

Operator: THOMAS GODWIN County: SAMPSON Date: 11/02/97

Distance to nearest residence (other than owner): 800.0 feet

1. STEADY STATE LIVE WEIGHT

0 sows (farrow to finish)	x	1417 lbs.	=	0 lbs
0 sows (farrow to feeder)	x	522 lbs.	=	0 lbs
2710 head (finishing only)	x	135 lbs.	=	365850 lbs
0 sows (farrow to wean)	x	433 lbs.	=	0 lbs
0 head (wean to feeder)	x	30 lbs.	=	0 lbs

TOTAL STEADY STATE LIVE WEIGHT (SSLW) = 365850 lbs

2. MINIMUM REQUIRED TREATMENT VOLUME OF LAGOON

Volume = 365850 lbs. SSLW x Treatment Volume(CF)/lb. SSLW
Treatment Volume(CF)/lb. SSLW = 1 CF/lb. SSLW
Volume = 365850 cubic feet

3. STORAGE VOLUME FOR SLUDGE ACCUMULATION

Volume = 0.0 cubic feet SLUDGE ACCUMULATION NOT COMPUTED
AT OWNERS REQUEST. REMOVE SLUDGE
AS NEEDED.

4. TOTAL DESIGN VOLUME

Inside top length 275.0 feet ; Inside top width 209.0 feet
Top of dike at elevation 53.0 feet
Freeboard 1.0 feet ; Side slopes 2.5 : 1 (Inside lagoon)
Total design lagoon liquid level at elevation 52.0 feet
Bottom of lagoon elevation 39.0 feet
Seasonal high water table elevation 38.0 feet

Total design volume using prismatic formula

SS/END1	SS/END2	SS/SIDE1	SS/SIDE2	LENGTH	WIDTH	DEPTH
2.5	2.5	2.5	2.5	270.0	204.0	13.00

AREA OF TOP

LENGTH * WIDTH =
270.0 204.0 55080 (AREA OF TOP)

AREA OF BOTTOM

LENGTH * WIDTH =
205.0 139.0 28495 (AREA OF BOTTOM)

AREA OF MIDSECTION

LENGTH * WIDTH * 4
237.5 171.5 162925 (AREA OF MIDSECTION * 4)

CU. FT. = [AREA TOP + (4*AREA MIDSECTION) + AREA BOTTOM] * DEPTH/6
55080.0 162925.0 28495.0 2.2

VOLUME OF LAGOON AT TOTAL DESIGN LIQUID LEVEL = 534063 CU. FT.

TEMPORARY STORAGE REQUIRED

DRAINAGE AREA:

Lagoon (top of dike)

Length * Width =

275.0 209.0 57475.0 square feet

Buildings (roof and lot water)

Length * Width =

0.0 0.0 0.0 square feet

TOTAL DA 57475.0 square feet

Design temporary storage period to be 180 days.

A. Volume of waste produced

Approximate daily production of manure in CF/LB SSLW 0.00136

Volume = 365850 Lbs. SSLW * CF of Waste/Lb./Day * 180 days

Volume = 89560 cubic feet

B. Volume of wash water

This is the amount of fresh water used for washing floors or volume of fresh water used for a flush system. Flush systems that recirculate the lagoon water are accounted for in 5A.

Volume = 0.0 gallons/day * 180 days storage/7.48 gallons
per CF

Volume = 0.0 cubic feet

C. Volume of rainfall in excess of evaporation

Use period of time when rainfall exceeds evaporation by largest amount.

180 days excess rainfall = 7.0 inches

Volume = 7.0 in * DA / 12 inches per foot

Volume = 33527.1 cubic feet

D. Volume of 25 year - 24 hour storm:

Volume = 7.0 inches / 12 inches per foot * DA

Volume = 33527.1 cubic feet

TOTAL REQUIRED TEMPORARY STORAGE

5A.	89560 cubic feet
5B.	0 cubic feet
5C.	33527 cubic feet
5D.	33527 cubic feet

TOTAL 156614 cubic feet

SUMMARY

Total required volume 522464 cubic feet

Total design volume avail. 534093 cubic feet

Min. req. treatment volume plus sludge accumulation 365850 cubic ft

At elev. 48.8 feet ; Volume is 369689 cubic feet (end pumping)

Total design volume less 25yr-24hr storm is 500556 cubic feet

At elev. 51.3 feet ; Volume is 496105 cubic feet (start pumping)

Seasonal high water table elevation 38.0 feet

DESIGNED BY:

APPROVED BY:

DATE:

DATE:

NOTE: SEE ATTACHED WASTE UTILIZATION PLAN

COMMENTS: ORIGINAL PLAN WAS DESIGNED FOR 1.3' OF FREEBOARD
AND 2680 ANIMALS. FARM WAS REGISTERED FOR
2710 ANIMALS. CALCULATING THE NUMBER OF ANIMALS
ON THE FARM AND 1.0' OF FREEBOARD THE LAGOON
MEETS THE REQUIRED VOLUME

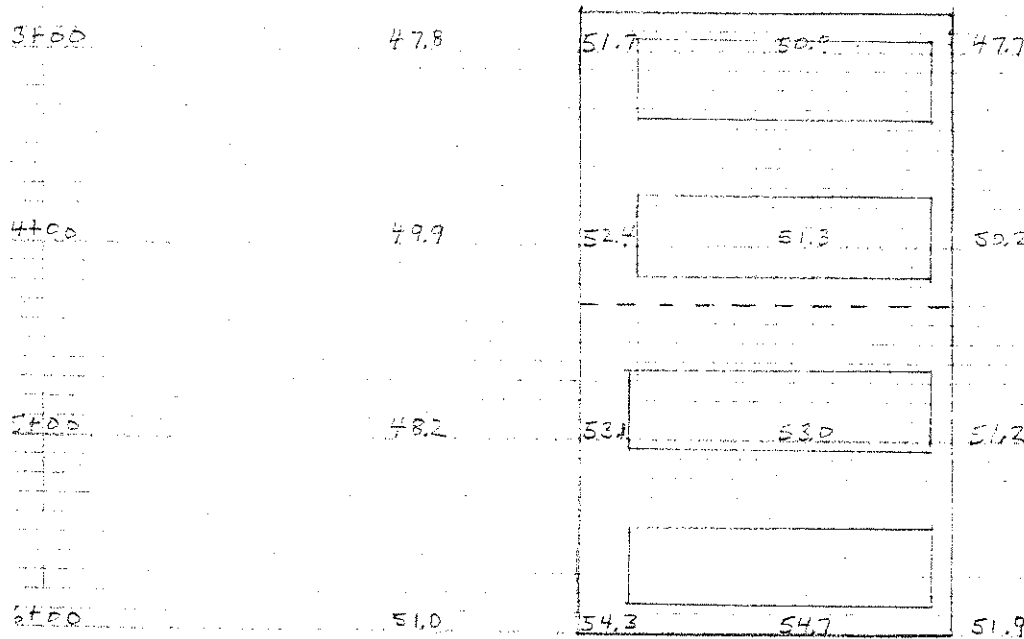
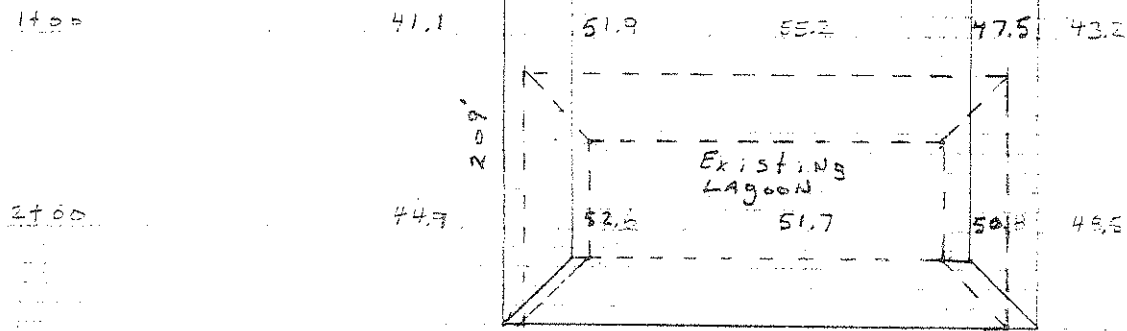
H. Allen Cifke
Tech Specialist
Prestige Farming, Inc.

C. Allen Spear
District Conservationist

A B C D E

TBM - Top of CORNER PI
 LOCATED @ D 0+00.
 ASSUMED ELEV. 5

0+00 39.5 51.2 51.2 48.4 43.2
 275'



2710 FINISHING

OPERATION AND MAINTENANCE PLAN



This lagoon is designed for waste treatment with minimum odor control. The time required for the planned fluid level to be reached may vary due to soil conditions, flushing operations, and the amount of fresh water added to the system.

Land application of waste water is recognized as an acceptable method of disposal. Methods of application include solid set, center pivot, guns, and traveling gun irrigation. Care should be taken when applying waste to prevent runoff from the field or damage to crops.

The following items are to be carried out:

1. It is strongly recommended that the treatment lagoon be pre-charged to 1/2 its capacity to prevent excessive odors during start-up. Pre-charging reduces the concentration of the initial waste entering the lagoon thereby reducing odors. Solids should be covered with effluent at all times.
2. The attached waste utilization plan shall be followed. This plan recommends sampling and testing of waste (see Attachment B) before land application.
3. Begin pump-out of the lagoon when fluid level reaches elevation 51.0 as marked by permanent markers. Stop pump-out when the fluid level reaches elevation 48.5 or before fluid depth is less than 6 feet deep (this prevents the loss of favorable bacteria).
4. The recommended maximum amount to apply per irrigation is one (1) inch and the recommended maximum application rate is 0.4 inch per hour.
5. Keep vegetation on the embankment and areas adjacent to the lagoon mowed annually. Vegetation should be fertilized as needed to maintain a vigorous stand.
6. Repair any eroded areas or areas damaged by rodents and establish in vegetation.
7. All surface runoff is to be diverted from the lagoon to stable outlets.
8. The Clean Water Act of 1977 prohibits the discharge of pollutants into waters of the United States. The Department of Environment, Health, and Natural Resources, Division of Environmental Management, has the responsibility for enforcing this law.

SPECIFICATIONS FOR CONSTRUCTION OF WASTE TREATMENT LAGOONS

Clearing:

All trees and brush shall be removed from the construction area before any excavating or fill is started. Stumps will be removed within the area of the foundation of the embankment and fill areas and all excavated areas. All stumps and roots exceeding one (1) inch in diameter shall be removed to a minimum depth of one (1) foot. Satisfactory disposition will be made of all debris. The foundation area shall be loosened thoroughly before placement of embankment material.

Cut-off Trench:

A cut-off trench (when specified) shall be installed as shown in the plans.

Construction:

Construction of excavated and earthfill areas shall be performed to the neat lines and grades as planned. Deviations from this will require prior approval of the SCS. Earthfill shall not be placed in standing water and reasonable compaction of the fills shall be performed by the construction equipment or sheeps-foot roller during placement. The embankment of the lagoon shall be installed using the more impervious materials. Construction of fill heights shall include ten (10) percent for settlement. To protect against seepage, when areas of unsuitable material are encountered, they will need to be excavated a minimum of one (1) foot below grade and backfilled and compacted with a suitable material (ie-CL,SC,CH). Refer to the soils investigation information in the plans for special considerations. Precautions should be taken during construction to prevent excessive erosion and sedimentation.

Vegetation:

All exposed embankment and other bare constructed areas shall be seeded to the planned type of vegetation as soon as possible after construction.

NAME: THOMAS GODWIN
COUNTY: SAMPSON
TYPE OPERATION: 2940 FEED--FINISH

TOTAL REQUIRED VOLUME 527161 CU FT

TOTAL DESIGN VOLUME AVAILABLE 594360 CU FT

ESTIMATED:

VOLUME OF LAGOON EXCAVATION 18751 CU YDS

TOTAL EXCAVATION 18751 CU YDS

VOLUME OF PAD FILL 12561 CU YDS

VOLUME OF DAM 2561 CU YDS

TOTAL FILL 15112 CU YDS

CUT - FILL RATIO 1.24 :1

* SIDE SLOPES FROM GROUND LEVEL TO APPROXIMATELY
5 TO 5.5 FEET BELOW WILL NEED TO BE OVEREXCAVATED
1 FOOT (MIN) AND REPLACED WITH COMPACTED CLAY.

SOIL INVESTIGATION TO DETERMINE SUITABILITY OF PROPOSED POND SITE

FARMER'S NAME <u>Thomas Snowlin</u>										DISTRICT <u>SAN JUAN</u>									
DATE <u>5-5-83</u>										COUNTY <u>SAN JUAN</u>									
S. C. S. PHOTO SHEET NO. _____										WORK UNIT <u>Chin-2.1</u>									

WATERSHED AREA MEASUREMENTS																			
CROPLAND _____ ACRES					PASTURE _____ ACRES														
WOODLAND _____ ACRES					TOTAL _____ ACRES					POND CLASS _____					WORK UNIT CONSERVATIONIST _____				

SKETCH OF PROPOSED POND SHOWING WHERE BORINGS WERE MADE (Approx. scale 1" = _____ feet)
Locate reference point on center line of dam and identify on sketch.

AC 50.2

46 49.3

SHOW DEPTH SCALE	BORING NUMBER AND PROFILE																						
	<small>Make and list dam-site and spillway borings first - then ponded area and borrow pit borings - separate with vertical red line. (Continued on back where necessary) Show water table elevations on dam-site borings.</small>																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
0-1	SM	SM	SM																				
1-2	SM	SM																					
2-3	SM	SM																					
3-4	SM	SM																					
4-5	SM	SM																					
5-6	SM	SM																					
6-7	SM	SM																					
7-8	SM	SM																					
8-9	SM	SM																					
9-10	SM	SM																					
10-11	SM	SM																					

BORINGS MADE BY _____	SIGNATURE & TITLE _____
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Operator: THOMAS GODWIN County: SAMPSON Date: 09/22/93

Distance to nearest residence (other than owner): 0.0 feet

1. STEADY STATE LIVE WEIGHT

0 sows (farrow to finish)	x	1417 lbs.	=	0 lbs
0 sows (farrow to feeder)	x	522 lbs.	=	0 lbs
2940 head (finishing only)	x	135 lbs.	=	396900 lbs
0 sows (farrow to wean)	x	433 lbs.	=	0 lbs
0 head (wean to feeder)	x	30 lbs.	=	0 lbs

TOTAL STEADY STATE LIVE WEIGHT (SSLW) = 396900 lbs

2. MINIMUM REQUIRED TREATMENT VOLUME OF LAGOON

Volume = 396900 lbs. SSLW x Treatment Volume(CF)/lb. SSLW
Treatment Volume(CF)/lb. SSLW = 1 CF/lb. SSLW
Volume = 396900 cubic feet

3. STORAGE VOLUME FOR SLUDGE ACCUMULATION

Volume = 0.0 cubic feet SLUDGE ACCUMULATION NOT COMPUTED
AT OWNERS REQUEST. REMOVE SLUDGE
AS NEEDED.

4. TOTAL DESIGN VOLUME

Inside top length 420.0 feet ; Inside top width 190.0 feet
Top of dike at elevation 53.0 feet
Freeboard 1.0 feet ; Side slopes 3.0 : 1 (Inside lagoon)
Total design lagoon liquid level at elevation 52.0 feet
Bottom of lagoon elevation 42.0 feet
Seasonal high water table elevation 46.8 feet

Total design volume using prismatic formula

SS/END1	SS/END2	SS/SIDE1	SS/SIDE2	LENGTH	WIDTH	DEPTH
3.0	3.0	3.0	3.0	414.0	184.0	10.00

AREA OF TOP

LENGTH * WIDTH =
414.0 184.0 76176 (AREA OF TOP)

AREA OF BOTTOM

LENGTH * WIDTH =
354.0 124.0 43896 (AREA OF BOTTOM)

AREA OF MIDSECTION

LENGTH * WIDTH * 4
384.0 154.0 236544 (AREA OF MIDSECTION * 4)

CU. FT. = [AREA TOP + (4*AREA MIDSECTION) + AREA BOTTOM] * DEPTH/6
76176.0 236544.0 43896.0 1.7

VOLUME OF LAGOON AT TOTAL DESIGN LIQUID LEVEL = 594360 CU. FT.

5. TEMPORARY STORAGE REQUIRED

DRAINAGE AREA:

Lagoon (top of dike)

Length * Width =

420.0 190.0 79800.0 square feet

Buildings (roof and lot water)

Length * Width =

0.0 0.0 0.0 square feet

TOTAL DA 79800.0 square feet

Design temporary storage period to be 180 days.

5A. Volume of waste produced

Approximate daily production of manure in CF/LB SSLW 0.00136

Volume = 396900 Lbs. SSLW * CF of Waste/Lb./Day * 180 days

Volume = 97161 cubic feet

5B. Volume of wash water

This is the amount of fresh water used for washing floors or volume of fresh water used for a flush system. Flush systems that recirculate the lagoon water are accounted for in 5A.

Volume = 0.0 gallons/day * 180 days storage / 7.48 gallons per CF

Volume = 0.0 cubic feet

5C. Volume of rainfall in excess of evaporation

Use period of time when rainfall exceeds evaporation by largest amount.

180 days excess rainfall = 7.0 inches

Volume = 7.0 in * DA / 12 inches per foot

Volume = 46550.0 cubic feet

5D. Volume of 25 year - 24 hour storm

Volume = 7.0 inches / 12 inches per foot * 5A

Volume = 46550.0 cubic feet

TOTAL REQUIRED TEMPORARY STORAGE

5A.	97161 cubic feet
5B.	0 cubic feet
5C.	46550 cubic feet
5D.	46550 cubic feet
TOTAL	190261 cubic feet

6. SUMMARY

Total required volume 587161 cubic feet

Total design volume avail. 594360 cubic feet

Min. req. treatment volume plus sludge accumulation 396900 cubic ft

At elev. 49.3 feet ; Volume is 401527 cubic feet (end pumping)

Total design volume less 25yr-24hr storm is 547810 cubic feet

At elev. 51.3 feet ; Volume is 541912 cubic feet (start pumping)

Seasonal high water table elevation 46.8 feet

7. DESIGNED BY: *Allen Clifton*
Preston Farm, Inc.

APPROVED BY:

DATE: 9/22/93

DATE:

NOTE: SEE ATTACHED WASTE UTILIZATION PLAN

COMMENTS: _____

SEEDING RECOMMENDATIONS

AREA TO BE SEEDED: 3.0 ACRES

USE THE SEED MIXTURE INDICATED:

0 LBS. FESCUE GRASS @ 60 LBS./ACRE
(BEST SUITED ON CLAYEY OR WET SOIL CONDITIONS)
SEEDING DATES: SEPTEMBER 15 TO NOVEMBER 30

0 LBS. 'PENSACOLA' BAHIA GRASS @ 60 LBS./ACRE
(SEE FOOTNOTE NO. 1)
SEEDING DATES: MARCH 15 TO JUNE 30

24 LBS. HULLED BERMUDA GRASS @ 8 LBS./AC.
(SUITED FOR MOST SOIL CONDITIONS)
SEEDING DATES: APRIL 1 TO JULY 31

90 LBS. RYE GRAIN @ 30 LBS./ACRE (NURSERY FOR FESCUE)

0 LBS. RYE GRASS @ 40 LBS./ACRE (TEMPORARY VEGETATION)
SEEDING DATES: DECEMBER 1 TO MARCH 30

____ LBS. _____

APPLY THE FOLLOWING:

3000 LBS. OF 10-10-10 FERTILIZER (1000 LBS./ACRE)

6 TONS OF DOLOMITIC LIME (2 TONS/ACRE)

300 BALES OF SMALL GRAIN STRAW (100 BALES/ACRE)

ALL SURFACE DRAINS SHOULD BE INSTALLED PRIOR TO SEEDING. SHAPE ALL DISTURBED AREA IMMEDIATELY AFTER EARTH MOVING IS COMPLETED. APPLY LIME AND FERTILIZER THEN DISK TO PREPARE A 3 TO 4 INCH SMOOTH SEEDBED. APPLY SEED AND FIRM SEEDBED WITH A CULTIPACKER OR SIMILAR EQUIPMENT. APPLY MULCH AND SECURE WITH A MULCH ANCHORING TOOL OR NETTING.

1. PENSACOLA BAHIA GRASS IS SLOWER TO ESTABLISH THAN COMMON BERMUDA GRASS. WHEN USING BAHIA, IT IS RECOMMENDED THAT 6 LBS./ACRE OF COMMON BERMUDA BE INCLUDED TO PROVIDE COVER UNTIL BAHIA GRASS IS ESTABLISHED.

CROSS-SECTION DATA

QUANTITY CALCULATIONS

prepared for

THOMAS GODWIN

in

SAMPSON County, North Carolina

Designer : GLENN CLIFTON

Date : 09/22/93

Job Number 084

Checker _____

Date _____

LAGOON EXCAVATION

TEMPLATE DATA:

Beginning Elevation = 42

Beginning Station = +50

+50 to 50+.5

C\3CL80/3

0.00000 ft/ft

50+.5 to 1+00

C\3CL92/3

0.00000 ft/ft

1+00 to 2+00

C\3CL125/3

0.00000 ft/ft

2+00 to 3+05

C\3CL164/3

0.00000 ft/ft

3+05 to 4+00

C\3CL164/3

0.00000 ft/ft

4+00 to 4+33

C\3CL164/3

0.00000 ft/ft

SECTION NUMBER 1

Centerline Station +50

ORIGINAL DATA:

300.0 / 51.0 400.0 / 50.7 500.0 / 49.1 530.0 / 47.9

SECTION NUMBER 2

Centerline Station 1+00

ORIGINAL DATA:

300.0 / 51.3 400.0 / 50.5 500.0 / 48.5 535.0 / 46.1

SECTION NUMBER 3

Centerline Station 2+00

ORIGINAL DATA:

300.0 / 50.1 400.0 / 49.6 500.0 / 48.9 565.0 / 46.6

SECTION NUMBER 4

Centerline Station 3+05

ORIGINAL DATA:

300.0 / 50.5 400.0 / 50.4 500.0 / 49.7 600.0 / 50.5

SECTION NUMBER 5

Centerline Station 4+00

ORIGINAL DATA:

300.0 / 51.6 400.0 / 51.9 500.0 / 51.3 600.0 / 52.0

SECTION NUMBER 6

Centerline Station 4+33

ORIGINAL DATA:

300.0 / 52.1 400.0 / 52.4 500.0 / 51.8 600.0 / 52.3

PLANNED

QUANTITY CALCULATIONS

prepared for

THOMAS GODWIN

in

SAMPSON County, North Carolina

Designer : GLENN CLIFTON

Checker

Date : 09/22/93

Date

Job Number 084.

LAGDON EXCAVATION

Bot Width	Left SS	Right SS	Off-CL (ft)	CL Sta	Dist (ft)	** EXCAVATION **		** FILL **	
						Area (SqFt)	Volume (Cu.Yds)	Area (SqFt)	Volume (Cu.Yds)
60	3:1	3:1	373.0	0+50		879.6		0.0	
					50		1678.1		0.0
92	3:1	3:1	373.0	1+00		932.8		0.0	
					100		5376.5		0.0
125	3:1	3:1	373.0	2+00		1075.2		0.0	
					105		10457.5		0.0
164	3:1	3:1	373.0	3+05		1527.6		0.0	
					95		16414.5		0.0
164	3:1	3:1	373.0	4+00		1838.4		0.0	
					33		18751.6		0.0
164	3:1	3:1	373.0	4+33		1965.9		0.0	

EARTHWORK COMPUTATION SHEET

NAME: THOMAS GODWIN

SETTLED TOP DIKE ELEVATION 53.0

TYPE EARTHWORK: X Dike 3:1 SS 12' Top: ____ Excav: ____ Pad

STATION	ELEV. GROUND	FILL HEIGHT	END AREA (Sq. Ft.)	SUM OF END AREAS	DISTANCE (feet)	DOUBLE VOLUME
0	50.8	2.2	40.92			
66	50.8	2.2	40.92	81.84	66.00	5401
162	49.3	3.7	85.47	126.39	96.00	12133
237	47.8	5.2	143.52	228.99	75.00	17174
342	48.5	4.5	114.75	258.27	105.00	27118
447	50.5	2.5	48.75	163.50	105.00	17168
547	51.8	1.2	18.72	67.47	100.00	6747
603	52.5	0.5	6.75	25.47	56.00	1426
679	52.2	0.8	11.52	18.27	76.00	1389
779	52.7	0.3	3.87	15.39	100.00	1539
845	52.6	0.4	5.28	9.15	66.00	604
901	51.8	1.2	18.72	24.00	56.00	1344
1001	50.5	2.5	48.75	67.47	100.00	6747
1101	50.0	3.0	63.00	111.75	100.00	11175
1201	51.0	2.0	36.00	99.00	100.00	9900
1277	50.8	2.2	40.92	76.92	76.00	5846

1277.00 125712

1. Double Volume of Fill = 62855.8 Cu. Ft.
2. Volume of fill (line 1/27) = 2328.0 Cu. Yd.
3. Allowance for settlement(10%)= 232.8 Cu. Yd.
4. Total Cubic Yds (2 + 3) = 2560.8 Cu. Yd.

Computed by: GLENN CLIFTON
Date: 09/22/93
Checked by:

CROSS-SECTION DATA

QUANTITY CALCULATIONS

prepared for

THOMAS BODWIN

in

SAMPSON County, North Carolina

Designer : GLENN CLIFTON

Date : 09/22/93

Job Number 085

Checker _____

Date _____

PAD FILL

TEMPLATE DATA:

Beginning Elevation = 53.9

Beginning Station = +82

+82 to 1+00

D/4CL320\4

0.00000 ft/ft

1+00 to 1+40

D/4CL320\4

0.00000 ft/ft

1+40 to 2+00

D/4CL320\4

-.00250 ft/ft

2+00 to 2+90

D/4CL320\4

-.00250 ft/ft

2+90 to 3+00

D/4CL320\4

0.00000 ft/ft

3+00 to 3+20

D/4CL320\4

0.00000 ft/ft

SECTION NUMBER 1

Centerline Station +82

ORIGINAL DATA:

0.0 / 45.0 100.0 / 47.3 200.0 / 47.4 300.0 / 48.1 400.0 / 49.2

SECTION NUMBER 2

Centerline Station 1+00

ORIGINAL DATA:

0.0 / 46.1 100.0 / 48.7 200.0 / 47.6 300.0 / 48.3 400.0 / 49.5

SECTION NUMBER 3

Centerline Station 1+40

ORIGINAL DATA:

0.0 / 47.1 100.0 / 47.6 200.0 / 48.2 300.0 / 48.2 400.0 / 50.1

SECTION NUMBER 4

Centerline Station 2+00

ORIGINAL DATA:

0.0 / 48.5	100.0 / 51.0	200.0 / 49.1	300.0 / 49.6	400.0 / 50.9
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SECTION NUMBER 5

Centerline Station 2+90

ORIGINAL DATA:

0.0 / 50.4	100.0 / 51.2	200.0 / 49.9	300.0 / 50.3	400.0 / 51.5
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SECTION NUMBER 6

Centerline Station 3+00

ORIGINAL DATA:

0.0 / 50.6	100.0 / 51.3	200.0 / 50.1	300.0 / 50.5	400.0 / 51.6
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SECTION NUMBER 7

Centerline Station 3+20

ORIGINAL DATA:

0.0 / 50.7	100.0 / 51.2	200.0 / 50.0	300.0 / 50.5	400.0 / 51.7
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PLANNED
QUANTITY CALCULATIONS
prepared for
THOMAS GODWIN
in
SAMPSON County, North Carolina

Designer : GLENN CLIFTON
Date : 09/22/93
Job Number 085

Checker _____
Date _____

PAD FILL

Top Width	Left SS	Right SS	Off-DL (ft)	CL Sta	Dist (ft)	** EXCAVATION **		** FILL **	
						Area (SqFt)	Volume (Cu.Yds)	Area (SqFt)	Volume (Cu.Yds)
320	4:1	4:1	40.0	0+82	18	0.0	0.0	2226.5	1405.7
320	4:1	4:1	40.0	1+00	40	0.0	0.0	1990.7	4209.3
320	4:1	4:1	40.0	1+40	60	0.0	0.0	1794.2	7655.5
320	4:1	4:1	40.0	2+00	90	0.0	0.0	1307.3	11491.1
320	4:1	4:1	40.0	2+90	10	0.0	0.0	974.0	11848.8
320	4:1	4:1	40.0	3+00	20	0.0	0.0	937.9	12550.7
320	4:1	4:1	30.0	3+20		0.0		957.1	

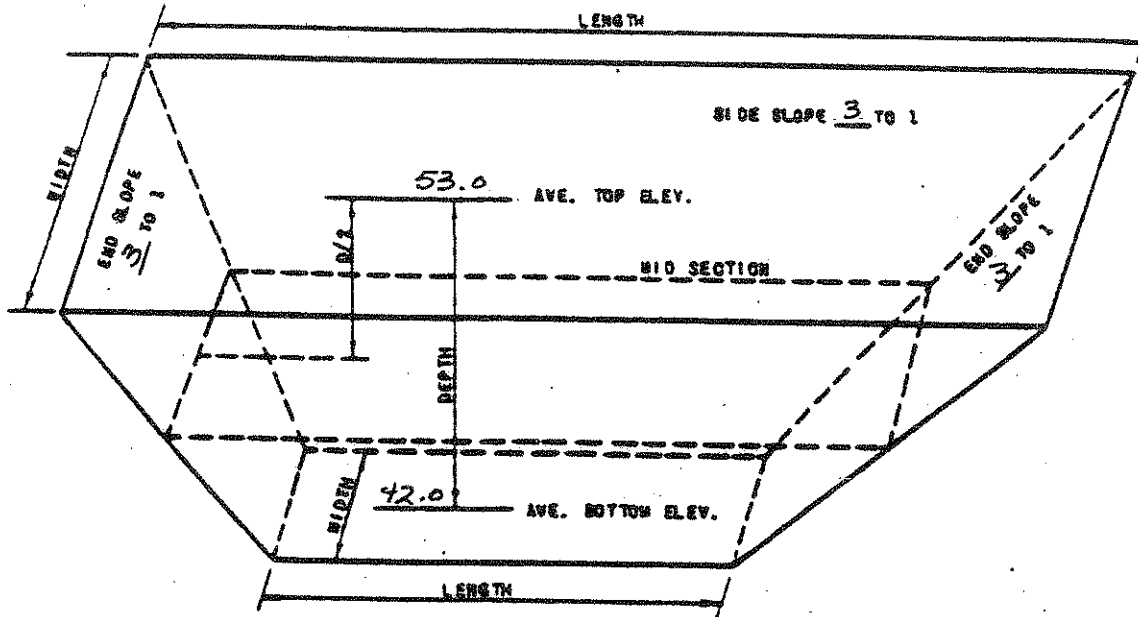
PLAN OF EXCAVATED WASTE STORAGE PIT

NAME: THOMAS GODWIN Date: 9/22/93

County: SAMPSON

Address: _____

* MEASUREMENTS ON TOP MAP.



(See back for volume calculations)

Use of facility: WASTE TREATMENT LAGOON

Capacity: 9445813 Gallons 894360 Ft³

Soil Type: K&A

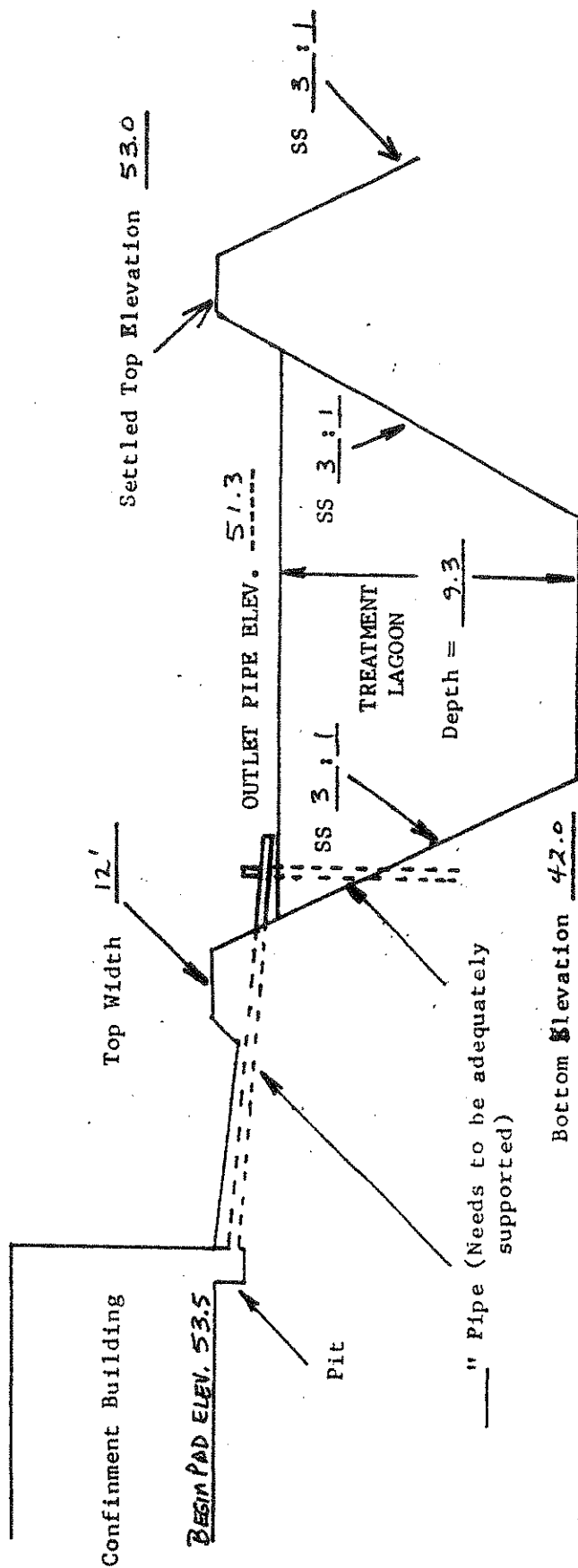
Bench Mark Description TOP OF CORNER PROPERTY MARKER LOCATED
10' NORTH OF STATION F 0+00.

SUMMARY

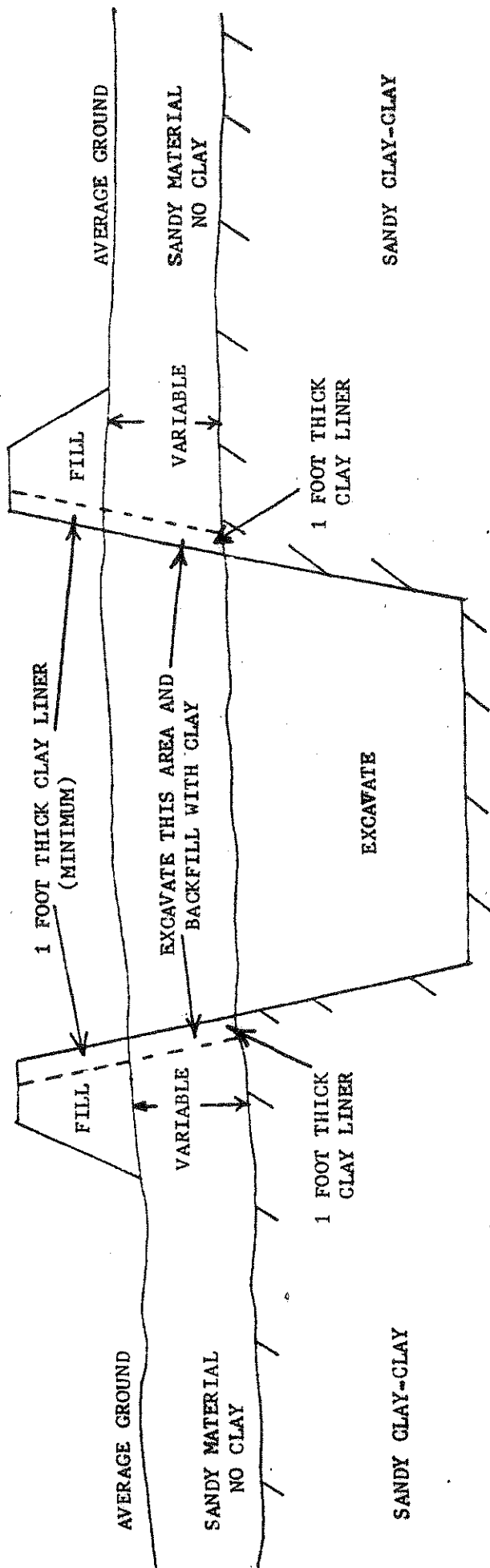
Bottom
Normal Liquid Level
Storage for normal Precip.
Maximum Liquid Level
25 yr. Storm Storage
Crest ESW
Max. Flow Depth
Freeboard
Top of Dam

Elev.	<u>42.0</u>
Elev.	<u>51.3</u>
(+)	<u>—</u> Ft.
Elev.	<u>51.3</u>
(+)	<u>.7</u> Ft.
Elev.	<u>—</u>
(+)	<u>—</u> Ft.
(+)	<u>1.0</u> Ft.
Elev.	<u>53.0</u>

TYPICAL VIEW OF A ONE-STAGE LAGOON SYSTEM



TYPICAL CROSS-SECTION OF
LAGOON CONSTRUCTION WITH
PARTIAL-CLAY LINER



ADDITIONAL EXCAVATION DUE TO LINER:

AVERAGE DEPTH TO CLAY 5' x 1 FOOT THICK X DISTANCE = 1224' CUBIC FEET = 227 CUBIC YARDS
27 CUBIC FEET/CUBIC YARDS

OPERATION AND MAINTENANCE PLAN

This lagoon is designed for waste treatment (permanent storage) with min. odor control. The time required for the planned fluid level to be reached (permanent + temporary storage) may vary due to soil conditions flushing operations, and the amount of fresh water added to the system.

The designed 6 months temporary storage is an estimated volume based on: 1) waste from animals; 2) excess rainfall after evaporation; and 3) the largest 24 hour (one day) rainfall that occurs on the average of once every 25 years. The volume of waste generated from a given number of animals will be fairly constant throughout the year and from year to year. This estimate is based on 7 inches of excess rainfall which is equal to or exceeds the highest 6 months excess in a year. The average annual excess rainfall is approximately 8 inches. Therefore, an average of 8 inches of excess rainfall will need to be pumped each year. The 25 year rainfall will not be a factor to consider in an annual pumping cycle, but this storage volume must always be available. A maximum elevation is determined in each design to begin pumping and this is usually the outlet invert of pipe(s) from building(s). If the outlet pipe is not installed on the elevation to begin pumping, a permanent marker must be installed on this elevation to indicate when pumping should begin. An elevation must be established to stop pumping to maintain minimum treatment depth (6 feet). Pumping can be started or stopped at any time between these two elevations for operating convenience as site conditions permit, such as weather, soils, crop, and equipment in order to apply waste without runoff or leaching.

Land application of waste water is recognized as an acceptable method of disposal. Methods of application include solid set, center pivot, guns, and traveling gun irrigation. Care should be taken when applying waste to prevent damage to crops.

The following items are to be carried out:

1. It is strongly recommended that the treatment lagoon be pre-charged to 1/2 its capacity to prevent excessive odors during start-up. Pre-charging reduces the concentration of the initial waste entering the lagoon thereby reducing odors. Solids should be covered with effluent at all times. When precharging is complete, flush buildings with recycled lagoon liquid. Fresh water should not be used for flushing after initial filling.
2. The attached waste utilization plan shall be followed. This plan recommends sampling and testing of waste (see attachment) before land application.
3. Begin pump-out of the lagoon when fluid level reaches elevation 51.3 as marked by permanent marker. Stop pump-out when the fluid level reaches elevation 49.3 or before the fluid depth is less than 6 feet deep (this prevents the loss of favorable bacteria). The design temporary storage, less 25 year storm is 143711 cubic feet or 1074959 gallons. As stated before, this volume will vary considerably from year to year.

4. The recommended maximum amount to apply per irrigation is one (1) inch and the recommended maximum application rate is 0.3 inch per hour.

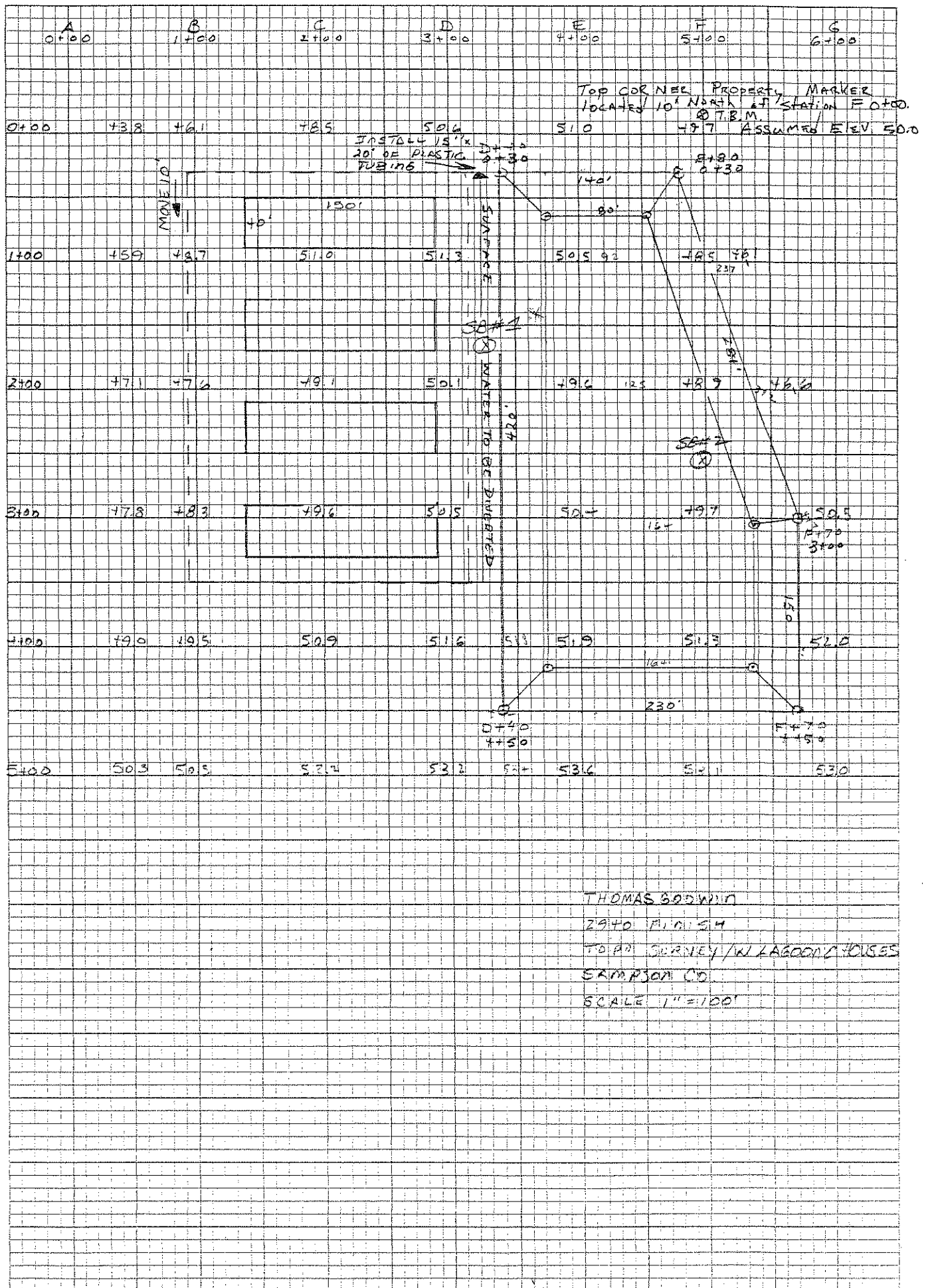
5. Keep vegetation on the embankment and areas adjacent to the lagoon mowed annually. Vegetation should be fertilized as needed to maintain a vigorous stand.

6. Repair any eroded areas or areas damaged by rodents and establish in vegetation.

7. All surface runoff is to be diverted from the lagoon to stable outlets.

8. Keep a minimum of 25 feet of grass vegetated buffer around waste utilization fields adjacent to perennial streams. Waste will not be applied in open ditches. Do not pump within 200 feet of a residence or within 100 feet of a well.

9. The Clean Water Act of 1977 prohibits the discharge of pollutants into waters of the United States. The Department of Environment, Health, and Natural Resources, Division of Environmental Management, has the responsibility for enforcing this law.



SAMPSON COUNTY
EMERGENCY ACTION PLAN ✓

DIVISION OF WATER QUALITY (DWQ)	910-433-3300
EMERGENCY MANAGEMENT SERVICES (EMS)	910-592-8996
SOIL & WATER CONSERVATION DISTRICT (SWCD)	910-592-7963
NATURAL RESOURCES CONSERVATION SERVICE (NRCS)	910-592-7963
COOPERATIVE EXTENSION SERVICE (CES)	910-592-7161

This plan will be implemented in the event that waste from your operation are leaking, overflowing, or running off the site. You should NOT wait until wastes reach surface waters or leave your property to consider that you have a problem. You should make every effort to ensure that this does not happen. This plan should be posted in an accessible location for all employees at the facility. The following are some action items you should take.

1. Stop the release of wastes. Depending on the situation, this may or may not be possible. Suggested response to problems are listed below:
 - A. Lagoon overflow-possible solutions are:
 - a. Add soil to berm to increase elevation of dam, any permanent alteration of the dam should be approved by a qualified technical specialist.
 - b. Pump wastes to field at an acceptable rate.
 - c. Stop all additional flow to the lagoon, hold wastes in the house if possible.
 - d. Call a pumping contractor.
 - e. Make sure no surface water is entering lagoon.
 - B. Runoff from wastes application field-action include:
 - a. Immediately stop wastes application.
 - b. Create a temporary diversion or berm to contain the waste.
 - c. Incorporate waste to reduce further runoff.
 - d. Evaluate and eliminate the reason(s) that caused the runoff.
 - e. Evaluate the application rates for the fields where runoff occurred.
 - C. Leakage from the waste pipes and sprinkler-action includes:
 - a. Stop recycle (flushing system) pump.
 - b. Stop irrigation pump.
 - c. Close valves to eliminate further discharge.
 - d. Repair all leaks prior to restarting pumps.
 - D. Leakage from flush system, houses, solids separators-action includes:
 - a. Stop recycle (flushing system) pump.
 - b. Stop irrigation pump.
 - c. Make sure no siphon effect has been created.
 - d. Stop all flows in the house, flush systems, or solid separators.
 - e. Repair all leaks prior to restarting pumps.
 - E. Leakage from base or sidewall of lagoon. Often this is seepage as opposed to flowing leaks-possible action:

- a. Dig a small sump or ditch to catch all seepage, put in a submersible pump, and pump back into lagoon.
 - b. If holes are caused by burrowing animals, trap or remove animals and fill holes and compact with a clay type soil.
 - c. Have a professional evaluate the condition of the sidewalls and the lagoon bottom as soon as possible.
2. Assess the extent of the spill and note any obvious damages.
 - a. Did the waste reach any surface waters?
 - b. Approximately how much was released and what duration?
 - c. Any damage noted, such as employee injury, fish kills, or property damage?
 - d. Did the spill leave the property?
 - e. Does the spill have the potential to reach surface waters?
 - f. Could a future rain event cause the spill to reach surface waters?
 - g. Are potable water wells in danger (either on or off of the property)?
 - h. How much reached surface waters?
3. Contact appropriate agencies.
 - a. During normal business hours, call your DWQ (Division of Water Quality) regional office, at 910-433-3300, after hours, emergency number: 1-800-858-0368. Your phone call should include: YOUR NAME , FACILITY NUMBER, TELEPHONE NUMBER, THE DETAILS OF TE INCIDENT FROM ITEM #2 ABOVE, THE EXACT LOCATION OF THE FACILITY, AND THE LOCATION OR DIRECTION OF MOVEMENT OF THE SPILL, WEATHER AND WIND CONDITIONS, THE CORRECTIVE MEASURES THAT HAVE BEEN UNDER TAKEN, AND THE SERIOUSNESS OF THE SITUATION.
 - b. If the spill leaves the property or enters surface waters, call local (EMS) Emergency Management Services at 910-592-8996.
 - c. Instruct EMS to contact local Health Department.
 - d. Contact local Soil and Water Conservation District, Natural Resources Conservation Service office at 910-592-7963 and Cooperative Extension Service at 910-592-7161 for advice/technical assistance.
4. If none of the above works call 911 or the sheriffs Department and explain your problem to them and ask that person to contact the proper agencies for you.
5. Contact the contractor of your choice to begin repair of the problem to minimize off-site damage.
 - a. Contractors Name: MCKENZIE GRADING
 - b. Contractors Address: _____
 - c. Contractors Phone: 910-564-6456

6. Contact the technical specialist who certified the lagoon.
 - a. Name: G. GLENN CLIFTON
 - b. Phone: 910-596-5749
7. Implement procedures as advised by DWQ and technical assistance agencies to rectify the damage, repair the system, and reassess the waste management plan to keep problems with release of wastes from happening again.
8. If you are a contract swine grower associated with a swine company integrator, contact the company representative at 910-592-5771.

Insect Control Checklist for Animal Operations

Source	Cause	BMPs to Control Insects		Site Specific Practices
		Liquid Systems		
Flush Gutters	<ul style="list-style-type: none"> Accumulation of solids 	<input type="checkbox"/>	<ul style="list-style-type: none"> Flush system is designed and operated sufficiently to remove accumulated solids from gutters as designed. Remove bridging of accumulated solids at discharge 	
Lagoons and Pits	<ul style="list-style-type: none"> Crusted Solids 	<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> Maintain lagoons, settling basins and pits where pest breeding is apparent to minimize the crusting of solids to a depth of no more than 6 - 8 inches over more than 30% of surface. 	
Excessive Vegetative Growth	<ul style="list-style-type: none"> Decaying vegetation 	<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> Maintain vegetative control along banks of lagoons and other impoundments to prevent accumulation of decaying vegetative matter along water's edge on impoundment's perimeter. 	
		Dry Systems		
Feeders	<ul style="list-style-type: none"> Feed Spillage 	<input type="checkbox"/>	<ul style="list-style-type: none"> Design, operate and maintain feed systems (e.g., bunkers and troughs) to minimize the accumulation of decaying wastage. Clean up spillage on a routine basis (e.g., 7 - 10 day interval during summer; 15-30 day interval during winter). 	
Feed Storage	<ul style="list-style-type: none"> Accumulations of feed residues 	<input type="checkbox"/>	<ul style="list-style-type: none"> Reduce moisture accumulation within and around immediate perimeter of feed storage areas by insuring drainage away from site and/or providing adequate containment (e.g., covered bin for brewer's grain and similar high moisture grain products). Inspect for and remove or break up accumulated solids in filter strips around feed storage as needed. 	

Swine Farm Waste Management Odor Control Checklist

Source	Cause	BMP's to Minimize Odor	Site Specific Practices
Farmstead	• Swine production	<input checked="" type="checkbox"/> Vegetative or wooded buffers; <input checked="" type="checkbox"/> Recommended best management practices; <input checked="" type="checkbox"/> Good judgment and common sense	
Animal body surfaces	• Dirty manure-covered animals	<input checked="" type="checkbox"/> Dry floors	
Floor surfaces	• Wet manure-covered floors	<input checked="" type="checkbox"/> Slotted floors; <input checked="" type="checkbox"/> Waterers located over slotted floors; <input type="checkbox"/> Feeders at high end of solid floors; <input checked="" type="checkbox"/> Scrape manure buildup from floors; <input checked="" type="checkbox"/> Underfloor ventilation for drying	
Manure collection pits	• Urine; • Partial microbial decomposition	<input checked="" type="checkbox"/> Frequent manure removal by flush, pit recharge, or scrape; <input checked="" type="checkbox"/> Underfloor ventilation	
Ventilation exhaust fans	• Volatile gases; Dust	<input checked="" type="checkbox"/> Fan maintenance; <input checked="" type="checkbox"/> Efficient air movement	
Indoor surfaces	• Dust	<input checked="" type="checkbox"/> Washdown between groups of animals; <input checked="" type="checkbox"/> Feed additives; <input type="checkbox"/> Feeder covers; <input checked="" type="checkbox"/> Feed delivery downspout extenders to feeder covers	
Flush tanks	• Agitation of recycled lagoon liquid while tanks are filling	<input type="checkbox"/> Flush tank covers; <input checked="" type="checkbox"/> Extend fill lines to near bottom of tanks with anti-siphon vents	
Flush alleys	• Agitation during wastewater conveyance	<input type="checkbox"/> Underfloor flush with underfloor ventilation	
Pit recharge points	• Agitation of recycled lagoon liquid while pits are filling	<input checked="" type="checkbox"/> Extend recharge lines to near bottom of pits with anti-siphon vents	
Lift stations	• Agitation during sump tank filling and drawdown	<input type="checkbox"/> Sump tank covers	
Outside drain collection or junction boxes	• Agitation during wastewater conveyance	<input type="checkbox"/> Box covers	

Source	Cause	BMPs to Minimize Odor	Site Specific Practices
End of drainpipes at lagoon	<ul style="list-style-type: none"> Agitation during wastewater conveyance 	<input type="checkbox"/> Extend discharge point of pipes underneath lagoon liquid level	
Lagoon surfaces	<ul style="list-style-type: none"> Volatile gas emissions; Biological mixing; Agitation 	<input checked="" type="checkbox"/> Proper lagoon liquid capacity; <input type="checkbox"/> Correct lagoon startup procedures; <input checked="" type="checkbox"/> Minimum surface area-to-volume ratio; <input checked="" type="checkbox"/> Minimum agitation when pumping; <input type="checkbox"/> Mechanical aeration; <input type="checkbox"/> Proven biological additives	
Irrigation sprinkler nozzles	<ul style="list-style-type: none"> High pressure agitation; Wind drift 	<input checked="" type="checkbox"/> Irrigate on dry days with little or no wind; <input checked="" type="checkbox"/> Minimum recommended operating pressure; <input checked="" type="checkbox"/> Pump intake near lagoon liquid surface; <input type="checkbox"/> Pump from second-stage lagoon	
Storage tank or basin surface	<ul style="list-style-type: none"> Partial microbial decomposition; Mixing while filling; Agitation when emptying 	<input type="checkbox"/> Bottom or midlevel loading; <input type="checkbox"/> Tank covers; <input type="checkbox"/> Basin surface mats of solids; <input type="checkbox"/> Proven biological additives or oxidants	
Settling basin surface	<ul style="list-style-type: none"> Partial microbial decomposition; Mixing while filling; Agitation when emptying 	<input type="checkbox"/> Extend drainpipe outlets underneath liquid level; <input type="checkbox"/> Remove settled solids regularly	
Manure, slurry or sludge spreader outlets	<ul style="list-style-type: none"> Agitation when spreading; Volatile gas emissions 	<input type="checkbox"/> Soil injection of slurry/sludges; <input type="checkbox"/> Wash residual manure from spreader after use; <input type="checkbox"/> Proven biological additives or oxidants	
Uncovered manure, slurry or sludge on field surfaces	<ul style="list-style-type: none"> Volatile gas emissions while drying 	<input type="checkbox"/> Soil injection of slurry/sludges <input type="checkbox"/> Soil incorporation within 48 hrs.; <input type="checkbox"/> Spread in thin uniform layers for rapid drying; <input type="checkbox"/> Proven biological additives or oxidants	
Dead animals	<ul style="list-style-type: none"> Carcass decomposition 	<input checked="" type="checkbox"/> Proper disposition of carcasses	
Dead animal disposal pits	<ul style="list-style-type: none"> Carcass decomposition 	<input type="checkbox"/> Complete covering of carcasses in burial pits; <input type="checkbox"/> Proper location/construction of disposal pits	
Incinerators	<ul style="list-style-type: none"> Incomplete combustion 	<input type="checkbox"/> Secondary stack burners	

Source	Cause	BMP's to Minimize Odor	Site Specific Practices
Standing water around facilities	<ul style="list-style-type: none"> • Improper drainage; • Microbial decomposition of organic matter 	<input checked="" type="checkbox"/> Grade and landscape such that water drains away from facilities	
Manure tracked onto public roads from farm access	<ul style="list-style-type: none"> • Poorly maintained access roads 	<input checked="" type="checkbox"/> Farm access road maintenance	

Additional Information :

Swine Manure Management ; 0200 Rule/BMP Packet
 Swine Production Farm Potential Odor Sources and Remedies ; EBAE Fact Sheet
 Swine Production Facility Manure Management: Pit Recharge - Lagoon Treatment ; EBAE 128-88
 Swine Production Facility Manure Management: Underfloor Flush - Lagoon Treatment ; EBAE 129-88
 Lagoon Design and Management for Livestock Manure Treatment and Storage ; EBAE 103-83
 Calibration of Manure and Wastewater Application Equipment ; EBAE Fact Sheet
 Controlling Odors from Swine Buildings ; PIH-33
 Environmental Assurance Program ; NPPC Manual
 Options for Managing Odor ; a report from the Swine Odor Task Force
 Nuisance Concerns in Animal Manure Management: Odors and Flies ; PRO107, 1995 Conference Proceedings

Available From :

NCSU, County Extension Center
 NCSU - BAE
 NCSU - BAE
 NCSU - BAE
 NCSU - BAE
 NCSU - BAE
 NCSU - Swine Extension
 NC Pork Producers Assoc
 NCSU Agri Communications
 Florida Cooperative Extension

✓
Mortality Management Methods
(check which method(s) are being implemented)

- ☐ Burial three feet beneath the surface of the ground within 24 hours after knowledge of the death. The burial must be at least 300 feet from any flowing stream or public body of water.
- ☒ Rendering at a rendering plant licensed under G.S. 106-168.7
- ☒ Complete incineration
- ☐ In the case of dead poultry only, placing in a disposal pit of a size and design approved by the Department of Agriculture
- ☐ Any method which in the professional opinion of the State Veterinarian would make possible the salvage of part of a dead animal's value without endangering human or animal health. (Written approval of the State Veterinarian must be attached)
- ☒ **FORCED AIR COMPOSTING**

December 18, 1996