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ENVIRONMENTAL INVESTIGATION

former Arctic Gardens Property

11 Mill Street, Deseronto, Ontario

prepared for:
Town of Deseronto

October, 2003
File: 321/171

Distribution:
2 copies - Town of Deseronto
1 copy - Malroz Engineering Inc.

Notice to Reader

Malroz Engineering Inc. (*Malroz*) was retained by the Town of Deseronto to undertake an environmental investigation at the former Arctic Gardens property at 11 Mills Street in Deseronto, Ontario. The objective of the work was to better define the extent of contamination in areas outlined in the Phase 2 Environmental Site Assessment completed by Malroz in January, 2001. The scope of work for the current investigation included the following: soils investigation, soil and groundwater sampling and analyses, and documentation of the work in a written report.

The findings reported in this document are based on the tasks completed by *Malroz* under the mutually agreed scope of work. Professional judgement, experience with similar investigations, and available data collected within the scope of work form the basis for this report. *Malroz* has prepared this report using information understood to be factual and correct, and shall not be responsible for conditions arising from information or facts that were inaccurate, concealed, or not fully disclosed at the time of investigation.

The assessment of environmental conditions is based on a review of data collected at specific locations within the study area. Conditions between data locations have been inferred and actual conditions may vary from those reported. Environmental conditions can be expected to change over time.

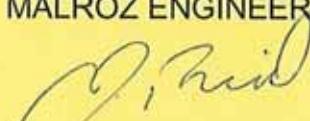
The findings and conclusions of this report are valid only at the time at which this work was conducted. If future work is undertaken, or additional information becomes available, *Malroz* should be requested to re-evaluate the conclusions of this report and make amendments as required.

This document has been prepared by *Malroz* for the sole use of the *Town of Deseronto*, in assessing areas of contamination on the subject site. Unauthorized reuse of this document for any other purpose, or by any other party, without the express written consent of *Malroz* shall be at such party's sole risk and without liability to *Malroz*.

This page is an integral part of this document and must remain with it at all times.

Respectfully Submitted,
MALROZ ENGINEERING INC.

per: Jeff Reid, C.E.T.
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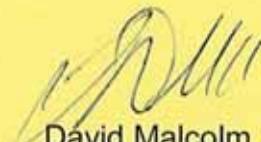


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1.0 Introduction

1.1 Property Description

The former Arctic Gardens property is located on Mill Street in Deseronto, between Main Street and the Bay of Quinte (refer to Figure 1).

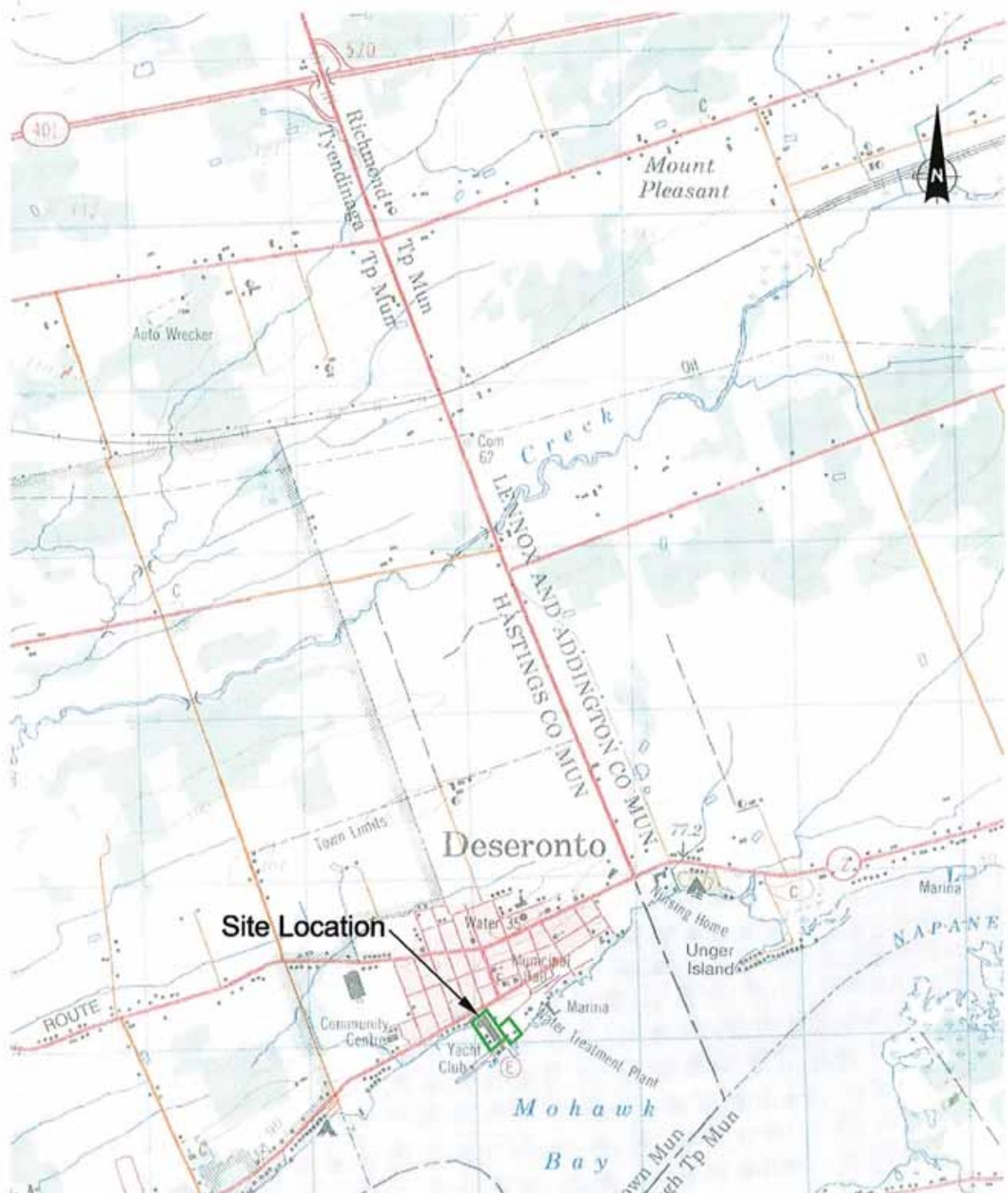
At present the property is vacant with scrub grass, shrubs and a copse of immature deciduous trees in the northwest and southeast corners of the property. All structures from the former canning factory have been demolished, leaving the concrete foundation slabs remaining. Asphalt pavement, used as former roadways and parking areas, are still present at some locations on the east portion of the property.

Adjacent land use consists of a flee market immediately to the north of the subject property, and a municipal water treatment facility to the east. The Bay of Quinte wraps around the south and west sides of the property. The peninsula to the southwest of the property is used as a park and boat moorage.

1.2 Background

The following environmental work has been previously undertaken at the subject property:

- ▶ A Phase 1 Environmental Site Assessment was conducted by Malroz on the subject property in May, 1999 (file ref. 321/102). The Phase 1 ESA report identified a potential for contamination from past fill placement and waste disposal, and on-site chemical storage in drums and USTs/ASTs. In addition, the potential for contamination from past lumber mill operations on the site was identified.
- ▶ Demolition of buildings and the clarifier was conducted in the fall/winter of 1999/2000 by Westendorp Demolition.
- ▶ Removal of fifty seven (57) 45-gallon chemical storage drums from the site was undertaken on various dates during the demolition by Drain-All.
- ▶ A Phase 2 Environmental Site Assessment was conducted by Malroz on the subject property between July, 2000 and January, 2001 (file ref. 321/139). The Phase 2 ESA report identified areas with existing soil and groundwater contamination from past site use.
- ▶ A Site Specific Risk Assessment (SSRA) was completed by Malroz on the subject property in September, 2001 (file ref. 321/145). The SSRA was conducted to evaluate whether the site supports the use of MOE Generic Criteria as soil clean-up objectives. Table B Generic Criteria has been excepted by the MOE for use as clean-up criteria on this property.



Based on Ministry of Energy, Mines
and Resources Canada Map, Belleville,
edition 7, 1991

Approximate Scale 1:50 000



Site Location Plan

Environmental Investigation
Arctic Gardens, 11 Mill Street, Deseronto, Ontario

Figure

1

File: 0310-321/171

1.3 Local Groundwater Use

The Town of Deseronto is serviced by municipal water and sewer. A review of available MOE water well records identified wells within the town limit, however the location of the wells and whether they are still in service is not well documented.

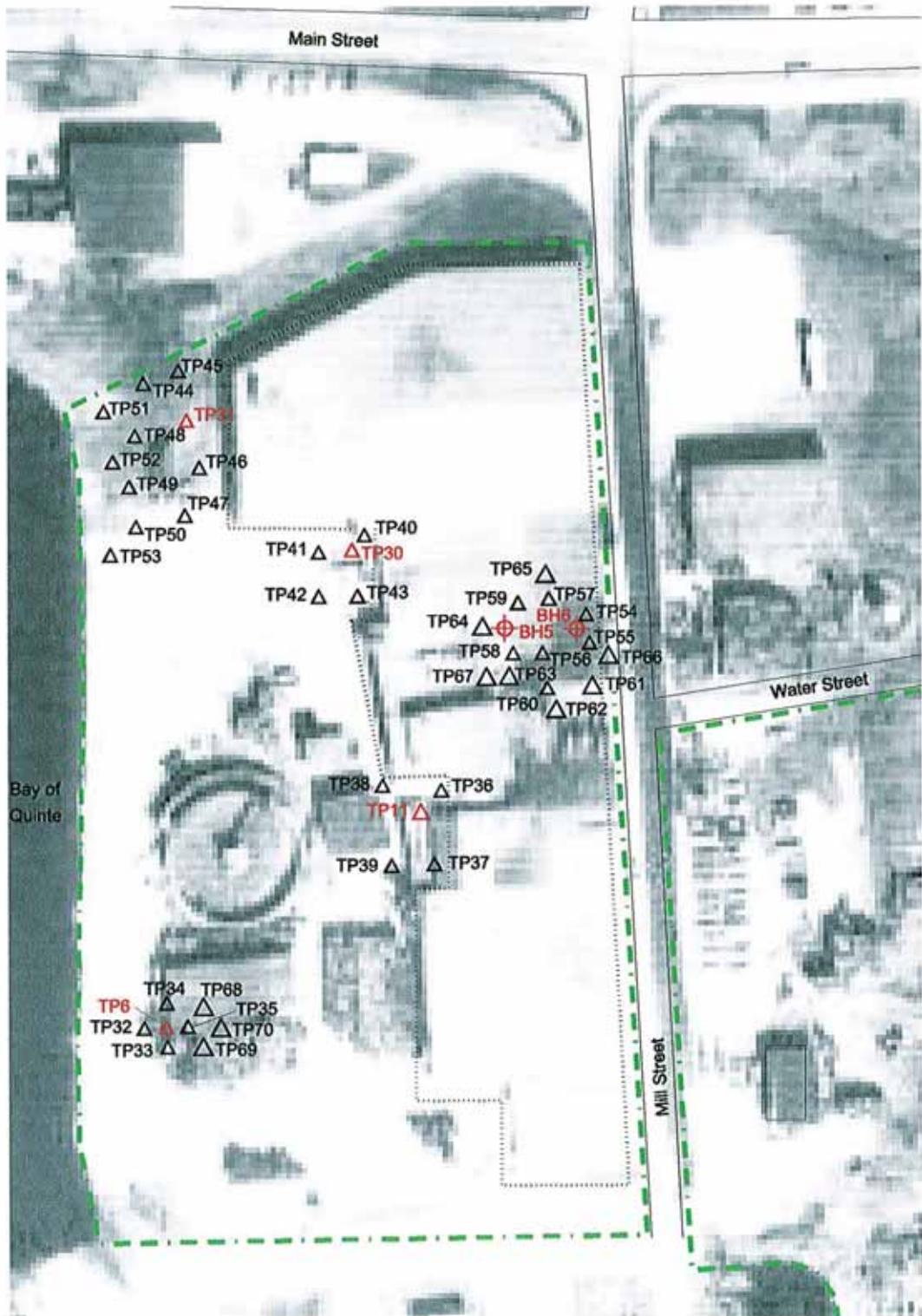
The nearest sensitive receptor is the Bay of Quinte which borders the site to the west and south.

1.4 Initiation and Scope of Work

Malroz was retained by *the Town of Deseronto* to undertake further investigation areas of concern outlined in the Phase 2 ESA. The following environmental work was completed in 2003:

- i. In June 2003, a test pit program was conducted to better delineate the extent of soil contamination in areas identified in the Phase 2 ESA as exceeding Table B clean-up criteria. Soil investigations were undertaken at: TP6 for copper; TP11 and TP30 for petroleum hydrocarbons; TP31 for petroleum hydrocarbons, zinc and PAHs; and BH5/6 for petroleum hydrocarbons, copper, lead, zinc and PAHs. Refer to Figure 2 for locations.
- ii. In June 2003, groundwater samples were collected from monitoring wells MW2, MW6, MW8 and MW13, and analyzed for PAHs to confirm detects reported in September 2000.
- iii. In August 2003, additional test pits in the areas of TP6 and BH5/6 were completed to better define the extent of contamination in these areas.
- iv. In August, 2003, groundwater samples were collected from monitoring wells MW2, MW6, MW8 and MW13 and analyzed for PAH parameters as further confirmation of previous results.

This report presents the methodology and analytical results, and discusses site remediation options.



Legend:

TP33 Δ/ΔTP69 test hole location and ID. (June/August, 2003)

ΔTP31

Phase 2 ESA test hole location and ID.
(referenced areas in report)

approximate property boundary

Approx. Scale
0 25 m



Testpit Location Plan

Arctic Gardens, 11 Mill Street, Deseronto, Ontario

Figure

2

File: 321/171

2.0 Field Methodology

2.1 Soil Investigation

The soils delineation program was conducted in two stages. Stage 1 was conducted on June 17 and 18, 2003 and consisted of excavating twenty-nine (29) test pits in areas which exceeded clean-up criteria in the Phase 2 ESA report; namely TP6, BH5/6, TP11, TP30 and TP31. Stage 2 was conducted on August 7, 2003, and consisted of excavating ten (10) test pits in areas not fully delineated during Stage 1 (TP6 and BH5/6). Given conditions in TP31 area, it was agreed no further work was warranted in this area during the August field investigation.

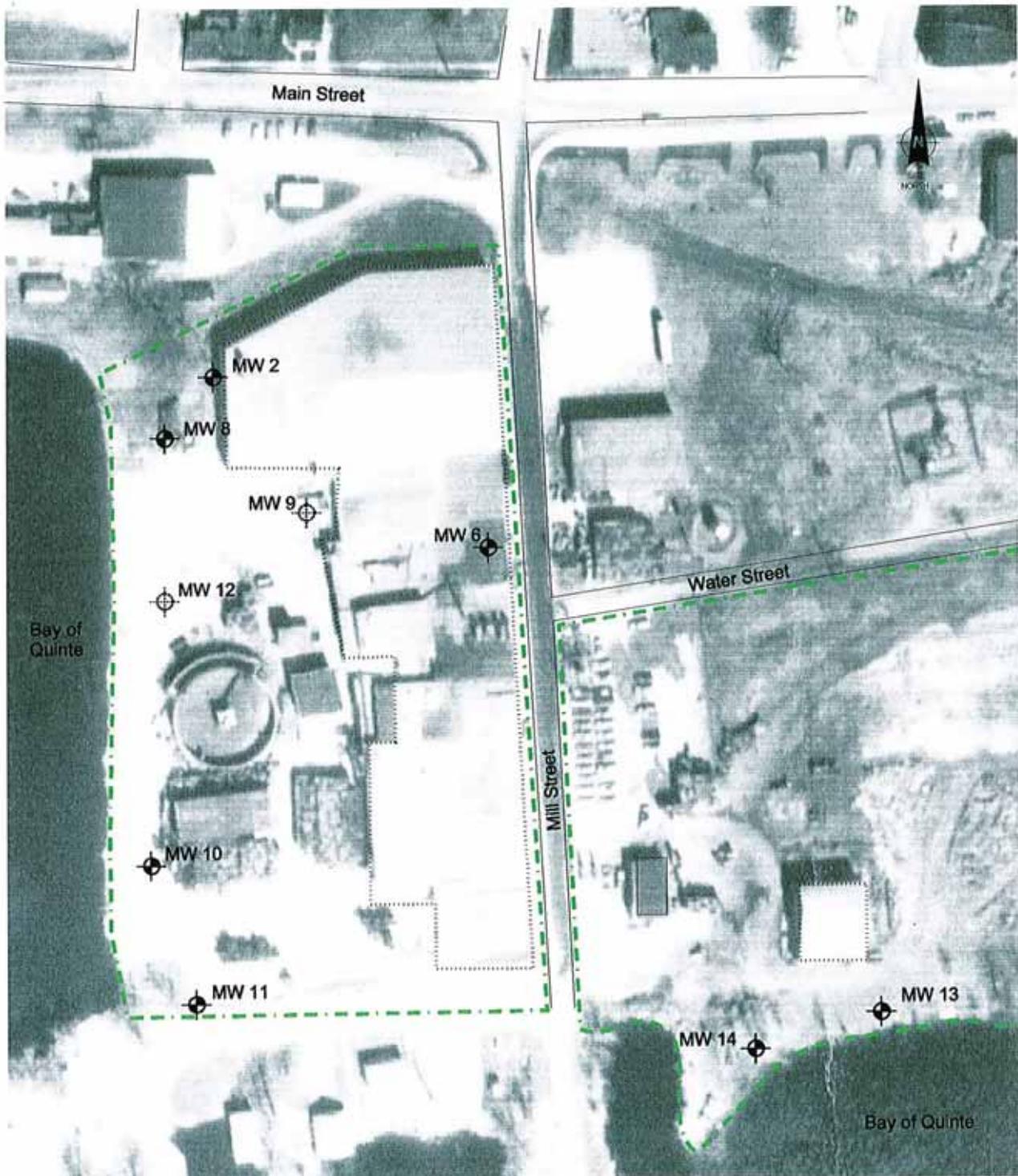
Test pits were excavated using a rubber tired backhoe, except in the area of BH5/6 which required a specialized drill rig equipped with a 9 inch (23 cm) core barrel to bore through the remains of the concrete building foundation and into the soils below. Test pits and borings were advanced to depths correlating with previously reported exceedences. Samples were logged for soil type, anthropogenic features, visual evidence of contamination, and presence of combustible vapours. Samples were placed in laboratory supplied bottles and packed with ice in a cooler before transferring them to the laboratory with the chain of custody form. Analyses varied between areas and depended upon field observations and suspected contaminants.

Figure 2 shows the test pit locations. Test pit logs are presented in Appendix A.

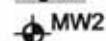
2.2 Groundwater Investigation

Malroz staff monitored groundwater conditions and checked for the presence of free phase product in the 7 existing monitoring wells on June 18 and August 7, 2003. Groundwater samples were collected on both occasions from four wells (MW2, MW8, MW6, and MW13) to determine current concentrations of the chemicals of concern. Locations of groundwater monitors are shown on Figure 3.

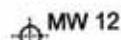
Groundwater monitors were opened and combustible vapour concentrations of headspace vapours were monitored in each well using an RKI Eagle combustible gas indicator set in full gas mode. Depth to water measurements were recorded to estimate shallow groundwater flow directions using an electronic sounding probe. Following depth measurements, monitors selected for sampling were purged of either three well volumes of water or until dry using dedicated waterra tubing equipped with a foot valve. Water samples were collected from groundwater which recharged into the monitor. Samples were placed in laboratory supplied bottles and packed with ice in a cooler before transferring them to the laboratory along with the chain of custody form. Samples were submitted for analyses of Polynuclear Aromatic Hydrocarbon (PAH) compounds.



Legend:



monitoring well location and ID.



destroyed monitoring well



approximate property boundary

Approx. Scale

0

50 m



Monitoring Well Location Plan

Arctic Gardens, 11 Mill Street, Deseronto, Ontario

Figure

3

File: 321/171

3.0 Results of Analyses

3.1 Soils

A total of forty (40) soil samples from the June and August, 2003 investigations, were submitted to an independent CAEAL certified laboratory for analyses. The samples were analyzed for those parameters reported as exceeding clean-up criteria in the Phase 2 ESA investigation (January, 2001). Samples were selected to provide representation of current soil conditions and to assist in better delineating the areas of impact.

Results of laboratory analyses have been summarized in Table 1 and compared to the clean-up criteria¹. The area of contamination around TP6, TP11 and TP30 appears to have been delineated. The probable volume of contaminated soil at 3 of the areas is presented in Table 2. The limit of impacted soil was not delineated at TP31 or BH5/6 areas.

Table 2
Estimate of Probable Contaminated Soil Volume

Location	Probable Thickness of Contamination (m)	Estimated Area of Contamination (m ²)	Probable Volume of Contaminated Soil (m ³)
TP6	1.5	65	100
TP11	0.8	55	50
TP30	1.6	55	90
TP31	3.6	>1200	unknown
BH5/6	2.7	>550	unknown

The results and inferred area of contamination is presented visually on Figure 4. The laboratory certificates are presented in Appendix B.

It must be emphasized that the estimated thicknesses, areas and volumes are based on a review of data collected at specific locations within the study area. Conditions between data locations have been inferred and actual conditions may vary from those reported. Also, environmental conditions can be expected to change over time. Therefore these estimates can only be used as a guideline.

¹ MOE *Guideline for Use at Contaminated Sites in Ontario* criteria (Table B - residential/parkland use in a nonpotable groundwater condition)

Table 1
Summary of Soil Analyses, June and August, 2003

PARAMETER	TESTING DATES (MONTH/ YEAR)	UNITS	NO. OF	TP84-01		TP84-02		TP84-03		TP84-04		TP84-05		TP84-06		TP84-07		TP84-08		TP84-09		TP84-10		TP84-11		TP84-12		TP84-13		TP84-14		TP84-15		TP84-16		TP84-17		TP84-18		TP84-19		TP84-20		TP84-21		TP84-22		TP84-23		TP84-24		TP84-25		TP84-26		TP84-27		TP84-28		TP84-29		TP84-30		TP84-31		TP84-32		TP84-33		TP84-34		TP84-35		TP84-36		TP84-37		TP84-38		TP84-39		TP84-40		TP84-41		TP84-42		TP84-43		TP84-44		TP84-45		TP84-46		TP84-47		TP84-48		TP84-49		TP84-50		TP84-51		TP84-52		TP84-53		TP84-54		TP84-55		TP84-56		TP84-57		TP84-58		TP84-59		TP84-60		TP84-61		TP84-62		TP84-63		TP84-64		TP84-65		TP84-66		TP84-67		TP84-68		TP84-69		TP84-70		TP84-71		TP84-72		TP84-73		TP84-74		TP84-75		TP84-76		TP84-77		TP84-78		TP84-79		TP84-80		TP84-81		TP84-82		TP84-83		TP84-84		TP84-85		TP84-86		TP84-87		TP84-88		TP84-89		TP84-90		TP84-91		TP84-92		TP84-93		TP84-94		TP84-95		TP84-96		TP84-97		TP84-98		TP84-99		TP84-100		TP84-101		TP84-102		TP84-103		TP84-104		TP84-105		TP84-106		TP84-107		TP84-108		TP84-109		TP84-110		TP84-111		TP84-112		TP84-113		TP84-114		TP84-115		TP84-116		TP84-117		TP84-118		TP84-119		TP84-120		TP84-121		TP84-122		TP84-123		TP84-124		TP84-125		TP84-126		TP84-127		TP84-128		TP84-129		TP84-130		TP84-131		TP84-132		TP84-133		TP84-134		TP84-135		TP84-136		TP84-137		TP84-138		TP84-139		TP84-140		TP84-141		TP84-142		TP84-143		TP84-144		TP84-145		TP84-146		TP84-147		TP84-148		TP84-149		TP84-150		TP84-151		TP84-152		TP84-153		TP84-154		TP84-155		TP84-156		TP84-157		TP84-158		TP84-159		TP84-160		TP84-161		TP84-162		TP84-163		TP84-164		TP84-165		TP84-166		TP84-167		TP84-168		TP84-169		TP84-170		TP84-171		TP84-172		TP84-173		TP84-174		TP84-175		TP84-176		TP84-177		TP84-178		TP84-179		TP84-180		TP84-181		TP84-182		TP84-183		TP84-184		TP84-185		TP84-186		TP84-187		TP84-188		TP84-189		TP84-190		TP84-191		TP84-192		TP84-193		TP84-194		TP84-195		TP84-196		TP84-197		TP84-198		TP84-199		TP84-200		TP84-201		TP84-202		TP84-203		TP84-204		TP84-205		TP84-206		TP84-207		TP84-208		TP84-209		TP84-210		TP84-211		TP84-212		TP84-213		TP84-214		TP84-215		TP84-216		TP84-217		TP84-218		TP84-219		TP84-220		TP84-221		TP84-222		TP84-223		TP84-224		TP84-225		TP84-226		TP84-227		TP84-228		TP84-229		TP84-230		TP84-231		TP84-232		TP84-233		TP84-234		TP84-235		TP84-236		TP84-237		TP84-238		TP84-239		TP84-240		TP84-241		TP84-242		TP84-243		TP84-244		TP84-245		TP84-246		TP84-247		TP84-248		TP84-249		TP84-250		TP84-251		TP84-252		TP84-253		TP84-254		TP84-255		TP84-256		TP84-257		TP84-258		TP84-259		TP84-260		TP84-261		TP84-262		TP84-263		TP84-264		TP84-265		TP84-266		TP84-267		TP84-268		TP84-269		TP84-270		TP84-271		TP84-272		TP84-273		TP84-274		TP84-275		TP84-276		TP84-277		TP84-278		TP84-279		TP84-280		TP84-281		TP84-282		TP84-283		TP84-284		TP84-285		TP84-286		TP84-287		TP84-288		TP84-289		TP84-290		TP84-291		TP84-292		TP84-293		TP84-294		TP84-295		TP84-296		TP84-297		TP84-298		TP84-299		TP84-300		TP84-301		TP84-302		TP84-303		TP84-304		TP84-305		TP84-306		TP84-307		TP84-308		TP84-309		TP84-310		TP84-311		TP84-312		TP84-313		TP84-314		TP84-315		TP84-316		TP84-317		TP84-318		TP84-319		TP84-320		TP84-321		TP84-322		TP84-323		TP84-324		TP84-325		TP84-326		TP84-327		TP84-328		TP84-329		TP84-330		TP84-331		TP84-332		TP84-333		TP84-334		TP84-335		TP84-336		TP84-337		TP84-338		TP84-339		TP84-340		TP84-341		TP84-342		TP84-343		TP84-344		TP84-345		TP84-346		TP84-347		TP84-348		TP84-349		TP84-350		TP84-351		TP84-352		TP84-353		TP84-354		TP84-355		TP84-356		TP84-357		TP84-358		TP84-359		TP84-360		TP84-361		TP84-362		TP84-363		TP84-364		TP84-365		TP84-366		TP84-367		TP84-368		TP84-369		TP84-370		TP84-371		TP84-372		TP84-373		TP84-374		TP84-375		TP84-376		TP84-377		TP84-378		TP84-379		TP84-380		TP84-381		TP84-382		TP84-383		TP84-384		TP84-385		TP84-386		TP84-387		TP84-388		TP84-389		TP84-390		TP84-391		TP84-392		TP84-393		TP84-394		TP84-395		TP84-396		TP84-397		TP84-398		TP84-399		TP84-400		TP84-401		TP84-402		TP84-403		TP84-404		TP84-405		TP84-406		TP84-407		TP84-408		TP84-409		TP84-410		TP84-411		TP84-412		TP84-413		TP84-414		TP84-415		TP84-416		TP84-417		TP84-418		TP84-419		TP84-420		TP84-421		TP84-422		TP84-423		TP84-424		TP84-425		TP84-426		TP84-427		TP84-428		TP84-429		TP84-430		TP84-431		TP84-432		TP84-433		TP84-434		TP84-435		TP84-436		TP84-437		TP84-438		TP84-439		TP84-440		TP84-441		TP84-442		TP84-443		TP84-444		TP84-445		TP84-446		TP84-447		TP84-448		TP84-449		TP84-450		TP84-451		TP84-452		TP84-453		TP84-454		TP84-455		TP84-456		TP84-457		TP84-458		TP84-459		TP84-460		TP84-461		TP84-462		TP84-463		TP84-464		TP84-465		TP84-466		TP84-467		TP84-468		TP84-469		TP84-470		TP84-471		TP84-472		TP84-473		TP84-474		TP84-475		TP84-476		TP84-477		TP84-478		TP84-479		TP84-480		TP84-481		TP84-482		TP84-483		TP84-484		TP84-485		TP84-486		TP84-487		TP84-488		TP84-489		TP84-490		TP84-491		TP84-492		TP84-493		TP84-494		TP84-495		TP84-496		TP84-497		TP84-498		TP84-499		TP84-500		TP84-501		TP84-502		TP84-503		TP84-504		TP84-505		TP84-506		TP84-507		TP84-508		TP84-509		TP84-5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Caution:
This figure is a conceptual rendering based on limited information. Actual conditions may vary from those shown. Refer to report text for discussion.

Approx. Scale
0 25 m



Soil Results and Inferred Area of Impact

Arctic Gardens, 11 Mill Street, Deseronto, Ontario

Figure

4

File: 321/171

3.2 Groundwater

Groundwater elevations were measured on June 18 and August 7, 2003, in the monitoring wells. In general, the shallow groundwater flow direction appears to radiate to the south and west towards the Bay of Quinte. Groundwater elevations and monitoring results are summarized in Table 3. Groundwater elevation contours are presented on Figure 5.

No evidence of phase separated liquid (i.e. free product) was observed during the groundwater sampling and monitoring visit.

Table 3
Summary of Groundwater Measurements

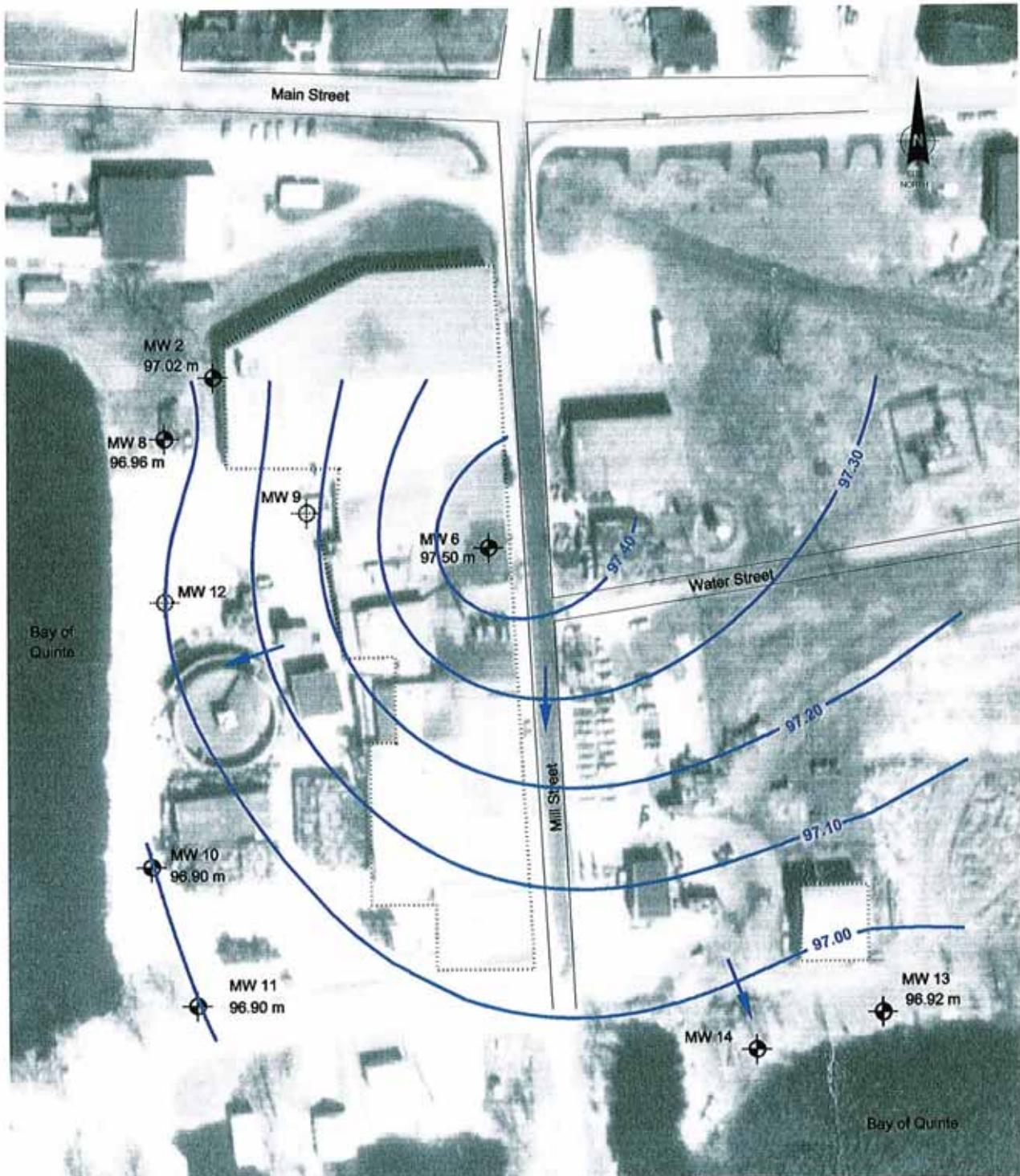
Monitoring Well	Depth to Groundwater (from Top of Pipe) (m)		Groundwater Elevation ⁽²⁾ (m)		Phase Separated Liquids	Comments
	June	August	June	August		
MW2	1.21	1.44	97.25	97.02	no	-
MW6	1.05	1.31	97.76	97.50	Slight oily film	-
MW8	0.8	1	97.16	96.96	no	-
MW9	-	-	-	-	-	well destroyed
MW10	1.19	1.3	97.01	96.90	no	-
MW11	1.47	1.58	97.01	96.90	no	-
MW12	-	-	-	-	-	well destroyed
MW13	0.67	0.78	97.03	96.92	no	-
MW14	0.45	NR	97.04	-	no	-

- Notes:
1. Groundwater levels are subject to seasonal fluctuations and variations.
 2. Groundwater elevations are referenced to an assumed elevation of 100.0 m (top nut on fire hydrant at Mill and Water Street intersection).
- NR denotes no reading recorded.

A total of eight groundwater samples were submitted to an independent CAEAL certified laboratory for analyses of PAHs. Samples were collected from monitoring wells which reported exceedences of non potable guideline criteria in the Phase 2 ESA report (MW2, MW6, MW8, MW13), and analyzed for those same parameters, namely, PAHs.

Results of laboratory analyses have been summarized in Table 3 and compared to MOE Guideline Criteria¹. Results show two wells (MW2 and MW8) with concentrations above Guideline Criteria. MW2 exceeded on both occasions for various PAHs and MW8 exceeded only in August for benzo(g,h,i)perylene.

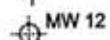
Groundwater results are presented visually on Figure 6. Laboratory certificates are presented in Appendix B.



Legend:



monitoring well location and ID.



destroyed monitoring well

96.90 m

groundwater elevation (in metres)



groundwater contour (0.1 m interval)



inferred groundwater flow direction

Note: contours generated using
Surfer version 6.03

Approx. Scale

0 50 m



Groundwater Contours, August 2003

Arctic Gardens, 11 Mill Street, Deseronto, Ontario

Figure

5

File: 321/171

Table 4
Summary of Groundwater Analyses, June and August, 2003

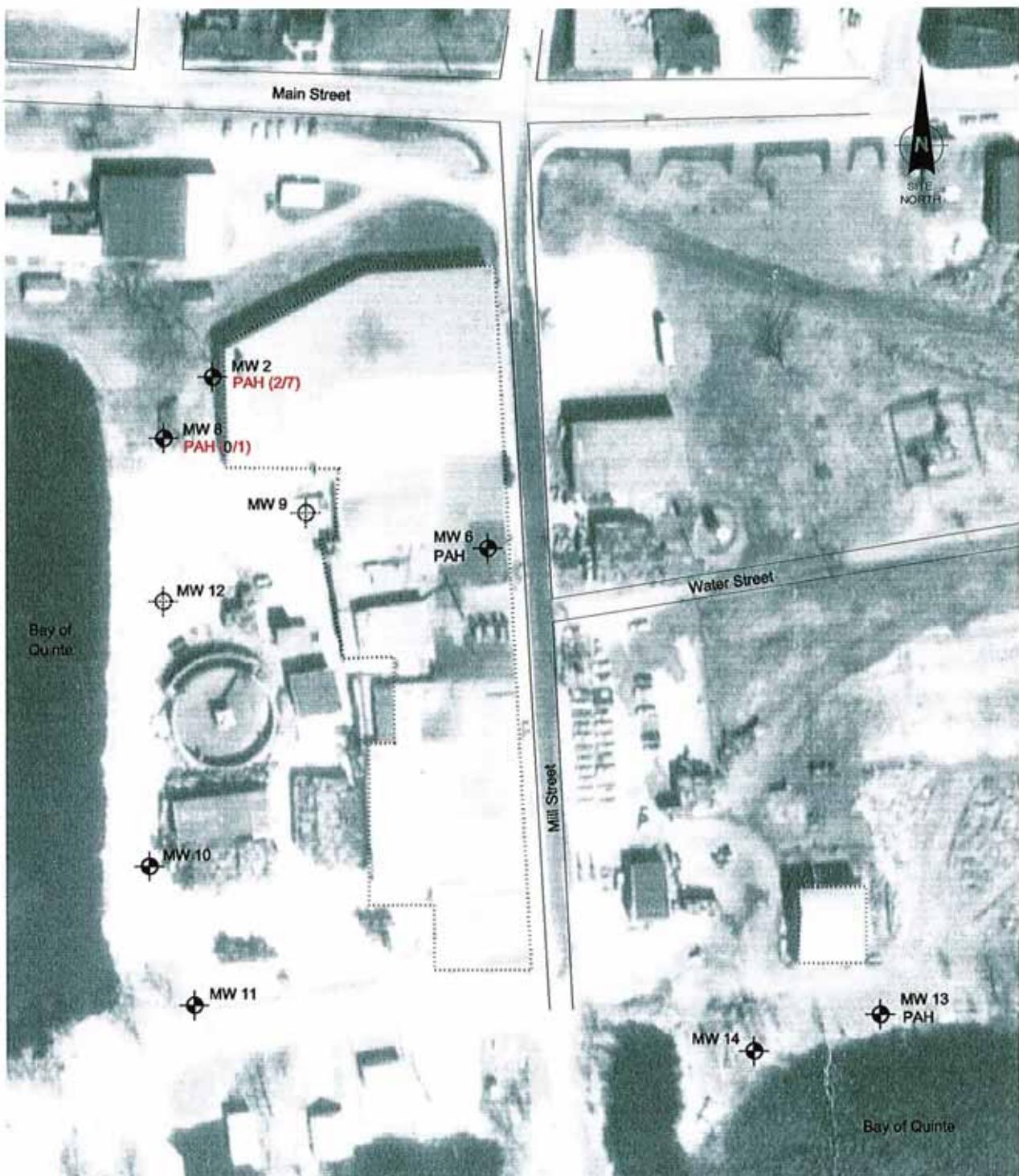
PARAMETER	UNITS	MDL	MW2		MW6		MW8		MW13		MW02		MW07		Jun 03		Aug 03		Guideline Criteria (Table B non potable)	
			03-W04	Jun 03	03-W08	Aug 03	03-W01	Jun 03	03-W05	Aug 03	03-W03	Jun 03	03-W07	Aug 03	03-W02	Aug 03	03-W06	Aug 03		
Aceanaphthene	ug/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	1700	2000
Aceanaphthylene	ug/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	12	5
Anthracene	ug/L	0.1	<	<	<	<	<	<	0.1	2	0.9	<	<	<	<	<	<	<	1.9	7
Benzol(a)anthracene	ug/L	0.1	<	<	7	<	<	<	<	<	0.5	<	<	<	<	<	<	<	0.2	0.2
Benzol(a)pyrene	ug/L	0.1	<	<	2	<	<	<	<	<	0.8	<	<	<	<	<	<	<	0.4	0.4
Benzol(b)fluoranthene	ug/L	0.1	11	5	5	0.1	<	<	2	0.8	<	<	<	<	<	<	<	<	3	3
Benzol(g,h,i)perylene	ug/L	0.2	<20	3	3	<	<	<	<	0.4	<	<	<	<	<	<	<	<	0.25	0.25
Benzol(k)fluoranthene	ug/L	0.1	16	3	3	<	<	<	<	<	0.4	<	<	<	<	<	<	<	130	130
Chrysene	ug/L	0.2	<20	4	4	<	<	<	<	<	2	0.7	<	<	<	<	<	<	0.25	0.25
Dibenzol(a,h)anthracene	ug/L	0.1	<10	4	4	<	<	<	<	<	0.7	<	<	<	<	<	<	<	63	63
Fluoranthene	ug/L	0.1	31	14	14	0.1	0.2	4	4	2.5	<	<	<	<	<	<	<	<	40	40
Fluorene	ug/L	0.1	<10	<	<	<	<	<	<	<	0.1	<	<	<	<	<	<	<	290	290
Indeno(1,2,3-c,d)pyrene	ug/L	0.1	<10	2	2	<	<	<	<	<	0.4	<	<	<	<	<	<	<	0.27	0.27
Naphthalene	ug/L	0.1	<10	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	5900	5900
Phenanthrene	ug/L	0.1	13	4	4	<	<	<	<	<	1	1.1	<	<	<	<	<	<	40	40
Pyrene	ug/L	0.2	27	10	10	<	<	<	<	<	3	1.7	<	<	<	<	<	<	1700	2000

Notes: 1. MDL denotes method detection limits

2. < denotes results below method detection limit, <10 indicates elevated detection limit

3. shading indicates parameters exceeding guideline criteria

4. Guideline criteria refers to MCE "Guidelines for Use at Contaminated Sites in Ontario",
(Table B- residential/parkland landuse in a non potable groundwater situation). Revised February, 1997.



Legend:

MW2

monitoring well location and ID.

MW 12

destroyed monitoring well

PAH

analyses performed

(2/7)

red indicates results exceed Table B (non potable criteria)

number of PAH parameters exceeding referenced criteria
(June/August, 2003)

Approx. Scale

0 50 m



June/August 2003 Groundwater Analyses

Arctic Gardens, 11 Mill Street, Deseronto, Ontario

Figure

6

File: 321/171

4.0 Conclusions & Recommendations

Based on the results of our work to date we offer the following conclusions and recommendations.

- (i) The soil investigation has defined the probable area and thickness of impacted soil in the vicinity of TP6, TP11 and TP30. We estimate that approximately 240 cubic metres of contaminated soil is present in these 3 areas. We recommend excavating to remove the contaminated soils and disposing of these soils at a facility licenced to receive the waste material.
- (ii) The soil investigation at BH5/6 did not fully delineate the extent of contamination in this area. Due to the size and expense involved with excavating and disposing of contaminated soil in this area, we recommend exploring alternative options. These alternatives may include, but not limited to, an SSRA and engineered solutions, application of the draft 'Brownfields' legislation, or retaining liability in the event of a sale.
- (iii) The groundwater investigation confirmed that concentrations of PAHs were below non potable criteria in monitoring wells MW6 and MW13. No further sampling of these wells is recommended at this time.
- (iv) The soil and groundwater investigation confirmed that concentrations of PAHs are still a problem in the northwest corner of the site (TP31 area including monitoring wells MW2 and MW8). We recommend developing a strategy to remediate this area. This work should be initiated as early as practical.

Appendix A
Test pit Logs

Test Pit Logs

TP6 Area (typical)

Test Pit ID.	Vapours (maximum)		Description	Remarks/Exceptions
Sample interval (m)	Field	Headspace		
TP32 - 35			Overburden/Fill (0 - 1.4 m)	
TP68 - 70			Sandy, Silty Clay, grey/brown, gravel, dry	
0 - 1.0	80 ppm	80 ppm		brick rubble at TP33, 35, and 68; wood debris at TP35 and 70, ashes TP68, orange discolouration on soil at TP69; boulders in TP68, 69, and 70.
1.0	-	-	End of Testhole at target depth	

Note: TP69 and TP70 advanced to 1.3 - 1.4 metres below grade.

TP11 Area (typical)

TP36 - 39	Overburden/Fill (0 - 1.8 m)		
	Sandy, Silty Clay, gravel, grey/brown, brick/concrete rubble, organics		no odour
0 - 1.6	-	-	
1.6 - 1.8	65 ppm	95 ppm	Sandy, Silty Clay, grey, wood cuttings, organics, wet
1.8	-	-	steel culvert encountered in TP38, 39 End of Testhole on bedrock bedrock at 1.5 m at TP37, 39

Appendix B
Laboratory Certificates

TP30 Area (typical)			
TP40 - 43	-	-	Overburden/Fill (0 - 2.4 m)
0 - 1.2	-	-	Sandy, Silty Clay, grey, gravel, brick and concrete
1.2 - 2.0	3% LEL	10% LEL	wood debris/cuttings, broken rock, organics, steel piping
2.4	-	-	End of Testhole at target depth

black staining, faint petroleum odour at TP42

TP31 Area (typical)			
TP 44 - 53	-	-	Overburden/Fill (0 - 2.5 m)
0 - 1.5	80 ppm	-	Fill- Sandy, Silty Clay, grey/brown, building materials (brick, concrete, metal)
1.5 - 2.5	>100% LEL	12% LEL	Fill- Sandy, Silty Clay, dark, organics, wood debris/cuttings, wet
2.5	-	-	End of Testhole at target depth

becoming wet at approximately 1.5 m

black staining, oil globules at TP44, 45, 49

BH5/6 Area (typical)			
TP 54 - 67	-	-	Overburden/Fill (0 - 2.7 m)
0 - 0.4	-	-	concrete foundation (15 - 40 cm thickness)
0.4 - 1.8	1% LEL	90 ppm	Sandy, Silty Clay, gravel, broken rock, organics, wood debris
1.8	-	-	End of Testhole at target depth

black staining at TP54, 55, 57, 64

slight oily film at TP56, 57

Note: TP64, TP66 and TP67 advanced to 2.5 - 2.7 metres below grade.

URATL RAT SLS

REPORT OF ANALYSIS

Client: Malroz Engineering
168 Montreal St.
Kingston, ON
K7K 3G4
Attention: Jeff Reid

Kingston Report: K3-1855
Report Number: 2309590
Date: 2003-07-03
Date Submitted: 2003-06-20
Project: 321.03

		P.O. Number:		Soil	
		Matrix:		GUIDELINE	
LAB ID:	257104	257105	257106	257107	257108
Sample Date:	2003-06-17	2003-06-17	2003-06-17	2003-06-17	2003-06-17
Sample ID:	TP32-01	TP33-01	TP34-01	TP35-01	TP36-01
PARAMETER	UNITS	MDL			
Total Petroleum Hydrocarbons	ug/g	20	<20	<20	<20
GRO (<C10)	ug/g	20	<20	<20	<20
DRO (C10-C24)	ug/g	20	<20	<20	<20
GRO + DRO	ug/g	20	<20	<20	<20
Oil & Grease	ug/g	100			
Oil & Grease - Mineral	ug/g				

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

A~JTL~. LABORATORY ANALYSIS

REPORT OF ANALYSIS

Client: Malroz Engineering
168 Montreal St.
Kingston, ON
K7K 3G4

Attention: Jeff Reid

Kingston Report: K3-1855
Report Number: 2309590
Date: 2003-07-03
Date Submitted: 2003-06-20

Project: 321.03

P.O. Number: Matrix:		Soil		GUIDELINE	
LAB ID:	257109	LAB ID:	257110	Sample Date:	2003-06-17
Sample Date:	2003-06-17	Sample ID:	TP37-01	Sample ID:	TP38-01
					TP40-01
					TP41-01
PARAMETER	UNITS	MDL			
Total Petroleum Hydrocarbons	ug/g	20	<20	<20	<20
GRO (<C10)	ug/g	20	<20	43	38
DRO (C10-C24)	ug/g	20	<20	43	38
GRO + DRO	ug/g	20	<20	79	571
Oil & Grease	ug/g	100		79	571
Oil & Grease - Mineral	ug/g				

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL:
Steven Blais
Organic Lab Coordinator

ACU, E&T LABORATORIES LTD

REPORT OF ANALYSIS

Client: Malroz Engineering
168 Montreal St.
Kingslon, ON
K7K 3G4
Attention: Jeff Reid

MANUFACTURED
WATER
WELL TESTS

Kingston Report:
2309590
Report Number:
2003-10-10
Date:
2003-06-20
Date Submitted:
Project:
321.03

Soil						
P.O. Number:	Matrix:	Soil	GUIDELINE			
PARAMETER	UNITS	MDL			TYPE	LIMIT
Total Petroleum Hydrocarbons	ug/g	20	<20	<20	<20	<20
GRO (<C10)	ug/g	20	838	24000	1920	1750
DRO (C10-C24)	ug/g	20	838	24000	1920	1750
GRO + DRO	ug/g	100	272	2760	945	149
Oil & Grease	ug/g					
Oil & Grease - Mineral	ug/g					

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective CG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration
Comment: This is a correction certificate and supersedes all other reports. TP49-02 renamed from TP49-01

APPROVAL:

for Steven Blais
Organic Lab Coordinator

A - U I L - L A T C U S S L

REPORT OF ANALYSIS

Client: Malroz Engineering
168 Montreal St.
Kingston, ON
K7K 3G4

Attention: Jeff Reid

Kingston Report:
Report Number:
Date:
Date Submitted:

Project: 321 03

K3-1855
2309590
2003-07-0
2003-06-2

2003-01-03

2003-06-20

BO Number:

Soil						
Matrix: Soil						
			GUIDELINE			
LAB ID:	257114	257115	257116	257117	257118	
Sample Date:	2003-06-24	2003-06-24	2003-06-17	2003-06-17	2003-06-17	
Sample ID:	TP42-01	TP43-01	TP44-01	TP45-01	TP47-01	
PARAMETER	UNITS	MDL			TYPE	LIMIT
Total Petroleum Hydrocarbons	ug/g	20	<20	<20	<20	<20
GRO (<C10)	ug/g	20	170	128	1200	1060
DRO (C10-C24)	ug/g	20	170	128	1200	1060
GRO + DRO	ug/g	100				
Oil & Grease	ug/g					
Oil & Grease - Mineral	ug/g	659	251	226		

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration MAC = Interim Maximum Allowable Concentration Comment:

Comment:

8-146 Colonel By Road Ottawa ON K2E 7Y1

608 Morris County Kingston NJ 07420

APPROVAL

Steven Blais
Organic Lab Co.

AMERICAN UTILITY SYSTEMS LTD.

REPORT OF ANALYSIS

Client: Mairoz Engineering
168 Montreal St.
Kingston, ON
K7K 3G4

Attention: Jeff Reid

Kingston Report: K3-1855
Report Number: 2309590
Date: 2003-07-03
Date Submitted: 2003-06-20

Project: 321.03

P.O. Number: Matrix: Soil						
GUIDELINE						
LAB ID:	257104	257105	257106	257107	257108	
Sample Date:	2003-06-17	2003-06-17	2003-06-17	2003-06-17	2003-06-17	
Sample ID:	TP32-01	TP33-01	TP34-01	TP35-01	TP36-01	
PARAMETER	UNITS	MDL			TYPE	LIMIT
Copper	ug/g	1	118	79	350	
Zinc	ug/g	1	185	102	219	101

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration

Comment:

TEST LABORATORIES LTD**REPORT OF ANALYSIS**

Client: Malroz Engineering
168 Montreal St.
Kingston, ON
K7K 3G4
Attention: Jeff Reid

Kingston Report: K3-1855
Report Number: 2309590
Date: 2003-10-10
Date Submitted: 2003-06-20

Project: 321.03

P.O. Number:

Matrix: Soil

LAB ID:	257116	257117	257118	257119	257120	257120	Soil	GUIDELINE	
Sample Date:	2003-06-17	2003-06-17	2003-06-17	2003-06-17	2003-06-17	2003-06-17			
Sample ID:	TP44-01	TP45-01	TP47-01	TP48-01	TP49-01	TP49-02			
PARAMETER	UNITS	MDL					TYPE	LIMIT	UNITS
Copper	ug/g	1	443	994	280	969		190	
Zinc	ug/g	1							

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration
Comment: This is a correction certificate and supersedes all other reports. TP49-02 renamed from TP49-01

APPROVAL: *J. Reid* *fcr*

Lorna Wilson
Agriculture Lab Supervisor

A~^~JT~^~ LA~^~ ATC~^~S.L.~^~

REPORT OF ANALYSIS

Client: Mairoz Engineering
168 Montreal St.
Kingston, ON
K7K 3G4

Attention: Jeff Reid

Kingston Report: K3-1855
Report Number: 2309590
Date: 2003-07-21
Date Submitted: 2003-06-20

Project: 321.03

PARAMETER	UNITS	MDL	Soil			
			P.O. Number:	GUIDELINE	TYPE	LIMIT
POLYNUCLEAR AROMATIC HYDROCARBONS - PAHs						
Acenaphthene	ug/g	0.1	<0.1	<1		
Acenaphthylene	ug/g	0.1	<0.1	<1		
Anthracene	ug/g	0.1	0.2	<1		
Benzo(a)anthracene	ug/g	0.1	<0.1	2		
Benzo(a)pyrene	ug/g	0.1	0.6	<1		
Benzo(b)fluoranthene	ug/g	0.1	0.5	<1		
Benzo(g,h,i)perylene	ug/g	0.1	<0.1	<1		
Benzo(k)fluoranthene	ug/g	0.1	<0.1	<1		
Chrysene	ug/g	0.1	1.1	<1		
Dibenz(a,h)anthracene	ug/g	0.1	<0.1	<1		
Fluoranthene	ug/g	0.1	0.5	<1		
Fluorene	ug/g	0.1	<0.1	<1		
Indeno(1,2,3-c,d)pyrene	ug/g	0.1	<0.1	<1		
Naphthalene	ug/g	0.1	<0.1	<1		
Phenanthrene	ug/g	0.1	0.3	<1		
Pyrene	ug/g	1.0				

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration

Comment:

257121: Due to sample matrix interferences, 10X dilution was required.

APPROVAL: _____
Mina Nasirai
Organic Lab Supervisor

TEST LABORATORY

REPORT OF ANALYSIS

Client: Malroz Engineering
168 Montreal St.
Kingston, ON
K7K 3G4
Attention: Jeff Reid

Kingston Report: K3-1855
Report Number: 2309591
Date: 2003-07-03
Date Submitted: 2003-06-20

Project: 321.03

PARAMETER	UNITS	MDL			TYPE	LIMIT	UNITS
Total Petroleum Hydrocarbons	ug/g	20	<20	<20	<20	<20	
GRO (<C10)	ug/g	20	2000	59	586	132	
DRO (C10-C24)	ug/g	20	2000	59	586	132	
GRO + DRO	ug/g	20	2000	59	586	132	
Oil & Grease	ug/g	100	1000			345	
Oil & Grease - Mineral	ug/g					345	

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL:

Steven Bias

Organic Lab Coordinator

ACUTE'S LABORATORIES LTD

REPORT OF ANALYSIS

Client: Malroz Engineering
168 Montreal St.
Kingston, ON
K7K 3G4
Attention: Jeff Reid

Kingston Report: K3-1855
Report Number: 2309591
Date: 2003-07-03
Date Submitted: 2003-06-20
Project: 321.03

PARAMETER	UNITS	MDL						
Total Petroleum Hydrocarbons	ug/g	20	<20	<20	<20	<20		
GRO (<C10)	ug/g	20	142	<20	1420			
DRO (C10-C24)	ug/g	20	142	<20	1420			
GRO + DRO	ug/g	100						
Oil & Grease	ug/g							
Oil & Grease - Mineral	ug/g							

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL

APPROVAL:

APPROVAL
Steven Blais
Organic Lab Coordinator

HISTOIRE DE LA LITTÉRATURE CHINOISE

REPORT OF ANALYSIS

Client: Malroz Engineering
168 Montreal St.
Kingston, ON
K7K 3G4

Attention: Jeff Reid

K3-1855
Report Number:
2309591
Date:
2003-07-01
Date Submitted:
2003-06-27

Project: 321 03

P.O. Number:		Soil		Soil	
		Matrix:		GUIDELINE	
LAB ID:	257124	257125	257126	257127	257128
Sample Date:	2003-06-17	2003-06-17	2003-06-17	2003-06-17	2003-06-17
Sample ID:	TP53-02	TP54-01	TP55-01	TP56-01	TP57-01
PARAMETER	UNITS	MDL			
Copper	ug/g	1	42	141	544
Lead	ug/g	1	332	180	1180
Zinc	ug/g	1	260	1700	942

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration

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APPROVAL: Lorna Wilson

AUUTÉS LABORATORIES LTD

REPORT OF ANALYSIS

Client: Malroz Engineering
168 Montreal St.
Kingston, ON
K7K 3G4
Attention: Jeff Reid

Kingston Report: K3-1855
Report Number: 2309591
Date: 2003-07-02
Date Submitted: 2003-06-20

Project: 321.03

		P.O. Number:		Soil GUIDELINE	
		Matrix:			
LAB ID:		257129	257130	257131	
Sample Date:		2003-06-17	2003-06-17	2003-06-17	
Sample ID:		TP58-01	TP59-01	TP60-01	
PARAMETER		UNITS	MDL		
Copper	ug/g	1	56	16	57
Lead	ug/g	1	92	13	74
Zinc	ug/g	1	761	88	169

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL:


Lorna Wilson

Agriculture and Science

AUTUMN LABORATORIES

KEPOKI OF ANALYSIS

Client: Malroz Engineering
168 Montreal St.
Kingston, ON
K7K 3G4
Attention: Jeff Reid

Kingston Report: K3-1855
Report Number: 2309591
Date: 2003-07-21
Date Submitted: 2003-06-20
Project: 321.03

PARAMETER	UNITS	MDL	Soil		GUIDELINE
			TYPE	LIMIT	
POLYNUCLEAR AROMATIC HYDROCARBONS - PAHs					
Acenaphthene	ug/g	0.1	<1	<0.1	
Acenaphthylene	ug/g	0.1	<1	<0.1	
Anthracene	ug/g	0.1	<1	0.1	
Benzo(a)anthracene	ug/g	0.1	<1	0.5	
Benzo(a)pyrene	ug/g	0.1	<1	0.5	
Benzo(b)fluoranthene	ug/g	0.1	<1	0.4	
Benzo(g,h,i)perylene	ug/g	0.1	<1	0.3	
Benzo(k)fluoranthene	ug/g	0.1	<1	0.4	
Chrysene	ug/g	0.1	<1	0.4	
Dibenzo(a,h)anthracene	ug/g	0.1	<1	0.3	
Fluoranthene	ug/g	0.1	<1	0.8	
Fluorene	ug/g	0.1	<1	<0.1	
Indeno(1,2,3-c,d)pyrene	ug/g	0.1	<1	0.2	
Naphthalene	ug/g	0.1	<1	0.2	
Phenanthrene	ug/g	0.1	<1	0.6	
Pyrene	ug/g	0.1	<1	0.7	

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAc = Interim Maximum Allowable Concentration Comment:

257127: Due to sample matrix interferences, 10X dilution was required.

APPROVAL:

Mina Nasirai
Organic Lab Supervisor

ANALYSIS REPORT

REPORT OF ANALYSIS

Client: Malroz Engineering
168 Montreal St.
Kingston, ON
K7K 3G4
Attention: Jeff Reid

Kingston Report:
Report Number:
Date:
Date Submitted:

K3-2479
2312247
2003-08-22
2003-08-08

Project:
321.03

PARAMETER		UNITS	MDL			TYPE	LIMIT	UNITS
Total Petroleum Hydrocarbons		ug/g	20	<20	<20	<20	<20	
GRO (<C10)		ug/g	20	<20	1540	86	96	<20
DRO (C10-C24)		ug/g	20	<20	1540	86	96	362
GRO + DRO		ug/g	20					362

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL:

100%

Mina Nasraij
Organic Lab Supervisor

A-UT-UTL CONSULTANTS LTD.

REPORT OF ANALYSIS

Client: Malfroz Engineering
168 Montreal St.
Kingston, ON
K7K 3G4

Attention: Jeff Reid

Kingston Report: K3-2479
Report Number: 2312247
Date: 2003-08-22
Date Submitted: 2003-08-08

Project: 321.03

Soil						
P.O. Number:	Matrix:	GUIDELINE				
LAB ID:	265040	265041	265042	265043	265044	
Sample Date:	2003-08-07	2003-08-07	2003-08-07	2003-08-07	2003-08-07	
Sample ID:	TP64-03	TP65-01	TP65-02	TP66-02	TP67-02	
PARAMETER	UNITS	MDL				
Total Petroleum Hydrocarbons	ug/g	20	<20	<20	<20	
GRO (<C10)	ug/g	20	186	60	154	<20
DRO (C10-C24)	ug/g	20	186	60	154	92
GRO + DRO						92

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL:

Mina Nasirai
Organic Lab Supervisor

TEST LABORATORY

REPORT OF ANALYSIS

Client: Mairoz Engineering
168 Montreal St.
Kingston, ON
K7K 3G4
Attention: Jeff Reid

Kingston Report: K3-2479
Report Number: 2312247
Date: 2003-08-22
Date Submitted: 2003-08-08

Project: 321.03

P.O. Number:
Matrix:

PARAMETER	UNITS	MDL			TYPE	LIMIT	UNITS
Copper	ug/g	1	46	32	11	26	142
Lead	ug/g	1			8	52	309
Zinc	ug/g	1			25	41	72

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL: *L.W.*

Lorna Wilson
Agriculture Lab Supervisor

ASSET LABORATORIES LTD

REPORT OF ANALYSIS

Client: Malroz Engineering
168 Montreal St.
Kingston, ON
K7K 3G4
Attention: Jeff Reid

Kingston Report:
K3-2479
Report Number:
2312247
Date:
2003-08-22
Date Submitted:
2003-08-08

Project:
321.03

P.O. Number:
265042
Matrix:
Soil
GUIDELINE

PARAMETER	UNITS	MDL			TYPE	LIMIT	UNITS
Copper	ug/g	1	39	824	779	49	20
Lead	ug/g	1	50	598	465	31	18
Zinc	ug/g	1	30	731	546	61	57

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL: *[Signature]*

Lorna Wilson
Agriculture Lab Supervisor

KEPOKI OF ANALYSIS

Client: Mairoz Engineering
168 Montreal St.
Kingston, ON
K7K 3G4

Attention: Jeff Reid

Kingston Report: K3-2479
Report Number: 2312247
Date: 2003-08-22
Date Submitted: 2003-08-08

Project: 321.03

P.O. Number:		Soil Matrix:		GUIDELINE		
LAB ID:	Sample Date:	LAB ID:	Sample Date:	TYPE	LIMIT	UNITS
265043	2003-08-07	265044	2003-08-07			
TP66-02	TP67-02					
PARAMETER	UNITS	MDL				
Copper	ug/g	1	19	97		
Lead	ug/g	1	19	141		
Zinc	ug/g	1	57	89		

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL: *LW*
Lorna Wilson
Agriculture Lab Supervisor

ANALYSIS REPORT

REPORT OF ANALYSIS

Client: Mafroz Engineering
168 Montreal St.
Kingston, ON
K7K 3G4

Attention: Jeff Reid

Kingston Report: K3-1814
Report Number: 2309213
Date: 2003-06-27
Date Submitted: 2003-06-18

Project: 321.03

PARAMETER	UNITS	MDL	Water		
			GUIDELINE		TYPE
	Sample ID:	LAB ID:	Sample Date:	LAB ID:	
POLYNUCLEAR AROMATIC HYDROCARBONS - PAHs					
Acenaphthene	ug/L	0.1	<0.1	<1	<10
Acenaphthylene	ug/L	0.1	<0.1	<1	<10
Anthracene	ug/L	0.1	<0.1	<1	<10
Benz(a)anthracene	ug/L	0.1	<0.1	2	<10
Benz(a)pyrene	ug/L	0.1	<0.1	<1	<10
Benz(b)fluoranthene	ug/L	0.1	0.1	2	<20
Benz(g,h,i)perylene	ug/L	0.2	<0.2	<2	<20
Benz(k)fluoranthene	ug/L	0.1	<0.1	<1	16
Chrysene	ug/L	0.2	<0.2	2	<20
Dibenz(a,h)anthracene	ug/L	0.1	<0.1	<1	<10
Fluoranthene	ug/L	0.1	0.1	4	31
Fluorene	ug/L	0.1	<0.1	<1	<10
Indeno(1,2,3-c,d)pyrene	ug/L	0.1	<0.1	<1	<10
Naphthalene	ug/L	0.1	<0.1	<1	<10
Phenanthrene	ug/L	0.1	<0.1	1	13
Pyrene	ug/L	0.2	<0.2	3	27

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Interim Maximum Allowable Concentration Comment: MAC = Maximum Allowable Concentration

APPROVAL:

Mina Nasirai
Organic - I

Client: Malroz Engineering
168 Montreal St.
Kingston, ON
K7K 3G4
Attention: Jeff Reid

Kingston Report:
Report Number:
Date:
Date Submitted:
Project:

K3-2480
2312249
2003-08-11
2003-08-08
321.03

PARAMETER	UNITS	MDL	P.O. Number: 265049			Water Matrix: 265050			Water Guideline		
			Sample Date: 2003-08-07	LAB ID: 265047	Sample ID: 03-W05	Sample Date: 2003-08-07	LAB ID: 265048	Sample ID: 03-W06	Sample Date: 2003-08-07	LAB ID: 265049	Sample ID: 03-W07
POLYNUCLEAR AROMATIC HYDROCARBONS - PAHs											
Acenaphthene	ug/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	<1
Acenaphthylene	ug/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	<1
Anthracene	ug/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.2	<1
Benz(a)anthracene	ug/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9	7	7
Benz(a)pyrene	ug/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.5	2	2
Benz(b)fluoranthene	ug/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.8	5	5
Benz(g,h,i)perylene	ug/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.4	3	3
Benz(k)fluoranthene	ug/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.4	3	3
Chrysene	ug/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.7	4	4
Dibenz(a,h)anthracene	ug/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.7	4	4
Fluoranthene	ug/L	0.1	0.2	0.2	0.2	0.2	0.2	0.2	2.5	14	14
Fluorene	ug/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<1	<1
Indeno(1,2,3-c,d)pyrene	ug/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.4	2	2
Naphthalene	ug/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	<1
Phenanthrene	ug/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.1	4	4
Pyrene	ug/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	1.7	10	10

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IAC = Interim Maximum Allowable Concentration Comment:

1 of 1

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608 Norris Court, Kingston, ON, K7P 2R9

APPROVAL:



Steven Blais
Organic Lab Coordinator