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ENGINEERING DEPARTMENT

Proposal For

Environmental Monitoring Program

THE GREAT BAEHRE CONSERVATION AREA

ROLAND DOAN, JR., PE TOWN ENGINEER

THE GREAT BAEHRE CONSERVATION AREA

TOWN OF AMHERST

ERIE COUNTY

GEOGRAPHIC LOCATION

The locational map and site plan of the Great Baehre Conservation Area are located in Exhibits #1 and #2.

The proposed Conservation Area encompasses some 50 acres in the central portion of the Town of Amherst, together with an additional 450 acres of adjacent wet-lands.

HISTORY

The Great Baehre Conservation Area and the contiguous 48 acre Park as shown on the enclosed maps, have been identified as open space areas for the past twenty-two years through the Town's master plan and environmental study processes. The proposed park area and adjacent 450 acre wetland were identified on the 1962 Master Plan as "Proposed Recreation and Ponding Area". This was further delineated in 1968 when the Development Plan (master plan) identified the area as "Proposed Open Space" and "Proposed Greenbelt or Drainage Easement".

In 1972 the Erie County Environmental Management Council working with the University of Buffalo prepared a detailed environmental study including the proposed park area. This study identified the area adjacent to the park site as the best example of a wooded wetland forest in Erie County. Further The Town Conservation Advisory Council, in its Open Space Index published in 1975, identified the Hopkins Road Swamp Area - of which the dump site is a part - as a prime area for storm water storage, environmental education and recreation.

In 1975 the area surrounding the 48 acre project site was designated by the New York State Department of Environmental Conservation as a protected freshwater wetland.

BACKGROUND

There is a lack of public recreation space available to the 108,700 residents of the Town. In the 1975 approved Community Development Plan it was reported that there were 2,146 acres of open space recreation land in the Town, of which 650 acres were Town owned. Of the remainder, almost 1000 acres were in private use (mostly golf courses) while approximately 250 acres were in school district ownership. Thus, public park and recreation space amounted to approximately 6.5 acres per 1000 population, while the generally accepted park and recreation standards recommend that there should be approximately 10 acres of public park and recreation space per 1000 population. Hence, according to this standard there is a deficiency of approximately 350 acres in the Town of public recreation space.

Of major importance is that there are no special recreation areas in the Town park system to serve the estimated 1600 handicapped persons residing within the Town who, because of their physical and mental limitations, require special facilities and park design. In part this has been because the Town has lacked sufficient funds to acquire land and construct the specialized facilities needed.

The Proposed Great Baehre Conservation Area provides an opportunity for the Town to provide these facilities for the first time. By utilizing the old dump site - which was once used for domestic wastes, and is a centrally located site of sufficient size to create a park and recreation facility - the Town will be able to provide the most cost effective site for a recreational area for the handicapped. In this way it is hoped that the Town of Amherst may meet the community and institutional need for a balanced Town recreation facilities inventory which includes an outdoor facility for handicapped.

OBJECTIVES

The following objectives describe the opportunities that the 48 acre former Town and Village dump site will fulfill by its development as a Town special recreation area.

- Provide a special park and recreation area for developmentally disabled persons of all ages.

- Reduce a mosquito problem created by the dump and surrounding protected wetlands which is a nusiance to adjacent residential areas.

- Provide positive re-use of former municipal dump site.

- Provide a special recreation area at a greatly reduced cost since no land has to be acquired.

- Provide a 48 acre special recreation facility in an area near the center of Amherst, easily accessible to area residents. The central location will be economical because of the short driving distance from homes, schools and metropolitan institutions for developmentally disabled persons who will use it.

- Provide specialized outdoor recreational services for a underserved group of residents. (Approximately 1.5 percent of Town residents (1630 people) are estimated to be handicapped).

- Integrate recreation opportunities for able-bodied and disabled residents.

- Provide a major recreation area for all Town residents at minimal cost, since the land is publicly owned and does not have to be acquired.

- Create a positive image (park) to adjacent residential areas and remove a negative factor (dump) thereby creating a more positive tax assessment character to the area.

- Utilize State University of New York at Buffalo Architecture Department's special expertise in recreational design and construction for the developmentally disabled, to design the handicapped recreation areas.

- Permit the park to be used as an outdoor learning center for architecture and other students to periodically evaluate the proposed University assisted recreational facilities and their uses.

SCHEDULE

The schedule of activities to prepare preliminary plans is shown in the enclosed documentation. All of the activities listed through March 1984 have been accomplished with the exception of printing the final report. (as new information e.g. soil testing becomes available, it is considered for addition). Design refinement is being done at present.

PROGRAM

In March 1983 the Amherst Conservation Advisory Council recommended the Great Baehre Conservation Park project to the Town Board which, in turn, approved the project's initiation. The Town Planning Department then developed a schedule of background research and design alternatives, which were completed in late Fall 1983.

The Town Board has subsequently approved further design of the 48 acre site to bring the concept to a development design level (Exhibit #3). In addition, a study of topography on the dump site has been undertaken, as has a watershed study for the area of the wetland surrounding the park site. Upon completion of the watershed study, alternative approaches proposed will be evaluated to determine what water retention facilities should be created. Since Water retention affects the proposed park site, it is anticipated that the park will have two major drainage channels at its boundary and a retention pond providing both flood control and recreation functions.

Municipal records indicate that the landfill was used for domestic waste. It is proposed that the Town Engineering Department, in cooperation with NYS DEC, will perform soil and water testing to verify the absence of toxic materials at the site. The placement, type and amount of testing is set forth in the following sections which, it is hoped, will satisfy the DEC's concerns.

Following the results of the testing analysis, site preparation will commence with rough grading of the 48 acre site. The grading plan which will establish different park area elevations is a key to the success of the park to separate activity areas and provide proper drainage(See exhibit #4 for existing contours). Fine grading, seeding and planting of the park will occur as each geographic area or phase has sufficient funding for development and as each has proven to provide no adverse health hazards.

PRELIMINARY ANALYTICAL EVALUATION

The Great Baehre Conservation Area on Hopkins Road was initially analyzed on August 29, 1983 with follow up analyses conducted on October 26, 1983, November 9, 1983, and December 8, 1983. A total of four (4) wells were installed for these original analyses (See exhibit #5). An additional spot check was performed for Arsenic and Selenium at well #1 on July 5, 1984.

Initial in situ analyses of pH, dissolved oxygen and temperature showed that pH was the most reliable indicator of representative groundwater composition. Thereafter each well was successively bailed in 10 liter amounts and the resulting well pH after each bailing was used to determine when the sample composition had reached a plateau. Samples were then withdrawn for analysis for conductivity, alkalinity, chloride, TKN, total phosphorus, COD, BOD5, TSS, VSS, the priority pollutant metals, and total halogenated organics.

The results of these analyses are summarized in Exhibits #6 - #9. These results show that while this groundwater is not suitable for drinking (some of the priority pollutant scans for metals show concentrations which exceed the limits set for drinking water) it is in general non-hazardous, that is the concentrations do not exceed the limits of E.P. toxicity for hazardous wastes. The only possible exceptions to this are the results found at well #1 for arsenic on 10/26, 11/09, and 12/08, and for Selenium on 11/09. Because these results are so highly variable (over four orders of magnitude for arsenic) it seems unreasonable at this time to believe that a toxicity problem exists. Further study will be necessary to explain the high variability encountered for arsenic and to verify the preliminary results so far obtained.

PROPOSED GROUNDWATER MONITORING AND SOIL CORE ANALYSES PROGRAM.

Previous analytical results from four existing ground water monitoring wells at the Great Baehre Conservation Area show highly variable concentrations of arsenic and selenium. As a result it is the Town's proposal to establish an adequate monitoring program to determine the actual concentrations of these elements present. It is our intention to have all wells dug and core samples taken by Empire Soils, Inc. (See exhibit #10), and analytical work performed by the laboratory staff at the Town of Amherst WPCF #16. This proposed program attempts to resolve the question of whether the preliminary analytical results are truly representative of the composition of the Conservation Area or if they are artifacts of the analytical procedure itself.

1. Proposed new monitoring wells and analyses:

Four new wells will be added and existing well #4 will be deepened such that these wells will extend underground to the 576 foot contour. (See exhibit #11 for locations.) If observations of the proposed core samples show a highly porous layer(s) which invites further investigation with respect to ground water migration, this new depth(s) will be used rather than the 576 foot contour to enable monitoring of a route(s) by which ground water could move away from the Conservation Area.

Ground water samples will be collected according to EPA-530/SW-611: Procedures Manual for Ground Water Monitoring at Solid Waste Disposal Facilities. All monitoring wells will be pumped or bailed prior to sample withdrawal until the sample composition is constant. In the field, pH has been a useful parameter for this purpose. Ground water samples will be preserved for metals and total halogenated organics analysis as recommended in EPA-600/4-82-029: Handbook for Sampling and Sample Preservation of Water and Wastewater.

Ground water samples will be analyzed principally for the priority pollutant metals and total halogenated organics according to EPA-600/4-79-020: Methods for Chemical Analysis of Water and Wastes. Quality of analytical results will be monitored as per EPA-600/4-79-019: Handbook for Analytical Quality Control in Water and Wastewater Laboratories. All metals analyses will be conducted in-house using an Instrumentation Laboratories Video 12 atomic absorption spectrophotometer. Total halogenated organics analysis will be performed by a consulting laboratory.

The proposed monitoring schedule is quarterly for all wells for two years, annually for the subsequent three years, and termination of monitoring at the end of that period unless the analytical results indicated a need for further testing.

According to EPA sources cited above, PVC is the best material for monitoring well casing and bottom screens. A screw cap or other cover which could be padlocked is recommended. (This is advisable since well tampering has been observed previously and the proposed new wells are in more visible and accessible locations than the current wells.) Wells should generally be marked with a flag to avoid damage from bulldozers and heavy equipment. (This may not be advisable in this case as it would draw attention to wells and invite vandalism.)

2. Proposed soil core samples and analyses:

Seven core samples will be taken and analyzed for priority pollutants and total halogenated organics as per the methods cited above and also EPA/SW-846: Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods. (See Exhibit #10 for locations.) Upon extrusion, each core will be photographed next to its respective stratigraphic chart for record-keeping purposes, then the strata will be marked for identification and subsampled for analysis.

A possible future investigation of subsurface methane concentrations is recommended, especially for areas where stockpiling of leaves has occurred.

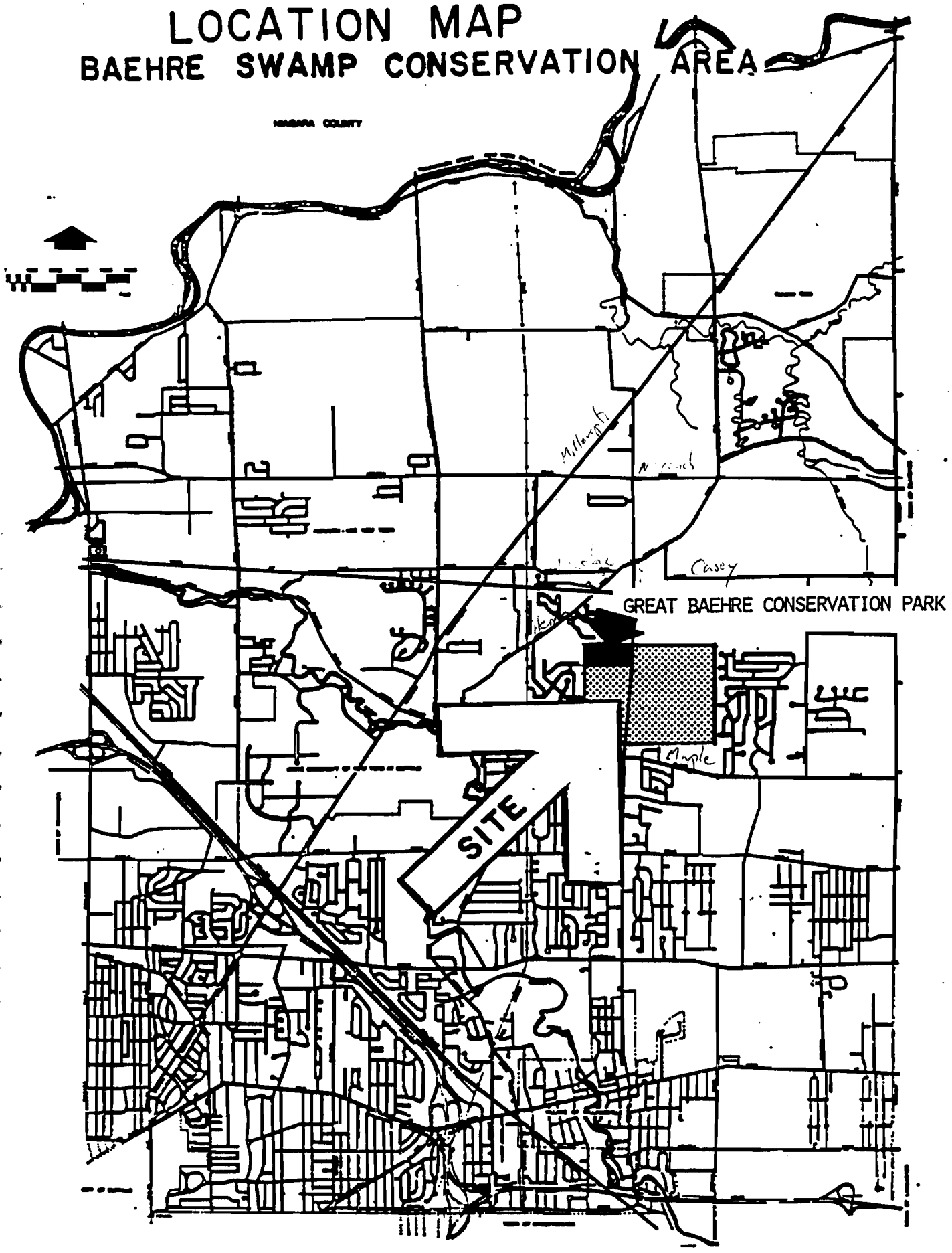
Analytical data on background soil composition could be evaluated to determine the influence of the Conservation Area on the composition of the local ground water. If later determined to be necessary, an investigation of the permeability and fracturing of underlying bedrock could prove useful for observing ground water plume movement other than could be determined from monitoring well and core data.

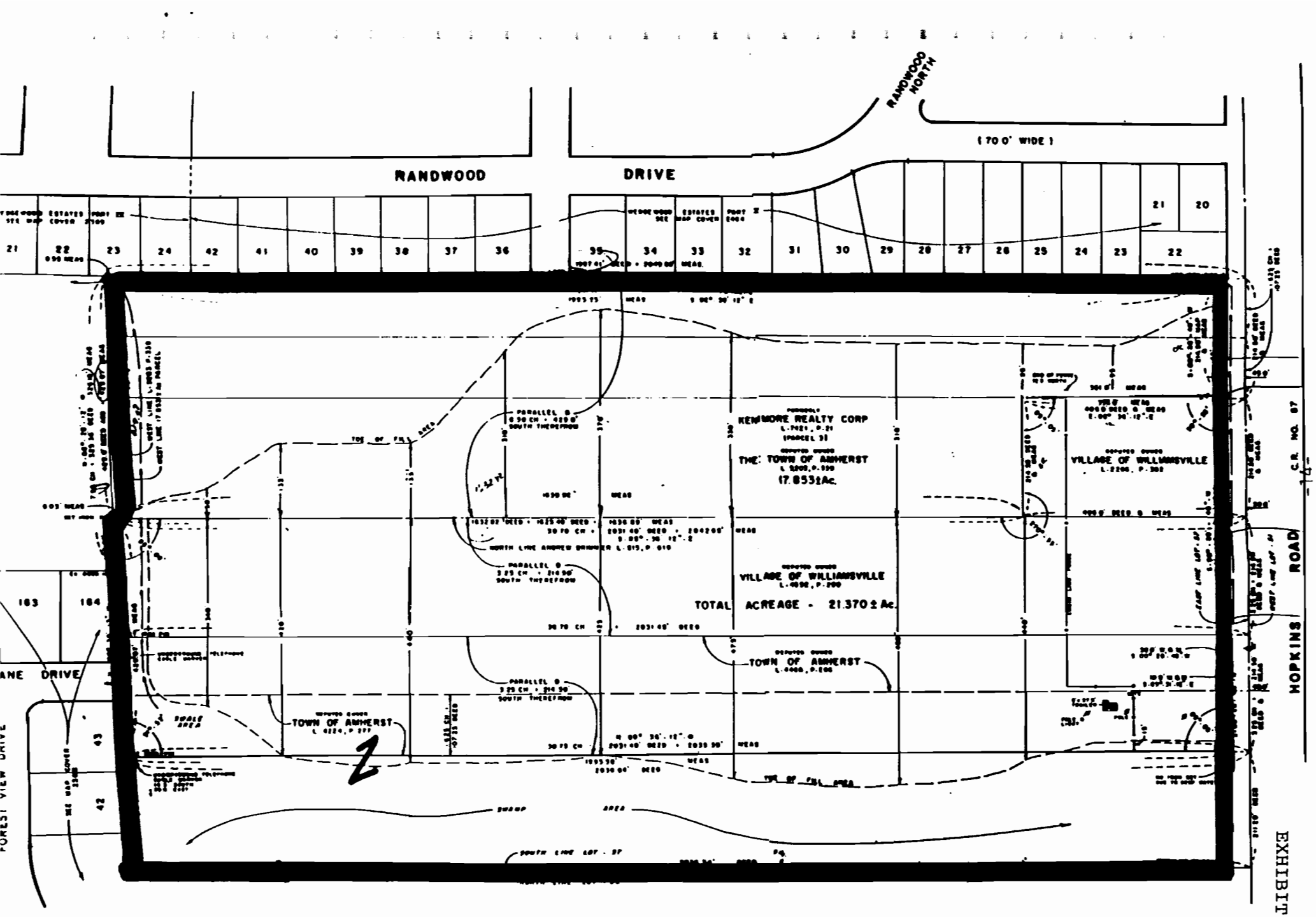
EXHIBIT #1

TOWN OF AMHERST

LOCATION MAP

BAEHRE SWAMP CONSERVATION AREA





GREAT BAEHRE CONSERVATION AREA

AMHERST NEW YORK

EXHIBIT #2

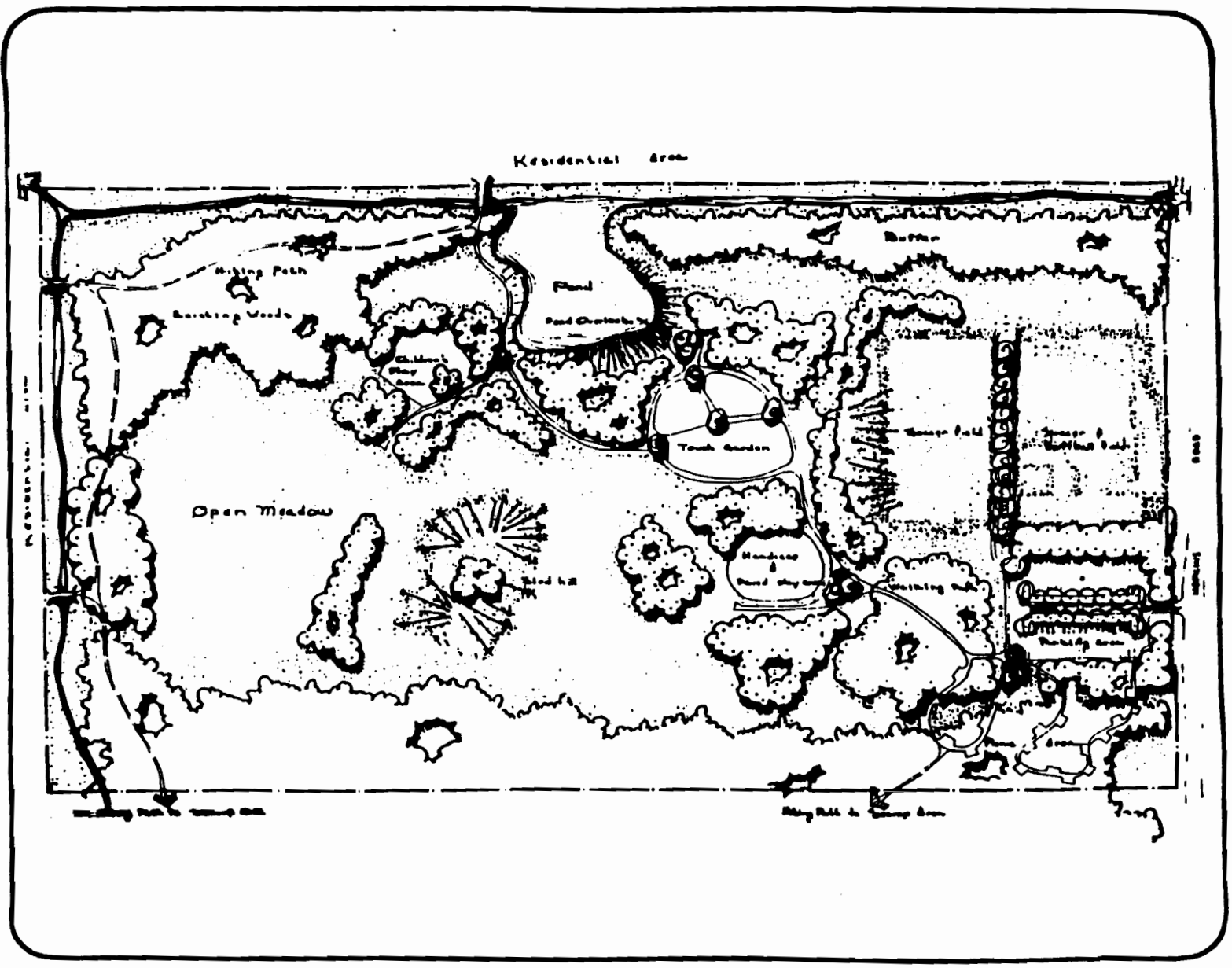


EXHIBIT #3

Alternate I

THE GREAT BAEHRE SWAMP CONSERVATION AREA

HOPKINS ROAD

WILLIAMSVILLE, N.Y.

TOWN OF AMHERST

PLANNING DEPARTMENT

SCALE 1"=

DATE

SHEET NUMBER

EXHIBIT #4

PROPERTY LINE DATA TAKEN FROM SURVEY
BY McINTOSH & McINTOSH, P.C.
DATED JUNE 25,1982

WEDGEWOOD ESTATES
PART - 4
(MAP COVER 2388)

WEDGEWOOD ESTATES
PART - 5
(MAP COVER 2404)

FOREST HEIGHTS ESTATES
PART - 3
(MAP COVER 2368)

HOPKINS RD. (C.R. 87)

EXHIBIT #5

PROPERTY LINE DATA TAKEN FROM SURVEY
BY McINTOSH & McINTOSH, P.C.
DATED JUNE 23,1982

E— EXISTING WELLS

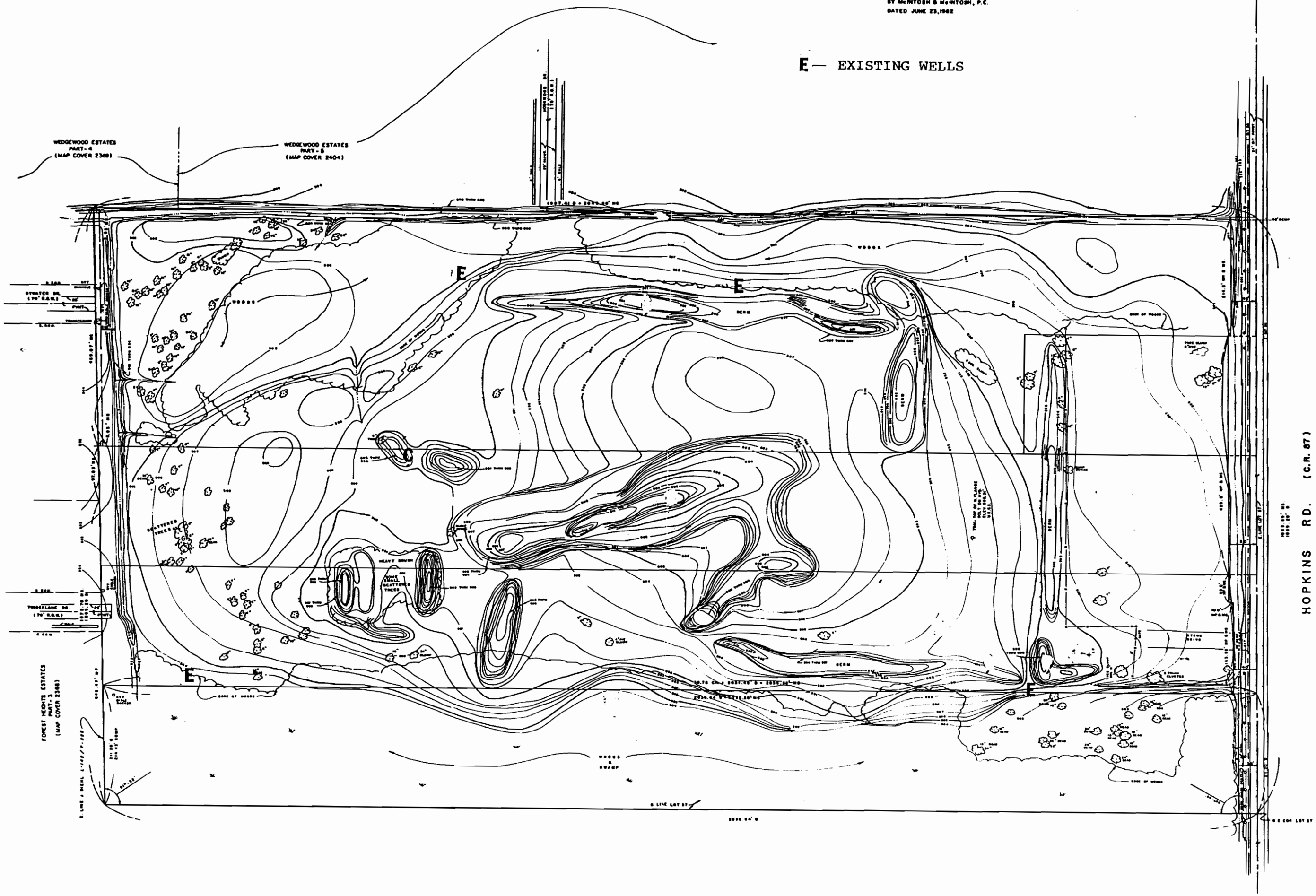


EXHIBIT #6

6

HOPKINS ROAD DUMP SITE

WELL #1

Sample Date	8/29/83	10/26/83	11/09/83	12/8/83	7/5/84
Lab ID#	83-1775	83-2279	83-2413	83-2701	84-3133
pH	6.34	6.33	6.52	6.68	7.23
Temperature (C)	17.7	11.8	10.8		
TSS mg/l	528	349	182	106	
VSS mg/l	149	86	75	77	
% Volatile	28	25	41		
COD mg/l	2400	2540	976	1540	
$cBOD_5$ mg/l	4.20	5.40	5.4		
BOD/COD	0.0018	0.0021	0.0055		
TKN mg/l	21.0	26.5	18.7	7.37	
TP mg/l	2.4	(0.1	2.0	(0.1	
Conductivity	103,600	117,000	56,400		
Chloride mg/l	54,200	58,400	58,800	52,500	
Cu mg/l	1.92	0.246	0.187	0.17	
Ag mg/l	0.140*	0.319*	0.0609*	0.14*	
Be mg/l	0.022	0.0408	0.0936	0.14	
Zn mg/l	0.145	0.174	3.960	0.068	
Pb mg/l	0.317*	4.760*	0.627*	0.31*	
Se mg/l	0.400*	0.0994*	5.500+	0.36*	(0.002
Cr mg/l	0.021	0.0482	0.120*	0.12*	
Tl mg/l	0.471	9.350	8.470	1.0	
Cd mg/l	0.119*	0.567*	0.945*	0.011*	
Sn mg/l	4.99				
Ni mg/l	1.53	85.4	145.5	83	
Hg mg/l	0.0069	(0.0008	(0.0004	(0.0004	
As mg/l	(0.010	75.3+	33.000+	26.+	(0.005
Ba mg/l	11.4*				
THO mg/l			0.0156	0.0015	
Sb mg/l		3.311	7.57	0.39	

* EXCEEDS DRINKING WATER STANDARDS

\+ EXCEEDS EP TOXICITY STANDARDS

HOPKINS ROAD DUMP SITE

EXHIBIT #7

WELL #2

Sample Date	10/26/83	11/9/83	12/8/83
Lab ID#	83-2280	83-2414	83-2702
pH	6.80	6.86	7.23
Temperature (C)	10.8	10.5	
TSS mg/l	132	53	19
VSS mg/l	23.4	19	
% Volatile	18	36	
COD mg/l	254	81.3	231
$cBOD_5$ mg/l	15.0	13.5	
BOD/COD	0.059	0.166	
TKN mg/l	9.24	7.83	6.26
TP mg/l	0.19	0.27	(0.1
Conductivity	2370	2570	
Chloride mg/l	218	247	230
Cu mg/l	(0.050	(0.050	(0.05
Ag mg/l	(0.001	(0.010	(0.001
Be mg/l	0.00105	0.0043	(0.001
Zn mg/l	0.0585	0.0285	(0.05
Pb mg/l	0.0167	(0.300*	(0.005
Se mg/l	0.00904	0.178*	0.079*
Cr mg/l	(0.010	(0.010	(0.005
Tl mg/l	(0.010	(0.010	0.014
Cd mg/l	0.0018	(0.002	(0.0005
Sn mg/l			
Ni mg/l	0.0505	(0.100	0.10
Hg mg/l	(0.0008	0.00056	(0.0004
As mg/l	0.0627*	0.0563*	0.057*
Ba mg/l			
THO mg/l		0.0340	0.00081
Sb mg/l	(0.020		0.022

8/29/83 - NO GROUNDWATER IN WELL

* EXCEEDS DRINKING WATER STANDARDS

\+ EXCEEDS EP TOXICITY STANDARDS

HOPKINS ROAD DUMP SITE

EXHIBIT #8

WELL #3

Sample Date	10/26/83	11/9/83	12/8/83
Lab ID#	83-2281	83-2415	83-2703
pH	6.96	6.82	6.75
Temperature (C)	11.8	11.5	
TSS mg/l	276	568	63
VSS mg/l	23.6	29	5
% Volatile	8.6	5.1	
COD mg/l	365	195	76.9
cBOD5 mg/l	5.34	1.5	
BOD/COD	0.0146	0.0077	
TKN mg/l	3.15	1.87	1.50
TP mg/l	0.12	0.35	(0.1
Conductivity	2770	3200	
Chloride mg/l	340	475	427
Cu mg/l	(0.050	(0.050	(0.05
Ag mg/l	(0.001	(0.010	(0.001
Be mg/l	0.00129	0.0051	(0.001
Zn mg/l	0.0638	0.0605	(0.05
Pb mg/l	0.0141	(0.300*	0.006
Se mg/l	0.00994	(0.020	0.070*
Cr mg/l	(0.010	0.0182	(0.005
Tl mg/l	(0.010	(0.010	0.018
Cd mg/l	0.0022	(0.002	(0.0005
Sn mg/l			
Ni mg/l	0.0625	(0.100	0.12
Hg mg/l	(0.0008		(0.0004
As mg/l	0.0669*	0.0338	0.040
Ba mg/l		0.00219	
THO mg/l		0.0144	0.0011
Sb mg/l	(0.020		0.027

8/29/83 - NO GROUNDWATER IN WELL

* EXCEEDS DRINKING WATER STANDARDS

\+ EXCEEDS TP TOXICITY STANDARDS

EXHIBIT #9

HOPKINS ROAD DUMP SITE

WELL #4

* 8/29/83, 10/26/83, 11/9/83, AND 12/8/83 NO GROUNDWATER IN WELL

EXHIBIT #10

EMPIRE
SOILS INVESTIGATIONS INC

August 16, 1984

Town of Amherst
Engineering Department
1100 North Forest Road
Williamsville, New York 14221

Attention: Thomas Wicks

Reference: Groundwater Monitoring - Soil Core Analysis
Hopkins Road Dump

Gentlemen:

As per my recent site visit and meeting with Mr. Tom Wicks of the Town of Amherst Engineering Department, we are pleased to present our proposal to perform soil sampling and monitoring well installation at the Hopkins Road Dump in Amherst, New York. A telephone conversation with Ms. N. Brown-Fonte was also conducted to better establish the required scope of services.

This scope has been defined as follows:

1. Installation of four (4) new monitoring wells at locations as indicated on the topographic survey plans prepared by Wendel Engineers, P.C. in June of 1984. Also redrilling of existing well #4 in order to deepen it to elevation 576. The installation of these wells will be as per Figure No. 51 which was supplied to us.

2. Drilling and continuous soil sampling from the surface to bedrock at a total of seven (7) locations as located on the Wendel Engineers' Plan. The sampling will include continuous split spoon samples which when extracted from the borehole will be photographed and marked for identification by representatives of the Town of Amherst.

The cost of our services will be as follows:

1. Mobilization and Demobilization, Drill Rig and Crew

   a. Providing no dozer is necessary or Town of Amherst provided equipment — Lump Sum -- $250.00

1. b.	If Empire provides dozer	$200.00/day
2.	Drilling with augers to collect samples or to install wells	
a.	3 3/4" diameter augers (for 2" diameter wells and split spoon sampling of soils)	$9.50/ft
b.	6 1/4" diameter augers to install 4" diameter wells	$17.50/ft
3.	Split Spoon Samples	$5.00/each
4.	Well Installation - including materials sand/cement/bentonite/etc.	
a.	2" diameter PVC with 5' slotted screen	$13.00/ft
b.	4" diameter PVC with 5' slotted screen	$18.00/ft
5.	Protective Casing with Locking Caps and Locks	
a.	4" diameter installed	$120.00/each
b.	6" diameter installed	$160.00/each
6.	Standby Time to develop wells, assist in sampling or to decon sampling and drilling equipment	$90.00/hour

We are in a position to begin work within seven to ten days after formal authorization to proceed is received.

Our payment terms are net 30 days from date of invoice; interest on unpaid balances will accrue at a rate of prime plus 3% per month.

If this proposal meets with your approval, please sign the acceptance copy of this letter and return it to our office as formal authorization to proceed.

EMPIRE

Thank you for considering Empire for this project. We feel that our vast expertise in the area of monitoring wells and groundwater hydrology will benefit the quality of your program.

If you should require any further information, please do not hesitate to contact our office at any time.

Very truly yours,

EMPIRE SOILS INVESTIGATIONS, INC.

Stanley J. Blas, Jr. gel

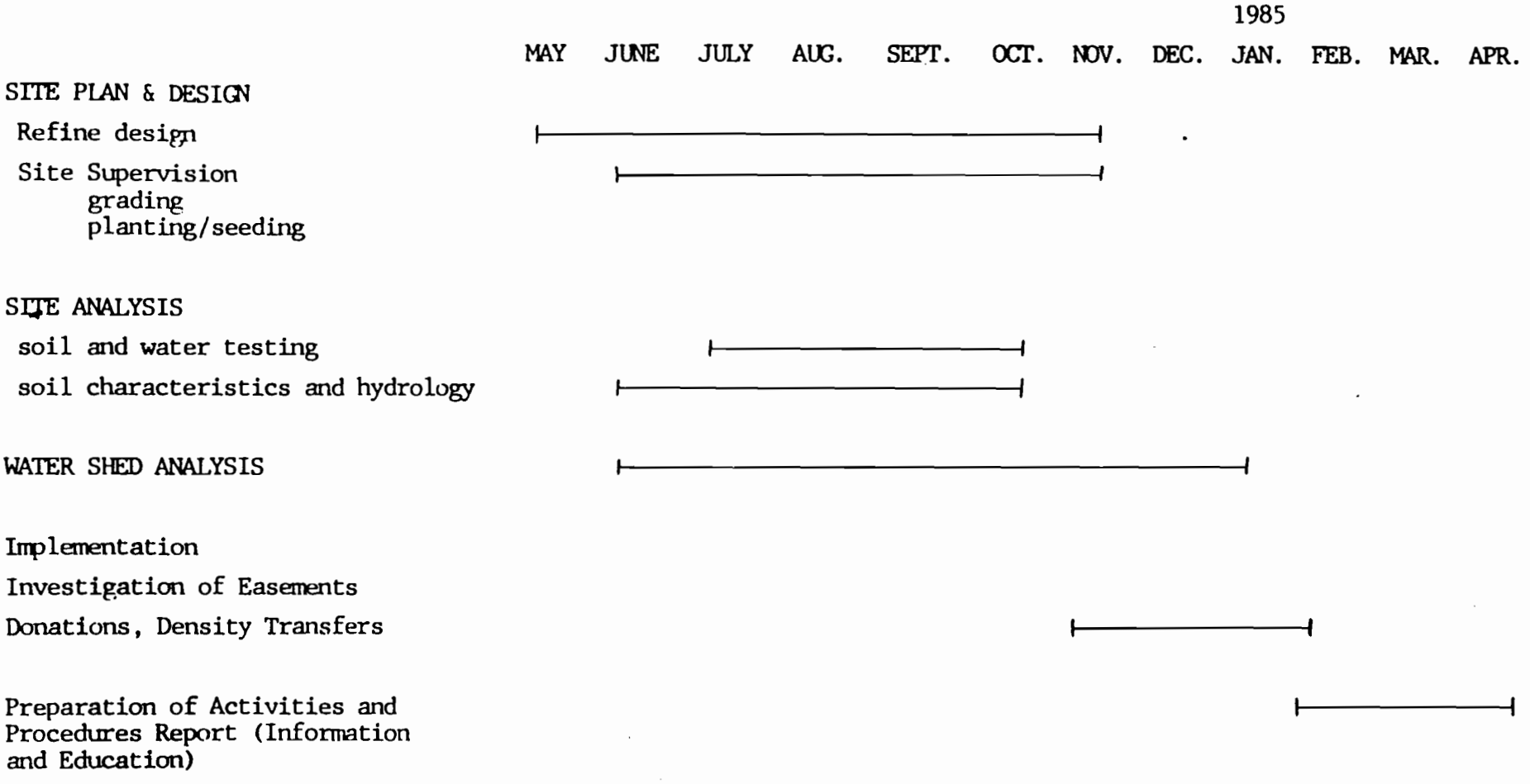
Stanley J. Blas, Jr., C.E.
Manager - Western District

gel

ACCEPTED BY: _____ TITLE: _____

FOR: _____ DATE: _____

PROPOSED
GENERAL ACTIVITIES SCHEDULE *
GREAT BAEHRE CONSERVATION AREA PARK
1984-1985



* Pursuant to State aid to Environmental Management Councils and Conservation Advisory Councils, NYSDEC

EXHIBIT #12

EXHIBIT #11

PROPERTY LINE DATA TAKEN FROM SURVEY
BY McINTOSH & McINTOSH, P.C.
DATED JUNE 23, 1982

N — NEW WELLS
E — EXISTING WELLS
C — CORE SITES

WEDGEWOOD ESTATES
PART-4
(MAP COVER 2389)

WEDGEWOOD ESTATES
PART-5
(MAP COVER 2404)

FOREST HEIGHTS ESTATES
PART-3
(MAP COVER 2368)

HOPKINS RD. (C.R. 87)