"), 141C. (286F.) with 13mm (1/2") pipe thread. The sprinkler system was installed in 1960, 1962, 1965 and 1970 and updated in 1976.

Protection Against Freezing: The 125 mm (5") sprinkler feed main between the 1965 and 1970 buildings is insulated and electrically traced. The electric power is supervised and connected to the Hamilton central station of ADT Security Systems. Also, five areas subject to freezing are protected by standard cold weather (Anti-freeze) systems, however, there is no recent test of the anti-freeze solution (Recommendation made).

Sprinkler Protection Required: Yes, see "Recommendation Letter".

Equipment Standard: No, inrack sprinklers are required in the finished goods storage area (See Recommendation).

Alarms: Full supervisory of "ADT" connected to their ULC listed central station. Local alarms consisting of an outside water gong an inside electric bell. (Grading = 20%).

"ADT" security also monitors the fire pump power supplies and "Pump Running" condition.

Primary Water Supplies: Municipal - Non-standard

Non-standard from a single supply from one 152.4 mm (6") connection to a 152.4 mm (6") and 203.2 mm (8") circulating loop main in Hillyard Street. Static pressure 448.5 kPa (65 psi).

Note: Graded as "Fair" as only one booster pump is provided.

The sprinkler system is provided an ULC listed 3800 L/min (1000 US gpm) at 517.5 kPa (75 psi) automatic starting electrically driven booster fire pump. The power supply is provided by underground lines from the transformer located in the yard connected directly into the switch gear room next to the pump room. The booster pump performed satisfactorily when tested on March 28, 1983.

A water flow test conducted on April 29, 1977 from the test header indicated that 1710 L/min (450 US gpm) at 400.2 kPa (58 psi), 3207.2 L/min (844 US gpm) at 324.3 kPa (47 psi), 4180 L/min (1100 US gpm) at 262.2 kPa (38 psi) are available with a static pressure of 455.4 kPa (66 psi).

The required water supply for this risk 5700 L/min (1500 US gpm) at 310.5 kPa (45 psi) at the base of the riser. This supply is available with the automatic starting booster fire pump which can provide 5700 L/min (1500 US gpm) at 483 kPa (70 psi). The municipal water supply available without the booster fire pump is 5700 L/min (1500 US gpm) at 117.3 kPa (17 psi) at the base of the riser.

Secondary Water Supplies: Provided - None Required - No

ADDITIONAL SPRINKLER PROTECTION DETAILS:

1948/1955 Warehouse:

Ordinary hazard pipe sizes with 7.3 sq. m (78 sq. ft.) to 7.8 sq. m (84 sq. ft.) spacing per sprinkler. This provides an average density of 16.3 mm/min (.4 US gpm/sq ft) over 278.7 m2 (3000 sq ft).

1960/1965 Manufacturing and 1970 Warehouse:

Extra hazard pipe sizing and 7.432 m2 (80 sq ft) pipe sizing. This provides an average density of 12.22 mm/min (.3 US gpm/sq ft) over 371.6 m2 (4000 sq ft) for the 1960/1965 manufacturing area and an average density of 13855 mm/min (340 US gpm/sq ft) over 278.7 m2 (3000 sq ft) for the 1970 warehouse.

Note:

All sprinklers are 14 mm (17/32"), 141.224 Deg C (286 Deg F) with 12 mm (1/2") thread of approximately 1976 issue.

OTHER PROTECTION:

Extinguishers: Standard

Standpipe and Hose: None

Watchman Service: None

Special Equipment: Non-Standard

Outside

The solvent wash tank in the manufacturing area is protected by a non-standard installation comprising three 2.3 kg (5 lb.) Underwriters' Laboratories labelled dry chemical extinguishing units hung above the wash tank. The units are activated by fusible links only and are not considered to be a standard installation.

OUTSIDE PROTECTION:

Public Hydrants: Non-Standard

There is only one public fire hydrant within 152.5m (500'), located within 15.3m (50') from the building. There is also a private fire hydrant located approximately 12.2m (40') south of the building (separated by a wired fence).

Private Hydrants: None

Public Fire Department: Paid Distance to Fire Hall 0.8 km (1/2 mile)

Private Fire Department: No

F.U.S. Municipality Classification: 2

Accessibility: To Property: Fair

Into Building: Good

EXTENDED COVERAGE

No unusual hazards overall.

WINDSTORM - No

LIGHTNING (FEATURES) - No

LIGHTNING (GROUNDED) - Yes

EXPLOSION - Yes

SPRINKLER LEAKAGE - Stock Skidded or Shelved: Yes

Stock Susceptible to Large Water Damage: No

Floors Drained: Yes

RIOT, VANDALISM, MALICIOUS ACTS:

Access Restricted: Yes

There's a burglar alarm system provided and is monitored by "ADT".

Guard Supervised: No

Yards Fenced: Yes

Yards Lit: Yes

Remote from Populated Areas: Yes

EARTHQUAKE - Zone: 0

IMPACT HAZARDS:

By Aircraft: No

By Road Vehicles: No

By Trains: No

By Floating Vessels: No

SMOKE DAMAGE - Susceptibility of stock to smoke damage: Light

BUSINESS INTERRUPTION

Seasonal: No

Operation: 8 Hrs/Day 5 Days/Wk.

Interdependency: No

Raw Materials: mainly domestic

Stock On Hand: 1 month

Stock Replacement Time: 1 week to 1 month

Computer Programming: No

Single Train Production: No

Vital Machinery Custom Made: No

Private Power Generation: No

Alternate Power Generation: No

Pollution Control: No

ADDITIONAL BUSINESS INTERRUPTION DETAILS:

No

UNDESIRABLE FEATURES

PROMINENT:

1. Sprinkler system test and fire booster pump test required. In addition, the anti-freeze solution within the cold weather section should be checked. (Recommendation made).

OTHER:

1. Inherent weakness in water supply due to there being only one electric powered booster fire pump.

2. Accessibility is limited due to dead end street, with railway spur crossing. Also is limited due to wire fencing.

3. Hydrant protection is fair due to only one public fire hydrant within 152.5 m (500').

4. Three 27300 L (6000 IMP gal) Alkyd resin tanks located in doors without adequate emergency venting (Recommendation made).

5. "Inrack" sprinklers are required in the finished goods warehouse.

MANAGEMENT - LOSS PREVENTION PROGRAMMES

Basic Fire Protection:

Control Required: Y Control Exercised: Yes

Fire Protection Equipment Maintenance:

Control Required: Y Control Exercised: No

Preventative Maintenance:

Control Required: Y Control Exercised: y

TENANTS

None.

MULTIPLE FIRE SECTION [1] SHEET:

LOCATION / BUILDING NO. 1 & 2

PERCENT SPRINKLERED: 99%

OCCUPANCY: Offices, laboratory, finished goods storage and manufacturing of paints

BUILT IN: 1948

Additions: 1955, 1960 and 1965

Repair: Good

HEIGHT: 1 & 2 Sto.(s) = 3.4m to 5.8m (11' to 19')

Basement: None

WALLS: Construction: 55% concrete block; 30% steel frame metal clad; 15% wood frame.

Type of Walls: Independent, Bearing, Non-bearing

FLOORS: 88% concrete on grade; 12% wood joist

ROOF: 61% wood joist; 39% metal on steel

AREA:

Grade - 1,362.5 sq. m (14,666 sq. ft.)

Total - 1,747.1 sq. m (18,806 sq. ft.)

Separation Walls: 20.3cm (8") concrete block wall separates manufacturing area from storage area. This includes a non-listed automatic closing fire door.

VERTICAL OPENINGS: Partially shut-off

Elevators: None

INTERIOR FINISH - Walls: Mainly open except non-combustible in offices.

INTERIOR FINISH - Ceilings: Mainly open except non-combustible in offices

COMBUSTIBLE CONCEALED SPACES: None

ADDITIONAL FIRE SECTION DETAILS

76 (EF) x 81/100 (RF) x 50/100 (AT) = 30

MULTIPLE FIRE SECTION [2] SHEET:

LOCATION / BUILDING NO. 3

PERCENT SPRINKLERED: 100%

OCCUPANCY: Warehouse of pigments and bulk tanks of resin (Toluol Solvent).

BUILT IN: 1970

Repair: Good

HEIGHT: 1 Sto.(s) = 6.1 m to 7.32 m (20' to 24')

Basement: None

WALLS: Construction: Steel frame metal clad

Type of Walls: Independent, non-bearing

FLOORS: Concrete on earth

ROOF: Metal on steel; non-combustible

AREA:

Grade - 637.3 sq. m (6,860 sq. ft.)

Total - 637.3 sq. m (6,860 sq. ft.)

Separation Walls: None

VERTICAL OPENINGS: None

Elevators: None

INTERIOR FINISH - Walls: Open

INTERIOR FINISH - Ceilings: Open

COMBUSTIBLE CONCEALED SPACES: None

ADDITIONAL FIRE SECTION DETAILS

100 (EF) x 100/100 (RF) x 50/100 (AT) = 50

MULTIPLE FIRE SECTION [3] SHEET:

LOCATION / BUILDING NO. 4

PERCENT SPRINKLERED: 0%

OCCUPANCY: Compressor Shed

BUILT IN: 1988

Repair: Good

HEIGHT: 1 Sto.(s) = 3m to 3.7m (10' to 12')

Basement: None

WALLS: Construction: Wood frame metal clad

Type of Walls: Independent, Bearing

FLOORS: Concrete on grade

ROOF: Metal on wood joist; non-combustible

AREA:

Grade - 21.7 sq. m (234 sq. ft.)

Total - 21.7 sq. m (234 sq. ft.)

Separation Walls: None

VERTICAL OPENINGS: None

Elevators: None

INTERIOR FINISH - Walls: Open

INTERIOR FINISH - Ceilings: Open

COMBUSTIBLE CONCEALED SPACES: None

ADDITIONAL FIRE SECTION DETAILS

100 (EF) x 100/100 (RF) x 50/100 = 50

RG:/ms 08/02/1993

ENVIROSCAN Report

Siteplan Report - 1986 Niagara Paint Chamical CO LTD 2 Hillyard St Hamilton ON L8L8J9

Requested by:
Eleanor Goolab
Date Completed: December 20, 2016 07:09:31

OPTA INFORMATION INTELLIGENCE

Siteplan Report - 1986 Niagara Paint Chamical CO LTD 2 Hillyard St Hamilton ON L8L8J9

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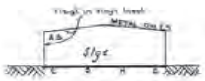
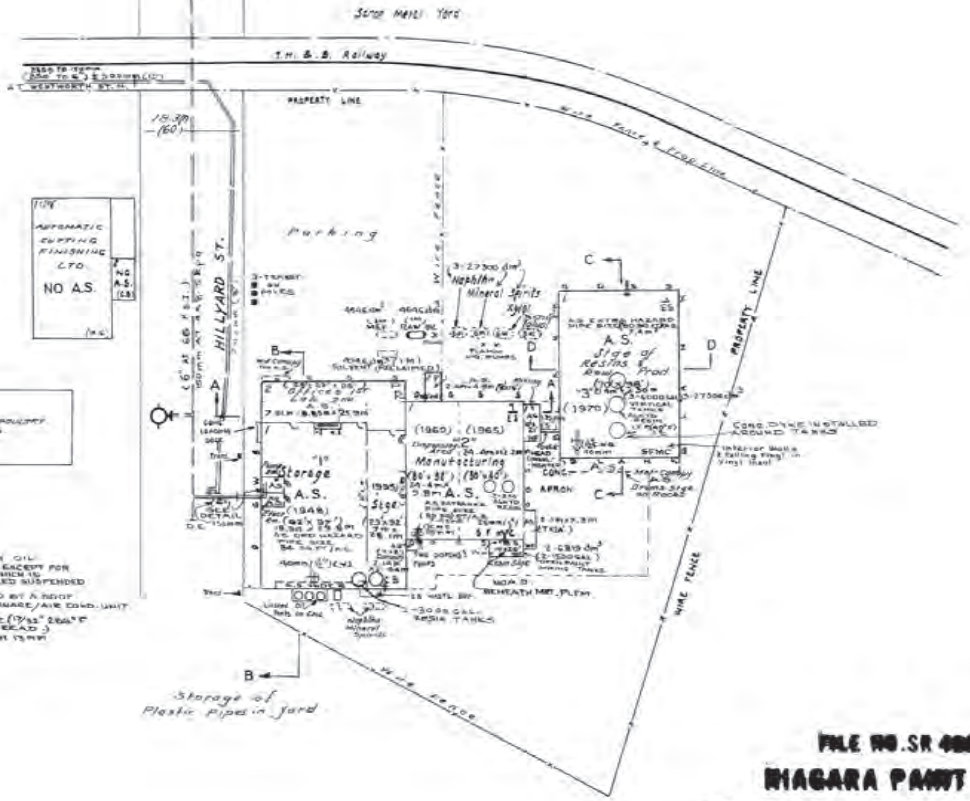
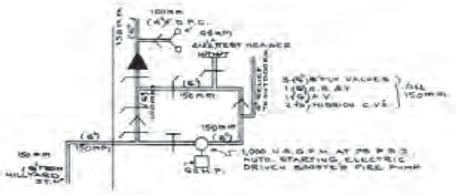
REVISED	
DATE	BY
MARCH 10, 1970	R.T.
JUNE, 1975	G.M.S.
APRIL, 1977	W.H.
MAR. 1984	L-H.
SEPT. 1986	W.H.







PUMP ROOM DETAIL
(N. T. S.)

FILE NO. SR 4884

NIAGARA PAINT AND CHEMICAL COMPANY LIMITED

HAMILTON, ONTARIO

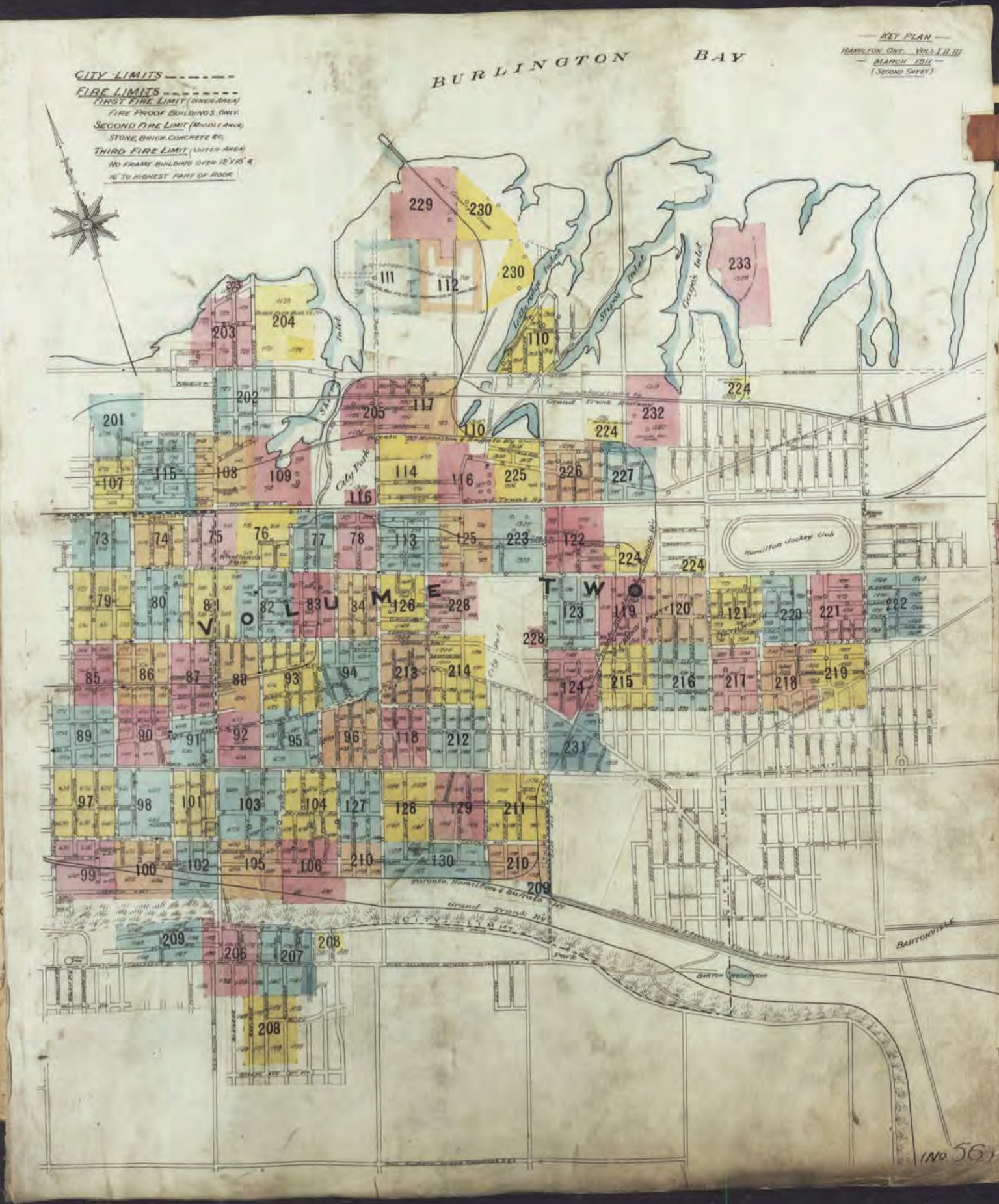
SCALE (1:50) 1:500 DATE APR. 7, 1987. INSP. F.H.

INSURERS' ADVISORY ORGANIZATION

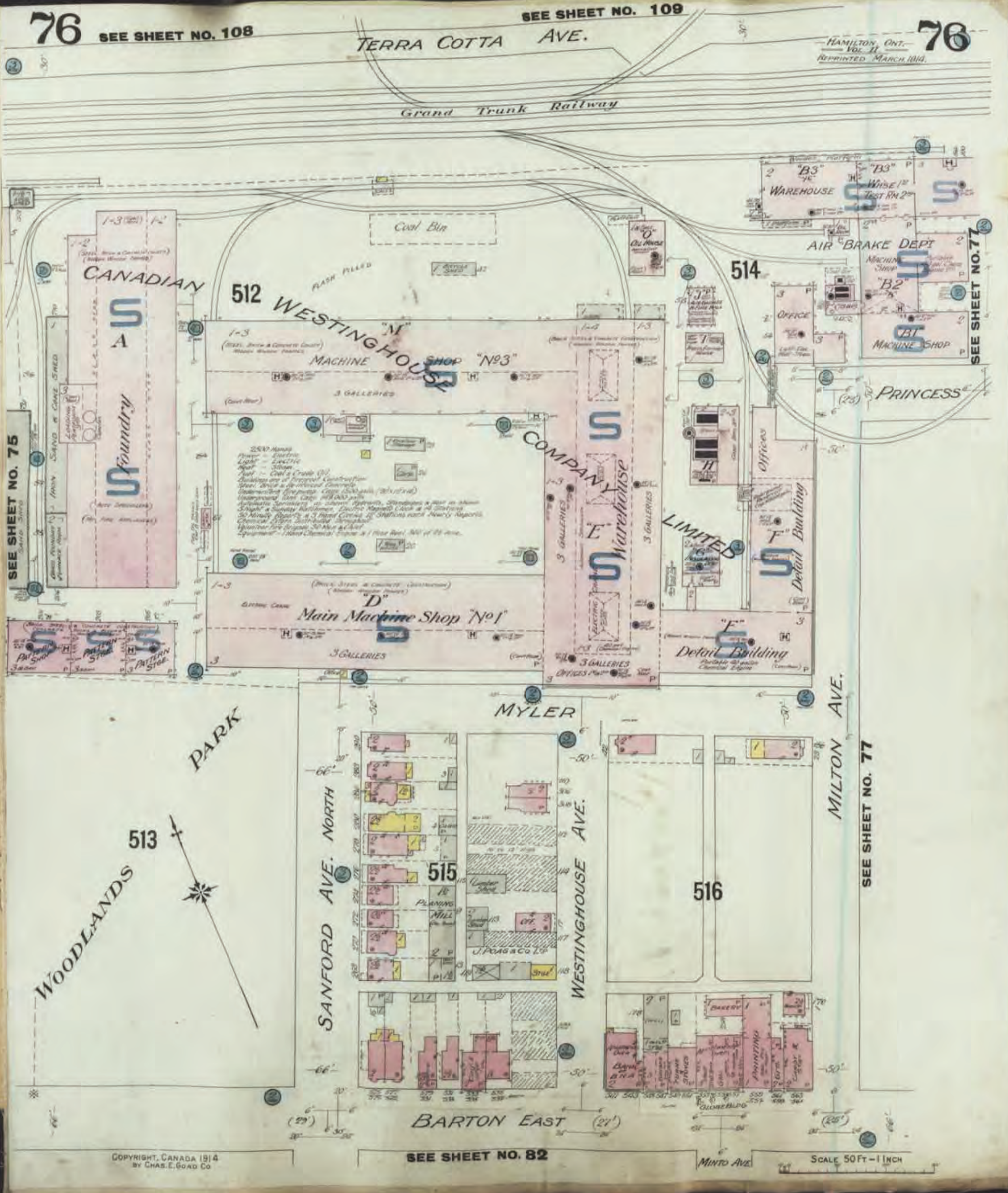
LOSS CONTROL, INSPECTION & ENGINEERING DEP'T

TORONTO

PLAN REFERENCE SHEET NO. 705. BLOCK NO. 712.


BURLINGTON BAY
CITY LIMITS
FIRE LIMITS
FIRST FIRE LIMIT (INNER AREA)
FIRE PROOF BUILDINGS ONLY.
SECOND FIRE LIMIT (MIDDLE AREA)
STONE, BRICK, CONCRETE &c.
THIRD FIRE LIMIT (OUTER AREA)
NO FRAME BUILDING OVER 12' X 16' & 16' TO HIGHEST PART OF ROOF
KEY PLAN
HAMILTON, ONT. VOLS I II III
MARCH 1911
(SECOND SHEET)
VOLUME TWO
Hamilton Jockey Club
City Park
Grand Trunk Ry
Toronto, Hamilton & Buffalo Ry
BARTONVILLE
(No 56)


75
TERRA COTTA AVE.
HAMILTON ONT.
VOL. II
MARCH 1911
75
SEE SHEET NO. 115
SEE SHEET No. 108
Grand Trunk Railway
Southern Division
BIRGE
Queen City Oil Co. Ltd.
Storage
Office
510
Scattered Lumber & Floors
Sand Shed
Lumber Shed
SEE SHEET No. 76
BIRGE
CHEEVER
508
WILLIAM
509
WENTWORTH (NORTH)
SEE SHEET No. 74
511
Woodlands Park
BARTON (EAST)
LEEMING
SEE SHEET No. 81
SCALE 50 FT. - 1 INCH


76
SEE SHEET NO. 108
SEE SHEET NO. 109
TERRA COTTA AVE.
HAMILTON, ONT. VOL. II
REPRINTED MARCH 1914.
76
Grand Trunk Railway
Coal Bin
CANADIAN
512
WESTINGHOUSE
COMPANY
LIMITED
514
"B3" WAREHOUSE
"B3" WHSE 1st TEST RM 2nd
AIR BRAKE DEPT
MACHINE SHOP "B2"
OFFICE
"B1" MACHINE SHOP
SEE SHEET NO. 77
PRINCESS
(25)
"M" MACHINE SHOP "No3"
3 GALLERIES
A
Foundry
IRON SAND & CAKE SHED
SEE SHEET NO. 75
"E" Warehouse
3 GALLERIES
"F" Detail Building
Offices
"D" Main Machine Shop "No1"
3 GALLERIES
"F" Detail Building
PATTERN SHOP
PATTERN STGE
PATTERN STGE
3 GALLERIES
OFFICES
MYLER
PARK
513
WOODLANDS
515
PLANING MILL
J. POAG & CO LTD
SANFORD AVE. NORTH
WESTINGHOUSE AVE.
516
MILTON AVE.
SEE SHEET NO. 77
BAKERY
PAINTING
GLOBE BLDG
BARTON EAST
(29')
(27')
(25')
-66'-
-50'-
-50'-
-66'-
COPYRIGHT, CANADA 1914 BY CHAS. E. GOAD CO.
SEE SHEET NO. 82
MINTO AVE.
SCALE 50 FT - 1 INCH

SEE SHEET Nº 109

HAMILTON ONT.
VOL. II
DEC. 1904

G. T. Ry (Southern Div.)

Toronto, Hamilton & Buffalo Ry siding

Air Brake Dept. Machine Shop Ltd

Westinghouse

Canadian

517

517A

BIRCH AVE.

PRINCESS

SEE SHEET Nº 76

MILTON AVE.

FULLERTON AVE.

519

518

520

BIRCH AVE.

GIBSON AVE. (FORMERLY SHERMAN)

SEE SHEET Nº 78

BARTON ST. PUBLIC SCHOOL

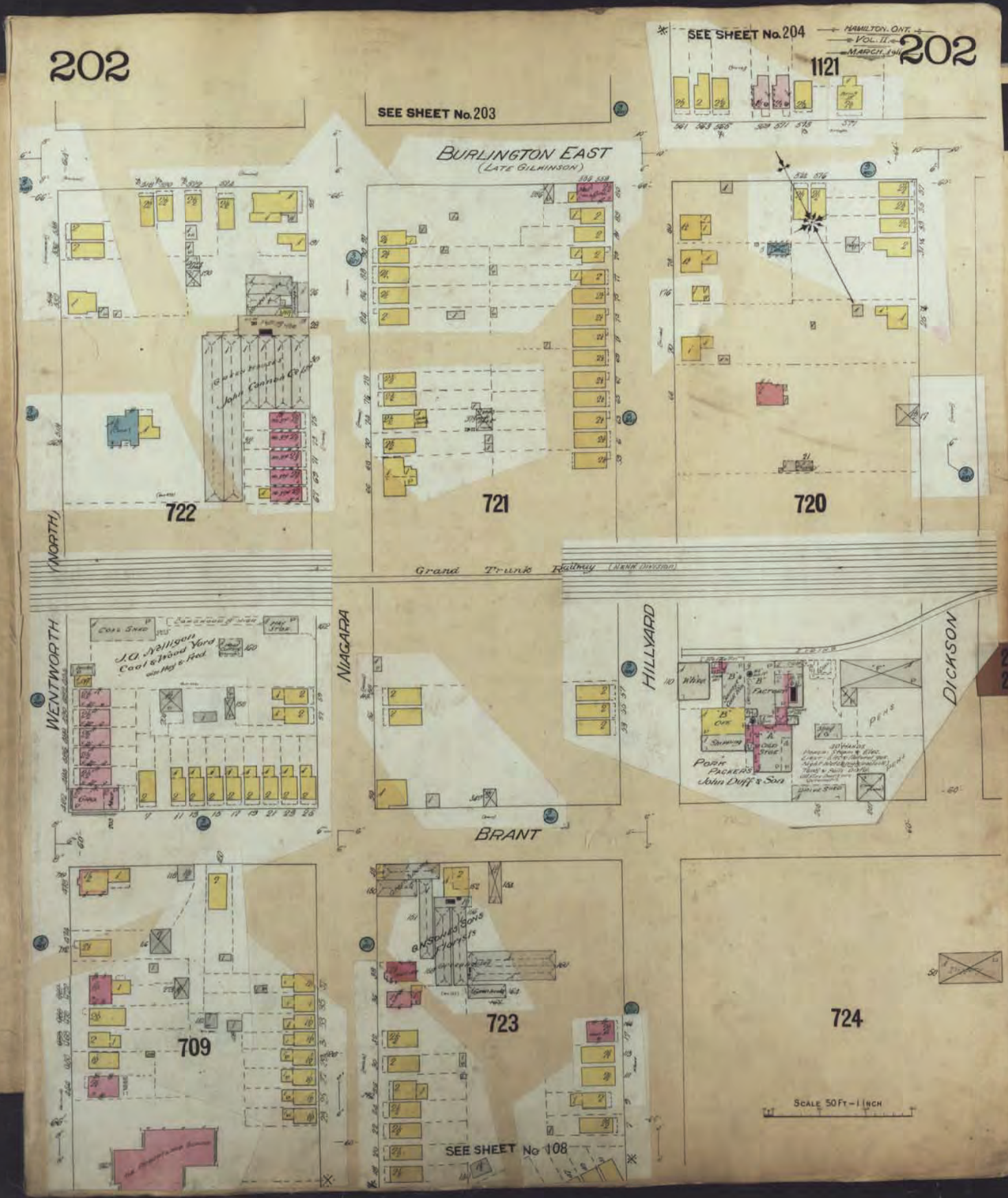
BARTON (EAST)

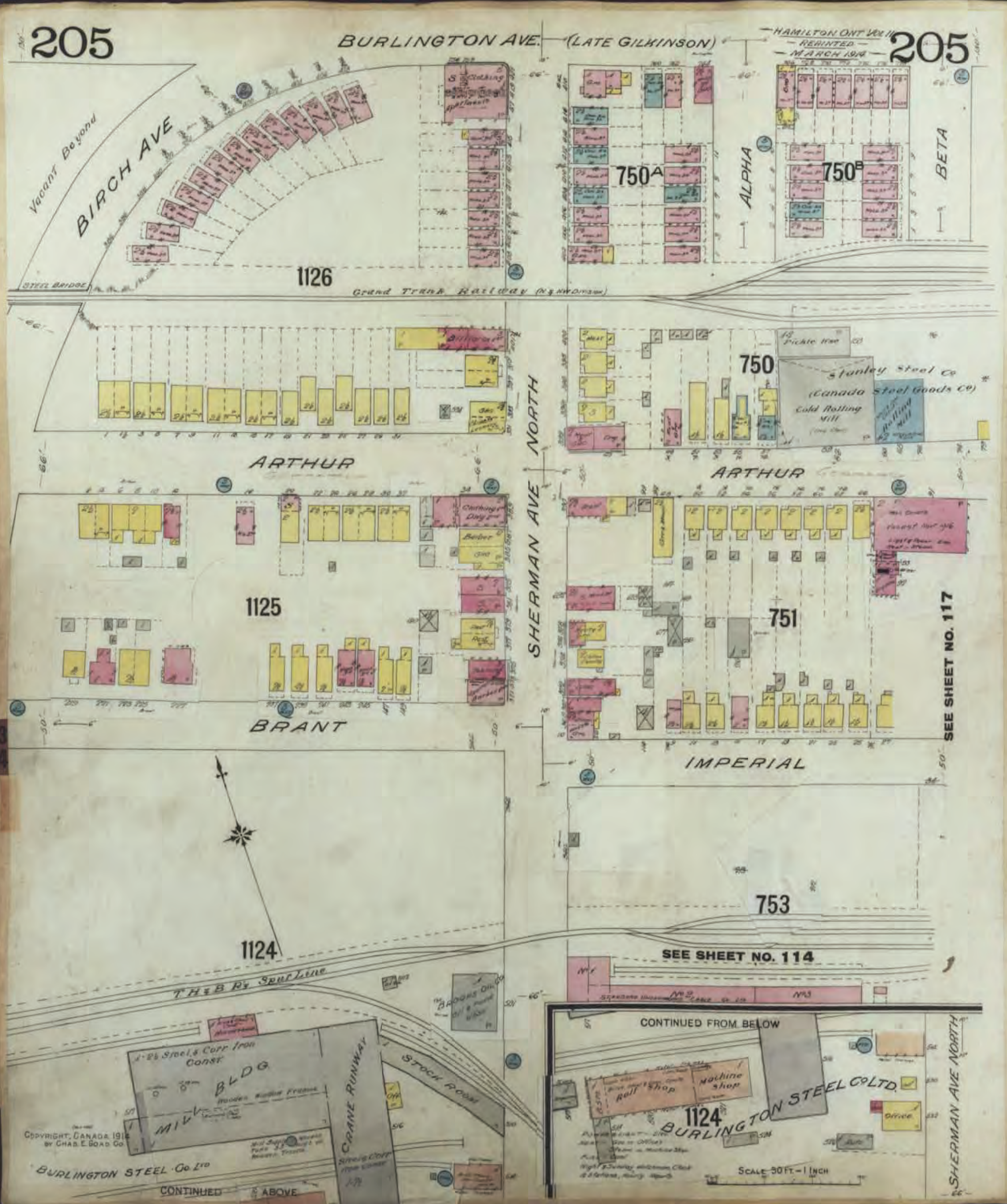
STIRTON AVE.

SEE SHEET Nº 83

108
SEE SHEET NO. 202
HAMILTON ONT. VOL. 2
REPRINTED MAR. 1916
108
723
MARS AVE.
704
The ROBERTLAND SCHOOL
709
NIAGARA
MUNRO AVE.
FRANCIS
705
CANADIAN CARRIERS LTD
EGG CARRIERS FAC.
710
KEITH
(NORTH)
TORONTO HAMILTON & BUFFALO RY.
706
SEE SHEET Nº 115
BURTON
WENTWORTH
HAMILTON STOCK YARDS CO. LIMITED
ARMOUR & Co.
PORK & BEEF PACKERS
Cold Storage
Killing Houses
Chill Rooms and Cold Storage
Hamilton Stock Yards Hotel
707
Gully
711
ROSEMARY AVE.
SEE SHEET Nº 109
Pattern Storage
Sewer Pipes Piled Around
Kiln
Drying Floors
The HAMILTON & TORONTO SEWER PIPE CO. LTD.
LORILLA
Coal Yard
708
Coal & Charcoal Shd
TERRA COTTA AVE.
SCALE 50 FT. - 1 INCH
COPYRIGHT, CANADA 1914 BY CHAS. E. GOAD CO.
SEE SHEET Nº 75
SEE SHEET Nº 76


109
109
HAMILTON ONT. VOL II
Toronto Hamilton & Buffalo Ry.
Inlet (Dry)
712
CITY SEWAGE DISPOSAL WORKS
Settling Tanks
FERTILIZER WORKS
W. A. Freeman & Co Ltd
715
PLANING MILL
COAL SHED
INLET
SEE SHEET No 108
PUMP HSE.
CANADIAN OIL COMPANIES LTD
714
713
DRYING FLOORS
HAMILTON & TORONTO SEWER PIPE CO LTD
Sewer Pipes Piled
TERRA COTTA AVE.
G. T. Ry (Southern Division)
SCALE 50 FT. - 1 INCH
SEE SHEET No 76


202
SEE SHEET No. 203
SEE SHEET No. 204
HAMILTON, ONT.
VOL. II.
MARCH, 1911
202
1121
BURLINGTON EAST
(LATE GILMINSON)
722
721
720
(NORTH)
Grand Trunk Railway (MAIN DIVISION)
WENTWORTH
J.O. Milligan Coal & Wood Yard
NIAGARA
HILLYARD
DICKSON
Pork Packers
John Duff & Son
BRANT
709
723
724
SEE SHEET No. 108
SCALE 50 FT. - 1 INCH


205
BURLINGTON AVE. (LATE GILKINSON)
HAMILTON ONT. VOL II
REPRINTED
MARCH 1914
205
Vacant Beyond
BIRCH AVE
STEEL BRIDGE
1126
750A
750B
ALPHA
BETA
Grand Trunk Railway
750
Pickle Hse
Stanley Steel Co
(Canada Steel Goods Co)
Cold Rolling Mill
Rolling Mill
ARTHUR
ARTHUR
SHERMAN AVE NORTH
1125
751
BRANT
IMPERIAL
SEE SHEET NO. 117
753
1124
SEE SHEET NO. 114
T.H.&B. Ry. Spur Line
STOCK ROAD
CRANE RUNWAY
MILL BLDG
Steel & Corr. Iron Const.
COPYRIGHT, CANADA 1914 BY CHAS. E. GOAD CO.
BURLINGTON STEEL Co. LTD
CONTINUED ABOVE
CONTINUED FROM BELOW
Roll Shop
Machine Shop
Office
1124
BURLINGTON STEEL Co. LTD.
SHERMAN AVE NORTH
SCALE 50 FT. = 1 INCH

Appendix F

CHAIN OF TITLE DOCUMENTS

CHAIN OF TITLE REPORT

Project # 161-17781-00
Address: 2 Hillyard Street, Hamilton
Legal Description: Part Lot 10, Con 1, Barton as in NS129802 & NS260283 Except NS260284
PIN# 17193-0018 (LT)

Searched at: Hamilton
LRO #: 62

INSTR #	DOC. TYPE	REG. DATE	PARTY FROM	PARTY TO
1820	Sheriff's Deed	10 07 1875	Sheriff of Wentworth	Jacob Lewis ENGLEHART
5473	Deed	25 02 1888	Jacob Lewis Englehart	Frank ROWLIN
49402	Deed	20 07 1891	Frank Rowlin	W. A. Freeman
57540	Deed	07 09 1894	W. A. Freeman	Bank of Hamilton
57869	Deed	19 10 1894	Bank of Hamilton	John PLANT
60378	Deed	14 11 1895	John Plant	The W. A. Freeman Company Limited
271575	Deed	30 12 1924	The W. A. Freeman Company Limited	The Corporation of The City of Hamilton
100750	Deed	27 09 1945	The W. A. Freeman Company Limited	Duro Aluminum Limited
NS129802	Deed	21 11 1947	The Corporation of The City of Hamilton	Niagara Paint and Chemical Company Limited

Cont'd on Page 2

CHAIN OF TITLE REPORT

Project # 161-17781-00
Address: 2 Hillyard Street, Hamilton
Legal Description: Part Lot 10, Con 1, Barton as in NS129802 & NS260283 Except NS260284
PIN# 17193-0018 (LT)

Searched at: Hamilton
LRO #: 62

INSTR #	DOC. TYPE	REG. DATE	PARTY FROM	PARTY TO
NS260283	Deed	01 03 1955	Duro Aluminum Limited	Niagara Paint and Chemical Company Limited
WE99839	Name Change	14 06 2002	Niagara Paint and Chemical Company Limited	50842 Ontario Inc.
WE99976	Deed **(Present Owner)**	14 06 2002	50842 Ontario Inc.	**1521020 Ontario Inc.**

Ontario ServiceOntario

LAND REGISTRY OFFICE #62

PARCEL REGISTER (ABBREVIATED) FOR PROPERTY IDENTIFIER

17193-0018 (LT)

PREPARED FOR Bertucci
ON 2016/12/23 AT 15:33:49

* CERTIFIED IN ACCORDANCE WITH THE LAND TITLES ACT * SUBJECT TO RESERVATIONS IN CROWN GRANT *

PROPERTY DESCRIPTION: PT LT 10, CON 1 BARTON , AS IN NS129802 & NS260283; EXCEPT NS260284 ; HAMILTON

PROPERTY REMARKS:

ESTATE/QUALIFIER:
FEE SIMPLE
LT CONVERSION QUALIFIED

RECENTLY:
FIRST CONVERSION FROM BOOK

PIN CREATION DATE:
1996/09/23

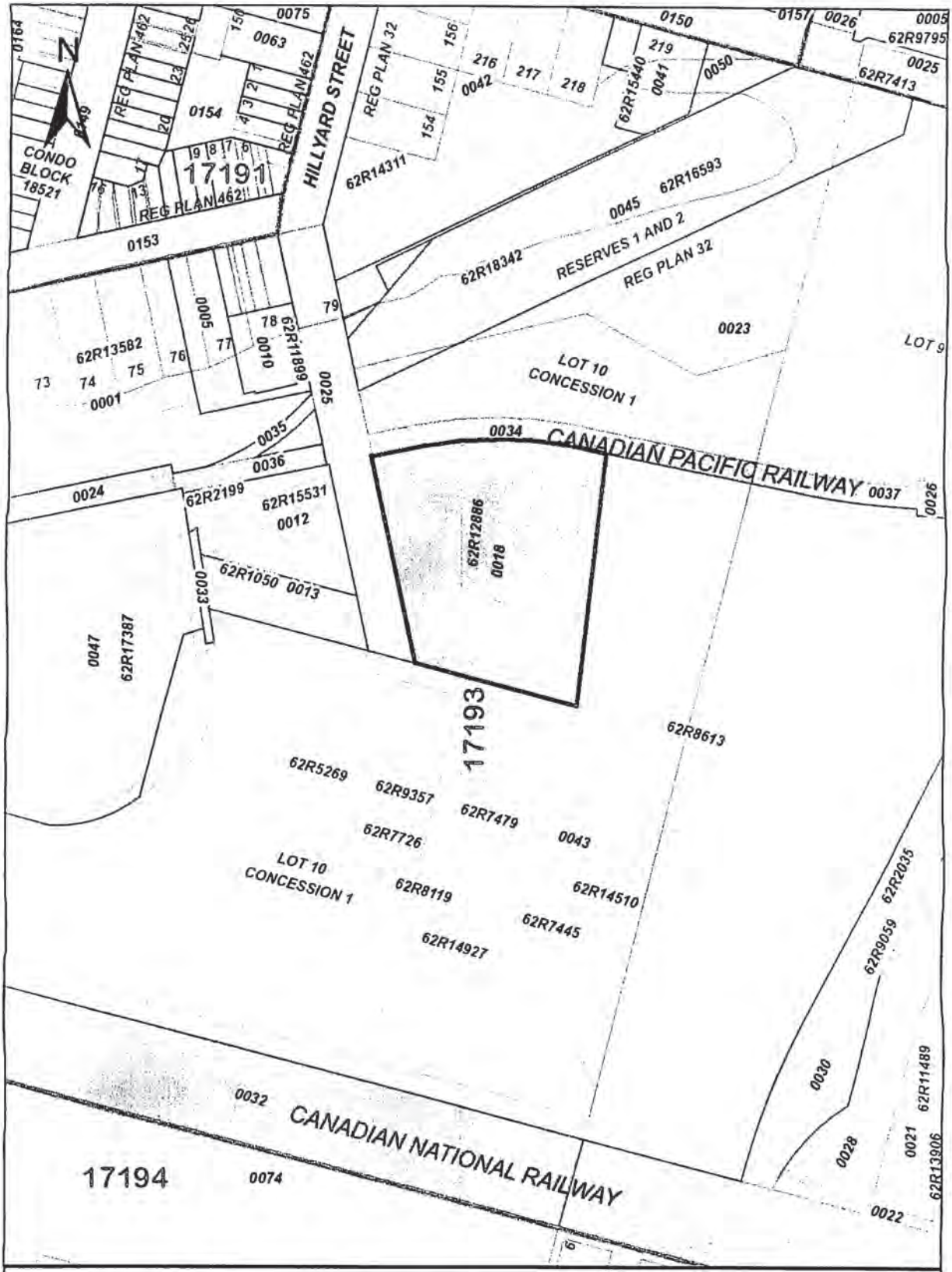
OWNERS' NAMES
1521020 ONTARIO INC.

CAPACITY SHARE
BENO

REG. NUM.	DATE	INSTRUMENT TYPE	AMOUNT	PARTIES FROM	PARTIES TO	CERT/ CHKD
EFFECTIVE 2000/07/29 THE NOTATION OF THE "BLOCK IMPLEMENTATION DATE" OF 1996/09/23 ON THIS PIN						
WAS REPLACED WITH THE "PIN CREATION DATE" OF 1996/09/23						
** PRINTOUT INCLUDES ALL DOCUMENT TYPES AND DELETED INSTRUMENTS SINCE 1996/09/20 **						
**SUBJECT, ON FIRST REGISTRATION UNDER THE LAND TITLES ACT, TO:						
** SUBSECTION 44(1) OF THE LAND TITLES ACT, EXCEPT PARAGRAPH 11, PARAGRAPH 14, PROVINCIAL SUCCESSION DUTIES *						
** AND ESCHEATS OR FORFEITURE TO THE CROWN.						
** THE RIGHTS OF ANY PERSON WHO WOULD, BUT FOR THE LAND TITLES ACT, BE ENTITLED TO THE LAND OR ANY PART OF						
** IT THROUGH LENGTH OF ADVERSE POSSESSION, PRESCRIPTION, MISDESCRIPTION OR BOUNDARIES SETTLED BY						
** CONVENTION.						
** ANY LEASE TO WHICH THE SUBSECTION 70(2) OF THE REGISTRY ACT APPLIES.						
**DATE OF CONVERSION TO LAND TITLES: 1996/09/23 **						
NS129802	1947/11/21	TRANSFER		*** COMPLETELY DELETED ***	NIAGARA PAINT AND CHEMICAL COMPANY LIMITED	
REMARKS: PLAN ATTACHED						
NS260283	1955/03/01	TRANSFER		*** COMPLETELY DELETED ***	NIAGARA PAINT AND CHEMICAL COMPANY LIMITED	
62R12886	1994/01/07	PLAN REFERENCE				C
WE99839	2002/06/14	APL CH NAME OWNER		*** COMPLETELY DELETED *** NIAGARA PAINT AND CHEMICAL COMPANY LIMITED	50842 ONTARIO INC.	
WE99976	2002/06/14	TRANSFER	$200,000	50842 ONTARIO INC.	1521020 ONTARIO INC.	C
REMARKS: PLANNING ACT STATEMENTS						
WE99977	2002/06/14	CHARGE		*** COMPLETELY DELETED ***		

NOTE: ADJOINING PROPERTIES SHOULD BE INVESTIGATED TO ASCERTAIN DESCRIPTIVE INCONSISTENCIES, IF ANY, WITH DESCRIPTION REPRESENTED FOR THIS PROPERTY.
NOTE: ENSURE THAT YOUR PRINTOUT STATES THE TOTAL NUMBER OF PAGES AND THAT YOU HAVE PICKED THEM ALL UP.

REG. NUM.	DATE	INSTRUMENT TYPE	AMOUNT	PARTIES FROM	PARTIES TO	CERT/ CHKD
				1521020 ONTARIO INC.	50842 ONTARIO INC.	
WE114707	2002/08/22	CHARGE	$180,000	1521020 ONTARIO INC.	BUSINESS DEVELOPMENT BANK OF CANADA	C
	REMARKS: PART 1 ON 62R-12886					
WE114715	2002/08/22	DISCH OF CHARGE		*** COMPLETELY DELETED *** 50842 ONTARIO INC.		
	REMARKS: RE: WE99977					
WE716070	2010/09/17	CHARGE	$400,000	1521020 ONTARIO INC.	THE BANK OF NOVA SCOTIA	C



ServiceOntario

PRINTED ON 21 DEC, 2016 AT 15:36:40
FOR CINDY

SCALE
0 25 50 75 Meters

PROPERTY INDEX MAP
WENTWORTH(No. 62)

LEGEND

FREEHOLD PROPERTY	
LEASEHOLD PROPERTY	
LIMITED INTEREST PROPERTY	
CONDOMINIUM PROPERTY	
RETIRED PIN (MAP UPDATE PENDING)	
PROPERTY NUMBER	0449
BLOCK NUMBER	08050
GEOGRAPHIC FABRIC	
EASEMENT	----

THIS IS NOT A PLAN OF SURVEY

NOTES

REVIEW THE TITLE RECORDS FOR COMPLETE PROPERTY INFORMATION AS THIS MAP MAY NOT REFLECT RECENT REGISTRATIONS

THIS MAP WAS COMPILED FROM PLANS AND DOCUMENTS RECORDED IN THE LAND REGISTRATION SYSTEM AND HAS BEEN PREPARED FOR PROPERTY INDEXING PURPOSES ONLY

FOR DIMENSIONS OF PROPERTIES BOUNDARIES SEE RECORDED PLANS AND DOCUMENTS

ONLY MAJOR EASEMENTS ARE SHOWN

REFERENCE PLANS UNDERLYING MORE RECENT REFERENCE PLANS ARE NOT ILLUSTRATED

Ontario

CHAIN OF TITLE REPORT

Project # 161-17781-00
Address: 80 Brant Street, Hamilton
Legal Description: Part Lots 9 & 10, Con 1 Barton
Pt Lt Water In Sherman Inlet, Con 1 Barton as in AB276680
PIN# 17193-0023 (LT)

Searched at: Hamilton
LRO #: 62

INSTR #	DOC. TYPE	REG. DATE	PARTY FROM	PARTY TO
1820	Sheriff's Deed	10 07 1875	Sheriff of Wentworth	Jacob Lewis ENGLEHART
5473	Deed	25 02 1888	Jacob Lewis Englehart	Frank ROWLIN
49402	Deed	20 07 1891	Frank Rowlin	W. A. Freeman
57540	Deed	07 09 1894	W. A. Freeman	Bank of Hamilton
57869	Deed	19 10 1894	Bank of Hamilton	John PLANT
60378	Deed	14 11 1895	John Plant	The W. A. Freeman Company Limited
134045	Deed	08 06 1912	The W. A. Freeman Company Limited	Toronto Dwellings Ltd.
175378	Deed	17 02 1917	Toronto Dwellings Ltd.	Toronto Niagara and Western Railway Co.
13914	Deed	13 01 1933	Toronto Niagara and Western Railway Co.	Canadian National Realties Limited

Cont'd on Page 2

CHAIN OF TITLE REPORT

Project # 161-17781-00
Address: 80 Brant Street, Hamilton
Legal Description: Part Lots 9 & 10, Con 1 Barton
Pt Lt Water In Sherman Inlet, Con 1 Barton as in AB276680
PIN# 17193-0023 (LT)

Searched at: Hamilton
LRO #: 62

INSTR #	DOC. TYPE	REG. DATE	PARTY FROM	PARTY TO
125620	Deed	25 07 1947	Canadian National Realties Limited	Samuel LAX
282489 VS	Deed	13 03 1956	Samuel Lax	Samuel LAX & Sheridan LAX
36862 VS	Deed	29 01 1958	Samuel Lax & Sheridan Lax	Sheridan Warehousing Limited
AB276680	Deed	29 12 1972	Sheridan Warehousing Limited	Slater Steel Industries Limited
LT611398	Name Change	27 07 2000	Slater Industries Inc. (Formerly Slater Steel Industries Limited)	Slater Steel Inc.
WE225283	Vesting Order	06 04 2004	Ontario Superior Court of Justice (Estate of Slater Steel Inc.)	HSB Steel Inc.
WE235785	Vesting Order	28 05 2004	Ontario Superior Court of Justice (Estate of HSB Steel Inc.)	Hamilton Specialty Bar Corporation
WE527047	Deed	05 02 2008	Hamilton Specialty Bar Corporation	Hamilton Specialty Bar (2007) Inc.
WE527191	Deed	06 02 2008	Hamilton Specialty Bar (2007) Inc.	2150492 Ontario Inc.

Cont'd on Page 3

CHAIN OF TITLE REPORT

Project # 161-17781-00
Address: 80 Brant Street, Hamilton
Legal Description: Part Lots 9 & 10, Con 1 Barton
Pt Lt Water In Sherman Inlet, Con 1 Barton as in AB276680
PIN# 17193-0023 (LT)

Searched at: Hamilton
LRO #: 62

INSTR #	DOC. TYPE	REG. DATE	PARTY FROM	PARTY TO
WE538159	Name Change	03 04 2008	2150492 Ontario Inc.	ZBX Hamilton Lands Inc.
WE1071907	Deed **(Present Owner)**	09 10 2015	ZBX Hamilton Lands Inc.	**City of Hamilton**

PROPERTY DESCRIPTION: PT LTS 9 & 10, CON 1 BARTON ; PT LT WATER IN SHERMAN INLET, CON 1 BARTON , AS IN AB276680 ; HAMILTON

PROPERTY REMARKS:

ESTATE/QUALIFIER:
FEE SIMPLE
LT CONVERSION QUALIFIED

RECENTLY:
FIRST CONVERSION FROM BOOK

PIN CREATION DATE:
1996/09/23

OWNERS' NAMES
CITY OF HAMILTON

CAPACITY SHARE
ROWN

REG. NUM.	DATE	INSTRUMENT TYPE	AMOUNT	PARTIES FROM	PARTIES TO	CERT/ CHKD
EFFECTIVE 2000/07/29 THE NOTATION OF THE "BLOCK IMPLEMENTATION DATE" OF 1996/09/23 ON THIS PIN						
WAS REPLACED WITH THE "PIN CREATION DATE" OF 1996/09/23						
** PRINTOUT INCLUDES ALL DOCUMENT TYPES AND DELETED INSTRUMENTS SINCE 1996/09/20 **						
**SUBJECT, ON FIRST REGISTRATION UNDER THE LAND TITLES ACT, TO:						
** SUBSECTION 44(1) OF THE LAND TITLES ACT, EXCEPT PARAGRAPH 11, PARAGRAPH 14, PROVINCIAL SUCCESSION DUTIES *						
** AND ESCHEATS OR FORFEITURE TO THE CROWN.						
** THE RIGHTS OF ANY PERSON WHO WOULD, BUT FOR THE LAND TITLES ACT, BE ENTITLED TO THE LAND OR ANY PART OF						
** IT THROUGH LENGTH OF ADVERSE POSSESSION, PRESCRIPTION, MISDESCRIPTION OR BOUNDARIES SETTLED BY						
** CONVENTION.						
** ANY LEASE TO WHICH THE SUBSECTION 70(2) OF THE REGISTRY ACT APPLIES.						
**DATE OF CONVERSION TO LAND TITLES: 1996/09/23 **						
AB276680	1972/12/29	TRANSFER		*** COMPLETELY DELETED ***	SLATER STEEL INDUSTRIES LIMITED	
AB290088	1973/04/30	QUIT CLAIM TRNSFR		*** COMPLETELY DELETED ***	SLATER STEEL INDUSTRIES LIMITED	
VM53784	1990/06/29	NOTICE		*** COMPLETELY DELETED ***		
REMARKS: RE: DELETED BY WE490317 FROM PINS 17193-0022, 17193-0021, 17193-0020						
LT424938	1996/10/29	CONSTRUCTION LIEN		*** COMPLETELY DELETED *** SLATER INDUSTRIES INC	BARCLAY CONSTRUCTION HAMILTON LIMITED	
REMARKS: DELETED LT424938 JULY 31/00 BY YVON PAQUETTE						
LT426085	1996/11/04	CONSTRUCTION LIEN		*** COMPLETELY DELETED ***		

NOTE: ADJOINING PROPERTIES SHOULD BE INVESTIGATED TO ASCERTAIN DESCRIPTIVE INCONSISTENCIES, IF ANY, WITH DESCRIPTION REPRESENTED FOR THIS PROPERTY.
NOTE: ENSURE THAT YOUR PRINTOUT STATES THE TOTAL NUMBER OF PAGES AND THAT YOU HAVE PICKED THEM ALL UP.

REG. NUM.	DATE	INSTRUMENT TYPE	AMOUNT	PARTIES FROM	PARTIES TO	CERT/ CHKD
				MCCAVOUR ENGINEERING LIMITED		
LT430988	1996/12/12	APL (GENERAL)		*** COMPLETELY DELETED *** ONTARIO COURT (GENERAL DIVISION)		
	REMARKS: VACATING LT424938					
LT430989	1996/12/12	APL (GENERAL)		*** COMPLETELY DELETED *** ONTARIO COURT (GENERAL DIVISION)		
	REMARKS: VACATING LT426085					
LT435165	1997/01/23	CONSTRUCTION LIEN		*** COMPLETELY DELETED *** BARCLAY CONSTRUCTION HAMILTON LIMITED		
LT437870	1997/02/13	CERTIFICATE		*** COMPLETELY DELETED *** BARCLAY CONSTRUCTION HAMILTON LIMITED		
	REMARKS: LT424938, LT435165					
LT438020	1997/02/14	APL (GENERAL)		*** COMPLETELY DELETED *** DANIELI & C.-OFFICE MECCANICHE S.P.A		
	REMARKS: RE: DELETING LT435165					
LT438315	1997/02/17	APL (GENERAL)		*** COMPLETELY DELETED *** DANIELI & C.-OFFICINE MECCANICHE S.P.A.		
	REMARKS: LT437870					
LT439585	1997/02/26	CONSTRUCTION LIEN		*** COMPLETELY DELETED *** SLATER STEEL INC.	MCCAVOUR ENGINEERING LIMITED	
LT441672	1997/03/11	APL (GENERAL)		*** COMPLETELY DELETED *** DANIELI & C.-OFFICINE MECCANICHES.P.A.		
	REMARKS: DELETE LT439585					
LT448803	1997/05/01	CONSTRUCTION LIEN		*** COMPLETELY DELETED *** BARCLAY CONSTRUCTION HAMILTON LIMITED	SLATER INDUSTRIES INC.	
	REMARKS: DELETED UNDER WE225283					
LT611398	2000/07/27	APL CH NAME OWNER		*** COMPLETELY DELETED *** SLATER INDUSTRIES INC.	SLATER STEEL INC.	
LT612487	2000/08/01	CHARGE		*** COMPLETELY DELETED *** SLATER STEEL INC.	THE TORONTO-DOMINION BANK	
	REMARKS: DELETED UNDER WE225283					

NOTE: ADJOINING PROPERTIES SHOULD BE INVESTIGATED TO ASCERTAIN DESCRIPTIVE INCONSISTENCIES, IF ANY, WITH DESCRIPTION REPRESENTED FOR THIS PROPERTY.
NOTE: ENSURE THAT YOUR PRINTOUT STATES THE TOTAL NUMBER OF PAGES AND THAT YOU HAVE PICKED THEM ALL UP.

REG. NUM.	DATE	INSTRUMENT TYPE	AMOUNT	PARTIES FROM	PARTIES TO	CERT/ CHKD
WE165682	2003/06/11	CONSTRUCTION LIEN		*** COMPLETELY DELETED *** 513125 ONTARIO LIMITED O/A DA-LEE DUST CONTROL		
	REMARKS: DELETED UNDER WE225283					
WE174872	2003/07/29	CERTIFICATE		*** COMPLETELY DELETED *** 513125 ONTARIO LIMITED		
	REMARKS: WE165682 DELETED UNDER WE225283					
WE181871	2003/08/29	CHARGE		*** COMPLETELY DELETED *** SLATER STEEL INC.	THE TORONTO-DOMINION BANK	
	REMARKS: DELETED UNDER WE225283					
WE225283	2004/04/06	APL VESTING ORDER		*** COMPLETELY DELETED *** ONTARIO SUPERIOR COURT OF JUSTICE (COMMERCIAL LIST)	HSB STEEL INC.	
	CORRECTIONS: 'THIS INSTRUMENT' WAS DELETED FROM PROPERTY 17218-0040 IN ERROR AND WAS RE-INSTATED ON 2004/05/13 BY ANNETTE VAN DUYN. 'THIS INSTRUMENT' WAS DELETED FROM PROPERTY 17193-0020 IN ERROR AND WAS RE-INSTATED ON 2004/05/13 BY ANNETTE VAN DUYN. 'THIS INSTRUMENT' WAS DELETED FROM PROPERTY 17193-0021 IN ERROR AND WAS RE-INSTATED ON 2004/05/13 BY ANNETTE VAN DUYN. 'THIS INSTRUMENT' WAS DELETED FROM PROPERTY 17193-0023 IN ERROR AND WAS RE-INSTATED ON 2004/05/13 BY ANNETTE VAN DUYN. 'THIS INSTRUMENT' WAS DELETED FROM PROPERTY 17193-0022 IN ERROR AND WAS RE-INSTATED ON 2004/05/13 BY ANNETTE VAN DUYN.					
WE232467	2004/05/13	LR'S ORDER		*** COMPLETELY DELETED *** LAND REGISTRAR		
	REMARKS: WE225283					
WE235785	2004/05/28	APL VESTING ORDER		*** DELETED AGAINST THIS PROPERTY *** ONTARIO SUPERIOR COURT OF JUSTICE (COMMERCIAL LIST)	HAMILTON SPECIALTY BAR CORPORATION	
WE235786	2004/05/28	CHARGE		*** COMPLETELY DELETED *** HAMILTON SPECIALTY BAR CORPORATION	DSC FINANCE S A R L	
	REMARKS: RE: DELETED BY WE490317 FROM PINS 17193-0022, 17193-0021, 17193-0020					
WE235787	2004/05/28	CHARGE		*** COMPLETELY DELETED *** HAMILTON SPECIALTY BAR CORPORATION	DSC MANAGERS LLC	
	REMARKS: RE: DELETED BY WE490317 FROM PINS 17193-0022, 17193-0021, 17193-0020					
WE398506	2006/06/16	CHARGE		*** COMPLETELY DELETED *** HAMILTON SPECIALTY BAR CORPORATION	DSC FINANCE S.A.R.L.	
	REMARKS: RE: DELETED BY WE490317 FROM PINS 17193-0022, 17193-0021, 17193-0020					
WE443085	2007/01/09	CHARGE		*** COMPLETELY DELETED *** HAMILTON SPECIALTY BAR CORPORATION	CIT BUSINESS CREDIT CANADA INC.	
	REMARKS: RE: DELETED BY WE490317 FROM PIN 17193-0022, 171793-0021, 17193-0020 DELETED BY WE490335					

NOTE: ADJOINING PROPERTIES SHOULD BE INVESTIGATED TO ASCERTAIN DESCRIPTIVE INCONSISTENCIES, IF ANY, WITH DESCRIPTION REPRESENTED FOR THIS PROPERTY.
NOTE: ENSURE THAT YOUR PRINTOUT STATES THE TOTAL NUMBER OF PAGES AND THAT YOU HAVE PICKED THEM ALL UP.

REG. NUM.	DATE	INSTRUMENT TYPE	AMOUNT	PARTIES FROM	PARTIES TO	CERT/ CHKD
	CORRECTIONS: 'THIS INSTRUMENT' WAS DELETED FROM PROPERTY 17193-0023 IN ERROR AND WAS RE-INSTATED ON 2007/09/11 BY CINDY JOHNSON.					
WE443096	2007/01/09	POSTPONEMENT		*** COMPLETELY DELETED ***		
				DSC FINANCE S A R L	CIT BUSINESS CREDIT CANADA INC.	
	REMARKS: WE235786 POSTPONED TO WE443085 DELETED BY WE490317 FROM PINS 17193-0022, 17193-0021, 17193-0020 DELETED BY WE490335					
	CORRECTIONS: 'THIS INSTRUMENT' WAS DELETED FROM PROPERTY 17193-0023 IN ERROR AND WAS RE-INSTATED ON 2007/09/11 BY CINDY JOHNSON.					
WE443097	2007/01/09	POSTPONEMENT		*** COMPLETELY DELETED ***		
				DSC MANAGERS LLC	CIT BUSINESS CREDIT CANADA INC.	
	REMARKS: WE235787 POSTPONED TO WE443085 DELETED BY WE490317 FROM PINS 17193-0022, 17193-0021, 17193-0020 DELETED BY WE490335					
	CORRECTIONS: 'THIS INSTRUMENT' WAS DELETED FROM PROPERTY 17193-0023 IN ERROR AND WAS RE-INSTATED ON 2007/09/11 BY CINDY JOHNSON.					
WE443098	2007/01/09	POSTPONEMENT		*** COMPLETELY DELETED ***		
				DSC FINANCE S.A.R.L.	CIT BUSINESS CREDIT CANADA INC.	
	REMARKS: WE398506 POSTPONED TO WE443085 DELETED BY WE490317 FROM PINS 17193-0022, 17193-0021, 17193-0020 DELETED BY WE490335					
	CORRECTIONS: 'THIS INSTRUMENT' WAS DELETED FROM PROPERTY 17193-0023 IN ERROR AND WAS RE-INSTATED ON 2007/09/11 BY CINDY JOHNSON.					
WE445058	2007/01/19	CONSTRUCTION LIEN		*** COMPLETELY DELETED ***		
				COMSTOCK CANADA LIMITED		
WE457313	2007/03/28	CERTIFICATE		*** COMPLETELY DELETED ***		
				COMSTOCK CANADA LIMITED		
	REMARKS: RE: WE445058					
WE490320	2007/08/17	NOTICE OF LEASE		*** COMPLETELY DELETED ***		
				HAMILTON SPECIALTY BAR (2007) INC.	HAMILTON SPECIALTY BAR (2007) INC.	
WE490327	2007/08/17	NO CHARGE LEASE		*** COMPLETELY DELETED ***		
				HAMILTON SPECIALTY BAR (2007) INC.	SANKATY ADVISORS, LLC	
	REMARKS: US CURRENCY					
WE490328	2007/08/17	NO CHARGE LEASE		*** COMPLETELY DELETED ***		
				HAMILTON SPECIALTY BAR (2007) INC.	SANKATY ADVISORS, LLC	
	REMARKS: US CURRENCY					
WE490335	2007/08/17	DISCH OF CHARGE		*** COMPLETELY DELETED ***		
				CIT BUSINESS CREDIT CANADA INC.		
	REMARKS: RE: WE443085					
WE495963	2007/09/10	LR'S ORDER		*** COMPLETELY DELETED ***		
				LAND REGISTRAR NO 62		
	REMARKS: AMEND INSTRUMENTS					

REG. NUM.	DATE	INSTRUMENT TYPE	AMOUNT	PARTIES FROM	PARTIES TO	CERT/ CHKD
WE498053	2007/09/19	LR'S ORDER		*** COMPLETELY DELETED ***		
				LAND REGISTRAR NO 62		
	REMARKS: WE490335, WE495963					
WE503552	2007/10/12	NOTICE		*** COMPLETELY DELETED ***		
				HAMILTON SPECIALTY BAR (2007) INC.	SANKATY ADVISORS, LLC	
	REMARKS: RE: WE490327					
WE503553	2007/10/12	NOTICE		*** COMPLETELY DELETED ***		
				HAMILTON SPECIALTY BAR (2007) INC.	SANKATY ADVISORS, LLC	
	REMARKS: RE: WE490328					
WE525275	2008/01/28	DISCH OF CHARGE		*** COMPLETELY DELETED ***		
				SANKATY ADVISORS, LLC		
	REMARKS: RE: WE490327					
WE525276	2008/01/28	DISCH OF CHARGE		*** COMPLETELY DELETED ***		
				SANKATY ADVISORS, LLC		
	REMARKS: RE: WE490328					
WE527045	2008/02/05	NO DET/SURR LEASE		*** COMPLETELY DELETED ***		
					HAMILTON SPECIALTY BAR (2007) INC.	
	REMARKS: RE: WE490320					
WE527046	2008/02/05	APL VESTING ORDER		*** COMPLETELY DELETED ***		
				ONTARIO SUPERIOR COURT OF JUSTICE	HAMILTON SPECIALTY BAR (2007) INC.	
	REMARKS: VESTING OF LAND & DELETION OF VARIOUS INSTRUMENTS					
WE527047	2008/02/05	TRANSFER		*** COMPLETELY DELETED ***		
				HAMILTON SPECIALTY BAR CORPORATION	HAMILTON SPECIALTY BAR (2007) INC.	
	REMARKS: S/T WRIT NO. 06-0002197 AGAINST HAMILTON SPECIALTY BAR CORPORATION IF ENFORCEABLE - EXECUTION #06-0002197 DELETED UNDER WE527046					
WE527191	2008/02/06	TRANSFER		*** COMPLETELY DELETED ***		
				HAMILTON SPECIALTY BAR (2007) INC.	2150492 ONTARIO INC.	
WE527193	2008/02/06	APL (GENERAL)		*** COMPLETELY DELETED ***		
				HAMILTON SPECIALTY BAR (2007) INC.		
	REMARKS: EXECUTION #06-0002197, WE527046, WE527047					
WE538159	2008/04/03	APL CH NAME OWNER		*** COMPLETELY DELETED ***		
				2150492 ONTARIO INC.	ZBX HAMILTON LANDS INC.	
WE564497	2008/07/30	CHARGE		*** COMPLETELY DELETED ***		

* CERTIFIED IN ACCORDANCE WITH THE LAND TITLES ACT * SUBJECT TO RESERVATIONS IN CROWN GRANT *

REG. NUM.	DATE	INSTRUMENT TYPE	AMOUNT	PARTIES FROM	PARTIES TO	CERT/ CHKD
				ZBX HAMILTON LANDS INC.	THE TORONTO-DOMINION BANK	
WE673013	2010/02/18	DISCH OF CHARGE		*** COMPLETELY DELETED *** THE TORONTO-DOMINION BANK		
	REMARKS: WE564497.					
WE832956	2012/05/25	NOTICE		DREHER INVESTMENTS (HAMILTON II), INC.		C
WE1071907	2015/10/09	TRANSFER	$1,850,000	ZBX HAMILTON LANDS INC.	CITY OF HAMILTON	C
	REMARKS: PLANNING ACT STATEMENTS.					

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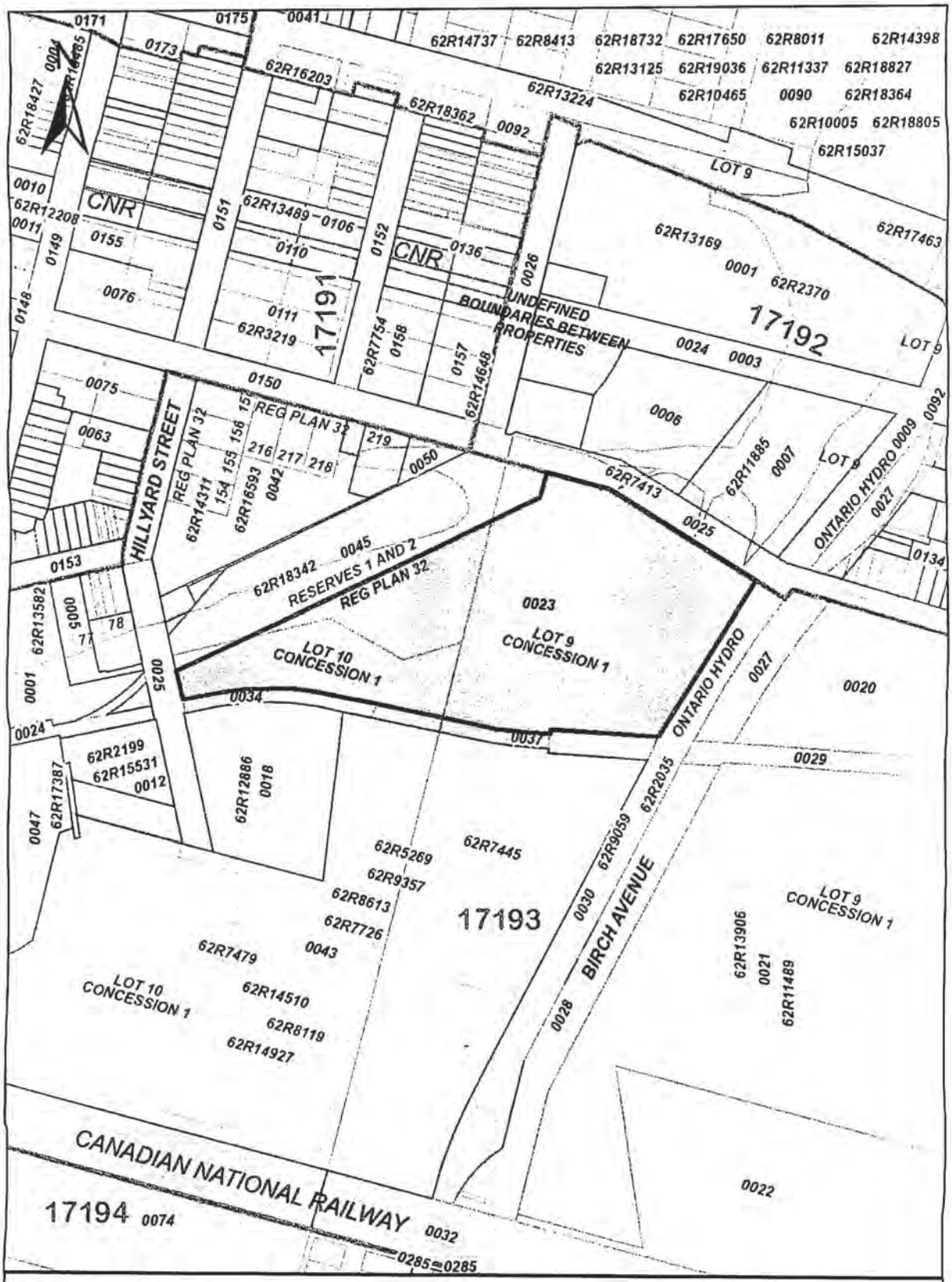

ServiceOntario

PRINTED ON 21 DEC, 2016 AT 15:35:51
FOR CINDY

SCALE
0 25 50 75 100 125 Meters

PROPERTY INDEX MAP
WENTWORTH(No. 62)

LEGEND

FREEHOLD PROPERTY	
LEASEHOLD PROPERTY	
LIMITED INTEREST PROPERTY	
CONDOMINIUM PROPERTY	
RETIRED PIN (MAP UPDATE PENDING)	
PROPERTY NUMBER	0449
BLOCK NUMBER	08050
GEOGRAPHIC FABRIC	
EASEMENT	

THIS IS NOT A PLAN OF SURVEY

NOTES

REVIEW THE TITLE RECORDS FOR COMPLETE PROPERTY INFORMATION AS THIS MAP MAY NOT REFLECT RECENT REGISTRATIONS

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FOR DIMENSIONS OF PROPERTIES BOUNDARIES SEE RECORDED PLANS AND DOCUMENTS

ONLY MAJOR EASEMENTS ARE SHOWN

REFERENCE PLANS UNDERLYING MORE RECENT REFERENCE PLANS ARE NOT ILLUSTRATED

Ontario

CHAIN OF TITLE REPORT

Project #: 161-17781-00
Address: 281 Birch Avenue, Hamilton
Legal Description: Part lots 9 & 10 Con 1 Barton

Searched at: Hamilton
LRO #: 62

PIN #: 17193-0043(LT)

INSTR #	DOC. TYPE	REG. DATE	PARTY FROM	PARTY TO
1820	Deed	10 07 1875	Sheriff of the County of Wentworth	Jacob Lewis ENGLEHART
5473	Deed	25 02 1888	Jacob Lewis Englehart	Frank ROWLIN
49402	Deed	20 07 1891	Frank Rowlin	W.A. FREMMAN
57540	Deed	07 09 1894	W.A. Freeman	Bank of Hamilton
57869	Deed	19 10 1894	Bank of Hamilton	John PLANT & Rufus GAGE
60378	Deed	14 11 1895	John Plant & Rufus Gage	W.A. Freeman Company
100750NS	Deed	27 09 1945	The W.A. Freeman Company Limited	Duro Aluminium Limited
CD308412	Vesting Order	25 03 1985	Supreme Court of Ontario (Duro Aluminium Limited)	GSW Inc.
LT547705	Deed (Present Owner)	14 04 1998	GSW Inc.	**The Regional Municipality of Hamilton-Wentworth**

Ontario ServiceOntario

PARCEL REGISTER (ABBREVIATED) FOR PROPERTY IDENTIFIER

LAND REGISTRY OFFICE #62

17193-0043 (LT)

PREPARED FOR Bertucci
ON 2017/01/30 AT 14:56:12

* CERTIFIED IN ACCORDANCE WITH THE LAND TITLES ACT * SUBJECT TO RESERVATIONS IN CROWN GRANT *

PROPERTY DESCRIPTION: CONSOLIDATION OF VARIOUS PROPERTIES: FIRSTLY: PT LTS 9 AND 10 CON 1 BARTON, PART 2 ON 62R8119; PT LT 9 CON 1 BARTON, PARTS 3, 4, 5, 6 AND 7 ON 62R8119; PT LT 10 CON 1 BARTON, PARTS 1, 2, 3, 4, 5, 6 AND 10 ON 62R7479 (PART 4 ON 62R7479 AKA ROSEMARY AVE) TERRA COTTA AVE (AS CLOSED BY CD431120) PT LT 10 CON 1 BARTON, PART 10 ON 62R8119; PT LT 10 CON 1 BARTON, PART 1 ON 62R7726; PT LT 10 CON 1 BARTON, PARTS 5 AND 6 ON 62R8613; S/T AND T/W CD304610 (EXCEPT THE EASEMENT THEREIN OVER PARTS 6 AND 7 ON 62R7479) S/T AND T/W CD416010; T/W HL321270,AB382978 AND VM52951; SECONDLY: PT LTS 9 AND 10 CON 1 BARTON, PART 1 ON 62R7445; EXCEPT PART 1 ON 62R7726; T/W CD308412 EXCEPT THE EASEMENT THEREIN OVER PART 2 ON 62R7445; HMILTON.

PROPERTY REMARKS:

ESTATE/QUALIFIER:
FEE SIMPLE
LT CONVERSION QUALIFIED

RECENTLY:
CONSOLIDATION FROM 17193-0004 17193-0019

PIN CREATION DATE:
2000/08/30

OWNERS' NAMES
THE REGIONAL MUNICIPALITY OF HAMILTON-WENTWORTH

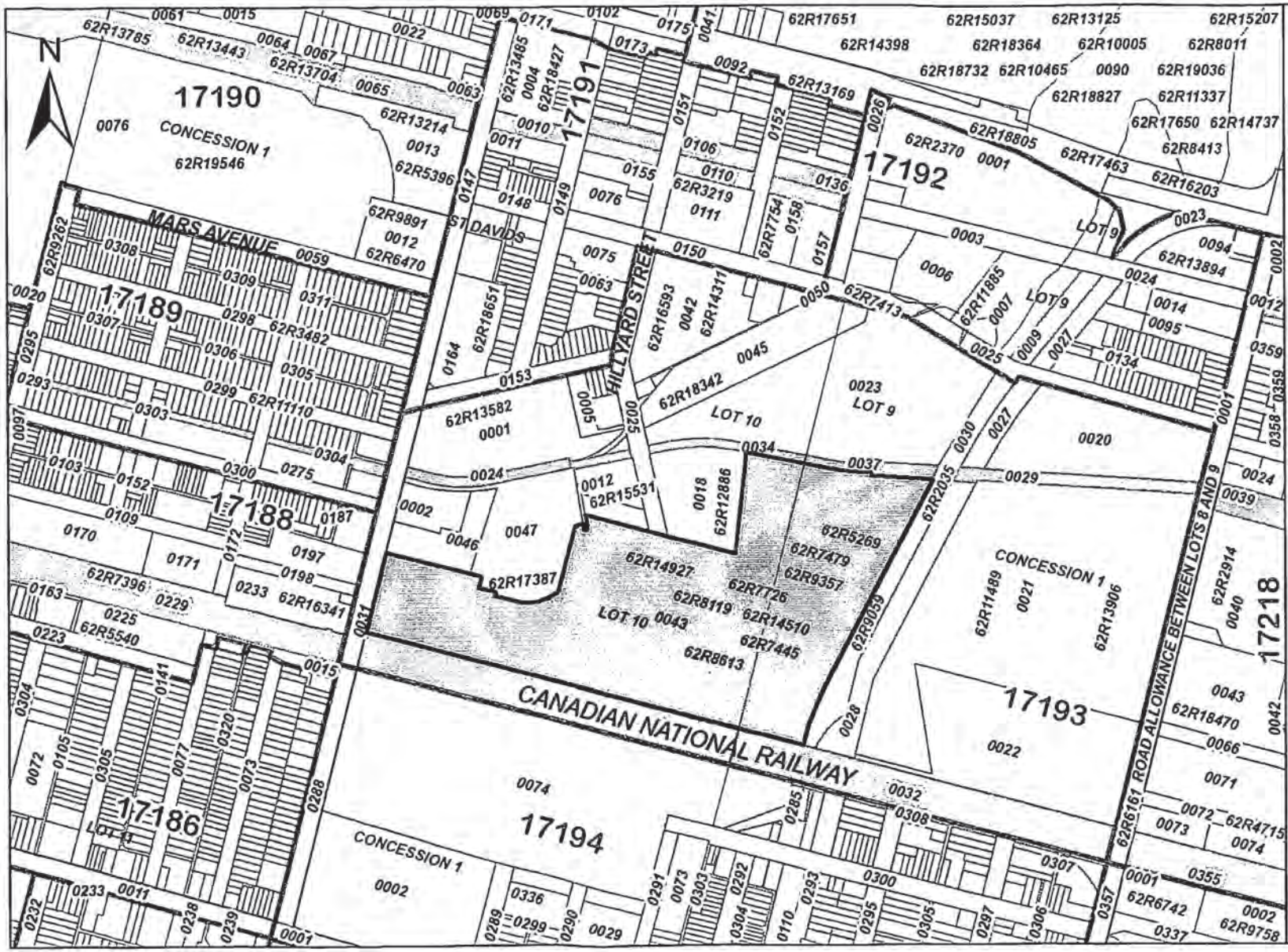
CAPACITY SHARE
BENO

REG. NUM.	DATE	INSTRUMENT TYPE	AMOUNT	PARTIES FROM	PARTIES TO	CERT/ CHKD
** PRINTOUT INCLUDES ALL DOCUMENT TYPES AND DELETED INSTRUMENTS SINCE 2000/08/30 **						
**SUBJECT, ON FIRST REGISTRATION UNDER THE LAND TITLES ACT, TO:						
** SUBSECTION 44(1) OF THE LAND TITLES ACT, EXCEPT PARAGRAPH 11, PARAGRAPH 14, PROVINCIAL SUCCESSION DUTIES *						
** AND ESCHEATS OR FORFEITURE TO THE CROWN.						
** THE RIGHTS OF ANY PERSON WHO WOULD, BUT FOR THE LAND TITLES ACT, BE ENTITLED TO THE LAND OR ANY PART OF						
** IT THROUGH LENGTH OF ADVERSE POSSESSION, PRESCRIPTION, MISDESCRIPTION OR BOUNDARIES SETTLED BY						
** CONVENTION.						
** ANY LEASE TO WHICH THE SUBSECTION 70(2) OF THE REGISTRY ACT APPLIES.						
**DATE OF CONVERSION TO LAND TITLES: 1996/09/23 **						
62R5269	1980/03/14	PLAN REFERENCE				C
62R7445	1984/12/18	PLAN REFERENCE				C
62R7726	1984/12/18	PLAN REFERENCE				C
62R7479	1985/01/16	PLAN REFERENCE				C
CD304610	1985/02/04	TRANSFER	$2		THE REGIONAL MUNICIPALITY OF HAMILTON-WENTWORTH	C
CD304639	1985/02/04	TRANSFER	$2		THE REGIONAL MUNICIPALITY OF HAMILTON-WENTWORTH	C
CD308412	1985/03/25	ORDER			GSW INC.	C
REMARKS: VESTING						
CD323018	1985/08/14	TRANSFER	$80,445		THE REGIONAL MUNICIPALITY OF HAMILTON-WENTWORTH	C

NOTE: ADJOINING PROPERTIES SHOULD BE INVESTIGATED TO ASCERTAIN DESCRIPTIVE INCONSISTENCIES, IF ANY, WITH DESCRIPTION REPRESENTED FOR THIS PROPERTY.
NOTE: ENSURE THAT YOUR PRINTOUT STATES THE TOTAL NUMBER OF PAGES AND THAT YOU HAVE PICKED THEM ALL UP.

REG. NUM.	DATE	INSTRUMENT TYPE	AMOUNT	PARTIES FROM	PARTIES TO	CERT/ CHKD
62R8119	1986/03/26	PLAN REFERENCE				C
CD352571	1986/05/16	QUIT CLAIM TRNSFR	$1		THE REGIONAL MUNICIPALITY OF HAMILTON-WENTWORTH	C
CD352572	1986/05/16	TRANSFER	$266,850		THE REGIONAL MUNICIPALITY OF HAMILTON-WENTWORTH	C
62R8613	1987/02/03	PLAN REFERENCE				C
CD416010	1987/06/25	TRANSFER	$33,750		THE REGIONAL MUNICIPALITY OF HAMILTON-WENTWORTH	C
CD431120	1987/10/08	BYLAW				C
62R9357	1988/02/04	PLAN REFERENCE				C
VM52951	1990/06/26	TRANSFER EASEMENT			THE REGIONAL MUNICIPALITY OF HAMILTON-WENTWORTH	C
VM75356	1991/02/15	TRANSFER	$78,576		THE REGIONAL MUNICIPALITY OF HAMILTON	C
62R14510	1998/03/27	PLAN REFERENCE				C
	REMARKS: PARTS 14 & 15 S/T EASEMENT AS IN 110274AB					
62R14927	1999/02/10	PLAN REFERENCE				C
	REMARKS: PART 2 - TOGETHER WITH RIGHT OF WAY IN CD308412					
LT547705	1999/04/14	TRANSFER		GSW INC.	THE REGIONAL MUNICIPALITY OF HAMILTON-WENTWORTH	C
	REMARKS: PLANNING ACT STATEMENTS					
LT614498	2000/08/16	APL (GENERAL)		THE REGIONAL MUNICIPALITY OF HAMILTON-WENTWORTH		C
	REMARKS: CONSOLIDATION OF 17193-0019 AND 17193-0004					

NOTE: ADJOINING PROPERTIES SHOULD BE INVESTIGATED TO ASCERTAIN DESCRIPTIVE INCONSISTENCIES, IF ANY, WITH DESCRIPTION REPRESENTED FOR THIS PROPERTY.
NOTE: ENSURE THAT YOUR PRINTOUT STATES THE TOTAL NUMBER OF PAGES AND THAT YOU HAVE PICKED THEM ALL UP.



ServiceOntario

PRINTED ON 26 JAN, 2017 AT 16:11:22
FOR BB

SCALE

0 60 120 180 240 meters

PROPERTY INDEX MAP

WENTWORTH(No. 62)

LEGEND

FREEHOLD PROPERTY	
LEASEHOLD PROPERTY	
LIMITED INTEREST PROPERTY	
CONDOMINIUM PROPERTY	
RETIRED PIN (MAP UPDATE PENDING)	
PROPERTY NUMBER	0449
BLOCK NUMBER	08050
GEOGRAPHIC FABRIC	—
EASEMENT	----

THIS IS NOT A PLAN OF SURVEY

NOTES

REVIEW THE TITLE RECORDS FOR COMPLETE PROPERTY INFORMATION AS THIS MAP MAY NOT REFLECT RECENT REGISTRATIONS

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FOR DIMENSIONS OF PROPERTIES BOUNDARIES SEE RECORDED PLANS AND DOCUMENTS

ONLY MAJOR EASEMENTS ARE SHOWN

REFERENCE PLANS UNDERLYING MORE RECENT REFERENCE PLANS ARE NOT ILLUSTRATED

Ontario

Ontario ServiceOntario

PARCEL REGISTER (ABBREVIATED) FOR PROPERTY IDENTIFIER

LAND REGISTRY OFFICE #62

17193-0034 (LT)

PREPARED FOR Bertucci1

ON 2017/02/10 AT 14:23:45

* CERTIFIED IN ACCORDANCE WITH THE LAND TITLES ACT * SUBJECT TO RESERVATIONS IN CROWN GRANT *

PROPERTY DESCRIPTION: PT LT 10, CON 1 BARTON , AS IN HA62174 EXCEPT PT 1, 62R6346; PT 1, 62R7445; PTS 1 & 6, 62R7479; BL1142; BL1200; NS68542; NS129802, NS260283; AB276680; & EXCEPT ALL LANDS DESCRIBED THEREIN LYING W OF HILLYARD ST AS ESTABLISHED BY BL1200 & BL1142 & ALL LYING W OF THE SLY PRODUCTION OF IT'S WLY LIMIT; S/T HA62174 ; HAMILTON

PROPERTY REMARKS:

ESTATE/QUALIFIER: FEE SIMPLE
LT CONVERSION QUALIFIED

RECENTLY: FIRST CONVERSION FROM BOOK

PIN CREATION DATE: 1996/09/23

OWNERS' NAMES: THE CORPORATION OF THE CITY OF HAMILTON

CAPACITY SHARE: BENO

REG. NUM.	DATE	INSTRUMENT TYPE	AMOUNT	PARTIES FROM	PARTIES TO	CERT/ CHKD
EFFECTIVE 2000/07/29 THE NOTATION OF THE "BLOCK IMPLEMENTATION DATE" OF 1996/09/23 ON THIS PIN						
WAS REPLACED WITH THE "PIN CREATION DATE" OF 1996/09/23						
** PRINTOUT INCLUDES ALL DOCUMENT TYPES AND DELETED INSTRUMENTS SINCE 1996/09/20 **						
**SUBJECT, ON FIRST REGISTRATION UNDER THE LAND TITLES ACT, TO						
**	SUBSECTION 44(1) OF THE LAND TITLES ACT, EXCEPT PARAGRAPH 11, PARAGRAPH 14, PROVINCIAL SUCCESSION DUTIES *					
**	AND ESCHEATS OR FORFEITURE TO THE CROWN.					
**	THE RIGHTS OF ANY PERSON WHO WOULD, BUT FOR THE LAND TITLES ACT, BE ENTITLED TO THE LAND OR ANY PART OF					
**	IT THROUGH LENGTH OF ADVERSE POSSESSION, PRESCRIPTION, MISDESCRIPTION OR BOUNDARIES SETTLED BY					
**	CONVENTION.					
**	ANY LEASE TO WHICH THE SUBSECTION 70(2) OF THE REGISTRY ACT APPLIES.					
**DATE OF CONVERSION TO LAND TITLES: 1996/09/23 **						
HA62174	1896/09/22	TRANSFER	$2,200		THE CORPORATION OF THE CITY OF HAMILTON	C
REMARKS: PLAN ATTACHED						

NOTE: ADJOINING PROPERTIES SHOULD BE INVESTIGATED TO ASCERTAIN DESCRIPTIVE INCONSISTENCIES, IF ANY, WITH DESCRIPTION REPRESENTED FOR THIS PROPERTY.
NOTE: ENSURE THAT YOUR PRINTOUT STATES THE TOTAL NUMBER OF PAGES AND THAT YOU HAVE PICKED THEM ALL UP.

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PARCEL REGISTER (ABBREVIATED) FOR PROPERTY IDENTIFIER

LAND REGISTRY OFFICE #62

17193-0037 (LT)

PREPARED FOR Bertucci1
ON 2017/02/10 AT 14:24:57

* CERTIFIED IN ACCORDANCE WITH THE LAND TITLES ACT * SUBJECT TO RESERVATIONS IN CROWN GRANT *

PROPERTY DESCRIPTION: PT LTS 9 & 10, CON 1 BARTON , AS IN HA71701 ; HAMILTON

PROPERTY REMARKS:

ESTATE/QUALIFIER:
FEE SIMPLE
LT CONVERSION QUALIFIED

RECENTLY:
FIRST CONVERSION FROM BOOK

PIN CREATION DATE:
1996/09/23

OWNERS' NAMES
TORONTO, HAMILTON AND BUFFALO RAILWAY COMPANY

CAPACITY SHARE
BENO

REG. NUM.	DATE	INSTRUMENT TYPE	AMOUNT	PARTIES FROM	PARTIES TO	CERT/ CHKD
EFFECTIVE 2000/07/29 THE NOTATION OF THE "BLOCK IMPLEMENTATION DATE" OF 1996/09/23 ON THIS PIN						
WAS REPLACED WITH THE "PIN CREATION DATE" OF 1996/09/23						
** PRINTOUT INCLUDES ALL DOCUMENT TYPES AND DELETED INSTRUMENTS SINCE 1996/09/20 **						
**SUBJECT, ON FIRST REGISTRATION UNDER THE LAND TITLES ACT, TO						
** SUBSECTION 44(1) OF THE LAND TITLES ACT, EXCEPT PARAGRAPH 11, PARAGRAPH 14, PROVINCIAL SUCCESSION DUTIES *						
** AND ESCHEATS OR FORFEITURE TO THE CROWN.						
** THE RIGHTS OF ANY PERSON WHO WOULD, BUT FOR THE LAND TITLES ACT, BE ENTITLED TO THE LAND OR ANY PART OF						
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** CONVENTION.						
** ANY LEASE TO WHICH THE SUBSECTION 70(2) OF THE REGISTRY ACT APPLIES.						
**DATE OF CONVERSION TO LAND TITLES: 1996/09/23 **						
HA71701	1901/03/16	TRANSFER	$180		TORONTO, HAMILTON AND BUFFALO RAILWAY COMPANY	C
	REMARKS: SKETCH ATTACHED					

NOTE: ADJOINING PROPERTIES SHOULD BE INVESTIGATED TO ASCERTAIN DESCRIPTIVE INCONSISTENCIES, IF ANY, WITH DESCRIPTION REPRESENTED FOR THIS PROPERTY.
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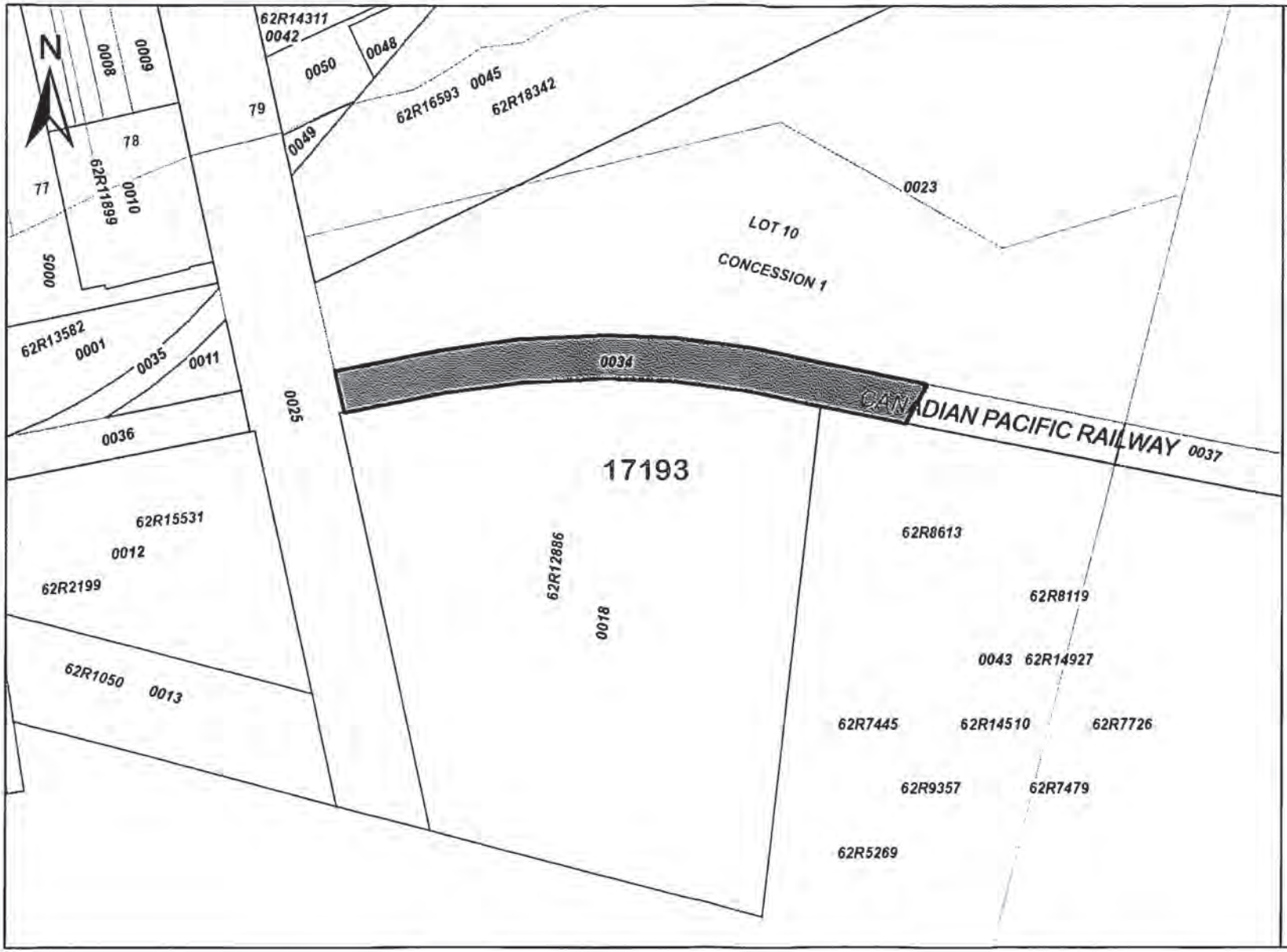

ServiceOntario

PRINTED ON 10 FEB, 2017 AT 14:24:38
FOR BERTUCCI1

SCALE

0 30 meters

PROPERTY INDEX MAP

WENTWORTH(No. 62)

LEGEND

FREEHOLD PROPERTY	
LEASEHOLD PROPERTY	
LIMITED INTEREST PROPERTY	
CONDOMINIUM PROPERTY	
RETIRED PIN (MAP UPDATE PENDING)	
PROPERTY NUMBER	0449
BLOCK NUMBER	08050
GEOGRAPHIC FABRIC	
EASEMENT	

THIS IS NOT A PLAN OF SURVEY

NOTES

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Ontario

CITY OF HAMILTON

PHASE II ENVIRONMENTAL SITE ASSESSMENT

FUTURE HSR STORAGE AND MAINTENANCE FACILITY

MAY 11, 2017

WSP

PHASE II ENVIRONMENTAL SITE ASSESSMENT

FUTURE HSR STORAGE AND MAINTENANCE FACILITY

City of Hamilton

Project nº : 161-17781-00-03

May 11, 2017

Distribution:
1 c Client (digital)
1 c V2PM Inc. (digital)

WSP Canada Inc.
4 Hughson Street South, Suite 300
Hamilton, ON L8N 3Z1

Phone: +1 905-529-4414
Fax: +1 905-521-2699
www.wspgroup.com

May 11, 2017

Ms. Shaba Shringi
Project Manager, Facilities
City of Hamilton
Facilities Management & Capital Programs Division
Corporate Assets & Strategic Planning, Public Works Department
28 James Street North, 5th Floor
Hamilton, Ontario
L8R 2K1

Subject : **Phase II Environmental Site Assessment**
Future HSR Storage and Maintenance Facility
Hamilton, Ontario
WSP Project No. 161-17781-00-03

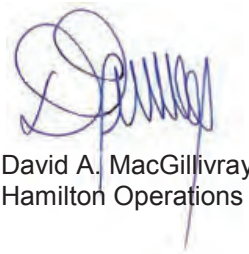
Dear Ms. Shringi,

WSP Canada Inc. is pleased to provide our report documenting the findings of the Phase II Environmental Site Assessment (ESA) completed at the above-noted site.

The assessment was completed using the Canadian Standards Association (CSA) Standard Z769-00 Phase II Environmental Site Assessment. The report describes the interpreted environmental conditions at the Site and provides conclusions for your consideration. It is understood that filing of a Record of Site Condition in accordance with Ontario Regulation 153/04 is not required for the site at this time.

We trust that the information provided herein is sufficient for your needs. Please contact the undersigned if you have any questions or comments or require additional information.

Yours truly,
WSP Canada Inc.



David A. MacGillivray, M.A.Sc., P.Geo., P.Eng., QP$_{ESA,RA}$
Hamilton Operations Manager, Environment

WSP Canada Inc.
4 Hughson Street South, Suite 300
Hamilton, ON L8N 3Z1

Phone: +1 905-529-4414
Fax: +1 905-521-2699
www.wspgroup.com

SIGNATURES

PREPARED BY

Rachel Bryan, M.A.Sc., P.Eng., QP_{ESA}
Project Engineer, Environment

REVIEWED BY

David A. MacGillivray, M.A.Sc., P.Eng., P.Geo., $QP_{ESA,RA}$
Senior Engineer, Environment

EXECUTIVE SUMMARY

WSP Canada Inc. (WSP) was retained by the City of Hamilton to conduct a Phase II Environmental Site Assessment (ESA) for the site of a proposed Hamilton Street Railway (HSR) Storage and Maintenance Facility, herein referred to as the Site. The Site includes 2 Hillyard St, 80 Brant St, the former CP Rail tracks between Hillyard St and Birch Ave, and the fleet yard at 330 Wentworth St N.

A Phase I ESA was recently completed by WSP at the Site in April 2017 for due diligence purposes prior to construction activities at the Site. The Phase I ESA recommended that a Phase II ESA be carried out to investigate soil and groundwater quality in 16 areas of potential environmental concern (APECs) identified on the Site. Contaminants of potential concern in soil and groundwater included petroleum hydrocarbons (PHCs), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), metals and inorganics, and polychlorinated biphenyls (PCBs).

Intrusive soil sampling through the advancement of boreholes and groundwater sampling from pre-existing and newly installed monitoring were used to investigate the subsurface conditions at the Site. A total of 22 boreholes were advanced on the Site; eight of the boreholes were completed as monitoring wells. Five pre-existing monitoring wells on the 80 Brant St property were also sampled to assess groundwater quality.

Note that at the time of the investigation the 2 Hillyard St property was not accessible. Soil and groundwater quality on this portion of the Site will be assessed at a later date. The results of the investigation on the 2 Hillyard St property will be issued under separate cover as an addendum to this report.

Analytical results were compared to the Ministry of the Environment and Climate Change (MOECC) Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Groundwater Condition for Industrial/Commercial/Community Property Use with medium and fine textured soils, as outlined in the *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* (April 15, 2011), hereinafter referred to as the “Table 3 SCS”.

Based on the results of the investigation, the following conclusions are presented:

- The Site is located within the former Sherman Inlet. In the early twentieth century fill was imported from off-Site sources to fill in the Sherman Inlet and associated wetlands. The fill is variable in nature and comprised of sand, silt, clay, ash, cinders, gravel, glass, wood, cobbles, brick, metal debris, slag, concrete, and foundry sand. The depth of fill in the boreholes ranged from 0.8 to 9.1 m.
- In the former wetland areas of the Site, organic peat material is present beneath the fill. Native clayey silt to silty clay soil underlies the peat and fill. Queenston shale bedrock is estimated to lie approximately 30 mbgs.

- Groundwater flow at the Site is estimated to be highly influenced by the presence of fill materials associated with the infilling of the former Sherman Inlet. Groundwater flow patterns are inferred to follow the branches of the former Sherman Inlet, with overall flow directed to the north towards Hamilton Harbour.
- *Fill soil quality:* Analytical results indicate that the fill soils present on the Site contain levels of metals, inorganics, and PAH parameters above the applicable Table 3 SCS. The contamination is widespread, with 26 of the 29 fill samples analyzed exceeding the Table 3 SCS for one or more metals, inorganics, and PAH parameters.

  Two areas of PHC contamination were also identified in the fill, as follows:

  - Borehole 17-06 contained concentrations of PHC F2 and F3 above the applicable Table 3 SCS in fill sampled at a depth of 1.5-2.1 mbgs.
  - Boreholes 17-13, 17-15, 17-16, 17-18, and 17-19, which are all located in the fleet yard of the 330 Wentworth St N property, contained concentrations of PHC F4 above the applicable Table 3 SCS in the fill, generally at depths of less than 1.5 mbgs.
- *Native silty clay soil quality:* Analytical results show exceedances for lead, conductivity, cyanide, benzo(a)pyrene and dibenzo(a,h)anthracene in the native silty clay soil beneath the fill. Six of the 14 samples analyzed exceeded the applicable Table 3 SCS for at least one metal, inorganic or PAH parameter.

  Three areas of PHC contamination were also identified in the native silty clay, as follows:

  - Borehole 17-06 contained a concentration of PHC F2 above the applicable Table 3 SCS in the native silty clay soil sampled at a depth of 9.1-9.8 mbgs.
  - Borehole 17-16 contained a concentration of PHC F1 above the applicable Table 3 SCS in the native silty clay soil sampled at a depth of 5.3-5.9 mbgs.
  - Boreholes 17-19 and 17-20 contained concentrations of PHC F1, F2, and F3 above the applicable Table 3 SCS in the native silty clay soil sampled between 4.6 and 5.9 mbgs.
- TCLP analysis results show the soil at the Site meets the Ontario Regulation 558 Table 4 Leachate Quality Criteria, and can be considered non-hazardous for disposal purposes.
- *Groundwater quality:* Analytical results indicate that shallow groundwater quality at the Site generally meets the Table 3 SCS with two exceptions, as follows:
  - There is a PHC-impacted area in the southeast portion of the Site. Groundwater in this area contains PHC concentrations above the applicable Table 3 SCS. The impacted area is estimated to include monitoring wells 17-19, 17-20, MW107B, BH32, and DC5, but may also extend beyond these wells. Free product was detected in BH32, which contained 0.90 m of LNAPL.
  - Vinyl chloride was measured at a concentration of 4.2 µg/L in monitoring well 17-11. The applicable Table 3 standard for vinyl chloride is 1.7 µgL. The source of vinyl chloride at 17-11 is estimated to be off-Site to the southeast. Records reviewed as part of the Phase I ESA identified trichloroethylene (TCE) contamination at the Brown Boggs Foundry, located

southeast of 17-11 in the inferred up-gradient groundwater flow direction. Vinyl chloride is a degradation product of TCE.

Based on the investigation, the following recommendations are presented:

- Excess fill and native silty clay soil generated during construction activities at the Site should be disposed of at a facility licensed to accept contaminated, non-hazardous waste.
- If construction dewatering is required, further characterization of the groundwater is recommended at the time of construction. Sampling and analysis should be carried out in order to meet the requirements of the sewer use bylaw. Treatment or disposal of groundwater will also need to be considered.
- The City should consider options for remediating the PHC-impacted area in the southeast of the Site in order to prevent further migration of the PHC plume. Some cost savings may be realized if the remediation can be conducted in conjunction with proposed construction activities at the Site.
- If they are no longer in use, the monitoring wells at the Site should be decommissioned prior to the commencement of construction activities by a licenced well contractor in accordance with Ontario Regulation 903. Alternatively, if the City wishes to retain some of the wells for continued monitoring and sampling purposes, they should be clearly marked and protected during proposed construction activities at the Site.

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1 INTRODUCTION

1.1 INTRODUCTION

WSP Canada Inc. (WSP) was retained by the City of Hamilton (City) to conduct a Phase II Environmental Site Assessment (ESA) for the site of a proposed Hamilton Street Railway (HSR) Storage and Maintenance Facility, herein referred to as the Site. The Site includes 2 Hillyard St, 80 Brant St, the former CP Rail tracks between Hillyard St and Birch Ave, and the fleet yard at 330 Wentworth St N. A Site Location Map is provided as Figure 1.

A Phase I ESA was recently completed at the Site by WSP for due diligence purposes prior to demolition and construction activities at the Site (WSP, 2017). The Phase I ESA recommended that a Phase II ESA was required to investigate soil and groundwater quality in the areas of potential environmental concern (APECs) identified on the Site.

There is no plan to change the land use at the Site. Given this, the Phase II ESA has been completed in general accordance with the Canadian Standards Association (CSA) Standard Z769-00, Phase II Environmental Site Assessment. This report has not been prepared to support a Record of Site Condition application for the Site.

1.2 BACKGROUND

The 7.9-hectare industrial Site is irregular in shape and lies within a predominantly industrial land use area with some residential and commercial use. The Site is bounded to the north by Brant St and to the east by a hydro corridor along the west side of Birch Ave. Adjacent lands to the south are occupied by the City Operations Centre and Birch Avenue Dog Park, while Hillyard St and a scrap metal and waste company, Hotz Ferrous Inc., bound the Site to the west.

A previous Phase I ESA was completed by WSP at the Site in April, 2017. The results of the Phase I ESA identified the following 16 Potentially Contaminating Activities (PCAs) on the Site:

2. Adhesives and Resins Manufacturing, Processing and Bulk Storage
14. Crude Oil Refining, Processing and Bulk Storage
22. Fertilizer Manufacturing, Processing and Bulk Storage
28. Gasoline and Associated Products Storage in Fixed Tanks
30. Importation of Fill Material of Unknown Quality
33. Metal Treatment, Coating, Plating and Finishing
34. Metal Fabrication
35. Mining, Smelting and Refining; Ore Processing; Tailings Storage
39. Paints Manufacturing, Processing and Bulk Storage
46. Rail Yards, Tracks and Spurs
48. Salt Manufacturing, Processing and Bulk Storage
49. Salvage Yard, including automobile wrecking

51. Solvent Manufacturing, Processing and Bulk Storage
55. Transformer Manufacturing, Processing and Use
56. Treatment of Sewage equal to or greater than 10,000 litres per day
58. Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners

The Site is situated within a predominantly industrial land use area. The following PCAs were identified off-Site within the Phase I Study Area:

2. Adhesives and Resins Manufacturing, Processing and Bulk Storage
5. Asphalt and Bitumen Manufacturing
8. Chemical Manufacturing, Processing and Bulk Storage
10. Commercial Autobody Shops
11. Commercial Trucking and Container Terminals
14. Crude Oil Refining, Processing and Bulk Storage
16. Drum and Barrel and Tank Reconditioning and Recycling
18. Electricity Generation, Transformation and Power Stations
27. Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles
28. Gasoline and Associated Products Storage in Fixed Tanks
30. Importation of Fill Material of Unknown Quality
32. Iron and Steel Manufacturing and Processing
33. Metal Treatment, Coating, Plating and Finishing
34. Metal Fabrication
39. Paints Manufacturing, Processing and Bulk Storage
43. Plastics (including Fibreglass) Manufacturing and Processing
46. Rail Yards, Tracks and Spurs
49. Salvage Yard, including automobile wrecking
52. Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems
55. Transformer Manufacturing, Processing and Use
57. Vehicles and Associated Parts Manufacturing
58. Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners

The PCAs listed above are considered to be contributing to 16 APECs on the Site, as described in the following table:

APEC	LOCATION OF APEC ON PROPERTY	CONTRIBUTING PCAs (PCA Numbers indicated)	LOCATION OF PCAs	CONTAMINANTS OF POTENTIAL CONCERN	MEDIA POTENTIALLY IMPACTED
1	Southeast portion of fleet yard on the 330 Wentworth St N property	A 3,000-L spill of hydraulic oil occurred in 1997 at GSW Heating Products Co. (34)	On-Site	PHCs BTEX	Soil and Groundwater
2	Northwest edge of Site on the 80 Brant St property	10, 28, 32, 33, 39, 46, 49, 55, 57, and 58	Off-Site to the northwest	M&I PAHs PHCs VOCs PCBs	Soil and Groundwater
3	Entire Site	30	On-Site	M&I PAHs PHCs VOCs PCBs	Soil and Groundwater
4	West portion of Site on the 2 Hillyard St property	2, 28, 35, 39, 51, and 55	On-Site	M&I PHCs VOCs PCBs	Soil and Groundwater
5	Southwest corner of Site on the 2 Hillyard and 330 Wentworth St N properties	2, 5, 8, 11, 27, 28, 32, 33, 49, 52, and 55	Off-Site to the southwest	M&I PAHs PHCs VOCs PCBs	Soil and Groundwater
6	Northwest corner on the 2 Hillyard and 80 Brant St properties	8, 10, 11, 28, 32, 33, 34, 43, 46, and 58	Off-Site to the west	M&I PAHs PHCs VOCs	Soil and Groundwater
7	South portion of Site on the 330 Wentworth St N property	14	On-Site and Off-Site to the south	PHCs VOCs	Soil and Groundwater
8	Three existing or former lines on the Site	46	On-Site	M&I PAHs PHCs VOCs	Soil and Groundwater
9	Two areas on the 80 Brant St and 330 Wentworth St N properties	28	On-Site	PHCs VOCs	Soil and Groundwater
10	West portion of the 2 Hillyard St property	56	On-Site	M&I PHCs VOCs	Soil and Groundwater

APEC	LOCATION OF APEC ON PROPERTY	CONTRIBUTING PCAs (PCA Numbers indicated)	LOCATION OF PCAs	CONTAMINANTS OF POTENTIAL CONCERN	MEDIA POTENTIALLY IMPACTED
11	Southcentral portion of Site on the 330 Wentworth St N property	22, 33, 34, and 55	On-Site	M&I PHCs VOCs PCBs	Soil and Groundwater
12	East edge of Site on the 330 Wentworth St N and 80 Brant St properties	8, 18, 28, 32, 34, 46, 55, and 57	Off-Site to the east	M&I PAHs PHCs VOCs PCBs	Soil and Groundwater
13	North portion of Site on the 80 Brant St property	49 and 58	On-Site	M&I PHCs VOCs	Soil and Groundwater
14	Centre of Site on the 330 Wentworth St N property	48	On-Site	Inorganics	Soil and Groundwater
15	North and East portions of 330 Wentworth St N property	58	On-Site	M&I PAHs PHCs VOCs	Soil and Groundwater
16	South portion of 330 Wentworth St N property	The oil-water separator for the floor drains of the off-Site 330 Wentworth St N Operations Center building is located on the Site (52)	On-Site	M&I PHCs VOCs	Soil and Groundwater

Notes:
M&I – Metals and inorganics
PHCs – petroleum hydrocarbons fractions F1-F4
VOCs – volatile organic compounds
PAHs – polycyclic aromatic hydrocarbons
PCBs – polychlorinated biphenyls

1.3 CURRENT AND PROPOSED FUTURE USES

The Site is currently being used for commercial and industrial purposes. We understand that the Site use is not proposed to change.

1.4 SCOPE OF WORK

In general, the purpose of the Phase II ESA is to characterize the soil and groundwater conditions at the Site in the areas that may potentially be contaminated.

The scope of work included the advancement of 22 boreholes and installation of eight monitoring wells on the Site. The drilling locations are illustrated on the Site Plan provided as Figure 2 and are also summarized in the following table.

Table 1-1 Drilling Locations

LOCATION ID	WELL INSTALLED	LOCATION ON SITE	APECs INVESTIGATED
17-01	No	West edge, 80 Brant St property	2, 3, 6, 8, 13
17-02	No	West side, railway tracks	3, 8
17-03	No	Northwest, 80 Brant St property	3, 8, 9, 13
17-04	No	Northcentral, 80 Brant St property	3, 13
17-05	No	North edge, 80 Brant St property	2, 3, 13
17-06	No	Northcentral, 80 Brant St property	3, 13
17-07	No	Northcentral, 80 Brant St property	3, 13
17-08	No	Central, 80 Brant St property	3, 8, 13
17-09	No	East side, railway tracks	3, 8, 12
17-10	No	Northeast, 80 Brant St property	3, 12, 13
17-11	Yes	Northeast, 80 Brant St property	3, 12, 13
17-12	Yes	South, 330 Wentworth St N property	3, 7, 12
17-13	Yes	Southcentral, 330 Wentworth St N property	3, 8, 11
17-14	No	Central, 330 Wentworth St N property	3, 8, 11
17-15	Yes	Central, 330 Wentworth St N property	3, 11, 14
17-16	No	Central, 330 Wentworth St N property	3, 11, 15
17-17	No	Central, 330 Wentworth St N property	3, 11
17-18	No	Southcentral, 330 Wentworth St N property	3, 9, 11
17-19	Yes	Southeast, 330 Wentworth St N property	1, 3, 11, 12
17-20	Yes	Southeast, 330 Wentworth St N property	1, 3, 11, 12
17-21	Yes	South, 330 Wentworth St N property	3, 7, 12
17-22	Yes	South, 330 Wentworth St N property	3, 7, 16

In addition to the eight monitoring wells installed as part of this investigation, nine pre-existing monitoring wells were also identified on the Site. Six of these were installed in 2015 during a previous Phase II ESA conducted on the 80 Brant St property (G2S Environmental Consulting Inc., 2015). These six wells, identified as MW101 and MW104 to MW108 in Figure 2, were in good condition and deemed to be suitable for sampling. The other three wells were installed in the 1990s and 2000s as part of a free product investigation on the former GSW Heating Products Company property, then 281 Birch Ave, now the 330 Wentworth St N fleet yard. These wells, identified as MW107B, BH32, and DC5 in Figure 2, were observed to be in poor condition. The wells were not sampled but were used to measure groundwater levels and light non-aqueous phase liquid (LNAPL) product thicknesses, if present.

Note that at the time of the investigation the 2 Hillyard St property was not accessible. Soil and groundwater quality on this portion of the Site will be assessed at a later date. The results of the investigation on the 2 Hillyard St property will be issued under separate cover as an addendum to this report.

1.5 APPLICABLE SITE CONDITION STANDARD

Analytical results were compared to the Ministry of the Environment and Climate Change (MOECC) Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Groundwater Condition for Industrial/Commercial/Community Property Use with medium and fine textured soils, as outlined in the *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* (April 15, 2011), hereinafter referred to as the "Table 3 SCS". This evaluation standard for the Site was selected for comparison purposes based on the following:

- Potable water for the Site and surrounding properties is supplied by the municipality from the Woodward Water Treatment Plant, whose intake is located approximately 6.3 km northeast of the Site in Lake Ontario;
- The Site is developed for industrial use. There is no land use change proposed for the Site;
- Surface water bodies were not identified on the Site or within 30 m of the Site boundaries;
- Grain size analysis results, included in Appendix C, show the native silty soil, which is estimated to comprise more than two thirds of the soil on the Site, consists of more than 50 per cent by mass of particles smaller than 75 µm in diameter; therefore, the medium and fine textured soil standards apply;
- Soil pH was analyzed in 14 surface soil samples and 25 subsurface soil samples from across the Site. The results show surface soil pH ranged from 7.35 to 11.9, with an average of 8.88 and median value of 8.34. Subsurface soil pH ranged from 6.99 to 11.6 with an average of 8.05 and median value of 7.66. Although there is significant variation in soil pH at the Site, the average and median pH values for surface and subsurface soils fall within the range of 5 to 9 for surface soil and 5 to 11 for subsurface soil. Therefore the Site is not considered to be environmentally sensitive based on soil pH;
- Areas of natural significance were not identified on the Site or within 30 m of the Site boundaries; and,
- The Site is not considered to be a shallow soil property, as defined by O. Reg. 153/04.

We note that if an RSC is needed for the Site that the Municipality will need to provide approval for use of the non-potable groundwater criteria.

2 PHASE II INVESTIGATION METHOD

2.1 GENERAL

Intrusive soil sampling and groundwater sampling from boreholes advanced and the monitoring wells installed as part of the drilling investigation were used to investigate the subsurface conditions at the Site. Groundwater samples were also collected from five of the pre-existing monitoring wells at the Site. Details of the investigation are described in the following sections. Drilling, soil sampling, and monitoring well installation activities were supervised by WSP personnel. Field notes were recorded in a dedicated field book, which is retained on file.

2.2 UTILITY LOCATES

Ontario One Call was contacted for the public utilities locates for the investigation. Frontier Utility Locating Inc. was retained by WSP to locate private utilities on-Site for all the subsurface investigation work.

2.3 DRILLING

The drilling program was completed on March 14-17, 20-22, and 31, 2017. Twenty-two boreholes (17-1 to 17-22) were advanced on the Site within the APECs identified by WSP during the Phase I ESA. Monitoring wells were installed in eight of the boreholes to allow for groundwater sampling. The boreholes were advanced using 215-mm diameter hollow stem augers by either a track-mounted or truck-mounted B-57 drill rig operated by Landshark Drilling of Brantford, Ontario. The borehole and monitoring well locations are shown on Figure 2.

The boreholes were advanced to depths ranging from 3.7 to 10.5 metres below ground surface (mbgs). Upon completion of the soil sampling activities the boreholes were either backfilled with bentonite pellets to surface or equipped with monitoring wells to allow for groundwater sampling.

Excess soil cuttings were drummed and removed on May 2, 2017 by Tesla Environmental Services Inc. for off-site disposal at a licensed facility.

2.4 SOIL SAMPLING

Semi-continuous soil sampling was conducted using a 0.61-m split spoon sampler driven at 0.76-m intervals. Disposable nitrile gloves were used during sample collection to minimize the potential for cross-contamination. Soil samples were described in the field by WSP staff, and observations were recorded in a dedicated field book. Soil samples selected for chemical analysis were stored at a temperature of less than 10°C and handled under chain of custody procedures until received at the laboratory. The soil samples selected for laboratory submission were considered to be representative of worst-case conditions in the boreholes based on field screening results, the location of the APECs, and observations of olfactory and visual characteristics.

Soil samples for volatile organic compound (VOC) analysis, including petroleum hydrocarbon (PHC) fraction F1, were collected directly into methanol-preserved vials.

A total of 50 soil samples, including eight blind field duplicates, were submitted to the laboratory for chemical analysis. The soil samples submitted for chemical analysis are summarized in Table 2-1.

Table 2-1 Soil Sample Details

SAMPLE ID	DEPTH (mbgs)	SOIL TYPE	PARAMETERS ANALYZED
17-01 SS2	0.76-1.37	Fill	M&I, VOCs, PHCs, PAHs
17-01 SS7	4.57-5.18	Fill	M&I, VOCs, PHCs, PAHs, PCBs
QA/QC1	4.57-5.18	Duplicate of 17-01 SS7	M&I
17-01 SS10	6.86-7.47	Silty clay	M&I, VOCs, PHCs, PAHs
17-02 SS1	0.00-0.61	Fill	M&I, VOCs, PHCs, PAHs
17-02 SS6	3.81-4.42	Silty clay	M&I, VOCs, PHCs, PAHs
QA/QC2	3.81-4.42	Duplicate of 17-02 SS6	M&I
17-03 SS2	0.76-1.37	Fill	M&I, PAHs
17-03 SS4	2.29-2.90	Fill	VOCs, PHCs, PCBs
17-03 SS10	6.86-7.47	Fill	M&I, VOCs, PHCs, PAHs
17-04 SS2	0.76-1.37	Fill	M&I, VOCs, PHCs, PAHs
17-04 SS5	3.05-3.66	Fill	M&I, VOCs, PHCs, PAHs
17-05 SS6	3.81-4.42	Fill	M&I, VOCs, PHCs, PAHs
17-06 SS3	1.52-2.13	Fill	M&I, VOCs, PHCs, PAHs
17-06 SS13	9.14-9.75	Silty clay	M&I, VOCs, PHCs, PAHs
17-07 SS3	1.52-2.13	Fill	M&I, VOCs, PHCs, PAHs
QA/QC3	1.52-2.13	Duplicate of 17-07 SS3	M&I
17-08 SS1	0.00-0.61	Fill	M&I, VOCs, PHCs, PAHs
17-09 SS2	0.76-1.37	Fill	M&I, VOCs, PHCs, PAHs
17-09 SS7	4.57-5.18	Fill	M&I, VOCs, PHCs, PAHs
17-10 SS3	1.52-2.13	Fill	M&I, VOCs, PHCs, PAHs, PCBs
17-11 SS1	0.00-0.61	Fill	M&I, VOCs, PHCs, PAHs
17-11 SS4	2.29-2.90	Silty clay	M&I, VOCs, PHCs, PAHs
17-12 SS3	1.52-2.13	Fill	M&I, VOCs, PHCs, PAHs
17-12 SS5	3.05-3.66	Silty clay	M&I, VOCs, PHCs, PAHs
17-13 SS2	0.76-1.37	Fill	M&I, VOCs, PHCs, PAHs
17-13 SS5	3.05-3.66	Silty clay	M&I, VOCs, PHCs, PAHs
QA/QC8	3.05-3.66	Duplicate of 17-13 SS5	VOCs, PHCs, PAHs
17-14 SS1	0.00-0.61	Fill	M&I, VOCs, PHCs, PAHs
17-14 SS10	6.86-7.47	Silty clay	M&I, VOCs, PHCs, PAHs
QA/QC7	6.86-7.47	Duplicate of 17-14 SS10	VOCs, PHCs, PAHs
17-15 SS2	0.76-1.37	Fill	M&I, VOCs, PHCs, PAHs

SAMPLE ID	DEPTH (mbgs)	SOIL TYPE	PARAMETERS ANALYZED
17-15 SS4	2.29-2.90	Silty clay	M&I, VOCs, PHCs, PAHs
17-16 SS4	2.29-2.90	Fill	M&I, VOCs, PHCs, PAHs
17-16 SS8	5.33-5.94	Silty clay	M&I, VOCs, PHCs, PAHs
17-17-SS1	0.00-0.61	Fill	M&I, VOCs, PHCs, PAHs
17-17-SS4	2.29-2.90	Fill	M&I, VOCs, PHCs, PAHs
17-18 SS1	0.00-0.61	Fill	M&I, VOCs, PHCs, PAHs, PCBs
17-18 SS7	4.57-5.18	Silty clay	M&I, VOCs, PHCs, PAHs
QA/QC4	4.57-5.18	Duplicate of 17-18 SS7	M&I
17-19 SS1	0.00-0.61	Fill	M&I, VOCs, PHCs, PAHs
QA/QC5	0.00-0.61	Duplicate of 17-19 SS1	VOCs, PHCs, PAHs
17-19 SS8	5.33-5.94	Silty clay	M&I, VOCs, PHCs, PAHs
QA/QC6	5.33-5.94	Duplicate of 17-19 SS8	VOCs, PHCs, PAHs
17-20 SS7	4.57-5.18	Silty clay	VOCs, PHCs
17-20 SS9	6.10-6.71	Silty clay	VOCs, PHCs
17-21 SS3	1.52-2.13	Fill	M&I, VOCs, PHCs, PAHs
17-21 SS5	3.05-3.66	Fill	M&I, VOCs, PHCs, PAHs
17-22 SS2	0.76-1.37	Fill	M&I, VOCs, PHCs, PAHs
17-22 SS4	2.29-2.90	Silty clay	M&I, VOCs, PHCs

Notes:
M&I – metals and inorganics
PHCs – petroleum hydrocarbons fractions F1-F4
VOCs – volatile organic compounds
PAHs – polycyclic aromatic hydrocarbons
PCBs – polychlorinated biphenyls

A composite soil sample was also collected and submitted for Toxicity Characteristic Leaching Procedure (TCLP) analysis of leachable VOCs, s-VOCs, PCBs, and metals and inorganics parameters to determine whether the soil is classified as hazardous or non-hazardous for future disposal purposes.

2.5 FIELD SCREENING MEASUREMENTS

Soil samples collected from the boreholes were screened for total organic vapours (TOV) using an IonScience Tiger LT photoionization detector (PID) calibrated to isobutylene. The TOV measurements are presented on the borehole logs included in Appendix A.

The field screening results showed low TOV readings in the 17 of the 22 boreholes, with maximum concentrations of less than 5 ppm. Five of the boreholes contained one or more soil samples with TOV concentrations greater than 5 ppm. The following table provides a summary of those samples.

Table 2-2 Soil Sample Field Screening Results: Samples containing TOV above 5 ppm

SAMPLE ID	DEPTH (mbgs)	TOV (ppm)
17-06 SS13	9.14-9.75	25.1
17-16 SS8	5.33-5.94	74.1
17-19 SS7	4.57-5.18	7.9
17-19 SS8	5.33-5.94	120
17-20 SS6	3.81-4.42	15.2
17-20 SS7	4.57-5.18	250
17-22 SS4	2.29-2.90	35
17-22 SS5	3.05-3.66	29
17-22 SS7	4.57-5.18	24.7

2.6 GROUNDWATER MONITORING WELL INSTALLATION

Groundwater monitoring wells were installed in boreholes 17-11 to 17-13, 17-15, and 17-19 to 17-22 by Landshark Drilling. Nitrile gloves were used to handle the well casings to minimize the potential for contamination during installation.

The monitoring wells were screened to intersect the local groundwater table, based on field observations of the soil conditions during borehole advancement (i.e. elevated moisture and colour change). The wells were constructed using 51 mm Schedule 40 PVC risers and included 3 m well screens (slot 10). Sand packs were placed in the annular space within the boreholes around the well screens from the bottom of the wells to approximately 0.3 m above the well screens. Bentonite hole plug seals were placed above the sand packs to ground surface. The wells were completed with either flush-mount or monument style protective casings and concreted in place. The monitoring well construction details are shown on the attached borehole logs presented in Appendix A.

The eight newly-installed monitoring wells as well as five of the pre-existing wells (MW101 and MW104 to 107) were equipped with dedicated 1/2-inch LDPE tubing and inertial lift foot valves to facilitate well development. The wells were developed on March 29 and 30, 2017 and on April 7, 2017 by removing three well volumes of groundwater or by purging the well dry three times. Monitoring well 17-12 was found to be dry on all occasions and could not be developed or sampled.

2.7 GROUNDWATER: FIELD MEASUREMENT OF WATER QUALITY PARAMETERS

A YSI 556 multi-parameter flow through cell was used to measure pH, conductivity, and temperature in the field during low flow sampling. Measurements obtained prior to sample collection are summarized in Table 2-3, below. The remaining measurements are maintained on file.

Table 2-3 Field-measured Water Quality Parameters

WELL ID	APPEARANCE/ODOUR	TEMPERATURE (°C)	pH	CONDUCTIVITY (µS/cm)
MW101	clear, no odour	9.2	7.79	1265
MW104	clear, no odour	10.9	7.18	1978
MW105	clear, no odour	12.4	6.92	3098
MW106	clear, no odour	10.3	6.81	1561
MW107	clear, no odour	9.5	6.86	7015
17-11	clear, no odour	7.4	7.83	1659
17-13	clear, no odour	8.2	7.36	2899
17-15	cloudy, light brown, no odour	12.1	7.34	1900
17-19	clear, PHC odour	11.7	6.85	2438
17-21	clear, no odour	13.7	7.24	1423
17-22	clear, slight PHC odour	14.0	7.23	850

2.8 GROUNDWATER SAMPLING

Groundwater samples were collected from selected monitoring wells on March 29 and 30, 2017 and on April 11, 2017. Dedicated 1/4-inch LDPE tubing was used to facilitate groundwater purging and sampling with a peristaltic pump. The samples were collected directly into laboratory-supplied bottles and kept according to chain of custody procedures until received at the laboratory.

A total of 13 groundwater samples, including two blind field duplicate samples, were submitted to the laboratory for analysis of metals and inorganics, PHCs, VOCs, PAHs, and PCBs. The following wells were sampled:

- MW101
- MW104
- MW105
- MW106
- MW107
- 17-11
- 17-13
- 17-15
- 17-19
- 17-21
- 17-22
- QA/QC1 (blind duplicate of MW105)
- QA/QC2 (blind duplicate of 17-22)

Note that monitoring well 17-15 contained insufficient volume to analyze for all parameters. Chromium VI, mercury, and PCBs were not analyzed at this location.

2.9 ANALYTICAL TESTING

Soil and groundwater samples were submitted to Maxxam Analytics (Maxxam) in Mississauga, Ontario for analysis of PHCs, VOCs, PAHs, PCBs, and metals and inorganics. Maxxam is certified by the Standards Council of Canada (SCC) and the Canadian Association for Laboratory Accreditation Inc. (CALA).

2.10 SURVEYING

Ground surface and top of pipe elevations of the monitoring wells and borehole locations were surveyed on March 23, 2017 by WSP personnel. Surveying was conducted using a Sokkia GCX2 GNSS high-precision Global Positioning System (GPS).

Ground surface elevations and UTM coordinates are provided on the borehole logs in Appendix A. Top of pipe elevations for the monitoring wells are provided in Table 1.

2.11 QUALITY ASSURANCE AND QUALITY CONTROL MEASURES

Sample containers were labelled with unique sample identification, the project number, and the sampling date. A laboratory-supplied chain of custody was completed for each laboratory submission; one copy was retained for the project file, while the remaining copy accompanied the samples to the laboratory.

Nitrile gloves, used during sample handling, were replaced after each sample was collected to reduce the potential for cross-contamination of the samples. Field equipment was decontaminated and rinsed with de-ionized water between samples.

As part of the quality assurance/quality control (QA/QC) program for the project, a minimum of one blind field duplicate sample for every ten samples was collected and analyzed for each parameter group in both soil and groundwater. The relative percent difference (RPD) between duplicate samples was calculated in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act as amended July 1, 2011 (i.e., 2011 Protocol). The calculated RPD was assessed against the recommended performance criteria outlined in the 2011 Protocol where the measured concentration was greater than 5 times the laboratory reportable detection limit (RDL).

A trip blank (distilled water sample), prepared by the laboratory, traveled along with the groundwater samples and was analyzed by the laboratory for VOCs. Positive results in the trip blank could indicate contamination from the sample containers, preservatives, transportation, or storage conditions. The results could also indicate if the laboratory instrument was detecting false interference.

Maxxam also performed QA/QC procedures as outlined in their SCC and CALA procedures. These procedures included analysis of lab duplicates and blanks as well as analysis of surrogate recovery as outlined in the Certificates of Analysis provided in Appendix B.

3 PHASE II REVIEW AND EVALUATION

3.1 GEOLOGY

A brief summary of the subsurface conditions encountered at the Site is presented below. Detailed borehole logs are included in Appendix A and an east-west cross section of the Site is provided as Figure 4.

The Site is located within the former Sherman Inlet. In the early twentieth century fill was imported from off-Site sources to fill in the Sherman Inlet and associated wetlands. The fill is variable in nature and comprised of sand, silt, clay, ash, cinders, gravel, glass, wood, cobbles, brick, metal debris, slag, concrete, and foundry sand.

Boreholes 17-12 to 17-22 were advanced through an approximately 0.10 m asphalt surface. Fill materials were encountered beneath the paving structure in boreholes 17-12 to 17-22 and at surface in boreholes 17-01 to 17-11. The depth of fill in the boreholes ranged from 0.8 to 9.1 m.

In the former wetland areas of the Site, organic peat material is present beneath the fill. Native clayey silt to silty clay soil underlies the peat and fill.

Regional geological mapping shows the overburden thickness at the Site is approximately 30 m (Vos, 1969) and the underlying bedrock consists of fractured reddish shale of the Queenston formation. Bedrock was not encountered during drilling activities at the Site, which reached a maximum depth of 10.5 mbgs.

3.2 GROUNDWATER ELEVATIONS AND FLOW DIRECTION

Groundwater levels measured in the monitoring wells on April 11, 2017 are provided in Table 1.

Groundwater levels were measured between 0.5 and 7.0 mbgs, corresponding to elevations ranging from 73.36 to 77.24 mASL.

A 0.90 m thick layer of LNAPL was measured in monitoring well BH32. None of the other wells contained measureable thicknesses of free product. The groundwater elevation was corrected for the presence of LNAPL in BH32 using a specific gravity of 0.85 for the presumed hydraulic oil.

Groundwater elevations and inferred flow direction in the fill and the silty clay are shown in Figure 3. Shallow groundwater flow at the Site is estimated to be highly influenced by the presence of fill materials associated with the infilling of the former Sherman Inlet. Groundwater flow patterns were inferred to follow the branches of the former Sherman Inlet, with overall flow directed to the north towards Hamilton Harbour.

The hydraulic conductivity of the fill materials is estimated to be high, while the hydraulic conductivity of the underlying native clayey silt to silty clay soils is estimated to be low.

3.3 SOIL QUALITY

Laboratory analysis results for the submitted soil samples are summarized in Table 2. Laboratory Certificates of Analysis are provided in Appendix B.

3.3.1 METALS AND INORGANICS

A total of 43 samples (including four blind field duplicates) from 21 boreholes were analyzed for metals and inorganics parameters. The samples consisted of 29 fill soil samples and 14 native silty clay soil samples.

The laboratory analysis results show concentrations of metals and inorganics parameters exceeded the applicable Table 3 SCS in 28 of the 43 samples. The exceedances were widespread across the Site, affecting 19 of the 21 boreholes.

In general, the fill soils contain elevated concentrations of several metals and inorganics parameters. In particular, lead and zinc were found at concentrations exceeding the Table 3 SCS in more than half of the fill samples analyzed.

The native silty clay soil samples did not exhibit widespread metals and inorganics contamination; however electrical conductivity, lead, and cyanide did exceed the applicable Table 3 SCS in several boreholes across the Site.

The following table summarizes the metals and inorganics parameters exceeding the Table 3 SCS at the Site:

Table 3-1 Summary of Metals and Inorganics Exceedances in Soil

PARAMETER	NUMBER OF EXCEEDANCES FILL	SILTY CLAY	BOREHOLES CONTAINING EXCEEDANCES (17-XX)
Antimony	2 / 29	0 / 14	03, 12
Arsenic	5 / 29	0 / 14	03, 04, 09, 12, 21
Boron (Hot water soluble)	7 / 29	0 / 14	03, 04, 06, 07, 09, 13
Cadmium	6 / 29	0 / 14	03, 04, 06, 08, 11, 12
Chromium (total)	5 / 29	0 / 14	03, 04, 06, 08, 18
Copper	4 / 29	0 / 14	03, 04, 06, 12
Lead	16 / 29	3 / 14	01, 03, 04, 06, 07, 08, 09, 11, 12, 17, 19, 21, 22
Mercury	1 / 29	0 / 14	03
Molybdenum	1 / 29	0 / 14	03
Nickel	1 / 29	0 / 14	03
Thallium	1 / 29	0 / 14	12
Vanadium	3 / 29	0 / 14	04, 06, 18
Zinc	15 / 29	0 / 14	03, 04, 06, 07, 08, 09, 11, 12, 15, 16, 17, 21, 22
Conductivity	5 / 29	5 / 14	06, 12, 14, 16, 17, 18, 19, 22
Sodium Adsorption Ratio	2 / 29	0 / 14	17, 19
Cyanide	2 / 29	1 / 14	03, 05, 06

3.3.2 POLYCYCLIC AROMATIC HYDROCARBONS

A total of 42 samples (including four blind field duplicates) from 21 boreholes were analyzed for PAHs. The samples consisted of 28 fill soil samples and 14 native silty clay soil samples.

The laboratory analysis results show concentrations of PAH parameters exceeded the applicable Table 3 SCS in 16 of the 42 samples. The exceedances were widespread across the Site, affecting 13 of the 21 boreholes.

In general, the fill soils contain elevated concentrations of several PAH parameters. In particular, benzo(a)pyrene, benzo(b/j)fluoranthene, and dibenzo(a,h)anthracene were found at concentrations exceeding the Table 3 SCS in approximately half of the fill samples analyzed.

The native silty clay soil samples generally met the Table 3 SCS for PAH parameters with the exception of benzo(a)pyrene and dibenzo(a,h)anthracene in borehole 17-19.

The following table summarizes the PAH parameters exceeding the Table 3 SCS at the Site:

Table 3-2 Summary of PAH Exceedances in Soil

PARAMETER	NUMBER OF EXCEEDANCES FILL	SILTY CLAY	BOREHOLES CONTAINING EXCEEDANCES (17-XX)
Acenaphthylene	5 / 28	0 / 14	02, 03, 04, 05, 17
Anthracene	4 / 28	0 / 14	03, 04, 17
Benzo(a)anthracene	7 / 28	0 / 14	02, 03, 04, 05, 17
Benzo(a)pyrene	15 / 28	1 / 14	01, 02, 03, 04, 05, 07, 08, 10, 13, 15, 17, 19, 21
Benzo(b/j)fluoranthene	13 / 28	0 / 14	01, 02, 03, 04, 05, 07, 08, 10, 13, 17
Benzo(ghi)perylene	1 / 28	0 / 14	17
Benzo(k)fluoranthene	4 / 28	0 / 14	03, 04, 17
Chrysene	1 / 28	0 / 14	17
Dibenzo(a,h)anthracene	14 / 28	1 / 14	01, 02, 03, 04, 05, 07, 08, 10, 13, 17, 19, 21
Fluoranthene	3 / 28	0 / 14	03, 04, 17
Indeno(1,2,3-cd)pyrene	7 / 28	0 / 14	02, 03, 04, 05, 17
Phenanthrene	2 / 28	0 / 14	04, 17

3.3.3 PETROLEUM HYDROCARBONS

A total of 45 samples (including four blind field duplicates) from 22 boreholes were analyzed for PHCs. The samples consisted of 28 fill soil samples and 17 native silty clay soil samples.

The laboratory analysis results show concentrations of PHCs exceeded the applicable Table 3 SCS in 13 of the 45 samples. The exceedances affected 8 of the 22 boreholes.

The following table summarizes the PHC parameters exceeding the Table 3 SCS at the Site:

Table 3-3 Summary of PHC Exceedances in Soil

PARAMETER	NUMBER OF EXCEEDANCES FILL	SILTY CLAY	BOREHOLES CONTAINING EXCEEDANCES (17-XX)
PHC F1 (C6 to C10)	0 / 28	3 / 17	16, 19, 20
PHC F2 (C10 to C16)	1 / 28	3 / 17	06, 19, 20
PHC F3 (C16 to C34)	1 / 28	1 / 17	06, 20
PHC F4 (C34 to C50) (Gravimetric)	7 / 28	0 / 17	13, 14, 15, 16, 18, 19

3.3.4 POLYCHLORINATED BIPHENYLS

A total of four fill soil samples from three boreholes were analyzed for PCBs.

The laboratory analysis results show concentrations of PCBs met the applicable Table 3 SCS in the submitted samples.

3.3.5 VOLATILE ORGANIC COMPOUNDS

A total of 45 samples (including four blind field duplicates) from 22 boreholes were analyzed for VOCs. The samples consisted of 28 fill soil samples and 17 native silty clay soil samples.

The laboratory analysis results show concentrations of VOCs met the applicable Table 3 SCS in the submitted soil samples.

3.3.6 SOIL CHARACTERIZATION FOR DISPOSAL PURPOSES

Based on the analytical results of the TCLP analyses, the reported concentrations were below the applicable Ontario Regulation 558 Table 4 Leachate Quality Criteria for the analyses conducted. The results of TCLP analysis indicate that the soil on the Site can be considered non-hazardous. Excess soil would need to be disposed of at a facility licensed to accept contaminated, non-hazardous waste.

The TCLP analysis results are provided on the Laboratory Certificates of Analysis in Appendix B.

3.4 GROUNDWATER QUALITY

Laboratory analysis results for the submitted groundwater samples are summarized in Table 3. Laboratory Certificates of Analysis are provided in Appendix B.

Concentrations of metals, inorganics, PAHs, and PCBs in the submitted groundwater samples met the applicable Table 3 SCS.

Concentrations of PHCs and VOCs also met the Table 3 SCS in the submitted groundwater samples with the exception of vinyl chloride in 17-11 and PHC F1 and F2 in 17-19. The parameter exceedances in the submitted groundwater samples summarized in the following table:

Table 3-4 Summary of Parameter Exceedances in Groundwater

SAMPLE ID	ELEVATED PARAMETER	UNITS	TABLE 3 SCS	ANALYTICAL RESULTS
17-11	Vinyl chloride	µg/L	1.7	4.2
17-19	PHC F1 PHC F2	µg/L µg/L	750 150	940 1100

In addition to the analytical exceedances noted above, a 0.90 m thick layer of LNAPL was measured in monitoring well BH32. None of the other wells contained measureable thicknesses of free product.

3.5 QUALITY ASSURANCE AND QUALITY CONTROL RESULTS

3.5.1 SOIL

Eight blind field duplicate soil samples were submitted for analysis. The calculated RPDs were assessed against the recommended performance criteria outlined in the 2011 Protocol.

The results showed high variability among the duplicate soil samples analyzed. In many cases, especially for metals, inorganics, and PAH parameters in duplicate samples of the fill, the RPDs did not meet the recommended performance criteria. The high variability between duplicate samples reflects the heterogeneity of the soils at the Site, especially the fill. Despite this variability, there was agreement between duplicate samples when assessing parameter concentrations against the applicable Table 3 SCS except in eight instances, which are summarized in Table 3-4.

Table 3-5 Summary of Inconsistencies in Soil QA/QC results

DUPLICATE SAMPLE IDs	SOIL TYPE	PARAMETER	RESULT 1	RESULT 2	TABLE 3 SCS
17-01 SS7, QA/QC1	Fill	Lead	64	230	120
17-07 SS3, QA/QC3	Fill	Boron (HWS)	1.8	2.7	2
		Lead	91	160	120
		Zinc	290	430	340
17-19 SS8, QA/QC6	Silty clay	PHC F1	19	150	65
		PHC F2	330	160	250
		Benzo(a)pyrene	0.028	0.64	0.3
		Dibenzo(a,h)anthracene	0.0066	0.11	0.1

Notes:
All concentrations in µg/g.
Yellow highlighting indicates that the parameter concentration exceeds the Table 3 SCS.

Overall, the QA/QC results indicate soils at the Site are highly heterogeneous. The analytical results, especially for metals, inorganics, and PAH parameters, are therefore best interpreted on a broad, Site-wide scale. Emphasis should not be placed on the analytical result for any one individual sample. Since a total of 50 soil samples, including 31 samples of the fill and 19 samples of the silty clay, were analyzed from the Site, the quantity of samples is sufficient to allow for a reliable and accurate interpretation of the soil quality at the Site, as a whole.

3.5.2 GROUNDWATER

Two blind field duplicate groundwater samples were submitted for analysis. The calculated RPDs were assessed against the recommended performance criteria outlined in the 2011 Protocol. The results indicated acceptable correlation between samples with the exception of zinc in duplicate groundwater samples 17-22 and QA/QC2, where the calculated RPD was 157%. Given that the zinc concentration was below the applicable Table 3 SCS in both duplicate samples, it can be concluded with a reasonable level of confidence that the concentration of zinc in groundwater at this location met the applicable Table 3 SCS despite some variability.

A trip blank (distilled water sample), prepared by the laboratory, travelled along with the groundwater samples and was analyzed by the laboratory for VOCs. All concentrations were below the RDL, indicating no contamination from the sample containers, preservatives, and transportation and storage conditions. The results also indicate that the laboratory instrument was not detecting false interference.

Maxxam also carried out internal QA/QC measures including process recoveries, blanks, and replicate samples. The laboratory QA/QC results are provided on the Certificates of Analysis in Appendix B. The results were acceptable and therefore suitable for interpretation.

4 CONCLUSIONS

Based on the results of the investigation, the following conclusions are presented:

- The Site is located within the former Sherman Inlet. In the early twentieth century fill was imported from off-Site sources to fill in the Sherman Inlet and associated wetlands. The fill is variable in nature and comprised of sand, silt, clay, ash, cinders, gravel, glass, wood, cobbles, brick, metal debris, slag, concrete, and foundry sand. The depth of fill in the boreholes ranged from 0.8 to 9.1 m.
- In the former wetland areas of the Site, organic peat material is present beneath the fill. Native clayey silt to silty clay soil underlies the peat and fill. Queenston shale bedrock is estimated to lie approximately 30 mbgs.
- Groundwater flow at the Site is estimated to be highly influenced by the presence of fill materials associated with the infilling of the former Sherman Inlet. Groundwater flow patterns are inferred to follow the branches of the former Sherman Inlet, with overall flow directed to the north towards Hamilton Harbour.
- *Fill soil quality:* Analytical results indicate that the fill soils present on the Site contain levels of metals, inorganics, and PAH parameters above the applicable Table 3 SCS. The contamination is widespread, with 26 of the 29 fill samples analyzed exceeding the Table 3 SCS for one or more metals, inorganics, and PAH parameters.

  Two areas of PHC contamination were also identified in the fill, as follows:

  - Borehole 17-06 contained concentrations of PHC F2 and F3 above the applicable Table 3 SCS in fill sampled at a depth of 1.5-2.1 mbgs.
  - Boreholes 17-13, 17-15, 17-16, 17-18, and 17-19, which are all located in the fleet yard of the 330 Wentworth St N property, contained concentrations of PHC F4 above the applicable Table 3 SCS in the fill, generally at depths of less than 1.5 mbgs.
- *Native silty clay soil quality:* Analytical results show exceedances for lead, conductivity, cyanide, benzo(a)pyrene and dibenzo(a,h)anthracene in the native silty clay soil beneath the fill. Six of the 14 samples analyzed exceeded the applicable Table 3 SCS for at least one metal, inorganic or PAH parameter.

  Three areas of PHC contamination were also identified in the native silty clay, as follows:

  - Borehole 17-06 contained a concentration of PHC F2 above the applicable Table 3 SCS in the native silty clay soil sampled at a depth of 9.1-9.8 mbgs.
  - Borehole 17-16 contained a concentration of PHC F1 above the applicable Table 3 SCS in the native silty clay soil sampled at a depth of 5.3-5.9 mbgs.
  - Boreholes 17-19 and 17-20 contained concentrations of PHC F1, F2, and F3 above the applicable Table 3 SCS in the native silty clay soil sampled between 4.6 and 5.9 mbgs.

- TCLP analysis results show the soil at the Site meets the Ontario Regulation 558 Table 4 Leachate Quality Criteria, and can be considered non-hazardous for disposal purposes.
- *Groundwater quality:* Analytical results indicate that shallow groundwater quality at the Site generally meets the Table 3 SCS with two exceptions, as follows:
  - There is a PHC-impacted area in the southeast portion of the Site. Groundwater in this area contains PHC concentrations above the applicable Table 3 SCS. The impacted area is estimated to include monitoring wells 17-19, 17-20, MW107B, BH32, and DC5, but may also extend beyond these wells. Free product was only detected in BH32, which contained 0.90 m of LNAPL.
  - Vinyl chloride was measured at a concentration of 4.2 µg/L in monitoring well 17-11. The applicable Table 3 standard for vinyl chloride is 1.7 µgL. The source of vinyl chloride at 17-11 is estimated to be off-Site to the southeast. Records reviewed as part of the Phase I ESA identified trichloroethylene (TCE) contamination at the Brown Boggs Foundry, located southeast of 17-11 in the inferred up-gradient groundwater flow direction. Vinyl chloride is a degradation product of TCE.

5 RECOMMENDATIONS

Based on the investigation, the following recommendations are presented:

- Excess fill and native silty clay soil generated during construction activities at the Site should be disposed of at a facility licensed to accept contaminated, non-hazardous waste.
- If construction dewatering is required, further characterization of the groundwater is recommended at the time of construction. Sampling and analysis should be carried out in order to meet the requirements of the sewer use bylaw. Treatment or disposal of groundwater will also need to be considered.
- The City should consider options for remediating the PHC-impacted area in the southeast of the Site in order to prevent further migration of the PHC plume. Some cost savings may be realized if the remediation can be conducted in conjunction with proposed construction activities at the Site.
- If they are no longer in use, the monitoring wells at the Site should be decommissioned prior to the commencement of construction activities by a licenced well contractor in accordance with Ontario Regulation 903. Alternatively, if the City wishes to retain some of the wells for continued monitoring and sampling purposes, they should be clearly marked and protected during proposed construction activities at the Site.

6 LIMITATIONS

This report has been prepared for the addressee. Release to any other company, concern, or individual is solely the responsibility of the addressee. WSP reserves the right to amend and/or supplement this report in the event additional information, documentation or evidence becomes available.

The information and conclusions contained in this report are based upon work undertaken by trained professional and technical staff in accordance with generally accepted engineering and scientific

practices current at the time the work was performed. Any use that a third party makes of this report, or any reliance on decisions made based on it, is the responsibility of such third parties. WSP accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made, or actions taken, based on this report.

Conclusions presented in this report should not be construed as legal advice and represent the best technical judgment of WSP staff. The conclusions are based on the Site conditions observed by WSP at the time the work was performed at the specific testing and/or sampling locations, and can only be extrapolated to an undefined limited area around these locations. The extent of the limited area depends on the soil and groundwater conditions, as well as the history of the Site reflecting natural, construction and other activities. In addition, analysis has been carried out for a limited number of chemical parameters, and it should not be inferred that other chemical species are not present. Due to the nature of the investigation and the limited data available, WSP cannot warrant against undiscovered environmental liabilities or adverse impacts off-Site.

If any conditions become apparent that differ significantly from our understanding of conditions as presented in this report, we request that we be notified immediately to reassess the conclusions and recommendations provided herein.

7 QUALIFICATIONS OF ASSESSORS

Mr. David A. MacGillivray, P.Eng., P.Geo., $QP_{ESA,RA}$, is the National Discipline Lead for Contaminated Lands and Environmental Site Assessments for WSP Canada. He is responsible for the operations of the environment group at WSP's Hamilton location. Mr. MacGillivray's career experience has included assignments involving Brownfields such as Phase One and Two ESAs, Record of Site Conditions, Risk Assessments, and Risk Management Plans. He has worked extensively in the area of groundwater resource development and groundwater impact assessment. Mr. MacGillivray also provides expertise in the completion of geotechnical and groundwater control studies for civil projects including subdivisions, transportation, buildings, and servicing. Mr. MacGillivray is a Qualified Person ($QP_{ESA,RA}$)with the Ministry of the Environment to complete Risk Assessments and submit Records of Site Condition under Ontario Regulation 153/04 (Brownfield Regulation).

Ms. Rachel Bryan, M.A.Sc., P.Eng., QP_{ESA}, is a Project Engineer in the Hamilton, Ontario office of WSP. She has experience in conducting Phase I and II Environmental Site Assessments on numerous residential, commercial, and industrial properties. Ms. Bryan also has experience in completing soil and groundwater contaminant delineation programs and is a Qualified Person (QP_{ESA}) with the MOECC under Ontario Regulation 153/04. She has also directed the implementation of soil remediation programs, verification sampling, and site restoration activities.

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Tables

Table 1
Groundwater Levels
Future HSR Storage and Maintenance Facility
161-17781-00

Monitoring Well ID	Top of Pipe Elevation (mASL)	Ground Surface Elevation (mASL)	Screened Interval (mASL)	Stratum Screened	Depth to LNAPL (mbtop)	Measured Depth to Groundwater (mbtop)	Apparent LNAPL Thickness (m)	Corrected Depth to Groundwater [1] (mbtop)	Corrected Depth to Groundwater [1] (mbgs)	Groundwater Elevation (mASL)	Comments
17-11	78.086	77.35	72.96 - 76.01	Silty clay	nd	1.64	-	1.64	0.91	76.45	
17-12	80.242	80.37	77.93 - 79.46	Fill	nd	dry	-	-	-	-	dry at 77.93 mASL
17-13	79.620	79.75	75.27 - 78.32	Silty clay	nd	2.38	-	2.38	2.51	77.24	
17-15	79.629	79.74	74.56 - 77.60	Silty clay	nd	4.81	-	4.81	4.92	74.82	very slow recharge, water level likely not at equilibrium
17-19	79.462	79.57	73.62 - 76.67	Fill	nd	3.95	-	3.95	4.06	75.51	
17-20	79.334	79.51	73.57 - 76.62	Fill	nd	3.16	-	3.16	3.34	76.17	
17-21	80.255	80.39	72.47 - 75.51	Silty clay	nd	6.90	-	6.90	7.04	73.36	very slow recharge, water level likely not at equilibrium
17-22	81.028	81.14	73.52 - 76.57	Silty clay	nd	6.58	-	6.58	6.69	74.45	very slow recharge, water level likely not at equilibrium
MW101	78.528	77.60	72.05 - 75.10	Fill	nd	2.24	-	2.24	1.31	76.29	
MW104	79.107	78.20	72.65 - 75.70	Fill	nd	3.73	-	3.73	2.82	75.38	
MW105	79.464	78.55	72.46 - 75.51	Fill	nd	3.13	-	3.13	2.22	76.33	
MW106	79.618	78.66	72.41 - 75.46	Silty clay	nd	3.73	-	3.73	2.77	75.89	
MW107	79.010	78.14	72.47 - 75.52	Fill	nd	2.44	-	2.44	1.57	76.57	
MW108	79.235	78.29	72.74 - 75.79	Fill	nd	2.81	-	2.81	1.87	76.43	
MW107B	77.360	77.14	73.49 - 76.53	Fill	nd	1.53	-	1.53	1.31	75.83	
BH32	76.653	76.04	71.04 - 74.52	Fill	0.97	1.87	0.90	1.11	0.49	75.55	
DC5	76.775	76.57	74.29 - 75.81	Fill	nd	1.40	-	1.40	1.20	75.38	

Notes:
mASL = metres above mean seal level
mbtop = metres below top of pipe
mbgs = metres below ground surface
nd = not detected
1. Groundwater levels corrected for the presence of LNAPL, if present, using a specific gravity of 0.85 for the presumed hydraulic oil.
2. Groundwater levels measured on April 11, 2017.

Table 2
Summary of Soil Analytical Results
Future HSR Storage and Maintenance Facility
161-17781-00

Parameter [1]	Sample ID	17-01 SS2	17-01 SS7	QA/QC1	17-01 SS10	17-02 SS1	17-02 SS6	QA/QC2	17-03 SS2	17-03 SS4	17-03 SS10	17-04 SS2	17-04 SS5	17-05 SS6	17-06 SS3	17-06 SS13	17-07 SS3	QA/QC3
	Sample Date	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/15/2017	3/16/2017	3/15/2017	3/22/2017	3/22/2017	3/16/2017	3/16/2017
	Sample Depth (mbgs)	0.76-1.37	4.57-5.18	4.57-5.18	6.86-7.47	0.00-0.61	3.81-4.42	3.81-4.42	0.76-1.37	2.29-2.90	6.86-7.47	0.76-1.37	3.05-3.66	3.81-4.42	1.52-2.13	9.14-9.75	1.52-2.13	1.52-2.13
	Soil Type	Fill	Fill	Fill	Silty clay	Fill	Silty clay	Silty clay	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Silty clay	Fill	Fill
	Table 3 SCS [2]			Blind Duplicate of 17-01 SS7				Blind Duplicate of 17-02 SS6										Blind Duplicate of 17-07 SS3
PETROLEUM HYDROCARBONS (PHCs)																		
F1 (C6 to C10)	65	<10	<10		<10	18	<10			<10	<10	<10	<10	<10	<10	<20	<10	
F1 (C6 to C10) - BTEX	65	<10	<10		<10	16	<10			<10	<10	<10	<10	<10	<10	<20	<10	
F2 (C10 to C16)	250	<10	59		<10	<10	<10			17	130	25	80	62	**540**	**1500**	16	
F3 (C16 to C34)	2500	170	550		<50	50	<50			960	1800	1200	1200	930	**17000**	2100	300	
F4 (C34 to C50)	6600	60	92		<50	<50	<50			250	360	290	380	190	3800	190	71	
Reached Baseline at C50		YES	NO		YES	YES	YES			YES	YES	YES	NO	NO	YES	YES	YES	
F4 Gravimetric	6600		610										1300	690				
VOLATILE ORGANIC COMPOUNDS (VOCs)																		
Acetone	28	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1	<0.50	
Benzene	0.4	<0.020	<0.020		<0.020	0.051	<0.020			0.054	0.15	<0.020	<0.020	<0.020	0.031	<0.040	<0.020	
Bromodichloromethane	18	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
Bromoform	1.7	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
Bromomethane	0.05	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**<0.10**	<0.050	
Carbon Tetrachloride	1.5	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
Chlorobenzene	2.7	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
Chloroform	0.18	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
Dibromochloromethane	13	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
1,2-Dichlorobenzene	8.5	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
1,3-Dichlorobenzene	12	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
1,4-Dichlorobenzene	0.84	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
1,1-Dichloroethane	21	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
1,2-Dichloroethane	0.05	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**<0.10**	<0.050	
1,1-Dichloroethylene	0.48	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
Cis-1,2-Dichloroethylene	37	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
Trans-1,2-Dichloroethylene	9.3	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
1,2-Dichloropropane	0.68	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
Cis-1,3-Dichloropropylene		<0.030	<0.030		<0.030	<0.030	<0.030			<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.060	<0.030	
Trans-1,3-Dichloropropylene		<0.040	<0.040		<0.040	<0.040	<0.040			<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.080	<0.040	
Ethylbenzene	19	<0.020	<0.020		<0.020	0.1	<0.020			0.054	0.073	<0.020	<0.020	<0.020	0.16	<0.040	<0.020	
Ethylene Dibromide	0.05	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**<0.10**	<0.050	
Methyl Ethyl Ketone	88	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<0.50	
Methylene Chloride	2	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
Methyl Isobutyl Ketone	210	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<0.50	
Methyl-t-Butyl Ether	3.2	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
Styrene	43	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
1,1,1,2-Tetrachloroethane	0.11	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
1,1,2,2-Tetrachloroethane	0.094	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**<0.10**	<0.050	
Toluene	78	0.023	<0.020		<0.020	0.39	<0.020			0.088	1.7	<0.020	0.024	0.47	0.41	0.062	0.073	
Tetrachloroethylene	21	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
1,1,1-Trichloroethane	12	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
1,1,2-Trichloroethane	0.11	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
Trichloroethylene	0.61	<0.050	<0.050		<0.050	<0.050	<0.050			0.069	<0.050	<0.050	<0.050	<0.050	0.079	<0.10	<0.050	
Vinyl Chloride	0.25	<0.020	<0.020		<0.020	<0.020	<0.020			<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.040	<0.020	
m-Xylene & p-Xylene		0.039	<0.020		<0.020	0.78	<0.020			0.12	0.05	<0.020	0.052	0.048	0.58	0.23	0.096	
o-Xylene		0.035	<0.020		<0.020	0.61	<0.020			0.066	<0.020	<0.020	0.03	<0.020	0.25	0.18	0.044	
Total Xylenes	30	0.074	<0.020		<0.020	1.4	<0.020			0.19	0.05	<0.020	0.082	0.048	0.83	0.41	0.14	
Dichlorodifluoromethane	25	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
Hexane(n)	88	<0.050	<0.050		<0.050	0.15	<0.050			0.078	<0.050	<0.050	<0.050	<0.050	0.065	<0.10	<0.050	
Trichlorofluoromethane	5.8	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	
1,3-Dichloropropene (cis + trans)	0.21	<0.050	<0.050		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	

Notes:

1. All concentrations in µg/g, unless indicated otherwise.
2. Table 3 SCS = Table 3: Full Depth Generic Site Condition Standards for Use in a Non-Potable Groundwater Condition for Use Under Part XV.1 of the Environmental Protection Act (04/15/11) Industrial/Commercial/Community Property Use, medium and fine textured soil standards.
3. Yellow highlighting indicates that the parameter concentration exceeds the Table 3 SCS, Blue highlighting indicates that MDL exceeds the Table 3 SCS.

Table 2
Summary of Soil Analytical Results
Future HSR Storage and Maintenance Facility
161-17781-00

Parameter[1]	Sample ID	17-01 SS2	17-01 SS7	QA/QC1	17-01 SS10	17-02 SS1	17-02 SS6	QA/QC2	17-03 SS2	17-03 SS4	17-03 SS10	17-04 SS2	17-04 SS5	17-05 SS6	17-06 SS3	17-06 SS13	17-07 SS3	QA/QC3
	Sample Date	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/15/2017	3/16/2017	3/15/2017	3/22/2017	3/22/2017	3/16/2017	3/16/2017
	Sample Depth (mbgs)	0.76-1.37	4.57-5.18	4.57-5.18	6.86-7.47	0.00-0.61	3.81-4.42	3.81-4.42	0.76-1.37	2.29-2.90	6.86-7.47	0.76-1.37	3.05-3.66	3.81-4.42	1.52-2.13	9.14-9.75	1.52-2.13	1.52-2.13
	Soil Type	Fill	Fill	Fill	Silty clay	Fill	Silty clay	Silty clay	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Silty clay	Fill	Fill
	Table 3 SCS[2]			Blind Duplicate of 17-01 SS7				Blind Duplicate of 17-02 SS6										Blind Duplicate of 17-07 SS3
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)																		
Acenaphthene	96	0.05	<0.0050		<0.0050	0.059	<0.0050		0.12		0.85	0.19	4.3	0.083	0.062	0.045	0.1	
Acenaphthylene	0.17	0.12	0.0052		<0.0050	**0.38**	<0.0050		0.074		**0.4**	0.047	**1.4**	**0.22**	<0.050	<0.015	0.021	
Anthracene	0.74	0.22	0.051		<0.0050	0.51	<0.0050		0.35		**2.6**	0.44	**9.9**	0.6	0.14	0.06	0.18	
Benzo(a)anthracene	0.96	0.79	0.028		0.01	**1.6**	<0.0050		**1.4**		**5.3**	0.92	**12**	**1.3**	0.17	0.028	0.63	
Benzo(a)pyrene	0.3	**0.81**	0.021		0.01	**1.5**	<0.0050		**1.6**		**3.9**	**0.94**	**9.4**	**1.4**	0.1	0.031	**0.76**	
Benzo(b/j)fluoranthene	0.96	**1.2**	0.034		0.016	**2.2**	<0.0050		**2.3**		**5.3**	**1.2**	**12**	**1.7**	0.21	0.041	**1**	
Benzo(ghi)perylene	9.6	0.53	0.019		0.0073	0.92	<0.0050		1.2		2.6	0.66	5	0.85	0.11	0.027	0.53	
Benzo(k)fluoranthene	0.96	0.39	0.0097		0.0054	0.85	<0.0050		0.73		**1.9**	0.45	**3.8**	0.6	0.051	<0.015	0.35	
Chrysene	9.6	0.78	0.038		0.011	1.4	0.009		1.2		4.3	0.8	9.2	1.1	0.32	0.026	0.58	
Dibenzo(a,h)anthracene	0.1	**0.16**	<0.0050		<0.0050	**0.33**	<0.0050		**0.27**		**0.74**	**0.16**	**1.6**	**0.24**	<0.050	<0.015	**0.13**	
Fluoranthene	9.6	1.4	0.05		0.022	2.7	<0.0050		2.7		**14**	2.2	**28**	2.1	0.71	0.062	1.4	
Fluorene	69	0.06	<0.020		<0.0050	0.12	<0.0050		0.17		1.2	0.19	5.8	0.25	0.21	0.048	0.077	
Indeno(1,2,3-cd)pyrene	0.95	0.61	0.018		0.0076	**1.1**	<0.0050		**1.2**		**3.1**	0.72	**5.9**	**1**	0.12	0.027	0.61	
1-Methylnaphthalene	85	0.079	<0.0050		<0.0050	0.16	<0.0050		0.11		0.23	0.059	1.7	0.06	0.078	0.8	0.022	
2-Methylnaphthalene	85	0.08	0.015		<0.0050	0.19	<0.0050		0.15		0.26	0.072	2.4	0.096	0.091	0.87	0.021	
Naphthalene	28	0.091	<0.0050		<0.0050	0.12	<0.0050		0.15		0.83	0.087	3.8	0.16	<0.070	0.16	<0.030	
Phenanthrene	16	0.81	0.17		0.016	1.4	<0.0050		1.2		8.3	1.7	**31**	1.9	0.42	0.28	0.78	
Pyrene	96	1.1	0.068		0.019	2.2	<0.0050		2.6		11	1.8	22	2.2	0.61	0.072	1.2	
Methylnaphthalene, 2-(1-)	85	0.16	0.015		<0.0071	0.35	<0.0071		0.26		0.5	0.13	4.1	0.16	0.17	1.7	0.042	
METALS AND INORGANICS																		
Antimony	50	2.2	<0.20	<0.20	<0.20	1.1	<0.20	<0.20	**210**		1.2	23	9.7	0.52	8.5	1	1.8	2.8
Arsenic	18	11	1.9	3.5	3.8	5.9	3	2.3	**67**		5.7	**55**	13	4.4	15	5.7	7.2	8.5
Barium	670	130	29	35	110	72	84	150	570		78	500	210	53	440	110	89	100
Beryllium	10	0.65	0.27	0.36	0.73	0.64	0.62	0.73	0.64		0.28	0.41	0.8	0.61	0.98	0.46	0.64	0.57
Boron (Hot Water Soluble)	2	0.93	0.51	0.37	0.19	0.32	0.31	0.28	**8.9**		1.5	**6.2**	**3**	0.52	**6.1**	0.58	1.8	**2.7**
Cadmium	1.9	0.65	<0.10	<0.10	<0.10	0.26	<0.10	<0.10	**130**		0.72	**14**	0.86	0.19	**8.1**	0.56	1	1.7
Chromium	160	55	9.6	13	28	17	22	26	**390**		10	**430**	44	19	**910**	14	40	53
Chromium VI	10	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2		<0.2	<0.2	<0.2	<0.2	3.9	<0.2	<0.2	<0.2
Cobalt	100	9.5	4.6	6.4	12	6.6	9.9	12	36		4.6	30	12	9.4	12	6.2	9.8	9.3
Copper	300	73	11	14	39	31	24	22	**3400**		200	**610**	130	60	**330**	110	210	250
Lead	120	**180**	64	**230**	20	57	12	14	**6000**		**370**	**880**	**450**	42	**620**	**290**	91	**160**
Mercury	20	0.38	<0.050	<0.050	<0.050	0.11	<0.050	<0.050	**22**		7.9	3.1	0.2	0.3	0.37	0.61	0.53	0.96
Molybdenum	40	5.7	<0.50	0.55	0.76	1.1	<0.50	<0.50	**47**		0.55	28	6.2	0.7	26	1.2	2	2.7
Nickel	340	27	8	10	29	16	23	29	**670**		15	180	35	21	120	17	25	27
Selenium	5.5	0.93	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.7		<0.50	1	1.9	<0.50	1.1	0.86	<0.50	0.85
Silver	50	0.25	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	29		3.4	1.3	0.93	<0.20	1.5	0.43	0.28	0.94
Thallium	3.3	0.16	0.066	0.1	0.17	0.13	0.14	0.18	1.1		0.12	0.19	0.25	0.096	0.19	0.18	0.14	0.13
Vanadium	86	30	16	20	32	21	29	31	30		14	**92**	41	28	**110**	19	29	31
Zinc	340	320	27	39	74	78	55	57	**28000**		**410**	**10000**	**600**	150	**3200**	280	290	**430**
pH (pH Units)		7.48	6.99	7.16	7.55	7.58	7.66	7.71	7.65		7.61	10.4	8.82	7.27	11.4	7.17	8.3	8.83
Conductivity (mS/cm)	1.4	0.26	0.33	0.35	0.26	0.2	0.28	0.27	1.3		0.76	0.91	0.49	0.33	0.6	**3.1**	0.35	0.36
Sodium Adsorption Ratio (unitless)	12	0.22	0.41	0.37	0.64	0.23	0.93	0.81	0.24		1.9	0.31	1.4	0.51	0.34	6.2	1.2	0.98
Cyanide, Free	0.051	0.01	0.03	0.03	<0.01	<0.01	<0.01	<0.01	<0.01		**0.08**	<0.01	<0.01	**0.17**	<0.01	**0.31**	<0.01	<0.01
Boron (Total)	120	9.2	<5.0	<5.0	7.9	6.4	9.5	9.1	83		6.2	87	11	8.3	98	11	9.3	11
Uranium	33	0.65	0.33	0.36	0.57	0.67	0.51	0.58	1.1		0.37	0.74	0.78	0.54	1.2	0.93	0.57	0.54
POLYCHLORINATED BIPHENYLS (PCBs)																		
Total PCBs	1.1		<0.010							0.59	0.021							

Notes:
1. All concentrations in µg/g, unless indicated otherwise.
2. Table 3 SCS = Table 3: Full Depth Generic Site Condition Standards for Use in a Non-Potable Groundwater Condition for Use Under Part XV.1 of the Environmental Protection Act (04/15/11) Industrial/Commercial/Community Property Use, medium and fine textured soil standards.
3. Yellow highlighting indicates that the parameter concentration exceeds the Table 3 SCS, Blue highlighting indicates that MDL exceeds the Table 3 SCS.

Table 2
Summary of Soil Analytical Results
Future HSR Storage and Maintenance Facility
161-17781-00

Parameter[1]	Sample ID	17-08 SS1	17-09 SS2	17-09 SS7	17-10 SS3	17-11 SS1	17-11 SS4	17-12 SS3	17-12 SS5	17-13 SS2	17-13 SS5	QA/QC8	17-14 SS1	17-14 SS10	QA/QC7	17-15 SS2	17-15 SS4	17-16 SS4
	Sample Date	3/15/2017	3/15/2017	3/15/2017	3/16/2017	3/22/2017	3/22/2017	3/17/2017	3/17/2017	3/21/2017	3/21/2017	3/21/2017	3/21/2017	3/21/2017	3/21/2017	3/20/2017	3/20/2017	3/20/2017
	Sample Depth (mbgs)	0.00-0.61	0.76-1.37	4.57-5.18	1.52-2.13	0.00-0.61	2.29-2.90	1.52-2.13	3.05-3.66	0.76-1.37	3.05-3.66	3.05-3.66	0.00-0.61	6.86-7.47	6.86-7.47	0.76-1.37	2.29-2.90	2.29-2.90
	Soil Type	Fill	Fill	Fill	Fill	Fill	Silty clay	Fill	Silty clay	Fill	Silty clay	Silty clay	Fill	Silty clay	Silty clay	Fill	Silty clay	Fill
	Table 3 SCS[2]											Blind Duplicate of 17-13 SS5			Blind Duplicate of 17-14 SS10			
PETROLEUM HYDROCARBONS (PHCs)																		
F1 (C6 to C10)	65	<10	<10	<10	<10	15	<10	<10	<10	<10	<10	<10	<10	<10	<10	12	<10	<10
F1 (C6 to C10) - BTEX	65	<10	<10	<10	<10	15	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
F2 (C10 to C16)	250	<10	<10	<10	<10	64	<10	10	10	21	<10	<10	20	<10	<10	29	<10	<10
F3 (C16 to C34)	2500	460	<50	<50	110	300	<50	110	160	750	120	<50	1100	<50	<50	1100	<50	1000
F4 (C34 to C50)	6600	250	<50	<50	<50	65	<50	240	71	2200	150	<50	3400	<50	<50	3200	<50	4000
Reached Baseline at C50		NO	YES	YES	YES	YES	YES	NO	NO	NO	NO	YES	NO	YES	YES	NO	YES	NO
F4 Gravimetric	6600	900						650	160	**7700**	910		**16000**			**10000**		**13000**
VOLATILE ORGANIC COMPOUNDS (VOCs)																		
Acetone	28	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Benzene	0.4	0.021	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.044	<0.020	<0.020
Bromodichloromethane	18	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Bromoform	1.7	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Bromomethane	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Carbon Tetrachloride	1.5	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chlorobenzene	2.7	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloroform	0.18	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Dibromochloromethane	13	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-Dichlorobenzene	8.5	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,3-Dichlorobenzene	12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,4-Dichlorobenzene	0.84	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,1-Dichloroethane	21	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-Dichloroethane	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,1-Dichloroethylene	0.48	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Cis-1,2-Dichloroethylene	37	<0.050	<0.050	<0.050	<0.050	<0.050	0.11	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Trans-1,2-Dichloroethylene	9.3	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-Dichloropropane	0.68	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Cis-1,3-Dichloropropylene		<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Trans-1,3-Dichloropropylene		<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Ethylbenzene	19	0.022	<0.020	<0.020	<0.020	<0.020	<0.020	0.037	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.21	<0.020	<0.020
Ethylene Dibromide	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Methyl Ethyl Ketone	88	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methylene Chloride	2	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Methyl Isobutyl Ketone	210	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl-t-Butyl Ether	3.2	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Styrene	43	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,1,1,2-Tetrachloroethane	0.11	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,1,2,2-Tetrachloroethane	0.094	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Toluene	78	0.06	0.056	<0.020	0.028	<0.020	<0.020	0.048	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.88	<0.020	<0.020
Tetrachloroethylene	21	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,1,1-Trichloroethane	12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,1,2-Trichloroethane	0.11	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Trichloroethylene	0.61	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Vinyl Chloride	0.25	<0.020	<0.020	<0.020	<0.020	<0.020	0.041	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
m-Xylene & p-Xylene		0.082	0.11	<0.020	<0.020	<0.020	<0.020	0.24	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.84	<0.020	<0.020
o-Xylene		0.076	0.081	<0.020	<0.020	<0.020	<0.020	0.17	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.61	<0.020	<0.020
Total Xylenes	30	0.16	0.19	<0.020	<0.020	<0.020	<0.020	0.41	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	1.5	<0.020	<0.020
Dichlorodifluoromethane	25	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Hexane(n)	88	<0.050	<0.050	<0.050	<0.050	0.24	<0.050	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.19	<0.050	<0.050
Trichlorofluoromethane	5.8	0.067	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,3-Dichloropropene (cis + trans)	0.21	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050

Notes:

1. All concentrations in µg/g, unless indicated otherwise.
2. Table 3 SCS = Table 3: Full Depth Generic Site Condition Standards for Use in a Non-Potable Groundwater Condition for Use Under Part XV.1 of the Environmental Protection Act (04/15/11) Industrial/Commercial/Community Property Use, medium and fine textured soil standards.
3. Yellow highlighting indicates that the parameter concentration exceeds the Table 3 SCS, Blue highlighting indicates that MDL exceeds the Table 3 SCS.

Table 2
Summary of Soil Analytical Results
Future HSR Storage and Maintenance Facility
161-17781-00

Parameter[1]	Sample ID	17-08 SS1	17-09 SS2	17-09 SS7	17-10 SS3	17-11 SS1	17-11 SS4	17-12 SS3	17-12 SS5	17-13 SS2	17-13 SS5	QA/QC8	17-14 SS1	17-14 SS10	QA/QC7	17-15 SS2	17-15 SS4	17-16 SS4
	Sample Date	3/15/2017	3/15/2017	3/15/2017	3/16/2017	3/22/2017	3/22/2017	3/17/2017	3/17/2017	3/21/2017	3/21/2017	3/21/2017	3/21/2017	3/21/2017	3/21/2017	3/20/2017	3/20/2017	3/20/2017
	Sample Depth (mbgs)	0.00-0.61	0.76-1.37	4.57-5.18	1.52-2.13	0.00-0.61	2.29-2.90	1.52-2.13	3.05-3.66	0.76-1.37	3.05-3.66	3.05-3.66	0.00-0.61	6.86-7.47	6.86-7.47	0.76-1.37	2.29-2.90	2.29-2.90
	Soil Type	Fill	Fill	Fill	Fill	Fill	Silty clay	Fill	Silty clay	Fill	Silty clay	Silty clay	Fill	Silty clay	Silty clay	Fill	Silty clay	Fill
	Table 3 SCS[2]											Blind Duplicate of 17-13 SS5			Blind Duplicate of 17-14 SS10			
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)																		
Acenaphthene	96	0.16	0.0061	<0.0050	0.041	0.023	<0.0050	<0.0050	<0.0050	0.08	<0.0050	<0.0050	<0.10	<0.0050	<0.0050	<0.050	<0.0050	<0.050
Acenaphthylene	0.17	0.044	0.0099	<0.0050	0.096	0.0095	<0.0050	0.0056	<0.0050	<0.050	<0.0050	<0.0050	<0.10	<0.0050	<0.0050	<0.050	<0.0050	<0.050
Anthracene	0.74	0.27	0.026	<0.0050	0.15	0.042	<0.0050	0.01	0.014	0.17	0.012	<0.0050	<0.10	<0.0050	<0.0050	<0.050	<0.0050	<0.050
Benzo(a)anthracene	0.96	0.8	0.059	<0.0050	0.71	0.026	<0.0050	0.038	0.11	0.68	0.055	<0.0050	<0.10	<0.0050	<0.0050	0.31	<0.0050	0.1
Benzo(a)pyrene	0.3	**0.92**	0.062	<0.0050	**0.74**	0.027	<0.0050	0.035	0.026	**0.71**	0.055	<0.0050	<0.10	<0.0050	<0.0050	**0.35**	<0.0050	0.12
Benzo(b/j)fluoranthene	0.96	**1.2**	0.095	<0.0050	**1.2**	0.053	<0.0050	0.051	0.017	**0.97**	0.067	<0.0050	0.1	<0.0050	<0.0050	0.52	<0.0050	0.16
Benzo(ghi)perylene	9.6	0.85	0.044	<0.0050	0.42	0.038	<0.0050	0.044	0.022	0.53	0.039	<0.0050	0.23	<0.0050	<0.0050	0.31	<0.0050	0.17
Benzo(k)fluoranthene	0.96	0.44	0.03	<0.0050	0.38	0.018	<0.0050	0.014	<0.0050	0.32	0.025	<0.0050	<0.10	<0.0050	<0.0050	0.16	<0.0050	<0.050
Chrysene	9.6	0.74	0.055	0.0052	0.62	0.032	0.01	0.041	0.14	0.66	0.049	<0.0050	<0.10	<0.0050	<0.0050	0.33	<0.0050	0.09
Dibenzo(a,h)anthracene	0.1	**0.19**	0.011	<0.0050	**0.15**	0.007	<0.0050	0.0071	<0.0050	**0.12**	0.0088	<0.0050	<0.10	<0.0050	<0.0050	0.059	<0.0050	<0.050
Fluoranthene	9.6	1.7	0.11	<0.0050	1.1	0.062	<0.0050	0.06	0.018	1.6	0.1	<0.0050	<0.10	<0.0050	<0.0050	0.4	<0.0050	0.22
Fluorene	69	0.14	0.0073	<0.0050	0.028	0.027	<0.0050	<0.0050	<0.0050	0.082	<0.0050	<0.0050	<0.10	<0.0050	<0.0050	<0.050	<0.0050	<0.050
Indeno(1,2,3-cd)pyrene	0.95	0.86	0.044	<0.0050	0.52	0.038	<0.0050	0.037	<0.0050	0.52	0.036	<0.0050	0.11	<0.0050	<0.0050	0.22	<0.0050	0.099
1-Methylnaphthalene	85	0.071	0.058	<0.0050	0.041	0.059	<0.0050	0.035	<0.0050	0.17	0.006	<0.0050	<0.10	<0.0050	<0.0050	0.075	<0.0050	<0.050
2-Methylnaphthalene	85	0.083	0.07	<0.0050	0.048	0.07	<0.0050	0.042	<0.0050	0.15	0.0058	<0.0050	<0.10	<0.0050	<0.0050	0.073	<0.0050	<0.050
Naphthalene	28	0.067	0.04	<0.0050	0.063	<0.020	<0.0050	0.022	<0.0050	0.096	<0.0050	<0.0050	<0.10	<0.0050	<0.0050	<0.050	<0.0050	<0.050
Phenanthrene	16	1.3	0.094	<0.0050	0.45	0.11	<0.0050	0.043	0.022	1.1	0.037	<0.0050	<0.10	<0.0050	0.0051	0.21	<0.0050	0.16
Pyrene	96	1.4	0.098	<0.0050	0.89	0.084	<0.0050	0.055	0.11	1.4	0.1	<0.0050	<0.10	<0.0050	0.0056	0.41	<0.0050	0.18
Methylnaphthalene, 2-(1-)	85	0.15	0.13	<0.0071	0.09	0.13	<0.0071	0.077	<0.0071	0.32	0.012	<0.0071	<0.14	<0.0071	<0.0071	0.15	<0.0071	<0.071
METALS AND INORGANICS																		
Antimony	50	3.7	4	<0.20	1.2	3.4	<0.20	**1400**	2.4	1.5	<0.20		0.2	<0.20		4.6	<0.20	0.62
Arsenic	18	11	**190**	3.2	11	2.7	2.7	**1600**	5.4	5.6	2.9		3.7	4.5		7.2	2.8	6.2
Barium	670	120	72	52	81	220	150	380	130	170	170		110	97		82	140	96
Beryllium	10	0.71	0.62	0.52	0.58	2.3	0.85	**<10**	0.78	0.94	0.75		0.3	0.68		0.56	0.8	0.86
Boron (Hot Water Soluble)	2	1.1	**2.2**	1.9	1.1	0.42	0.17	1.2	0.56	**2.9**	0.26		0.48	0.24		0.96	0.34	0.29
Cadmium	1.9	**3.2**	1.3	<0.10	0.4	**2.2**	0.1	**12**	0.12	0.64	<0.10		0.45	<0.10		1.1	<0.10	0.75
Chromium	160	**260**	34	17	22	73	28	<50	25	120	26		33	23		89	28	23
Chromium VI	10	0.3	<0.2	<0.2	<0.2	0.6	<0.2	<0.2	0.2	1.2	<0.2		0.2	<0.2		0.7	<0.2	<0.2
Cobalt	100	12	9.8	8.1	7	4	14	15	13	7.4	11		2.9	11		4.9	13	4.2
Copper	300	290	92	20	68	100	24	**3000**	27	60	25		12	28		28	23	28
Lead	120	**250**	**220**	10	39	**150**	15	**64000**	**260**	100	20		53	18		120	14	70
Mercury	20	0.45	0.24	<0.050	<0.050	0.2	<0.050	<2.5	<0.050	0.062	<0.050		<0.050	<0.050		0.08	<0.050	<0.050
Molybdenum	40	9.9	4.4	<0.50	1.7	5.6	<0.50	<25	<0.50	2.3	0.72		2.5	1		1.9	<0.50	1.2
Nickel	340	86	39	17	29	33	31	77	27	25	26		9.5	25		16	31	12
Selenium	5.5	0.55	1	<0.50	0.5	0.99	<0.50	**<25**	<0.50	0.56	<0.50		<0.50	<0.50		0.67	<0.50	<0.50
Silver	50	0.44	0.27	<0.20	<0.20	<0.20	<0.20	<10	<0.20	<0.20	<0.20		<0.20	<0.20		<0.20	<0.20	<0.20
Thallium	3.3	0.17	0.29	0.096	0.15	0.2	0.13	**7.5**	0.18	0.14	0.16		0.12	0.19		0.15	0.14	0.071
Vanadium	86	63	22	26	28	19	34	**<250**	32	34	29		28	30		69	35	21
Zinc	340	**770**	**360**	43	120	**880**	62	**2000**	65	320	89		200	60		**460**	64	**400**
pH (pH Units)		7.7	7.35	7.36	7.34	8.33	7.69	7.86	7.67	9.73	7.66		8.34	7.58		10.6	7.7	11.6
Conductivity (mS/cm)	1.4	0.28	0.34	0.34	0.3	0.21	0.34	**1.8**	**1.9**	0.78	0.66		0.48	**1.5**		0.98	0.61	0.95
Sodium Adsorption Ratio (unitless)	12	0.24	0.5	1	0.28	0.25	0.55	5.8	12	1.5	1.9		2.2	6.1		10	2.9	1.9
Cyanide, Free	0.051	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	<0.01		<0.01	<0.01	<0.01
Boron (Total)	120	15	20	9	15	21	11	**<250**	11	22	9.4		12	9		16	11	20
Uranium	33	0.88	0.45	0.5	0.43	1.5	0.63	<2.5	0.53	0.85	0.63		0.87	0.58		0.81	0.7	0.76
POLYCHLORINATED BIPHENYLS (PCBs)																		
Total PCBs	1.1																	

Notes:
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Future HSR Storage and Maintenance Facility
161-17781-00

Parameter [1]	Sample ID	17-16 SS8	17-17-SS1	17-17-SS4	17-18 SS1	17-18 SS7	QA/QC4	17-19 SS1	QA/QC5	17-19 SS8	QA/QC6	17-20 SS7	17-20 SS9	17-21 SS3	17-21 SS5	17-22 SS2	17-22 SS4
	Sample Date	3/20/2017	3/20/2017	3/20/2017	3/17/2017	3/17/2017	3/17/2017	3/21/2017	3/21/2017	3/21/2017	3/21/2017	3/21/2017	3/21/2017	3/17/2017	3/17/2017	3/17/2017	3/17/2017
	Sample Depth (mbgs)	5.33-5.94	0.00-0.61	2.29-2.90	0.00-0.61	4.57-5.18	4.57-5.18	0.00-0.61	0.00-0.61	5.33-5.94	5.33-5.94	4.57-5.18	6.10-6.71	1.52-2.13	3.05-3.66	0.76-1.37	2.29-2.90
	Soil Type	Silty clay	Fill	Fill	Fill	Silty clay	Silty clay	Fill	Fill	Silty clay	Silty clay	Silty clay	Silty clay	Fill	Fill	Fill	Silty clay
	Table 3 SCS [2]						Blind Duplicate of 17-18 SS7		Blind Duplicate of 17-19 SS1		Blind Duplicate of 17-19 SS8						
PETROLEUM HYDROCARBONS (PHCs)																	
F1 (C6 to C10)	65	**80**	<10	<10	<10	<10		<10	<10	19	**150**	**1200**	<10	<10	<10	<10	16
F1 (C6 to C10) - BTEX	65	**78**	<10	<10	<10	<10		<10	<10	18	**140**	**1100**	<10	<10	<10	<10	16
F2 (C10 to C16)	250	31	11	40	33	<10		29	23	**330**	160	**4300**	<10	10	16	16	220
F3 (C16 to C34)	2500	130	290	1100	2200	<50		610	580	510	310	**8000**	<50	65	1000	210	270
F4 (C34 to C50)	6600	<50	300	720	**7000**	<50		2000	1800	52	78	1200	<50	98	570	270	<50
Reached Baseline at C50		YES	NO	NO	NO	YES		NO	NO	YES	NO	YES	YES	NO	NO	NO	YES
F4 Gravimetric	6600		1100	2500	**20000**			**6700**	**7000**		160			270	2000	1100	
VOLATILE ORGANIC COMPOUNDS (VOCs)																	
Acetone	28	1.1	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50	<2.5	<13	<0.50	<0.50	<0.50	<0.50	<0.50
Benzene	0.4	<0.020	<0.020	<0.020	<0.020	<0.020		<0.020	<0.020	<0.020	<0.10	0.14	<0.020	<0.020	0.042	<0.020	<0.020
Bromodichloromethane	18	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.25	<1.3	<0.050	<0.050	<0.050	<0.050	<0.050
Bromoform	1.7	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.25	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Bromomethane	0.05	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Carbon Tetrachloride	1.5	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chlorobenzene	2.7	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.25	<1.3	<0.050	<0.050	<0.050	<0.050	<0.050
Chloroform	0.18	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Dibromochloromethane	13	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.25	<1.3	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-Dichlorobenzene	8.5	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.25	<1.3	<0.050	<0.050	<0.050	<0.050	<0.050
1,3-Dichlorobenzene	12	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.25	<1.3	<0.050	<0.050	<0.050	<0.050	<0.050
1,4-Dichlorobenzene	0.84	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.050	<0.14	<0.050	<0.050	<0.050	<0.050	<0.050
1,1-Dichloroethane	21	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.25	<1.3	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-Dichloroethane	0.05	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,1-Dichloroethylene	0.48	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Cis-1,2-Dichloroethylene	37	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.25	<1.3	<0.050	<0.050	<0.050	<0.050	<0.050
Trans-1,2-Dichloroethylene	9.3	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.25	<1.3	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-Dichloropropane	0.68	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.050	<0.090	<0.050	<0.050	<0.050	<0.050	<0.050
Cis-1,3-Dichloropropylene		<0.030	<0.030	<0.030	<0.030	<0.030		<0.030	<0.030	<0.030	<0.15	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Trans-1,3-Dichloropropylene		<0.040	<0.040	<0.040	<0.040	<0.040		<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Ethylbenzene	19	0.079	<0.020	<0.020	<0.020	<0.020		<0.020	<0.020	<0.020	0.11	2.8	<0.020	0.031	0.059	<0.020	0.022
Ethylene Dibromide	0.05	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Methyl Ethyl Ketone	88	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50	<2.5	<13	<0.50	<0.50	<0.50	<0.50	<0.50
Methylene Chloride	2	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.25	<1.3	<0.050	<0.050	<0.050	<0.050	<0.050
Methyl Isobutyl Ketone	210	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50	<2.5	<13	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl-t-Butyl Ether	3.2	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.25	<1.3	<0.050	<0.050	<0.050	<0.050	<0.050
Styrene	43	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.25	<1.3	<0.050	<0.050	<0.050	<0.050	<0.050
1,1,1,2-Tetrachloroethane	0.11	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,1,2,2-Tetrachloroethane	0.094	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Toluene	78	0.09	<0.020	0.029	0.027	<0.020		<0.020	<0.020	0.027	0.12	2.3	<0.020	0.12	0.15	0.026	0.065
Tetrachloroethylene	21	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.25	<1.3	<0.050	<0.050	<0.050	<0.050	<0.050
1,1,1-Trichloroethane	12	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.25	<1.3	<0.050	<0.050	<0.050	<0.050	<0.050
1,1,2-Trichloroethane	0.11	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Trichloroethylene	0.61	<0.050	<0.050	0.12	<0.050	<0.050		<0.050	<0.050	<0.050	<0.25	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Vinyl Chloride	0.25	<0.020	<0.020	<0.020	<0.020	<0.020		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
m-Xylene & p-Xylene		1.3	<0.020	0.034	0.025	<0.020		<0.020	0.021	0.16	0.93	19	<0.020	0.26	0.16	0.056	0.11
o-Xylene		0.56	<0.020	0.021	<0.020	<0.020		<0.020	<0.020	0.091	0.45	10	<0.020	0.2	0.13	0.051	0.065
Total Xylenes	30	1.8	<0.020	0.055	0.025	<0.020		<0.020	0.021	0.25	1.4	29	<0.020	0.46	0.3	0.11	0.17
Dichlorodifluoromethane	25	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.25	<1.3	<0.050	<0.050	<0.050	<0.050	<0.050
Hexane(n)	88	0.59	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	0.11	0.8	3.3	<0.050	0.061	0.066	<0.050	<0.050
Trichlorofluoromethane	5.8	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	0.33	<0.050	<0.25	<1.3	<0.050	<0.050	<0.050	<0.050	<0.050
1,3-Dichloropropene (cis + trans)	0.21	<0.050	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.16	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050

Notes:

1. All concentrations in µg/g, unless indicated otherwise.
2. Table 3 SCS = Table 3: Full Depth Generic Site Condition Standards for Use in a Non-Potable Groundwater Condition for Use Under Part XV.1 of the Environmental Protection Act (04/15/11) Industrial/Commercial/Community Property Use, medium and fine textured soil standards.
3. Yellow highlighting indicates that the parameter concentration exceeds the Table 3 SCS, Blue highlighting indicates that MDL exceeds the Table 3 SCS.

Table 2
Summary of Soil Analytical Results
Future HSR Storage and Maintenance Facility
161-17781-00

Parameter[1]	Sample ID	17-16 SS8	17-17-SS1	17-17-SS4	17-18 SS1	17-18 SS7	QA/QC4	17-19 SS1	QA/QC5	17-19 SS8	QA/QC6	17-20 SS7	17-20 SS9	17-21 SS3	17-21 SS5	17-22 SS2	17-22 SS4
	Sample Date	3/20/2017	3/20/2017	3/20/2017	3/17/2017	3/17/2017	3/17/2017	3/21/2017	3/21/2017	3/21/2017	3/21/2017	3/21/2017	3/21/2017	3/17/2017	3/17/2017	3/17/2017	3/17/2017
	Sample Depth (mbgs)	5.33-5.94	0.00-0.61	2.29-2.90	0.00-0.61	4.57-5.18	4.57-5.18	0.00-0.61	0.00-0.61	5.33-5.94	5.33-5.94	4.57-5.18	6.10-6.71	1.52-2.13	3.05-3.66	0.76-1.37	2.29-2.90
	Soil Type	Silty clay	Fill	Fill	Fill	Silty clay	Silty clay	Fill	Fill	Silty clay	Silty clay	Silty clay	Silty clay	Fill	Fill	Fill	Silty clay
	Table 3 SCS[2]						Blind Duplicate of 17-18 SS7		Blind Duplicate of 17-19 SS1		Blind Duplicate of 17-19 SS8						
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)																	
Acenaphthene	96	0.007	0.72	6.9	<0.050	<0.0050		<0.050	<0.050	0.057	0.19			0.039	<0.050	0.0081	
Acenaphthylene	0.17	<0.0050	0.07	**0.19**	<0.050	<0.0050		<0.050	<0.050	<0.020	0.03			0.11	<0.050	0.051	
Anthracene	0.74	0.014	**1.3**	**10**	<0.050	<0.0050		<0.050	<0.050	0.13	0.31			0.12	<0.050	0.052	
Benzo(a)anthracene	0.96	<0.0070	**4.1**	**24**	0.087	<0.0050		0.052	0.078	0.058	0.7			0.31	0.67	0.19	
Benzo(a)pyrene	0.3	0.006	**4.1**	**22**	0.12	<0.0050		0.057	0.092	0.028	**0.64**			0.28	**0.64**	0.17	
Benzo(b/j)fluoranthene	0.96	<0.0050	**5.4**	**28**	0.14	<0.0050		0.097	0.15	0.034	0.85			0.3	0.51	0.19	
Benzo(ghi)perylene	9.6	0.016	2.5	**13**	0.23	<0.0050		0.11	0.18	0.021	0.43			0.21	0.95	0.13	
Benzo(k)fluoranthene	0.96	<0.0050	**1.9**	**11**	<0.050	<0.0050		<0.050	<0.050	0.009	0.33			0.096	0.051	0.06	
Chrysene	9.6	<0.0050	3.6	**20**	0.13	0.0074		0.079	0.1	0.1	0.71			0.25	0.94	0.17	
Dibenzo(a,h)anthracene	0.1	<0.0050	**0.65**	**3.5**	<0.050	<0.0050		<0.050	<0.050	0.0066	**0.11**			0.04	**0.29**	0.027	
Fluoranthene	9.6	0.0058	9.6	**60**	0.19	<0.0050		0.13	0.18	0.07	1.7			0.6	0.072	0.29	
Fluorene	69	0.016	0.6	5.7	<0.050	<0.0050		<0.050	<0.050	<0.060	0.17			0.047	<0.050	0.013	
Indeno(1,2,3-cd)pyrene	0.95	0.0098	**2.8**	**14**	0.087	<0.0050		0.054	0.091	0.014	0.47			0.23	0.27	0.15	
1-Methylnaphthalene	85	0.46	0.11	1.1	0.1	<0.0050		0.051	0.065	0.29	0.31			0.042	0.055	0.07	
2-Methylnaphthalene	85	0.58	0.12	1.1	0.13	<0.0050		0.064	0.085	0.29	0.18			0.049	0.075	0.076	
Naphthalene	28	0.35	0.21	2.2	<0.050	<0.0050		<0.050	<0.050	<0.050	0.12			0.14	<0.050	0.037	
Phenanthrene	16	0.037	6.4	**50**	0.17	<0.0050		0.1	0.15	0.38	1.4			0.34	0.1	0.13	
Pyrene	96	0.03	7.5	46	0.19	<0.0050		0.15	0.21	0.2	1.5			0.5	0.25	0.28	
Methylnaphthalene, 2-(1-)	85	1	0.23	2.2	0.24	<0.0071		0.12	0.15	0.58	0.49			0.09	0.13	0.15	
METALS AND INORGANICS																	
Antimony	50	<0.20	0.45	1.2	0.99	<0.20	<0.20	0.34		0.93				4.8	5.6	2.2	<0.20
Arsenic	18	2.6	5.3	6.8	2.6	2.8	3.7	4.4		4.2				9.2	**27**	9.8	3.5
Barium	670	81	70	91	43	170	140	150		84				130	86	120	120
Beryllium	10	0.56	0.48	0.46	0.36	0.77	0.78	0.43		0.65				0.8	0.64	0.63	0.76
Boron (Hot Water Soluble)	2	0.31	0.76	0.55	0.99	0.096	0.1	1.2		1.5				0.49	1	0.87	0.058
Cadmium	1.9	<0.10	0.37	1.3	0.8	<0.10	<0.10	0.33		0.24				1.4	0.77	0.92	<0.10
Chromium	160	19	23	34	**270**	26	27	65		23				21	15	23	27
Chromium VI	10	<0.2	0.5	<0.2	1.4	<0.2	0.2	0.8		<0.2				<0.2	<0.2	<0.2	<0.2
Cobalt	100	7.9	5.7	5.7	2.6	11	13	3.1		8.2				7	6.7	8.5	12
Copper	300	17	27	41	30	28	27	17		29				160	35	65	25
Lead	120	11	36	**170**	62	13	14	55		**1500**				**780**	**2400**	**370**	35
Mercury	20	<0.050	0.054	0.2	<0.050	<0.050	<0.050	<0.050		0.051				0.07	<0.050	0.11	<0.050
Molybdenum	40	<0.50	1.2	1.8	3.8	<0.50	<0.50	2.8		0.71				2.9	1.9	1.5	<0.50
Nickel	340	16	13	16	21	26	26	11		17				30	16	20	28
Selenium	5.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50				<0.50	<0.50	0.58	<0.50
Silver	50	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20		<0.20				0.42	<0.20	<0.20	<0.20
Thallium	3.3	0.14	0.092	0.16	0.063	0.11	0.12	0.17		0.35				0.26	0.5	0.2	0.17
Vanadium	86	30	21	23	**140**	33	32	37		27				27	27	28	33
Zinc	340	54	220	**4200**	260	60	62	150		100				**600**	97	**470**	80
pH (pH Units)		7.29	9.47	10.6	11.9	7.66	7.69	10.1		7.25				7.82	7.84	7.64	7.52
Conductivity (mS/cm)	1.4	**2.7**	**8.5**	1.3	**2.4**	0.25	0.43	**5.9**		**1.8**				0.62	1.3	**2.2**	0.55
Sodium Adsorption Ratio (unitless)	12	5.5	**110**	2.8	2.1	0.35	0.83	**40**		7.1				5.1	12	1.6	7.4
Cyanide, Free	0.051	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.03				<0.01	<0.01	<0.01	<0.01
Boron (Total)	120	5.4	12	17	41	12	11	20		8				25	17	14	8.3
Uranium	33	0.57	0.78	0.84	0.65	0.67	0.63	1.1		0.64				0.74	0.43	0.62	0.54
POLYCHLORINATED BIPHENYLS (PCBs)																	
Total PCBs	1.1				<0.010												

Notes:
1. All concentrations in µg/g, unless indicated otherwise.
2. Table 3 SCS = Table 3: Full Depth Generic Site Condition Standards for Use in a Non-Potable Groundwater Condition for Use Under Part XV.1 of the Environmental Protection Act (04/15/11) Industrial/Commercial/Community Property Use, medium and fine textured soil standards.
3. Yellow highlighting indicates that the parameter concentration exceeds the Table 3 SCS, Blue highlighting indicates that MDL exceeds the Table 3 SCS.

Table 3
Summary of Groundwater Analytical Results
Future HSR Storage and Maintenance Facility
161-17781-00

Parameter [1]	Sample ID	17-11	17-13	17-19	MW101	MW104	MW105	QA/QC1	MW106	MW107	17-15	17-21	17-22	QA/QC2
	Sample Date	3/30/2017	3/30/2017	3/30/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/30/2017	4/11/2017	4/11/2017	4/11/2017	4/11/2017
	Table 3 SCS[2]							Blind Duplicate of MW105						Blind Duplicate of 17-22
PETROLEUM HYDROCARBONS (PHCs)														
F1 (C6-C10)	750	<25	<25	**940**	<25	25	<25	<25	<25	<25	<25	<25	<25	<25
F1 (C6-C10) - BTEX	750	<25	<25	**910**	<25	25	<25	<25	<25	<25	<25	<25	<25	<25
F2 (C10-C16)	150	<100	<100	**1100**	<100	<100	<100	<100	120	<100	<100	<100	<100	<100
F3 (C16-C34)	500	<200	<200	260	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
F4 (C34-C50)	500	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
Reached Baseline at C50		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
F4 Gravimetric	500													
VOLATILE ORGANIC COMPOUNDS (VOCs)														
Acetone	130000	<10	<10	120	14	<10	<10	<10	130	<10	<10	<10	<10	<10
Benzene	430	<0.20	<0.20	0.44	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromodichloromethane	85000	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromoform	770	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	56	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon Tetrachloride	8.4	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorobenzene	630	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroform	22	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	82000	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichlorobenzene	9600	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	9600	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	67	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethane	3100	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloroethane	12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethylene	17	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Cis-1,2-Dichloroethylene	17	9.3	1.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trans-1,2-Dichloroethylene	17	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloropropane	140	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Cis-1,3-Dichloropropylene		<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Trans-1,3-Dichloropropylene		<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Ethylbenzene	2300	<0.20	<0.20	2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylene Dibromide	0.83	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl Ethyl Ketone	1500000	<10	<10	33	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Methylene Chloride	5500	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Isobutyl Ketone	580000	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methyl-t-Butyl Ether	1400	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	9100	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	28	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	15	<0.50	<0.50	<1.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	18000	<0.20	<0.20	3.9	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.4	<0.20	<0.20	<0.20
Tetrachloroethylene	17	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,1-Trichloroethane	6700	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,2-Trichloroethane	30	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethylene	17	1.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Vinyl Chloride	1.7	**4.2**	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
m-Xylene & p-Xylene		<0.20	<0.20	12	<0.20	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
o-Xylene		<0.20	<0.20	7	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Total Xylenes	4200	<0.20	<0.20	19	<0.20	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dichlorodifluoromethane	4400	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hexane(n)	520	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	2500	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichloropropene (cis + trans)	45	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.50	<0.50	<0.50	<0.50

Notes:

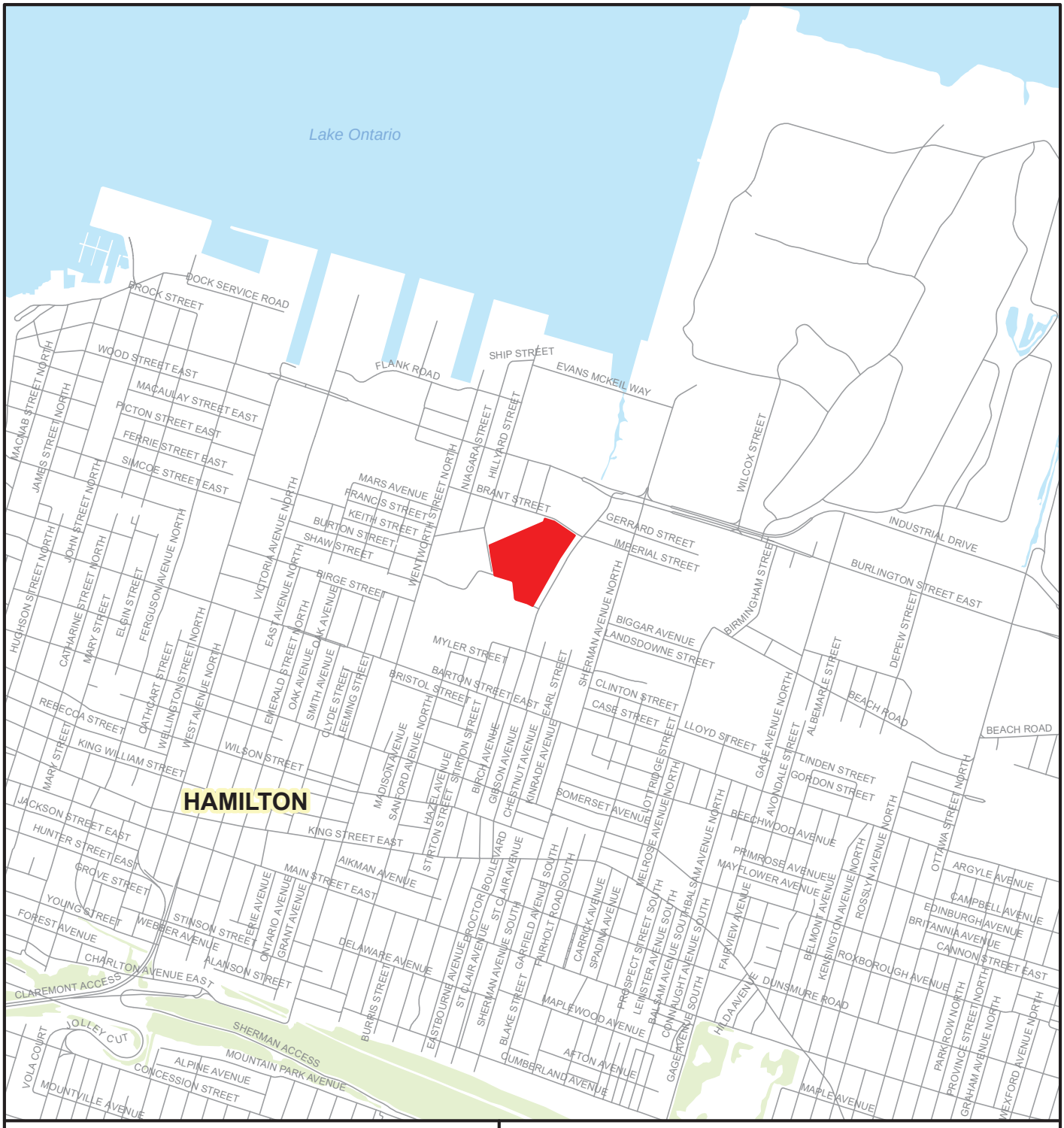
1. All concentrations in µg/L, unless indicated otherwise.
2. Table 3 SCS = Table 3: Full Depth Generic Site Condition Standards for Use in a Non-Potable Groundwater Condition for Use Under Part XV.1 of the Environmental Protection Act (04/15/11) All Type of Property Use, medium and fine textured soil standards.
3. Yellow highlighting indicates that the parameter concentration exceeds the Table 3 SCS, Blue highlighting indicates that MDL exceeds the Table 3 SCS.

Table 3
Summary of Groundwater Analytical Results
Future HSR Storage and Maintenance Facility
161-17781-00

Parameter [1]	Sample ID	17-11	17-13	17-19	MW101	MW104	MW105	QA/QC1	MW106	MW107	17-15	17-21	17-22	QA/QC2
	Sample Date	3/30/2017	3/30/2017	3/30/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/30/2017	4/11/2017	4/11/2017	4/11/2017	4/11/2017
	Table 3 SCS[2]							Blind Duplicate of MW105						Blind Duplicate of 17-22
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)														
Acenaphthene	1700	<0.050	<0.050	0.25	0.62	0.063	<0.050	<0.050	0.065	<0.050	<0.050	<0.050	<0.050	<0.050
Acenaphthylene	1.8	<0.050	<0.050	<0.050	0.073	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Anthracene	2.4	<0.050	<0.050	0.1	<0.050	<0.050	<0.050	<0.050	0.051	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo(a)anthracene	4.7	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo(a)pyrene	0.81	0.032	<0.010	0.012	0.014	0.039	0.034	0.031	<0.010	0.032	<0.010	<0.010	<0.010	<0.010
Benzo(b/j)fluoranthene	0.75	<0.050	<0.050	<0.050	<0.050	0.061	0.052	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo(ghi)perylene	0.2	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo(k)fluoranthene	0.4	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chrysene	1	<0.050	<0.050	<0.050	<0.050	0.053	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Dibenzo(a,h)anthracene	0.52	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Fluoranthene	130	<0.050	<0.050	<0.050	<0.050	0.13	0.076	0.066	0.063	<0.050	<0.050	<0.050	<0.050	<0.050
Fluorene	400	<0.050	<0.050	0.25	<0.050	<0.050	<0.050	<0.050	0.19	<0.050	<0.050	<0.050	<0.050	<0.050
Indeno(1,2,3-cd)pyrene	0.2	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1-Methylnaphthalene	1800	<0.050	<0.050	4.9	<0.050	0.068	<0.050	<0.050	0.2	<0.050	<0.050	<0.050	<0.050	<0.050
2-Methylnaphthalene	1800	<0.050	<0.050	4.1	<0.050	<0.050	<0.050	<0.050	0.13	<0.050	<0.050	<0.050	<0.050	<0.050
Naphthalene	6400	<0.050	<0.050	2.8	<0.050	<0.070	<0.050	<0.050	0.39	<0.050	<0.050	<0.050	<0.050	<0.050
Phenanthrene	580	<0.030	0.06	0.5	0.038	0.056	0.047	0.046	1.3	<0.030	<0.030	<0.030	<0.030	<0.030
Pyrene	68	<0.050	<0.050	<0.050	<0.050	0.12	0.072	0.062	0.45	0.055	<0.050	<0.050	<0.050	<0.050
Methylnaphthalene, 2-(1-)	1800	<0.10	<0.10	9.0	<0.10	0.068	<0.10	<0.10	0.33	<0.10	<0.071	<0.071	<0.071	<0.071
METALS AND INORGANICS														
Antimony	20000	0.52	<0.50	0.57	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.63	0.64
Arsenic	1900	3.7	1.3	4.2	<1.0	<1.0	8.6	8.5	2.4	<1.0	2.1	1.5	2.1	2.1
Barium	29000	100	73	730	120	390	550	560	310	400	68	140	150	170
Beryllium	67	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Boron	45000	230	76	230	620	830	1100	1200	260	370	48	77	42	39
Cadmium	2.7	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chromium	810	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chromium VI	140	1.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50
Cobalt	66	<0.50	0.81	4.1	<0.50	0.61	3.2	3.2	18	0.71	<0.50	0.55	<0.50	<0.50
Copper	87	1.7	3	3.2	<1.0	<1.0	<1.0	<1.0	1.3	<1.0	5.2	2.2	1.1	<1.0
Lead	25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Mercury	2.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1
Molybdenum	9200	10	4.8	3.2	<0.50	<0.50	<0.50	<0.50	3.8	<0.50	3.6	6.4	8.5	7.7
Nickel	490	1.7	2.1	5.1	1.4	1.8	<1.0	<1.0	7	<1.0	<1.0	<1.0	<1.0	<1.0
Sodium	2300000	66000	280000	180000	100000	94000	220000	220000	38000	740000	160000	66000	46000	40000
Selenium	63	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Silver	1.5	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	510	<0.050	0.067	0.11	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.053	<0.050	<0.050
Vanadium	250	1.3	0.75	2.2	2.4	1.2	0.86	0.78	3.1	2.2	0.75	0.52	0.85	0.97
Zinc	1100	<5.0	7.1	16	<5.0	<5.0	<5.0	<5.0	8.2	<5.0	5	9.4	71	8.5
Cyanide, Free	66	<1	<1	<4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloride (mg/L)	2300	140	740	710	64	140	620	610	78	1900	410	290	110	110
Uranium	420	7.2	13	6.5	<0.10	0.14	<0.10	<0.10	6.3	<0.10	7.5	5.1	2.5	2.5
POLYCHLORINATED BIPHENYLS (PCBs)														
Total PCBs	15	<0.05	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05	<0.05	<0.05

Notes:
1. All concentrations in µg/L, unless indicated otherwise.
2. Table 3 SCS = Table 3: Full Depth Generic Site Condition Standards for Use in a Non-Potable Groundwater Condition for Use Under Part XV.1 of the Environmental Protection Act (04/15/11) All Type of Property Use, medium and fine textured soil standards.
3. Yellow highlighting indicates that the parameter concentration exceeds the Table 3 SCS, Blue highlighting indicates that MDL exceeds the Table 3 SCS.

Figures



LEGEND

APPROXIMATE SITE BOUNDARY

N
W E
S

300 150 0 300 Metres

Data Source: Ministry of Natural Resources, Ontario Base Mapping, March 2014.

SITE LOCATION MAP

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FUTURE HSR STORAGE & MAINTENANCE FACILITY
For City of Hamilton

DATE: APRIL 2017	SCALE: 1:25000
PROJECT: 161-17781-00 03	FILE. NO.:161-17781-00 03 F1

WSP

FIGURE 1

LEGEND

- SITE BOUNDARY (Approximate)
- 17-1 BOREHOLE LOCATION AND DESIGNATION (MARCH, 2017)
- 17-21 MONITORING WELL LOCATION AND DESIGNATION (MARCH, 2017)
- MW101 PREVIOUS MONITORING WELL LOCATION AND DESIGNATION
- A A' CROSS SECTION A-A', SHOWN ON FIGURE 4

0 50 100 metres

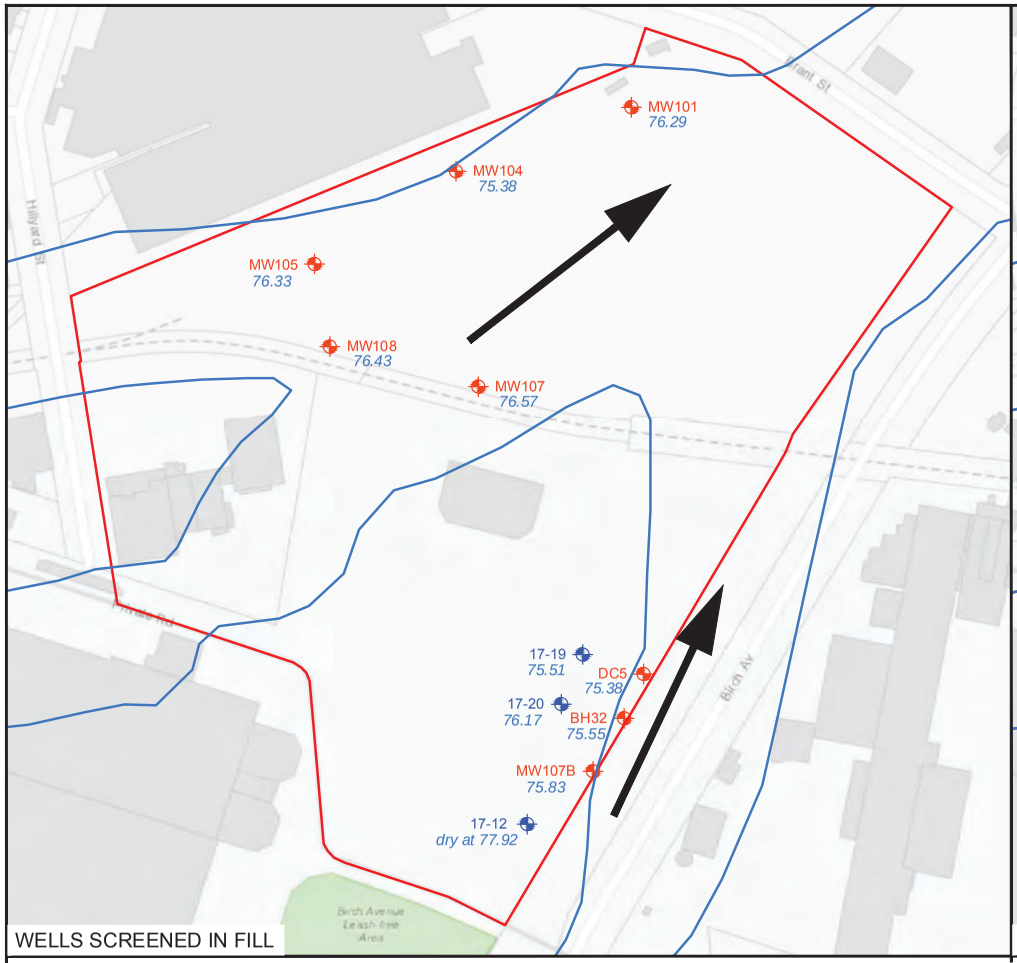
SITE PLAN

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FUTURE HSR STORAGE AND MAINTENANCE FACILITY
For: City of Hamilton

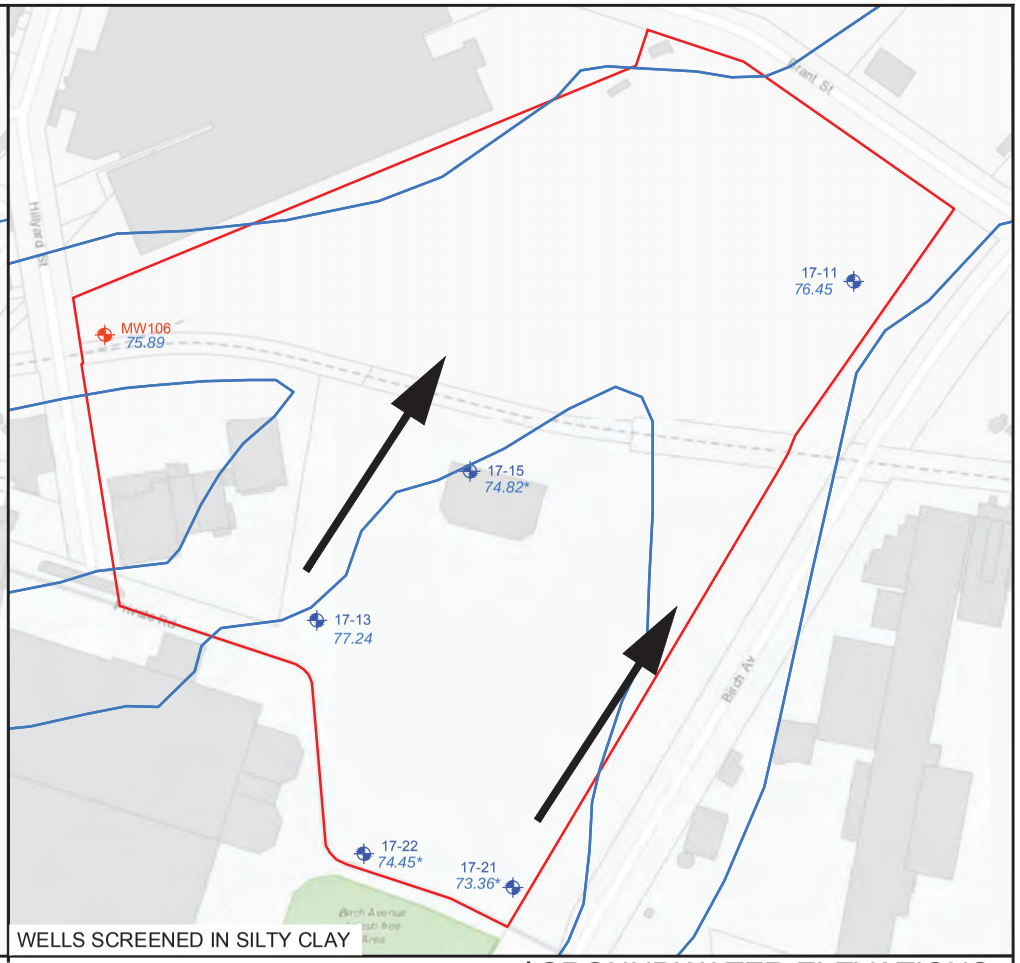
DATE: APRIL 2017	SCALE: AS SHOWN
PROJECT: 161-17781-00 - 03	REF. NO.: 161-17781-00 - 03 F2-SP

WSP

FIGURE 2



WELLS SCREENED IN FILL



WELLS SCREENED IN SILTY CLAY

LEGEND

- SITE BOUNDARY (Approximate)
- APPROXIMATE LOCATION OF FORMER SHERMAN INLET (INFILLED)
- 17-21 MONITORING WELL LOCATION AND DESIGNATION (INSTALLED BY WSP IN MARCH, 2017)
- MW101 PREVIOUS MONITORING WELL LOCATION AND DESIGNATION, INSTALLED BY OTHERS
- 76.45 GROUNDWATER ELEVATION, mASL (11-APR-2017)
- 74.82* GROUNDWATER ELEVATION NOT AT EQUILIBRIUM
- INFERRED GROUNDWATER FLOW DIRECTION

0 50 100 metres

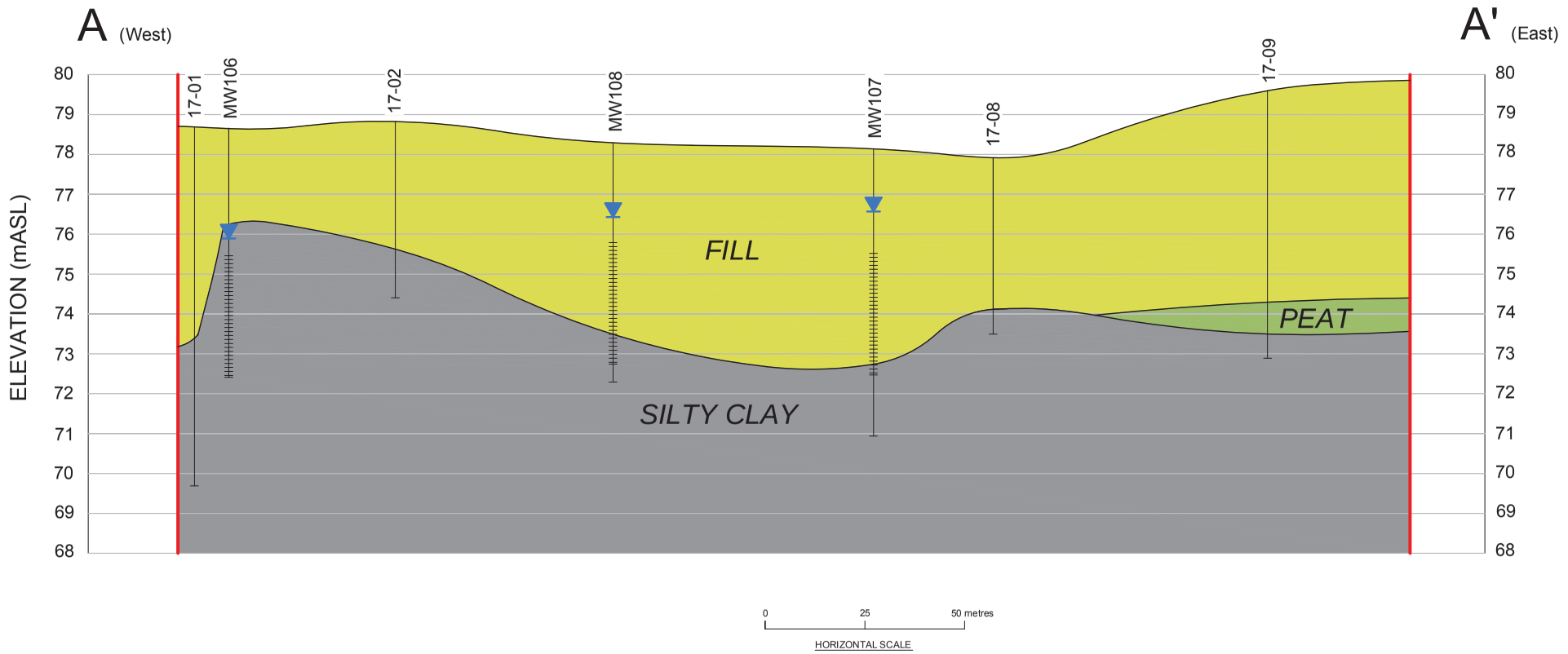
GROUNDWATER ELEVATIONS AND INFERRED FLOW

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FUTURE HSR STORAGE AND MAINTENANCE FACILITY
For: City of Hamilton

DATE: APRIL 2017	SCALE: AS SHOWN
PROJECT: 161-17781-00 - 03	REF. NO.: 161-17781-00 - 03 F3-GW

WSP

FIGURE 3



LEGEND

SITE BOUNDARY (Approximate)

GROUNDWATER LEVEL MEASURED ON APRIL 11, 2017

CROSS SECTION A-A'

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FUTURE HSR STORAGE AND MAINTENANCE FACILITY
For: City of Hamilton

DATE: APRIL 2017	SCALE: AS SHOWN
PROJECT: 161-17781-00 - 03	REF. NO.: 161-17781-00 - 03 F4-XA

WSP

FIGURE 4

Appendix A

BOREHOLE LOGS

LOG OF BOREHOLE BH17-01

PROJECT: Phase II ESA
CLIENT: City of Hamilton
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
BH LOCATION: N 4790744.782 E 594092.131

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 108 mm
Date: Mar/14/2017

REF. NO.: 161-17781-00
ENCL NO.: 1

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT; WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
78.7	Ground Surface							50 100 150 200 250	10 20 30			
0.0	**FILL:** Silty sand, some gravel, brown, dry, compact		1	SS	18							
77.8							78					
1 0.9	Silty clay, trace sand and gravel, dark brown to black, trace debris, moist, firm to very stiff		2	SS	27							SS2: VOCs, M&I, PAHs, PHCs
	Grey-brown, trace sand, becoming firm		3	SS	8		77					
2	Red and brown, trace sand, gravel and debris		4	SS	7		76					
3 75.6												
3.1	Clayey silt and sand, red-brown and black, moist, firm		5	SS	6		75					
74.9												
4 3.8	Silty sand and clay, brown, moist, very loose/very soft to compact/stiff		6	SS	4							
5	Black staining, odour		7	SS	2		74					SS7: VOCs, M&I, PAHs, PHCs, PCBs
			8	SS	3		73					
6	Stiff		9	SS	10		72					
71.8												
7 6.9	**SILTY CLAY:** Some sand, trace gravel, brown and grey, moist, stiff to very stiff		10	SS	15					100		SS10: VOCs, M&I, PAHs, PHCs
8			11	SS	12		71			188		1 10 55 33
			12	SS	11		70			88		
69.7												
9.0	**END OF BOREHOLE** **NOTE:** 1) Borehole dry and open to 7.6 m on completion											

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^{3}$, $\times^{3}$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

WSP SOIL LOG /W VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

LOG OF BOREHOLE BH17-02

PROJECT: Phase II ESA
CLIENT: City of Hamilton
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
BH LOCATION: N 4790738.85 E 594142.196

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 108 mm
Date: Mar/14/2017

REF. NO.: 161-17781-00
ENCL NO.: 2

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm) 50 100 150 200 250	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
78.8	Ground Surface											
0.0	**FILL:** Sand, some gravel, black and brown, moist, compact		1	SS	13							SS1: VOCs, M&I, PAHs, PHCs
77.9							78					
0.9	Sandy silt, red, moist, compact		2	SS	10							
			3	SS	11		77					
			4	SS	10							
75.6							76					
3.2	**SILTY CLAY:** some sand, trace gravel, grey and brown, moist, stiff		5	SS	10					175		
			6	SS	12		75			175		SS6: VOCs, M&I, PAHs, PHCs
74.4												
4.4	**END OF BOREHOLE** **NOTE:** 1) Borehole open and dry to 4.3 m on completion											

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH17-03

PROJECT: Phase II ESA
CLIENT: City of Hamilton
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
BH LOCATION: N 4790775.957 E 594192.49

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 108 mm
Date: Mar/14/2017

REF. NO.: 161-17781-00
ENCL NO.: 3

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT (w_P, w, w_L) WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
78.5	Ground Surface							50 100 150 200 250	10 20 30			
0.0	**FILL:** Sand and gravel, some debris, grey and black, dry, very dense		1	SS	64/ 101mm		78					
77.7												
0.8	Sand, some silt, trace gravel and debris, black and brown, moist, dense		2	SS	40		77					SS2: M&I, PAHs
77.0												
1.5	Silty sand, trace gravel, brick pieces, black and red, moist, compact to very loose		3	SS	25							
			4	SS	2		76					SS4: VOCs, PHCs, PCBs
75.2	Some clay and black staining		5	SS	4		75					
3.3	Clayey silt, trace sand, grey and black, wet, soft											
74.8												
3.7	Peaty silty sand, black, some plant debris, moist, loose		6	SS	6	▽ W. L. 74.7 m on completion	74					
	Becoming dark grey											
	Becoming wet		7	SS	5							
73.5							73					
5.0	Silty sand, black, PHC odour, wet, very loose		8	SS	2							
72.2												
6.3	Organic silty sand, dark brown, moist, very loose		9	SS	2		72			64		
			10	SS	2							SS10: VOCs, M&I, PAHs, PHCs
70.7							71					
7.8	**PEAT:** Some sand and silt, brown to black, moist, very soft		11	SS	2					53		
			12	SS	4		70			41		
69.5												
9.0	**END OF BOREHOLE** **NOTE:** 1) Borehole open to 6.4 m on completion 2) Water level measured at 3.8 m on completion											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH17-04

PROJECT: Phase II ESA
CLIENT: City of Hamilton
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
BH LOCATION: N 4790787.586 E 594276.3

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 108 mm
Date: Mar/16/2017

REF. NO.: 161-17781-00
ENCL NO.: 4

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT (w_P / w / w_L) WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
77.8	Ground Surface							50 100 150 200 250	10 20 30			
0.0	**FILL:** Gravelly sand, grey and brown, dry, very dense		1	SS	50/ 127mm		77					
1	---------- Black staining, dense		2	SS	40							SS2: VOCs, M&I, PAHs, PHCs
76.3												
1.5	Clayey silt mixed with sand and gravel, brown, black staining, moist, firm to very stiff		3	SS	17		76					
2			4	SS	4		75					
74.7						▽						
3.1	Gravelly sand, some debris, mixed with organic material, dark grey, wet, very loose		5	SS	4		W. L. 74.7 m on completion					SS5: VOCs, M&I, PAHs, PHCs
4			6	SS	2		74					
5			7	SS	3		73					
			8	SS	2		72					
6			9	SS	2		71					
7			10	SS	1							
	---------- Some clay		11	SS	2		70					
69.4												
8.4	Organic sandy silt, black, PHC odour, wet, very loose		12	SS	0		69					
9 68.7												
9.1	**PEAT:** Trace clay and organics, brown, moist, very soft		13	SS	4							
68.0												
9.8	**END OF BOREHOLE** **NOTE:** 1) Borehole open to 6.1 m on completion 2) Water level measured at 3.1 m on completion											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

WSP SOIL LOG /W VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

LOG OF BOREHOLE BH17-05

PROJECT: Phase II ESA
CLIENT: City of Hamilton
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
BH LOCATION: N 4790831.304 E 594275.579

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 108 mm
Date: Mar/15/2017

REF. NO.: 161-17781-00
ENCL NO.: 5

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT (w_P / w / w_L) WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
78.0	Ground Surface							50 100 150 200 250	10 20 30			
0.0	**FILL:** Gravelly sand, brown, moist, dense		1	SS	40							
77.3							77					
0.8	Silty clay mixed with sand, some gravel, dark brown, orange and grey sand, moist, firm		2	SS	6							
1			3	SS	6		76					
2												
75.7												
2.3	Clay mixed with sand, red-brown, black staining, moist, soft		4	SS	5		75					
	wet											
3	Some debris, very soft		5	SS	3							
			6	SS	2		74					SS6: VOCs, M&I, PAHs, PHCs
4												
73.4						▽						
4.6	Organic silty clay, sandy, dark brown, black staining, moist, very soft		7	SS	1		W. L. 73.4 m on completion	80				
5							73					
72.7												
5.3	Silty clay and sand, trace gravel, some organics, grey, moist, firm		8	SS	5							
6							72					
71.9												
6.1	**SILTY CLAY:** brown to grey, moist, stiff		9	SS	12					225		
71.3												
6.7	**END OF BOREHOLE** **NOTE:** 1) Borehole open to 6.7 m on completion 2) Water level measured at 4.6 m on completion											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH17-06

PROJECT: Phase II ESA
CLIENT: City of Hamilton
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
BH LOCATION: N 4790805.625 E 594354.14

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 108 mm
Date: Mar/22/2017

REF. NO.: 161-17781-00
ENCL NO.: 6

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT; WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
77.2	Ground Surface							50 100 150 200 250	10 20 30			
0.0	**FILL:** Sand, some silt, trace gravel, grey, moist, compact to very dense		1	SS	28		77					
			2	SS	38		76					
	Black, wet		3	SS	64		75					SS3: VOCs, M&I, PAHs, PHCs
	Some clay, wood pieces, loose		4	SS	7		74					
	Some debris, compact		5	SS	7		73					
72.6			6	SS	11							
4.6	Silty clay mixed with sand and organic material, grey, wet, very soft to firm		7	SS	4		72					
			8	SS	3		71					
			9	SS	2		70					
			10	SS	3		69					
68.8			11	SS	4							
8.4	Organic silty clay, very soft to firm, black, moist		12	SS	1		68					SS13: VOCs, M&I, PAHs, PHCs
67.8			13	SS	6							
9.4	**PEAT:** trace clay and organics, brown to black, firm, moist		14	SS	6		67					
66.7												
10.5	**END OF BOREHOLE**											

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH17-07

PROJECT: Phase II ESA
CLIENT: City of Hamilton
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
BH LOCATION: N 4790767.07 E 594324.037

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 108 mm
Date: Mar/16/2017

REF. NO.: 161-17781-00
ENCL NO.: 7

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT; WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
77.4	Ground Surface							50 100 150 200 250	10 20 30			
0.0	**FILL:** Sand and gravel mixed with silt, clay, and organics, brown and grey, moist, dense		1	SS	47		77					
1	Black staining, organics, very dense		2	SS	50/ 152mm							
2	Some debris, compact		3	SS	18		76					SS3: VOCs, M&I, PAHs, PHCs
	Becoming wet, loose		4	SS	7		75					
3	Some red clay		5	SS	8		74					
73.6												
3.8	sand and gravel mixed with organic material, some debris, moist, very loose to loose		6	SS	1	▽				49		
	Black, saturated, loose		7	SS	7		W. L. 73.2 m on completion			53		
	Moist, very loose		8	SS	3		72			71		
6	Loose		9	SS	4		71					
7			10	SS	4					50		
69.8							70					
7.6	**ORGANIC CLAYEY SILT:** Dark brown, black staining, moist, very soft to soft		11	SS	2							
8			12	SS	3		69			79		
68.3												
9.1	**PEAT:** some silt and clay, trace organics, brown, moist, very soft		13	SS	2		68			60		
67.7												
9.8	**END OF BOREHOLE** **NOTE:** 1) Borehole open to 5.8 m on completion 2) Water level measured at 4.3 m on completion											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

WSP SOIL LOG /W VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

LOG OF BOREHOLE BH17-08

PROJECT: Phase II ESA
CLIENT: City of Hamilton
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
BH LOCATION: N 4790715.819 E 594290.232

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 108 mm
Date: Mar/15/2017

REF. NO.: 161-17781-00
ENCL NO.: 8

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
77.9	Ground Surface							50 100 150 200 250	10 20 30			GR SA SI CL
0.0 / 77.2	**FILL:** Silty clay, dark brown, some black sand, moist, stiff		1	SS	10							SS1: VOCs, M&I, PAHs, PHCs
0.8 / 75.8	Silty sand, organics, black and orange, saturated, very loose		2	SS	2		77					
			3	SS	2		76					
2.1 / 74.1	Organic sandy silt, dark brown and grey, black staining, wet, very loose --- Black and brown, some silt		4	SS	3	▽	W. L. 75.5 m on completion		73			
			5	SS	2		75		89			
3.8 / 73.5	**SILTY CLAY:** Trace sand, red-brown, trace mottling, moist, stiff		6	SS	13		74		49	225		0 4 37 59
4.4	**END OF BOREHOLE** **NOTE:** 1) Borehole open to 3.1 m on completion 2) Water level measured at 2.4 m on completion											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH17-09

PROJECT: Phase II ESA
CLIENT: City of Hamilton
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
BH LOCATION: N 4790700.198 E 594357.325

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 108 mm
Date: Mar/15/2017

REF. NO.: 161-17781-00
ENCL NO.: 9

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT (w_P, w, w_L) WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
79.6	Ground Surface							50 100 150 200 250	10 20 30			
0.0 / 78.8	**FILL:** Sand and gravel, brown, some red and black coarse sand, moist, loose		1	SS	7		79					
0.8 / 78.1	Sand and gravel, brown to black, trace organics, moist, very loose		2	SS	2		78					SS2: VOCs, M&I, PAHs, PHCs
1.5	Silty sand, red, moist, very loose to compact		3	SS	3							
			4	SS	10		77					
	Black staining		5	SS	9		76					
	Dark brown with grey mottling, trace silt		6	SS	2	▽						
	Becoming clayey, grey, wet		7	SS	1		W. L. 75.0 m on completion					SS7: VOCs, M&I, PAHs, PHCs
5.3 / 74.3	Organic silty clay, dark brown and black, wet, stiff		8	SS	8		74		83			
6.1 / 73.5	Silty clay, sandy, trace organics, grey and brown, wet, very soft		9	SS	1		73					
6.7 / 72.9	**END OF BOREHOLE** **NOTE:** 1) Borehole open to 5.2 m on completion 2) Water level measured at 4.6 m on completion											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH17-10

PROJECT: Phase II ESA
CLIENT: City of Hamilton
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
BH LOCATION: N 4790748.665 E 594404.702

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 108 mm
Date: Mar/16/2017

REF. NO.: 161-17781-00
ENCL NO.: 10

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT; WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
77.5	Ground Surface							50 100 150 200 250	10 20 30			
0.0	**FILL:** Sand and gravel, brown and black, moist, compact		1	SS	18		77					
76.7												
0.8	Silty sand, black, moist, compact		2	SS	12							
	becoming wet		3	SS	21	▽	76					SS3: VOCs, M&I, PAHs, PHCs, PCBs
								W. L. 76.0 m on completion				
75.1												
2.4	Organic silty clay, grey, moist, soft		4	SS	3		75		47			
	Some sand, black staining, some roots, wood pieces		5	SS	3		74		47			
73.7												
3.8	**SILTY CLAY:** trace organics, grey, moist, stiff		6	SS	10					225		
							73					
			7	SS	10					225		
72.3												
5.2	**END OF BOREHOLE** **NOTE:** 1) Borehole open to 2.4 m on completion 2) Water level measured at 1.5 m on completion											

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH17-11

PROJECT: Phase II ESA
CLIENT: City of Hamilton
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
BH LOCATION: N 4790767.963 E 594420.103

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 108 mm
Date: Mar/22/2017

REF. NO.: 161-17781-00
ENCL NO.: 11

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
77.4	Ground Surface							50 100 150 200 250	10 20 30			GR SA SI CL
0.0 / 76.6	**FILL:** Sand and gravel, brown, moist, very dense		1	SS	58/ 178mm		77					SS1: VOCs, M&I, PAHs, PHCs
0.8 / 75.8	Silty clay and sand, dark brown, moist, firm		2	SS	7	W. L. 76.4 m Apr 11, 2017						
1.5	**SILTY CLAY:** Trace sand, trace gravel, dark brown, moist, stiff		3	SS	10	W. L. 76.0 m Mar 30, 2017				225		
	Grey/brown		4	SS	14		75			225		SS4: VOCs, M&I, PAHs, PHCs
			5	SS	13		74		42	225		1 5 42 52
			6	SS	14					225		
72.2			7	SS	12		73			225		
5.2	**END OF BOREHOLE**											

NOTE:
1) Borehole open and dry on completion
2) 50 mm dia. monitoring well installed in the borehole upon completion of drilling
3) Water level measurements in monitoring well:

Date	W.L. Depth (m)
March 30, 2017	1.3
April 11, 2017	0.9

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH17-12

PROJECT: Phase II ESA
CLIENT: City of Hamilton
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
BH LOCATION: N 4790536.201 E 594281.725

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 108 mm
Date: Mar/17/2017

REF. NO.: 161-17781-00
ENCL NO.: 12

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm) 50 100 150 200 250	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
80.2	Ground Surface											
80.0	**ASPHALTIC CONCRETE:** 130mm											
0.1	**FILL:** Sand and gravel, brick/debris, brown, moist, compact		1	SS	20		80					
1			2	SS	18		79					
	---------- Some silt, black staining, loose		3	SS	7							SS3: VOCs, M&I, PAHs, PHCs
2							78					
77.8												
2.4	**SILTY CLAY:** Trace organics, brown, moist, stiff to very stiff		4	SS	13					175		
3			5	SS	19		77			225		SS5: VOCs, M&I, PAHs, PHCs
76.6												
3.7	**END OF BOREHOLE**											

NOTE:
1) Borehole open and dry on completion
2) 50 mm dia. monitoring well installed in the borehole upon completion of drilling
3) Water level measurements in monitoring well:

Date	W.L. Depth (m)
March 30, 2017	DRY
April 11, 2017	DRY

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH17-13

PROJECT: Phase II ESA

CLIENT: City of Hamilton

PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton

DATUM: Geodetic, NAD83 UTM Zone 17T, mASL

BH LOCATION: N 4790623.713 E 594191.235

DRILLING DATA

Method: Hollow Stem Auger

Diameter: 108 mm

Date: Mar/21/2017

REF. NO.: 161-17781-00

ENCL NO.: 13

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT; WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
79.6	Ground Surface							50 100 150 200 250	10 20 30			
0.0	**FILL:** Sand, some gravel, brown, moist, dense to very dense		1	SS	45		79					
1			2	SS	70							SS2: VOCs, M&I, PAHs, PHCs
78.1												
1.5	**SILTY CLAY:** Trace sand, grey and brown, mottled, moist, very stiff		3	SS	19		78			225		
2			4	SS	19	▽	W. L. 77.1 m Apr 11, 2017			225		
3			5	SS	16	▽	W. L. 76.2 m Mar 30, 2017			225		SS5: VOCs, M&I, PAHs, PHCs
4			6	SS	17					225		
			7	SS	15		75			225		
5												
74.4												
5.2	**END OF BOREHOLE** **NOTE:** 1) Borehole open and dry on completion 2) 50 mm dia. monitoring well installed in the borehole upon completion of drilling 3) Water level measurements in monitoring well: Date — W.L. Depth (m) March 30, 2017 — 3.4 April 11, 2017 — 2.5											

GROUNDWATER ELEVATIONS

Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

WSP SOIL LOG /W VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

LOG OF BOREHOLE BH17-14

PROJECT: Phase II ESA
CLIENT: City of Hamilton
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
BH LOCATION: N 4790665.151 E 594201.065

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 108 mm
Date: Mar/21/2017

REF. NO.: 161-17781-00
ENCL NO.: 14

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT; WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
79.5	Ground Surface											
79.3	**ASPHALTIC CONCRETE:** 150mm											
0.2	**FILL:** Sand and gravel, grey and black, damp, very loose to compact		1	SS	22		79					SS1: VOCs, M&I, PAHs, PHCs
1	Some silt, bricks, and stones		2	SS	8							
2	Some clay and debris, becoming loose		3	SS	3		78					
	Black staining, PHC odour		4	SS	3		77					
3	Becoming wet		5	SS	2		76					
75.5												
4.0	Sandy silty clay, grey, black staining, moist, soft to stiff		6	SS	9					188		
	Some silt, trace sand and organics, soft, slight PHC odour		7	SS	2		75			175		
5			8	SS	2		74			75		
73.4												
6.1	Organic silty clay, soft, trace black staining, wet		9	SS	3		73			44 25		
72.6												
6.9	**SILTY CLAY:** Grey and brown, wet, very stiff		10	SS	16					225		SS10: VOCs, M&I, PAHs, PHCs
72.0							72					
7.5	**END OF BOREHOLE** **NOTE:** 1) Borehole dry and open to 7.6 m on completion											

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH17-15

PROJECT: Phase II ESA
CLIENT: City of Hamilton
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
BH LOCATION: N 4790687.198 E 594256.515

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 108 mm
Date: Mar/20/2017

REF. NO.: 161-17781-00
ENCL NO.: 15

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT; WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
79.6	Ground Surface											
79.6 / 0.0	**ASPHALTIC CONCRETE:** 100mm											
79.5 / 0.1	**FILL:** Sand and gravel, trace stones, grey and brown, dry, compact to dense		1	SS	35		79					
1			2	SS	14							SS2: VOCs, M&I, PAHs, PHCs
78.1	Some silt, black staining											
78.1 / 1.5	**SILTY CLAY:** Trace sand, trace gravel, grey and brown, trace mottling, moist, stiff to very stiff		3	SS	9		78		47	225		1 7 38 54
2			4	SS	15		77			225		SS4: VOCs, M&I, PAHs, PHCs
3			5	SS	13		76			225		
4			6	SS	8					225		
			7	SS	11	▽	75			188		
5							W. L. 74.7 m Apr 11, 2017					
			8	SS	9		74			163		
73.7 / 5.9	**END OF BOREHOLE**											

NOTE:
1) Borehole open and dry on completion
2) 50 mm dia. monitoring well installed in the borehole upon completion of drilling
3) Water level measurements in monitoring well:

Date	W.L. Depth (m)
April 11, 2017	4.9

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH17-16

PROJECT: Phase II ESA
CLIENT: City of Hamilton
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
BH LOCATION: N 4790688.19 E 594322.513

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 108 mm
Date: Mar/20/2017

REF. NO.: 161-17781-00
ENCL NO.: 16

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT (w_P w w_L) WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
79.1	Ground Surface							50 100 150 200 250	10 20 30			
0.0	**FILL:** Silty sand mixed with clay, some gravel, trace debris, brown, moist, loose to compact		1	SS	6		79					
1	Some stones and black staining		2	SS	25		78					
2	Increasing silt content		3	SS	11		77					
			4	SS	13							SS4: VOCs, M&I, PAHs, PHCs
3	Black staining		5	SS	9		76					
75.3												
3.8	Silty clay, some sand, trace organics and debris, brown, moist, soft		6	SS	2		75					
4	Black staining		7	SS	3							
5	Decreased black staining, some organics		8	SS	3		74					SS8: VOCs, M&I, PAHs, PHCs
6	Some sand, trace black staining		9	SS	3	▽	73					
72.3								W. L. 72.6 m on completion				
6.9	**SILTY CLAY:** trace to some sand, grey, moist, very stiff		10	SS	17		72			225		
7												
71.6												
7.5	**END OF BOREHOLE** **NOTE:** 1) Borehole open to 6.7 m on completion 2) Water level measured at 6.6 m on completion											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

WSP SOIL LOG /W VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

LOG OF BOREHOLE BH17-17

PROJECT: Phase II ESA
CLIENT: City of Hamilton
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
BH LOCATION: N 4790644.468 E 594295.917

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 108 mm
Date: Mar/20/2017

REF. NO.: 161-17781-00
ENCL NO.: 17

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT; WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
79.2	Ground Surface											
79.0	**ASPHALTIC CONCRETE:** 150mm											
0.2	**FILL:** Sand and gravel, some stones, grey and brown, moist, compact		1	SS	19		79					SS1: VOCs, M&I, PAHs, PHCs
78.5												
0.8	Silty sand, some gravel, grey and brown, moist, loose		2	SS	9		78					
	Some pieces of concrete and brick		3	SS	9							
76.9							77					
2.3	Sand and gravel, black and grey, moist, compact to dense		4	SS	32							SS4: VOCs, M&I, PAHs, PHCs
			5	SS	14		76					
75.4												
3.8	**SILTY CLAY:** grey-brown, moist, firm to very stiff		6	SS	23		75			225		
	Shale fragments		7	SS	13					225		
			8	SS	7		74			125		
73.3												
5.9	**END OF BOREHOLE** **NOTE:** 1) Borehole open and dry to 5.9 m on completion											

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

WSP SOIL LOG /W VOC 0~300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

LOG OF BOREHOLE BH17-18

PROJECT: Phase II ESA
CLIENT: City of Hamilton
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
BH LOCATION: N 4790619.803 E 594242.31

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 108 mm
Date: Mar/17/2017

REF. NO.: 161-17781-00
ENCL NO.: 18

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS "N" 0.3 m	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT; WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
79.7	Ground Surface							50 100 150 200 250	10 20 30			
79.6 / 0.1	**ASPHALTIC CONCRETE:** 70mm		1	SS	50/ 50mm		79					SS1: VOCs, M&I, PAHs, PHCs, PCBs
78.7 / 1.1	**FILL:** Sand and gravel, grey and black, damp, compact to very dense		2	SS	10							
	Silty clay mixed with sand, moist, stiff		3	SS	9		78					
77.5 / 2.3	**SILTY CLAY:** Trace sand, brown, moist, stiff		4	SS	13		77			225		
	Trace mottling		5	SS	14					225		
			6	SS	13		76			225		
			7	SS	11		75			175		SS7: VOCs, M&I, PAHs, PHCs
74.6 / 5.2	**END OF BOREHOLE** **NOTE:** 1) Borehole open and dry to 5.2 m on completion											

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH17-19

PROJECT: Phase II ESA
CLIENT: City of Hamilton
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
BH LOCATION: N 4790608.463 E 594305.394

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 108 mm
Date: Mar/21/2017

REF. NO.: 161-17781-00
ENCL NO.: 19

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
79.5	Ground Surface							50 100 150 200 250	10 20 30			
79.0 / 0.1	**ASPHALTIC CONCRETE:** 130mm **FILL:** Sand and gravel, grey and brown, damp, compact to very dense		1	SS	74		79					SS1: VOCs, M&I, PAHs, PHCs
77.9 / 1.5	Silty clay mixed with sand, trace gravel, brown, moist, firm to very stiff		2	SS	24		78					
			3	SS	13							
			4	SS	12		77					
			5	SS	16		76					
			6	SS	9			W. L. 75.4 m Apr 11, 2017				
			7	SS	6		75					
			8	SS	5		74	W. L. 74.4 m Mar 30, 2017				SS8: VOCs, M&I, PAHs, PHCs
	Black staining, PHC odour											
73.4 / 6.1	**SILTY CLAY:** Trace organics, some sand, grey, moist, stiff		9	SS	12		73			225		
72.8 / 6.7	**END OF BOREHOLE** **NOTE:** 1) Borehole open and dry on completion 2) 50 mm dia. monitoring well installed in the borehole upon completion of drilling 3) Water level measurements in monitoring well: Date — W.L. Depth (m) March 30, 2017 — 5.1 April 11, 2017 — 4.1											

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH17-20

PROJECT: Phase II ESA
CLIENT: City of Hamilton
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
BH LOCATION: N 4790587.295 E 594296.313

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 108 mm
Date: Mar/21/2017

REF. NO.: 161-17781-00
ENCL NO.: 20

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
79.3 / 0.0	Ground Surface				
79.0 / 0.1	**ASPHALTIC CONCRETE:** 130mm				
	FILL: Sand and gravel, trace silt, brown and grey, moist, compact to very dense	1	SS	50/ 152mm	
		2	SS	31	
		3	SS	20	
		4	SS	16	
76.3 / 3.1	Sandy silt and clay, trace gravel, dark brown, trace black staining, very moist, firm	5	SS	6	
75.5 / 3.8	Silty clay, some sand, dark brown, black staining, very moist, PHC odour, firm to stiff	6	SS	4	
		7	SS	7	SS7: VOCs, PHCs
	Becoming grey	8	SS	9	
73.2 / 6.1	**SILTY CLAY:** Some sand, grey, moist, stiff	9	SS	11	SS9: VOCs, PHCs
72.6 / 6.7	**END OF BOREHOLE**				

NOTE:
1) Borehole open and dry on completion
2) 50 mm dia. monitoring well installed in the borehole upon completion of drilling
3) Water level measurements in monitoring well:

Date	W.L. Depth (m)
March 30, 2017	3.4
April 11, 2017	3.3

Head Space Combustible Vapor Reading (ppm): 50, 100, 150, 200, 250

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%): 10, 20, 30

ELEVATION: 79, 78, 77, 76, 75, 74, 73

W. L. 75.9 m
Mar 24, 2017

POCKET PEN. (Cu) (kPa): 225

NATURAL UNIT WT (kN/m³)

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; $\circ^{\varepsilon=3\%}$ Strain at Failure

LOG OF BOREHOLE BH17-21

PROJECT: Phase II ESA
CLIENT: City of Hamilton
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
BH LOCATION: N 4790509.914 E 594274.72

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 108 mm
Date: Mar/31/2017

REF. NO.: 161-17781-00
ENCL NO.: 21

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
80.3	Ground Surface							50 100 150 200 250	10 20 30			
80.2 / 0.1	**ASPHALTIC CONCRETE:** 50mm											
79.5	**FILL:** Sand and gravel, mixed with organics, brown, moist, compact		1	SS	13		80			42		
0.8	Silty sand, some clay, trace gravel, pieces of brick, brown, moist, loose		2	SS	8		79					
78.6												
1.7	Sand, some gravel, black and red, moist, loose		3	SS	9							SS3: VOCs, M&I, PAHs, PHCs
	Some silt and clay, very loose		4	SS	3		78					
			5	SS	3		77					SS5: VOCs, M&I, PAHs, PHCs
	compact		6	SS	10		76					
75.7												
4.6	**SILTY CLAY:** Grey and brown, moist, very stiff		7	SS	21					225		
			8	SS	19		75			225		
			9	SS	22		74			225		
			10	SS	16	W. L. 73.2 m Apr 11, 2017				175		
			11	SS	20					175		
72.0												
8.2	**END OF BOREHOLE**											

NOTE:
1) Auger refusal at 7.9 m after retrieving SS11
2) Borehole open and dry on completion
3) 50 mm dia. monitoring well installed in the borehole upon completion of drilling to augered depth
4) Water level measurements in monitoring well:

Date	W.L. Depth (m)
April 11, 2017	7.0

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH17-22

PROJECT: Phase II ESA
CLIENT: City of Hamilton
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
BH LOCATION: N 4790524.332 E 594211.23

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 108 mm
Date: Mar/31/2017

REF. NO.: 161-17781-00
ENCL NO.: 22

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS "N" 0.3 m	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT — WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
81.0 / 0.0	Ground Surface											
80.9 / 0.1	**ASPHALTIC CONCRETE:** 70mm											
	FILL: Sand and gravel, trace clay, grey and brown, damp, compact		1	SS	14							
80.3 / 0.8	Sandy silt and clay, trace gravel and debris, brown, moist, compact		2	SS	10		80					SS2: VOCs, M&I, PAHs, PHCs
			3	SS	13		79					
78.7 / 2.3	**SILTY CLAY:** Trace to some sand, brown, moist, very stiff		4	SS	15		78			225		SS4: VOCs, M&I, PHCs
	Becoming grey, trace black staining		5	SS	20					225		
			6	SS	18		77			225		
			7	SS	15		76			225		
			8	SS	20							
	stiff		9	SS	9		75			175		
	firm		10	SS	6		74			100		
73.4 / 7.6	**END OF BOREHOLE**											

W. L. 74.3 m
Apr 11, 2017

NOTE:
1) Borehole open and dry on completion
2) 50 mm dia. monitoring well installed in the borehole upon completion of drilling
3) Water level measurements in monitoring well:

Date	W.L. Depth (m)
April 11, 2017	6.7

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure