COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ENVIRONMENTAL CLEANUP PROGRAM

Southcentral Regional Office
Hazardous Sites Cleanup Program
909 Elmerton Avenue
Harrisburg, PA. 17110
(717) 705-4844

HAZARDOUS SITE ASSESSMENT REPORT

CONESTOGA PINES PARK
CITY OF LANCASTER
LANCASTER COUNTY, PENNSYLVANIA

Prepared by: Richard Morgan, Supervisor
July 13, 2001

TABLE OF CONTENTS

List of Figures

Table

List of Sections

Section

1.0 INTRODUCTION

1.1 Scope of Work

This investigation report has been prepared by the Pennsylvania Department of Environmental Protection (Department) Hazardous Sites Cleanup Program to further summarize investigative reports and known activities that have occurred at the Conestoga Pines Park site (Site).

Information regarding the Site location, layout, history and environmental setting is detailed in depth in subsequent sections of this document.

This report was prepared pursuant to the Department's activities under authority of the Hazardous Sites Cleanup Act, Act of October 18, 1988, P.L. 756, No. 108, 35 P.S. Sections 6020.101 - 6020.1305.

2.0 SITE

2.1 Site Location

The Site is located in Lancaster City, Lancaster County. The Site is situated between Pitney Road and the Conestoga River. (Figure 1)

2.2 Site Layout

The Site is a Lancaster City Park. It is bordered on the north/northeast by a residential housing (Eden Manor Development), and Pitney Road to the east. Beyond Pitney Road, and up gradient of the Site, is the Commerce Industrial Park East. The Norfolk Southern railroad tracks and the CBS/Playskool, Inc. facility are located to the south. The Conestoga River forms the Site's western property boundary. The General Electric facility property lies to the west of the Conestoga River down gradient of the Site. (Figure 1)

The Site slopes westward from Pitney Road toward the Conestoga River. The upper portion of the Site contains an existing renovated barn used as a recreation center, and the grass covered remnants of a former house foundation that is approximately 250 feet north of the barn.. Approximately 100 feet below the former house foundation, is a spring discharge that forms a stream that runs to the Conestoga River through the northern third of the Site. Mid-way through the northern third portion of the Site (down-slope) is the ruins of a former day camp. Below this area is a public swimming pool and parking lot. In the southwestern portion of the Site is the Lancaster Municipal Water Authority Public Water Filtration Plant. Water taken from the Conestoga River is treated for potable use by the City of Lancaster. (Figure 2)

2.3 Site History

The water filtration plant was established in the 1930's to provide potable water for the Lancaster City residents. The plant currently treats influent water for pH adjustment, coagulation, settling, filtration and disinfection.[1] An average of eight (8) million gallons of water per day is supplied by this filtration plant.[1]

In the 1930s, a Civilian Conservation Corps camp was developed on the Site. Physical structures related to this camp are visible on aerial photographs from the 1940's until the 1970's.[1] The current recreation barn building and house foundation remnants are related to past farming operations.[1]

3.0 ENVIRONMENTAL SETTING

3.1 Surface Water

A spring emanates near an earthen mound that is the former building/house foundation. The springhead comes from a buried pipe, and is the headwater of the stream that flows through the Site into the Conestoga River. One or more springs discharge into the stream prior to entering the Conestoga River.

3.2. Geology

The Site lies within the Conestoga Valley section of the Piedmont Physiographic Province. The Conestoga Valley is underlain primarily by shale and carbonate rocks. Bedrock under the Site is predominately the Cambrian age Ledger Formation. This is typically a massive, light gray, medium to coarsely crystalline, sparkling dolomite. In unconformable contact with the Ledger, is the Conestoga Formation that outcrops to the south of and to a limited extent within the park itself. The Conestoga is a medium gray crystalline limestone, containing argillaceous laminae. The rock has a schistose appearance with thin graphitic or micaceous beds. Both lithologic units can be observed in the North bank of the railroad cut between the site and the Playskool site.[1] Strike and dip measurements of these rock outcrops confirm the published Northeast strike and southern dip of bedding planes in the Conestoga Formation. No surfaces could be measured in the Vintage dolomite.

3.2.1. Soils

Soils in the park are within the Duffield-Hagerstown unit. These soils are generally found in nearly level to steep broad valleys, are well drained, and formed in the residium of limestone bedrock. The soil groups within the Site are the Clarksburg which surrounds the intermittent tributary stream, and Duffield soils that represent the majority of remaining undeveloped Site land.[2] (See Figure 3)

A change in topography east of the headwaters of the tributary stream indicates a fill area. This location corresponds to a former foundation. A limited excavation (pit) by the Department on May 19, 1993 revealed demolition and rubble fill to what may have been the original brick floor of a building. This fill was observed at sixty-six (66) inches below the existing grade.[1]

3.2.2 Groundwater

There is little groundwater information within the park boundaries. Site investigation studies on the CBS/Playskool property immediately south of the park indicate a groundwater flow direction to the west/southwest, away from the park[1] The headwater spring has consistently been the most highly volatile organic contaminated area. A well (Landis Well) is located east of the headwater spring across Pitney Road. This well has shown no contamination. Although it has been used as a background sampling point, it is not directly up-gradient of the headwater spring.[1]

3.3 Land Use

The land surrounding the site consists of industrial facilities to the east, south and west, and a residential development to the north. The Site is used as a city park and contains a public swimming pool. A public water treatment plant is located in the southwest corner of the Site adjacent to the Conestoga River.

3.4 Population Distribution

The Site is located in Lancaster City. The population of Lancaster City is 57,690[3].

3.5 Water Use

The Site and surrounding areas are served by the City of Lancaster Water Authority (Authority). The Authority leases the water treatment facility to the City of Lancaster. An average of eight (8) million gallons of water per day is supplied by the filtration plant at the Site.[1]

3.6 Sensitive Environments

There are no known critical environments within the area surrounding the Site.[1]

4.0 INVESTIGATION OF RELEASE OR THREAT OF RELEASE

4.1 Previous Investigations

The General Electric Company drilled two monitoring wells in 1991 (MWs 9109 & 9110), and two monitoring wells in 1992 (MWs 9211 & 9212) at the Site as part of an Environmental Protection Agency (EPA) mandated Resource Conservation and Recovery Act (RCRA) Facility Investigation. Sampling of these wells showed elevated levels of volatile organic compounds (VOCs). The VOCs found were trichloroethylene (TCE), cis-1,2-dichloroethylene (cis-1,2-DCE), 1,1,1-trichoroethane (1,1,1-TCA), 1,1-dichloroethylene (1,1-DCE) and 1,1-dichloroethane (1,1-DCA). (See Table 1)

The highest levels of contamination have been at the spring forming the headwaters of the stream. Sampling during 1992, 1993, 1994, 1995, and 1996 showed TCE levels in this spring ranging from 820 micrograms per liter (µg/L) to 498 µg/L. (See Table 2)

Wells 9109 and 9110 were drilled on the west Site boundary near the Conestoga River to trace the plume of migrating TCE contamination from the GE facility on the west side of the Conestoga River. When TCE levels were found to be higher on the Site, wells 9211 and 9212 were drilled along an observed air photo lineament. These wells are near the stream headwaters. Well 9211 is 200 feet deep, and well 9212 is 30 feet deep. Water level measurements of wells 9211 and 9212 being similar, indicates hydraulic communication and negligible hydraulic gradient. The level of contamination decreases with depth in this well cluster. This indicates that the source of contamination is fairly close to the surface and in an eastern direction (up-gradient)[1] (See Figure 2)

The Department performed a Site soil gas survey in October 1992. Several areas were strongly affected by VOCs in the soil gas. The most highly contaminated areas appeared northeast and northwest of the park barn and in a linear pattern extending to the west along the paved road to a former sand storage area (sand-pit). The area northeast of the barn is between the area of the former structure and the wooded land from which the contaminated spring arises. The area northwest of the barn (sand pit)is approximately fifty (50) feet south of the paved road on the edge of the wooded hill that slopes to the south.[1]

A limited number of soil samples at some of the gas monitoring points were taken in May 1993. None of the soil samples indicated a source of continuously released organic contamination.[1]

4.2 Current Investigation

On October13, 1999 and January 14, 2000, the Department sampled several surface water locations along the stream that runs approximately ¼ mile through the park. The analytical results show the springhead identified as the "headwater location" continues to have the highest levels of TCE. The range of headwater spring VOCs above groundwater regulatory standards are TCE (450 - 580 µg/L), cis-1,2-DCE (510 - 548 µg/L), and 1,1-DCE (18 µg/L). The regulatory standards are 5 ug/L, 70 ug/l and 7 ug/l respectively. (See Table 3)

4.3 Source Threats

Contaminated groundwater, presumably from a Site source, is currently impacting surface water above regulatory standards and provides a threat to the public and the environment. TCE is listed as a carcinogen by the United States Environmental Protection Agency (USEPA). TCE is readily absorbed following ingestion, and absorbed readily into the lungs during inhalation. TCE is also absorbed through the skin although not as readily as through ingestion and inhalation. The acute effects of TCE are pronounced in central nervous system disturbances and heart, liver and kidney damage. The chronic effects of TCE create central nervous system and heart damage.

Although not listed as a carcinogen, 1,1-DCE is readily absorbed by ingestion and inhalation. To a lesser degree, it is absorbed through the skin. Acute affects are demonstrated as disturbances to the central nervous system and respiratory system. Chronic effects of exposure can cause kidney and liver damage.

The water quality criteria of 25 PA Code Chapter 16 (Water Quality Toxics) are the numeric limits for parameters or stream conditions that need to be maintained or attained to prevent or eliminate pollution. The latest aqueous sampling on January 14, 2001, shows TCE to exceed continuous concentrations for fish and aquatic life at the springhead, and exceeds human health criteria from the head spring to 50 feet from the confluence with the Conestoga River. Past sampling showed TCE human health criteria to be exceeded at the confluence with the Conestoga River. Human health criteria for 1,1-DCE are exceeded from the headspring to within 50 feet of the confluence with the Conestoga River. (See Table 4)

The major exposure threat is to humans coming into contact with the unrestricted unnamed tributary, and its affect on aquatic life particularly near the headspring.

5.0 Responsible Parties and Enforcement

5.1 Responsible Parties

City of Lancaster (Property owner)
120 N. Duke Street
P.O. Box 1599
Lancaster, PA 17603-1599

6.0 REFERENCES

6.1 List of References

1. PADEP Progress Report, July 1993
2. Soil Survey of Lancaster County, PA, U.S.D.A Soil Conservation Service, May, 1985
3. Rand McNally, Standard Reference Map and Guide of Pennsylvania

6.2 Figures

Figure 1 - United State Geological Survey, Lancaster, Pennsylvania Quadrangle.
Figure 2 - Conestoga Pines Site Sketch
Figure 3 - Conestoga Pines Soils Map

6.3 Tables

Table 1 – Monitoring Well Water Data for 7/91 & 4/92
Table 2 – Spring and Surface Water Data for 5/13/92 through 12/10/96
Table 3 - Spring and Surface Water Data for 10/13/99 & 1/14/00
Table 4 – Comparison to Water Quality Criteria (1/14/00 data)

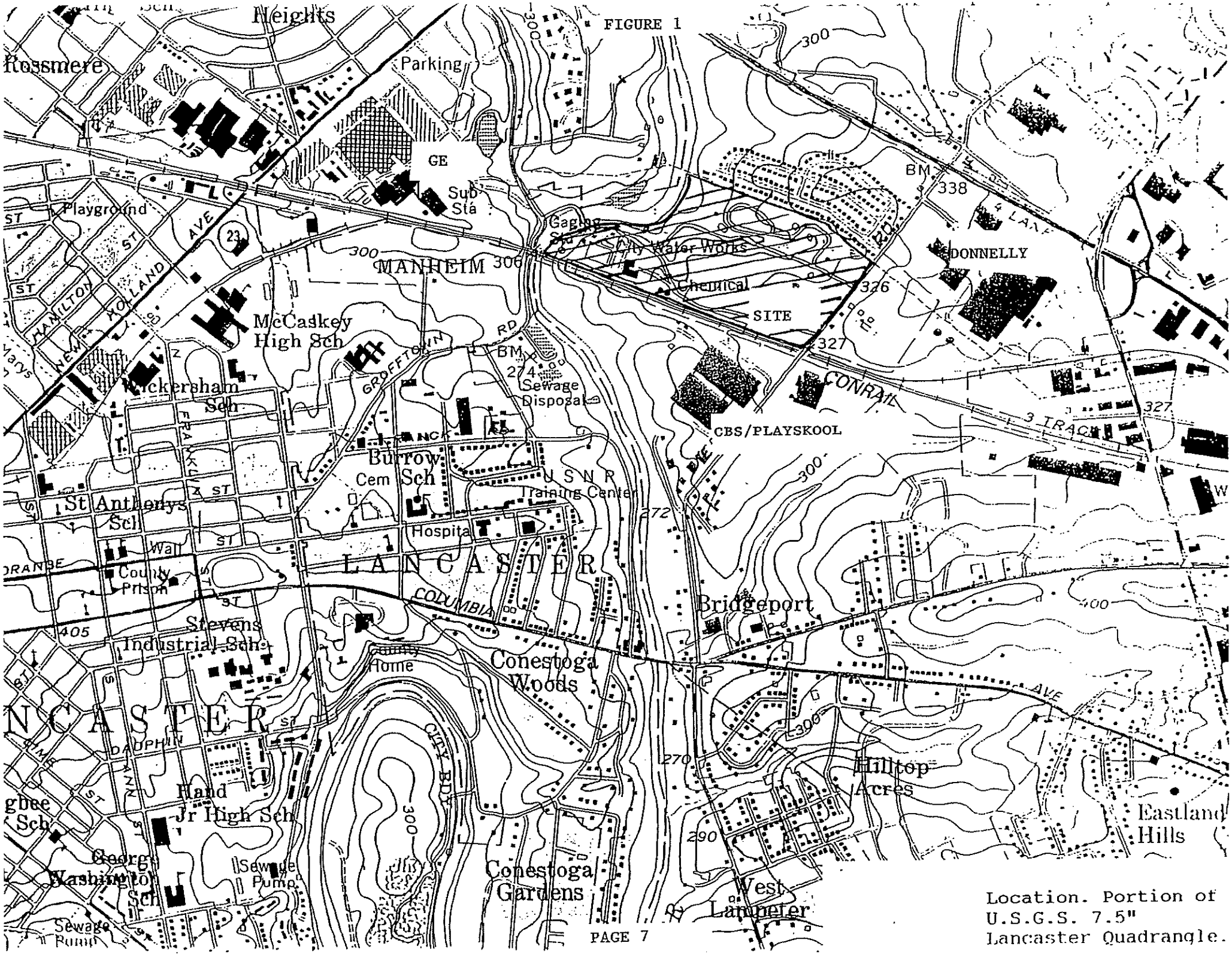

FIGURE 1

Location. Portion of U.S.G.S. 7.5" Lancaster Quadrangle.

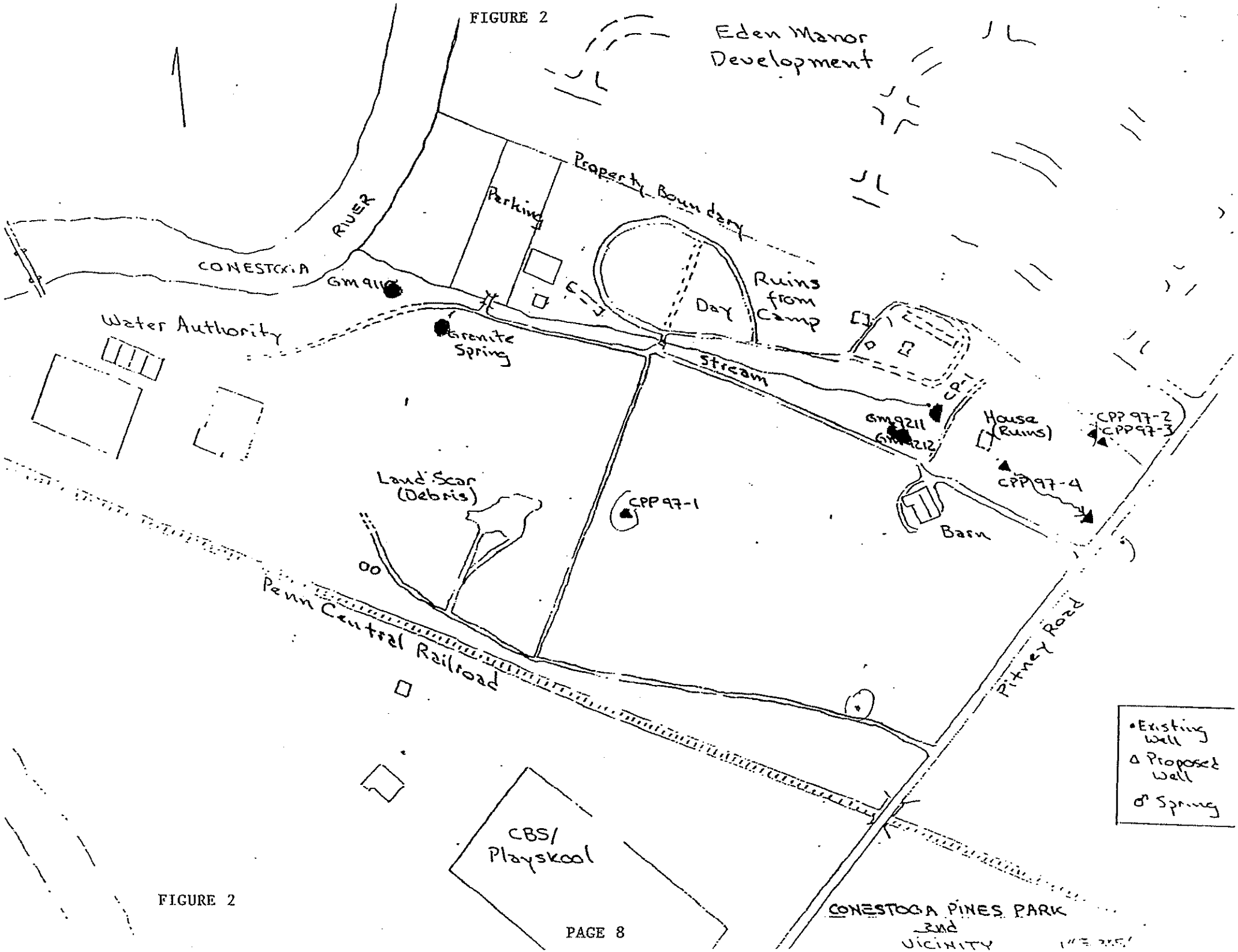
Eden Manor Development
Property Boundary
Parking
RIVER
CONESTOGA
GM 9110
Water Authority
Granite Spring
Stream
Day
Ruins from Camp
GM 9211
GM 9212
House (Ruins)
CPP 97-2
CPP 97-3
CPP 97-4
CPP 97-1
Land Scar (Debris)
Barn
Penn Central Railroad
Pitney Road
CBS/ Playskool
CONESTOGA PINES PARK and VICINITY
• Existing Well
△ Proposed Well
♂ Spring

FIGURE 2

FIGURE 3

Soils Map. U.S.D.A. Soil Cons. Service. May 1985.

Table 1

DATE	Location	LocationDescription	Contaminant	Result in ug/L	MSC g/L
7/16/91	MW -9109	Water Authority Plant	TCE	4	5 M
7/3/91	MW-9110	Near Swimming Pool	TCE	**43**	5 M
4/10/92	MW-9211	Near Headwater Spring	TCE	**570**	5 M
			Cis-1, 2-DCE	**300**	70 M
4/10/92	MW-9212	Adjacent to MW 9211	TCE	**680**	5 M
			Cis-1, 2-DCE	**560**	70 M
			1,1,1-TCA	49	200 M
			1,1-DCE	**20**	7 M
			1,1-DCA	18	27 N

MSC – non-residential, used aquifer less than or equal to 2500 Total Dissolved Solids (TSD)
Exceedances of Maximum Contaminant Level (M) or Inhalation (N) are bolded and shaded
All results are reported in ug/L

TABLE 2

DATE	Location	Location Description	Contaminant	Result in ug/L	MSC ug/L
5/13/92	CP-1	Headwater Spring	1,1-DCE	**35**	7
			1,1-DCA	25	110
			Cis-1,2-DCE	**900**	70
			Chloroform	6	100
			1,1,1-TCA	38	200
			Carbon tetrachloride	**11**	5
			TCE	**1200**	5
			PCE	3.2	5
5/13/92	CP-2	Sample in stream across from	1,1-DCE	**10**	7
		Drilled wells (GE)	1,1-DCA	11	110
			Cis-1,2-DCE	**410**	70
			Chloroform	2.8	100
			1,1,1-TCA	24	200
			Carbon tetrachloride.	3.2	5
			TCE	**460**	5
5/13/92	CP-3	Confluence w/Conestoga R.	Cis-1,2-DCE	18	70
			TCE	**21**	5
6/16/92	CP-1	Headwater spring	1,1-DCE	**28.5**	7
			1,1-DCA	20.5	110
			Cis-1,2-DCE	**770**	70
			Chloroform	4.7	100
			1,1,1-TCA	65	200
			Carbon tetrachloride	**7.2**	5
			1,2-DCA	2.0	5
			TCE	**820**	5
			1,1,2-TCA	1.0	5
			PCE	3.0	5
6/16/92	CP-2B	Upwelling- @ Bridge to Pool	1,1-DCE	3.2	7
			1,1-DCA	2.0	110
			Cis-1,2-DCE	47	70
			Chloroform	1.3	100
			1,1,1-TCA	7.7	200
			Carbon tetrachloride	2.0	5
			TCE	**80**	5
6/16/92	CP-2A	SW trib ↑ bridge to pool	Cis-1,2-DCE	12	70
			1,1,1-TCA	0.9	200
			TCE	**11**	5
4/13/93	CP-1	Headwater spring	1,1-DCE	**30**	7
			1,1-DCA	21.9	110
			Cis-1,2-DCE	**654.9**	70
			Chloroform	5.9	100
			1,1,1-TCA	72.1	200
			Carbon tetrachloride	**10**	5
			TCE	**810.4**	5
			PCE	3.3	5
4/13/93	CP-2B	Upwelling- @ Bridge to Pool	Cis-1,2-DCE	25	70
			1,1,1-TCA	4.4	200
			TCE	**46.4**	5
4/13/93	CP-2A	SW trib ↑ bridge to pool	Cis-1,2-DCE	49.0	70
			1,1,1-TCA	4.3	200
			TCE	**57.7**	5

TABLE 2

4/13/93	CP-2C	Granite Spring	Cis-1,2-DCE	26.9	70
			1,1,1-TCA	3.7	200
			TCE	**44.0**	5
5/19/93	CP-1	Headwater spring	1,1-DCE	**25**	7
			1,1-DCA	20.7	110
			Cis-1,2-DCE	**631.1**	70
			Chloroform	6.0	100
			1,1,1-TCA	59	200
			Carbon tetrachloride	**8.3**	5
			TCE	**816.1**	5
			PCE	3.0	5
4/25/94	GW 9110	MW below bridge to pool	1,1-DCE	0.6	7
			1,1-DCA	0.5	110
			Cis-1,2-DCE	8.6	70
			1,1,1-TCA	0.7	200
			TCE	**16.6**	5
4/25/94	GW 9212	MW below park barn	1,1-DCE	**18.3**	7
			1,1-DCA	12.9	110
			Cis-1,2-DCE	**450**	70
			Chloroform	4.0	100
			1,1,1-TCA	37	200
			Carbon tetrachloride	3.0	5
			Benzene	1.2	5
			TCE	**510**	5
			1,1,2-TCA	0.7	5
			PCE	1.5	5
4/25/94	CP-2C	Granite Spring	1,1-DCE	0.5	7
			Cis-1,2-DCE	7.4	70
			1,1,1-TCA	1.0	200
			TCE	**13.6**	5
4/25/94	CP-2B		1,1-DCE	1.3	7
			1,1-DCA	0.8	110
			Cis-1,2-DCE	17.2	70
			Chloroform	0.7	100
			1,1,1-TCA	2.5	200
			Carbon tetrachloride	0.7	5
			TCE	**32**	5
4/25/94	CP-1	Headwater Spring	1,1-DCE	**26**	7
			1,1-DCA	13.3	110
			Cis-1,2-DCE	**570**	70
			Chloroform	4.4	100
			1,1,1-TCA	40	200
			Carbon tetrachloride	**9.0**	5
			1,2-DCA	0.8	5
			TCE	**690**	5
			1,1,2-TCA	0.6	5
			PCE	2.5	5
7/11/95	CP-1	Headwater spring	1,1-DCE	**8**	7
			Acetone	6	10000
			1,1-DCA	10	110
			Cis-1,2-DCE	**310E**	70
			Chloroform	4	100

TABLE 2

			1,1,1-TCA	78E	200
			Carbon tetrachloride	**12**	5
			TCE	**350E**	5
			PCE	2	5
7/11/95	CP-2B	Upwelling- @ Bridge to Pool	Cis-1,2-DCE	44	70
			TCE	**79**	5
7/11/95	CP-2A	SW trib ↑ bridge to pool	Cis-1,2-DCE	22	70
			TCE	**19**	5
7/11/95	CP-2C	Granite Spring	Cis-1,2-DCE	27	70
			TCE	**48**	5
5/6/96	CP-1	Headwater spring	Chloroform	58.2B	100
			Cis-1,2-DCE	**372**	70
			1,1,1-TCA	26.6	200
			TCE	**498**	5
5/6/96	CP-2B	Upwelling- Bridge to Pool	Chloroform	7B	100
			Cis-1,2-DCE	19.1	70
			1,1,1-TCA	2.4	200
			TCE	**35.4**	5
5/6/96	CP-2C	Granite Spring	Cis-1,2-DCE	7.8	70
			1,1,1-TCA	0.83	200
			TCE	**10**	5
12/10/96	CP-2C	Granite Spring	1,1-DCA	0.52	110
			1,1-DCE	0.59	7
			Cis-1,2-DCE	12	70
			1,1,1-TCA	1.4	200
			TCE	**17**	5
12/10/96	CP-2B	Upwelling- Bridge to Pool	Cis-1,2-DCE	15Q	70
			TCE	**28Q**	5
12/10/96	CP-2D	Fracture Spring	Chloroform	9.5	100
			TCE	2.5	5
12/10/96	CP-1	Headwaters Spring	Carbon tetrachloride	4.0	5
			1,1-DCA	8.5	110
			1,1-DCE	**16**	7
			Cis-1,2-DCE	**390**	70
			Trans-1,2-DCE	4.7	100
			1,1,1-TCA	22	200
			TCE	**440**	5

MSC – non-residential, used aquifer ≤ 2500 TDS,
Exceedances of the MCL are highlighted
All results reported in ug/L

Table 3

DATE	Location	LocationDescription	Contaminant	Result in ug/L	MSC g/L
10/13/99	CP-1	Headwater Spring	TCE	**580**	5 M
			Cis-1, 2-DCE	**548**	70 M
			1,1,1-TCA	32	200 M
10/13//99	CP-1A	Stream at Bridge to	TCE	**53.8**	5 M
		Old CCC Camp	Cis-1, 2-DCE	59.4	70 M
10/13/99	CP-1B	Spring Below Bridge	TCE	**61.3**	5 M
		To Pool	Cis-1, 2-DCE	31.5	70M
10/13/99	CP-1C	50 feet Confluence With	TCE	**17.8**	5 M
		Conestoga River	Cis-1, 2-DCE	16.7	70 M
1/14/00	CP-1	Headwater Spring	TCE	**450**	5 M
			Cis-1, 2-DCE	**510**	70 M
			1,1,1-TCA	23	200 M
			1,1-DCE	**18**	7 M
			1,1-DCA	13	27 N
1/14/00	CP_1A	Stream at Bridge to	TCE	**21**	5 M
		Old CCC Camp	Cis-1, 2-DCE	24	70 M
1/14/00	CP-1B	Spring Below Bridge	TCE	**50**	5 M
		To Pool	Cis-1, 2-DCE	32	70 M
1/14/00	CP-1C	50 feet Confluence With	TCE	**11**	5 M
		Conestoga River	Cis-1, 2-DCE	9.4	70 M
			1,1,1-TCA	0.52	200 M
			1,1-DCE	0.34	7 M
			1,1-DCA	0.29	27 N

MSC – non-residential, used aquifer less than or equal to 2500 Total Dissolved Solids (TSD)
Exceedances of Maximum Contaminant Level (M) or Inhalation (N) are bolded and shaded
All results are reported in ug/L

Conestoga Pines – Comparison to Water Quality Criteria For 1/14/00 data

Table 4

DATE	Location	LocationDescription	Contaminant	Results	Human Health	Aquatic Life
1/14/00	CP-1	Headwater Spring	TCE	450	3 CRL	450 CRL
			1,1-DCE	18	.06CRL	
1/14/00	CP_1A	Stream at Bridge to	TCE	21	3 CRL	
		Old CCC Camp				
1/14/00	CP-1B	Spring Below Bridge	TCE	50	3 CRL	
		To Pool				
1/14/00	CP-1C	50 feet Confluence With	TCE	11	3 CRL	
		Conestoga River	1,1-DCE	0.34	.06CRL	

All results are reported in ug/L
CRL denotes Cancer Risk Level