ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director

NORTH CAROLINA
Environmental Quality

September 23, 2019

B & W Hog Farms Inc
Barefoot Nursery
3340 Giddensville Rd
Faison, NC 28341-6843

Subject: Certificate of Coverage No. AWS820058
Barefoot Nursery
Swine Waste Collection, Treatment,
Storage and Application System
Sampson County

Dear B & W Hog Farms Inc:

In accordance with your renewal request, we are hereby forwarding to you this Certificate of Coverage (COC) issued to B & W Hog Farms Inc, authorizing the operation of the subject animal waste management system in accordance with General Permit AWG100000. Please read this COC and the enclosed State General Permit carefully.

This approval shall consist of the operation of this system including, but not limited to, the management and land application of animal waste as specified in the facility's Certified Animal Waste Management Plan (CAWMP) for Barefoot Nursery, located in Sampson County, with a swine animal capacity of no greater than the following annual averages:

Wean to Finish:	Feeder to Finish:	Boar/Stud:
Wean to Feeder: **5120**	Farrow to Wean:	Gilts:
Farrow to Finish:	Farrow to Feeder:	Other:

If this is a Farrow to Wean or Farrow to Feeder operation, there may be one boar for each 15 sows. Where boars are unnecessary, they may be replaced by an equivalent number of sows. Any of the sows may be replaced by gilts at a rate of 4 gilts for every 3 sows.

This COC shall be effective from October 1, 2019 until September 30, 2024 and shall hereby void Certificate of Coverage Number AWS820058 that was previously issued to this facility. Pursuant to this COC, you are authorized and required to operate the system in conformity with the conditions and limitations as specified in the General Permit, the facility's CAWMP, and this COC. An adequate system for collecting and maintaining the required monitoring data and operational information must be established for this facility. Any increase in waste production greater than the certified design capacity or increase in number of animals authorized by this COC (as provided above) will require a modification to the CAWMP and this COC and must be completed prior to actual increase in either wastewater flow or number of animals.

You are encouraged to update your Swine Odor Control Checklist using the enclosed form. If you do so, you must send a copy of the updated form to the Animal Feeding Operations Program at the address below.

Please pay careful attention to the record keeping and monitoring conditions in this permit. Stocking and Mortality Form (STOCK-1) has been updated; all other record keeping forms are unchanged with this General Permit. Please use the most current record keeping forms.

If your Waste Utilization Plan (WUP) has been developed based on site-specific information, careful evaluation of future samples is necessary. Should your records show that the current WUP is inaccurate you will need to have a new WUP developed.

The issuance of this COC does not excuse the Permittee from the obligation to comply with all applicable laws, rules, standards, and ordinances (local, state, and federal), nor does issuance of a COC to operate under this permit convey any property rights in either real or personal property.

Per 15A NCAC 02T .1304 and NRCS standards a 100-foot separation shall be maintained between water supply wells and any lagoon, storage pond, or any land application of waste.

Please be advised that any violation of the terms and conditions specified in this COC, the General Permit or the CAWMP may result in the revocation of this COC, or penalties in accordance with NCGS 143-215.6A through 143-215.6C including civil penalties, criminal penalties, and injunctive relief.

If any parts, requirements, or limitations contained in this COC are unacceptable, you have the right to apply for an individual permit by contacting the Animal Feeding Operations Program for information on this process. Unless such a request is made within 30 days, this COC shall be final and binding.

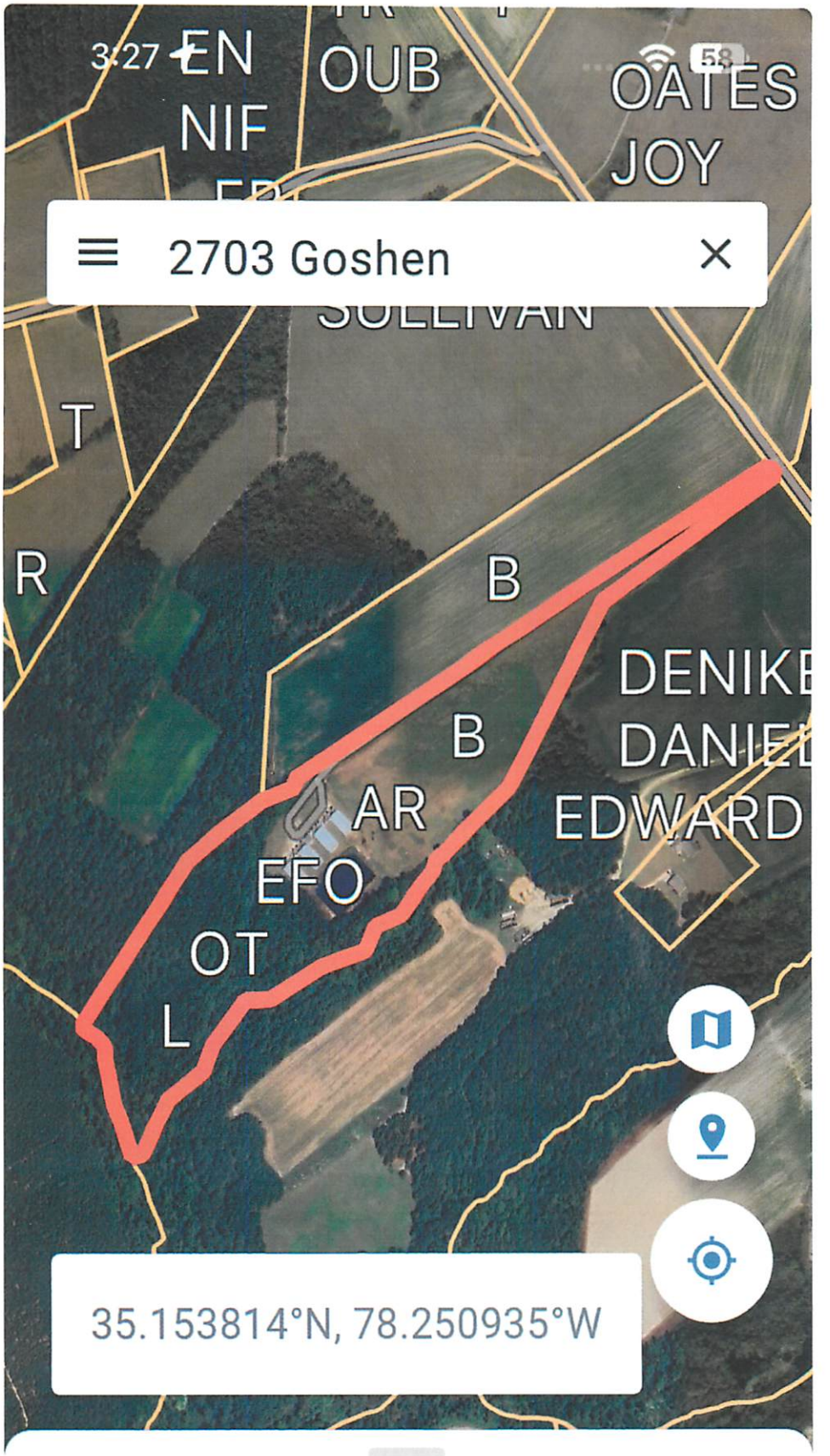
In accordance with Condition II.23 of the General Permit, waste application shall cease within twelve (12) hours of the time that the National Weather Service issues a Hurricane Warning, Tropical Storm Warning, or a Flood Watch/Flash Flood Watch associated with a tropical system for the county in which the facility is located. You may find detailed watch/warning information for your county by calling the Raleigh, NC National Weather Service office at (919) 326-1042, or by visiting their website at: www.weather.gov/rah/

This facility is located in a county covered by our Fayetteville Regional Office. The Regional Office staff may be reached at 910-433-3300. If you need additional information concerning this COC or the General Permit, please contact the Animal Feeding Operations Program staff at (919) 707-9129.

Sincerely,

for Linda Culpepper
Director, Division of Water Resources

Enclosures (General Permit AWG100000)
cc: (Certificate of Coverage only for all ccs)
Fayetteville Regional Office, Water Quality Regional Operations Section
Sampson County Health Department
Sampson County Soil and Water Conservation District
Central Files (Permit No. AWS820058)
Murphy-Brown LLC



BAREFOOT LARRY M

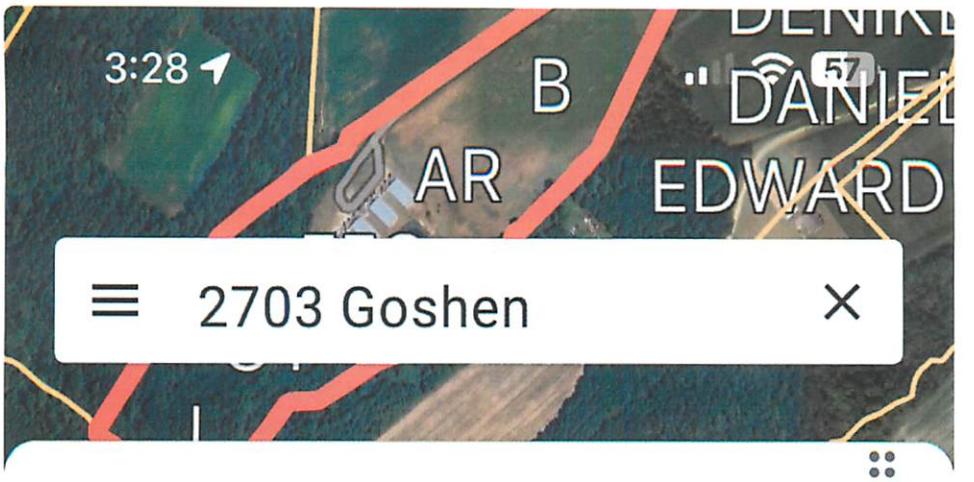
Owner

2703 GOSHEN CHURCH

Address

13048000004

Parcel ID

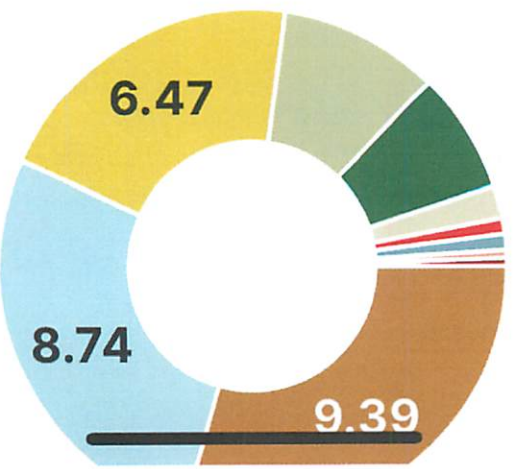


Land

33.53 Deeded Acres	**31.89** Calculated Acres	**Residential** Residential
-- Land Use Class	**--** Land Use Code	**154.93 ft** Elevation

Coverage

Land Cover | Crop Cover



FRO

WASTE UTILIZATION PLAN
DATE 04/28/98 REVISED NEW FORMAT FN 82-58

Producer: LARRY BAREFOOT

Location: 1605 GOSHEN CHURCH RD.
FAISON, NC 28341

Telephone: 910-594-0094

82-58

Type Operation: WEAN TO FEEDER (B)

Number of Animals: 5120

The waste from your animal facility must be land applied at a specified rate to prevent pollution of surface and/or groundwater. The plant nutrients in the animal waste should be used to reduce the amount of commercial fertilizer required for the crops in the fields where waste is to be applied. This waste utilization plan uses nitrogen as the limiting nutrient. Waste should be analyzed before each application cycle. Annual soil tests are strongly encouraged so that all plant nutrients can be balanced for realistic yields of the crop to be grown.

Several factors are important in implementing your waste utilization plan in order to maximize the fertilizer value of the waste and to ensure that it is applied in an environmentally safe manner. Always apply waste based on the needs of the crop to be grown and the nutrient content of the waste. Do not apply more nitrogen than the crop can utilize. Soil types are important as they have different infiltration rates, leaching potentials, cation exchange capacities, and available water holding capacities. Normally waste shall not be applied to land eroding at greater than 5 tons per acre per year. With special precautions, waste may be applied to land eroding at up to 10 tons per acre per year. Do not apply waste on saturated soils, when it is raining, or when the surface is frozen. Either of these conditions may result in runoff to surface waters which is not allowed under DWQ regulations. Wind conditions should also be considered to avoid drift and downwind odor problems. To maximize the value of the nutrients for crop production and to reduce the potential for pollution, the waste should be applied to a growing crop or applied to bare ground not more than 30 days prior to planting. Injecting the waste or disking will conserve nutrients and reduce odor problems.
This plan is based on waste application through irrigation for this is the manner in which you have chosen to apply your waste. If you choose to inject the waste in the future, you need to revise this plan. Nutrient levels for injecting waste and irrigating waste are not the same.

The estimated acres needed to apply the animal waste is based on typical nutrient content for this type of facility. Acreage requirements should be based on the waste analysis report from your waste management facility. Attached you will find information on proper sampling techniques, preparation, and transfer of waste samples to the lab for analysis.

This waste utilization plan, if carried out, meets the requirements for compliance with 15A NCAC 2H.0217 adopted by the Environmental Management Commission.

AMOUNT OF WASTE PRODUCED PER YEAR (GALLONS, FT3, TONS, ETC.)

5120 hogs x 0.4 tons waste/hogs/year = 2048 tons

AMOUNT OF PLANT AVAILABLE NITROGEN (PAN) PRODUCED PER YEAR

5120 hogs x 0.48 PAN/hogs/year = 2457.6 lbs. PAN/year

Applying the above amount of waste is a big job. You should plan time and have appropriate equipment to apply the waste in a timely manner.

The following acreage will be needed for waste application based on the crop to be grown, soil type and surface application.

TABLE 1: ACRES OWNED BY PRODUCER

TRACT	FIELD	SOIL TYPE & CLASS-DETERMINING PHASE	CROP CODE	YIELD	LBS AW N PER AC	COMM PER AC	** ACRES	* LBS AW USED APPLIC. TIME
7266	5	WAB	BH	5.5	300		8.2	2460
7266	~5	WAB	SG	1	100		8.2	820
								0
								0
								0
								0
								0
								0
								0
								0
								0
								0
							Total	3280

~ Indicates that this field is being over seeded (i.e. interplanted) or winter annuals follow summer annuals.

NOTE: The applicator is cautioned that P and K may be over applied while meeting the N requirements. Beginning in 1996 the Coastal Zone Management Act will require farmers in some eastern counties of NC to have a nutrient management plan that addresses all nutrients. This plan only addresses Nitrogen.

WASTE UTILIZATION PLAN

TABLE 2: ACRES WITH AGREEMENT OR LONG TERM LEASE

(Agreement with adjacent landowners must be attached.)
(Required only if operator does not own adequate land. See required specifications 2.)

TRACT	FIELD	SOIL TYPE & CLASS-DETERMINING PHASE	CROP CODE	YIELD	LBS AW N PER AC	COMM PER AC	A	
								0
								0
								0
								0
								0
								0
								0
							Total	0

~ Indicates that this field is being over seeded (i.e. interplanted) or winter annuals follow summer annuals.

** Acreage figures may exceed total acreage in fields due to over seeding.

* lbs AW N (animal waste nitrogen) equals total required nitrogen less any commercial nitrogen (COMM N) supplied.

The following legend explains the crop codes used in tables 1 and 2 above:

CROP CODE	CROP	UNITS	LBS N PER UNIT	APPLY MONTH
BH	HYBRID BERMUDA GRASS-HAY	TONS	50	MAR - OCT ~~APR-SEPT~~ ~~OCT~~
C	CORN	BUSHELS	1.25	MAR-JUNE
SG	SMALL GRAIN OVER SEED	AC	100	SEPT-APR
SA	SUMMER ANNUALS	AC	110	APR-MAY
WA	WINTER ANNUALS	AC	100	SEPT-APR
BC	HYBRID BERMUDA GRASS-CON GRAZED	TONS	50	APR-SEPT
BP	HYBRID BERMUDA GRASS-PASTURE	TONS	50	APR-SEPT
FC	TALL FESCUE-CON GRAZED	TONS	50	SEPT-APR
FH	TALL FESCUE-HAY	TONS	50	SEPT-APR
FP	TALL FESCUE-PASTURE	TONS	50	SEPT-APR
SB	SOY BEANS	BUSHELS	4	JUN-SEPT
DSB	DOUBLE CROP SOY BEANS	BUSHELS	4	JUN-SEPT
CO	COTTON	TONS	0.1	MAY-JUN
W	WHEAT	BUSHELS	2	OCT-MAR

TOTALS FROM TABLES 1 AND 2

	ACRES	LBS AW N USED
TABLE 1	8.2	3280
TABLE 2	0	0
TOTAL	8.2	3280
AMOUNT OF N PRODUCED		2457.6
*** BALANCE		-822.4

*** This number must be less than or equal to 0 in order to fully utilize the animal waste N produced.

Acres shown in each of the preceding tables are considered to be the usable acres excluding required buffers, filter strips along ditches, odd areas unable to be irrigated, and perimeter areas not receiving full application rates due to equipment limitations. Actual total acres in the fields listed may, and most likely will be, more than the acres shown in the tables.

NOTE: The Waste Utilization Plan must contain provisions for periodic land application of sludge at agronomic rates. The sludge will be nutrient rich and will require precautionary measures to prevent over application of nutrients or other elements. Your production facility will produce approximately 387.12 pounds of plant available nitrogen (PAN) per year in the sludge that will need to be removed on a periodic basis. This figure is PAN when broadcasting the sludge equipment, may be needed when you remove this sludge.

See attached map showing the fields to be used for the utilization of waste water.

APPLICATION OF WASTE BY IRRIGATION

The irrigation application rate should not exceed the intake rate of the soil at the time of irrigation such that runoff or ponding occurs. This rate is limited by initial soil moisture content, soil structure, soil texture, water droplet size, and organic solids. The application amount should not exceed the available water holding capacity of the soil at the time of irrigation nor should the plant available nitrogen applied exceed the nitrogen needs of the crop.

Your facility is designed for 180 days of temporary storage and the temporary storage must be removed on the average of once every 6 months. In no instance should the volume of waste being stored in your structure be within 1.7 feet of the top of the dike.

If surface irrigation is the method of land application for this plan, it it is the responsibility of the producer and irrigation ‹signer to ensure that an irrigation system is installed to properly irrigate the acres shown in Tables 1 and 2. Failure to apply the recommended rates and amounts of Nitrogen shown in the tables may make this plan invalid

Call your Agriment Services representative for assistance in determining the amount of waste per acre and the proper application rate prior to beginning the application of your waste.

NARRATIVE OF OPERATION: SEE ATTACHMENT

NARRATIVE OF OPERATION

THIS PLAN WAS REVISED TO REFLECT THE NEW FORMAT FOR WASTE UTILIZATION PLANS. THE SAME YIELDS WERE USED FOR THE PREDOMINATE SOIL TYPE (WAGRAM) AS USED IN THE PREVIOUS PLAN PREPARED BY THE LATE TECHNICAL SPECIALIST HERMAN RIGGS. SMALL GRAIN OVER-SEED WAS INCORPORATED AT THE NEW RATES FOR FALL/WINTER APPLICATIONS.

THIS WASTE PLAN TAKES IN ACCOUNT BUFFERS TO "WATERS OF THE STATE". MR BAREFOOT PLANS TO APPLY HIS WASTE NOT TO EXCEED THE HYDRAULIC OR AGRONOMIC LOADING OF THE SOILS OR CROPS. MR. BAREFOOT WILL APPPLY HIS WASTE IN ACCORDANCE WITH HIS WASTE ANALYSIS REPORT.

4/28/98
Ronnie G. Kennedy Jr.
Technical Specialist

1. Animal waste shall not reach surface waters of the state by runoff, drift, manmade conveyances, direct application, or direct discharge during operation or land application. Any discharge of waste which reaches surface water is prohibited. Illegal discharges are subject to assessment of civil penalties of $10,000 per day by the Division of Water Quality for every day the discharge continues.

2. The Local NRCS office must have documentation in the design folder that the producer either owns or has long term access to adequate land to properly dispose of waste. If the producer does not own adequate land to properly dispose of waste, he shall provide NRCS with a copy of a written agreement with a landowner who is within a reasonable proximity, allowing him/her the use of the land for waste application for the life expectancy of the production facility. It is the responsibility of the owner of the facility to secure an updated Waste Utilization Plan when there is a change in the operation, increase in the number of animals, method of utilization, or available land.

3. Animal waste shall be applied to meet, but not exceed, the Nitrogen needs for realistic crop yields based on soil type, available moisture, historical data, climate conditions, and level of management, unless there are regulations that restrict the rate of application for other nutrients.

4. Animal waste may be applied to land that has a Resource Management System (RMS) or an Alternative Conservation System (ACS). If an ACS is used the soil loss shall be no greater than 10 tons per acre per year and appropriate filter strips will be used where runoff leaves the field. These filter strips will be in addition to "Buffers" required by DEM. (See FOTG Standard 393-Filter Strips and Standard 390 Interim Riparian Forest Buffers).

5. Odors can be reduced by injecting the waste or disking after waste application. Waste should not be applied when the wind is blowing.

6. When animal waste is to be applied on acres subject to flooding, it will be soil incorporated on conventionally tilled cropland. When applied to conservation tilled crops or grassland, the waste may be broadcast provided the application does not occur during a season prone to flooding. (See "Weather and Climate in North Carolina" in the NRCS Technical Reference - Environment file for guidance.

7. Liquid waste shall be applied at rates not to exceed the soil infiltration rate such that runoff does not occur off-site or to surface waters and in a method which does not cause drift from the site during application. No ponding should occur in order to control conditions conducive to odor or flies and to provide uniformity of application.

8. Animal waste shall not be applied to saturated soils, during rainfall event, or when the surface is frozen.

9. Animal waste shall be applied on actively growing crops in such a manner that the crop is not covered with waste to a depth that would inhibit growth. The potential for salt damage from animal waste should also be considered.

10. Waste nutrients shall not be applied in fall or winter for spring planted crops on soils with a high potential for leaching. Waste nutrient loading rates on these soils should be held to a minimum and a suitable winter cover crop planted to take up released nutrients. Waste shall not be applied more than 30 days prior to planting of a crop on bare soil.

11. Animal waste shall not be applied closer than 25 feet to surface water. This distance may be reduced for waters that are not perennial provided adequate vegetative filter strips are present. (See standard 393 - Filter Strips)

12. Animal waste shall not be applied closer than 100 feet to wells.

13. Animal waste shall not be applied closer than 200 feet of dwellings other than those owned by the landowner.

14. Waste shall be applied in a manner not to reach other property and public right-of ways.

15. Animal waste shall not be discharged into surface waters, drainage ways, or wetlands by discharge or by over-spraying. Animal waste may be applied to prior converted wetlands provided they have been approved as a land application site by a "technical specialist". Animal waste should not be applied on grassed waterways that discharge into water courses, except when applied at agronomic rates and the application causes no runoff or drift from the site.

16. Domestic and industrial waste from wash down facilities, showers, toilets, sinks, etc., shall not be discharged into the animal waste management system.

17. Lagoons and other uncovered waste containment structures must maintain a maximum operating level to provide adequate storage for a 25-year, 24-hour storm event in addition to one (1) foot mandatory freeboard.

18. A protective cover of appropriate vegetation will be established on all disturbed areas (lagoon embankments, berms, pipe runs, etc.). If needed, special vegetation shall be provided for these areas and and shall be fenced, as necessary to protect the vegetation. Vegetation such as trees, shrubs, and other woody species, etc. are limited to areas where considered appropriate. Lagoon areas should be kept mowed and accessible. Lagoon berms and structures should be inspected regularly for evidence of erosion, leakage or discharge.

19. If animal production at the facility is to be suspended or terminated, the owner is responsible for obtaining and implementing a "closure plan" which will eliminate the possibility of an illegal discharge, pollution and erosion.

20. Waste handling structures, piping, pumps, reels, etc., should be inspected on a regular basis to prevent breakdowns, leaks, and spills. A regular maintenance checklist should be kept on site.

21. Animal waste can be used in a rotation that includes vegetables and other crops for direct human consumption. However, if animal waste is used on crops for direct human consumption it should only be applied pre plant with no further applications of animal waste during the crop season.

22. Highly visible markers shall be installed to mark the top and bottom elevations of the temporary storage (pumping volume) of all waste treatment lagoons. Pumping shall be managed to maintain the liquid level between the markers. A marker will be required to mark the maximum storage volume for waste storage ponds.

23. Waste shall be tested within sixty days of utilization and soil shall be tested at least annually at crop sites where waste products are applied. Nitrogen shall be the rate - determining element. Zinc and copper levels in the soils shall be monitored and alternative crop sites shall be used when these metals approach excessive levels. pH and waste analysis records shall be kept for five years. Poultry dry waste application records shall be maintained for three years. Waste application records for all other waste shall be maintained for five years.

24. Dead animals will be disposed of in a manner that meets North Carolina State regulations or other States' regulations.

SAMPSON COUNTY

NORTH CAROLINA

PREPARED BY THE

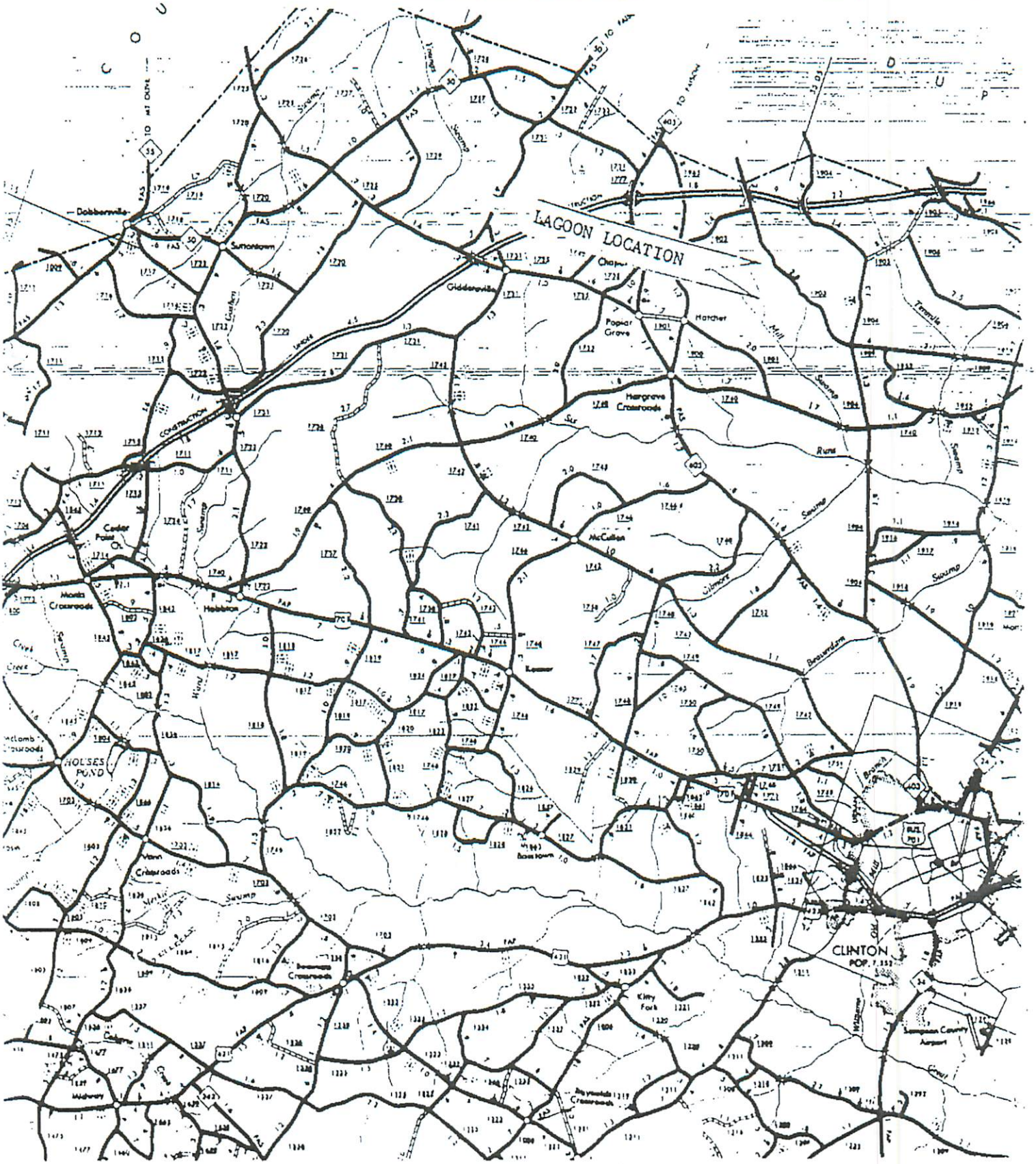
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

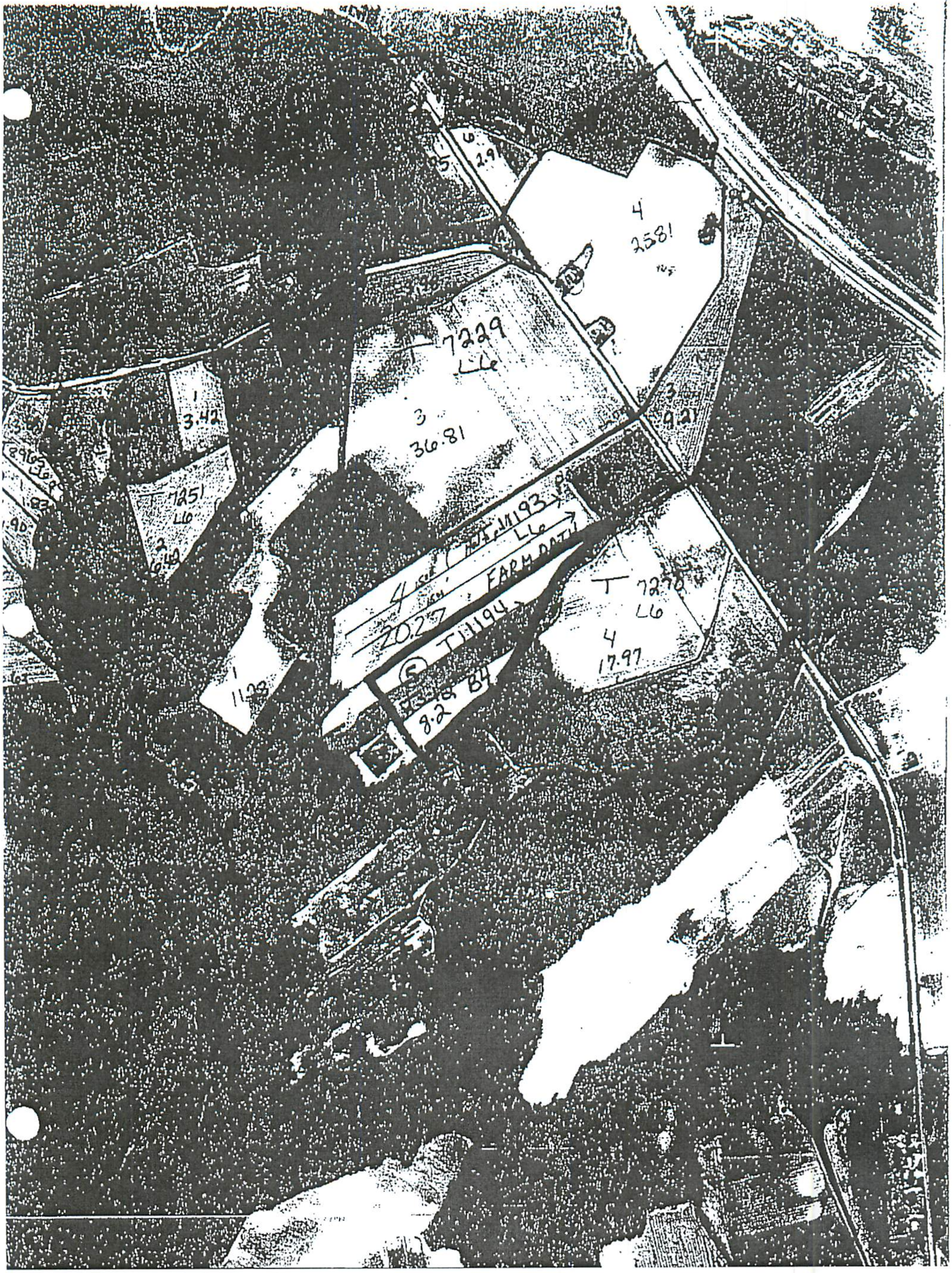
DIVISION OF HIGHWAYS — PLANNING AND RESEARCH BRANCH

IN COOPERATION WITH THE

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

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ANIMAL WASTE MANAGEMENT PLAN CERTIFICATION FOR EXISTING FEEDLOTS

Please return the completed form to the Division of Environmental Management at the address on the reverse side of this form.

Name of farm (Please print): Barefoot Nursery — Larry Barefoot
Mailing Address: RFD Box 96 Faison NC 28341 Phone No.: 910 594 0094
Sampson County (of farm):
Farm location: Latitude and Longitude: 35 09 15 / 78 15 04 (required). Also, please attach a copy of a county road map with location identified.
Type of operation (swine, layer, dairy, etc.): Swine Wean to Feeder
Design capacity (number of animals): 5720
Average size of operation (12 month population avg.): 5720
Average acreage needed for land application of waste (acres): 9

Technical Specialist Certification

As a technical specialist designated by the North Carolina Soil and Water Conservation Commission pursuant to 15A NCAC 6F .0005, I certify that the existing animal waste management system for the farm named above has an animal waste management plan that meets the operation and maintenance standards and specifications of the Division of Environmental Management and the USDA-Soil Conservation Service and/or the North Carolina Soil and Water Conservation Commission pursuant to 15A NCAC 2H.0217 and 15A NCAC 6F .0001-.0005. The following elements and their corresponding minimum criteria have been verified by me or other designated technical specialists and are included in the plan as applicable: minimum separations (buffers), adequate quantity and amount of land for waste utilization (or use of third party); access or ownership of proper waste application equipment; schedule for timing of applications; application rates; loading rates; and the control of the discharge of pollutants from stormwater runoff events less severe than the 25-year, 24-hour storm.

Name of Technical Specialist (Please Print): C. Wilson Spencer
Affiliation (Agency): Natural Resources Conservation Service (NRCS)
Address: 84 County Complex Rd, Clinton, NC 28328 Phone No. 910 592-7963
Signature: C. Wilson Spencer Date: 4-15-96

Owner/Manager Agreement

I (we) understand the operation and maintenance procedures established in the approved animal waste management plan for the farm named above and will implement these procedures. I (we) know that any expansion to the existing design capacity of the waste treatment and storage system or construction of new facilities will require a new certification to be submitted to the Division of Environmental Management before the new animals are stocked. I (we) also understand that there must be no discharge of animal waste from this system to surface waters of the state either directly through a man-made conveyance or through runoff from a storm event less severe than the 25-year, 24-hour storm. The approved plan will be filed at the farm and at the office of the local Soil and Water Conservation District.

Name of Land Owner (Please Print): Larry Barefoot
Signature: Larry M Barefoot Date: 4-15-96
Name of Manager, if different from owner (Please print):
Signature: Date:

Note: A change in land ownership requires notification or a new certification if the approved plan is changed within 60 days of a title transfer.

DEM USE ONLY: ACEN

5. TEMPORARY STORAGE REQUIRED

Drainage Area:

Lagoon (top of dike)

Length X Width =

240 150 36000 Square Feet

Buildings (roof and lot water)

Length X Width =

0 0 0 Square Feet

TOTAL DA 36000 Square Feet

===> Design temporary storage to be 180 days.

A. Volume of waste produced

Approximate daily production of manure in CF/LB SSLW 0.00136

Volume = 153600 Lbs. SSLW X CF of waste/lb/day X 180
Volume = 37601 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 Gallons/day X 180 days storage/7.48 gallons per CF
Volume = 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 Inches X DA / 12 inches per foot

Volume = 21000 Cubic feet

D. Volume of 25 year - 24 hour storm

Volume = 7.0 inches / 12 inches per foot X DA

Volume = 21000 Cubic feet

TOTAL REQUIRED TEMPORARY STORAGE

5A.	37601 Cubic feet
5B.	0 Cubic feet
5C.	21000 Cubic feet
5D.	21000 Cubic feet
TOTAL	79601 Cubic feet

6. SUMMARY

Total required volume = 233201 Cubic feet

Total design volume avail.= 239407 Cubic feet

Min. reqrd. trtmnt. vol. plus sludge accum.= 153600 Cu. Ft.

At elev. 48.00 Ft; Vol= 158208 Cubic feet (end pumping)

Total design volume less 25yr-24hr storm = 218407 Cu. Ft.

At elev. 50.00 Ft; Vol= 216840 Cubic feet (start pumping)

Seasonal high water table elevation is 45.00 Feet, which must be lower than the elevation of top of treatment volume 48.00

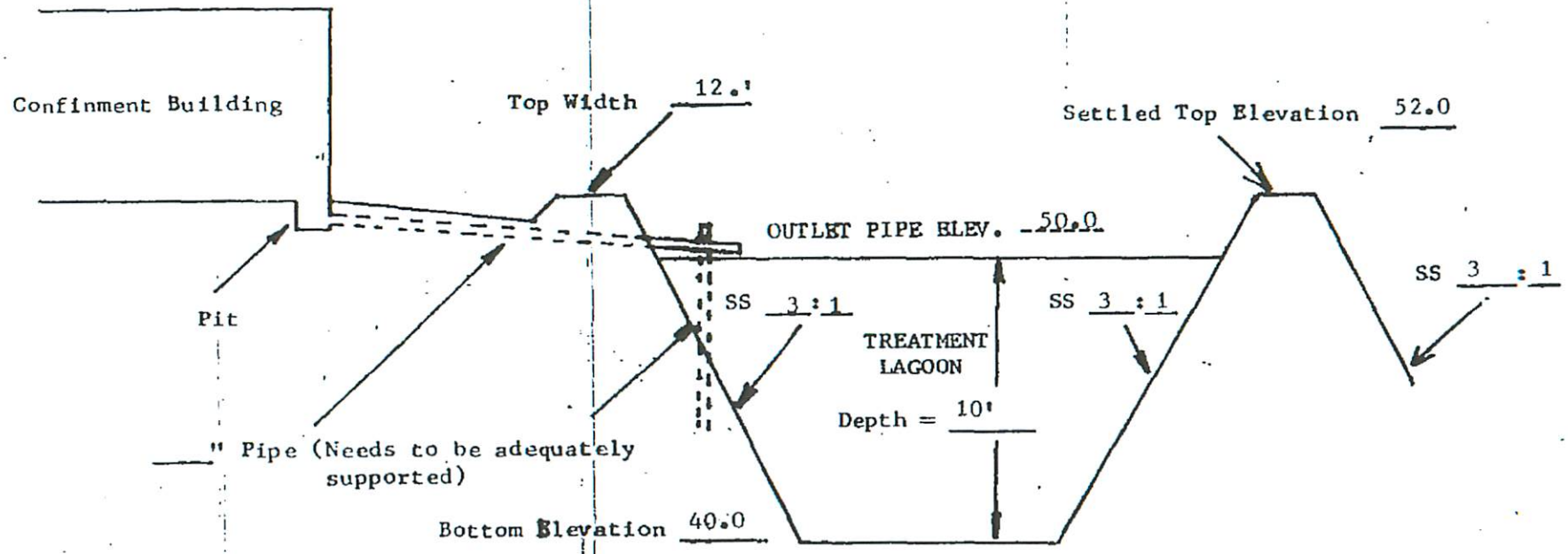
DESIGNED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

NOTE: SEE ATTACHED WASTE UTILIZATION PLAN

ADDITIONAL NOTES: _____

TYPICAL VIEW OF A ONE-STAGE LAGOON SYSTEM



U. S. DEPARTMENT OF AGRICULTURE
Soil Conservation Service

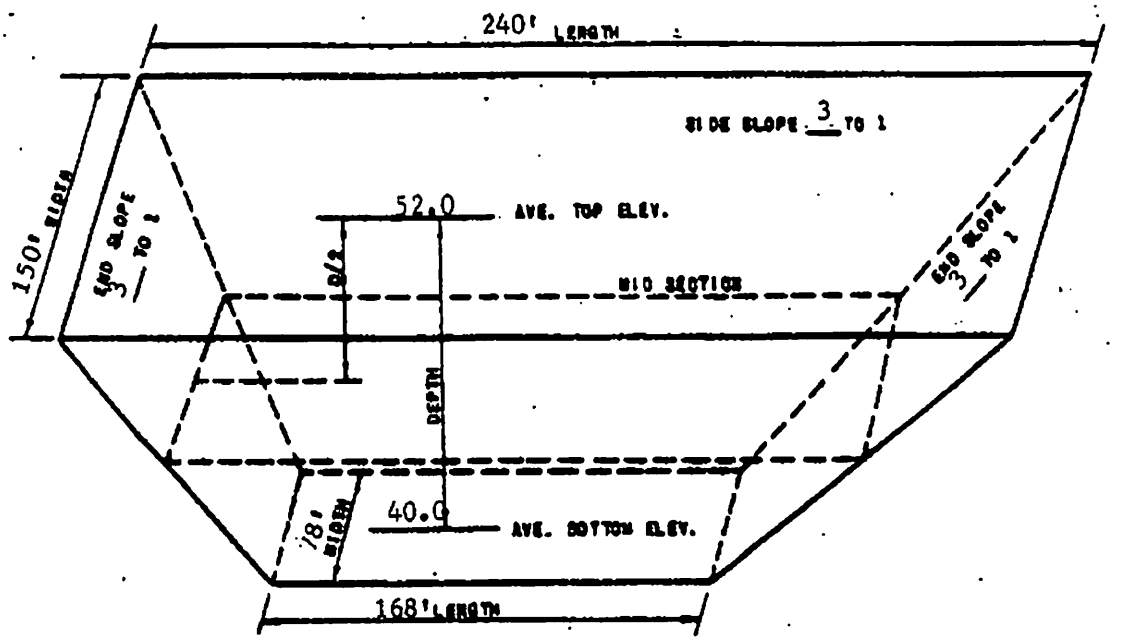
NC-ENG-48
Rev. 7/91

PLAN OF EXCAVATED WASTE STORAGE PIT

NAME: Larry Barefoot Date: 5/3/93

County: Sampson

Address: Rt. 1 Turkey, NC 28393



(See back for volume calculations)

Use of facility: _____

Capacity: _____ Gallons _____ Ft3

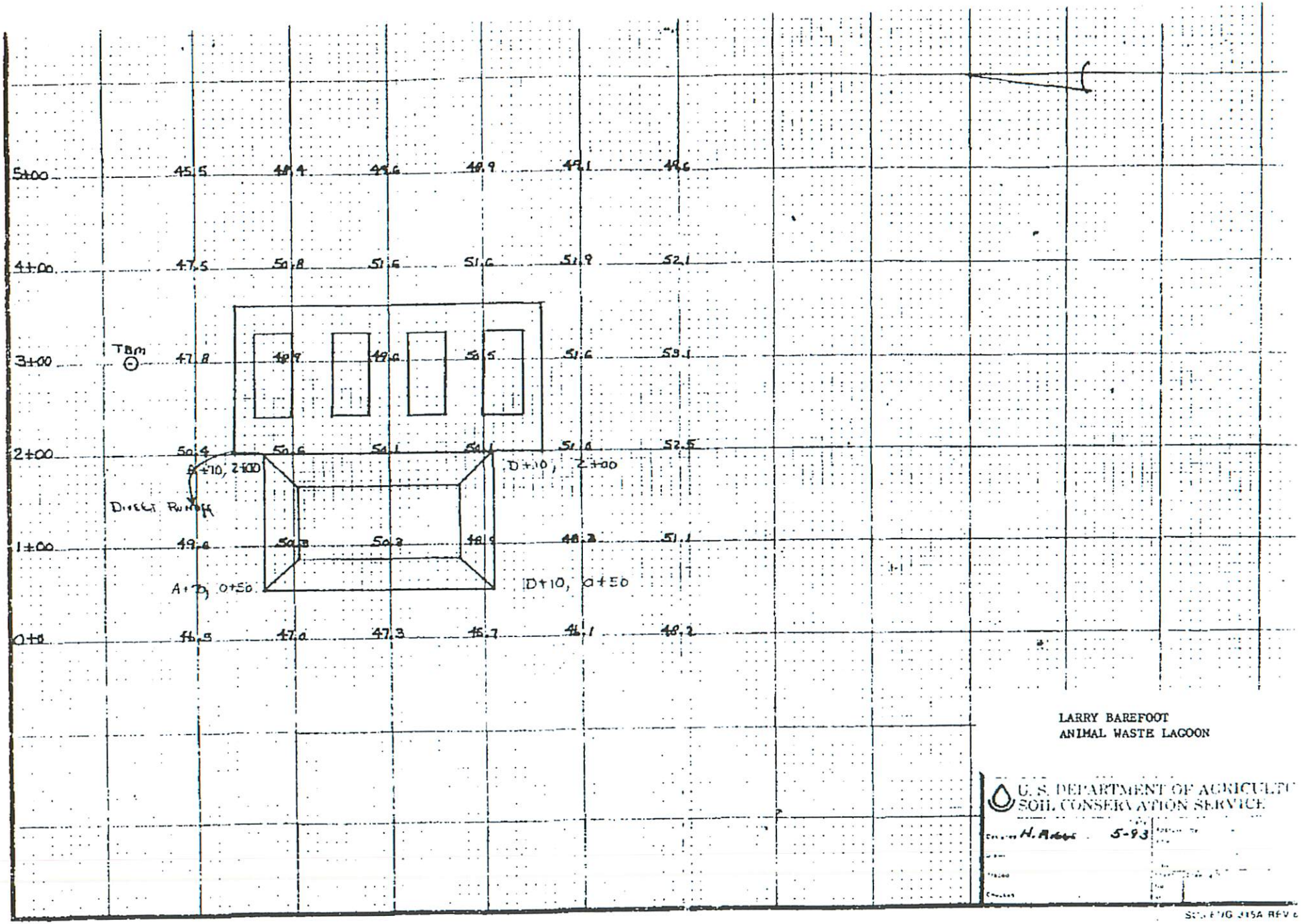
Soil Type: _____

Bench Mark Description _____

_____

SUMMARY

Bottom	Elev.	40.0
Normal Liquid Level	Elev.	
Storage for normal Precip.	(+)	Ft.
Maximum Liquid Level	Elev.	50.0
25 yr. Storm Storage	(+)	.7 Ft.
Crest ESW	Elev.	
Max.Flow Depth	(+)	Ft.
Freeboard	(+)	1.3 Ft.
Top of Dam	Elev.	52.0
T.B.M.	Elev	50.0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TBm
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50.4 50.6 50.1 50.1 51.6 52.5
49.6 50.8 50.3 48.9 48.3 51.1
46.5 47.6 47.3 45.7 46.1 46.2
D+10, 2+00
D+10, 0+50
LARRY BAREFOOT
ANIMAL WASTE LAGOON
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
5-93

IRRIGATION SYSTEM DESIGN

LARRY BAREFOOT NURSERIES

6/3/98

EXHIBIT D-1

IRRIGATION SYSTEM DESIGN PARAMETERS

Landowner/Operator Name: LARRY BAREFOOT
Address: 1605 GOSHEN CHURCH RD.
FAISON NC 28341
Telephone: (919) 594-0094

County: SAMPSON
Date: JUNE 3, 1998

TABLE 1 - Field Specifications

Field[1] Number	Approximate Maximum Useable Size of Field[2] (acres)	Soil Type	Slope (%)	Crop(s)	Maximum Application Rate[3] (in/hr)	Maximum Application per Irrigation Cycle[3] (inches)	Comments
1	8.57	GbB	< 5	Bermuda	.60	.50	*NEVER OPERATE BOTH NELSON P-100 GUNS ON THE SAME LATERAL LINE

[1]See attached map.
[2]Total field acreage minus required buffer areas.
[3]Refer to N. C. Irrigation Guide, Field Office Technical Guide, Section II G. Annual application must not exceed the agronomic rates for the soil and crop used.

TABLE 3 - Solid Set Irrigation Gun Settings

Make, Model and Type of Equipment: NELSON P-100 BIG GUN - BERKLEY B 1½ TBM PUMP

~~Field No~~ Hydrant No and ~~Line No~~[2]	Number of Hydrants	Wetted Diameter (feet)	Hydrant Spacing (ft) Along Pipeline	Hydrant Spacing (ft) Between Pipelines	Application Rate (in/hr)	OPERATING PARAMETERS Nozzle Diameter (inches)	Operating Pressure @ Gun (psi)	Operating Time @ Hydrant (hr)	Comments	
1	1	240	140	140	.43	.60	60	1hr 10min	180° arc	.22 acres
2	1	240	140	140	.43	.60	60	1hr 10min	180° arc	.22 acres
3	1	240	140	140	.43	.60	60	1hr 10min	180° arc	.22 acres
4	1	240	140	140	.43	.60	60	1hr 10min	180° arc	.22 acres
5	1	240	140	140	.43	.60	60	1hr 10min	180° arc	.22 acres
6	1	240	140	140	.43	.60	60	1hr 10min	180° arc	.22 acres
7	1	240	140	140	.43	.60	60	1hr 10min	180° arc	.22 acres
8	1	240	140	140	.54	.60	60	55 min	145° arc	.19 acres
9	1	240	140	140	.38	.60	60	1hr 45min	270° arc	.34 acres
10	1	240	140	140	.21	.60	60	2hr 15min	360° arc	.45 acres
11	1	240	140	140	.21	.60	60	2hr 15min	360° arc	.45 acres
12	1	240	140	140	.21	.60	60	2hr 15min	360° arc	.45 acres
13	1	240	140	140	.21	.60	60	2hr 15min	360° arc	.45 acres
14	1	240	140	140	.21	.60	60	2hr 15min	360° arc	.45 acres
15	1	240	140	140	.28	.60	60	1hr 45min	270° arc	.34 acres
16	1	240	140	140	.35	.60	60	1hr 20min	220° arc	.275 acres

[1]See attached map.
[2]Show separate entries for each pipeline with hydrants in each field.

TABLE 3 - Solid Set Irrigation Gun Settings

Make, Model and Type of Equipment: SAME

~~Field No~~ Hydrant No and ~~Line No~~[2]	Number of Hydrants	Wetted Diameter (feet)	Hydrant Spacing (ft) Along Pipeline	Hydrant Spacing (ft) Between Pipelines	Application Rate (in/hr)	OPERATING PARAMETERS Nozzle Diameter (inches)	Operating Pressure @ Gun (psi)	Operating Time @ Hydrant (hr)	Comments	
17	1	240	140	140	.35	.60	60	1hr 20min	220° arc	.275 acres
18	1	240	140	140	.21	.60	60	2hr 15min	360° arc	.45 acres
19	1	240	140	140	.21	.60	60	2hr 15min	360° arc	.45 acres
20	1	240	140	140	.21	.60	60	2hr 15 min	360° arc	.45 acres
21	1	240	140	140	.21	.60	60	2hr 15min	360° arc	.45 acres
22	1	240	140	140	.22	.60	60	1 hr 45min	270° arc	.34 acres
23	1	240	140	140	.21	.60	60	2hr 15min	360° arc	.45 acres
24	1	240	140	140	.35	.60	60	1hr 20min	220° arc	.275 acres
25	1	240	140	140	.35	.60	60	1hr 20min	220° arc	.275 acres
26	1	240	140	140	.43	.60	60	1hr 10min	180° arc	.22 acres

[1] See attached map.
[2] Show separate entries for each pipeline with hydrants in each field.

TABLE 4 - Irrigation System Specifications

	Traveling Irrigation Gun	Solid Set Irrigation
Flow Rate of Sprinkler (gpm)		81 per
perating Pressure at Pump (psi)		73 (2 guns operating)
Design Precipitation Rate (in/hr)		.21
Hose Length (feet)		XXXXXXXX
Type of Speed Compensation		XXXXXXXX
Pump Type (PTO, Engine, Electric)		Electric
Pump Power Requirement (hp)		9.36 - 10

TABLE 5 - Thrust Block Specifications[1]

Designer may provide thrust block details on separate sheet.

LOCATION	THRUST BLOCK AREA (sq. ft.)
90° Bend	2.14
Dead End	1.52
Tee	1.06

[1] See USDA-NRCS Field Office Technical Guide, Section IV, Practice Code 430-DD.

EXHIBIT D-5

IRRIGATION SYSTEM DESIGNER

Name: KRAIG A. WESTERBEEK, CID

Company: SELF EMPLOYEED

Address: 1635 W. WARDS BRIDGE RD. WARSAW, NC 28398

Phone: (910) 293-6787

REQUIRED DOCUMENTATION

The following details of design and materials must accompany all irrigation designs:

1. A scale drawing of the proposed irrigation system which includes hydrant locations, travel lanes, pipeline routes, thrust block locations and buffer areas where applicable.
2. Assumptions and computations for determining total dynamic head and horsepower requirements.
3. Computations used to determine all mainline and lateral pipe sizes.
4. Sources and/or calculations used for determining application rates.
5. Computations used to determine the size of thrust blocks and illustrations of all thrust block configurations required in the system.
6. Manufacturer's specifications for the irrigation pump, traveler and sprinkler(s).
7. Manufacturer's specifications for the irrigation pipe and/or USDA-NRCS standard for Irrigation Water Conveyance, N.C. Field Office Technical Guide, Section IV, Practice Code 430-DD.
8. The information required by this form are the minimum requirements. It is the responsibility of the designer to consider all relevant factors at a particular site and address them as appropriate.
9. Irrigation pipes should not be installed in lagoon or storage pond embankments without the approval of the designer.

NOTE: A buffer strip 25 feet wide or wider must be maintained between the limits of the irrigation system and all perennial streams and surface waters per NC Statutes.

Sprinkler Specifications

Nelson P100 (Part Circle) Big Gun w/ .60 Taper Bore Nozzle
@60psi: - 81 GPM Flowrate
- 240 Wetted Diameter

Sprinkler Spacing - 140 feet

$$\frac{140'}{240'} = .58 = 58\%$$

Application Rate

$$\frac{96.3 \times 81}{\pi(.9 \times 120)^2} = \frac{7800.3}{36,642.5} = .21 \text{ inches/hr.}$$

360° (Full Circle) = .21"/hr
270° (TQ) = .28"/hr.
220° = .35"/hr.
180° = .43"/hr
145° = .54"/hr.

Run Time per Hydrant

360° - $\frac{.5"}{.21"/hr}$ = 2 hours 15 mins.

270° - $\frac{.5"}{.28"/hr}$ = 1 hour 45 mins.

220° - $\frac{.5"}{.35"/hr}$ = 1 hour 20 mins.

180° - $\frac{.5"}{.43"/hr}$ = 1 hour 10 mins.

145° - $\frac{.5"}{.54"/hr}$ = 55 minutes

$$H_f = \frac{1045\left(\frac{162}{150}\right)^{1.852}}{4^{4.87}} = \frac{1205}{855} = 1.41'/100' \text{ pipe}$$

From Pump to L2 $320' \times 1.41'/100' = 4.5'$

From L2 to L1 $140' \times .39'/100' = .55'$

Max Lateral Line Friction Loss (Hydrants 1, 16 operating)

$$H_f = \frac{1045\left(\frac{81}{150}\right)^{1.852}}{4^{4.87}} = .39'/100'$$

* to hydrant 2 - $840' \times .39'/100' = 3.3'$

* to hydrant 16 - $840' \times .39'/100' = 3.3'$

$6.6'$

*Never operate both guns on same lateral

Velocity Check

$$V = \frac{.408 \times 162}{(4)^2} = 4.13 < 5 \text{ OK *MAX V}$$

Total Dynamic Head

Sprinkler Pressure	138.6' or 60psi
Max Mainline Friction Loss	5.05' or 2.2 psi
Max Lateral line F/L	6.6' or 2.9 psi
Elevation to gun	4' or 1.73psi
Max field Elevation	0' or .0 ipsi
4" Suction Hose Loss + 6' lift	6.3' or 2.7 psi
5% Misc. Fitting Loss	8.03 or 3.48psi
	168.6 or 73.0psi

$$Whp = \frac{162 \times 169'}{3960} = 6.9', hp$$

$$Bhp = \frac{6.9hp}{.737} = 9.36hp$$

*Based on eff. of 73.7% using a Berkley B1½ TBM w/ 6-9/16" Impeller

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NPSHR @ 162gpm = 18'

NPSHA = (14.3 × 2.31) - 6' - 1.0' - .8' = 25.2'

NPSHA > NPSHR - OK

Thrust Blocks (100psi MAX, 1200lb/ft² SBS)

4" End Cap - $\frac{1820}{1200} = 1.52 ft^2$

4" Tee - $1.52 \times .70 = 1.06 ft^2$

4" Elbow (90°) - $1.52 \times 1.41 = 2.14 ft^2$

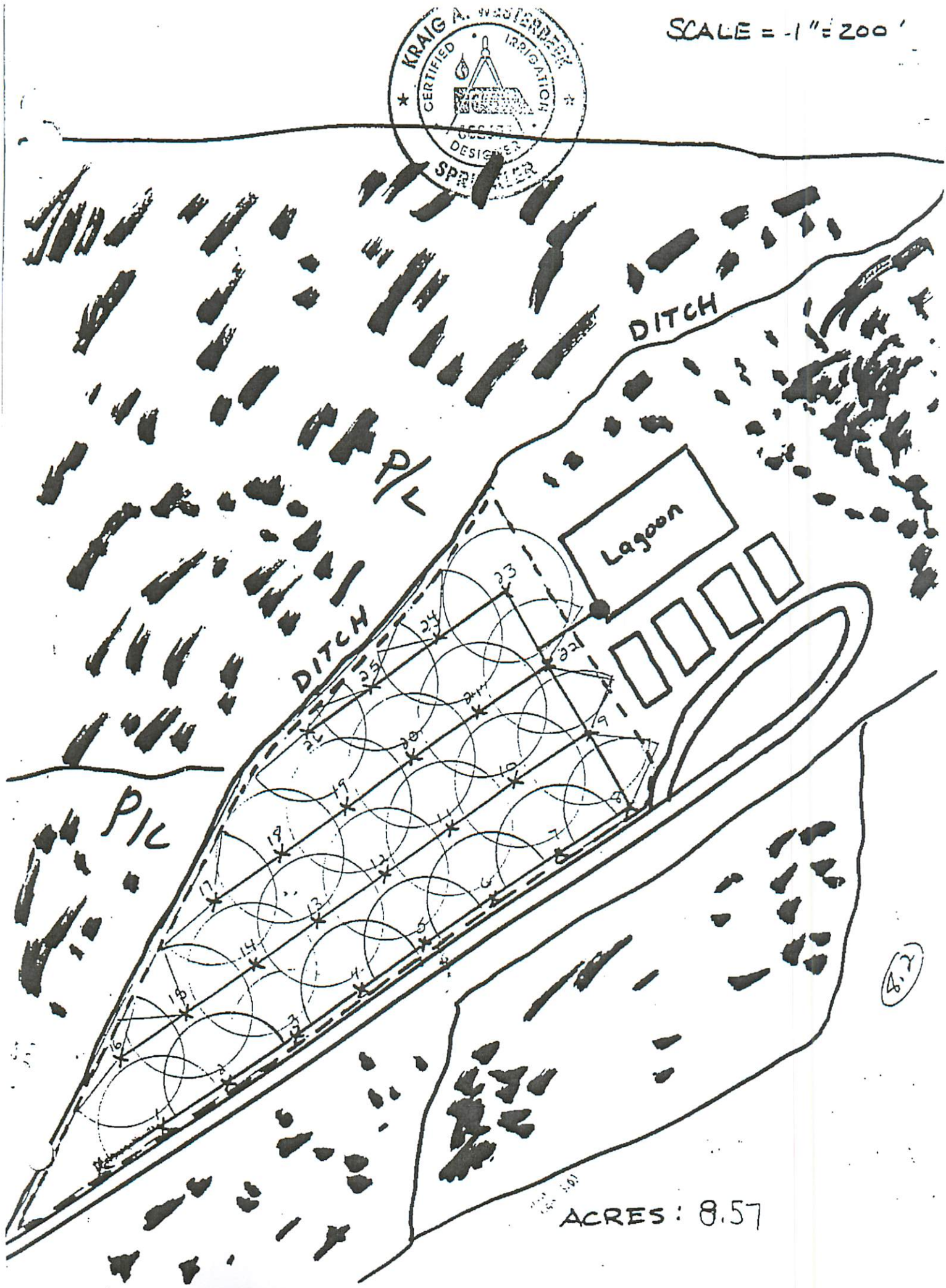
Pumping Days

5120hd × 1.0gl/h/d × 365 = 1,868,800 gallons

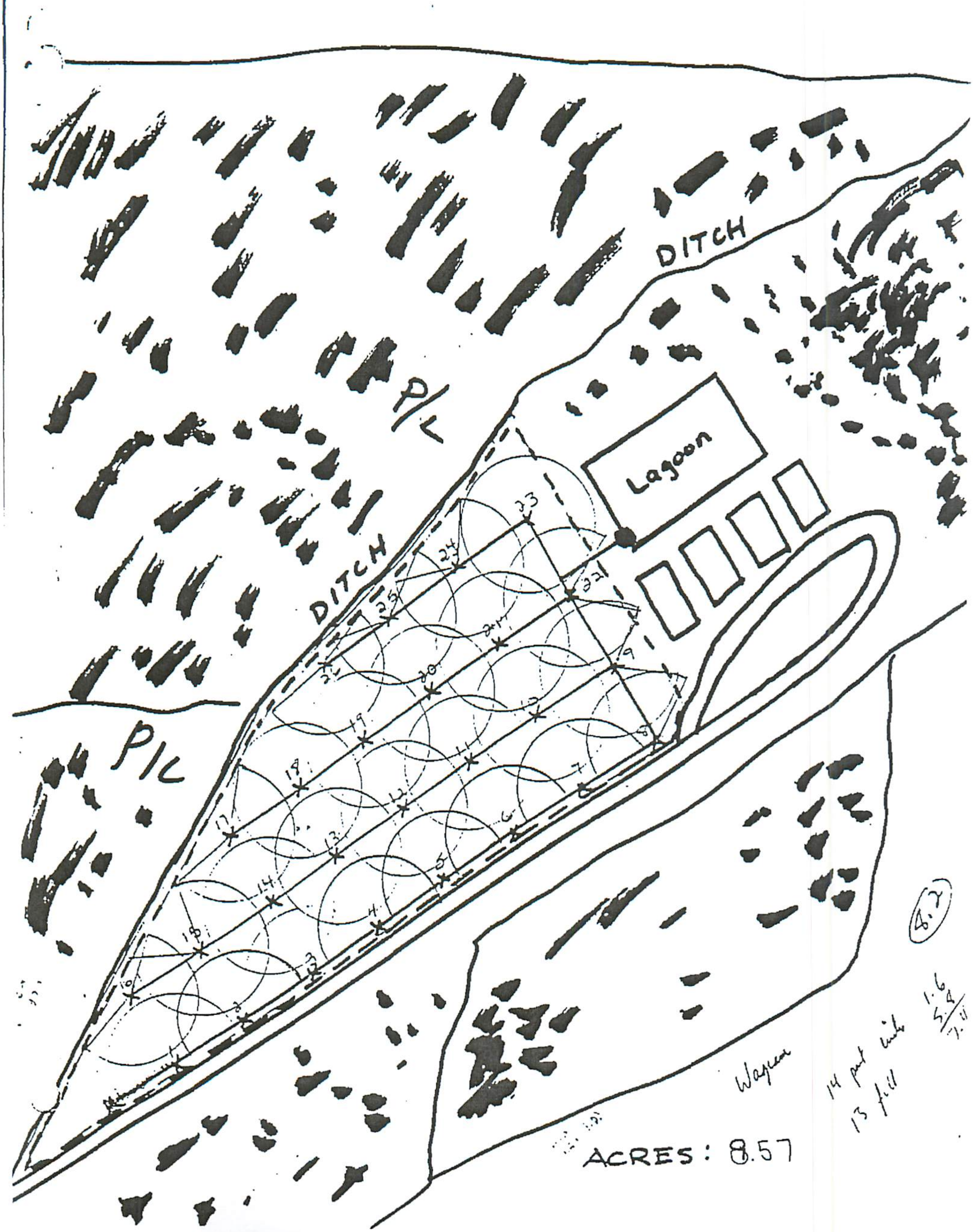
1acre × 9.5"/yr. × 27,154 = 257,963gallons

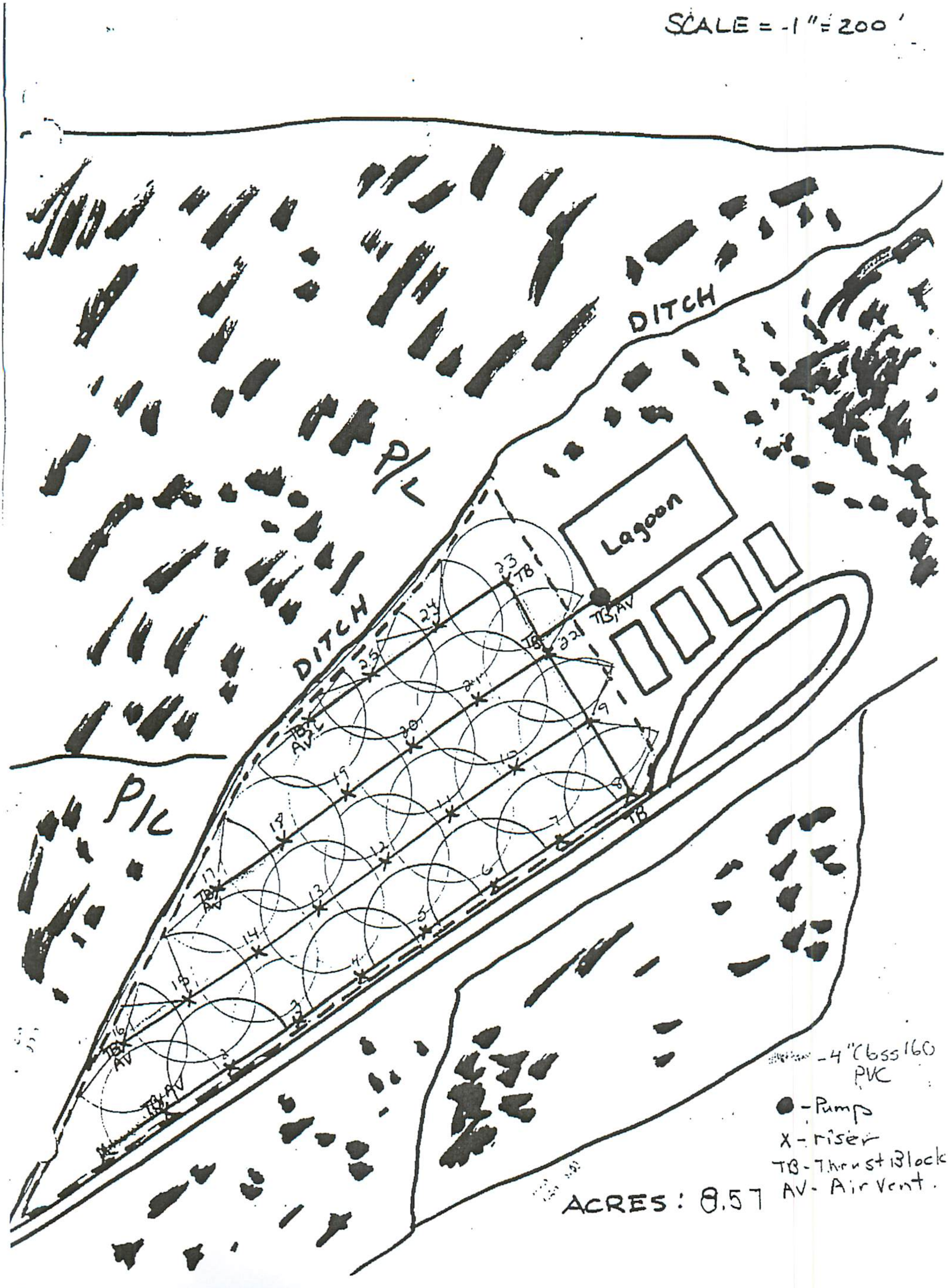
2,126,763gallons ÷ 162gpm ÷ 60min/hr ÷ 8hr/day =

27days per year


SCALE = 1" = 200'
KRAIG A. WESTERBEEK
CERTIFIED IRRIGATION
DESIGNER
DITCH
P/L
Lagoon
DITCH
P/L
ACRES: 8.57

SCALE = 1" = 200'




SCALE = 1" = 200'
DITCH
DITCH
P/L
P/L
Lagoon
TB, AV
TB
AV
-4" Class 160 PVC
● - Pump
X - riser
TB - Thrust Block
AV - Air Vent.
ACRES: 8.57

Appendix 1. Lagoon Sludge Survey Form

346,477.50 gals. sludge

A. Farm Permit or DWQ Identification Number AWS820058

B. Lagoon Identification Barefoot Nursery

C. Person(s) Taking Measurements Nathan Bridges

D. Date of Measurement 12/31/24

E. Methods/Devices Used for Measurement of:

a. Distance from the lagoon liquid surface to the top of the sludge layer.
Disk

b. Distance from the lagoon liquid surface to the bottom (soil) of the lagoon.
Grade rod

c. Thickness of the sludge layer if making a direct measurement with "core sampler".
N/A

F. Lagoon Surface Area (using dimensions at inside top of bank): _____ (acres)
(Draw a sketch of the lagoon on a separate sheet, list dimensions, and calculate surface area. **The lagoon may have been built different than designed, so measurements should be made.)**

G. Estimate number of sampling points:

a. Less than 1.33 acres: Use 8 points

b. If more than 1.33 ac. 0 acres x 6 = 9.0 , with maximum of 24.

(Using sketch and dimensions, develop a uniform grid that has the same number of intersections as the estimated number of sampling points needed. Number the intersection points on the lagoon grid so that data recorded at each can be easily matched.)

H. Conduct sludge survey and record data on "Sludge Survey Data Sheet" (Appendix 2). **Also, at the location of the pump intake, take measurements of distance from liquid surface to top of sludge layer and record it on the Data Sheet (last row); this must be at least 2.5 ft. when irrigating.**

I. At the time of the survey, also measure the distance from the Maximum Liquid Level to the Present Liquid Level (measure at the lagoon gauge pole): 0.2

J. Determine the distance from the top of bank to the Maximum Liquid Level (use lagoon management plan or other lagoon records) 1.6

K. Determine the distance from the Maximum Liquid to the Minimum Liquid level: (use lagoon management plan or other lagoon records) 2.0

L. Calculate the distance from the present liquid surface level to the Minimum Liquid Level (**Item K Minus Item I**, assuming the present liquid level is below the Maximum Liquid Level) 1.8

M. Record from the Sludge Survey Data Sheet the distance from the present liquid surface level to the lagoon bottom (average for all the measurement points) 8.0

N. Record from the Sludge Survey Data Sheet the distance from the present liquid surface level to the top of the sludge layer (average for all the measurement points): 5.0

O. Record from the Sludge Survey Data Sheet the average thickness of the sludge layer: 3.0

P. Calculate the thickness of the existing Liquid Treatment Zone (**Item N minus Item L**): 3.2

Q. **If Item O is greater than Item P, proceed to the Worksheet for Sludge Volume and Treatment Volume. If Item O is equal to or less than Item P, you do not have to determine volumes.**

Completed by: Nathan Bridges Date: 12/31/24
Print Name /Signature

Appendix 2. Sludge Survey Data Sheet* Revised August 2008

Lagoon Identification: Barefoot Nursery

Completed by: Nathan Bridges _____ Date: 12/31/24

Print Name Signature

(A) Grid Point No.	(B) Distance from liquid surface to top of sludge			(C) Distance from liquid surface to lagoon bottom (soil)			(C) - (B) Thickness of sludge layer		
	Ft.	& in.	Ft. (tenths)	Ft.	& in.	Ft. (tenths)	Ft.	& in.	Ft. (tenths)
1			7.0			8.1			
2			8.3			9.0			
3			7.2			8.3			
4			2.4			8.4			
5			3.4			7.5			
6			6.0			8.2			
7			4.2			7.8			
8			3.0			7.1			
9			3.2			7.5			
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
Number of points with readings			9.0	X	X	9.0	X	X	NA
Average of points	X	X	5	X	X	8.0	X	X	3.0
At pump intake	X	X		X	X	X	X	X	X

*All Grid Points and corresponding sludge layer thicknesses must be shown on a sketch attached to this Sludge Survey Data Sheet.

Agriment Services, Inc.

Appendix 1. Lagoon Sludge Survey Form **Revised August 2008**

A. Farm Permitor DWQ Identification Number: → **82-58**

B. Lagoon Identification: → **Barefoot Nursery**

C. Person(s) taking Measurements: → **Nathan Bridges**

D. Date of Measurements: → **12/31/2024**

E. Methods/Devices Used for Measurement of:

a. Distance from the lagoon liquid surface to the top of the sludge layer: → **Sonar Boat**

b. Distance form the lagoon liquid surface to the bottom soil of lagoon: → **Range Pole**

c. Thickness of the sludge layer if making a direct measurement with "core sampler": **n/a**

F. Lagoon Surface Area (using dimensions at inside to of bank): → **0.83**
(Draw a sketch of the lagoon on separate sheet, list dimensions and calculate surface area. **The lagoon may have been built different than designed, so measurements should be made.)**

G. Estimate number of sampling points:

a. Less than 1.33 acre, use 8 points: → **8**

b. If more than 1.33 acre, surface area acres x 6 = sampling points, with a maxium of 24: →

(Using sketch and dimensions, develop a uniform grid that has the same number of intersection as the estimated number of sampling points needed. Number the intersection points on the lagoon grid so that data recorded at each can be easily matched.)

H. Conduct sludge survey and record data on "Sludge Survey Data Sheet" (Appendix 2). **Also, at the location of the pump intake, take measurement of distance from liquid surface to top of sludge layer and record it on the Data Sheet (last row); this must be at least 2.5 ft. when irrigating.**

I. At time of sludge survey, also measure the distance from the Maximum Liquid Level to the Present Liquid Level (measure at the lagoon gage pole): → **0.20**

J. Determine distance from top of bank to the Maximum Liquid Level (use lagoon management plan or other lagoon records): → **1.60**

K. Determine distance from Maximum Liquid Level to Minimum Liquid Level (use lagoon management plan or other lagoon records): → **2.00**

L. Calculate distance from present liquid surface level to Minimum Liquid Level (**Item K - Item I**, assuming present liquid level is below Max. Liq. Level): → **1.80**

M. Record from sludge survey data sheet the distance from the present liquid surface level to the lagoon bottom (average for all the measurement points): → **8.00**

N. Record from sludge survey data sheet the distance from the present liquid surface level to the top of the sludge layer (average for all the measurement points): → **5.00**

O. Record from sludge survey data sheet the average thickness of the Sludge Layer: → **3.00**

P. Calculate the thickness of the existing Liquid Treatment Zone (**Item N - Item L**): → **3.20**

Q. **If Item O is greater than Item P, proceed to the Worksheet for Sludge Volume and Treatment Volume. If Item O is equal to or less than Item P, you do not have to determine volumes.**

Completed by: **Ronnie G. Kennedy** (Print Name) _____ (Signature)

Agriment Services, Inc.

Appendix 3. Worksheet for sludge volume and treatment volume **Revised August 2008**

The average thickness of the sludge layer and the thickness of the existing liquid (sludge-free) treatment zone (are determined from information on the Lagoon Sludge Survey Form (Item O and P, respectively). **If the lagoon has a designed sludge storage volume, see notes at end of the worksheet.** The dimensions of the lagoon as measured and the side slope are needed for calculations of sludge volume and of total treatment volume. If the lagoon is a standard geometric shape, the sludge volume and treatment volume in the lagoon can be estimated by using standard equations. For approximate volumes of rectangular lagoons with constant side slope, calculate length and width at the midpoint of the layer, and multily by layer thickness to calculate layer volume. For irregular shapes, convert the total surface area to a square or rectangular shape. For exact volumes for lagoons with constant side slope, the "Prismoidal Equations" may be used.

	Lagoon
1 Average Sludge Layer Thickness *(T)* :	3.00 ft.
2 Depth of lagoon from top of bank to bottom soil surface *(D)* :	12.00 ft.
3 Slope = horizontal/vertical side slope *(S)* :	3.00
4 Length at top inside bank *(L)* :	240.00 ft.
5 Width at top inside bank *(W)* :	150.00 ft.
6 Length at midpoint of sludge layer *(Lm) = L - 2 S (D - (T/2))* :	177.00 ft.
7 Width at midpoint of sludge layer *(Wm) = W - 2 S (D - (T/2))* :	87.00 ft.
8 Volume of sludge *(Vs) = Lm Wm T* :	46,197.00 ft³
9 Volume in gallons *Vsg = V (7.5 gal./ft³)* :	346,477.50 gal.
10 Thickness of existing liquid tmt. zone (Y)	3.20 ft.
11 Thickness of total treatment zone (Z) = T + Y	6.20 ft.
12 Length at midpoint of total tmt. zone Lz = L - 2(S)(D-(Z/2)	186.60 ft.
13 Width at midpoint of total tmt. Zone Wz = W - 2(S) (D -(Z/2)	96.60 ft.
14 Volume of total treatment zone (Vz) = Lz Wz Z	111,758.47 ft³
15 Ratio (R) of sludge layer volume to total Treatment volume R = Vs/Vz	0.41

If the ratio exceeds 50%, than a sludge Plan of Action may be required. Check with DWQ for information on filing the Plan of Action.

Note: If the lagoon has a designed sludge storage volume (DSSV), subtract that volume from both the volume of sludge (Vs) (Item 8) and from the volume of total treatment zone (Vz) (Item 14), and take the ratio:

16 Design sludge storage volume (DSSV)	ft³
17 Ratio (R) of sludge layer volume to treatment volume adjusted for (DSSV).	0.41

Lagoon Identification: Barefoot Nursery Date: 12/31/2024

Completed by: Ronnie G. Kennedy (Print Name) _____ (Signature)