TELEPHONE
309-673-2131
TESTS * INVESTIGATIONS
ANALYSIS * DESIGN * EVALUATIONS
CONSULTATION * REPORTS * INSPECTIONS
ARBITRATION * EXPERT WITNESS TESTIMONY
* * * * * * * * * *
SOILS * PORTLAND CEMENT CONCRETE
BITUMINOUS CONCRETE * STEEL
ASPHALT * AGGREGATES * EMULSIONS
POZOLANIC MATERIALS * LIME

WHITNEY & ASSOCIATES
INCORPORATED
2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604-3193

TELEFAX
309-673-3050
GEOTECHNICAL ENGINEERING
CONSTRUCTION QUALITY CONTROL
SUBSURFACE EXPLORATIONS
ENVIRONMENTAL INVESTIGATIONS
* * * * * * * * * *
MONITORING WELL INSTALLATIONS
BUILT-UP ROOF INVESTIGATIONS
WELDER CERTIFICATIONS
INSURANCE INVESTIGATIONS

August 15, 1997

Mr. Ed Collins
McClure Engineering Associates, Inc.
P. O. Box 593
Macomb, Illinois 61455

Re: Geotechnical Engineering
Report Of Site Investigation
Bigger Farms Lagoon Investigation
Biggsville, Illinois

Dear Mr. Collins:

Pursuant to your request, our geotechnical engineering firm has performed a brief subsurface soils and ground water investigation at the above referenced project site. Included in this report are the results of our field and laboratory tests as well as a summary of the data which was obtained during this investigation.

This investigation included the drilling of two (2) continuous exploratory test borings which extended to depths ranging from sixty-two (62) to sixty-four (64) feet below the existing surface grades. The locations of the exploratory soil borings were established by Whitney & Associates personnel from information provided by McClure Engineering Associates and have been documented on the Site Plan sheet. The approximate surface elevations of the borings have been referenced to the U.S.G.S. datum from topographical information provided on the Site Plan sheet. The results of this investigation have been summarized on the enclosed Soil Boring Logs which have been analyzed by

our geotechnical engineer and which form the basis for the following site observations and comments.

Beneath the existing surface grades in the immediate vicinity of the proposed lagoons, normally consolidated loessial soils were encountered and extended to depths ranging from approximately twenty (20) to twenty-two (22) feet below the existing surface grades. These soils were classified as silt loam and silty clay loam soils near the surface grades and silty clay and clay soil types at the lower extent of the loess mantle. As the exploratory borings were extended beyond the loess mantle, preconsolidated glacial till soils were encountered and extended in depth until the exploratory borings were discontinued by our drill crew personnel.

The consistency of the cohesive soils encountered within the upper portion of the site were classified as medium to very stiff whereas the consistency of the preconsolidated glacial till soils within the mid to lower extent of the investigation was classified as stiff to hard.

It is apparent from an inspection of the Soil Boring Logs that ground water was encountered at the site. The ground water levels in the open bore holes were checked after the completion of the drilling operations and after a time lapse of 24+ hours. These readings and site observations indicate that ground water appears to exist at a depth of approximately eight (8) feet in the area of Boring B-1 and approximately seventeen (17) feet in the area of Boring B-2.

The stratification of the soils as indicated on the Soil Boring Logs represent the soil conditions at the actual boring locations and variations from these conditions may exist throughout the limits of the site. The lines of

demarcation represent the approximate boundary between the soil types although the transition between the various soils may be gradual.

Based on the results of the subsurface investigation performed at the proposed Bigger Farms Lagoon Sites near Biggsville, Illinois, it is our professional opinion that none of the cohesive soils within at least fifty (50) feet of the floor of either lagoon would be considered aquifer materials as defined by the State of Illinois, Department of Agriculture Final Rules To The Livestock Management Facilities Act. Furthermore, it is our professional opinion that neither a compacted soil liner nor ground water monitoring is required at the proposed sites based on the subsurface conditions encountered and interetation of the Pollution Control Board Final Rules.

It should be noted however that the silt loam soils and to some extent the silty clay loam soils encountered throughout the upper portion of the site are relatively sensitive and would not be considered ideal material for construction of the anticipated lagoon berms. The remainder of the soils encountered during this investigation, particularly the glacial till soils, are most acceptable for the proposed lagoon construction. The glacial till soils encountered at the site would be anticipated to possess a coefficient of hydraulic conductivity or permeability of less than 1×10^{-7} centimeters per second in the native as well as recompacted state and possess excellent structural integrity when utilized as recompacted structural fills.

In summary, a brief subsurface exploration has been conducted at the proposed site for the Bigger Farms Lagoons near Biggsville, Illinois. The observations and comments submitted in this brief report are based on the

available subsurface soil and ground water information as well as the preliminary design details which have been furnished by the Owner's representative.

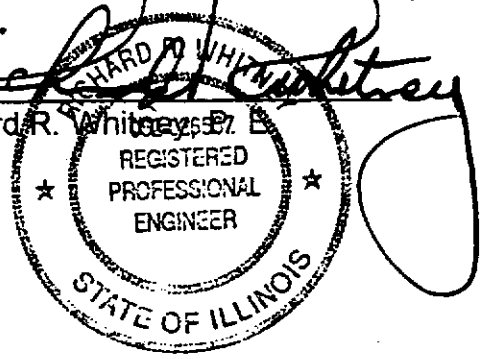
Should you have any questions or comments whatsoever in regard to this brief Geotechnical Engineering Report, or if any additional information is desired, please do not hesitate to contact us at your convenience.

Respectfully submitted,

WHITNEY & ASSOCIATES

(By)_____
James R. Krusemark

(By)_____
Richard R. Whitney, P.E.

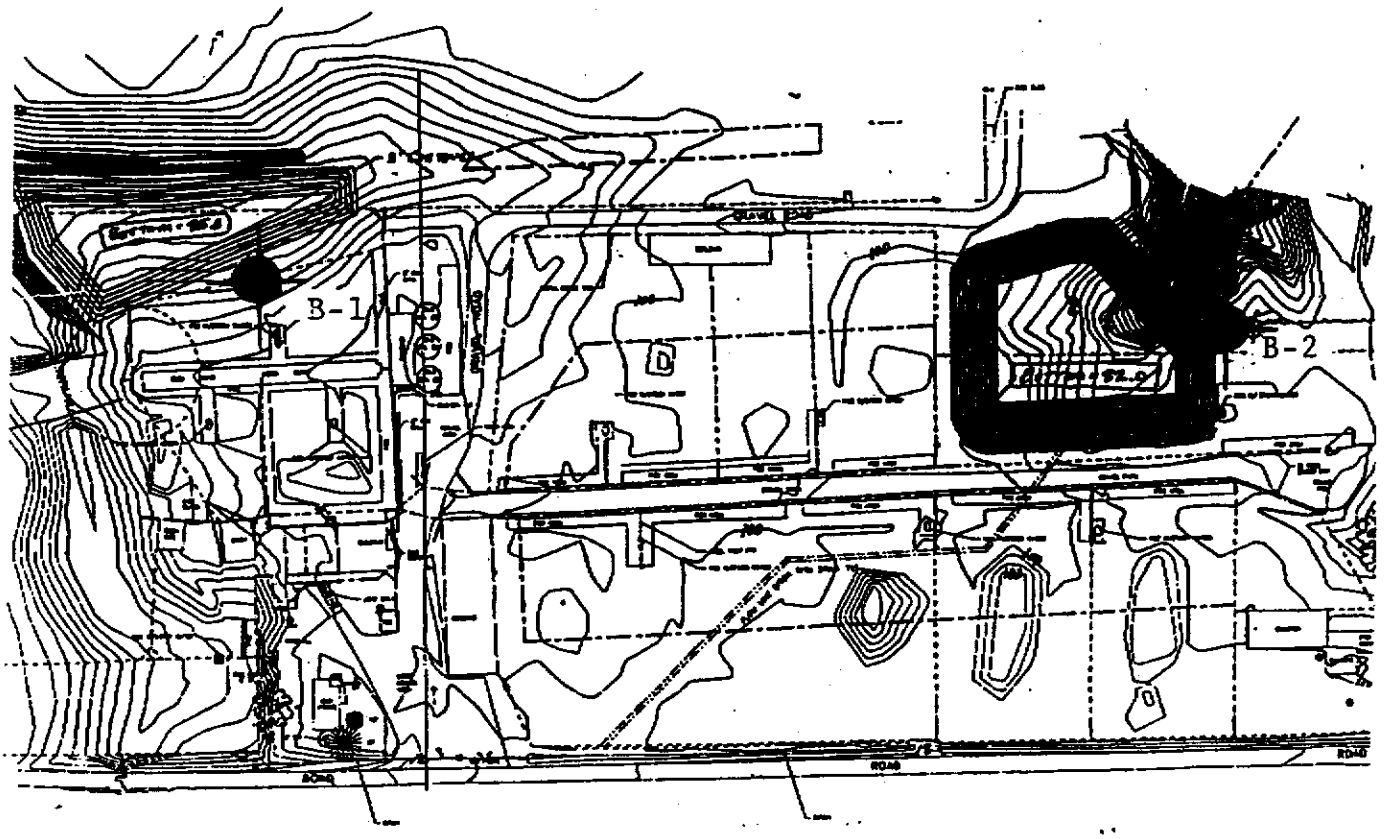


JRK/RRW:rma

Enclosures

PROJECT		
Bigger Farms Phase I Lagoon Investigation PROJECT LOCATION Biggsville, Illinois		DATE August 15, 1997 W. & A. FILE NO. 8930 SCALE Sketch

PLOT PLAN



Exploratory Soil Boring Locations

BORING NO. B-01
DATE 7-29-97
W. & A. FILE NO. 8930
SHEET 1 OF 6

WHITNEY & ASSOCIATES
INCORPORATED
2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

BORING LOG

PROJECT BIGGER FARMS PHASE I LAGOON INVESTIGATION
LOCATION Biggsville, Illinois
BORING LOCATION West Lagoon
DRILLED BY Winslow
BORING TYPE Hollow-Stem Auger
WEATHER CONDITIONS Partly Cloudy & Mild
SOIL CLASSIFICATION SYSTEM U.S.B.S.C.
SEEPAGE WATER ENCOUNTERED AT ELEVATION 79.1
GROUND SURFACE ELEVATION 94.5
GROUND WATER ELEVATION AT 24+ HRS. 86.0
BORING DISCONTINUED AT ELEVATION 32.5
GROUND WATER ELEVATION AT COMPLETION 71.9

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Q_p	Q_u	Dd	Mc
Brown SILT LOAM Organic Topsoil	14.5"						
Very Stiff, Brown SILT LOAM	21.6"		3 4				
Stiff, Light Brown Mottled Orange-Brown And Gray SILTY CLAY		SS	4 5	3.5	-	-	19
			2 2				
	04	SS	2 2	1.5	-	-	26
Stiff, Light Brown Mottled Orange-Brown SILTY CLAY LOAM			3 4				
		SS	4 4	1.8	-	-	28
	08	SS	PUSH	1.5	-	-	25
			3 4				
		SS	4 6	2.0	-	-	22
			3 5				
	12	SS	5 6	1.2	-	-	23
			3 2				
Stiff, Dark Brown CLAY		SS	3 3	1.5	-	-	26
Stiff, Dark Brown And Brown SILTY CLAY			2 3				
	16	SS	4 4	1.5	-	-	25
			3 4				
Very Stiff, Light Brown Mottled Orange-Brown SILTY CLAY		SS	6 6	2.5	-	-	23
			4 4				
Stiff, Blue-Gray Mottled Orange-Brown CLAY	20	SS	6 7	2.3	-	-	26
			2 3				
		SS	4 4	1.8	-	-	20
Stiff, Brown, Weathered GLACIAL SILTY CLAY TILL			3 4				
Very Stiff, Gray, Unweathered GLACIAL SILTY CLAY TILL	24	SS	4 5	1.5	-	-	18
			4 6				
		SS	7 10	3.0	-	-	15

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES
SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE

Q_p - CALIBRATED PENETROMETER READING - T.S.F.
Q_u - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.
Dd - NATURAL DRY DENSITY - P.C.F.
Mc - NATURAL MOISTURE CONTENT - %

BORING LOG

BORING NO. B-01 (CONTINUATION) DATE 7-29-97

PROJECT Bigger Farms Phase I Lagoon Investigation SHEET 2 OF 6

LOCATION Biggsville, Illinois W. & A. FILE NO. 8930

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Q_p	Q_u	D_d	Mc
See Sheet 1 of 6							
		CT	-	2.8	-	-	14
	30	CT	-	2.3	-	-	14
		CT	-	4.0	-	-	13
Hard, Gray Mottled Orange-Brown, Unweathered GLACIAL SILTY CLAY TILL							
Stiff, Gray, Unweathered GLACIAL SILTY CLAY TILL	34	CT	-	4.5+	-	-	13
		CT	-	1.5	-	-	16
Very Stiff, Gray, Unweathered GLACIAL SILTY CLAY TILL	38	CT	-	1.3	-	-	16
		CT	-	2.8	-	-	13
	42	CT	-	3.8	-	-	13
		CT	-	2.8	-	-	14
	46	CT	-	4.0	-	-	12
Stiff, Dark Gray, Unweathered GLACIAL SILTY CLAY TILL		CT	-	2.5	-	-	13
	50	CT	-	1.8	-	-	15
Very Stiff, Dark Gray, Unweathered GLACIAL SILTY CLAY TILL		CT	-	2.5	-	-	13
	54	CT	-	4.0	-	-	12
		CT	-	3.5	-	-	12

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES
SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE

Q_p - CALIBRATED PENETROMETER READING - T.S.F.
Q_u - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.
D_d - NATURAL DRY DENSITY - P.C.F.
Mc - NATURAL MOISTURE CONTENT - %

BORING LOG

BORING NO. B-01 (CONTINUATION) DATE 7-29-97

PROJECT Bigger Farms Phase I Lagoon Investigation SHEET 3 OF 6

LOCATION Biggsville, Illinois W. & A. FILE NO. 8930

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Qp	Qu	Dd	Mc
See Sheet 2 of 6							
		CT	-	3.5	-	-	13
	60	CT	-	4.0	-	-	12
Hard, Dark Gray, Unweathered GLACIAL SILTY CLAY TILL		CT	-	4.5+	-	-	11
EXPLORATORY BORING DISCONTINUED	64						
	68						
	72						
	76						
	80						
	84						

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES
SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE

Qp - CALIBRATED PENETROMETER READING - T.S.F.
Qu - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.
Dd - NATURAL DRY DENSITY - P.C.F.
Mc - NATURAL MOISTURE CONTENT - %

WHITNEY & ASSOCIATES
INCORPORATED
2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

BORING LOG

BORING NO. B-02
DATE 7-29-97
W. & A. FILE NO. 8930
SHEET 4 OF 6

PROJECT BIGGER FARMS PHASE I LAGOON INVESTIGATION
LOCATION Biggsville, Illinois
BORING LOCATION East Lagoon
DRILLED BY Winslow
BORING TYPE Hollow-Stem Auger
WEATHER CONDITIONS Partly Cloudy & Mild
SOIL CLASSIFICATION SYSTEM U.S.B.S.C.
SEEPAGE WATER ENCOUNTERED AT ELEVATION None
GROUND SURFACE ELEVATION 97.1
GROUND WATER ELEVATION AT 24+ HRS. 80.2
BORING DISCONTINUED AT ELEVATION 33.1
GROUND WATER ELEVATION AT COMPLETION None

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Qp	Qu	Dd	Mc
Brown SILT LOAM Organic Topsoil	13"						
Stiff, Light Brown And Orange-Brown SILT LOAM		CT	-	1.5	-	-	11
	04	CT	-	1.2	-	-	8
Medium To Stiff, Gray Mottled Orange-Brown SILTY CLAY LOAM		CT	-	1.5	-	-	16
	08	CT	-	1.0	-	-	18
		CT	-	1.3	-	-	17
Very Stiff, Brown Mottled Orange-Brown SILTY CLAY LOAM	12	CT	-	2.3	-	-	20
Stiff, Dark Brown SILTY CLAY With Some Organic Matter		CT	-	2.5	-	-	20
Stiff, Brown Mottled Orange-Brown SILTY CLAY	16	CT	-	1.8	-	-	25
Very Stiff, Gray And Brown CLAY		SS	2 3 4 5	1.5	-	-	22
	20	SS	3 4 5 5	2.3	2.1	103	22
Very Stiff, Gray, Unweathered GLACIAL SILTY CLAY TILL		SS	3 4 6 6	2.5	-	-	21
	24	SS	4 5 6 7	1.3	-	-	17
		SS	2 4 6 6	2.5	-	-	14

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES
SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE

Qp - CALIBRATED PENETROMETER READING - T.S.F.
Qu - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.
Dd - NATURAL DRY DENSITY - P.C.F.
Mc - NATURAL MOISTURE CONTENT - %

BORING LOG

(CONTINUATION)

BORING NO. B-02 **DATE** 7-29-97

PROJECT Bigger Farms Phase I Lagoon Investigation SHEET 5 OF 6

LOCATION Biggsville, Illinois W. & A. FILE NO. 8930

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Qp	Qu	Dd	Mc
See Sheet 4 of 6							
			4 8				
	—	SS	10 11	3.5	-	-	12
			5 8				
	— 30	SS	10 12	4.2	-	-	13
			6 7				
	—	SS	8 10	3.0	-	-	14
			5 8				
	— 34	SS	9 11	2.5	-	-	14
			5 6				
	—	SS	7 9	2.8	-	-	13
			5 6				
	— 38	SS	8 10	3.0	-	-	13
			4 5				
	—	SS	7 11	3.1	-	-	14
			5 6				
	— 42	SS	9 11	2.2	-	-	13
			5 6				
	—	SS	7 9	3.2	-	-	15
			5 7				
	— 46	SS	8 10	3.3	-	-	14
			5 7				
	—	SS	9 12	3.5	-	-	15
			6 7				
	— 50	SS	9 12	3.2	-	-	13
			7 7				
	—	SS	10 13	3.5	-	-	12
			6 6				
	— 54	SS	8 9	3.2	-	-	13
			5 7				
		SS	7 8	3.0	-	-	13

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES
SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE

Qp - CALIBRATED PENETROMETER READING - T.S.F.
Qu - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.
Dd - NATURAL DRY DENSITY - P.C.F.
Mc - NATURAL MOISTURE CONTENT - %

BORING LOG

(CONTINUATION)

BORING NO. B-02 **DATE** 7-29-97

PROJECT Bigger Farms Phase I Lagoon Investigation SHEET 6 OF 6

LOCATION Biggsville, Illinois W. & A. FILE NO. 8930

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Q_p	Q_u	D_d	M_c
See Sheet 5 of 6							
			7 7				
		SS	7 9	3.7	-	-	14
			7 8				
	60	SS	10 12	4.0	-	-	12
			5 7				
		SS	6 8	3.5	-	-	13
Hard, Gray, Unweathered GLACIAL SILTY CLAY TILL							
			9 11				
	64	SS	13 14	4.5+	-	-	12
			10 10				
		SS	12 13	4.5+	-	-	11
EXPLORATORY BORING DISCONTINUED							
	68						
	72						
	76						
	80						
	84						

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES
SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE

Q_p - CALIBRATED PENETROMETER READING - T.S.F.
Q_u - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.
D_d - NATURAL DRY DENSITY - P.C.F.
M_c - NATURAL MOISTURE CONTENT - %

McCLURE ENGINEERING ASSOCIATES, INC.

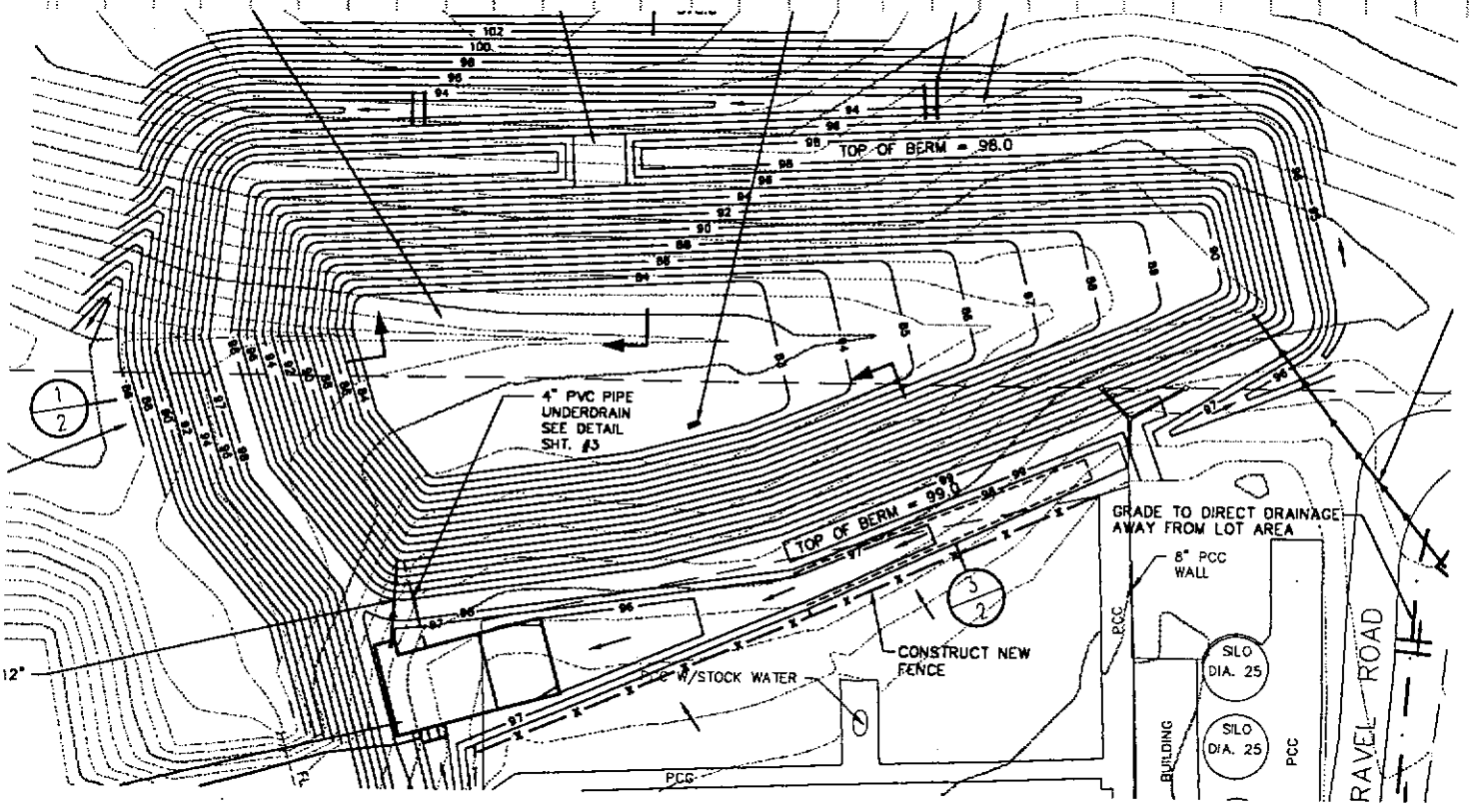
Civil Engineers • Structural Engineers • Land Surveyors • Planners

PROJECT NO. 03-23-97078	DATE 9/22/97
PROJECT TITLE BIGGER FARMS	OF
SUBJECT WASTE MANAGEMENT	BY TAB
	CKD

BASIN LAYOUT AS OF 9/22/97

BOTTOM = 83.0
HWE = 96.0
PUMP ON = 94.0

STORAGE REQD = 6.4 AC. FT
STORAGE PROVIDED = 8.3 AC. FT.



T:\DRAWINGS\BIGGFARM\BIGG-PL1 Mon Sep 22 19:28:53 19

McCLURE ENGINEERING ASSOCIATES, INC.

Civil Engineers • Structural Engineers • Land Surveyors • Planners

PROJECT NO. 03-23-97072	DATE 9/22/97
PROJECT TITLE BIGGER FARMS W.M.	OF
SUBJECT REVISED BASIN #1 SIZE	BY TAB
	CKD

REVISED BASIN SIZE

BOTTOM = 83.0

HWE = 96.0

	AREA	DEPTH	VOLUME
83	9943		
		1'	11,163
84	12383		
			13,666
85	14,949		
			16295
86	17,641		
			19050
87	20,458		
			21930
88	23401		
			24933
89	26465		
			28032
90	29607		
			30879
91	32,151		
			33456
92	34,760		
			36098
93	37435		
			38804
94	40,172		
			41573
95	42,973		
		1'	44486
96	45839		

$\frac{360,285}{43560} = 8.3$ AC. FT.

McCLURE ENGINEERING ASSOCIATES, INC.

Civil Engineers • Structural Engineers • Land Surveyors • Planners

PROJECT NO. 03-28-97078	DATE 9/4/97
PROJECT TITLE BIGGER FARMS	OF
SUBJECT WASTE MANAGEMENT	BY TAB
	CKD

NORTHWEST BASIN (#1)
PUMP ON CALCULATIONS

AREA INTO BASIN

NORTH MANAGEMENT AREA. = 75,990 S.F.
NORTHWEST AREA = 64,480 S.F.
BASIN AREA. = 51,755 S.F.
TOTAL AREA INTO BASIN - 195,225 S.F.

25 YR STORM = 5.2" OVER ENTIRE AREA.

195,225 SF x 5.2/12 = 84598' CF ÷ 43560 = 1.94 AC.FT.

ELEVATIONS	VOLUME BETWEEN	CUM. TOTAL
96 - 95	44,486	
95 - 94	41,873	86,359
94 - 93	38,804	125,163

86 359 - 84,598 = 1761 C.F.
1761 ÷ 41,873 = 0.04' ABOVE ELEV. 94.0 (ROUND DOWN)
PUMP ON MH2K = ELEV. 94.0