

Nutrient Management Plan

For Cannon Hill Feeders

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GENERAL INFORMATION

2019 Operation Information for Cannon Hill Feeders

Calendar Year 2019

Reporting: January 1 through December 31, 2019

Name:	Zachary Mautz	
Business	Cannon Hill Feeders	
Mailing	P.O. Box 1625, Nyssa, OR 97913	
Facility	3127 Kimberly Ave, Nyssa, OR 97913	County: Malheur
Telephone	(541) 372-5680	Cell Phone NA
E-mail	cannonhillfeeders@wildblue.net	

Permitted and Proposed number of animals by type on the farm averaged over the year [S4.D.2(a)/S4.D.2(a)(ii) of the permit].

Animal Type	Average Weight (Lbs)	Days on Farm		Permitted	Proposed
		Start Month	End Month		
Beef Feeders	900	January	December	11,000	20,000
Other:					
Total Animals-				11,000	20,000

Estimated Solids Generated:	Manure Solids Generated -	8,127,090 CF
	Bedding Generated -	0 CF
	Imported Solids -	0 CF
	Total Solids to Store -	8,127,090 CF

Estimated Liquids Generated:	Manure Liquids Generated -	0 CF
	Rainfall-Evaporation on Storage plus Runoff Generated -	90,583 CF
	Process Water Generated -	0 CF
	Imported Liquids -	0 CF
	Total Liquids to Store -	90,583 CF

Land Application:	Estimated Liquids Applied to Land -	90,583 CF
	Estimated Solids Applied to Land -	6,597,090 CF
	Estimated Grazing Manure Applied to Land -	0 CF
	Estimated Liquids Exported -	0 CF
	Estimated Solids Exported -	1,530,000 CF
	Acres of Land for Land Application Covered by NMP -	450.9 Ac
	Acres of Land Under Operator Control Used for Manure Applications -	450.9 Ac

2019 Storage Facilities for Cannon Hill Feeders

Facility Name	Description	Type	Capacity	Units	Storage Period (Days)	Diameter (ft)	Top Length (ft)	Top Width (ft)	Depth (ft)	Sideslope Z	Freeboard (ft)	Volume (CF)	Covered
Area 1 Livestock Pens	Feedlot 1	Solid	1,722,554	CF	136		1,942	1,774	0.5	0	0	1,722,554	N
Area 2 Livestock Pens	Feedlot 2	Solid	732,716	CF	58		1,244	1,178	0.5	0	0	732,716	N
Area 3 Livestock Pens	Feedlot 3	Solid	592,519	CF	47		1,333	889	0.5	0	0	592,519	N
Lagoon 1	Area 1 Runoff Lagoon	Liquid	226,335	CF	29		864	177	2.6	3	1	226,895	N
Lagoon 2	Area 1 Runoff Lagoon	Liquid	346,260	CF	45		863	226	2.9	3	1	346,644	N
Lagoon 3	Area 2 Upper Runoff Lagoon	Liquid	39,902	CF	5		287	55	5	3	1	40,004	N
Lagoon 4	Area 3 Lower Runoff Lagoon	Liquid	124,680	CF	16		265	144	5	3	1	495,636	N
Lagoon 5	Lower Runoff Lagoon	Liquid	56,664	CF	7		199	96	5	3	1	56,664	N
Lagoon 6	Lower Runoff Lagoon	Liquid	36,672	CF	5		246	58	5	3	1	36,672	N
Lagoon 7	Lower Runoff Lagoon	Liquid	156,408	CF	20		584	87	5	3	1	156,408	N
Lagoon 8	Lower Runoff Lagoon	Liquid	47,312	CF	6		208	80	5	3	1	47,312	N
Compost Yard	Composting Area	Solid	1,575,290	CF	124		1,062	262	0.5	0	0	1,575,290	N

2019 Storage Period Calculations for Cannon Hill Feeders

SOLIDS STORAGE		Month	Number of Days	Manure CF	Bedding CF	Imported Solids CF	Solids to Store CF	Storage Volume Needed, CF
Storage Unroofed Surface Area, SF=	6,373,821	October	31	690,246	0	0	172,562	172,562
Available Storage, CF=	4,623,079	November	30	667,980	0	0	166,995	339,557
Solids Removal Factor=	1.00	December	31	690,246	0	0	172,562	512,118
Storage Volume Reduction Factor=	0.75	January	31	690,246	0	0	172,562	684,680
Solids Storage Period, Days=	365	February	28	623,448	0	0	155,862	840,542
		March	31	690,246	0	0	172,562	1,013,103
		April	30	667,980	0	0	166,995	1,180,098
		May	31	690,246	0	0	172,562	1,352,660
		June	30	667,980	0	0	166,995	1,519,655
		July	31	690,246	0	0	172,562	1,692,216
		August	31	690,246	0	0	172,562	1,864,778
		September	30	667,980	0	0	166,995	2,031,773
		Annual	365	8,127,090	0	0	2,031,773	

LIQUID STORAGE		Month	Number of days	Rainfall Inches	Evaporation Inches	Rain-Evap on Storages CF	Rainfall Runoff CF	Manure CF	Process Water CF	Imported Liquids CF	Monthly Liquids to Store CF	Total Storage Volume Needed, CF
Climate Station-	Malheur	October	31	0.65	1.98	21,031	8,283	0	0	0	29,314	29,314
Storage Unroofed Surface Area, SF=	589,000	November	30	1.19	0.50	191,885	21,823	0	0	0	213,709	243,022
Available Storage, CF=	1,034,233	December	31	1.38	0.71	216,133	26,957	0	0	0	243,090	486,112
Runoff Area, SF=	358,377	January	31	1.29	0.74	198,292	24,510	0	0	0	222,802	708,915
25Yr-24Hr Storm Precip, In=	1.80	February	28	1.04	1.09	135,645	17,870	0	0	0	153,516	862,430
25Yr-24Hr Storm Runoff, CF=	181,429	March	31	1.08	2.06	95,309	18,914	0	0	0	114,223	976,654
25Yr-24Hr Storm on Storage, CF=	88,350	April	30	0.84	3.79	-33,254	12,794	0	0	0	-20,460	956,194
Total 25Yr-24Hr Storm Storage Needed, CF=	269,779	May	31	0.98	5.12	-73,073	16,321	0	0	0	-56,752	899,442
Storage Period without 25yr-24 Storm, Days=	365	June	30	0.76	6.08	-160,205	10,849	0	0	0	-149,355	750,086
Storage Period with 25yr-24 Storm, Days=	133	July	31	0.36	7.62	-308,541	2,486	0	0	0	-306,055	444,032
		August	31	0.38	6.51	-250,421	2,820	0	0	0	-247,602	196,430
		September	30	0.48	4.03	-110,508	4,661	0	0	0	-105,846	90,583
		Annual	365	10.43	40.23	-77,705	168,289	0	0	0	90,583	

2019 Manure Nutrient Balance for Cannon Hill Feeders

Manure Nutrients in Storage-

Nutrient Concentrations:	Nitrogen (Total N)	Phosphorus (P ₂ O ₅)	Potassium (K ₂ O)	Units
Liquid Manure-	4.05	2.21	18.19	lbs/1000 Gal
Solid Manure-	7.60	7.00	14.00	lbs/Ton

Manure Nutrient Balance-

Nutrients Generated:	N Generated (lbs) after Losses	P ₂ O ₅ Generated (lbs) after Losses	K ₂ O Generated (lbs) after Losses
Liquid Manure-	29,587 lbs	16,145 lbs	132,885 lbs
Solid Manure-	277,946 lbs	256,003 lbs	512,007 lbs
Grazing Manure-	0 lbs	0 lbs	0 lbs
Total-	307,533 lbs	272,148 lbs	644,891 lbs

Exported Nutrients:	N Exported (lbs) after Losses	P ₂ O ₅ Exported (lbs) after Losses	K ₂ O Exported (lbs) after Losses
Liquid Manure-	0 lbs	0 lbs	0 lbs
Solid Manure-	156,987 lbs	144,593 lbs	289,187 lbs
Total-	156,987 lbs	144,593 lbs	289,187 lbs

Crop Nutrient Removal:	N Utilized (lbs)	P ₂ O ₅ Utilized (lbs)	K ₂ O Utilized (lbs)
Total-	155,701 lbs	61,911 lbs	229,477 lbs

Net Nutrients:	Nutrients Generated after Losses(lbs.)	Nutrients Removed by Crop and Exported after Losses (lbs)	Net Nutrient Balance after Losses (lbs)
Nitrogen (N)-	307,533 lbs	312,688 lbs	-5,155 lbs
Phosphate (P ₂ O ₅)-	272,148 lbs	206,504 lbs	65,644 lbs
Potassium (K ₂ O)-	644,891 lbs	518,664 lbs	126,228 lbs

System Losses:	Nutrients Generated (lbs)	Nutrients Remaining after Losses (lbs)	Nutrients Lost in System (lbs)
Nitrogen (N)-	2,365,200 lbs	307,533 lbs	2,057,667 lbs
Phosphate (P ₂ O ₅)-	662,282 lbs	272,148 lbs	390,134 lbs
Potassium (K ₂ O)-	870,854 lbs	644,891 lbs	225,962 lbs

Note: Total nutrients utilized and generated are computed from reference data taken from Extension Publications or the USDA Natural Resources Conservation Service National Agricultural Waste Management Field Handbook. Nutrients generated after losses are computed from analytical data by taking the total volume of material times the nutrient analysis of the material except for grazing where reference data is used.

GENERAL INFORMATION

Background And Site Information

Cannon Hills Feeders is located at 3127 Kimberly Ave. in Nyssa, Oregon and is owned by Zachary Mautz. The operation is a beef finishing feedlot and is set on 791.1 acres in Malheur County. Approximately 340.2 acres are used for the beef finishing feedlot areas and 450.9 acres are available for manure application. The beef feedlot is in full operation yearlong, at which time animal numbers may reach 20,000 head. Currently the feedlot is permitted for 11,000 mature cattle and an application to modify animal numbers is located in the Supplemental Documents section of the nutrient management plan. Drawings and calculations for the existing feedlot layout and rainfall runoff storage lagoons in Area 1 and the planned feedlot layout and rainfall runoff storage lagoons in Area 2 and Area 3 are located in the Supplemental Documents section of the nutrient management plan.

The cattle are of mixed breeds. The majority of young animals are brought on to the feedlot at a weight of approximately 600 pounds. Most animals are shipped off the operation when finished at approximately 1200 pounds. The average weight of the animals during the confinement period is 900 pounds.

Any mortalities that happen on the Lightning Feedlot are picked up and disposed of by the Darling Delaware rendering service.

Manure Collection Methods

All the cattle are confined in earthen pens. The manure is collected in the pens where it dehydrates and is used as bedding for the cattle. When the cattle are removed from the facility, the pens are cleaned and the dry manure is used as a soil amendment. Some manure is left in the pens, mounded and packed for bedding in the fall.

There are two rainfall runoff storage lagoons use to catch contaminated runoff that may occur during a winter storm event from the feedlot shown in Area 1 on the Headquarters map in Section 2 of the nutrient management plan. There are five rainfall runoff storage lagoons planned for Area 2 and Area 3 shown on the Headquarters map in Section 2 of the nutrient management plan to catch contaminated runoff that may occur during a winter storm event from the planned feedlots. All of the stored runoff in the rainfall runoff storage lagoons evaporates by fall except when there is a large winter storm event such as a 25 year-24 hour storm. Any rainfall runoff remaining in the rainfall runoff storage lagoons is pumped to the crop land fields. Earthen berms and grass filter strips are maintained around the pens to reduce potential for runoff during a large winter storm event.

Manure Storage Facilities and Transfer

The manure generated at the facility is handled in a dry solid form. Dry manure is scraped and stacked within feedlots during the confinement period, some manure may be moved to a secure dry stack area until land is open for application, and then land applied during the growing season. Any runoff from the secure dry stack area will drain to the evaporation ponds. All manure will be contained within the facilities. Clean water is diverted around the system, except in extreme conditions, when some rainfall enters the feedlots.

The two existing and two planned rainfall runoff storage lagoons are available to catch contaminated rainfall runoff that falls on the pens. All rainfall runoff that is collected in the rainfall runoff storage lagoons evaporates due to the dry climate (10.43" average annual rainfall, 40.23" average annual evaporation). Solids that are collected in the ponds are cleaned out every five years, or as needed. The solids are applied to crop ground at agronomic rates.

GENERAL INFORMATION

The solid manure is stored within the feedlot pens, but some may be moved to a secure dry stack area. Solid manure is transported to fields using a 450 cubic foot manure spreader.

Corn silage is stored in 340' x 300' concrete bunker. All leachate and contaminated runoff is contained and evaporated.

Manure Utilization

The land available for manure application is owned by Henry Mautz. There are 450.9 acres crop land adjacent to the feedlots used for a utilization area for the manure produced from the feedlots. Currently the alfalfa yields 7 tons per acre, the corn silage yields 30 tons (as-fed) per acre, the corn grain yields 4 tons per acre, and the wheat yields 110 bushels per acre. The crops are used as feed in a high roughage ration for the cattle. Additional feedstuffs are imported to the feedlot.

Manure is applied via a 450 cubic foot solid manure spreader. Buffers shown on the map in Section 3 of the nutrient management plan are maintained next to drainageways and irrigation ditches to keep manure from entering surface water sources during applications of manure.

Dry manure is spread in a wheat-corn silage-corn grain rotation. Some manure is applied to the alfalfa at this time. Approximately 75% of the dry manure is exported off the farm by local farmers and gardeners. These manure solids are exported from spring through fall of each year. Manure is not only used for nutrient benefits, but also to improve soil tilth via the inputs of organic material. The applications of manure are balanced for nitrogen production and use.

GENERAL INFORMATION

Emergency Response Plan

In Case of an Emergency Storage Facility Spill, Leak or Failure-

Implement the following first containment steps:

- Stop all other activities to address the spill.
- Stop the flow. For example, use skid loader or tractor with blade to contain or divert spill or leak.
- Call for help and excavator if needed.
- Complete the clean-up and repair the necessary components.
- Assess the extent of the emergency and request additional help if needed.

In Case of an Emergency Spill, Leak or Failure during Transport or Land Application-

Implement the following first containment steps:

- Stop all other activities to address the spill and stop the flow.
- Call for help if needed.
- If the spill posed a hazard to local traffic, call for local traffic control assistance and clear the road

and roadside of spilled material.

Contain the spill or runoff from entering surface waters using straw bales, saw dust, soil or other

appropriate materials.

If flow is coming from a tile, plug the tile with a tile plug immediately.

Assess the extent of the emergency and request additional help if needed.

Contacts to be made by the owner or operator within 24 hours-

Organization

Phone Number

Oregon Department of Agriculture

(503) 986-4699

Natural Resources Division TTD

(503) 986-4762

635 Capitol St., N.E.

Salem, OR 97301-2532

Oregon Emergency Response (System OERS) (800) 452-0311

Be prepared to provide the following information:

Your name and contact information.

Farm location (driving directions) and other pertinent information.

Description of emergency.

Estimate of the amounts, area covered, and distance traveled.

Whether manure has reached surface waters or major field drains. Include the name of the surface water source that manure reached. Contact the Oregon

Emergency Response System if manure entered a drinking water source.

Whether there is any obvious damage: employee injury, fish kill, or property damage.

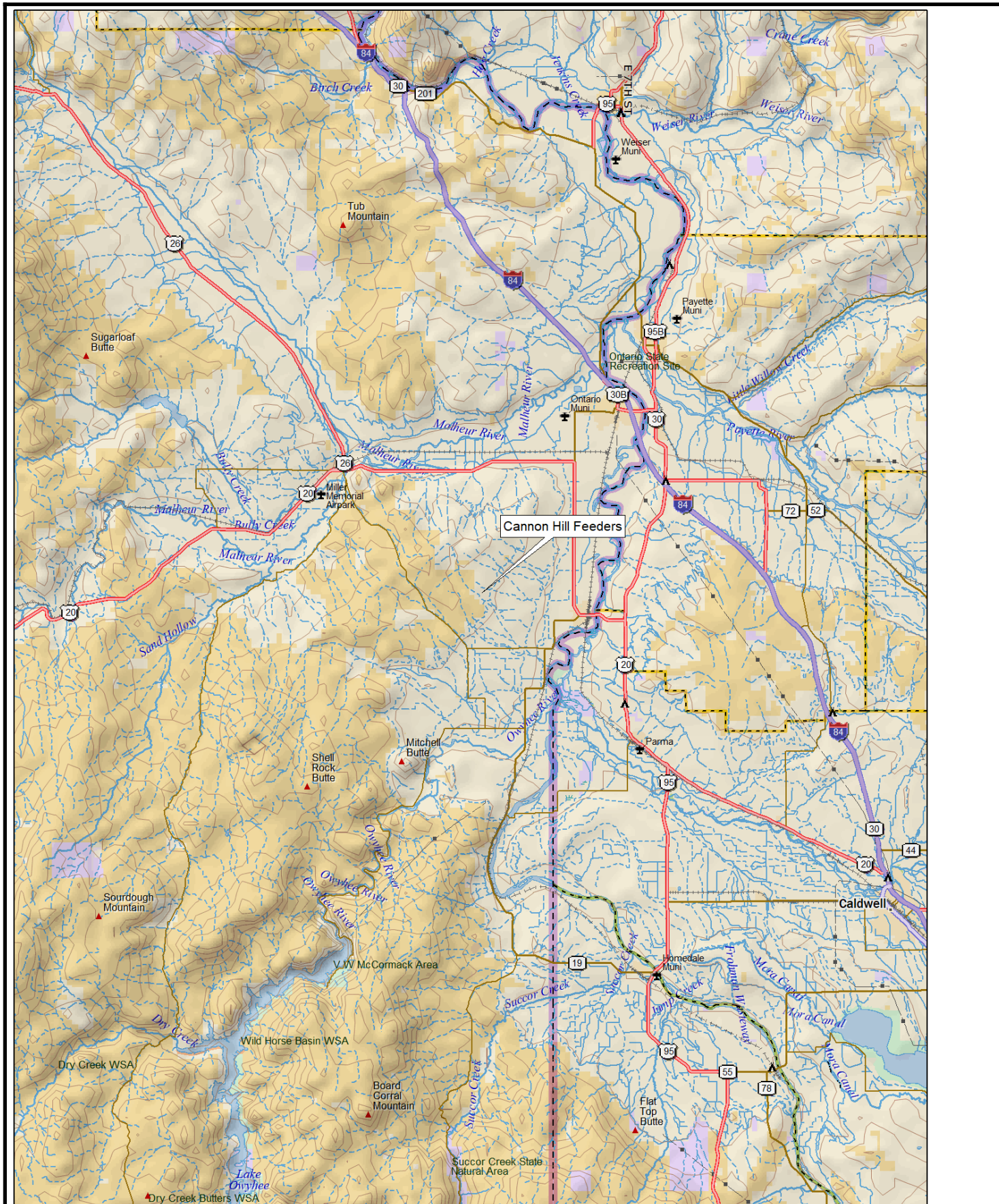
If a grab sample of the discharge was taken.

Current status of containment efforts.

GENERAL INFORMATION

Location Maps for Cannon Hill Feeders

Location Map #1



Data use subject to license.

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www.delorme.com



Scale 1 : 400,000



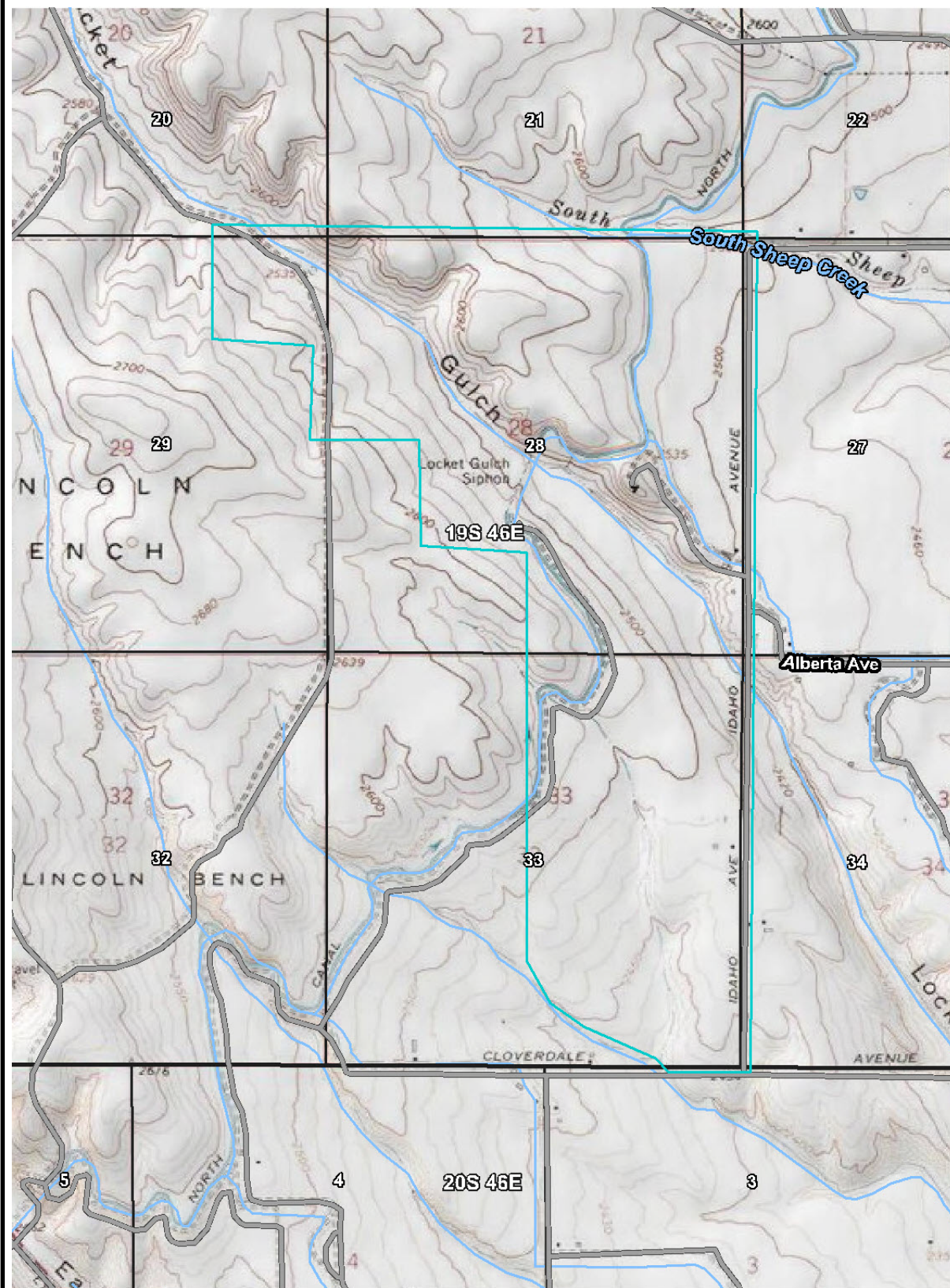
1" = 6.31 mi

Data Zoom 9-0

GENERAL INFORMATION

Topographical Maps for Cannon Hill Feeders

Topographical Map #1



Map Scale: 1:24,000 if printed on A portrait (8.5" x 11") sheet.



PRODUCTION AREA

Animal Mortality

To decrease non-point source pollution of surface and ground water resources, reduce the impact of odors that result from improperly handled animal mortality, and decrease the likelihood of the spread of disease or other pathogens, approved handling and utilization methods shall be implemented in the handling of normal mortality losses.

Animal mortalities must be handled in accordance to ORS 601.140 to prevent the discharge of pollutants to state waters. Animal mortalities will be managed to ensure that they are not disposed of in a liquid manure, storm water, process waste water storage or treatment system, or that is not specifically designed to treat animal mortalities.

Under no circumstances are animal mortalities to be disposed of in any type of liquid manure storage facility.

Guidance for Proper Management of Dead Animals

Refer to Plan for Catastrophic Animal Mortality Handling for guidance on what steps to take for a catastrophic animal mortality event. Having dead animals sent to an acceptable disposal site is the best method to deal with animal mortalities. A list of landfills and phone numbers can be found on the internet at <http://www.deq.state.or.us/lq/sw/disposal/permittedfacilities.html>. If a local landfill is not permitted to accept animal carcasses, the Oregon Department of Environmental Quality (DEQ) may grant an exception. Phone numbers to local DEQ offices can be found in most phone books or on the internet at <http://www.deq.state.or.us/about/locations.html>.

Under no circumstances are animal mortalities to be disposed of in any type of liquid manure storage facility.

Acceptable methods and guidance for animal mortality disposal are:

Composting- Composting animal mortalities requires a composting plan be prepared and submitted to the Oregon Department of Agriculture, Natural Resources Division. A composting plan consists of a site plan drawing of the composting facility, a description of how any runoff from the facility will be contained, a description of the composting process to be used and how the compost will be used. The composting facility for animal mortalities must have a concrete floor or similar impervious surface to prevent nutrient leaching. A roof covering the animal mortality composting facility is recommended to control moisture added by rainfall and rainfall runoff. Assistance to develop a composting plan is available from the Natural Resources Division of the Oregon Department of Agriculture, (503) 986-4700. A permit is also needed from the Department of Environmental Quality (DEQ) if animal mortalities will be imported from other farms for composting.

Rapid composting of dead animals occurs when the carbon to nitrogen (C:N) ratio of the compost mix ranges between 10 and 20 to 1. To achieve the recommended C:N ratio, build the initial compost pile by placing 18 inches of sawdust or other bulking agent on the floor of the composting area. The bulking agent should extend beyond the perimeter of the animal to be composted by at least 2 feet. If using a compost bin the bulking material should extend at least 1 foot beyond the perimeter of the animal being composted. Using a bulking agent such as sawdust will absorb any liquids as the animal decomposes during the composting process.

Once the bulking agent has been placed on the floor of the composting area, place the animal carcass on top. To decrease composting time and prevent bloating the body cavity should be cut open. Cover the carcass with 1 to 3 feet of separated manure solids or other material that has a moisture content between 30 to 60 percent and a C:N ratio of not more than 30 to 1. Use 1 foot of material for small carcasses and 3 feet for large carcasses such as cattle. Be careful not to add material that is too wet as it will hinder the composting process and cause odors. Small animals can be layered in a compost pile by placing 12

inches of the bulking agent between layers as shown in the figure below. Be sure the total height of the compost pile does not exceed 7 feet in height as it may spontaneously combust causing a fire. The first heating or primary composting cycle will take approximately 15 to 90 days depending on the size of the animal being composted. Refer to the table below for estimated primary composting times. Check pile temperature using thermometer probe on a daily basis. The pile temperature should be checked at multiple points around the compost pile and at a point approximately 3 feet into the pile. The temperature of the compost pile should reach 130 degrees Fahrenheit (F) within a few days. Temperatures should peak between 130 and 150 degrees F in 3 to 4 days. When the temperature of the compost pile falls below 130 degrees F, the compost needs to be aerated by turning or other means. Be sure carcasses remain covered with the bulking agent after being aerated. It is important to maintain a temperature above 130 degrees F for at least 7 days during the primary composting cycle as failure to do so may result in the incomplete destruction of pathogens and can cause fly and odor problems. After aerating the compost pile, the secondary composting times will be similar to the first. CAUTION: It is unclear whether prions that are the proteins that cause Bovine Spongiform Encephalitis (BSE or Mad Cow Disease) are destroyed in the composting process. Animals showing signs of Mad Cow Disease and those with anthrax should not be composted and must be reported to the Oregon Department of Agriculture, Animal Health and Identification Division at (503) 986-4680 for guidance on disposal.

After aerating the compost pile by turning or other means, be sure to check the moisture content and add water if necessary being careful not to add too much water. The compost pile should feel moist to the touch but you should not be able to squeeze any water out of it.

Odors given off by the composting operation is a good indicator of how the compost operation is proceeding. Foul odors may mean that the process has turned from aerobic to anaerobic. Anaerobic conditions are the result of insufficient oxygen in the compost. This may be caused by excessive moisture in the compost or the need for turning or aerating of the compost pile.

After the composting process is finished, it may be used as a bulking agent for a new compost pile. A rule of thumb is to use 50 percent of the composted material for a bulking agent but you may want to use more or less depending on how degraded the bulking agent is in the finished compost. Using finished compost in a new compost pile reduces the amount of bulking agent needed for the new pile and provides microbial inoculants to get the composting process started.

Finished compost can also be applied to crop and pasture land fields for utilization of the nutrients and organics in the composted material. Compost from animal mortalities should not be applied to crops that will be consumed directly by humans. The nutrient content of the composted material should be determined and application equipment calibrated to ensure nutrients contained in the composted material are not over applied.

Natural Disposal- To allow nature to take its course the dead animal needs to be transported to a location at least ½ mile from any off-farm dwelling and at least ¼ mile from any water way in accordance with ORS 601.140. Once this criteria is met the carcass can be left to degrade naturally with the help of scavengers. This method is not an acceptable means of disposal for a large number of animal mortalities or for byproducts generated during butchering.

Landfill- Dead animals may be transported to a permitted landfill that accepts animal carcasses for disposal. Be sure to call the chosen landfill first to insure a landfill will accept your animal carcasses. Refer to the website given previously for permitted landfills to call. Contact the landfill operator and the DEQ at (800) 452-4011 if the landfill you would like to use is not a permitted facility to see if an exception may be granted for the disposal of animal carcasses.

Incineration- Dead animals may be burned as a method of disposal and as a method to control diseases. The economics of incineration and availability of incineration units usually make this option undesirable. A permit is needed from the Oregon Department of Environmental Quality (DEQ) Air Quality program to operate an incineration unit. Contact your DEQ at (800) 452-4011 for guidance on incineration of animal carcasses.

Burial- Dead animals may be buried in accordance with ORS 601.090(7) as a method of disposal. Large animals such as an adult cow will require a hole approximately 2 feet by 7 feet by 8 feet deep. Be sure to select a site that doesn't have a water table to insure the bottom of the hole will be dry. The animal carcass should be covered with hydrated lime and covered with at least 4 feet of soil mounded 2 feet above the natural ground line to allow for settling as the carcass decomposes. Burial sites should be located at least 500 feet down slope from surface waters or wells. Burial is not an acceptable method of disposal for animal byproducts generated from butchering. Burial of large numbers of animal mortalities is not acceptable unless performed in accordance with a Catastrophic Animal Mortality Management Plan. Burial of imported animal mortalities is subject to disposal regulations and the Oregon Department of Environmental Quality (DEQ), the Oregon Department of Agriculture (ODA) and the local land use planning authority should be contacted.

Plan for Catastrophic Animal Mortality Handling

The following information describes how you plan to manage catastrophic loss of animals in a manner that protects surface and ground water quality. You must follow all national, state and local laws, regulations and guidelines that protect soil, water, air, plants, animals and human health.

Guidance in the event of a catastrophic animal mortality event:

Remove animal mortalities from the livestock production area and place in an area designated for mortality storage to be determined at the time of the catastrophic event.

Contact the state veterinarian if animal death is suspicious or animal displayed unusual symptoms before death.

If it is determined that a disease outbreak may be eminent, implement procedures as directed by the State Veterinarian. This may include killing exposed animals, burning carcasses and burial of ashes in a predetermined catastrophic mortality burial areas.

Refer to state guidance regarding appropriate catastrophic animal mortality handling methods.

**Contact Information-
Organization**

Oregon Department of Agriculture
Natural Resources Division
635 Capitol St. NE
Salem, OR 97301-2532

Phone Number

(503) 986-4699
TTD- (503) 986-4762

Oregon Emergency Response System (OERS)

(800) 452-0311

Oregon State Veterinarian
USDA APHIS
530 Center Street NE, Suite 335
Salem, OR 97301

(503) 378-4710
(503) 399-5871
Fax- (503) 399-5607

PRODUCTION AREA

Operation and Maintenance Considerations

Rainfall Runoff Storage Lagoons-

The rainfall runoff storage lagoons is used to store rainfall runoff containing manure generated by the farm. The wastewater stored in the rainfall runoff storage lagoons should evaporate during the spring and summer months. If the stored rainfall runoff is not totally evaporated by the fall, the lagoons must be pumped to the lowest level possible to function properly and have the greatest management flexibility before the fall and winter rainy season begins. Any annual sludge buildup in the evaporation lagoons must be removed to maintain design capacity taking care not to damage the bentonite soil liner and applied to land application areas in accordance with guidance given in Section 3 of this Nutrient Management Plan.

Inspect the rainfall runoff storage lagoons weekly to insure structural integrity and that at least 1 foot-6 inches of freeboard is being maintained to accommodate excess rainfall such as a 25 year-24hour storm and prevent overtopping the embankment. If the structural integrity of the rainfall runoff storage lagoon embankment is found to be compromised, immediately draw the liquid level down below the damaged area to determine the cause. Seek the services of a qualified engineer to assess the damage and recommend necessary repairs before allowing wastewater levels above the damaged area.

Inspect the rainfall runoff storage lagoons during the summer months when all of the wastewater has evaporated and inspect the embankments for structural damage. If structural damage to the embankment of a rainfall runoff storage lagoon is discovered, seek the services of a qualified engineer to assess the damage and recommend necessary repairs before allowing wastewater levels above the damaged area. Follow the guidance given in Section 3 of this Nutrient Management Plan if wastewater has to be applied to the crop land fields.

Do not permit livestock access to the rainfall runoff storage lagoons or on the lagoons embankments. Control undesirable vegetation growth by spraying or mowing. Control rodents as necessary. Check elevations of earthfills periodically and restore to grade and shape as necessary. Fill and reseed eroded embankment areas or repair with well graded rock riprap. Safety features such as signs and fences should be kept in good repair.

Do not dispose of animal carcasses in any rainfall runoff storage lagoon. It is against the law to do so.

Building Roofs-

Inspect building roofs annually as a minimum. Repair and/or replace all rusted sections and secure loose sections as needed. Immediately replace all broken trusses, rafters, beams, poles as needed. Immediately determining the cause and necessary modification(s) to prevent reoccurring structural failure is essential.

Feedlot Pens-

Maintaining a firm, dry feedlot surface is an important factor in maintaining a good environment that promotes good animal health.

Maintain diversions and drainageways so they direct clean water runoff away from the feedlot pens and holding areas. Stormwater runoff from the feedlot pens should be

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directed to storage or treatment areas.

Manure shall be contained in the feedlot pens until it can be transferred to a storage facility or applied to the fields for utilization of nutrients and organics. Manure accumulations created for bedding mounds shall be managed such that manure does not create a potential pollution hazard.

Take care to maintain the compacted layer when removing excess manure from the feedlot pens.

Dikes and Berms-

Periodically check elevations of earthfills and restore to grade and shape, if necessary. All settlement or cracks in the dike should be investigated to determine the cause and immediately repaired.

Maintain vigorous growth of vegetative coverings. This includes reseeding, fertilization, and application of herbicides when necessary. Fertilize the established stand with at least 200 pounds of 21-0-0 per acre or equivalent annually or as needed to maintain a uniform vigorous stand. Avoid excess travel and uncontrolled grazing on any portion of the dike system that will harm or destroy vegetative cover. Periodic mowing or controlled grazing may also be needed to control height.

Maintain installed fences to prevent unauthorized human access or uncontrolled grazing of dike surfaces. Livestock can be used to control vegetation height, providing grazing is controlled to short periods of time when damage to the dike surface and vegetation will not result.

Check all erosion control sections for accelerated weathering and displacement of materials. Replace to original shape and grade if necessary.

Immediately repair any vandalism, vehicular, or livestock damage to the dike or other appurtenance.

Eradicate or otherwise remove all rodents or burrowing animals and repair any damage caused by their activity.

Culverts-

Culverts should be inspected at least once annually. Inspect culverts after large rainfall events to insure no damage has been done to the culvert that would prevent it from functioning as intended. Remove any debris that may affect the culverts capacity. Any damage to the culvert and surrounding area should be repaired as soon as possible.

Fences-

Do not allow livestock access to open water courses and drainageways. Provide off stream watering facilities where possible and limit access to designated watering areas.

Inspect fences periodically and repair or replace broken or decayed posts and tighten sagging wire as needed. Broken wire can be spliced or replaced. Replace broken or missing insulators on electric fences as needed and repair or replace inoperative electric fence controllers.

Insure gates and other appurtenances are in good working order. Replace or repair components as needed.

Animal Access Lanes and Walkways-

Debris and excess manure shall be removed from access lanes, walkways, and drainage areas. Good vegetative cover should be maintained on all areas adjacent to access lanes and walkways.

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Irrigation Systems-

Apply irrigation water and wastewater in accordance with guidance in the irrigation water management plan in Section 3.

Maintain sprinkler irrigation systems in accordance with the manufacturer's recommendations to help ensure trouble free operation. Prevent livestock access to equipment during operation.

Clean plugged nozzles and replace if worn or defective.

Promptly repair all leaks by replacing valves, fittings, gaskets, worn or damaged parts.

Prompt repair or replacement of damaged or worn components is necessary. Check to make sure all application components i.e. water control structures, gates, valves, ditches, etc. are functional and are in good operating condition.

Maintain screening and filtering facilities.

Maintain vigorous vegetative growth where applicable.

Livestock Watering Facilities-

Check all above ground connections, valves, gates, rodent guards, inlets and outlets to make sure they are functioning properly. Check troughs and tanks for leaks or cracks and repair or replace immediately, if necessary.

Make certain the area adjacent to the trough is well protected with gravel, paving, or good cover. Be sure that the outlet pipe has a free outlet and is not causing any serious erosion problems. Check periodically to see if debris has fallen into the trough or tank which may restrict inflow or planned functions of the outflow system.

Clean the entire system periodically and remove moss, algae growth, and/or sludge. Chemicals such as copper sulfate and chlorine can be used to prevent moss and algae growth. Local rules and regulations are to be followed when using chemicals to make sure they are safe for animals.

Where necessary maintain coverings and insulation to prevent damage by freezing.

Eradicate or otherwise remove all rodents or burrowing animals. Immediately repair any damage caused by their activity.

Immediately repair any vandalism, vehicular or livestock damage.

Pipelines-

Drain the pipeline and components in areas that are subject to freezing. If parts of the pipeline cannot be drained, a non-toxic antifreeze solution may be added.

Check to make sure all valves and air vents are set at the proper operating condition so they can provide protection to the pipeline.

Inspect pipelines for signs of failure. Inspect risers and valves periodically for leaks or worn gaskets.

Repair or replace pipeline, risers and valves as needed.

Eradicate or otherwise remove all rodents or burrowing animals. Immediately repair any damage caused by their activity.

Pumps-

Operate and maintain pumps in accordance with good judgment and manufacture's manuals and recommendations.

Drain liquid manure from pumps during cold weather to prevent freezing. If parts of the system cannot be drained, a non-toxic antifreeze solution may be added.

Inspect pumps periodically and remove debris wrapped around shafts and impellers. Maintain foot valves and check valves for proper operation.

For proper operation of electric motors and controls, maintain lubrication for all bearings, keep electric panel free from obstructions and debris. Maintain electrical safety devices, assure all electrical contacts are tight, and lock main electrical switch to "OFF" position during non-use season. Maintain adequate shade and ventilation for pump motors.

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For proper operation of pumps, maintain lubrication for all bearings and pump shafts, assure belts are adjusted properly, maintain safety covering devices on open shafts and belt drives, check to make sure all safety valves and devices are set at proper operating conditions so they may provide protection to the pump and power unit. For centrifugal pumps, periodically measure tolerance between pump impeller and pump casing (i.e. wearing) and replace wear ring as needed to help restore new pump operating characteristics.

Use portable pressure gauge (preferably a liquid filled gauge) to monitor pump performance.

Operate and maintain agitators in accordance with the manufacture's manual and recommendations.

Inspect all plumbing annually as a minimum.

Replace, tighten, or repair broken or loose connections and lines as needed.

Well(s)-

Protect the area immediately surrounding the well from being damaged by agriculture machinery, vehicles, or livestock.

All fences, railings, and/or warning signs shall be maintained to provide warning and/or prevent unauthorized human or livestock entry.

Do not allow any foreign debris to accumulate and maintain soil and vegetative covering in the immediate vicinity of the well.

Eradicate or otherwise remove all rodents or burrowing animals. Immediately repair any damage caused by their activity.

Check metal surfaces for rust and other damage especially sections in contact with earthfill and with other materials. Repair or replace damaged section and apply paint as a protective covering.

Keep all surface water from entering or accumulating at the immediate vicinity of the well site.

Immediately repair any vandalism, vehicular, or livestock damage.

Chemical Handling Checklist-

The following measures shall be taken to prevent chemicals from contaminating process water or storm water storage and treatment systems:

1. Make sure all chemicals are stored in proper containers. Expired chemicals and empty containers are to be properly disposed of in accordance with state and federal regulations. Pesticides and associate refuse are to be disposed of in accordance with the FIFRA label.
2. Chemical storage areas are to be self-contained with no drains or other pathways that will allow spilled chemicals to exit the storage area.
3. Chemical storage areas are to be covered to prevent chemical contact with rain or snow.
4. Emergency procedures and equipment are to be in place to contain and clean up chemical spills.
5. Chemical handling and equipment wash areas are to be designed and constructed to prevent contamination of surface waters, waste water, and storm water storage and treatment systems.

PRODUCTION AREA

Production Area Maps for Cannon Hill Feeders

Production Area Map #1

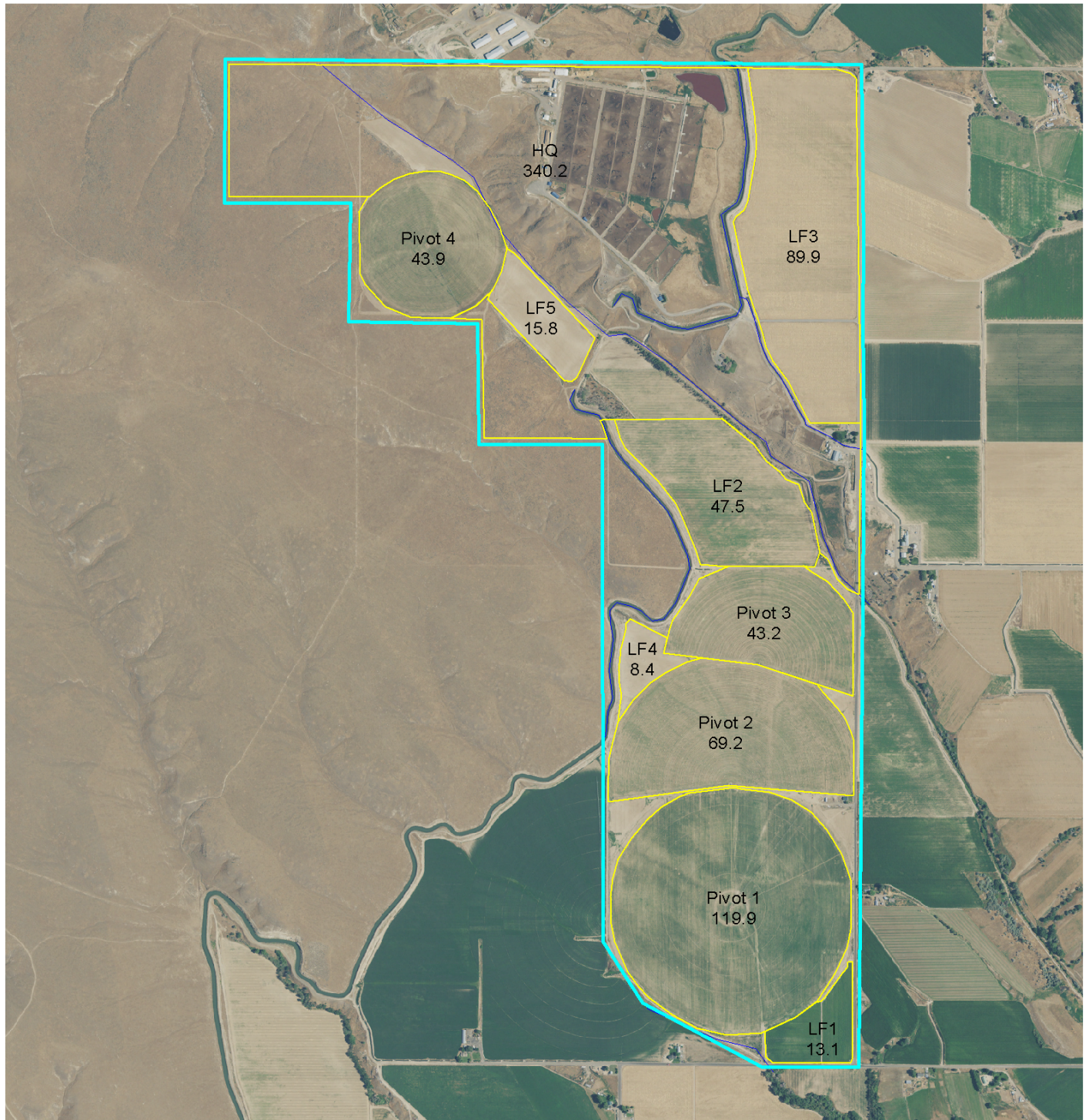


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Field Maps for Cannon Hill Feeders

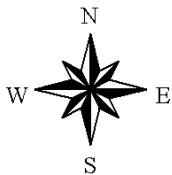
Field(s) Map #1

Cannon Hill Feeders



Map Legend

Field Name
Acres - Field Boundaries, Field Name, Acres



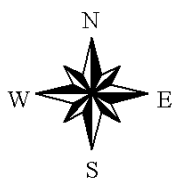
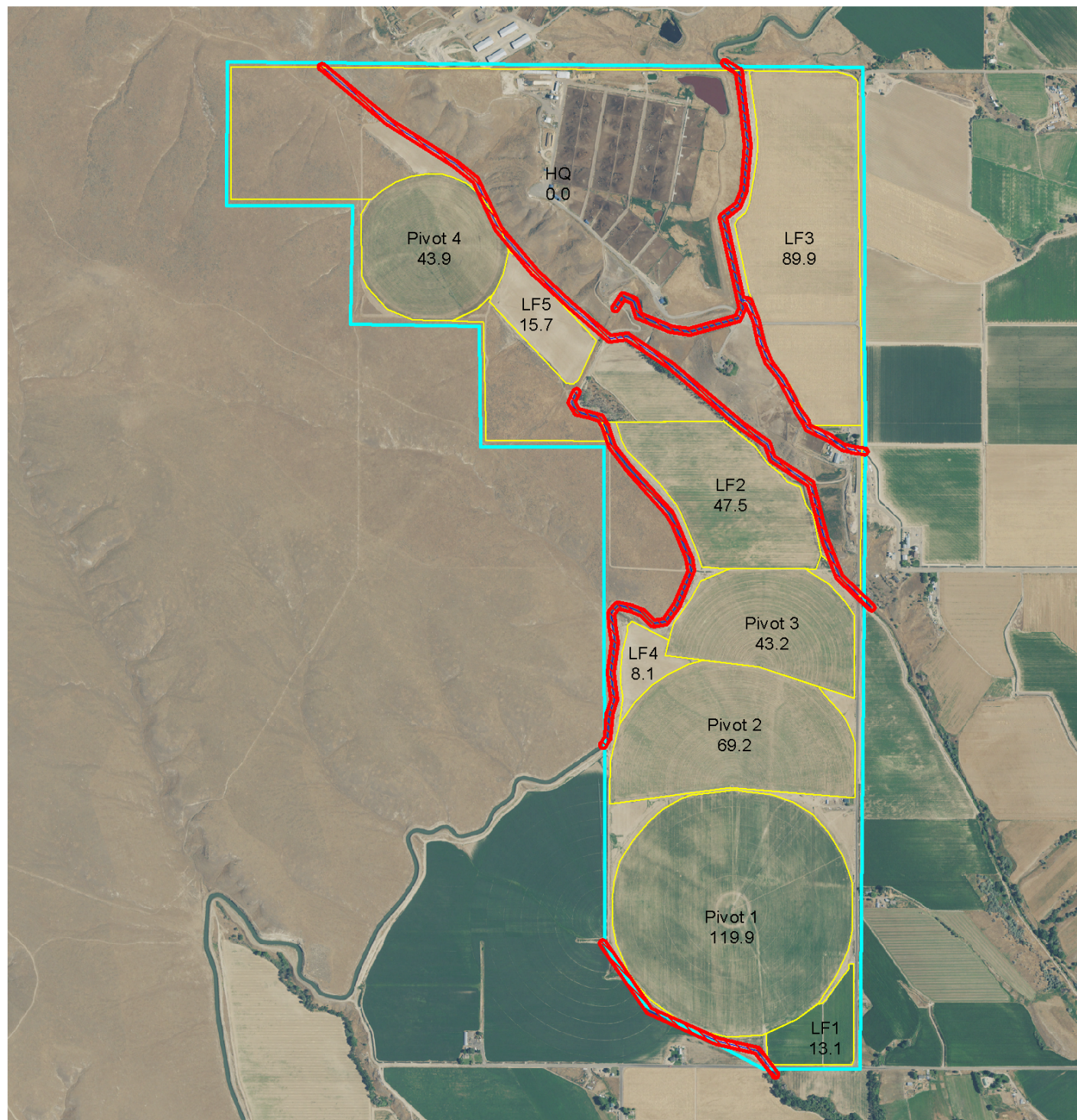
Scale 0 1500 3000 4500 Feet

UTILIZATION AREA

Setback Maps for Cannon Hill Feeders

Setback Map #1

Cannon Hill Feeders



Scale 0 1500 3000 4500 Feet

Map Legend

Field Name
Spreadable Acres

- Field Boundaries, Field Name,
Spreadable Acres



- Setback Areas

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Application Considerations

The manure and irrigation application systems will be calibrated in accordance with guidance in this section to insure the applications of manure, bedding and runoff from the waste storage facilities are in accordance with agronomic rates.

No application of wastewater or solids containing manure is to be made to the field buffer areas shown on the Setback Map in Section 3-2. Applications of wastewater and solids containing manure should be made in accordance with guidance in this section to reduce the risk of contaminated runoff to surface water sources and leaching of contaminants to ground water sources.

The phosphorus runoff rating for each of the farm fields is based on the Oregon Natural Resources Conservation Service Phosphorus Index and is shown in the table in Section 4-3. Wastewater, solids and commercial fertilizer for any field with a LOW runoff rating can be applied on a nitrogen basis. Wastewater, solids and commercial fertilizer for any field with a MEDIUM or HIGH runoff rating must be applied on a phosphorus basis. No applications of manure or commercial fertilizer containing phosphorus are to be made on a field with a ZERO OUT phosphorus runoff rating.

Manure applications may be made at any time of the year provided certain factors have been considered. However, the overriding factor one should use in considering whether or not to apply nutrients to a crop, irrespective of the nutrient source, is the agronomic need of the crop at the time of application. The following guidelines are to be considered once the decision has been made to make a manure application.

Consider using T-Sum 200 to determine when manure applications are to begin as long as you can comply with all other permit and AWMP requirements. Calculations for T-Sum 200 are outlined in OSU Extension Fertilizer Guide for Pastures (OSU FG63, 2000). T-Sum 200 is based on accumulated heat units and is an accurate guide to estimate plant activity. Research has shown that T-Sum 200 is the earliest date when plant roots begin to grow in the spring and thus are receptive to applied nutrients.

Surface air temperature is monitored and the daily minimum and maximum air temperatures are summed and divided by two to get the average daily air temperature then converted to centigrade ($F \text{ degrees minus } 32 \text{ times } 0.556$). Manure applications may begin once 200 heat units have been accumulated. However, one must still apply manure at agronomic rates based on the estimated growth potential of the crop and anticipated climatic events.

Based on crop nutrient uptake patterns, manure applications should stop when the crop is done growing for the year and before the first significant rainfall event that is expected to result in saturated soils or surface runoff.

Fields that are subsurface (TILE) drained require additional precautions when manure is applied. Any pre-application tillage should leave as much residue as possible on the soil surface. Water control structures installed in subsurface drainage systems should be managed to prevent discharge of manure and wastewater during periods of application.

Be aware of the location of sensitive areas, concerns of neighbors or concerns of the public, which require special application procedures. To reduce odor problems, apply

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wastewater and solids containing manure in mid-morning when temperatures are warming and air is rising rather than in the afternoon or evening when air is cooling and settling. Avoid applications during periods of fog.

Calibrate application equipment to insure uniform distribution and accurate application rates in accordance with guidance given in the Considerations for Manure Applications and with guidance on the calibration of application equipment.

Maintain setbacks for manure application from any surface waters. The management goal is not to allow manure to enter surface waters at any time. The following table shows **minimum setback requirements** for manure applications:

Manure Type	Application Equipment	Month and Setback Distance in Feet ^{a, b}											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Liquid	Big gun	100	100	100	35	35	35	35	35	35	100	100	100
Liquid	Spreader Bar	100	100	35	35	35/10 ^c	10	10	10	35	100	100	100
Liquid	Tank Wagon	100	100	35	35	35/10 ^c	10	10	10	35	100	100	100
Liquid	Tanker Truck	100	100	35	35	35/10 ^c	10	10	10	35	100	100	100
Solid	Spreader	100	100	35	35	35/10 ^c	10	10	10	35	100	100	100

Note:

- a. Setbacks are the distance between open waterways and manure application area.
- b. Setback requirements will generally increase for manures which are applied aerially (such as a traveling big gun) versus manures applied lower to the ground (such as a splash bar) due to potential for drift from wind or splashing.
- c. This is a floating date and should be evaluated based on current weather conditions and forecast information.

Record applications, transfers or exports of nutrients (manure and fertilizer) and maintain them for at least 5 years. The CAFO Recordkeeping Calendar or other acceptable record keeping systems can be used to record this information.

CONSIDERATIONS FOR DRY SEASON MANURE APPLICATIONS:

Apply wastewater and solids containing manure at agronomic rates using the following guidelines:

Consider using T-Sum 200 as a guideline to begin making manure applications.

Do not apply to soils immediately before or during rainfall events that are expected to result in saturated soils or surface runoff.

Apply to land being prepared for crops. Till manure into soil within 3 days of application if possible or apply to actively growing crops such as grass, clover or alfalfa after cutting.

Maintain the setback buffer distances described in this section and shown on the Setback Map when making applications of liquids or solids containing manure.

Record applications, transfers or exports of nutrients (manure and fertilizer) and maintain them for at least 5 years. The CAFO Recordkeeping Calendar or other acceptable record keeping systems can be used to record this information.

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CONSIDERATIONS FOR LATE WET SEASON MANURE APPLICATIONS:

Only apply manure during this time period if the following guidelines CAN be met. Call the ODA CAFO Program at (503) 986-4700 for guidance if a manure application is needed and the following guidelines CAN NOT be met:

- Apply manure only to actively growing crops such as grass, clover or alfalfa.
- Minimize application rates by using the maximum travel rates for the application equipment.
- Maintain the setback buffer distances described in this section and shown on the Setback Map when making applications of liquids or solids containing manure.
- Do not apply to soils immediately before or during rainfall events that are expected to result in saturated soils or surface runoff.
- Do not apply to saturated or flooded soils. It is recommended that application(s) be limited to soils (areas) where the flooding frequency class rating is None, Very Rare or Rare.
- Do not apply to slopes greater than 5%. See the Soil Map in Section 4-1 for the location of soil map units with slopes greater than 5%.
- Applications of wastewater or solids containing manure to frozen soils should be avoided. Do the following if an application of wastewater or solids containing manure is to be made to frozen soils:
 - Apply only enough wastewater or solids containing manure to address storage limitations until suitable soil conditions for application are available.
 - Minimize applications to 5 wet tons per acre or less of solids containing manure and 6,788 gallons (0.25 inches) per acre or less of wastewater.
 - Apply to alternating strips to reduce the risk of contaminated runoff reaching surface water sources.
 - Apply to fields of established hay, pasture or fields containing at least 90% cover and are the furthest from open water sources.
 - Do not apply wastewater or solids containing manure within 200 feet of surface water sources, drainageways, wells, or inlets to subsurface drainage systems.
 - Runoff control systems such as earthen dikes must be in place where applications will be made to fields with slopes greater than 5%.

Record applications, transfers or exports of nutrients (manure and fertilizer) and maintain them for at least 5 years. The CAFO Recordkeeping Calendar or other acceptable record keeping systems can be used to record this information.

Do not apply manure or commercial fertilizer to fields receiving applications unless the nutrients applied in the manure are less than the annual application of nutrients planned in the nutrient budget for the fields.

HOW TO CALIBRATE APPLICATION EQUIPMENT

Calibration of application equipment is a critical part of nutrient management. Calibration should be completed at least annually to insure manure and fertilizer will be uniformly applied. There are two basic approaches for calibrating a manure spreader – the load area and the weight area methods. The load area method is more accurate and can be used for both liquid and solid manure. The weight area method works only with solid or semi-solid manure.

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Irrigation System Calibration

Place 3-5 buckets throughout the irrigation spray pattern and collect samples while operating the pump at a given rpm and pressure (for a traveling gun record the travel speed also). At the end of the planned sample period measure the amount of liquid collected in inches (average the samples). The following chart shows how many gallons per acre applied per inch of liquid applied:

<u>Inches Liquid Manure Applied</u>	<u>Gallons per Acre</u>
0.20	5,431
0.30	8,146
0.40	10,862
0.50	13,577
0.75	20,366
1.00	27,154
1.25	33,943
1.50	40,731

Soft Hose Injection System with Irrigation Hose:

Alternative 1. Use a flow meter mounted on the injector system and calculate the distance and width to determine amount applied over a measured area. Example the flow meter measures 1,000 gallons over a distance of 600 feet and 10 feet wide.

Formula: Application Rate (7,260 gallons/acre) = (Gallons Applied (1,000 gal) X 43,560 sq. ft/acre) divided by (Distance traveled (600 ft) X Application width (10 ft))

Alternative 2. (Requires a 10-20 gallon graduated measuring container)

Step 1) In the field, measure the flow out of one injector for 5 seconds into the graduated measuring container and record gallons, repeat three (3) times and average the results.

Step 2) Multiply the average amount collected from one injector by the number of injectors (equals amount applied for the whole system for 5 seconds).

Step 3) Multiply the results of Step 2 times 12 to get gallons per minute.

Step 4) Place the injector in the soil at the planned depth and operating speed and record the distance traveled in 1 minute (average 3 different measurements).

Step 5) Determine the effective application width (number of injectors X injector spacing in feet).

Step 6) Multiply the effective width times the distance traveled in 1 minute (this gives the square feet covered in 1 minute).

Step 7) Divide the result of Step 6 by 43,560 (this gives the acres covered in 1 minute).

Step 8) Divide the results of Step 3 (gallons per minute) by the results of Step 7 (acres covered in 1 minute) - (this gives the gallons applied per acre.

For example:

Step 1) Collect an average of 6 gallons from one injector for 5 seconds.

Step 2) Applicator has 8 injectors (8 injectors X 6 gallons per injector = 48 gallons for 5 seconds)

Step 3) 48 gallons in 5 seconds X 12 = 576 gallons/minute applied

Step 4) Average distance covered in 1 minute was 250 feet

Step 5) Average width of the applicator is 12 feet.

Step 6) 12 feet wide X 250 feet long = 3000 square feet

Step 7) 3000 square feet divided by 43,560 square feet/acre = .0688 acres covered in 1 minute

Step 8) 576 gallons/minute divided by .0688 acres/minute = 8,372 gallons/acre.

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Manure Spreader/Tanker Calibration

There are several methods that can be used to calibrate the application rate of a manure spreader. The two best methods are the load-area method and the weight-area method. It is desirable to repeat the calibration procedure 2 to 3 times and average the results to establish a more accurate calibration. Before calibrating a manure spreader, the spreader settings such as splash plates should be adjusted so that the spread is uniform. Most spreaders tend to deposit more manure near the middle than at the edge of the spread pattern. Overlapping can make the overall application more uniform. Calibrating application rates when overlapping is involved requires measuring the width of two spreads and dividing by two to get the effective spread width. Calibration should take place annually or whenever manure is being applied from a different source or consistency.

Load-Area Method:

The load-area method is the most accurate and can be used for both liquid and solid manure. The load area method is a 3-step process:

Step 1) Determine the amount of manure in the spreader. The most accurate way to determine the amount of manure in a spreader is weighting the spreader when it is empty and again when it is full. For a reliable estimate of spreader capacity, weigh several representative loads (at least five) to determine the average gross weight. Subtract the empty spreader weight. Then, calculate the average net loaded weight.

Step 2) Determine the area of spread using the method at the right. Width measurements near the beginning and end of the spread pattern should be avoided because the spreader may not be operating at full capacity.

Step 3) Calculate the application rate. The application rate is calculated using the formula for either liquid or solid manure.

Formula for Solid Manure Equals Tons/Acre

(Average Loaded Weight (lbs) x 21.81) divided by (Distance Traveled (ft) x Width of Spread (ft))

Formula for Liquid Manure Equals Gal/Acre

(Tank Volume (gal) x 43,560) divided by (Distance Traveled (ft) x Width of Spread (ft))

Weight-Area Method:

The weight-area method can only be used with solid or semi-solid manure. When a scale is not available, the application rate of a box spreader can be determined by collecting manure on a tarp or piece of heavy material. The weight area method is less accurate than the load area method.

This method consists of eight steps:

Step 1) Prepare/cut three 56-inch square tarps or pieces of heavy material (this size equals 1/2,000 of an acre). The pounds of manure collected on 56 inches square equals tons applied per acre.

Step 2) Weigh one of the clean tarps and a large bucket on a platform scale. Record the weight.

Step 3) Anchor the three tarps in the field ahead of the spreader near the beginning, middle, and end of the area that will be spread with one load.

Step 4) Drive over the three tarps at a normal speed to collect a representative manure

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sample.

Step 5) Fold and place the first tarp into the empty bucket without spilling the manure.

Weigh the bucket, tarp, and manure. Subtract the weight of the clean tarp and bucket recorded in step 2.

Step 6) Repeat the process for each of the two remaining tarps.

Calculate the average weight (pounds) of the manure collected. This value equals tons of manure applied per acre.

Factor for converting pounds to tons and square feet to acres ($21.8 = 43,560 \text{ sq ft per acre divided by } 2,000 \text{ lbs/ton}$).

The factor for converting square feet to acres = $43,560 \text{ sq ft per acre}$.

Step 7) Determining Area of Spread.

The “area of spread” is the length and width of the ground covered with one load of manure. The area of spread is affected by speed and equipment settings. Spreaders discharge manure at varying rates depending on travel and PTO speed, gear box settings, and discharge openings. It is important to adjust the spreader so the pattern is as uniform as possible. Accurately measuring the length and width of this area is essential. To determine width, measure two adjacent spreads and divide by two to find the “effective” spread width. This accounts for overlap, which is often needed for a more uniform application. The length of spread is determined using the following three values:

Desired manure application rate based on soil and manure tests,

Width of the manure spread, and

Manure spreader holding capacity (weight and/or volume).

From these values, calculate the distance or lengths of spread using these formulas:

Formula: Solid Manure Equals Feet/Load

$(\text{Average Load Weight (lbs)} \times 21.81) \text{ divided by } (\text{Spread Width (ft)} \times \text{App. Rate (tons/ac)})$

Formula: Liquid Manure Equals Feet/Load

$(\text{Tank Volume (gal)} \times 43,560) \text{ divided by } (\text{Spread Width (ft)} \times \text{Desired App. Rate (gal/ac)})$

Step 8) Spread a load. If the distance traveled does not equal the calculated distance, adjust the speed or equipment settings.

AMOUNT OF MANURE TO APPLY FOR CROPS GROWN

The formulas for determining the total nutrient application rate per unit yield for each crop shown in the table below are as follows:

Total N to apply in pounds = N in pounds per yield unit from the table for the crop grown X Yield Units per Acre X actual percent (%) dry matter (DM) of harvested crop/percent (%) dry matter (DM) from table

Total P_2O_5 to apply in pounds = P in pounds per yield unit from the table for the crop grown X Yield Units per Acre X $2.291 P_2O_5/P$ X actual percent (%) dry matter (DM) of harvested crop/percent (%) dry matter (DM) from table

Total K_2O to apply in pounds = K in pounds per yield unit from the table for the crop grown X Yield Units per Acre X $1.205 K_2O/K$ X actual percent (%) dry matter (DM) of harvested crop/percent (%) dry matter (DM) from table

Example- for a field with 5 tons per acre of grass/legume hay harvested at 90% dry matter:

Total N to apply in pounds per acre = $(33.92 \text{ lb N / ton}) \times (5 \text{ tons / acre}) \times (90\% \text{DM} / 100\% \text{DM}) = 153 \text{ lbs N / acre}$

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The following tables show the crops that may be grown on this farm:

FRUIT OR VEGETABLES

	Yield Unit	lb/Unit	% DM	Nutrient Removal (lb/yield unit)		
				N	P	K
Beans, dry edible	cwt	100	100	3.13	0.45	0.85
Blueberries	ton	2000	100	13.93	1.30	11.57
Caneberries	ton	2000	100	11.43	7.42	11.43
Corn, Sweet	ton	2000	100	20.67	5.60	13.66
Mixed Vegetables & Fruit	ton	2000	100	8.33	2.08	10.20
Onions	cwt	100	100	0.18	0.04	0.13
Orchard, Fruit	ton	2000	100	13.00	2.00	16.00
Pea, edible	ton	2000	100	73.60	8.00	18.00
Potatoes	ton	2000	100	30.0	5.45	47.27
Squash	ton	2000	100	21.33	6.80	11.40

GRAIN, SEED OR OIL CROPS

	Yield Unit	lb/Unit	% DM	Nutrient Removal (lb/yield unit)		
				N	P	K
Barley	bushels	48	100	0.87	0.16	0.21
Beets, sugar	ton	2000	100	4.00	0.60	2.78
Bluegrass, Seed	cwt	100	100	2.88	0.43	1.98
Canola	ton	2000	100	70.00	12.00	18.00
Corn, grain shelled	bushels	56	100	0.90	0.16	0.22
Crimson Clover seed	lb	1	100	0.05	0.01	0.02
Fescue Seed, Straw Removed	cwt	100	100	1.97	0.20	2.00
Fescue, seed (Fine or Tall)	lb	1	100	1.47	0.31	1.67
Oats, grain	bushels	32	100	0.62	0.11	0.16
Orchardgrass seed	lb	1	100	0.016	0.002	0.004
Peppermint for Oil	ton	2000	100	4.20	1.80	2.80
Peppermint for Oil, Leaves & Stems Removed	ton	2000	100	87.23	36.80	57.80
Pumpkins	ton	2000	100	4.00	1.40	6.60
Rapeseed	bushels	50	100	1.38	0.30	0.30
Red Clover seed	cwt	100	100	4.55	1.00	2.00
Ryegrass seed	cwt	100	100	1.67	0.27	1.42
Ryegrass Seed, Straw Removed	Ton	2000	100	30.00	18.80	37.60
Ryegrass, Perennial seed	lb	1	100	0.02	0.002	0.004
Wheat, Soft White for grain	bushels	60	100	1.00	0.24	0.21
Wheat, Soft White, Straw Removed	ton	2000	100	43.40	8.90	20.90
Wheat, Hard Red for grain	bushels	60	100	1.60	0.37	0.31
Wheat, Hard Red, Straw Removed	ton	2000	100	53.36	10.96	23.76

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HAY AND PASTURE CROPS				Nutrient Removal (lb/yield unit)		
	Yield Unit	lb/Unit	% DM	N	P	K
Alfalfa, Hay	ton	2000	100	54.40	6.83	35.70
Alfalfa, Seed	cwt	100	100	6.12	0.70	2.34
Alta Fescue Hay/Pasture	ton	2000	100	32.98	6.88	37.60
Grass Legume Hay/Pasture	ton	2000	100	33.92	5.30	7.56
Meadow Fescue Hay/Pasture	ton	2000	100	41.56	8.70	47.43
Oats Hay/Pasture	ton	2000	100	26.01	10.20	14.79
Orchardgrass Hay/Pasture	ton	2000	100	53.21	8.58	18.62
Perennial Grass Hay/Pasture	ton	2000	100	58.00	8.00	40.00
Reed Canary Grass	ton	2000	100	27.00	3.57	41.57
Ryegrass Hay	ton	2000	100	33.41	5.44	28.39
Ryegrass, Perennial Pasture	ton	2000	100	58.00	8.00	48.00
Sorghum-Sudan Haylage	ton	2000	100	54.40	6.40	58.00
Tall Fescue Hay/Pasture	ton	2000	100	39.40	4.00	40.00
Vetch Hay	ton	2000	100	51.93	7.20	44.76

SILAGE AND HAYLAGE CROPS				Nutrient Removal (lb/yield unit)		
	Yield Unit	lb/Unit	% DM	N	P	K
Alfalfa/Grass Haylage	ton	2000	100	15.60	1.02	6.84
Corn for Silage	ton	2000	100	25.00	4.00	20.00
Crimson Clover forage	ton	2000	100	40.00	4.48	33.28
Field Pea, Forage	ton	2000	100	73.60	8.00	18.00
Mustard, White	ton	2000	100	38.55	0.0	0.0
Oat haylage	ton	2000	100	26.0	10.2	14.8
Oats & Peas/ Green Beans	ton	2000	100	32.03	5.58	18.65
Perennial Grass Haylage	ton	2000	100	15.00	2.40	12.78
Red Clover forage	ton	2000	100	40.00	4.41	32.98
Ryegrass Haylage	ton	2000	100	15.00	2.40	12.78
Sorghum-Sudan Haylage	ton	2000	100	16.32	1.92	17.40
Triticale Haylage	ton	2000	100	49.00	6.80	11.40
Vetch Haylage	ton	2000	100	59.67	6.57	50.00
Wheat Haylage	ton	2000	100	41.30	5.00	57.30
Wheatgrass Hay/Pasture	ton	2000	100	49.59	6.21	68.76

OTHER CROPS				Nutrient Removal (lb/yield unit)		
	Yield Unit	lb/Unit	% DM	N	P	K
Filberts	ton	2000	100	41.70	7.30	39.29
Hops, Cones	bale	200	100	9.00	0.96	5.00
Natural Area (Trees & Grass)	ton	2000	100	10.52	1.56	9.20
Nursery Stock	ton	2000	100	8.33	2.08	10.20
Poplars, Pulpwood	ton	2000	100	0.30	0.09	0.12
Hemp/Cannabis	ton	2000	100	31.09	3.37	36.23

Note: Nutrient uptake values are taken from the NRCS National Agricultural Waste Management Field Handbook and updated with more current information from the Extension Service when available. When nutrient uptake values are not available from NRCS or Extension references, then nutrient uptake data from the NRCS Plant Database or other approved data sources is used.

UTILIZATION AREA

Nutrient Applications



Nutrient Applications Report

Cannon Hill Feeders

Nyssa

LF1

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P ₂ O ₅ lbs/ac	K ₂ O lbs/ac
04/10/2019	Area 3 Livestock Pens	Manure Spreader	100	25 Ton/Ac	190	401	422
10/16/2019	Area 3 Livestock Pens	Manure Spreader	100	25 Ton/Ac	190	401	422
LF1 Totals:					380	802	844

LF2

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P ₂ O ₅ lbs/ac	K ₂ O lbs/ac
04/17/2019	Area 2 Livestock Pens	Manure Spreader	100	28 Ton/Ac	213	449	472
LF2 Totals:					213	449	472

LF3

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P ₂ O ₅ lbs/ac	K ₂ O lbs/ac
09/18/2019	Area 1 Livestock Pens	Manure Spreader	100	25 Ton/Ac	190	401	422
LF3 Totals:					190	401	422

LF4

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P ₂ O ₅ lbs/ac	K ₂ O lbs/ac
09/20/2019	Compost Yard	Manure Spreader	100	25 Ton/Ac	190	401	422
LF4 Totals:					190	401	422

LF5

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P ₂ O ₅ lbs/ac	K ₂ O lbs/ac
09/25/2019	Compost Yard	Manure Spreader	100	25 Ton/Ac	190	401	422
LF5 Totals:					190	401	422

Nutrient Applications Report - Cannon Hill Feeders

Pivot 1

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P ₂ O ₅ lbs/ac	K ₂ O lbs/ac
04/17/2019	Area 2 Livestock Pens	Manure Spreader	100	25 Ton/Ac	190	401	422
10/09/2019	Area 3 Livestock Pens	Manure Spreader	100	25 Ton/Ac	190	401	422
Pivot 1 Totals:					380	802	844

Pivot 2

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P ₂ O ₅ lbs/ac	K ₂ O lbs/ac
04/03/2019	Area 2 Livestock Pens	Manure Spreader	100	10 Ton/Ac	76	160	169
09/25/2019	Area 2 Livestock Pens	Manure Spreader	100	25 Ton/Ac	190	401	422
Pivot 2 Totals:					266	561	590

Pivot 3

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P ₂ O ₅ lbs/ac	K ₂ O lbs/ac
03/27/2019	Area 3 Livestock Pens	Manure Spreader	100	10 Ton/Ac	76	160	169
09/11/2019	Area 3 Livestock Pens	Manure Spreader	100	25 Ton/Ac	190	401	422
Pivot 3 Totals:					266	561	590

Pivot 4

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P ₂ O ₅ lbs/ac	K ₂ O lbs/ac
10/30/2019	Area 1 Livestock Pens	Manure Spreader	100	25 Ton/Ac	190	401	422
Pivot 4 Totals:					190	401	422

UTILIZATION AREA

Sampling Guidance

Manure and Soil Sampling Frequency

For large concentrated animal feeding operations, sample liquids and solids containing manure during applications in early spring annually and have each sample analyzed for Total Nitrogen (TKN), Ammonium Nitrogen ($\text{NH}_4\text{-N}$), Phosphorus (P_2O_5) and Potassium (K_2O) plus percent moisture. Ask the lab to report results in pounds per ton for the solids containing manure and in pounds per thousand gallons for liquids containing manure. Analyses of solids and liquids containing manure should be performed by a laboratory that meets the requirements and performance standards of the Manure Testing Laboratory Certification Program (MTLCP),

<https://www.mda.state.mn.us/licensing/licensetypes/mapprogram.aspx>.

For small and medium animal feeding operations, if no samples of liquids and solids containing manure have been taken, take a sample of liquids and solids during applications in early spring once a year for three consecutive years to develop a cumulative manure analysis history as a basis for nutrient allocation to the fields. If there is a sampling history of liquids and solids containing manure, take a sample of liquids and solids during applications in early spring once every 5 years or whenever a significant change in animal numbers or in the manure handling system occurs. Have each sample analyzed for Total Nitrogen (TKN), Ammonium Nitrogen ($\text{NH}_4\text{-N}$), Phosphorus (P_2O_5) and Potassium (K_2O) plus percent moisture. Ask the lab to report results in pounds per ton for the solids containing manure and in pounds per thousand gallons for liquids containing manure. Analyses of solids and liquids containing manure should be performed by a laboratory that meets the requirements and performance standards of the Manure Testing Laboratory Certification Program (MTLCP),

<https://www.mda.state.mn.us/licensing/licensetypes/mapprogram.aspx>.

Large CAFO's are required to test a minimum of 20% of their fields annually which would result in all of the fields being tested once every five (%) years. Small and Medium CAFO's are only required to test all of their fields once every five (%) years. However, from a management standpoint, more frequent soil testing offers good information on the nutrient status of your soils.

Collect soil samples from 20 percent of the fields receiving solids or liquids containing manure **annually** in the fall after harvest or before rains begin (typically September 15-October 15) in accordance with **Pacific Northwest (PNW) Extension publication 570-E, "Monitoring Soil Nutrients Using a Management Unit Approach"**, <https://catalog.extension.oregonstate.edu/pnw570>. Have the soil samples analyzed for Total Nitrogen (TKN) and Phosphorus (P) and ask the lab to report results in parts per million (ppm). Soil test analyses should be performed by laboratories that meet the requirements and performance standards of the North American Proficiency Testing Program (NAPT) Proficiency Assessment Program (PAP); <http://www.naptprogram.org/pap/>.

How to Sample Liquid Manure

Obtain a composite following one of the procedures listed below and thoroughly mix. Using a plunger, an up-and-down action works well for mixing liquid manure in a five-gallon bucket. Fill a one-quart plastic bottle not more than three-quarters full with the composite sample. Store sample in freezer if not delivered to the lab immediately.

Procedure 1. Sampling from storage- Agitate storage facility thoroughly before sampling. Collect at least five samples from the storage facility or during loading using a five-gallon bucket. Place a sub sample of the composite sample in a one-quart plastic container. Sampling a liquid manure storage facility without proper agitation (2-4 hrs. minimum) is not recommended due to nutrient stratification, which occurs in liquid systems. If manure is sampled from a lagoon that was not properly agitated, typically the nitrogen and potassium will be more concentrated in the top liquid, while the phosphorus will be more concentrated in the bottom solids.

Procedure 2. Sampling during application- Place buckets around field to catch manure from spreader or irrigation equipment. Combine and mix samples into one composite sub sample in a one-quart plastic container.

How to Sample Solid Manure

Collect a composite sample by following one of the procedures listed below. A method for mixing a composite sample is to pile the manure and then shovel from the outside to the inside of the pile until well mixed. Fill a one-gallon plastic heavy-duty zip lock bag approximately one-half full with the composite sample, squeeze out excess air, close and seal. Store sample in freezer if not delivered to the laboratory immediately.

Procedure 1. Sampling while loading - Recommended method for sampling from a stack or bedded pack. Take at least ten samples while loading several spreader loads and combine to form one composite sample. Thoroughly mix the composite sample and take an approximately one pound sub sample using a one-gallon plastic bag. Sampling directly from a stack or bedded pack is not recommended.

Procedure 2. Sampling during spreading - Spread a tarp in field and catch the manure from one pass. Sample from several locations and create a composite sample. Thoroughly mix the composite sample together and take a one-pound sub sample using a one-gallon plastic bag.

Procedure 3. Sampling daily haul - Place a five-gallon bucket under the barn cleaner 4-5 times while loading a spreader. Thoroughly mix the composite sample together and take a one-pound sub sample using a one-gallon plastic bag. Repeat sampling 2-3 times over a period of time and test separately to determine variability.

Procedure 4. Sampling poultry in-house - Collect 8-10 samples from throughout the house to the depth the litter will be removed. Samples near feeders and waterers may not be indicative of the entire house and sub samples taken near here should be proportionate to their space occupied in the whole house. Mix the samples well in a five-gallon pail and take a one-pound sub sample, place it in a one-gallon zip lock bag.

Procedure 5. Sampling stockpiled litter - Take ten sub samples from different locations around the pile at least 18 inches below the surface. Mix in a five-gallon pail and place a one-pound composite sample in a gallon zip lock bag.

Sample Identification and Delivery

Identify the sample container with information regarding the farm, animal species and date. This information should also be included on the sample information sheet along with application method, which is important in determining first year availability of nitrogen.

Keep all manure samples frozen until shipped or delivered to a laboratory. Ship early in the week (Mon.-Wed.) and avoid holidays and weekends.

How to Sample Soils

Current soil tests must be used in the development and editing of nutrient management plans. A current soil test is one that is no older than 5 years that is used to represent the nutrient status of the entire field. Soil analysis must be performed by laboratories successfully meeting the requirements and performance standards of the North American Proficiency Testing Program-Performance Assessment Program (NAPT-PAP). Results of these analysis will be used to determine application rates for manure, litter, and process wastewater. Guidance for soil sampling can be found in the **Pacific Northwest (PNW) Extension publication 570-E, "Monitoring Soil Nutrients Using a Management Unit Approach"**, <https://catalog.extension.oregonstate.edu/pnw570>. **Oregon State University Extension publication EC1478, "Soil Test Interpretation**

Guide", <https://catalog.extension.oregonstate.edu/ec1478> provides guidance on how to determine soil nutrient concentrations and how to adjust soil pH to improve nutrient availability.

Field Area. A composite soil sample should represent a uniform field area. Each area should have similar crop and fertility history. Soil characteristics (color, slope, texture, drainage) should be similar. Exclude small areas within a field that are obviously different. The field area represented by a single composite sample should represent no more than 40 irrigated acres or 100 dry land acres.

Sampling Depth. Laboratory tests are calibrated to specific depths. It is vital to collect samples from appropriate depths. Sampling depth for most soils is the rooting depth in 6-inch intervals. In Oregon, as a minimum, soil samples should be collected from the 0-12" depth. The 0-6" surface soil samples are normally used for conventional tests of organic matter, nitrogen, phosphorus, potassium, pH and salt levels. Additionally, subsurface samples from the 6-24" depth are needed to estimate nitrogen availability for crops grown in dry land areas.

Post Harvest Soil Testing for Evaluating Nutrient Applications. Refer to **Pacific Northwest (PNW) Extension publication 570-E, "Monitoring Soil Nutrients Using a Management Unit Approach"**, <https://catalog.extension.oregonstate.edu/pnw570>, for guidance on how to evaluate nutrient applications and crop uptake of nutrients.

UTILIZATION AREA

Manure Tests



Nutrient Analysis Report

Cannon Hill Feeders

Nyssa

Sample Date	Storage Name	Units	Total N	P ₂ O ₅	K ₂ O	NH ₄ -N	NO ₃ -N	Org N	Density Lbs/CF
03/06/2019	Area 1 Livestock Pens	lbs/Ton	7.6	7.0	14.0	3.8	0.0	3.8	36.0
03/06/2019	Area 2 Livestock Pens	lbs/Ton	7.6	7.0	14.0	3.8	0.0	3.8	36.0
03/06/2019	Area 3 Livestock Pens	lbs/Ton	7.6	7.0	14.0	3.8	0.0	3.8	36.0
03/06/2019	Lagoon 1	lbs/1000gal	4.05	2.21	18.19	2.0	0.0	2.05	62.0
03/06/2019	Lagoon 2	lbs/1000gal	4.05	2.21	18.19	2.0	0.0	2.05	62.0
03/06/2019	Lagoon 3	lbs/1000gal	4.05	2.21	18.19	3.8	0.0	0.25	62.0
03/06/2019	Lagoon 4	lbs/1000gal	4.05	2.21	18.19	2.0	0.0	2.05	62.0
03/06/2019	Lagoon 5	lbs/1000gal	4.05	2.21	18.19	2.0	0.0	2.05	62.0
03/06/2019	Lagoon 6	lbs/1000gal	4.05	2.21	18.19	3.8	0.0	0.25	62.0
03/06/2019	Lagoon 7	lbs/1000gal	4.05	2.21	18.19	2.0	0.0	2.05	62.0
03/06/2019	Compost Yard	lbs/Ton	7.6	7.0	14.0	3.8	0.0	3.8	36.0

UTILIZATION AREA

Soil Tests



Soils Testing Report

Cannon Hill Feeders

3127 Kimberly Rd, Nyssa

LF1

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/16/2019	20012	Pivot #1	12.0	8.6		0.17	2.83			9.0	195.0	582.0 ppm	5732.0 ppm	290.0 ppm	3.0 ppm	2.0 ppm	22.0	0.3	3.3	2.0	1.1	8.0		

LF2

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
11/17/2015	25871	Field #5	12.0	7.7		0.21	2.95			2.95	657.0	449.0 ppm	3835.0 ppm	154.0 ppm	56.0 ppm	17.0 ppm	23.0	0.4	1.6	6.0	0.9	7.0		

LF3

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
3/5/2019	13526	Pivot 95	12.0	7.4		0.43	3.55			24.0	758.0	399.0 ppm	2547.0 ppm	95.0 ppm	12.0 ppm	2.0 ppm	29.0	0.4	0.5	23.0	1.5	100.0		

LF4

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
3/6/2019	13526	Pivot 95	12.0	7.4		0.43	3.55			24.0	758.0	399.0 ppm	2547.0 ppm	95.0 ppm	12.0 ppm	2.0 ppm	29.0	0.4	0.5	23.0	1.5	100.0		

LF5

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
3/6/2019	20012	Pivot #1	12.0	8.6		0.17	2.53			9.0	195.0	582.0 ppm	5732.0 ppm	290.0 ppm	3.0 ppm	2.0 ppm	22.0	0.3	3.3	2.9	1.1	8.0		

Soils Testing Report - Cannon Hill Feeders

Pivot 1

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/16/2019	20012	Pivot #1	12.0	8.6		0.17	2.83			9.0	195.0	582.0 ppm	5732.0 ppm	290.0 ppm	3.0 ppm	2.0 ppm	22.0	0.3	3.3	2.0	1.1	8.0		

Pivot 2

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
3/5/2019	13525	Pivot #2	12.0	7.6		0.27	2.47			18.0	173.0	337.0 ppm	3511.0 ppm	78.0 ppm	6.0 ppm	2.0 ppm	34.0	0.7	1.8	5.0	1.2	11.0		

Pivot 3

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/16/2019	20013	Pivot #3	12.0	7.6		0.25	3.67			14.0	227.0	432.0 ppm	2855.0 ppm	261.0 ppm	13.0 ppm	8.0 ppm	14.0	0.2	1.9	7.0	1.3	13.0		

Pivot 4

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/16/2019	20014	Pivot #4	12.0	8.6		0.16	3.71			30.0	502.0	463.0 ppm	5669.0 ppm	225.0 ppm	3.0 ppm	3.0 ppm	20.0	0.4	5.0	20.0	1.3	19.0		

Soil test analyses should be performed by laboratories that meet the requirements and performance standards of the North American Proficiency Testing Program (NAPT) Proficiency Assessment Program (PAP);
<http://www.naptprogram.org/pap/>

UTILIZATION AREA

Nutrient Balances



Nutrient Balances Report

Cannon Hill Feeders

Nyssa

Field	Acres	Crop	Yield	Nutrient Uptake (lbs/ac)			Nutrient Applied (lbs/ac)			Nutrient Balance (lbs/ac)		
				N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
LF1	13.1	Alfalfa Hay	7 Ton	381	109	301	380	802	844	(-1)	693	542
LF2	47.5	Corn, Silage	9 Ton	225	82	217	213	449	472	(-12)	367	255
LF3	89.9	Wheat, Winter Straw Removed	4 Ton	213	100	115	190	401	422	(-23)	300	307
LF4	8.4	Wheat, Winter Straw Removed	4 Ton	213	100	115	190	401	422	(-23)	300	307
LF5	15.8	Wheat, Winter Straw Removed	4 Ton	213	100	115	190	401	422	(-23)	300	307
Pivot 1	119.9	Alfalfa Hay	7 Ton	381	109	301	380	802	844	(-1)	693	542
Pivot 2	69.2	Corn, Grain Stover Removed	4 Ton	272	110	210	266	561	590	(-6)	451	381
Pivot 3	43.2	Corn, Grain Stover Removed	4 Ton	272	110	210	266	561	590	(-6)	451	381
Pivot 4	43.9	Corn, Silage	9 Ton	225	82	217	190	401	422	(-35)	318	205

UTILIZATION AREA

Export Nutrient History



Exports Report

Cannon Hill Feeders
Nyssa

Storage	Date Exported	Quantity	Analysis Available	Total N	P ₂ O ₅	K ₂ O	Target
Compost Yard	05/13/2019	6885.0 Ton	Yes	52,326	48,195	96,390	Surrounding Farms
Compost Yard	05/20/2019	6885.0 Ton	Yes	52,326	48,195	96,390	Surrounding Farms
Compost Yard	05/29/2019	6885.0 Ton	Yes	52,326	48,195	96,390	Surrounding Farms
Compost Yard	06/05/2019	6885.0 Ton	Yes	52,326	48,195	96,390	Surrounding Farms
Sub Totals:		1,530,000 CF		209,304	192,780	385,560	
Totals:		1,530,000 CF		209,304	192,780	385,560	

UTILIZATION AREA

Cropping History



Cropping Report

Cannon Hill Feeders

Nyssa

Planted	Field	Acres	Crop	Yield	Nutrient Uptake (lbs/ac)		
					N	P ₂ O ₅	K ₂ O
01/01/2019	LF1	13.1	Alfalfa Hay	7 Ton	54	16	43
	LF1 Totals:				54	16	43
01/01/2019	LF2	47.5	Corn, Silage	9 Ton	25	9	24
	LF2 Totals:				25	9	24
01/01/2019	LF3	89.9	Wheat, Winter Straw Removed	4 Ton	53	25	29
	LF3 Totals:				53	25	29
01/01/2019	LF4	8.4	Wheat, Winter Straw Removed	4 Ton	53	25	29
	LF4 Totals:				53	25	29
01/01/2019	LF5	15.8	Wheat, Winter Straw Removed	4 Ton	53	25	29
	LF5 Totals:				53	25	29
01/01/2019	Pivot 1	119.9	Alfalfa Hay	7 Ton	54	16	43
	Pivot 1 Totals:				54	16	43
01/01/2019	Pivot 2	69.2	Corn, Grain Stover Removed	4 Ton	68	27	52
	Pivot 2 Totals:				68	27	52
01/01/2019	Pivot 3	43.2	Corn, Grain Stover Removed	4 Ton	68	27	52
	Pivot 3 Totals:				68	27	52
01/01/2019	Pivot 4	43.9	Corn, Silage	9 Ton	25	9	24
	Pivot 4 Totals:				25	9	24

UTILIZATION AREA

Irrigation Water Management

The application of Irrigation Water Management to the irrigated fields as shown on the Field Map will manage soil moisture to promote the desired crop response, optimize the available water supplies, minimize irrigation induced erosion, decrease non-point source pollution of surface and groundwater sources, manage salts in the crop root zone and manage the crop micro climate.

Permits: Under Oregon law all water is publicly owned, and anyone planning to store or divert surface or groundwater for the purpose of irrigation must obtain a permit or water right from the Oregon Water Resources Department. These permits or water rights must be obtained prior to the use of the water. It is the responsibility of the Farmer to file for the necessary permits or water rights. More information about Oregon water rights can be found at <http://www.oregon.gov/owrd/Pages/wr/index.aspx>.

The irrigation system used to irrigate crops should be adapted for site conditions (soil, slope, crop grown, climate, water quantity and quality, etc.) and capable of applying water and wastewater to meet the consumptive use of the crop. The following table shows the estimated Available Water Holding Capacity (AWHC) and sprinkler intake rates by soil texture that should be considered in the design of the irrigation system.^{1/}

<u>Symbol</u>	<u>Soil Texture</u>	<u>AWHC Range (in/in)</u>	<u>Sprinkler Intake Rate Range (in/hour)</u>
COS	Coarse Sand	0.01-0.03	1.0+
S	Sand	0.01-0.03	0.5+
FS	Fine Sand	0.05-0.07	0.5+
VFS	Very Fine Sand	0.05-0.07	0.5+
LCOS	Loamy Coarse Sand	0.06-0.08	1.0+
LS	Loamy Sand	0.06-0.08	0.4-1.5
LFS	Loamy Fine Sand	0.09-0.11	0.4-1.5
LVFS	Loamy Very Fine Sand	0.10-0.12	0.3-1.25
COSL	Coarse Sandy Loam	0.10-0.12	0.3-1.25
SL	Sandy Loam	0.11-0.13	0.3-1.25
FSL	Fine Sandy Loam	0.13-0.15	0.3-1.0
VFSL	Very Fine Sandy Loam	0.15-0.17	0.3-1.0
L	Loam	0.16-0.18	0.6-0.7
SIL	Silt Loam	0.19-0.21	0.5-0.7
SI	Silt Loam	0.16-0.18	0.5-0.7
SCL	Sandy Clay Loam	0.14-0.16	0.1-0.5
CL	Clay Loam	0.19-0.21	0.1-0.5
SICL	Silty Clay Loam	0.19-0.21	0.1-0.4
SC	Sandy Clay	0.15-0.17	0.1-0.4
SIC	Silty Clay	0.15-0.17	0.1-0.2
C	Clay	0.14-0.16	0.1-0.2

^{1/} Values in this table are taken from the Natural Resources Conservation Service National Engineering Handbook, Part 652, Irrigation Guide and are estimates based on soil texture and should only be used where local data is unavailable.

Irrigation water management requires knowledge, skills, and desire to determine when irrigation water should be applied. The main factors influencing IWM are irrigation interval (time between irrigations), irrigation set time (time water is applied), and application rate (rate at which water is applied). These parameters define the timing and duration of irrigation and the amount of water applied. System design and maintenance are also important factors influencing irrigation water management.

UTILIZATION AREA

Guidance given in the irrigation water requirements worksheets was developed based on Oregon State University Extension Miscellaneous 8530, Oregon Crop Water Use and Irrigation Requirements publication. For additional information on irrigation water management contact a professional with the required knowledge and skill. The following average monthly evapotranspiration and precipitation graphs can be used to estimate when to irrigate and how much to apply:

UTILIZATION AREA

Irrigation Water Flows, Volumes, and Relationships

Equation 1 -

$$Q \times T = D \times A$$

where

Q = flow rate (acre-in/hr or cfs)

T = time (hr)

D = gross depth applied (in)

A = area (acres)

Equation 2 -

$$Q = \frac{453 \times A \times D}{F \times H}$$

where

Q = flow rate (acre-in/hr or cfs)

A = area (acres)

D = gross depth applied (in)

F = irrigation period (days)

H = Hours of operation per

Water Flow

1 cubic foot per second (cfs)
= 448.8 gallons per minute
1 cfs for 1 hour = 0.99 acre-inch
1 cfs for 24 hr = 1.98 acre-ft
1,000 gpm = 2.23 cfs
1,000 gpm for 24 hr = 4.42 ac-ft
1 gpm/acre = 0.053 ac-in/ac/day
1 cfs = 40 miner's inches in OR, No CA
1 cfs = 50 miner's inches in ID, WA

1 miner's inch = 11.22 gpm in OR
1 miner's inch = 9 gpm in ID, WA
1 cfs = 28.32 liters/sec
1 cubic meter/sec = 35.3 cfs
1 liter/sec = 15.85 gpm

Q x T = D x where:

Q = cfs, T = hr, D = inches depth; A =

Gpm for 5 ft/s velocity in PVC pipe:

6"	8"	10"	12"	14"
480	800	125	175	215

Water Volumes & Weights:

1 cubic foot = 7.48 gallons
= 62.4 lbs = 28.3 liters
1 acre-foot = 43,560 cubic feet
(1 acre covered 1 ft deep)
12 acre-in = 1 acre-ft = 325,829 gal
1 million gallons = 3.07 acre-ft
1 acre-ft = 1,234 cubic meters
1 cu meter = 1,000 liters = 35.3 cu ft

Pressure and Pressure Head:

1 psi = 2.31 ft of pressure head
1 atmosphere (sea level)
= 14.7 psi = 33.9 ft of head

Lengths and Areas:

1 mile = 5,280 ft = 1.61 km
1 meter = 3.28 ft = 39.37 inches
1 acre = 43,560 square ft
1 hectare = 2.47 acres

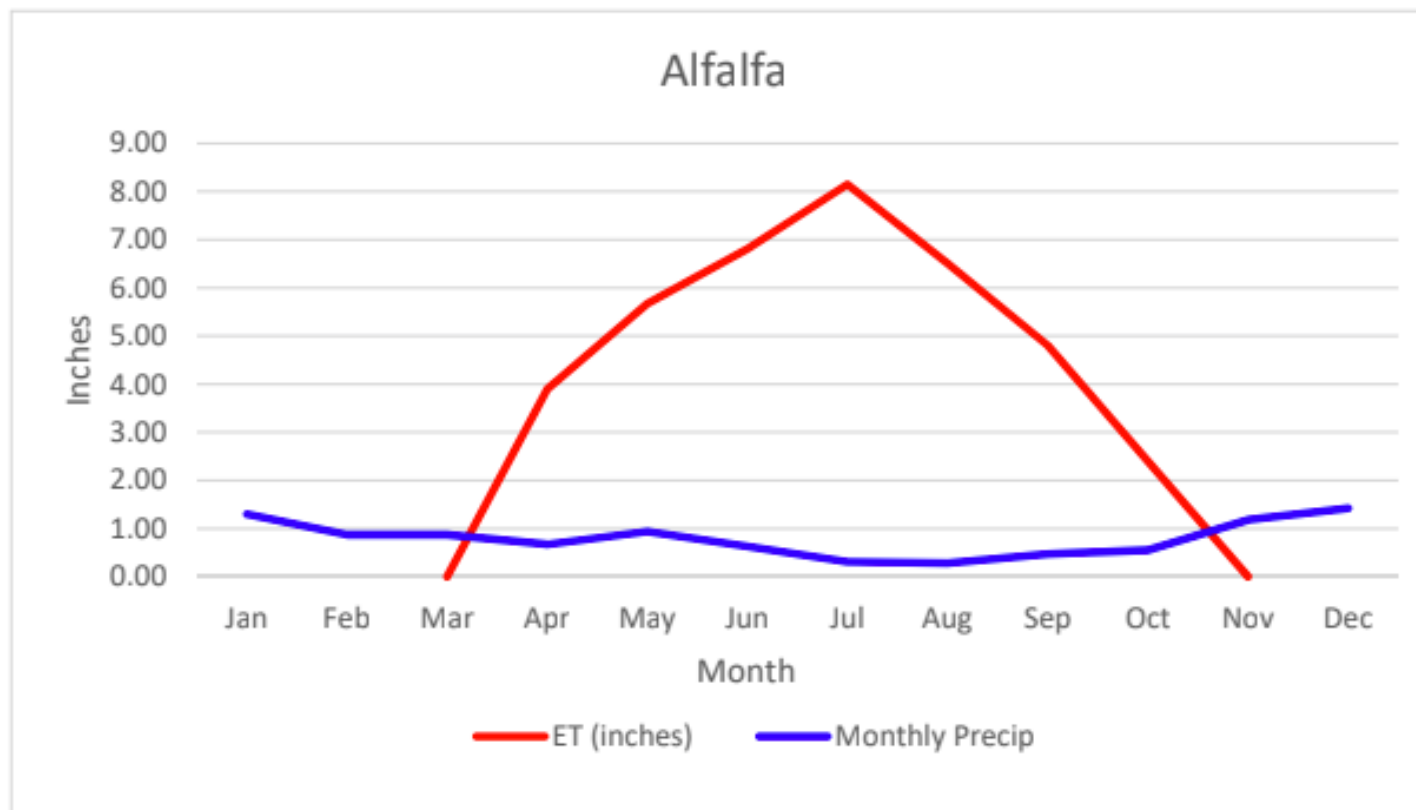
Pump Power Requirement

$$\text{Horsepower} = \frac{\text{Pump Head in ft} \times \text{gpm}}{39.6 \times \% \text{ Pump Efficiency}}$$

UTILIZATION AREA

Crop- Alfalfa
Region- Southeast

Total Seasonal Evapotranspiration-	38.23 Inches
Peak Evapotranspiration Rate-	0.27 Inches/Day
Maximum Allowed Depletion-	50 %
Critical Moisture Deficit Period-	Jul

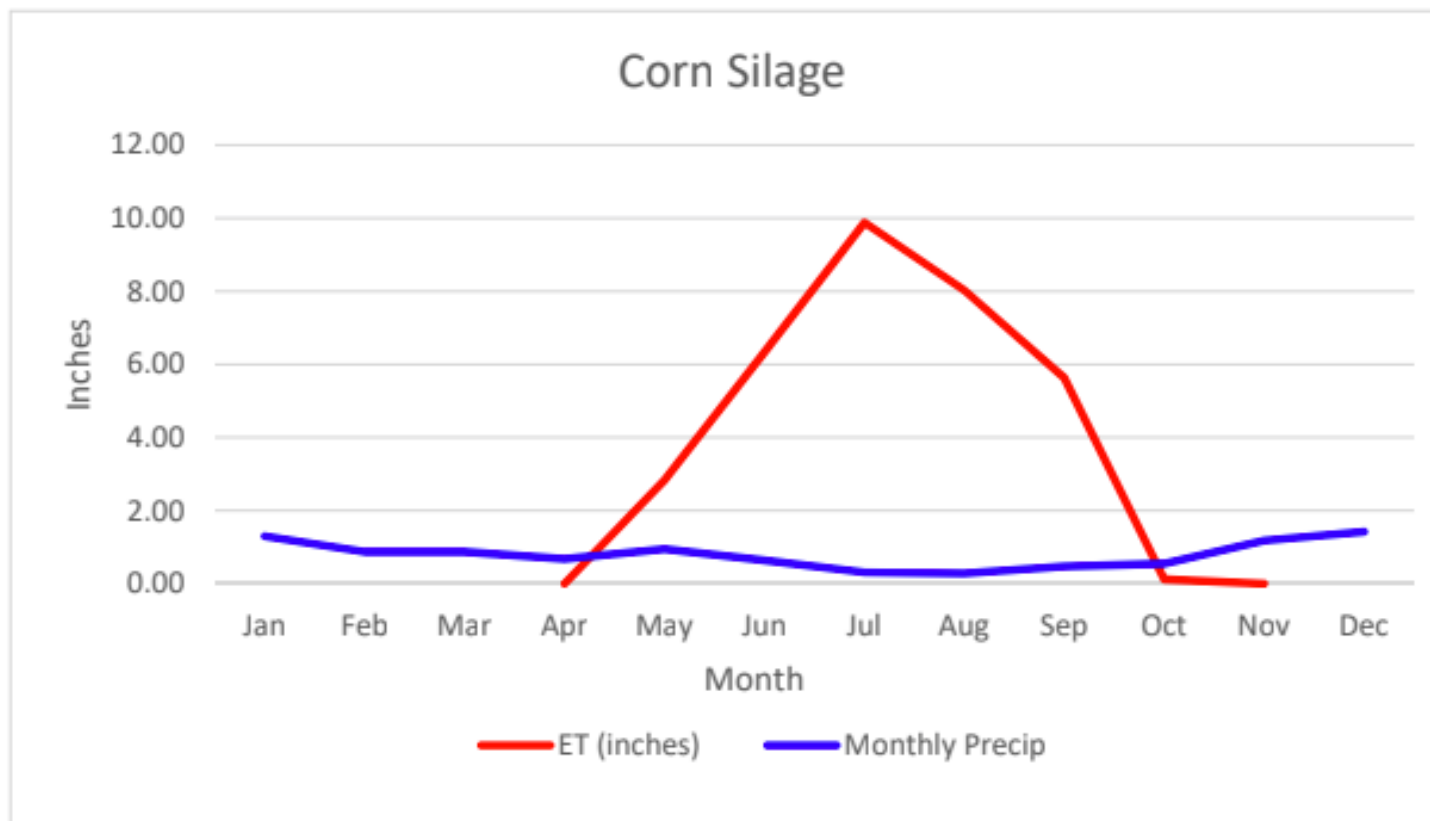


UTILIZATION AREA

Crop- Corn Silage

Region- Southeast

Total Seasonal Evapotranspiration-	32.83 Inches
Peak Evapotranspiration Rate-	0.33 Inches/Day
Maximum Allowed Depletion-	50 %
Critical Moisture Deficit Period-	Jul

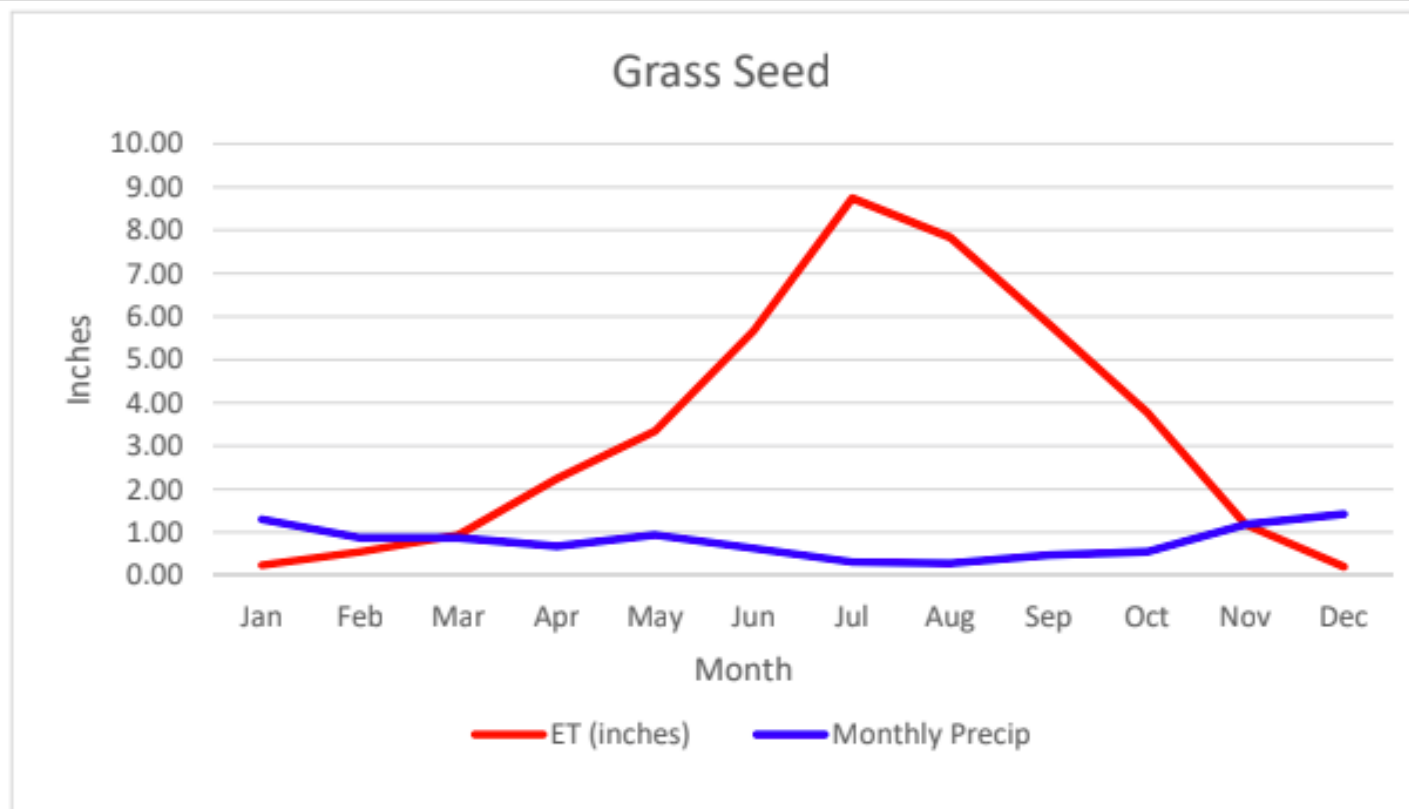


UTILIZATION AREA

Crop- Grass Seed

Region- Southeast

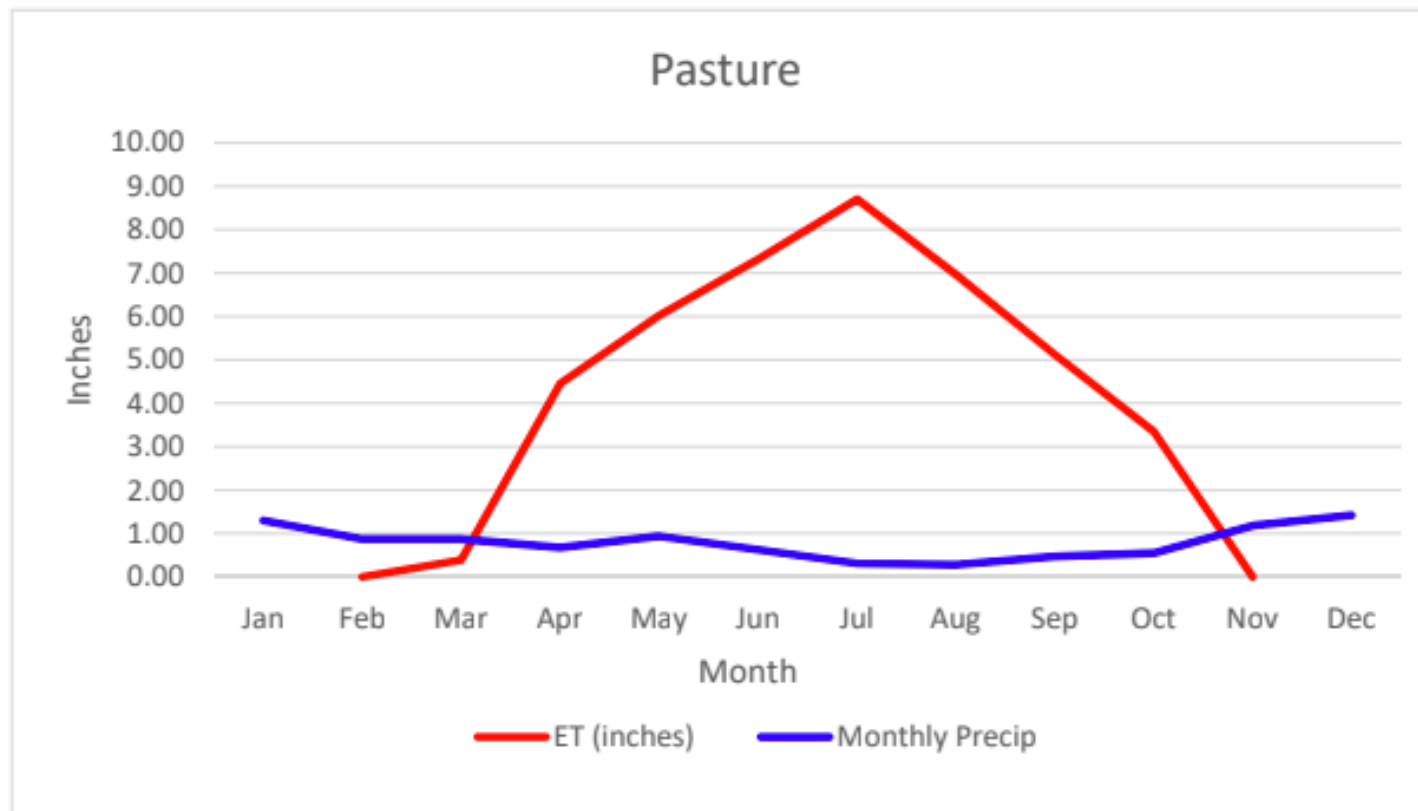
Total Seasonal Evapotranspiration-	40.55 Inches
Peak Evapotranspiration Rate-	0.29 Inches/Day
Maximum Allowed Depletion-	50 %
Critical Moisture Deficit Period-	Jul



UTILIZATION AREA

Crop- Pasture
Region- Southeast

Total Seasonal Evapotranspiration-	42.32 Inches
Peak Evapotranspiration Rate-	0.29 Inches/Day
Maximum Allowed Depletion-	50 %
Critical Moisture Deficit Period-	Jul

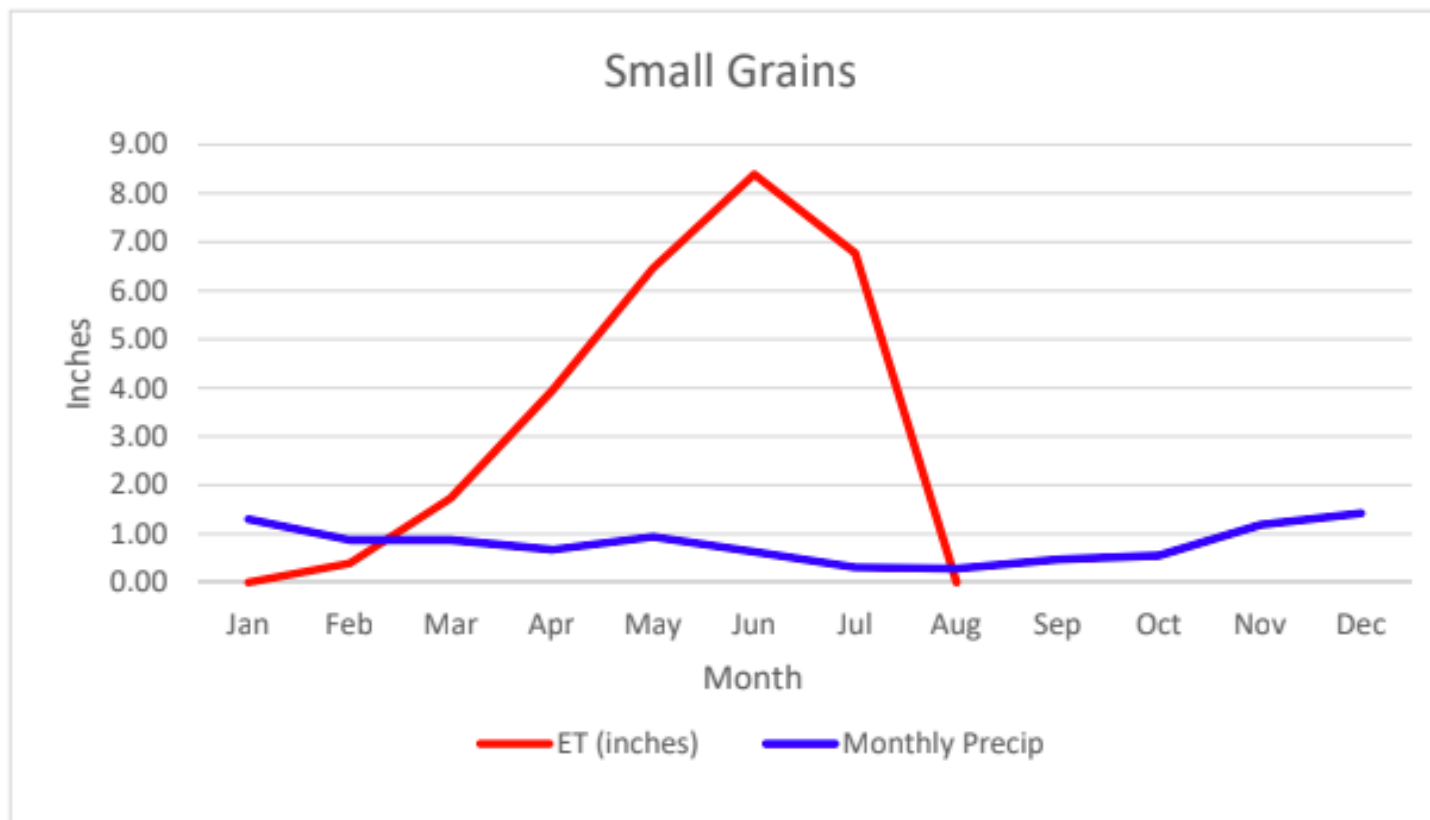


UTILIZATION AREA

Crop- Small Grains

Region- Southeast

Total Seasonal Evapotranspiration-	27.68 Inches
Peak Evapotranspiration Rate-	0.28 Inches/Day
Maximum Allowed Depletion-	50 %
Critical Moisture Deficit Period-	Jun

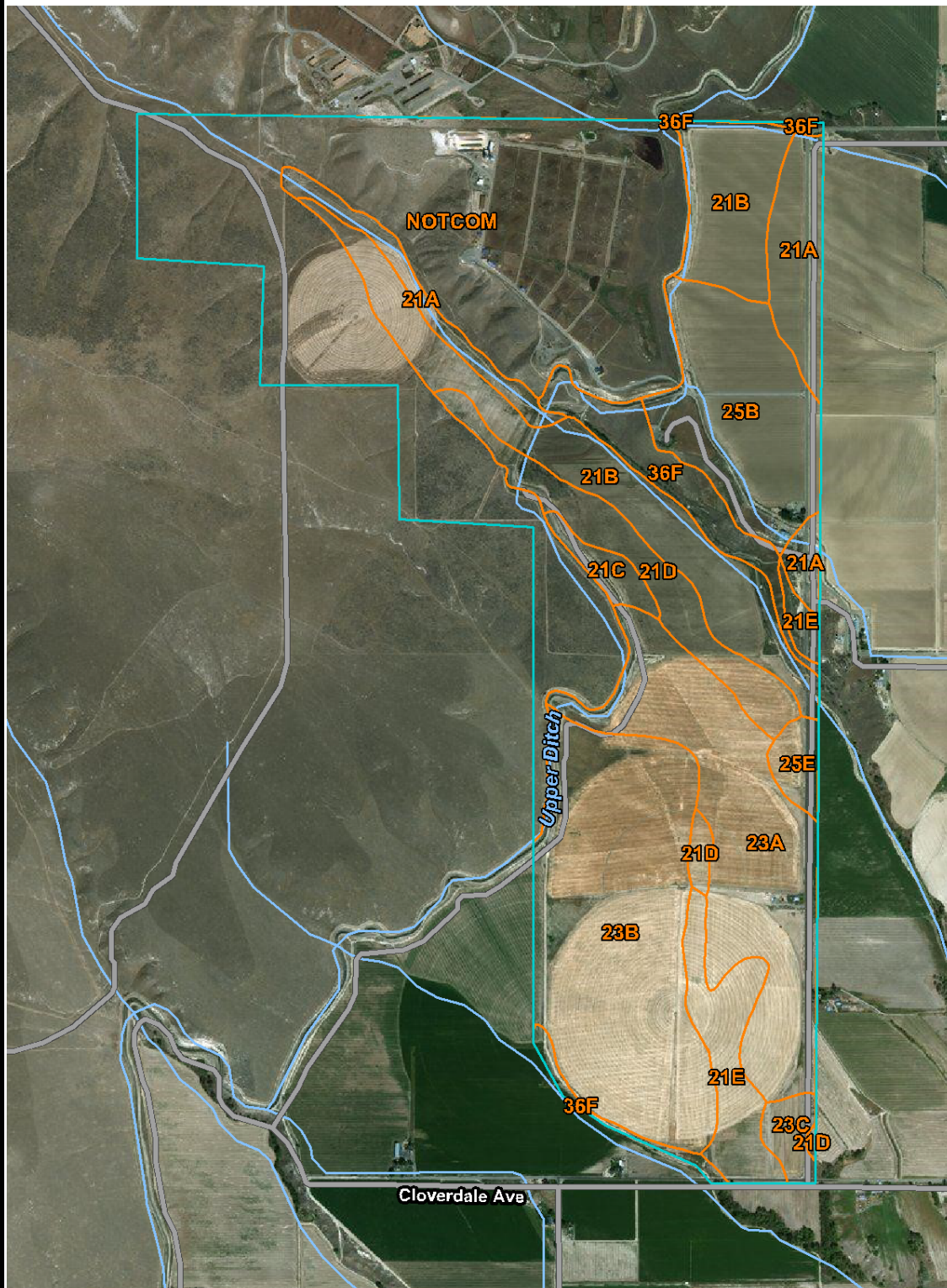


SOIL AND RISK

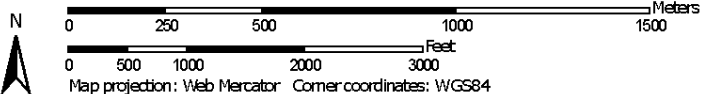
Soil Maps for Cannon Hill Feeders

Soils Map #1

Soil Map—Malheur County, Oregon, Northeastern Part; and Malheur County, Oregon, Northern Part
(Cannon Hill Feeders)



Map Scale: 1:19,100 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84

SOIL AND RISK

Soil Reports

Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named, soils that are similar to the named components, and some minor components that differ in use and management from the major soils.

Most of the soils similar to the major components have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Some minor components, however, have properties and behavior characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a soil series. All the soils of a series

SOIL AND RISK

have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into soil phases. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A complex consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An association is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An undifferentiated group is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include miscellaneous areas. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description

Malheur County, Oregon, Northeastern Part

21A—Nyssa silt loam, 0 to 2 percent slopes

Map Unit Setting National map unit symbol: 23c0 Elevation: 2,100 to 2,600 feet

SOIL AND RISK

Map Unit Description---Malheur County, Oregon, Northeastern Part; and Malheur County, Oregon, Northern Part

Lightning Feeders

Mean annual precipitation: 9 to 11 inches Mean annual air temperature: 50 to 54 degrees F Frost-free period: 150 to 170 days Farmland classification: Prime farmland if irrigated

Map Unit Composition Nyssa and similar soils: 59 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nyssa Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Lacustrine deposits Typical profile H1 - 0 to 13 inches: silt loam H2 - 13 to 25 inches: silt loam H3 - 25 to 31 inches: cemented material H4 - 31 to 60 inches: stratified silt loam to fine sandy loam to loam Properties and qualities Slope: 0 to 2 percent Depth to restrictive feature: 20 to 40 inches to duripan Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 10 percent Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) Available water storage in profile: Low (about 4.9 inches) Interpretive groups Land capability classification (irrigated): 3s Land capability classification (nonirrigated): 6e Hydrologic Soil Group: C Ecological site: SILTY 8-11 PZ (R011XY012OR) Hydric soil rating: No

21B—Nyssa silt loam, 2 to 5 percent slopes

Map Unit Setting National map unit symbol: 23c1 Elevation: 2,100 to 2,600 feet Mean annual precipitation: 9 to 11 inches Mean annual air temperature: 50 to 54 degrees F

Frost-free period: 150 to 170 days Farmland classification: Prime farmland if irrigated

Map Unit Composition Nyssa and similar soils: 68 percent Minor components: 1 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nyssa Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Lacustrine deposits Typical profile H1 - 0 to 13 inches: silt loam H2 - 13 to 25 inches: silt loam H3 - 25 to 31 inches: cemented material H4 - 31 to 60 inches: stratified silt loam to fine sandy loam to loam Properties and qualities Slope: 2 to 5 percent Depth to restrictive feature: 20 to 40 inches to duripan Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 10 percent Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) Available water storage in profile: Low (about 4.9 inches) Interpretive groups Land capability classification (irrigated): 3e Land capability classification (nonirrigated): 6e Hydrologic Soil Group: C Ecological site: SILTY 8-11 PZ (R011XY012OR) Hydric soil rating: No

Minor Components Aquepts, poorly drained Percent of map unit: 1 percent Landform: Flood plains Hydric soil rating: Yes

21C—Nyssa silt loam, 5 to 8 percent slopes

Map Unit Setting National map unit symbol: 23c2 Elevation: 2,100 to 2,600 feet Mean annual precipitation: 9 to 11 inches Mean annual air temperature: 50 to 54 degrees F Frost-free period: 150 to 170 days Farmland classification: Farmland of statewide importance

SOIL AND RISK

Map Unit Composition Nyssa and similar soils: 65 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nyssa Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Lacustrine deposits Typical profile H1 - 0 to 13 inches: silt loam H2 - 13 to 25 inches: silt loam H3 - 25 to 31 inches: cemented material H4 - 31 to 60 inches: stratified silt loam to fine sandy loam to loam Properties and qualities Slope: 5 to 8 percent Depth to restrictive feature: 20 to 40 inches to duripan Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 10 percent Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) Available water storage in profile: Low (about 4.9 inches) Interpretive groups Land capability classification (irrigated): 3e Land capability classification (nonirrigated): 6e Hydrologic Soil Group: C Ecological site: SILTY 8-11 PZ (R011XY012OR) Hydric soil rating: No

21D—Nyssa silt loam, 8 to 12 percent slopes

Map Unit Setting National map unit symbol: 23c3 Elevation: 2,100 to 2,600 feet Mean annual precipitation: 9 to 11 inches Mean annual air temperature: 50 to 54 degrees F Frost-free period: 150 to 170 days Farmland classification: Farmland of statewide importance

Map Unit Composition Nyssa and similar soils: 60 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nyssa Setting Landform: Terraces Landform position (three-dimensional): Riser Down-slope shape: Linear Across-slope shape: Linear Parent material: Lacustrine deposits Typical profile H1 - 0 to 13 inches: silt loam H2 - 13 to 25 inches: silt loam H3 - 25 to 31 inches: cemented material H4 - 31 to 60 inches: stratified silt loam to fine sandy loam to loam Properties and qualities Slope: 8 to 12 percent Depth to restrictive feature: 20 to 40 inches to duripan Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 10 percent Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) Available water storage in profile: Low (about 4.9 inches) Interpretive groups Land capability classification (irrigated): 4e Land capability classification (nonirrigated): 6e Hydrologic Soil Group: C Ecological site: SILTY 8-11 PZ (R011XY012OR) Hydric soil rating: No

21E—Nyssa silt loam, 12 to 20 percent slopes

Map Unit Setting National map unit symbol: 23c4 Elevation: 2,100 to 2,600 feet Mean annual precipitation: 9 to 11 inches Mean annual air temperature: 50 to 54 degrees F Frost-free period: 150 to 170 days Farmland classification: Farmland of statewide importance

Map Unit Composition Nyssa and similar soils: 55 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nyssa Setting Landform: Terraces Landform position (three-dimensional): Riser Down-slope shape: Linear Across-slope shape: Linear Parent material: Lacustrine deposits Typical profile H1 - 0 to 13 inches: silt loam H2 - 13 to 25 inches: silt loam H3 - 25 to 31 inches: cemented material H4 - 31 to 60 inches: stratified silt loam to fine sandy loam to loam Properties and qualities Slope: 12 to 20 percent Depth to restrictive feature: 20 to 40 inches to duripan Natural drainage class: Well drained Capacity of the most

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limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 10 percent Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) Available water storage in profile: Low (about 4.9 inches) Interpretive groups Land capability classification (irrigated): 6e Land capability classification (nonirrigated): 6e Hydrologic Soil Group: C Ecological site: SILTY NORTH SLOPES 8-11 PZ (R011XY032OR) Hydric soil rating: No

23A—Nyssa-Malheur silt loams, 0 to 2 percent slopes

Map Unit Setting National map unit symbol: 23cb Elevation: 2,100 to 2,600 feet Mean annual precipitation: 9 to 11 inches Mean annual air temperature: 50 to 54 degrees F Frost-free period: 150 to 170 days Farmland classification: Prime farmland if irrigated

Map Unit Composition Nyssa and similar soils: 55 percent Malheur and similar soils: 30 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nyssa Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Lacustrine deposits Typical profile H1 - 0 to 13 inches: silt loam H2 - 13 to 25 inches: silt loam H3 - 25 to 31 inches: cemented material H4 - 31 to 60 inches: stratified silt loam to fine sandy loam to loam Properties and qualities Slope: 0 to 2 percent Depth to restrictive feature: 20 to 40 inches to duripan Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 10 percent Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) Available water storage in profile: Low (about 4.9 inches) Interpretive groups Land capability classification (irrigated): 3s Land capability classification (nonirrigated): 6e Hydrologic Soil Group: C Ecological site: SILTY 8-11 PZ (R011XY012OR) Hydric soil rating: No

Description of Malheur Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Lacustrine deposits and loess Typical profile H1 - 0 to 9 inches: silt loam H2 - 9 to 19 inches: silty clay loam H3 - 19 to 23 inches: silt loam H4 - 23 to 26 inches: cemented material H5 - 26 to 42 inches: silt loam Properties and qualities Slope: 0 to 2 percent Depth to restrictive feature: 20 to 40 inches to duripan Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 10 percent Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) Sodium adsorption ratio, maximum in profile: 25.0 Available water storage in profile: Low (about 4.4 inches) Interpretive groups Land capability classification (irrigated): 3s Land capability classification (nonirrigated): 6s Hydrologic Soil Group: C Ecological site: SILTY 8-11 PZ (R011XY012OR) Hydric soil rating: No

23B—Nyssa-Malheur silt loams, 2 to 5 percent slopes

Map Unit Setting National map unit symbol: 23cc Elevation: 2,100 to 2,600 feet Mean annual precipitation: 9 to 11 inches Mean annual air temperature: 50 to 54 degrees F Frost-free period: 150 to 170 days Farmland classification: Prime farmland if irrigated

Map Unit Composition Nyssa and similar soils: 55 percent Malheur and similar soils: 30 percent Estimates are based on observations, descriptions, and transects of the mapunit.

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Description of Nyssa Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Lacustrine deposits Typical profile H1 - 0 to 13 inches: silt loam H2 - 13 to 25 inches: silt loam H3 - 25 to 31 inches: cemented material H4 - 31 to 60 inches: stratified silt loam to fine sandy loam to loam Properties and qualities Slope: 2 to 5 percent Depth to restrictive feature: 20 to 40 inches to duripan Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 10 percent Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) Available water storage in profile: Low (about 4.9 inches) Interpretive groups Land capability classification (irrigated): 3e Land capability classification (nonirrigated): 6e Hydrologic Soil Group: C Ecological site: SILTY 8-11 PZ (R011XY012OR) Hydric soil rating: No

Description of Malheur Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Lacustrine deposits and loess Typical profile H1 - 0 to 9 inches: silt loam H2 - 9 to 19 inches: silty clay loam H3 - 19 to 23 inches: silt loam H4 - 23 to 26 inches: cemented material H5 - 26 to 42 inches: silt loam Properties and qualities Slope: 2 to 5 percent Depth to restrictive feature: 20 to 40 inches to duripan Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 10 percent Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) Sodium adsorption ratio, maximum in profile: 25.0 Available water storage in profile: Low (about 4.4 inches) Interpretive groups Land capability classification (irrigated): 3e Land capability classification (nonirrigated): 6e Hydrologic Soil Group: C Ecological site: SILTY 8-11 PZ (R011XY012OR) Hydric soil rating: No

23C—Nyssa-Malheur silt loams, 5 to 8 percent slopes

Map Unit Setting National map unit symbol: 23cd Elevation: 2,100 to 2,600 feet Mean annual precipitation: 9 to 11 inches Mean annual air temperature: 50 to 54 degrees F Frost-free period: 150 to 170 days Farmland classification: Farmland of statewide importance

Map Unit Composition Nyssa and similar soils: 55 percent Malheur and similar soils: 30 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nyssa Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Lacustrine deposits Typical profile H1 - 0 to 13 inches: silt loam H2 - 13 to 25 inches: silt loam H3 - 25 to 31 inches: cemented material H4 - 31 to 60 inches: stratified silt loam to fine sandy loam to loam

Properties and qualities Slope: 5 to 8 percent Depth to restrictive feature: 20 to 40 inches to duripan Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 10 percent Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) Available water storage in profile: Low (about 4.9 inches) Interpretive groups Land capability classification (irrigated): 3e Land capability classification (nonirrigated): 6e Hydrologic Soil Group: C Ecological site: SILTY 8-11 PZ (R011XY012OR) Hydric soil rating: No

Description of Malheur Setting Landform: Terraces Landform position (three-dimensional):

SOIL AND RISK

Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Lacustrine deposits and loess Typical profile H1 - 0 to 9 inches: silt loam H2 - 9 to 19 inches: silty clay loam H3 - 19 to 23 inches: silt loam H4 - 23 to 26 inches: cemented material H5 - 26 to 42 inches: silt loam Properties and qualities Slope: 5 to 8 percent Depth to restrictive feature: 20 to 40 inches to duripan Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 10 percent Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) Sodium adsorption ratio, maximum in profile: 25.0 Available water storage in profile: Low (about 4.4 inches) Interpretive groups Land capability classification (irrigated): 3e Land capability classification (nonirrigated): 6e Hydrologic Soil Group: C Ecological site: SILTY 8-11 PZ (R011XY012OR) Hydric soil rating: No

25B—Owyhee silt loam, 2 to 5 percent slopes

Map Unit Setting National map unit symbol: 23ch Elevation: 2,100 to 2,500 feet Mean annual precipitation: 8 to 10 inches Mean annual air temperature: 50 to 52 degrees F Frost-free period: 150 to 170 days Farmland classification: Prime farmland if irrigated

Map Unit Composition Owyhee and similar soils: 85 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Owyhee Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Lacustrine deposits Typical profile H1 - 0 to 16 inches: silt loam H2 - 16 to 38 inches: silt loam H3 - 38 to 60 inches: very fine sandy loam Properties and qualities Slope: 2 to 5 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 25 percent Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) Sodium adsorption ratio, maximum in profile: 5.0 Available water storage in profile: High (about 10.2 inches) Interpretive groups Land capability classification (irrigated): 2e Land capability classification (nonirrigated): 6c Hydrologic Soil Group: C Ecological site: SILTY 8-11 PZ (R011XY012OR) Hydric soil rating: No

25E—Owyhee silt loam, 12 to 20 percent slopes

Map Unit Setting National map unit symbol: 23cl Elevation: 2,100 to 2,500 feet Mean annual precipitation: 8 to 10 inches Mean annual air temperature: 50 to 52 degrees F Frost-free period: 150 to 170 days Farmland classification: Farmland of statewide importance

Map Unit Composition Owyhee and similar soils: 85 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Owyhee Setting Landform: Terraces Landform position (three-dimensional): Riser Down-slope shape: Linear Across-slope shape: Linear Parent material: Lacustrine deposits Typical profile H1 - 0 to 16 inches: silt loam H2 - 16 to 38 inches: silt loam H3 - 38 to 60 inches: very fine sandy loam Properties and qualities Slope: 12 to 20 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding:

SOIL AND RISK

None Calcium carbonate, maximum in profile: 25 percent Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) Sodium adsorption ratio, maximum in profile: 5.0 Available water storage in profile: High (about 10.2 inches)

Interpretive groups Land capability classification (irrigated): 6e Land capability classification (nonirrigated): 6e Hydrologic Soil Group: C Ecological site: SILTY NORTH SLOPES 8-11 PZ (R011XY032OR) Hydric soil rating: No

36F—Xeric Torriorthents, very steep

Map Unit Composition Xeric torriorthents and similar soils: 100 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Xeric Torriorthents Setting Landform: Terraces Landform position (three-dimensional): Riser Down-slope shape: Linear Across-slope shape: Linear Parent material: Lacustrine deposits Typical profile H1 - 0 to 60 inches: variable Properties and qualities Slope: 20 to 60 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Well drained Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Interpretive groups Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 7e Ecological site: SHALLOW ESCARPMENT COMPLEX 8-11 PZ (R011XY022OR) Hydric soil rating: No Malheur County, Oregon, Northern Part NOTCOM—No Digital Data Available Map Unit Composition Notcom: 100 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Notcom Properties and qualities

Data Source Information

Soil Survey Area: Malheur County, Oregon, Northeastern Part
Survey Area Data: Version 14, Sep 11, 2019

Soil Survey Area: Malheur County, Oregon, Northern Part
Survey Area Data: Version 2, Sep 11, 2019

SOIL AND RISK ASSESSMENT



Phosphorus Index Report

Cannon Hill Feeders - 2019

Nyssa

Field	Acres	Soil	Soil Test Date	Bray P (ppm)	Olsen (ppm)	K (ppm)	pH	TFS	SFS	Score	Rating
LF1	13.1	21E, Nyssa	09/16/2019		9.0	195.0	8.6	6.25	15.0	93.75	Low
LF2	47.5	21B, Nyssa	11/17/2015		2.95	657.0	7.7	2.75	11.92	32.78	Low
LF3	89.9	25B, Owyhee	03/05/2019		24.0	758.0	7.4	2.75	11.9	32.73	Low
Pivot 1	119.9	23B, Malheur	09/16/2019		9.0	195.0	8.6	2.75	15.0	41.25	Low
Pivot 2	69.2	23B, Nyssa	03/05/2019		18.0	173.0	7.6	2.75	12.9	35.48	Low
Pivot 3	43.2	23A, Nyssa	09/16/2019		14.0	227.0	7.6	2.75	12.89	35.47	Low
Pivot 4	43.9	21B, Nyssa	09/16/2019		30.0	502.0	8.6	2.75	12.5	34.38	Low
LF4	8.4	23B, Nyssa	03/06/2019		24.0	758.0	7.4	2.0	11.9	23.8	Low
LF5	15.8	21B, Nyssa	03/06/2019		9.0	195.0	8.6	2.0	11.5	23.0	Low

SOIL AND RISK

PI Interpretations

<u>P-Index Rating</u>	<u>Interpretation for Oregon</u>	<u>Recommended Nutrient Limitation</u>
West PI Score ≤ 25 or East PI Score ≤ 100	The site has a LOW potential for P movement from the site. If farming practices are maintained at current levels, the probability of an adverse impact to surface water resources from P losses from this site are low. Phosphorus can be applied at rates greater than crop requirement	Nitrogen
West PI Score 25.1 to 50 or East PI Score 100.1 to 400	The site has a MEDIUM potential for P movement from the site. The probability for an adverse impact to surface water resources is greater than that from a LOW vulnerability rated site. Some remedial action should be taken to lessen the probability of P movement. Phosphorus can be applied not to exceed the crop requirement rate.	Phosphorus
West PI Score 50.1 to 75 or East PI Score 400.1 to 600	The site has a HIGH potential for P movement from the site. There is a high probability for an adverse impact to surface water resources unless action is taken to reduce the risk of P movement and probable water quality degradation. Phosphorus can be applied not to exceed the crop removal rate if the following requirements are met: A soil phosphorus drawdown strategy has been implemented, and A site assessment for nutrients and soil loss has been conducted to determine if mitigation practices are required to protect water quality.	Phosphorus
West PI Score > 75 or East PI Score > 600	ZERO OUT- The environmental threshold above which the risk of P loss from a field is too great to warrant the application of P for plant production.	No Manure

SUPPLEMENTAL

**Notice of Registration and Oregon Confined Animal Feeding Operation (CAFO)
National Pollutant Discharge Elimination System (NPDES) General Permit Summary**

Overview of CAFO General Permit Summary	The Oregon CAFO General Permit No. 01-2016 (permit) was issued by the Oregon Department of Agriculture (ODA) and Department of Environmental Quality (DEQ) on March 31, 2016 and became effective on April 20, 2016. The permit expires on February 28, 2021. A copy of the permit is enclosed. This Notice of Registration describes your specific permit registration information and an overview of permit requirements. Your large concentrated CAFO was registered to CAFO Permit No. 1-2016 on April 28, 2017, based on information provided by you as follows:
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Master Address No. AG-P0182893CAFG

EPA Registration No. ORG010177

	Operator	Legal owner, if different
Name	Henry Mautz	
Business Name	Lightning Feeders	
Mailing Address	PO Box 1625, Nyssa, OR 97913	
Facility Address	3127 Kimberly Rd., Nyssa, OR 97913	
Phone	541/372/5680	
Cell	208/283/5021	
E-mail Address	N/A	
Maximum Number of Animals	The maximum number of animals that may be held at this feedlot CAFO is 11,000 cattle based on a herd composition of 11,000 mature cattle . You may not exceed this number by more than 10% or 25 animals; whichever is greater, without first providing ODA with a revised Animal Waste Management Plan (AWMP) and receiving written ODA approval.	
Facility Classification	Based on the type and size of your operation, ODA has determined that you operate a large concentrated CAFO . <i>Note: Large Concentrated CAFOs have additional requirements. Please see general permit.</i>	

Malheur County

Annual Permit Fee	Each fiscal year, you will be assessed an annual compliance fee of \$300.00 to maintain this registration under the general permit.
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For Questions/ Additional Information	If you have questions, call your regional livestock water quality specialist for Area VI at (541) 881-6020 or the Salem office at (503) 986-4699 . Additional CAFO program information is available on the internet at http://oregon.gov/ODA/NRD/cafo_front.shtml
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General Permit Conditions	The operator must be in compliance with <u>all</u> terms and conditions of the permit (not only this summary of the permit) at all times.
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Prohibited Discharges See permit section S2.A, pg. 10 for full text.	The following types of discharges are prohibited: - Contaminated runoff from confinement or waste accumulation areas; - Overflow or discharges from waste storage facilities; - Discharges due to improper land application activities from seepage below the root zone, surface drainages or field tile outlets; - Discharges due to equipment failure; and - Leakage or seepage from facilities in the production area in excess of approved designs
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When Discharge is Allowed Permit sections S2.B, pg. 10; G14, Pg. 24, S2.C, Pg. 10, 11	Production Area: Discharges of process waste water to surface waters of the state are generally prohibited except: - When rainfall events cause an overflow of waste management and storage facilities designed, constructed, operated, and maintained to contain all manure, litter and process wastewaters including the runoff and direct precipitation from a 25-year, 24-hour rainfall event; and the production area is operated in accordance with the applicable inspection, maintenance, recordkeeping, and reporting requirements of this permit. - All authorized discharges from the production area must be properly land applied or otherwise handled in a way that minimizes impacts on surface water and groundwater sources. Land Application Area: Registrant must apply manure, litter and process wastewater to land at agronomic rates in accordance with the permit registrant's ODA-approved AWMP.
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Animal Waste Management Plan (AWMP) Requirement Permit section S3, pg. 13-16.	The permit requires that each permitted operation have a current AWMP approved by ODA. An AWMP describes how a CAFO is managed with respect to containment, treatment, storage, and utilization of manure, litter, and process wastewater in order to remain in compliance with permit conditions and water quality laws. The AWMP must accurately represent current land base, manure storage, herd/flock size, and current management practices used at the livestock operation. The AWMP must reflect production practices and be implemented accordingly.
Storage Requirement Permit section S2.E, pg. 11.	You must provide adequate storage capacity for solid and liquid wastes at all times so that land application occurs only during periods when soil and weather conditions allow for agronomic application and are in compliance with the Land Application Limitations in S2.C.
Monitoring, Recordkeeping & Reporting Permit section S4, pg. 17-20.	Monitoring, recordkeeping and reporting of waste applications, and inspection requirements must occur as described in an AWMP approved by ODA and requirements in section S4. of the permit. <i>Note: Large concentrated CAFOs have additional requirements.</i>
Land Application Rates & Timing Permit sections S2.C, pg. 10 & 11; S3.C, pg. 13 & 14.	You must apply manure, litter and process wastes to lands at agronomic rates in accordance with the permit registrant's ODA-approved AWMP. Waste applications must not exceed the capacity of the soil and crops to assimilate nutrients and minimize water pollution, must be quantifiable, and based on the NRCS Phosphorous Index, Agronomy Technical Note #26, revised June 2008, and must account for all other nitrogen and phosphorus. Prohibitions: If discharge to surface water or groundwater will result, application to flooded and saturated land is prohibited. Proposed waste and wastewater application to frozen soil must be included in an AWMP. Land application of wastes or wastewater during rainfall events that are expected to result in saturated soils or surface runoff is prohibited.
Duty to Report Noncompliance Permit section S4.D.1, pg. 19.	If at any time you are unable to comply with any permit conditions, you have a duty to contact ODA immediately so the situation can be assessed and remedial actions taken if necessary. <i>Note: If you have a discharge to surface water or groundwater that is not allowed by the permit, you must notify ODA within 24 hours of the discharge. Please call your area livestock water quality specialist (see page 1 for phone number) at or CAFO Program support in Salem at (503) 986-4699.</i>
Annual Report Permit section S4.D.2, pg. 19.	You must submit an annual report to ODA by March 15th of each year.
Construction of Waste Storage and Waste Water Control Facilities Permit section S2.E.2, pg. 11.	S2.E. 2 of the permit states that you "must site, design, construct, operate, and maintain all waste storage facilities consistent with the AWMP approved by ODA. New and modified construction of waste facilities must be approved in advance and prior to construction by ODA in conformance with ORS 468B.055 and OARs 340-051 and 603-074." Experimental or unproven technologies must receive prior approval from ODA. For all other modifications or new construction, no approval will be required. Certification forms are available from ODA.
Public Noticing & Participation Permit section S1.H, pg. 8 & 9	Prior to approving new permit coverage, renewing permit coverage, or approving proposed substantial changes to an AWMP, ODA will provide public notice and participation.


Ray Jaendl, Director
Natural Resources and Pesticide Programs

**OREGON DEPARTMENT OF AGRICULTURE
MODIFICATION OF ANIMAL NUMBERS
National Pollutant Discharge Elimination System
(NPDES PERMIT)**

Statutory Authority
Oregon Revised Statutes (ORS) 468B.050 When permit required
ORS 468B.210 Maximum numbers of animals based on ability to contain, treat, hold and dispose of
wastes as necessary to comply with all conditions of the permit.

A. General Information

Master Address #AG-P0182893CAFG EPA#ORG010177

Name or Business Name – Cannon Hill Feeders

Facility Location Address – 3127 Kimberly Rd

City – Nyssa, OR

Zip Code 97913

County - Malheur

B. Livestock Type: Circle the item that best represents your operation.

1. Beef Feedlot (Fattening) 2. Beef Cattle (Cow/calf) 3. Hogs 4. Sheep and Goats
5. Dairy Farm, Heifer Replacement Farm 6. Poultry/Broiler 7. Poultry/Eggs
7. Mink/Rabbits 8. Horses and Other Equine 9. Other _____

C. Current Permitted Animal Numbers: In the space below please describe your number of animals by herd composition or class.
Lightning Feeders is a Large Concentrated CAFO currently permitted for 11,000 Beef Cattle.

D. Current Permitted CAFO Designation: Circle one. See reverse side for table.

Large Concentrated Medium Concentrated Medium Confined Small Confined Small Concentrated

E. Proposed change in permitted animal numbers: In the space below please describe your proposed animal numbers by herd composition or class.
Lightning Feeders is requesting to be permitted for 20,000 Beef Cattle.

F. New CAFO Designation based on increase / decrease in animal numbers. Circle one. See reverse side for table.

Large Concentrated Medium Concentrated Medium Confined Small Confined Small Concentrated

G. Certification:

I understand that an approved animal waste management plan is required prior to permit increase. I agree to prepare and implement an animal waste management plan in accordance with the requirements and timelines specified in the permit.

Signature (operator or owner)

Date

Print Name

Signature (operator or owner)

Date

Print Name

Definition of Legally Authorized Representative: See 40 CFR 122.22 for more detail. Please also provide the information requested in brackets []	
◆	Corporation — President, secretary, treasurer, vice-president, or any person who performs principal business functions; or a manager of one or more facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million that is authorized in accordance to corporate procedure to sign such documents
◆	Partnership — General partner <i>[list of general partners, their addresses, and telephone numbers]</i>
◆	Sole Proprietorship — Owner(s) <i>[each owner must sign the application]</i>
◆	City, County, State, Federal, or other Public Facility — Principal executive officer or ranking elected official
◆	Limited Liability Company — Member <i>[articles of organization]</i>
◆	Trusts — Acting trustee <i>[list of trustees, their addresses, and telephone numbers]</i>

SEND THIS FORM TO:

Oregon Department of Agriculture
 Natural Resources Division
 635 Capitol Street NE
 Salem, Oregon 97301-2532

ANIMAL MODIFICATION REQUEST INSTRUCTIONS

A. GENERAL INFORMATION:

1. Enter the legal name.
2. Enter the common name of the facility or operation, if different than the legal name.
3. Enter the facility's physical address (physical location), including city, state, zip code and telephone number.

B. CIRCLE THE APPROPRIATE LIVESTOCK TYPE OF YOUR OPERATION.

- C. Self-explanatory
 D. Self-explanatory
 E. Describe your proposed animal increase by herd composition or class
 F. Self-explanatory
 G. Signature

CAFO Designation by Size Threshold (used for items D and F)

	Confined		Concentrated		
	Confines more than one animal for more than 4 months on prepared surface		Stabled or confined and fed or maintained for total of 45 days or more in any 12-month period Crops, vegetation, forage growth, or post-harvest residues not sustained in normal growing season in lot or facility		
	<i>Small Confined</i> Waste water control facility or disposal system for wet wastes	<i>Medium Confined</i> Waste water control facility or disposal system for wet or dry wastes	<i>Small Concentrated</i> Significant contributor of pollutants to waters of the U.S. Designated by director [40CFR §122.23(b)(9)]	<i>Medium Concentrated</i> Discharging pollutants to waters of the U.S. [40 CFR §122.23(b)(6)]	<i>Large Concentrated</i> [40 CFR §122.23(b)(4)]
Animal sector	Small Confined	Medium Confined	Small Concentrated	Medium Concentrated	Large Concentrated
Mature dairy cows ¹	<200	200-699	<200	200-699	≥700
Veal calves	<300	300-999	<300	300-999	≥1,000
Cattle ²	<300	300-999	<300	300-999	≥1,000
Swine > 55 lbs	<750	750-2,499	<750	750-2,499	≥2,500
Swine < 55 lbs	<3,000	3,000-9,999	<3,000	3,000-9,999	≥10,000
Horses	<150	150-499	<150	150-499	≥500
Sheep or lambs	<3,000	3,000-9,999	<3,000	3,000-9,999	≥10,000
Turkeys	<16,500	16,500-54,999	<16,500	16,500-54,999	≥55,000
Chickens, including laying hens or broilers w/wet waste system manure handling system)	<9,000	9,000-29,999	<9,000	9,000-29,999	≥30,000
Laying hens w/dry waste system	NA	25,000-81,999	<25,000	25,000-81,999	≥82,000
Broiler chickens w/dry waste system	NA	37,500-124,999	<37,500	37,500-124,999	≥125,000
Ducks w/other than wet waste system	<10,000	10,000-29,999	<10,000	10,000-29,999	≥30,000
Ducks w/wet waste system	<1,500	1,500-4,999	<1,500	1,500-4,999	≥5,000
Other animal type	As determined by ODA. ³		Designated by director.	NA	NA

¹ Whether milked or dry.

² Other than mature dairy cows or veal calves; cattle includes but is not limited to heifers, steers, bulls and cow/calf pairs.

³ To determine the number of animals that require permit coverage, ODA will compare the operation to the most similar animal type in the table.

STORM DRAINAGE MASTER
CALCULATIONS FOR:

Mautz Feedlot
Nyssa, Oregon

Revised March 31, 2006
Job No. AP1005

AS PREPARED BY:
Earl, Mason, & Stanfield, Inc.
314 Badiola St.
Caldwell, Idaho 83605
(208) 454-0256



EXPIRATION DATE 12/31/2006

Stamp date April 3, 2006

RECEIVED
APR 10 2006
NATURAL RESOURCES
DIVISION

CALCULATION METHODOLOGY

VOLUME CALCULATIONS

Monthly precipitation and evaporation rates were obtained utilizing the Malheur Branch Experiment Station. The highest 6 month precipitation rates with the corresponding evaporation rates were utilized to examine the worst case 6 month runoff volume. Rainfall runoff for the basin areas are calculated using 100% runoff for the hard surface (concrete) areas and 25% runoff for the unpaved areas which drain into the runoff storage ponds. Storage facilities are designed for a 25-year 24-hour return frequency storm which has been calculated as the worst case condition.

The storage ponds have been oversized per the owner's request. In addition, bentonite lining was added for seepage control also at the request of the owner.

STORM DRAINAGE DESIGN CALCULATIONS

PROJECT: Mautz Feedlot
 JOB NO.: AP1005
 LOCATION: Nyssa, Oregon
 DATE: Revised March 31, 2006
 BY: WJM

DESIGN CRITERIA

Runoff Areas		
Description	Basin 1	Basin 2
Unpaved Corral	1,379,925	2,065,184
Conc. Feedbunk	46,570	78,280
Gravel Transfer Alley	82,380	164,935

	Basin 1	Basin 2
Runoff Area	1,508,875	2,308,399

Climatic and Hydrologic Data

Climatic Station-Malheur Branch Experiment Station

25 Yr - 24 Hr. Storm Rainfall = 1.8 inches

Month	Monthly Average in Inches		% Lot Runoff Factors	
	Precipitation	Evaporation	Concrete	Unpaved
January	1.26	0.74	100	25
February	0.98	1.09	100	25
March	0.92	2.06	100	25
April	0.70	3.79	100	25
May	0.98	5.12	100	25
June	0.83	6.08	100	25
July	0.19	7.62	100	25
August	0.38	6.51	100	25
September	0.49	4.03	100	25
October	0.71	1.98	100	25
November	1.21	0.50	100	25
December	1.32	0.71	100	25
Annual	9.97	40.23		

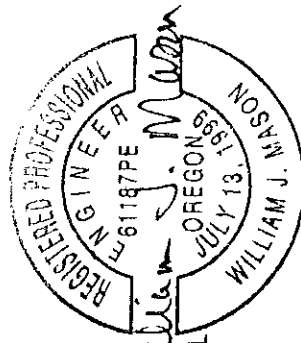
Worst Case

180 days 6.39 inches 8.89 inches

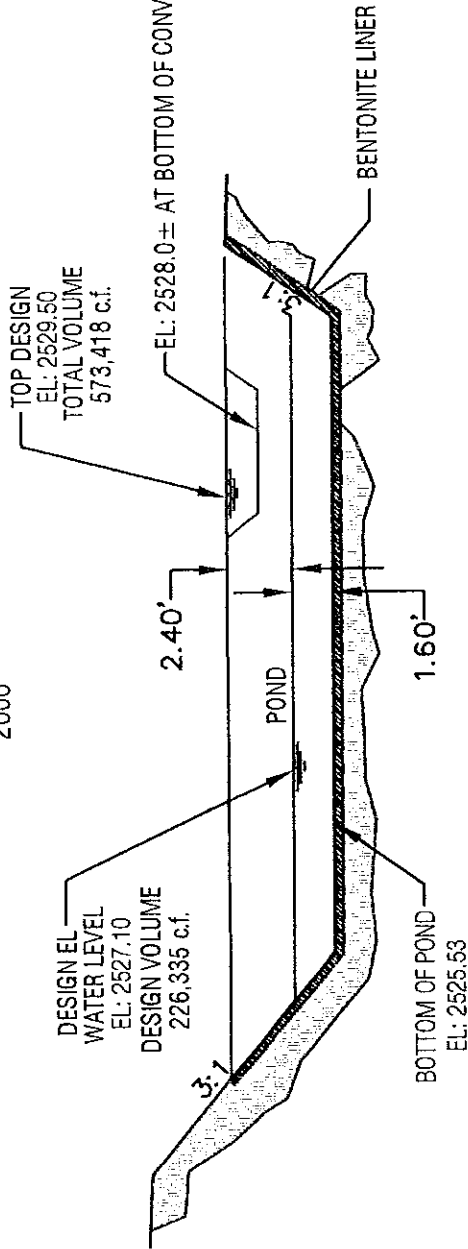
	Basin 1		Basin 2	
Accumulated Runoff Volume	219,466.4	cf	338,567.2	cf
Design Storm Runoff Volume	226,331.3	cf	346,259.9	cf

SITE PLAN MAUTZ FEEDLOT

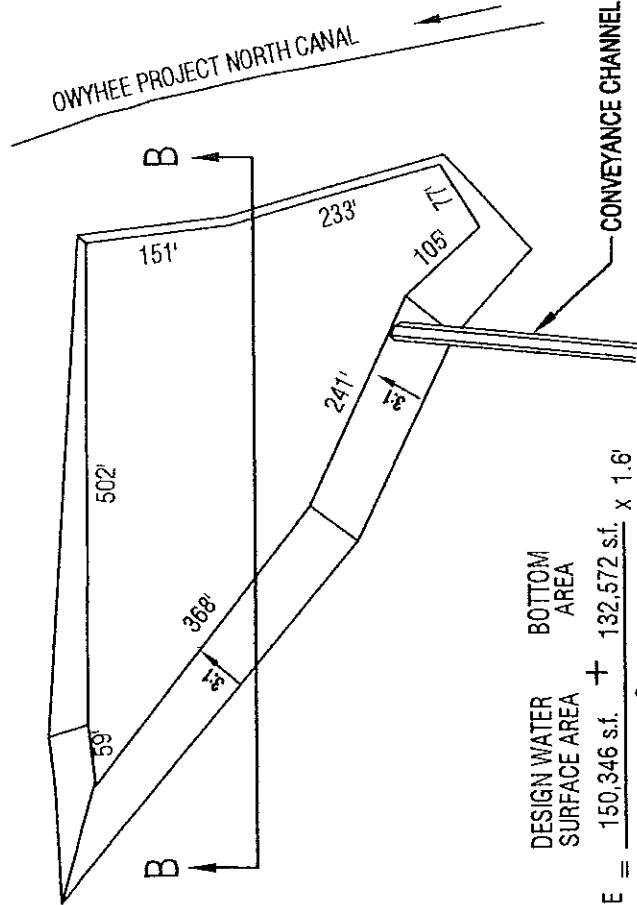
PART OF THE N 1/2, SECTION 28, T. 19 S., R. 46 E., W.M.,
MALHEUR COUNTY, OREGON
2006



EXPIRATION DATE: 12/31/2006
Stamp date 4/4/06



TYPICAL POND CROSS SECTION B-B
N.T.S.



$$\text{DESIGN VOLUME} = \frac{\text{DESIGN WATER SURFACE AREA} + \text{BOTTOM AREA}}{2} \times 1.6'$$

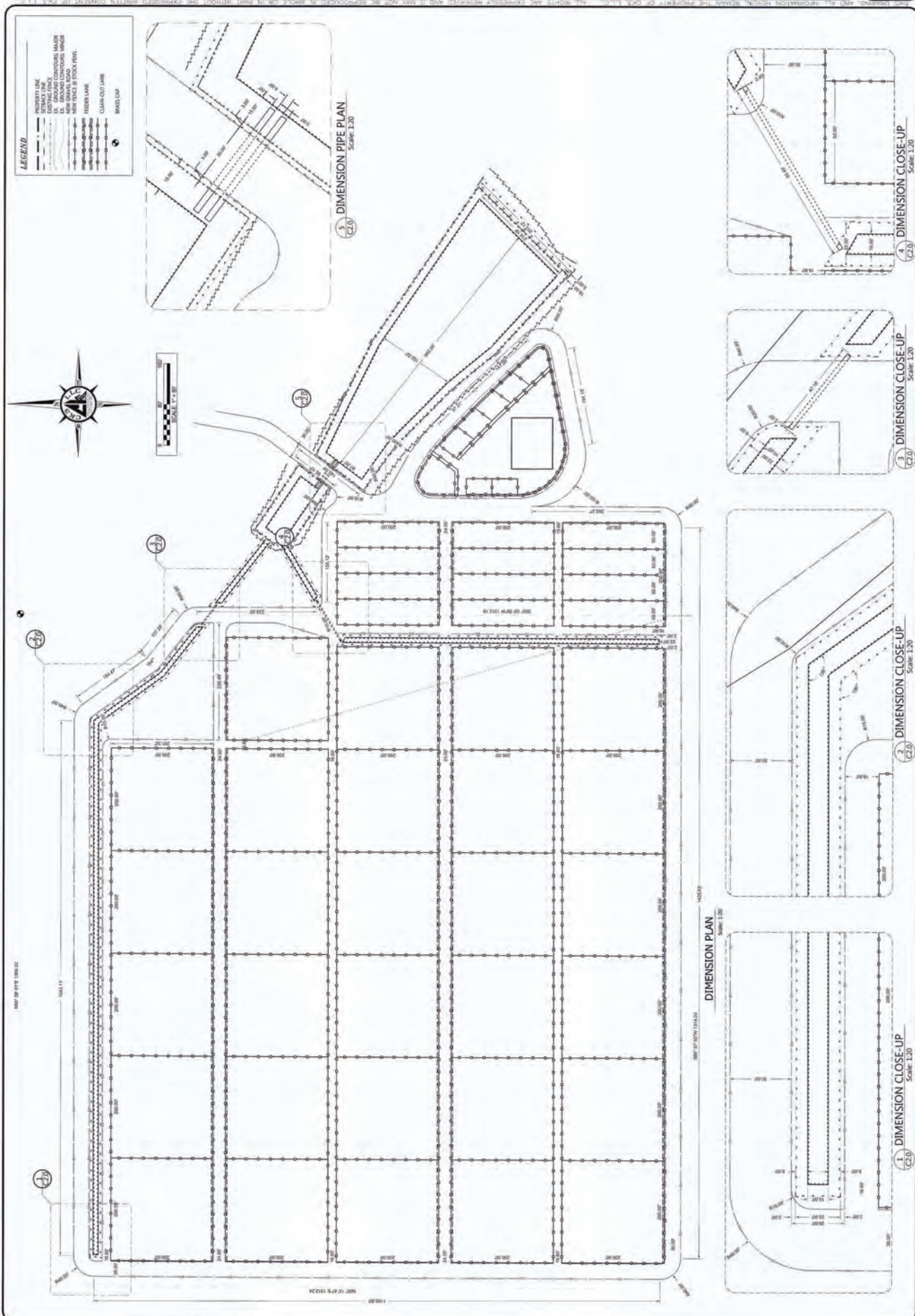
$$= \frac{150,346 \text{ s.f.} + 132,572 \text{ s.f.}}{2} \times 1.6'$$

$$= 226,335 \text{ c.f.}$$



Marl Mason & Standfield, Inc.
Professional Engineers, Land Surveyors & Planners
514 S. 4th St. # 2nd Floor, ID 83806
(208) 464-0256
(208) 464-0979 Fax
RT720002.0mg 11/16/05
SHEET 1 of 2





Block & Page:	1/1
Drawn By:	AS/SSM
Checked By:	SS/MS
Approved By:	1/21
Project Name:	Site Plan
Project No.:	021000
Revision:	02/2021

DATE	DESCRIPTION



CS3, LLC
 CIVIL, STRUCTURAL, ELECTRICAL
 ENGINEERING, SURVEYING & PLANNING
 345 W. 5th Avenue
 Medford, OR 97504
 P: (541) 588-5411 F: (541) 587-2345
 WEB: cs3llc.net

**NEW CONTAINMENT & POND
 SITE PLAN**
 LIGHTENING FEEDERS
 SITE DEVELOPMENT
 NASSA, OREGON
 ZACHARY MAITZ
 P.O. BOX 2603
 NASSA, OREGON 97913
 CLIENT:

C3.0
 SHEET NO. 1 OF 1
 DWG NO. 021000
 REV NO. 02/2021

STORAGE CALCULATIONS

VOLUME = AREA * AREA * 4.5'

UPPER POND:	2
5,156.71' x 18,886.40' x 4.5' = 406,536.61	
LOWER POND:	2
87,884.9' x 135,125.68' x 4.5' = 406,536.61	
STORAGE REQUIRED:	2
293,071' x 406,536' = 119,428,156	
STORAGE PROVIDED:	2
293,071' x 406,536' = 119,428,156	

